

Virtual Business Service–Availability User's Guide

Veritas Operations Manager 5.0

Virtual Business Service–Availability User's Guide

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Overview of Virtual Business Services

This chapter includes the following topics:

- [About Virtual Business Services](#)
- [Features of Virtual Business Services](#)
- [Sample Virtual Business Service configuration](#)
- [Virtualization support in Virtual Business Services](#)
- [About the Veritas Operations Manager policy checks for Virtual Business Services](#)
- [Supported software for Virtual Business Services](#)

About Virtual Business Services

Virtual Business Services provide continuous high availability and reduce frequency and duration of service disruptions for multi-tier business applications running on heterogeneous operating systems and virtualization technologies. A Virtual Business Service represents the multi-tier application as a single consolidated entity and builds on the high availability and disaster recovery provided for the individual tiers by Symantec products such as Veritas Cluster Server and Symantec ApplicationHA. Additionally, a Virtual Business Service can also represent all the assets used by the service such as arrays, hosts, and file systems, though they are not migrated between server tiers. A Virtual Business Service provides a single consolidated entity that represents a multi-tier business service in its entirety. Application components that are managed by Veritas Cluster Server or Symantec ApplicationHA can be actively managed through a Virtual Business Service.

You can configure and manage Virtual Business Services created in Veritas Operations Manager by using Veritas Operations Manager Virtual Business Services Availability Add-on. Besides providing all the functionality that was earlier available through Business Entity Operations Add-on, VBS Availability Add-on provides the additional ability to configure fault dependencies between the components of the multi-tier application.

Note: All the Application Entities that were created using Veritas Operations Manager Business Entity Operations Add-on versions 3.1 and 4.0 are available as Virtual Business Services after you deploy the VBS Availability Add-on in Veritas Operations Manager 5.0. Veritas Operations Manager 5.0 is a prerequisite for running Virtual Business Services.

See [“Enabling fault management for a Virtual Business Service”](#) on page 77.

See [“Starting and stopping Virtual Business Services”](#) on page 66.

Features of Virtual Business Services

You can use the VBS Availability Add-on to perform the following tasks:

- Start Virtual Business Services from the Veritas Operations Manager console. When a Virtual Business Service starts, its associated service groups are brought online.
- Stop Virtual Business Services from the Veritas Operations Manager console. When a Virtual Business Service stops, its associated service groups are taken offline.
Applications that are under the control of Symantec ApplicationHA can be part of a Virtual Business Service. Symantec ApplicationHA enables starting, stopping, and monitoring of an application within a virtual machine. If applications are hosted on VMware virtual machines, you can configure the virtual machines to automatically start or stop when you start or stop the Virtual Business Service.
- Establish service group relationships and set the order to bring service groups online and to take them offline. It ensures that the service groups from different clusters are brought online or taken offline in the correct order. This order is governed by the service group's relationships with other service groups, which are referred to as child service groups. Setting the correct order of service group dependency is critical to achieve business continuity and high availability.
- Establish service group relationships and specify the required reaction of an application component to a high availability event in an underlying tier.

- Manage the Virtual Business Service from Veritas Operations Manager or from the clusters participating in the Virtual Business Service.
- Recover the entire Virtual Business Service to a remote site when a disaster occurs.

However, the following operations cannot be managed using VBS Availability Add-on:

- The service group operations that are performed using the Veritas Cluster Server management console.
- The service group operations that are performed using the Veritas Cluster Server command-line interface.
- The service group operations that are performed using the Veritas Cluster Server Java console.
- VBS Availability Add-on is not supported for composite Virtual Business Services. You can use it only for Virtual Business Services.

See [“Starting and stopping Virtual Business Services”](#) on page 66.

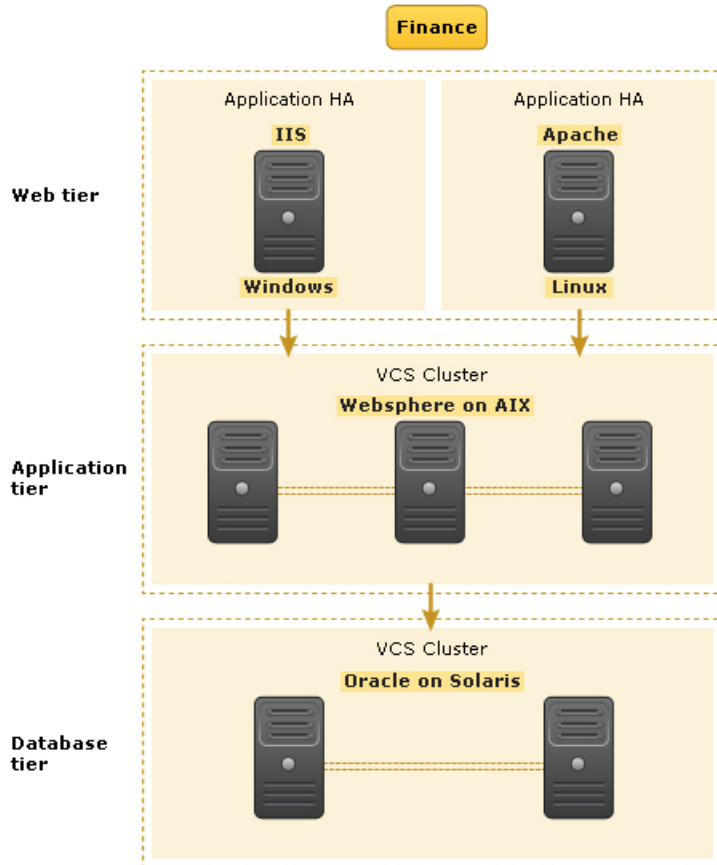
Sample Virtual Business Service configuration

This section provides a sample Virtual Business Service configuration comprising a multi-tier application. [Figure 1-1](#) shows a Finance application that is dependent on components that run on three different operating systems and on three different clusters.

- Databases such as Oracle running on Solaris operating systems form the database tier.
- Middleware applications such as WebSphere running on AIX operating systems form the middle tier.
- Web applications such as Apache and IIS running on Windows and Linux virtual machines form the Web tier. This tier is composed of ApplicationHA nodes.

Each tier can have its own high availability mechanism. For example, you can use Veritas Cluster Server for the databases and middleware applications, and Symantec ApplicationHA for the Web servers.

Figure 1-1 Sample Virtual Business Service configuration



Each time you start the Finance business application, typically you need to bring the components online in the following order – Oracle database, WebSphere, Apache and IIS. In addition, you must bring the virtual machines online before you start the Web tier. To stop the Finance application, you must take the components offline in the reverse order. From the business perspective, the Finance service is unavailable if any of the tiers becomes unavailable.

When you configure the Finance application as a Virtual Business Service, you can specify that the Oracle database must start first, followed by WebSphere and the Web servers. The reverse order automatically applies when you stop the Virtual Business Service. When you start or stop the Virtual Business Service, the components of the service are started or stopped in the defined order.

See [“About Virtual Business Services”](#) on page 13.

Virtualization support in Virtual Business Services

Applications that are under the control of Symantec ApplicationHA can be part of a Virtual Business Service. ApplicationHA architecture uses the agent framework to monitor the state of the applications and their dependent components running on the virtual machines. It supports virtualization technologies such as VMware, LPAR, OracleVM Server for SPARC (formerly LDOM), and KVM.

When an application running on a non-VMware virtual machine is part of a Virtual Business Service, you can:

- Enable fault management for the Virtual Business Service.
- Specify the order in which applications must start and stop when you start or stop the Virtual Business Service.

When an application running on a VMware virtual machine is part of a Virtual Business Service, you can perform the tasks that are supported for non-VMware virtual machines. Additionally, you can:

- Configure the virtual machine to start or stop when you start or stop the Virtual Business Service.

For more information on ApplicationHA, see the *Symantec ApplicationHA User's Guide*.

See [“Enabling fault management for a Virtual Business Service”](#) on page 77.

See [“Configuring Virtual Business Service start and stop using Veritas Operations Manager Virtual Business Services Availability Add-on”](#) on page 53.

VMware virtualization support in VBS Availability Add-on

With managed hosts virtualization support, Veritas Operations Manager users can manage Virtual Business Service's services groups that are configured on virtual hosts. If the host is turned off, Veritas Operations Manager automatically starts the host using the virtual server that is specified for the host. The ability to automatically start the managed hosts ensures the availability of configured service groups.

You can use the virtualization management feature of Veritas Operations Manager to add VMware vCenter Server. Navigate to **Settings > Virtualization** to perform the operations that are related to virtual infrastructure management.

See [“VMware virtualization support prerequisites for Veritas Operations Manager Virtual Business Services Availability Add-on”](#) on page 18.

See [“Virtualization workflow for Virtual Business Service start operation”](#) on page 68.

See [“Virtualization workflow for Virtual Business Service stop operation”](#) on page 71.

VMware virtualization support prerequisites for Veritas Operations Manager Virtual Business Services Availability Add-on

Ensure that you meet the following prerequisites before configuring the VMware virtualization support in VBS Availability Add-on:

- The virtual systems in the service group's system list are already added to Veritas Operations Manager as managed hosts.
- The virtual machine must already be registered on a host where it can be online when viewed from the VMware vCenter Server. The vCenter Server for the virtual machine is already added to Veritas Operations Manager.
To know more about the virtual center configuration in the Veritas Operations Manager, refer to the *Veritas Operations Manager Management Server Administrator's Guide*.

See [“VMware virtualization support in VBS Availability Add-on”](#) on page 17.

About the Veritas Operations Manager policy checks for Virtual Business Services

In Veritas Operations Manager policy checks use individual rules to validate whether the datacenter configuration conforms to a predefined standard. These individual rules are referred to as signatures. You can select one or more such signatures, add them to your policy template, and scan the datacenter storage objects using that policy template.

When you install VBS Availability Add-on, it automatically installs VBS-specific signature. You can view the signature under the **Policies > Installed signatures** option of Veritas Operations Manager console. The VBS Availability Configuration signature checks for the following parameters:

- VBS package installation status
- Fault management status
- Presence of service group in a Virtual Business Service
- Cluster service group availability and state

For each policy template, you can view its previous scan cycles, scan violations summary, and the ignored violations.

For more information on policies and signatures, refer to *Using Policy Check* chapter of *Veritas Operations Manager Management Server Administrator's Guide*

Supported software for Virtual Business Services

[Table 1-1](#) lists the software supported for Virtual Business Services.

Table 1-1 Supported software

Category	Platform	Version
Operating system	Solaris on SPARC	9
		10
		11
	Solaris on x86_64	10
		11
	Red Hat Enterprise Linux	5 Update 4 and later 6 and later
	SUSE Linux Enterprise Server (SLES)	10 SP4 11 SP1 11 SP2
	OEL5	OEL5 U5, U6, U7, U8
	OEL6	OEL6 U1, U2, U3
	AIX on Power5, AIX on Power6, and AIX on Power7	5.3 6.1 7.1
HP-UX on PA-RISC, HP-UX on IA64	11iv3	
Windows	Windows Server 2003 R2 Windows Server 2003 SP2 Windows Server 2008 Windows Server 2008 R2	

Table 1-1 Supported software (*continued*)

Category	Platform	Version
Storage Foundation and High Availability for UNIX	HP-UX on PA-RISC, HP-UX on IA64	5.0.1RP3 5.1 SP1RP1 6.0 6.0.1
	Linux, Solaris, AIX	5.1 5.1SP1 with latest PR or RP 6.0 6.0.1
Storage Foundation and High Availability for Windows	Windows	5.1SP1 5.1SP2 6.0 6.0.1
Symantec ApplicationHA	Supported Windows and Linux guest operating systems on VMware	5.1 SP2
	Supported Windows and Linux guest operating systems on VMware	6.0
	Supported KVM, LPAR, and Oracle VM Server for SPARC (formerly LDOM) guest operating systems	

Internationalization (I18N) support

Internationalization support for Virtual Business Services is available in Level 0.

Level 0 denotes that the base product (the English version) functions correctly on the local operating system.

Installing and configuring Virtual Business Services

This chapter includes the following topics:

- [About the Virtual Business Services components](#)
- [Virtual Business Services workflow](#)
- [Support matrix for VBS](#)
- [Prerequisites for using VBS Availability Add-on](#)
- [Installing Veritas Operations Manager Virtual Business Services Availability Add-on](#)
- [Installing the VRTSvbs package using Veritas Operations Manager](#)
- [Configuring a Virtual Business Service](#)

About the Virtual Business Services components

[Table 2-1](#) lists the components that enable the Virtual Business Service functionality.

Table 2-1 Virtual Business Services components

Components	Role
Veritas Cluster Server and Symantec ApplicationHA	Provide high availability for individual components of Virtual Business Services.
Veritas Operations Manager	Provides the management capability for Virtual Business Services.

Table 2-1 Virtual Business Services components (*continued*)

Components	Role
Veritas Operations Manager Virtual Business Services Availability Add-on	Is installed on Veritas Operations Manager Management Server to configure and manage Virtual Business Services. You can create a Virtual Business Service and configure it only by using Management Server.
The Virtual Business Services (VRTSvbs) package	Is installed on the nodes participating in the Virtual Business Service to enable inter-cluster fault management and command line operations for Virtual Business Services.

Note: You can use multiple Management Servers to manage the cluster nodes in a Virtual Business Service. However, you can enable fault management for a Virtual Business Service from only one Management Server.

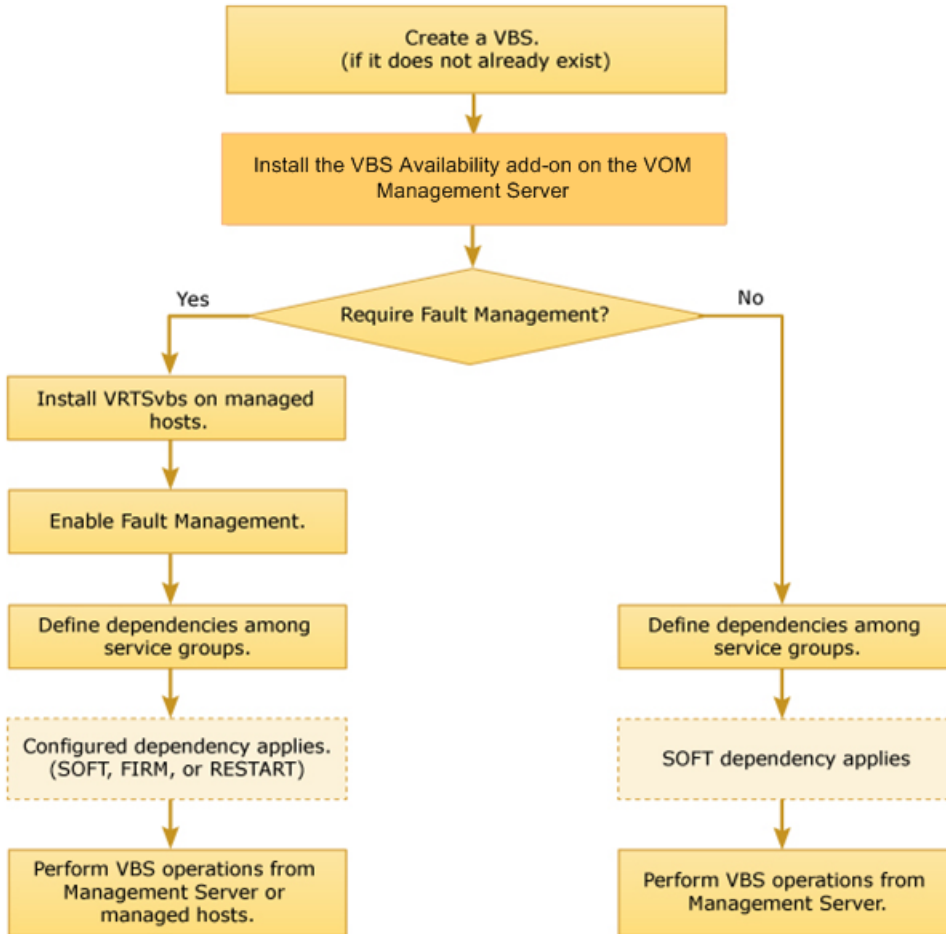
See [“About Virtual Business Services”](#) on page 13.

See [“Installing the VRTSvbs package using Veritas Operations Manager”](#) on page 26.

Virtual Business Services workflow

[Figure 2-1](#) illustrates the Virtual Business Services workflow.

Figure 2-1 Virtual Business Services workflow



Support matrix for VBS

The following matrix lists the supported VBS versions on a tier depending on the versions of Central Server (CS), VBS Addon, and Managed Hosts (MH) on the Veritas Operations Manager server.

Considerations for functionality introduced in VBS 6.0.1:

- For VBS 6.0.1 features to be available, the CS and VBS Availability Add-on and MH versions must all be 5.0 on the Veritas Operations Manager server.

- If a VBS comprises of tiers with VRTSvbs 6.0 and 6.0.1 versions, then the new features introduced in VBS 6.0.1 are not supported for that VBS.

Table 2-2 Support matrix for VBS

CS version	VBS Availability Add-on version	MH version	VBS version on first Tier	VBS version on second Tier	Supported VBS feature set
5.0	5.0	5.0	6.0.1	6.0.1	6.0.1
5.0	5.0	5.0	6.0.1	6.0	6.0
5.0	5.0	5.0	6.0.1	6.0	6.0
5.0	5.0	4.1	6.0.1	6.0.1	6.0
5.0	5.0	4.1	6.0.1	6.0	6.0
5.0	5.0	4.1	6.0	6.0	6.0
5.0	4.1	4.1	6.0.1	6.0.1	6.0
5.0	4.1	4.1	6.0.1	6.0	6.0
5.0	4.1	4.1	6.0	6.0	6.0
4.1	4.1	4.1	4.1	6.0.1	6.0
4.1	4.1	4.1	6.0.1	6.0	6.0

Prerequisites for using VBS Availability Add-on

Ensure that the following prerequisites are met before you start using VBS Availability Add-on:

- You are logged on as the Domain Administrator or the administrator of the Virtual Business Service.
- You have installed Veritas Operations Manager Management Server version 4.1, or later. The managed host version should also be 4.1, or later.

- You have configured high availability for the application components that are part of the Virtual Business Service either with Veritas Cluster Server or Symantec ApplicationHA.
For more information on the supported versions of Veritas Cluster Server and ApplicationHA:
See “[Supported software for Virtual Business Services](#)” on page 19.
- You have Veritas Operations Manager Add-on for Veritas Cluster Server Administration enabled on Management Server.
- Port 2410 is open for Virtual Business Service daemon communication.

Installing Veritas Operations Manager Virtual Business Services Availability Add-on

Install Veritas Operations Manager Virtual Business Services Availability Add-on on Management Server.

To install VBS Availability Add-on

- 1 Download Veritas Operations Manager Virtual Business Services Availability Add-on to a temporary directory on your computer from the following location:
<https://sort.symantec.com/vom>
The add-on is available for download from Symantec FileConnect and Trialware too.
- 2 In the Veritas Operations Manager console, select **Settings > Deployment**.
- 3 Upload the add-on to the repository by using the **Actions > Upload** option in the Deployment Management view.
- 4 Select the VBS Availability Add-on and click **Actions > Install**.
- 5 In the Install Solution panel, select the option to install the add-on.
- 6 Click **Actions > Install**.
- 7 Log out of Management Server.
- 8 Log in to Management Server. The Web server is restarted automatically.

Installing the VRTSvbs package using Veritas Operations Manager

To install the VRTSvbs package using Veritas Operations Manager

Skip this section if you installed or upgraded to VCS 6.0 or SFHA 6.0. VRTSvbs is automatically installed with these products.

Perform these steps if you installed an earlier supported version of VCS or SFHA. You must install the VRTSvbs package on each host of each cluster that you want to manage. VRTSvbs is not supported on the Management Server.

Note: Before you install the VRTSvbs package on a managed host, ensure that the VRTSsfmh package version 4.1 is installed on the host. If VRTSsfmh 4.1 is not installed, installation of VRTSvbs fails.

- 1 Download the VRTSvbs package to a temporary directory on your computer from the following location:

<https://sort.symantec.com/vom>

The package is available for download from Symantec FileConnect and Trialware too.

- 2 In the Veritas Operations Manager console, select **Settings > Deployment**.
- 3 Upload the package to the repository by using the **Actions > Upload** option in the Deployment Management view.

You need to upload the VRTSvbs package for each platform that you want to deploy VBS on.

- 4 Select VRTSvbs package, and then do one of the following:

- Click **Actions > Install**.
- Right-click VRTSvbs package and then select **Actions > Install**.

If you installed the VRTSvbs package on a host manually, the Management Server might not show that the VRTSvbs is installed on the host. To work around this issue, navigate to **Settings > Host Management**, and click the host on which you installed VRTSvbs manually. Click **Actions > Refresh Host(s)**.

- 5 In the Install Solution panel, select the required option (**Hosts** or **Platforms**). Select the hosts or platforms on which to install the VRTSvbs package and deploy Virtual Business Services.

- 6 Click **Actions > Install**.
- 7 In the Result panel, click **OK**.

Windows systems: When VRTSvbs is installed, an entry named **VRTSvbs** is created in the **Programs and Features** (Windows 2008) or **Add or Remove Programs**(Windows 2003) menu.

Note: Though you can also install the VRTSvbs package on a managed host from the Management Server, you can uninstall VRTSvbs only by using the command line on UNIX systems. On Windows systems, you can uninstall VRTSvbs only by using the **Programs and Features** (Windows 2008) or **Add or Remove Programs**(Windows 2003) option from the Control Panel.

See [“Uninstalling the VRTSvbs package”](#) on page 99.

Configuring a Virtual Business Service

Configuring a Virtual Business Service can be done only through Veritas Operations Manager.

After configuring a Virtual Business Service in Veritas Operations Manager, you can administer the Virtual Business Service by using the Management Server or by using the command line interface on managed hosts.

Considerations for creating a Virtual Business Service

Before you create a Virtual Business Service, ensure that you consider the following factors:

- The ClusterService group must not be selected as a part of the Virtual Business Service.
- At least one of the tiers in the Virtual Business Service is recommended to be a multi-node cluster.
- The names of clusters in the Virtual Business Service must be unique.
- No two Virtual Business Services can have the same name, irrespective of the case.

Note: Veritas Operations Manager is case-sensitive and lets you create two Virtual Business Services, say, *ABC* and *abc*. However, the VBS command line is case-insensitive and treats *ABC* and *abc* as the same Virtual Business Service. In such a situation, you must rename one Virtual Business Service.

- The name of a Virtual Business Service must not contain only numbers although Veritas Operations Manager does not caution you against creation of such a Virtual Business Service.

See [“About Virtual Business Services”](#) on page 13.

Creating Virtual Business Services

With Virtual Business Services, the administrators can treat a collection of objects as a single entity.

When generating Veritas Operations Manager reports, you can specify a Virtual Business Service to run the report on. The users with domain administrator role can manage the Virtual Business Service in Veritas Operations Manager.

You can create a Virtual Business Service in one of the following ways:

- From the Virtual Business Services view
- From the Business Entities view

To create a Virtual Business Service from the Virtual Business Services view

- 1 In the Veritas Operations Manager console, select **Manage > Virtual Business Services**.
- 2 In the **Virtual Business Services** view, at the top of the table that lists the Virtual Business Service, click **Actions > Create Virtual Business Service**.
- 3 In the **Virtual Business Service Attributes**, enter its name and description, and click **Next**.

See [“Virtual Business Service Attributes options for creating a Virtual Business Service”](#) on page 31.

- 4 In the **Select Base Object Types** panel, select one or more available items and click **Next**.

Each of the base object types that you select displays an associated Select Base item panel from which you can select items of that type.

See [“Select Base Object Types options for creating a Virtual Business Service”](#) on page 32.

- 5 In the Select Base item panels, do the following:
 - If the **Select Base Databases** panel appears, select one or more databases and click **Next**.
See [“Select Base Databases options for creating a Virtual Business Service”](#) on page 32.

- If the **Select Base Exchange Servers** panel appears, select one or more enclosures and click **Next**.
See “[Select Base Exchange Servers options for creating a Virtual Business Service](#)” on page 34.
 - If the **Select Base Clusters** panel appears, select one or more clusters and click **Next**.
See “[Select Base Clusters options for creating a Virtual Business Service](#)” on page 34.
 - If the **Select Base Service Groups** panel appears, select one or more service groups and click **Next**.
See “[Select Base Service Groups options for creating a Virtual Business Service](#)” on page 33.
 - If the **Select Base Hosts** panel appears, select one or more hosts and click **Next**.
See “[Select Base Hosts options for creating a Virtual Business Service](#)” on page 33.
 - If the **Select Base File Systems** panel appears, select one or more file systems and click **Next**.
See “[Select Base File Systems options for creating a Virtual Business Service](#)” on page 33.
 - If the **Select Base Disk Groups** panel appears, select one or more disk groups and click **Next**.
See “[Select Base Disk Groups options for creating a Virtual Business Service](#)” on page 35.
 - If the **Select Base Enclosures** panel appears, select one or more enclosures and click **Next**.
See “[Select Base Disk Groups options for creating a Virtual Business Service](#)” on page 35.
- 6 In the **Business Entity Summary** panel, review your selections and click **Finish**.
See “[Virtual Business Service summary for creating a Virtual Business Service](#)” on page 35.
 - 7 In the **Results** panel that confirms the creation of the Virtual Business Service, click **OK**.

To create a Virtual Business Service from the business entities view

- 1 In the Veritas Operations Manager console, select **Manage > Business Entities**.
- 2 In the **Business Entities** view, at the top of the table that lists the Virtual Business Service, click **Actions > Create Business Entities (VBS/OE)**.
- 3 In the **Business Entity Attributes**, select the type of business entity as **Virtual business Service**. Enter its name and description, and click **Next**.

See [“Business Entity Attributes options for creating a business entity”](#) on page 35.

- 4 In the **Select Base Object Types** panel, select one or more available items and click **Next**.

Each of the base object types that you select displays an associated Select Base item panel from which you can select items of that type.

See [“Select Base Object Types options for creating a business entity”](#) on page 36.

- 5 In the Select Base item panels, do the following:

- If the **Select Base Databases** panel appears, select one or more databases and click **Next**.

See [“Select Base Databases options for creating a business entity”](#) on page 37.

- If the **Select Base Exchange Servers** panel appears, select one or more enclosures and click **Next**.

See [“Select Base Exchange Servers options for creating a business entity”](#) on page 39.

- If the **Select Base Clusters** panel appears, select one or more clusters and click **Next**.

See [“Select Base Clusters options for creating a business entity”](#) on page 37.

- If the **Select Base Service Groups** panel appears, select one or more service groups and click **Next**.

See [“Select Base Service Groups options for creating a business entity”](#) on page 38.

- If the **Select Base Hosts** panel appears, select one or more hosts and click **Next**

See [“Select Base Hosts options for creating a business entity”](#) on page 37.

- If the **Select Base File Systems** panel appears, select one or more file systems and click **Next**

See [“Select Base File Systems options for creating a business entity”](#) on page 38.

- If the **Select Base Disk Groups** panel appears, select one or more disk groups and click **Next**
 See [“Select Base Disk Groups options for creating a business entity”](#) on page 38.
 - If the **Select Base Enclosures** panel appears, select one or more enclosures and click **Next**.
 See [“Select Base Enclosures options for creating a business entity”](#) on page 39.
- 6** In the **Business Entity Summary** panel, review your selections and click **Finish**.
 See [“Business Entity Summary options for creating a business entity”](#) on page 39.
- 7** In the **Results** panel that confirms the creation of the Virtual Business Service, click **OK**.
 See [“Editing Virtual Business Services”](#) on page 39.
 See [“Deleting Virtual Business Services”](#) on page 52.

Virtual Business Service Attributes options for creating a Virtual Business Service

Use this panel to create a Virtual Business Service. Veritas Operations Manager automatically determines the resources that can belong to a Virtual Business Service.

Table 2-3 Virtual Business Service Attributes options

Field	Description
Name	Enter the name of the Virtual Business Service. In this field, you can enter up to 255 characters. Example: Accounts Receivable
Description	Enter a description for this Virtual Business Service. In this field, you can enter up to 255 characters. Example: All servers and storage that are associated with the Accounts Receivable billing system.

See [“Creating Virtual Business Services”](#) on page 28.

Select Base Object Types options for creating a Virtual Business Service

Use this wizard panel to specify the type of base objects on which the new Virtual Business Service is to be predicated on. Base objects determine the other objects in the Virtual Business Service. All other objects that are associated with the base object are included automatically to the Virtual Business Service.

For example, you might choose a host to be the base object. Then, all the objects that are associated with the hosts are added to the Virtual Business Service.

Table 2-4 Select Base Object Types panel options

Field	Description
Applications	You can select the check box for one or more of the following application types to add them as base objects. <ul style="list-style-type: none"> ■ Databases ■ Exchange Servers
HA-DR	You can select the check box for one or more of the following HA-DR objects to add them as base objects. <ul style="list-style-type: none"> ■ Clusters ■ Service Groups
Servers	You can select the check box for one or more of the following server types to add them as base objects. <ul style="list-style-type: none"> ■ Hosts ■ File Systems ■ Disk Groups
Storage	You can select the check box for Enclosures to add it as the base object.

See [“Creating Virtual Business Services”](#) on page 28.

Select Base Databases options for creating a Virtual Business Service

Use this wizard panel to select one or more databases as base objects for the Virtual Business Service.

Table 2-5 Select Base Databases

Field	Description
Database Table	Select one or more databases to include as base objects for the Virtual Business Service.

See [“Creating Virtual Business Services”](#) on page 28.

Select Base Hosts options for creating a Virtual Business Service

Use this wizard panel to select the base hosts for the Virtual Business Service.

Table 2-6 Select Base Hosts

Field	Description
Host Table	Select one or more hosts to include as base objects for the Virtual Business Service.

See [“Creating Virtual Business Services”](#) on page 28.

Select Base File Systems options for creating a Virtual Business Service

Use this wizard panel to select the file systems for the Virtual Business Service.

Table 2-7 Select Base File Systems

Field	Description
File System Table	Select one or more file systems to include as base objects for the Virtual Business Service.

See [“Creating Virtual Business Services”](#) on page 28.

Select Base Service Groups options for creating a Virtual Business Service

Use this wizard panel to select the base service groups for the Virtual Business Service.

Table 2-8 Select Base Service Groups panel options

Field	Description
Service Group Table	Select one or more service groups to include as base objects for the Virtual Business Service.

See [“Creating Virtual Business Services”](#) on page 28.

Select Base Enclosures options for creating a Virtual Business Service

Use this wizard panel to select the base enclosures for the Virtual Business Service.

Table 2-9 Select Base Enclosures panel options

Field	Description
Enclosures Table	Select one or more enclosures to include as base objects for the Virtual Business Service.

See [“Creating Virtual Business Services”](#) on page 28.

Select Base Exchange Servers options for creating a Virtual Business Service

Use this wizard panel to select the base Exchange Servers for the Virtual Business Service.

Table 2-10 Select Base Exchange Servers panel options

Field	Description
Exchange Servers Table	Select one or more Exchange Servers to include as base objects for the Virtual Business Service.

See [“Creating Virtual Business Services”](#) on page 28.

Select Base Clusters options for creating a Virtual Business Service

Use this wizard panel to select the base clusters for the Virtual Business Service.

Table 2-11 Select Base Clusters options

Field	Description
Clusters Table	Select one or more clusters to include as base objects for the Virtual Business Service.

See [“Creating Virtual Business Services”](#) on page 28.

Select Base Disk Groups options for creating a Virtual Business Service

Use this wizard panel to select the base disk groups for the Virtual Business Service.

Table 2-12 Select Base Disk Groups

Field	Description
Disk Group Table	Select one or more disk groups to include as base objects for the Virtual Business Service.

See [“Creating Virtual Business Services”](#) on page 28.

Virtual Business Service summary for creating a Virtual Business Service

Use this wizard panel to review the contents and attributes of the business entity before creating it.

See [“Creating Virtual Business Services”](#) on page 28.

Business Entity Attributes options for creating a business entity

Use this panel to create a business entity. Veritas Operations Manager automatically determines the resources that can belong to a business entity.

Table 2-13 Business Entity Attributes options

Field	Description
Name	Enter the name of the business entity. In this field, you can enter up to 255 characters. Example: Accounts Receivable

Table 2-13 Business Entity Attributes options (*continued*)

Field	Description
Description	<p>Enter a description for this business entity. In this field, you can enter up to 255 characters.</p> <p>Example: All servers and storage that are associated with the Accounts Receivable billing system.</p>
Type	<p>Select one of the following types of business entity to create:</p> <ul style="list-style-type: none"> ■ Virtual Business Service: A Virtual Business Service (VBS) is a collection of assets such as arrays, hosts, files systems, and clusters that you can manage as a single consolidated entity. It is more resource intensive, so should be limited to specifying less than 100 base objects. ■ Organization: A group of logically associated hosts. For example, by Admin, by Team, by Datacenter. It is less resource intensive, and can include potentially thousands of base hosts.

See “[Creating Virtual Business Services](#)” on page 28.

Select Base Object Types options for creating a business entity

Use this wizard panel to specify the type of base objects on which the new business entity is to be predicated on. Base objects determine the other objects in the business entity. All other objects that are associated with the base object are included automatically to the business entity.

For example, you might choose a host to be the base object. Then, all the objects that are associated with the hosts are added to the business entity.

Table 2-14 Select Base Object Types panel options

Field	Description
Applications	<p>You can select the check box for one or more of the following application types to add them as base objects.</p> <ul style="list-style-type: none"> ■ Databases ■ Exchange Servers
HA-DR	<p>You can select the check box for one or more of the following HA-DR objects to add them as base objects.</p> <ul style="list-style-type: none"> ■ Clusters ■ Service Groups

Table 2-14 Select Base Object Types panel options (*continued*)

Field	Description
Servers	You can select the check box for one or more of the following server types to add them as base objects. <ul style="list-style-type: none"> ■ Hosts ■ File Systems ■ Disk Groups
Storage	You can select the check box for Enclosures to add it as the base object.

See [“Creating Virtual Business Services”](#) on page 28.

Select Base Databases options for creating a business entity

Use this wizard panel to select one or more databases as base objects for the business entity.

Table 2-15 Select Base Databases

Field	Description
Database Table	Select one or more databases to include as base objects for the business entity.

See [“Creating Virtual Business Services”](#) on page 28.

Select Base Hosts options for creating a business entity

Use this wizard panel to select the base hosts for the business entity.

Table 2-16 Select Base Hosts

Field	Description
Host Table	Select one or more hosts to include as base objects for the business entity.

See [“Creating Virtual Business Services”](#) on page 28.

Select Base Clusters options for creating a business entity

Use this wizard panel to select the base clusters for the business entity.

Table 2-17 Select Base Clusters options

Field	Description
Clusters Table	Select one or more clusters to include as base objects for the business entity.

See [“Creating Virtual Business Services”](#) on page 28.

Select Base Disk Groups options for creating a business entity

Use this wizard panel to select the base disk groups for the business entity.

Table 2-18 Select Base Disk Groups

Field	Description
Disk Group Table	Select one or more disk groups to include as base objects for the business entity.

See [“Creating Virtual Business Services”](#) on page 28.

Select Base File Systems options for creating a business entity

Use this wizard panel to select the file systems for the business entity.

Table 2-19 Select Base File Systems

Field	Description
File System Table	Select one or more file systems to include as base objects for the business entity.

See [“Creating Virtual Business Services”](#) on page 28.

Select Base Service Groups options for creating a business entity

Use this wizard panel to select the base service groups for the business entity.

Table 2-20 Select Base Service Groups panel options

Field	Description
Service Group Table	Select one or more service groups to include as base objects for the business entity.

See [“Creating Virtual Business Services”](#) on page 28.

Select Base Enclosures options for creating a business entity

Use this wizard panel to select the base enclosures for the business entity.

Table 2-21 Select Base Enclosures panel options

Field	Description
Enclosures Table	Select one or more enclosures to include as base objects for the business entity.

See [“Creating Virtual Business Services”](#) on page 28.

Select Base Exchange Servers options for creating a business entity

Use this wizard panel to select the base Exchange Servers for the business entity.

Table 2-22 Select Base Exchange Servers options

Field	Description
Exchange Servers Table	Select one or more Exchange Servers to include as base objects for the business entity.

See [“Creating Virtual Business Services”](#) on page 28.

Business Entity Summary options for creating a business entity

Use this wizard panel to review the contents and attributes of the business entity before creating it.

See [“Creating Virtual Business Services”](#) on page 28.

Editing Virtual Business Services

The administrators can edit the content of a Virtual Business Services by modifying the selection of the base objects, and their dependencies on the Virtual Business Services.

You can edit a Virtual Business Service in one of the following ways:

- From the Virtual Business Services view
- From the Business Entities view

To edit a Virtual Business Services

- 1 In the Veritas Operations Manager console, select **Manage > Virtual Business Services**.
- 2 In the **Virtual Business Services** view, do one of the following:
 - Select the Virtual Business Service that you want to edit and click **Actions > Edit Virtual Business Services**.
 - Right-click the Virtual Business Service and from the submenu, select **Edit Virtual Business Services**.
- 3 In the **Virtual Business Service Attributes** panel, modify the details and click **Next**.

See “[Virtual Business Service Attributes options for editing a Virtual Business Service](#)” on page 43.

- 4 In the **Select Base Object Types** panel, select one or more of the available items to modify the selection and click **Next**.

Each of the base object types you select displays an associated Select Base item panel. You can select the desired items from the list. For instance, under **Applications** base object type, you can select **Database** and **Exchange Servers**.

See “[Select Base Object Types options for editing a business entity](#)” on page 48.

- 5 In the Select Base item panels, do the following:
 - If the **Select Base Databases** panel appears, select one or more databases to modify the selection and click **Next**.
See “[Select Base Databases options for editing a Virtual Business Service](#)” on page 44.
 - If the **Select Base Exchange Servers** panel appears, select one or more disk groups to modify the selection and click **Next**.
See “[Select Base Exchange Servers options for editing a Virtual Business Service](#)” on page 47.
 - If the **Select Base Clusters** panel appears, select one or more clusters to modify the selection and click **Next**.
See “[Select Base Clusters options for editing a Virtual Business Service](#)” on page 47.
 - If the **Select Base Service Groups** panel appears, select one or more service groups to modify the selection and click **Next**.
See “[Select Base Service Groups options for editing a Virtual Business Service](#)” on page 45.

- If the **Select Base Hosts** panel appears, select one or more hosts to modify the selection and click **Next**.
See “[Select Base Hosts options for editing a Virtual Business Service](#)” on page 44.
 - If the **Select Base File Systems** panel appears, select one or more file systems to modify the selection and click **Next**.
See “[Select Base File Systems options for editing a Virtual Business Service](#)” on page 45.
 - If the **Select Base Disk Groups** panel appears, select one or more disk groups to modify the selection and click **Next**.
See “[Select Base Disk Groups options for editing a Virtual Business Service](#)” on page 46.
 - If the **Select Base Enclosures** panel appears, select one or more disk groups to modify the selection and click **Next**.
See “[Select Base Enclosures options for editing a Virtual Business Service](#)” on page 46.
- 6 In the **Business Entity Summary** panel, review your modified selections and click **Finish**.
See “[Virtual Business Service Summary for editing a Virtual Business Service](#)” on page 47.
- 7 In the **Results** panel, click **OK**.
See “[Creating Virtual Business Services](#)” on page 28.
See “[Deleting Virtual Business Services](#)” on page 52.

To edit a Virtual Business Service from the Business Entities view

- 1 In the Veritas Operations Manager console, select **Manage > Business Entities**.
- 2 In the **Business Entities** view, do one of the following:
 - Select the Virtual Business Service that you want to edit and click **Actions > Edit Business Entities (VBS/OE)**.
 - Right-click the Virtual Business Service and from the submenu, select **Edit Business Entities (VBS/OE)**.
- 3 In the **Business Entity Attributes** panel, modify the details and click **Next**.
See “[Business entity Attributes options for editing a business entity](#)” on page 47.

- 4 In the **Select Base Object Types** panel, select one or more of the available items to modify the selection and click **Next**.

Each of the base object types you select displays an associated Select Base item panel. You can select the desired items from the list. For instance, under **Applications** base object type, you can select **Database** and **Exchange Servers**.

See “[Select Base Object Types options for editing a Virtual Business Service](#)” on page 43.

- 5 In the Select Base item panels, do the following:

- If the **Select Base Databases** panel appears, select one or more databases to modify the selection and click **Next**.
See “[Select Base Databases options for editing a business entity](#)” on page 49.
- If the **Select Base Exchange Servers** panel appears, select one or more disk groups to modify the selection and click **Next**.
See “[Select Base Exchange Servers options for editing a business entity](#)” on page 51.
- If the **Select Base Clusters** panel appears, select one or more clusters to modify the selection and click **Next**.
See “[Select Base Clusters options for editing a business entity](#)” on page 51.
- If the **Select Base Service Groups** panel appears, select one or more service groups to modify the selection and click **Next**.
See “[Select Base Service Groups options for editing a business entity](#)” on page 49.
- If the **Select Base Hosts** panel appears, select one or more hosts to modify the selection and click **Next**.
See “[Select Base Hosts options for editing a business entity](#)” on page 49.
- If the **Select Base File Systems** panel appears, select one or more file systems to modify the selection and click **Next**.
See “[Select Base File Systems options for editing a business entity](#)” on page 50.
- If the **Select Base Disk Groups** panel appears, select one or more disk groups to modify the selection and click **Next**.
See “[Select Base Disk Groups options for editing a business entity](#)” on page 50.
- If the **Select Base Enclosures** panel appears, select one or more disk groups to modify the selection and click **Next**.
See “[Select Base Enclosures options for editing a business entity](#)” on page 50.

6 In the **Business Entity Summary** panel, review your modified selections and click **Finish**.

See “[Business Entity Summary for editing a business entity](#)” on page 52.

7 In the **Results** panel, click **OK**.

See “[Creating Virtual Business Services](#)” on page 28.

Virtual Business Service Attributes options for editing a Virtual Business Service

Use this wizard panel to modify the name and the description of a Virtual Business Service.

Table 2-23 Virtual Business Service Attributes options

Field	Description
Name	Modify the name of the Virtual Business Service. You can enter up to 255 characters in this field.
Description	Modify the description for the Virtual Business Service. You can enter up to 255 characters in this field.

See “[Editing Virtual Business Services](#)” on page 39.

Select Base Object Types options for editing a Virtual Business Service

Use this wizard panel to modify the selection of the type of objects on which the Virtual Business Service is based.

Table 2-24 Select Base Object Types options

Field	Description
Applications	Modify the selection of one or more of the following application types to include or exclude them as base objects. <ul style="list-style-type: none">■ Databases■ Exchange Servers

Table 2-24 Select Base Object Types options (*continued*)

Field	Description
HA-DR	<p>Modify the selection of one or more of the following HA-DR objects to include or exclude them as base objects.</p> <ul style="list-style-type: none"> ■ Clusters ■ Service Groups
Servers	<p>Modify the selection of one or more of the following server types to include or exclude them as base objects.</p> <ul style="list-style-type: none"> ■ Hosts ■ File Systems ■ Disk Groups
Storage	<p>Modify the selection to include or exclude Enclosures as the base object.</p>

See [“Editing Virtual Business Services”](#) on page 39.

Select Base Databases options for editing a Virtual Business Service

Use this wizard panel to modify the selection of base database(s) for the Virtual Business Service.

Table 2-25 Select Base Databases options

Field	Description
Database Table	Select one or more databases to include as base objects for the Virtual Business Service.

Use the dynamic search to filter the list of base databases. Use the **Only show current bases** option to see only those base databases, which are currently part of the Virtual Business Service.

See [“Editing Virtual Business Services”](#) on page 39.

Select Base Hosts options for editing a Virtual Business Service

Use this wizard panel to modify the selection of the base hosts for the Virtual Business Service.

Table 2-26 Select Base Hosts panel options

Field	Description
Host Table	Select one or more hosts to include as base objects for the Virtual Business Service.

Use the dynamic search to filter the list of base hosts. Use the **Only show current bases** option to see only those base hosts, which are currently part of the Virtual Business Service.

See [“Editing Virtual Business Services”](#) on page 39.

Select Base Service Groups options for editing a Virtual Business Service

Use this wizard panel to modify the selection of the base service groups for the Virtual Business Service.

Table 2-27 Select Base Service Groups options

Field	Description
Service Group Table	Select one or more service groups to include as base objects for the Virtual Business Service.

Use the dynamic search to filter the list of base service groups. Use the **Only show current bases** option to see only those base service groups, which are currently part of the Virtual Business Service.

See [“Editing Virtual Business Services”](#) on page 39.

Select Base File Systems options for editing a Virtual Business Service

Use this wizard panel to modify the selection of the file systems for the Virtual Business Service.

Table 2-28 Select Base File Systems options

Field	Description
File System Table	Select one or more file systems to include as base objects for the Virtual Business Service.

Use the dynamic search to filter the list of base file systems. Use the **Only show current bases** option to see only those base file systems, which are currently part of the Virtual Business Service.

See [“Editing Virtual Business Services”](#) on page 39.

Select Base Disk Groups options for editing a Virtual Business Service

Use this wizard panel to modify the selection of the base disk groups for the Virtual Business Service.

Table 2-29 Select Base Disk Groups panel options

Field	Description
Disk group Table	Select one or more disk groups to include as base objects for the Virtual Business Service.

Use the dynamic search to filter the list of base disk groups. Use the **Only show current bases** option to see only those base disk groups, which are currently part of the Virtual Business Service.

See [“Editing Virtual Business Services”](#) on page 39.

Select Base Enclosures options for editing a Virtual Business Service

Use this wizard panel to modify the selection of the base enclosures for the Virtual Business Service.

Table 2-30 Select Base Enclosures panel options

Field	Description
Enclosures Table	Select one or more enclosures to include as base objects for the Virtual Business Service.

Use the dynamic search to filter the list of base enclosures. Use the **Only show current bases** option to see only those base enclosures, which are currently part of the Virtual Business Service.

See [“Editing Virtual Business Services”](#) on page 39.

Select Base Clusters options for editing a Virtual Business Service

Use this wizard panel to modify the selection of clusters for the Virtual Business Service.

Table 2-31 Select Base Clusters options

Field	Description
Base Clusters Table	Select one or more clusters to include as base objects for the Virtual Business Service.

Use the dynamic search to filter the list of base clusters. Use the **Only show current bases** option to see only those base clusters, which are currently part of the Virtual Business Service.

See [“Editing Virtual Business Services”](#) on page 39.

Select Base Exchange Servers options for editing a Virtual Business Service

Use this wizard panel to modify the selection of the base Exchange Servers for the Virtual Business Service.

Table 2-32 Select Base Exchange Servers options

Field	Description
Exchange Servers Table	Select one or more Exchange Servers to include as base objects for the Virtual Business Service.

See [“Editing Virtual Business Services”](#) on page 39.

Virtual Business Service Summary for editing a Virtual Business Service

Use this wizard panel to review the modified contents and attributes of the virtual business service.

See [“Editing Virtual Business Services”](#) on page 39.

Business entity Attributes options for editing a business entity

Use this wizard panel to modify the name and the description of a business entity.

Table 2-33 Business Entity Attributes options

Field	Description
Name	Modify the name of the business entity. You can enter up to 255 characters in this field.
Description	Modify the description for the business entity. You can enter up to 255 characters in this field.

See [“Editing Virtual Business Services”](#) on page 39.

Select Base Object Types options for editing a business entity

Use this wizard panel to modify the selection of the type of objects on which the business entity is based.

Table 2-34 Select Base Object Types options

Field	Description
Applications	Modify the selection of one or more of the following application types to include or exclude them as base objects. <ul style="list-style-type: none"> ■ Databases ■ Exchange Servers
HA-DR	Modify the selection of one or more of the following HA-DR objects to include or exclude them as base objects.. <ul style="list-style-type: none"> ■ Clusters ■ Service Groups
Servers	Modify the selection of one or more of the following server types to include or exclude them as base objects. <ul style="list-style-type: none"> ■ Hosts ■ File Systems ■ Disk Groups
Storage	Modify the selection to include or exclude Enclosures as the base object.

See [“Editing Virtual Business Services”](#) on page 39.

Select Base Databases options for editing a business entity

Use this wizard panel to modify the selection of base database(s) for the business entity.

Table 2-35 Select Base Databases options

Field	Description
Database Table	Select one or more databases to include as base objects for the business entity.

Use the dynamic search to filter the list of base databases. Use the **Only show current bases** option to see only those base databases, which are currently part of the business entity.

See [“Editing Virtual Business Services”](#) on page 39.

Select Base Hosts options for editing a business entity

Use this wizard panel to modify the selection of the base hosts for the business entity.

Table 2-36 Select Base Hosts panel options

Field	Description
Host Table	Select one or more hosts to include as base objects for the business entity.

Use the dynamic search to filter the list of base hosts. Use the **Only show current bases** option to see only those base hosts, which are currently part of the business entity.

See [“Editing Virtual Business Services”](#) on page 39.

Select Base Service Groups options for editing a business entity

Use this wizard panel to modify the selection of the base service groups for the business entity.

Table 2-37 Select Base Service Groups options

Field	Description
Service Group Table	Select one or more service groups to include as base objects for the business entity.

Use the dynamic search to filter the list of base service groups. Use the **Only show current bases** option to see only those base service groups, which are currently part of the business entity.

See [“Editing Virtual Business Services”](#) on page 39.

Select Base File Systems options for editing a business entity

Use this wizard panel to modify the selection of the file systems for the business entity.

Table 2-38 Select Base File Systems options

Field	Description
File System Table	Select one or more file systems to include as base objects for the business entity.

Use the dynamic search to filter the list of base file systems. Use the **Only show current bases** option to see only those base file systems, which are currently part of the business entity.

See [“Editing Virtual Business Services”](#) on page 39.

Select Base Disk Groups options for editing a business entity

Use this wizard panel to modify the selection of the base disk groups for the business entity.

Table 2-39 Select Base Disk Groups panel options

Field	Description
Disk group Table	Select one or more disk groups to include as base objects for the business entity.

Use the dynamic search to filter the list of base disk groups. Use the **Only show current bases** option to see only those base disk groups, which are currently part of the business entity.

See [“Editing Virtual Business Services”](#) on page 39.

Select Base Enclosures options for editing a business entity

Use this wizard panel to modify the selection of the base enclosures for the business entity.

Table 2-40 Select Base Enclosures panel options

Field	Description
Enclosures Table	Select one or more enclosures to include as base objects for the business entity.

Use the dynamic search to filter the list of base enclosures. Use the **Only show current bases** option to see only those base enclosures, which are currently part of the business entity.

See [“Editing Virtual Business Services”](#) on page 39.

Select Base Clusters options for editing a business entity

Use this wizard panel to modify the selection of clusters for the business entity.

Table 2-41 Select Base Clusters options

Field	Description
Base Clusters Table	Select one or more clusters to include as base objects for the business entity.

Use the dynamic search to filter the list of base clusters. Use the **Only show current bases** option to see only those base clusters, which are currently part of the business entity.

See [“Editing Virtual Business Services”](#) on page 39.

Select Base Exchange Servers options for editing a business entity

Use this wizard panel to modify the selection of the base Exchange Servers for the business entity.

Table 2-42 Select Base Exchange Servers options

Field	Description
Exchange Servers Table	Select one or more Exchange Servers to include as base objects for the business entity.

See [“Editing Virtual Business Services”](#) on page 39.

Business Entity Summary for editing a business entity

Use this wizard panel to review the modified contents and attributes of the business entity.

See [“Editing Virtual Business Services”](#) on page 39.

Deleting Virtual Business Services

You can use the **Delete Virtual Business Service** option to delete an existing Virtual Business Service in the Veritas Operations Manager console.

You can delete a Virtual Business Service in one of the following ways:

- From the Virtual Business Service view
- From the Business Entities view

To delete a Virtual Business Service from the Virtual Business Services view

- 1 In the Veritas Operations Manager console, select **Manage > Virtual Business Service**.
- 2 In the **Virtual Business Service** view, select the Virtual Business Service that you want to delete and do one of the following:
 - Click **Actions > Delete Virtual Business Service**.
 - Right-click the Virtual Business Service from the submenu, select **Delete Virtual Business Service**.
- 3 In the **Delete Virtual Business Service** wizard, click **Yes**.
See [“Delete Virtual Business Service options for deleting a Virtual Business Service”](#) on page 53.
- 4 In the **Results** panel, click **OK**.

To delete a Virtual Business Service from the Business Entities view

- 1 In the Veritas Operations Manager console, select **Manage > Business Entities**.
- 2 In the **Business Entities** view, select the business entity that you want to delete and do one of the following:
 - Click **Actions > Delete Business Entity**.
 - Right-click the business entity and from the submenu, select **Delete Business Entity**.
- 3 In the **Delete Business Entity** wizard, click **Yes**.
- 4 In the **Results** panel, click **OK**.

See [“Creating Virtual Business Services”](#) on page 28.

See [“Editing Virtual Business Services”](#) on page 39.

Delete Virtual Business Service options for deleting a Virtual Business Service

Use this wizard panel to delete an existing Virtual Business Service.

See [“Deleting Virtual Business Services”](#) on page 52.

Configuring Virtual Business Service start and stop using Veritas Operations Manager Virtual Business Services Availability Add-on

For a selected Virtual Business Service, you can configure the order in which its constituent service groups are brought online (during Virtual Business Service start operation) and taken offline (during Virtual Business Service stop operation).

You can establish a service group’s relationships with its child service groups. For the service groups that are configured on virtual machines, you can also enable virtual machine auto-start and auto-stop options. It ensures that if the virtual machine is detected as turned off during Virtual Business Service start operation, Veritas Operations Manager automatically turns it on, and brings the service group online on that virtual machine. Similarly, if you have selected virtual machine auto-stop option, after the service group is taken offline, Veritas Operations Manager automatically turns off that virtual machine. The start and stop operations apply only to the VCS and ApplicationHA service groups that are part of the selected Virtual Business Service.

Note: To configure application start and stop operation, you must have administrative privileges on the Virtual Business Service. Secondly, Virtual Business Service will not alter the dependencies that are set through Veritas Cluster Server.

To configure application start and stop in a Virtual Business Service

- 1 In the Veritas Operations Manager console, select **Manage > Virtual Business Services**.
- 2 Under **Virtual Business Services**, select the Virtual Business Service, and do one of the following:
 - Select **Actions > VBS Availability > Configure Service Group Dependencies**.
 - Right-click the Virtual Business Service, and then select **VBS Availability > Configure Service Group Dependencies**.

- Click the Virtual Business Service and in the Virtual Business Service details page, click **Actions > VBS Availability > Configure Service Group Dependencies**.
- 3 In the **Virtual Business Service start order** wizard panel, under **Select parent service group**, select the parent service group from the drop-down list. Under **Select child service group**, select the child service group that you want to associate with the selected parent service group, and click **Link**. The result of this operation is listed in the table where you can view the dependencies. Select the type of dependency from the drop-down list. By default, it is set to soft. To use firm and restart type of dependencies and to enable command line operations, you need to enable fault management. To use fault management feature, ensure that you install VRTSvbs package, and enable fault management.

See [“Enabling fault management for a Virtual Business Service”](#) on page 77.
 - 4 In the **Virtualization configuration** wizard panel, select service group for which you want to enable virtual machine auto-start and auto-stop option.

See [“Virtualization configuration panel options”](#) on page 57.
 - 5 In the **Virtual Business Service configuration summary** wizard panel, review the configuration that you have made for selected Virtual Business Service.

See [“Virtual Business Service configuration summary panel”](#) on page 58.
 - 6 Click **Finish**.

Note: If the Virtual Business Service contains a mix of local and global service groups, and one or more global service groups are in online or partial state on a remote reachable cluster (which is in running state), then Virtual Business Service start operation is rejected. For such a Virtual Business Service, you need to manually take all the global service groups on the remote clusters offline, and then bring Virtual Business Service at the local site online.

See [“Starting a Virtual Business Service using VBS Availability Add-on”](#) on page 67.

See [“Stopping a Virtual Business Service using VBS Availability Add-on”](#) on page 70.

Virtual Business Service start order panel options

Use **Virtual Business Service start order** wizard panel to establish parent-child service groups relationships, and set the order in which the service groups must be brought online during Virtual Business Service start operation. For Virtual Business Service stop operation (that is, when the service groups are taken offline),

the reverse order is followed. You can also set the type of group dependency for the parent-child service group pair.

Table 2-43 Virtual Business Service start order option

Fields	Description
Select parent service group	Select the parent service group for which you want to set the order.
Select child service group	Select the child service group to be associated with the selected parent service group.
Link	Click to establish the relationship between the selected parent and child service group. After you have established the dependency, corresponding child and parent service groups are listed in the adjacent table with the default dependency type as soft.
Parent	Displays the name of the parent service group that is linked with the child service group.
Child	Displays the name of the child service group that is associated with the parent service group.

Table 2-43 Virtual Business Service start order option (*continued*)

Fields	Description
Dependency Type	<p>Select the type of dependency for the parent-child service group pair. By default, it is set to soft. You can also use other two types of dependencies, namely, firm and restart. However, it is mandatory to enable fault management to use firm and restart type of dependencies. To enable fault management, install the VRTSvbs package on the host, and then select the Enable Fault Management check box.</p> <p>The fault propagation behavior of three policies is listed below:</p> <ul style="list-style-type: none"> ■ Soft: When the child faults or recovers from the fault, the parent ignores the events. The parent does not take any action. This type of dependency is used when only start or stop ordering is required, and no fault policy action is needed. ■ Firm: When the child faults, the parent is taken offline. When the child recovers, the parent is brought online. ■ Restart: When the child faults, the parent ignores the event. When the child recovers, the parent is taken offline, and then brought online.
Reset	Click to reset parent-child service group dependencies.
Remove All	Select this check box to remove all VBS-level dependencies. Note that VCS-level dependencies are not removed.
Enable Fault Management	Select this check box to enable fault management for the Virtual Business Service. Fault management enables firm and restart types of dependencies in the Virtual Business Service.

See “[Configuring Virtual Business Service start and stop using Veritas Operations Manager Virtual Business Services Availability Add-on](#)” on page 53.

Virtualization configuration panel options

Use the **Virtualization configuration** panel to configure the start or the stop operations for the virtual machine, which has the service group configured on it. This configuration is supported only for VMware.

Table 2-44 Virtualization configuration options

Fields	Description
Service group	The name of the configured service group.
Cluster	The name of the cluster the service group belongs to.
Virtual machines	The name of virtual machine that is turned on or off as per your selection in Start VM and Stop VM check boxes.
Start VM	<p>Select this check box, to switch on the virtual machine if it is off when the Virtual Business Service starts. After the virtual machine is switched on, the service group is brought online on that virtual machine.</p> <p>If you do not select the check box, during the Virtual Business Service start operation, Veritas Operations Manager searches for other available systems in the service group's system list, and selects the system on which the service group can be brought online.</p>
Stop VM	<p>Select this check box, to take the service group (configured on the virtual machine) offline before turning off the virtual machine during Virtual Business Service stop operation. The virtual machine stop operation is ignored if other service groups are running on that virtual machine.</p> <p>If you do select this check box, during the Virtual Business Service stop operation, only the service group is taken offline; the virtual machine remains on.</p>

See [“Configuring Virtual Business Service start and stop using Veritas Operations Manager Virtual Business Services Availability Add-on”](#) on page 53.

Virtual Business Service configuration summary panel

The Virtual Business Service configuration summary panel provides the following information that is related to Virtual Business Service:

- The service group start or stop order, and the name of available child service groups for the parent service group. It also displays the dependency type. If the fault management is not enabled for the Virtual Business Service, an appropriate error message is also displayed to the user.
- The name of all service groups for which virtual machine auto-start option is enabled.
- The name of all service groups for which virtual machine auto-stop option is enabled.
- The details about the virtualization servers, and the virtual machines that are used in the virtualization configuration.

Note: In a multi-tier VBS that has one of the tier configured for GCO, VBS daemons across tiers communicate using the virtual IP address set in the clusteraddress attribute of the GCO tier.

See [“Configuring Virtual Business Service start and stop using Veritas Operations Manager Virtual Business Services Availability Add-on”](#) on page 53.

Prerequisites for enabling fault management

In a Virtual Business Service, one of the three types of dependencies is present among the parent service group and its child service groups.

- The SOFT dependency is available by default and does not require fault management to be enabled.
- The FIRM and RESTART dependencies require fault management to be enabled. See [“Fault management overview”](#) on page 83.

(Optional) You can choose to configure a virtual IP address for every VBS daemon in a multi-node cluster. Alternatively, you can allow VBS to auto discover the IP address of every VBS daemon. See, [Communication among VBS daemons](#).

The VBS daemon is configured as a resource (vbsapp) in the ClusterService group. You must ensure that the ClusterService group is not in FAULTED state before you enable fault management. For clusters in a GCO configuration, the ClusterService group is already present.

For information about the ClusterService group, see the *Veritas Cluster Server Administrator's Guide*.

Communication among VBS daemons

VBS daemons across clusters communicate over IP addresses.

Depending on the environment in which your VBS is functioning, you may want to configure virtual IP addresses for every VBS daemon on clusters that are part of VBS, or you may want VBS to auto discover the IP address of the VBS daemon.

The three methods for VBS daemon communication are:

- Auto discovery of IP addresses for every VBS daemon in the cluster
See [“Auto discovery of VBS Daemon on each cluster”](#) on page 59.
- Manually configuring a virtual IP address for every VBS daemon in the cluster

Note: If you wish to have a virtual IP configured, it is recommended to do so before enabling the Fault Policy.

See [“Manually configuring a virtual IP address for every VBS daemon on a multi-node cluster”](#) on page 60.

- Configure virtual IP for a few tiers and allow auto discovery of the remaining IPs.

Consider a VBS consisting of multi-node clusters on three-tiers. One tier is configured to use a virtual IP address and the remaining tiers are configured to automatically discover the IP address. Every cluster updates the IP addresses of the VBS Daemons running on other clusters. This ensures communication among VBS Daemons.

Note: In a multi-tier VBS that has one of the tier configured for GCO, VBS daemons across tiers communicate using the virtual IP address set in the clusteraddress attribute of the GCO tier.

Auto discovery of VBS Daemon on each cluster

VBS daemons auto-discover the IP addresses of other VBS daemons within the VBS using HTTP ping messages and handshakes.

Configuring auto discovery for each cluster in VBS

Auto discovery is supported only for tiers that do not have GCO configured. For any tier with GCO configured, virtual IP is the only supported communication mechanism.

Auto discovery is configured in following scenarios:

- Configuring auto discovery for fresh installations: This is automatic and no user intervention is required.
- Configuring auto discovery for upgrades: The procedure for this is described below.

Caution: Do not set auto discovery on a tier that has GCO configured.

Before configuring auto discovery, ensure that vbsapp resource is brought offline.

To configure auto discovery of IP address of VBS daemon on a cluster:

1 Log on to any node of a cluster that is a part of your VBS.

2 Make the configuration read-writable.

```
# haconf -makerw
```

3 Delete the IP resource configured for virtual IP of the VBS daemon.

```
# hares -delete csgip
```

4 Delete the NIC resource configured for virtual IP of the VBS daemon.

```
# hares -delete csgnic
```

5 Delete the cluster IP address.

```
# haclus -modify Cluster Address ""
```

6 Make the configuration read-only.

```
# haconf -dump -makero
```

Manually configuring a virtual IP address for every VBS daemon on a multi-node cluster

To set a virtual IP address for every VBS daemon on a multi-node cluster, you need to run the csconfig script.

The VBS daemons across clusters communicate over IP addresses. Because the VBS daemon is configured as a failover service group, you must configure a virtual IP address for every VBS daemon in a multi-node cluster. The virtual IP address allows the VBS daemons to communicate with each other even on failing over or switching to other nodes in the cluster. This virtual IP address is also required

for communication between the Virtual Business Services command line and the VBS daemon on that cluster.

To configure fault management, you must provide information such as NIC, IP address, and Netmask for each cluster whose service groups are part of the Virtual Business Service. The IP resource contains the virtual IP address of the cluster. The NIC resource and IP resource are configured as part of the special ClusterService group. You must ensure that the ClusterService group is not in FAULTED state before you enable fault management.

For clusters in a GCO configuration, the ClusterService group is already present. The VBS daemon is configured as a resource (vbsapp) in the ClusterService group. For information about the ClusterService group, see the *Veritas Operations Manager Management Server Administrator's Guide*.

For UNIX systems: You can create csgnic (NIC resource) and csgip (IP resource) in the ClusterService group by running the interactive `csgconfig` script. The script creates ClusterService as the infrastructure service group. ClusterService provides virtual IP infrastructure on the cluster. It also provides the infrastructure for the high availability of the VBS daemon. If ClusterService is already configured in a cluster or if the cluster is an ApplicationHA node, you need not execute `csgconfig`. The vbsapp resource is configured as an application resource when you enable fault management. Though you can create the csgnic resource and csgip resource through Veritas Operations Manager for UNIX systems, the `csgconfig` script automates the steps.

See “[Configuring the resources required for fault management on UNIX systems](#)” on page 61.

For Windows systems: You can create csgnic resource and csgip resource in the ClusterService group through Veritas Operations Manager. The vbsapp resource is configured as a process resource when you enable fault management.

See “[Configuring the resources required for fault management on Windows systems](#)” on page 62.

Configuring the resources required for fault management on UNIX systems

To configure the NIC resource and IP resource that are required for fault management, run the `csgconfig` command.

You must run the `csgconfig` command after you install the VRTSvbs package and before you enable fault management.

The output from an interactive `csgconfig` session resembles:

```
# /opt/VRTSvbs/bin/csgconfig -configure
```

```
Configuring existing ClusterService ServiceGroup
```

```
Active NIC devices discovered on galaxy: eth0 eth1
```

```
Enter the NIC for Virtual Business Service configuration to use on galaxy: eth1
```

```
Enter the Virtual IP address for the Virtual Business Service configuration: 10.209.68.251
```

```
Enter the netmask for 10.209.68.251 (255.255.252.0)
```

```
Adding NIC resource (csgnic) to group ClusterService
```

```
Adding IP resource (csgip) to group ClusterService
```

```
Adding Application resource vbsapp to group ClusterService
```

Configuring the resources required for fault management on Windows systems

For a multi-node Windows cluster, create the ClusterService group through Veritas Operations Manager.

Making the cluster configuration read-writable

To make the cluster configuration read-writable

- 1 In the Veritas Operations Manager console, select **Manage > Clusters**.
- 2 Select the cluster on which ClusterService group is to be configured.
- 3 Select **Actions > Configuration > Open Configuration** to make cluster configuration read-writable.

Creating the ClusterService group

To create ClusterService group

- 1 In the Veritas Operations Manager console, select **Manage > Clusters**.
- 2 Select the cluster name.
- 3 Select **Actions > Create Service Group**.
- 4 On the Create Service Group wizard panel, enter the Name as **Cluster Service** and select Type as **Failover**.
- 5 Click **Next**.
- 6 On the Configure System List screen, click >> to add all systems to the System List.

- 7 Click **Next**.
- 8 On the Configure Resource screen, configure the NIC resource:
Enter the **Name** as **gconic** and select **Type** as **NIC**. Click **Add**.
Click ... under **Edit**. Enter appropriate values for resource attributes such as **MACAddress**, **MaxTxErrInterval**, **PingHostList**, and so on.
- 9 Configure the IP resource:
Enter the **Name** as **gcoip** and select **Type** as **IP**. Click **Add**.
Click ... under **Edit**. Enter appropriate values for resource attributes such as **MAC Address**, **Address**, **SubNetMask**, and so on.
- 10 Select **Enabled** for both resources.
- 11 Click **Next**.
- 12 On the Resource Dependencies screen, select **gcoip** from the **Select Parent** list and select **gconic** from the **Select Child** list.
- 13 Click **Link** to create the dependency.
- 14 Click **Finish** to create ClusterService group and resources.

Setting the ClusterAddress attribute

To set the ClusterAddress attribute

- 1 In the Veritas Operations Manager console, select **Manage > Clusters**.
- 2 Click the cluster name.
- 3 On the cluster information screen, click the **All Attributes** tab.
- 4 Select **ClusterAddress** and click **Actions > Edit Attribute**.
- 5 On the Edit Attribute screen, select **All Systems** and enter the IP address configured with the gcoip resource in the **Attribute Value** text box.
- 6 Click **OK**.

Saving the cluster configuration as read-only

To make the cluster configuration read-only

- 1 In the Veritas Operations Manager console, select **Manage > Clusters**.
- 2 Click the cluster name.
- 3 Select **Actions > Configuration > Close configuration**.
- 4 Click **OK**.

Virtual Business Services operations

This chapter includes the following topics:

- [Operations using Veritas Operations Manager and command line](#)
- [Starting and stopping Virtual Business Services](#)
- [Viewing the overview of a Virtual Business Service](#)
- [Viewing the Virtual Business Service status from the command line](#)
- [Viewing the status of a Virtual Business Service](#)
- [Viewing the logs of a Virtual Business Service](#)
- [Enabling fault management for a Virtual Business Service](#)
- [Disabling fault management for a Virtual Business Service](#)

Operations using Veritas Operations Manager and command line

[Table 3-1](#) lists the operations that can be performed on the Management Server and on the managed hosts.

Table 3-1 Virtual Business Services operations

Operation	Possible on Veritas Operations Manager Management Server?	Possible through CLI on managed hosts?
Create a Virtual Business Service.	Yes	No

Table 3-1 Virtual Business Services operations (*continued*)

Operation	Possible on Veritas Operations Manager Management Server?	Possible through CLI on managed hosts?
Start or stop a Virtual Business Service.	Yes Note: You can start or stop VMware virtual machines that host the applications.	Yes Note: You can start or stop VMware virtual machines that host the applications.
Configure start and stop order of applications.	Yes	No
List the Virtual Business Services.	Yes You can view the status of all Virtual Business Services configured in the Management Server.	Yes You can view the status of the Virtual Business Services that contain service groups from the cluster or ApplicationHA node.
View status of a Virtual Business Service.	Yes You can view the service groups and other entities.	Yes You can view only the service groups.
Query log file data.	Yes	Yes
Configure disaster recovery.	Yes	Yes
Configure fault management.	Yes	No

Starting and stopping Virtual Business Services

After you create a Virtual Business Service and define the dependencies among its components in Veritas Operations Manager, you can start or stop the Virtual Business Service from Veritas Operations Manager or from the command line on a host.

It is not mandatory for Veritas Operations Manager to be online for starting or stopping the Virtual Business Service because all inter-cluster communication is handled by the Virtual Business Service components. Any failure or downtime of Veritas Operations Manager Management Server does not affect the Virtual Business Service start or stop operations and these operations can continue through the command line.

Note: Veritas Operations Manager Virtual Business Services Availability Add-on is not supported for the Composite Virtual Business Services. You can use it only for Virtual Business Services.

See [“Starting a Virtual Business Service from the command line”](#) on page 69.

See [“Stopping a Virtual Business Service from the command line”](#) on page 72.

Starting a Virtual Business Service using VBS Availability Add-on

You can start a Virtual Business Service using VBS Availability Add-on. When you start a Virtual Business Service, its associated service groups are brought online in the specified order. The order in which the service groups in a Virtual Business Service come online is determined by the start order defined in Veritas Operations Manager. You can define the start order of service groups using the **Configure Service Group Dependencies** option of the VBS Availability Add-on. You can specify one or more service groups as the child of a parent service group. Veritas Operations Manager ensures that all child service groups are brought online before the parent service group. If two service groups are not related by the start order, they may come online at the same time. If a service group is configured on a VMware virtual machine, you can also set auto-start for that virtual machine.

See [“Fault management overview”](#) on page 83.

You can view the Virtual Business Service start details in **Tasks** page (under **Monitor > Tasks**) of Veritas Operations Manager console. The page displays the operations that are complete and under progress.

Before you start a Virtual Business Service, ensure that the following prerequisites are met:

- The service groups in the Virtual Business Service must not be in frozen state.
- The service groups in the Virtual Business Service must not be in faulted state.
- The service groups in the Virtual Business Service must not be in auto-disabled, or disabled state.
- Cyclic dependencies must not exist among the service groups in the Virtual Business Service.
- The Virtual Business Service must not contain any remote group resources.
- The Cluster Service group must not be part of the Virtual Business Service.
- If you want to establish firm and restart type of dependencies, make sure that you have enabled fault management for the Virtual Business Service.

To start a Virtual Business Service

- 1 In the Veritas Operations Manager console, select **Manage > Virtual Business Services**.
- 2 Under **Virtual Business Services**, select the Virtual Business Service that you want to start, and do one of the following:
 - Select **Actions > VBS Availability > Start VBS**.
 - Right-click on the Virtual Business Service, and then select **VBS Availability > Start VBS**.
 - Click the Virtual Business Service and in the Virtual Business Service details page, click **Actions > VBS Availability > Start VBS**.
- 3 On the **Start Virtual Business Service** wizard panel, click **OK** to confirm.

When you start a Virtual Business Service, you are redirected to the **Service Group Order** tab of the Virtual Business Service details page. The page displays the progress of the start operation graphically. If you want to terminate the start operation, click **Abort** under the **Service Group Order** tab.

See [“Stopping a Virtual Business Service using VBS Availability Add-on”](#) on page 70.

See [“Virtualization workflow for Virtual Business Service start operation”](#) on page 68.

See [“Configuring Virtual Business Service start and stop using Veritas Operations Manager Virtual Business Services Availability Add-on”](#) on page 53.

Virtualization workflow for Virtual Business Service start operation

During Virtual Business Service start operation, when Veritas Operations Manager discovers any service group with the following properties:

- The service group contains VMware virtual machines in its system list.
- No other system is available to the service group where it can start.
One example is Symantec ApplicationHA (single node cluster) service group where the service group's system list has only one virtual machine.

For the above-mentioned scenarios, Veritas Operations Manager selects a virtual machine from the service group's system list, and then starts the virtual machine using the Virtual Center that is specified for that virtual machine. When this service group is successfully set to online, Veritas Operations Manager starts to online other service groups in the Virtual Business Service.

See “[Virtualization workflow for Virtual Business Service stop operation](#)” on page 71.

Starting a Virtual Business Service from the command line

To start a Virtual Business Service, use the following command from a host on any of the clusters that are part of the Virtual Business Service. The command brings the service groups online in the required order.

UNIX systems:

```
# /opt/VRTSvbs/bin/vbssvc -start vbs_name
```

Windows systems:

```
C:\Program Files\VERITAS\VRTSvbs\bin\vbssvc.exe -start vbs_name
```

The start operation on a VBS brings online all the children of a service group present in the same VBS before bringing online the service group itself. It does not take into account child service groups that are outside the VBS in question. Any local VCS dependencies of a service group are still honored, whether or not they are a part of the same VBS.

The `vbssvc -start` command supports automatic starting of VMware virtual machines before it brings the service groups on the virtual machines online. However, you must enable the Start VM option on the Virtualization configuration options panel in Veritas Operations Manager. Also, ensure that the `VRTSsfmh` package version is 5.0.

Note: In the case of disaster recovery or planned migration of VBS, you can use the command line to automatically start the VMware machines before the service groups are brought online.

A virtual machine start operation through the start command is supported only for ApplicationHA or single node VCS clusters.

To terminate the start operation from the command line (for example, if the command becomes unresponsive), use the `vbssvc -flush` command.

UNIX systems:

```
# /opt/VRTSvbs/bin/vbssvc -flush vbs_name
```

Windows systems:

```
C:\Program Files\VERITAS\VRTSvbs\bin\vbssvc.exe -flush vbs_name
```

See [“Starting a Virtual Business Service using VBS Availability Add-on”](#) on page 67.

See [“Starting and stopping Virtual Business Services”](#) on page 66.

Stopping a Virtual Business Service using VBS Availability Add-on

You can stop a Virtual Business Service using VBS Availability Add-on. When you stop a Virtual Business Service, its associated service groups are taken offline in the specified order. The order in which Veritas Operations Manager takes the service groups offline is the reverse of the start order defined in Veritas Operations Manager for the service groups of the Virtual Business Service.

A parent service group may depend on one or more child service groups. When you stop a Virtual Business Service, the parent service group is taken offline before its child service groups.

See [“Fault management overview”](#) on page 83.

Before you stop a Virtual Business Service, ensure that the following prerequisites are met:

- The service groups in the Virtual Business Service should not be in faulted or frozen state.
- The service groups in the Virtual Business Service should not be in auto-disabled or disabled state.

Note: You can view the business entity stop operation details in the **Tasks** page (under **Monitor > Tasks**) of Veritas Operations Manager console. The page displays all previous operations and the operations, which are in progress.

To stop a Virtual Business Service

- 1 In the Veritas Operations Manager console, select **Manage > Virtual Business Services**.
- 2 Under **Virtual Business Services**, select the Virtual Business Service that you want to stop, and do one of the following:
 - Select **Actions > VBS Availability > Stop VBS**.
 - Right-click the Virtual Business Service, and then select **VBS Availability > Stop VBS**.

- Click the Virtual Business Service and in the Virtual Business Service details page, click **Actions > VBS Availability > Stop VBS**.
- 3** On the **Stop Virtual Business Service** wizard panel, click **OK** to confirm.
- When you stop a Virtual Business Service, you are redirected to the **Service Group Order** tab of the Virtual Business Service details page. The page displays the progress of the stop operation graphically. If you want to terminate the stop operation, click **Abort** under the **Service Group Order** tab.

Note: The stop operation does not offline the service groups, which are shared with other Virtual Business Services and children of such service groups. If you want to override this behavior, and take offline all service groups in the selected Virtual Business Service, select the **Offline shared service groups** option in the **Stop Virtual Business Service** wizard panel.

See [“Starting a Virtual Business Service using VBS Availability Add-on”](#) on page 67.

See [“Virtualization workflow for Virtual Business Service stop operation”](#) on page 71.

See [“Configuring Virtual Business Service start and stop using Veritas Operations Manager Virtual Business Services Availability Add-on”](#) on page 53.

Virtualization workflow for Virtual Business Service stop operation

During the Virtual Business Service stop operation, when Veritas Operations Manager discovers any service group that is online on a virtual machine, Veritas Operations Manager will offline that service group, and thereafter, if there are no other service groups configured on the VMware virtual machine, Veritas Operations Manager will offline the virtual machine itself.

Note that the virtual machine stop operation is ignored if other service groups are running on that virtual machine. To enable this virtual machine auto-stop feature, make sure that you have already selected the virtual machine stop option in VBS Availability Add-on Configuration Wizard panel. Veritas Operations Manager stops the virtual machine using the specified Virtual Center (vCenter Server). The option is supported only for the VMware virtual machines.

See [“Virtualization workflow for Virtual Business Service start operation”](#) on page 68.

Stopping a Virtual Business Service from the command line

To stop a Virtual Business Service, use the following command from a node on any of the clusters that are part of the Virtual Business Service. The command takes the service groups offline in the required order.

UNIX systems:

```
# /opt/VRTSvbs/bin/vbssvc -stop myVBS
```

Windows systems:

```
C:\Program Files\VERITAS\VRTSvbs\bin\vbssvc.exe -stop myVBS
```

The `vbssvc -stop` command does not take shared service groups or their children offline. If you want to override this behavior and take offline all service groups in the Virtual Business Service including shared service groups, use the `-force` switch as follows:

UNIX systems:

```
# /opt/VRTSvbs/bin/vbssvc -stop -force vbs_name
```

Windows systems:

```
C:\Program Files\VERITAS\VRTSvbs\bin\vbssvc.exe -stop -force vbs_name
```

The `vbssvc -stop` command automatically stops VMware virtual machines that host online service groups after taking the service groups offline. However, you must enable the Stop VM option on the Virtualization configuration options panel in Veritas Operations Manager. Also, ensure that the `VRTSsfmh` package version is 5.0.

Note: In the case of disaster recovery or planned migration of VBS, you can use the command line to automatically stop the VMware machines after the service groups are taken offline.

Note: Consider a virtual machine running a service group that is part of a VBS and other service groups that are not part of the VBS. When you run the stop command, VBS does not stop the virtual machine as there are other service groups running on the virtual machine. However, VBS does not consider VCS internal service groups such as ClusterServiceGroup, VCSAppMonHBSG, and VCSInfraSG that may not be part of the VBS while stopping the virtual machine.

Also, if a service group that is part of a virtual machine is already offline, the stop command does not stop the Virtual Machine.

A virtual machine stop operation through the stop command is supported only for Symantec ApplicationHA or single node VCS clusters.

To terminate the stop operation from the command line (for example, if the command becomes unresponsive), use the `vbssvc -flush` command.

UNIX systems:

```
# /opt/VRTSvbs/bin/vbssvc -flush vbs_name
```

Windows systems:

```
C:\Program Files\VERITAS\VRTSvbs\bin\vbssvc.exe -flush vbs_name
```

Note: From the command line, you can stop a Virtual Business Service whose service groups are faulted. However, stopping a Virtual Business Service whose service groups are faulted is not possible from Veritas Operations Manager.

See [“Stopping a Virtual Business Service using VBS Availability Add-on”](#) on page 70.

See [“Starting and stopping Virtual Business Services”](#) on page 66.

About propagation behavior for start and stop operations

- The Virtual Business Service start operation does not propagate the online operation on constituent service groups to the child service groups that are in the local cluster but outside the Virtual Business Service. If the child service groups are not online when you start the Virtual Business Service, the parent service group inside the Virtual Business Service is not brought online.
- The Virtual Business Service stop operation does not propagate the offline operation on constituent service groups to their parent service groups (with FIRM or HARD VCS-level dependencies) that are in the local cluster but outside the Virtual Business Service. If the parent service groups are not offline when you stop the Virtual Business Service, the child service group inside the Virtual Business Service is not taken offline.

Viewing the overview of a Virtual Business Service

The Overview view of a Virtual Business Service displays the faulted conditions that are associated with it.

In the **Faulted Conditions** table, you can view the following details:

- Possible cause of the problem

- Entity that is faulted
- Source that is faulted
- Time at which the fault is reported
- Icon to display the Fault dependency view

In the Overview view of an application business entity, you can do the following tasks:

- Suppress the faults.
- Unsuppress the faults.
- Create rules for associating alerts to a faulted object.
- Analyze all faults.

To view the overview of a Virtual Business Service

- 1 Select **Manage > Business Entities**.
- 2 In the Business Entities view, in the table that lists the business entities, click the name of the Virtual Business Service to display its details.
- 3 In the **Overview** tab, review the details of the faulted conditions that are associated with the Virtual Business Service, if any.

Viewing the Virtual Business Service status from the command line

Use the `vbssvc -state` command to list the availability status of all Virtual Business Services visible to the local cluster. You can run the command from any system in any cluster that is part of a Virtual Business Service. You can list the availability status of a specific Virtual Business Service by running the `vbssvc -state vbs_name` command.

UNIX systems:

```
# /opt/VRTSvbs/bin/vbssvc -state vbs_name
```

Windows systems:

```
C:\Program Files\VERITAS\VRTSvbs\bin\vbssvc.exe -state vbs_name
```

For information on how to view the availability status and health of Virtual Business Services using Veritas Operations Manager, see the *Veritas Operations Manager Management Server Administrator's Guide*.

Viewing the status of a Virtual Business Service

You can view the fault management status of a Virtual Business Service in the Veritas Operations Manager console. The information can be viewed in the **Fault Mgmt status** tab, which is enabled only if you enable fault management for a Virtual Business Service.

The **Fault Mgmt status** tab includes two tables - the **VBS Fault Management configuration status** table, and the **VBS Info** table.

In the **VBS Fault Management configuration status** table, you can view the following details:

- **Host Name:** Name of the host.
- **Cluster name:** Name of the cluster that the host belongs to.
- **Configured status:** Indicates the fault management configuration status of the host.

Configured Status	Description
Enabled	Fault management is enabled for Virtual Business Services on the specified host. This implies that the credentials for fault management configuration are deployed and the vbsapp resource is present on the specified host and VRTSvbs package is installed.
Not Enabled	Fault management is not enabled for Virtual Business Services on the specified host. This means that the credentials for fault management configuration are not deployed.
Enabled by another VOM	Credentials for fault management configuration are deployed and the vbsapp resource is present, but the host belongs to another Veritas Operations Manager Management Server domain.
Partially Enabled	Fault management configuration has not been completed for Virtual Business Service on the specified host. This implies that credentials for fault management configuration are deployed, but the vbsapp resource is not present on the specified host.

- **Host status (Last ping time):** Indicates whether the last discovery cycle was successful on the host. The value **Up** indicates a successful discovery cycle, while the value **down** indicates an unsuccessful discovery cycle. It also displays the time when the last discovery cycle occurred.
- **VBS Package version:** Indicates the VBS package version installed on the host.

In the **VBS Info** table, you can view the following details :

■ Controller Name

To view the fault management status of a Virtual Business Service

- 1 In the Veritas Operations Manager console, select **Manage > Business Entities**.
- 2 In the **Business Entities** view, review the Virtual Business Services that have the Fault Management column marked as Enabled. Click the Virtual Business Service that has fault management enabled.
- 3 In the details view of the Virtual Business Service, click the **Fault Mgmt Status** tab to view its fault management status.

See [“Enabling fault management for a Virtual Business Service”](#) on page 77.

See [“Disabling fault management for a Virtual Business Service”](#) on page 78.

Viewing the logs of a Virtual Business Service

The Virtual Business Service log provides information on the operations that are performed on a Virtual Business Service, and also the errors that may have occurred while the operations are performed. All users can view the log.

Note: If you want to view the log for a Virtual Business Service, ensure that the fault management is already enabled for the selected Virtual Business Service.

In a Virtual Business Service log, you can view the following information for each operation or error that occurs on the selected Virtual Business Service:

- Time when the operation was performed, or when the error occurred.
- Severity: Critical, Error, Warning, Notice, or Info.
- UMI or the message code.
- Message

While viewing the log, you can select **Log Summary** to view a summarized version of the log. To download the log as a text file, click **Download**.

To view the log for a Virtual Business Service

- 1 In the Veritas Operations Manager console, click **Manage > Virtual Business Services**.
- 2 In the **Virtual Business Services** view, select the Virtual Business Service, and do one of the following:
 - Select **Actions > VBS Availability > View Logs**.

- Right-click the Virtual Business Service, and then select **VBS Availability > View logs**.
- Click the Virtual Business Service and in the Virtual Business Service details page, click **Actions > VBS Availability > View Logs**.

See “[Enabling fault management for a Virtual Business Service](#)” on page 77.

Enabling fault management for a Virtual Business Service

The fault management feature further extends VBS Availability Add-on’s capabilities of fault handling in a multi-tier application environment. In a Virtual Business Service, one of the three types of dependencies can exist among the parent and its child service groups. The dependencies are soft, firm, and restart. They determine a tier’s configurable reaction to the lower tier event, and control fault propagation.

For example, the Virtual Business Service notifies the middle tier about the fault and recovery that has occurred at the database tier. The reaction of the middle tier to the events at the lower tier can be configured. The middle tier can choose to restart to update its state to reflect the failover at the database tier, or it can choose to ignore the event.

The soft type of dependency is available by default. You are not required to enable fault management to use soft type of dependency. If you want to use the remaining two dependency types (firm and restart), you need to enable fault management feature. This feature is activated by installing the `VRTSvbs` package on the cluster nodes, and enabling fault management.

Note: The fault management feature is optional, and it is required only when you want to use service groups dependencies other than the default dependency type, which is soft. The fault management feature, when enabled, lets you use firm and restart type of dependencies in addition to the soft type. If you are not using fault management feature, you can still establish parent-child service group relationships with the dependency type as soft.

To enable fault management for a Virtual Business Service

- 1 In the Veritas Operations Manager console, select **Manage > Virtual Business Services**.
- 2 Under the **Virtual Business Services** view, select the Virtual Business Service, and do one of the following:

- Select **Actions > VBS Availability > Enable Fault Management**.
 - Right-click the Virtual Business Service, and then select **VBS Availability > Enable Fault Management**.
- 3 On the **Enable Fault Management** wizard panel, click **OK** to confirm.

Note: Though a Virtual Business Service contains objects other than the service groups, the changes made for the fault management affect only service groups.

See “[Disabling fault management for a Virtual Business Service](#)” on page 78.

Disabling fault management for a Virtual Business Service

When you disable fault management for a Virtual Business Service, you will no longer be able to use firm and restart type of dependencies.

To disable fault management for a Virtual Business Service

- 1 In the Veritas Operations Manager console, select **Manage > Virtual Business Services**.
- 2 Under the **Virtual Business Services** view, select the Virtual Business Service for which you want to disable fault management, and do one of the following:
 - Select **Actions > VBS Availability > Disable Fault Management**.
 - Right-click on the Virtual Business Service, and then select **VBS Availability > Disable Fault Management**.
- 3 On the **Disable Fault Management** wizard panel, click **OK** to confirm.

See “[Enabling fault management for a Virtual Business Service](#)” on page 77.

Virtual Business Services security

This chapter includes the following topics:

- [About the Virtual Business Services security model](#)
- [Virtual Business Services security model example](#)
- [Authentication for start and stop operations](#)

About the Virtual Business Services security model

This topic describes the Virtual Business Services security model as applied to the managed hosts.

For information about the security model for Veritas Operations Manager, see the *Veritas Operations Manager Management Server Administrator's Guide*.

Only root level users of UNIX systems and administrators of Windows systems are valid users who can access the managed hosts to perform Virtual Business Service operations. Other users cannot perform any Virtual Business Service operations. However, Virtual Business Services provide a security mechanism to prevent hosts that are outside the Virtual Business Service boundary from performing valid operations or from breaching security.

The security mechanism is based on using an embedded Web server inside the Virtual Business Service daemon (VBSD). The embedded Web server makes use of VxAT. The communication among different VBS daemons happen over a secure channel based on the https protocol.

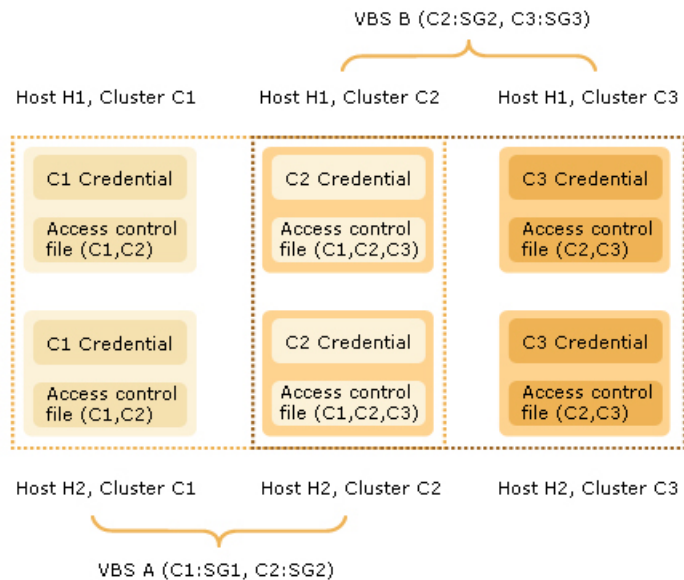
Note: VBS daemon communicates through port 2410. Ensure that firewall filters do not block this port on all hosts participating in the Virtual Business Service.

Virtual Business Services security model example

Consider two Virtual Business Services:

- VBS A that consists of cluster C1 and cluster C2
- VBS B that consists of cluster C2 and cluster C3

Figure 4-1 Virtual Business Services security model



Assume the following service groups for each cluster:

- Service group SG1 for cluster C1
- Service group SG2 for cluster C2
- Service group SG3 for cluster C3

When you enable fault management for a Virtual Business Service from the Veritas Operations Manager interface, Veritas Operations Manager deploys a per-cluster credential (digital certificate) to each cluster. All hosts on the cluster get a credential that identifies them as belonging to that cluster. The cluster credential contains the cluster ID. Likewise, hosts on another cluster also get credentials that identify them as belonging to their respective cluster.

Additionally, the credential also has information about the Management Server that sent the credential. This information is required when one host is managed by multiple Management Servers.

Security mechanism for cluster C1

When the VBS daemon on C1 is started, it reads the contents of the configuration file on the host to determine the clusters that are allowed to communicate with C1. In this case, *VBS A* consists of C1 and C2. The VBS daemon determines that C2 can communicate with C1. Hence, it adds the cluster IDs of C1 and C2 to the access control file, `$VBS_HOME/web/admin/.xpctlaccess`.

```
# cat /opt/VRTSvbs/web/admin/.xpctlaccess
```

```
<ClusterId of C1>@vbs_domain@<Name of VOM CMS>.vx:user
```

```
<ClusterId of C2>@vbs_domain@<Name of VOM CMS>.vx:user
```

If cluster C3 tries to communicate with C1, the VBS daemon on C1 looks up the access control file and disallows C3 from communicating with C1. Also, no external hosts or clusters can pretend to be one of C1 or C2 because they do not have the credential.

Assume that there is a reconfiguration of *VBS A* such that a service group which belongs to an outside cluster is now part of *VBS A*. The new configuration is deployed to cluster C1 and the VBS daemon updates the access control file to include the cluster ID of the outside cluster.

Security mechanism for cluster C2

When the VBS daemon on C2 is started, it reads the contents of the configuration file on the host to determine the clusters that are allowed to communicate with C2. As *VBS B* consists of C2 and C3, the VBS daemon determines that C3 can communicate with C2. However, C2 is part of both *VBS A* and *VBS B*. So, it can also communicate with C1, which is part of *VBS A*.

Hence, the VBS daemon adds the Cluster IDs of C1, C2, and C3 to the access control file, `$VBS_HOME/web/admin/.xpctlaccess`.

```
# cat /opt/VRTSvbs/web/admin/.xpctlaccess
```

```
<ClusterId of C1>@vbs_domain@<Name of VOM CMS>.vx:user
```

```
<ClusterId of C2>@vbs_domain@<Name of VOM CMS>.vx:user
```

```
<ClusterId of C3>@vbs_domain@<Name of VOM CMS>.vx:user
```

No external hosts or clusters can pretend to be one of C1, C2, or C3 because they do not have the credential.

Security mechanism for cluster C3

When the VBS daemon on C3 is started, it reads the contents of the configuration file to determine the clusters that are allowed to communicate with C3. As *VBS B* consists of C2 and C3, the VBS daemon determines that C2 can communicate with C3.

Hence, the VBS daemon adds the Cluster IDs of C2 and C3 to the access control file, `$VBS_HOME/web/admin/.xpctlaccess`.

```
# cat /opt/VRTSvbs/web/admin/.xpctlaccess
```

```
<ClusterId of C2>@vbs_domain@<Name of VOM CMS>.vx:user
```

```
<ClusterId of C3>@vbs_domain@<Name of VOM CMS>.vx:user
```

No external hosts or clusters can pretend to be one of C2 or C3 because they do not have the credential.

Authentication for start and stop operations

Start or stop operations on a Virtual Business Service can be initiated only by clusters that are part of the Virtual Business Service. When a start operation or stop operation of a Virtual Business Service is initiated, VBS daemon ensures that the start or stop request comes from a cluster that is part of the Virtual Business Service.

Fault management in Virtual Business Services

This chapter includes the following topics:

- [Fault management overview](#)

Fault management overview

A Virtual Business Service allows high availability decisions to be localized at the cluster level, while it propagates the events up the dependency chain. It is not mandatory for Veritas Operations Manager to be online for the fault to be propagated and the configured behavior to be executed. The high availability of a Virtual Business Service is guaranteed even if Veritas Operations Manager Management Server is temporarily down.

The following events can occur in response to a failure of the database application.

See [“Sample Virtual Business Service configuration”](#) on page 15.

- Each tier has its own high availability mechanism, such as Veritas Cluster Server or ApplicationHA.
- Inter-cluster fault propagation allows for the high availability events to be propagated up. For example, the Virtual Business Service notifies the middle tier about the fault and any subsequent recovery that occurs in the database tier.
- You can configure how the middle tier must respond to the fault in the lower tier and so on. Depending on the business need, the middle tier might be configured to stop, restart, or stay online. The event might be propagated upwards based on the fault policy configured.

[Table 5-1](#) lists how a parent behaves in response to a fault or recovery on its child for various dependency types.

Table 5-1 Virtual Business Services fault policy behavior

Fault dependency type	Behavior
SOFT	<p>When the child faults or recovers from the fault, the parent ignores the events. The parent does not take any action.</p> <p>This type of dependency is used when only start or stop ordering is required and no fault policy action is needed.</p>
FIRM	<p>When the child faults, the parent is taken OFFLINE.</p> <p>When the child recovers, the parent is brought ONLINE.</p>
RESTART	<p>When the child faults, the parent takes no immediate action.</p> <p>When the child recovers, the parent is taken OFFLINE and then brought ONLINE.</p>

[Table 5-2](#) list how a parent propagates a fault to its parents in response to a fault or recovery on its child for different dependency types.

Table 5-2 Virtual Business Services fault propagation behavior

Fault dependency type	Fault propagation
SOFT	<p>When a parent gets notification about a child fault or a child recovery, the parent does not propagate this notification to its parents.</p>
FIRM	<p>When a parent goes offline as a result of a child fault, the parent propagates the fault to its parents.</p> <p>When a parent comes online as a result of a child recovery, the parent propagates the recovery to its parents.</p>
RESTART	<p>When a child faults, the parent does not immediately propagate the fault to its parents.</p> <p>When the parent is brought offline as a result of child recovery, the deferred fault is propagated to its parents.</p> <p>When the parent is subsequently brought online as a result of child recovery, the recovery is propagated to its parents.</p>

See [“Enabling fault management for a Virtual Business Service”](#) on page 77.

See [“Disabling fault management for a Virtual Business Service”](#) on page 78.

VCS dependencies in Virtual Business Services

If two service groups in a Virtual Business Service have a VCS-level dependency set between them, this dependency is represented as VCS type dependency in the Virtual Business Service. VCS-level dependencies between two participating service groups are visible in a Virtual Business Service, but there is no action taken on the dependency by the VBS daemon. The dependency is used by the VBS daemon only determining the start or stop order. So, the behavior for this dependency is identical to that of the SOFT dependency type.

A VCS-level dependency cannot be set or modified from Veritas Operations Manager. When VCS-level dependencies exist, they are given higher precedence than VBS-type dependencies.

Parallel and failover service groups

- The VBS daemon considers a failover service group as FAULTED when the online instance of the service group is faulted.
- The VBS daemon considers a parallel service group as FAULTED only when the last online instance of the service group is faulted.

Note: For fault management purposes, hybrid service groups behave like parallel service groups.

Shared service groups

A shared service group is one that is part of multiple Virtual Business Services. Virtual Business Service fault management does not distinguish between shared and non-shared service groups because fault and recovery in service groups are asynchronous events that are not tied to any Virtual Business Service. Any fault or recovery is propagated to the parent and acted upon based on the dependency type.

Types of faults handled

Virtual Business Service fault management handles application failures as well as node failures. When a node crashes, VCS detects the failure, which is propagated to the Virtual Business Service through the Veritas Operations Manager discovery mechanism. Fault management treats all service groups that were running on the node as FAULTED. Based on the dependency configured, the appropriate action is taken provided at least one node is left in RUNNING state in the cluster.

Intentional shutdown of a node or VCS daemon (HAD) is not treated as a node fault. Virtual Business Service fault management takes no action in this case.

When a cluster node goes into EXITED state, Virtual Business Service fault management treats the outage as planned downtime and takes no action.

Fault management considerations in ApplicationHA environments

If applications running on ApplicationHA nodes have parent service groups that are part of a Virtual Business Service, fault propagation may have certain issues.

If VM.GracefulRebootPolicy is enabled and App.RestartAttempts is set to 0, the VBS daemon does not get sufficient time to notify the update to other VBS daemons. If VM.GracefulRebootPolicy is disabled or if the ApplicationHA node is the top tier, fault propagation works correctly. Ensure that VM.GracefulRebootPolicy is disabled if the ApplicationHA tier has parent service groups in a Virtual Business Service.

For information about ApplicationHA-initiated virtual machine restarts, see the *Symantec ApplicationHA User's Guide*.

Fault propagation for virtual machines

Fault propagation behavior impacts only service groups that are running inside virtual machines and not the virtual machines. The virtual machines do not start or stop as a part of fault policy.

Reconfiguring an ApplicationHA node

If an ApplicationHA service group is part of a Virtual Business Service and you reconfigure application monitoring for the ApplicationHA node, fault management and command line operations may not work. The ApplicationHA service group dependencies get removed from the Virtual Business Service.

To reconfigure an ApplicationHA node, perform the following steps.

1. Remove ApplicationHA service groups from the Virtual Business Service on which ApplicationHA reconfiguration is planned.
2. Complete the reconfiguration on ApplicationHA.
3. After the reconfiguration, add the ApplicationHA service groups that are created and create any dependencies that are required.

Disaster recovery in Virtual Business Services

This chapter includes the following topics:

- [About disaster recovery for Virtual Business Services](#)
- [Prerequisites](#)
- [Sample disaster recovery configuration](#)
- [Disaster recovery alerts](#)
- [About the disaster recovery plan](#)
- [Bringing up Virtual Business Services at the DR site](#)
- [Performing planned migration of Virtual Business Services](#)
- [Concurrency violation](#)

About disaster recovery for Virtual Business Services

Disaster recovery (DR) ensures automated recovery of applications by migrating or failing over applications to a remote cluster that is located at any distance from the original cluster.

Virtual Business Services extend the existing DR functionality of Veritas Cluster Server, enabling you to migrate or fail over multi-tier applications running on multiple clusters between two sites.

Prerequisites

The following prerequisites apply:

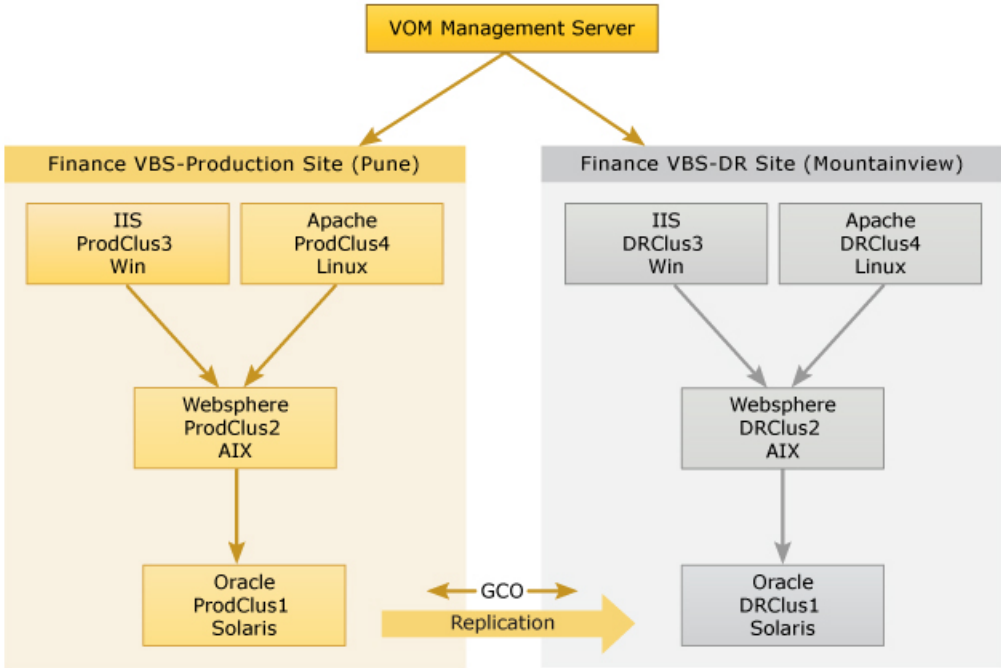
- At least one tier in the Virtual Business Service must be configured for VCS disaster recovery.
- The global service group must not be configured to fail over to another cluster automatically. For information on how to set the `ClusterFailOverPolicy` attribute, see the *Veritas Cluster Server Administrator's Guide*.
- The global service group and its DR counterpart must not be part of the same Virtual Business Service.

Sample disaster recovery configuration

[Figure 6-1](#) shows a production site and a DR site.

The two Virtual Business Services are shown to be symmetrical but they are not required to be symmetrical. The same Management Server is preferred to manage the production site and DR site but you can use two different Management Servers too.

Figure 6-1 Sample disaster recovery configuration



To enable disaster recovery for the Oracle database, global cluster option (GCO) is configured at the database tier. Traditional VCS global service group failover ensures that the database is online only at one site at a time. If there is a failure of the database tier on the production cluster, a disaster recovery alert is triggered by VCS GCO.

If you start the Virtual Business Service at the DR site in response to the alert, the entire Finance application is brought up in the specified order. At the production site, the inter-cluster fault propagation mechanism propagates the fault at the database tier to the middle tier and so on. Depending on the configured behavior, the applications in other tiers might go down or stay online.

The end-to-end Finance application is now fully available at the DR site, while it is in PARTIAL state or FAULTED state at the production site.

Disaster recovery alerts

The disaster recovery alerts that apply for Virtual Business Services are:

- The CFAULT alert is triggered whenever a cluster where GCO is configured is faulted. A notification is sent to the remote cluster. You can see the alert in the logs and then take appropriate corrective action.
- The GNOFAIL alert is triggered when the global service group is unable to failover.

For more information about these alerts, see the *Veritas Cluster Server Administrator's Guide*.

About the disaster recovery plan

The disaster recovery plan (DR plan) provides the sequence of operations that will be performed at the DR site, in the event of a disaster. To view the Virtual Business Service DR plan, use the `vbssvc -showplan` command. You can run this command from the production site or from the DR site.

The command output might resemble the following:

```
# vbssvc -showplan FinanceVBS
```

```
VCS NOTICE V-16-25-40234 virtual business service FinanceVBS  
can not be started.
```

```
VCS WARNING V-16-25-40239 service group DBSG_Fin : Online on  
remote cluster MtViewVBS. At least one service group in virtual business  
service is not global.
```

Table 6-1 lists a few scenarios and possible DR plan command outputs.

Table 6-1 DR plan examples

Scenario	DR plan output
Global service group is faulted.	The plan shows that the global service group at the production site is FAULTED. The <code>-force</code> option will be used to bring the global service group online at the DR site.
Global service group is offline.	The plan shows that the global service group is offline at the production site. You can start the Virtual Business Service at the DR site.
Production cluster is faulted.	The plan shows that the service group is global and that the production cluster is FAULTED or DOWN. When you start the Virtual Business Service on the DR site, the <code>-force</code> option will be used to bring the global service group online at the DR site.

Table 6-1 DR plan examples (*continued*)

Scenario	DR plan output
Global service group is online at the production site and there are one or more non-global service groups in the Virtual Business Service.	The plan shows that the production cluster is up and the global service group is online on the production cluster. You cannot start the Virtual Business Service at the DR site.
Global service group is online at the production site and all service groups are global.	The plan shows the status of each service group on the production site. The <code>-switch</code> option will be used to bring the global service groups online at the DR site for the global service groups that are online at the production site.

Bringing up Virtual Business Services at the DR site

To recover a Virtual Business Service after a disaster occurred, perform the following tasks:

1. Check the logs for the CFAULT alert. CFAULT indicates that the production site cluster failed.
2. View the DR plan for the global service group by running the `vbssvc -showplan vbs_name` command.

The command output shows that the global cluster on the production site is faulted.

3. Start the Virtual Business Service on the DR Site by running the `vbssvc -start vbs_name` command.

The `vbssvc -start` command brings the global service group online at the DR site by using the `-force` option.

Performing planned migration of Virtual Business Services

You can perform a planned failover of a Virtual Business Service to the DR site to minimize application downtime during planned maintenance of the production site.

1. Verify whether a service group is part of a Virtual Business Service.

```
# vbssvc -display
```

2. Stop the Virtual Business Service on the production site.

```
# vbssvc -stop vbs_name
```

3. View the status of the global service group on the production site and on the DR site.

```
# vbssvc -showplan
```

4. Start the Virtual Business Service at the DR site.

```
# vbssvc -start vbs_name
```

Concurrency violation

A paired Virtual Business Service must not be online at the same time on the production site and on the DR site. The GNOFAIL alert is used to prevent concurrency violation. Concurrency violation at Virtual Business Service level is prevented by the VBS daemon if all service groups are global. But in case some service groups are non-global, you must ensure that all groups in the Virtual Business Service at the production are offline or faulted before you start the Virtual Business Service at the DR site.

Enhancements to Virtual Business Service

This chapter includes the following topics:

- [About VBS Availability Add-on 5.0](#)
- [Auto discovery of IP addresses for inter-cluster communication](#)
- [Automatic start and stop of VMware virtual machines from the command line](#)

About VBS Availability Add-on 5.0

The VBS Availability Add-on 5.0.xxx.0 release includes enhancements and fixes to issues.

The enhancement is:

Recovery plans consist of the steps that need to be run when a disaster or contingency arises. Veritas Operations Manager provides the ability to create and store recovery plans, to manually run a plan, and to monitor and log its progress and status.

Using the Veritas Operations Manager console, you can perform the following tasks:

- Create a recovery plan.
- Edit a recovery plan.
- Delete a recovery plan.
- Run a recovery plan.

Auto discovery of IP addresses for inter-cluster communication

In the previous release of Virtual Business Services, a virtual IP address (VIP) had to be configured for every participating cluster. With this release, VIP configuration is optional. In the absence of VIP, VBS daemons intelligently auto discover the peer cluster IP addresses.

Note: For clusters having the global cluster option configured, VIP remains the only mode of communication and auto discovery is not supported.

See [“Communication among VBS daemons”](#) on page 59.

Automatic start and stop of VMware virtual machines from the command line

A service group participating in a VBS can be hosted on a virtual machine. If the virtual machine is a VMware machine, VBS can automatically bring it online on a VBS start operation or take it offline on a VBS stop operation. This functionality is supported through the VBS start command or VBS stop command issued from the command line, as well as through Veritas Operations Manager. This operation was only supported through Veritas Operations Manager before this release.

See [“Considerations for creating a Virtual Business Service”](#) on page 27.

Upgrading Virtual Business Service

This chapter includes the following topics:

- [Prerequisites for upgrading to VBS Availability Add-on version 5.0](#)
- [Upgrading VBS Availability Add-on to 5.0](#)
- [Upgrading the VRTSvbs package using Veritas Operations Manager](#)

Prerequisites for upgrading to VBS Availability Add-on version 5.0

Ensure that the following prerequisites are met before you start upgrading the VBS Availability Add-on (VRTSBEopr-5.0.x.x.sfa).

- You are logged on as the Domain Administrator or the administrator of the Virtual Business Service.
- You installed Veritas Operations Manager Management Server version 5.0.
- The Managed host version is 5.0.

Note: As a best practice, before you upgrade a tier, you must disable fault management for all Virtual Business Services that consist of service groups from that tier and then enable fault management after the upgrade is complete.

See [“Enabling fault management for a Virtual Business Service”](#) on page 77.

See [“Disabling fault management for a Virtual Business Service”](#) on page 78.

To get the full functionality of Virtual Business Services provided by version 6.0.1 of VCS, SFHA, or SFWHA, you must upgrade to the following software or package versions:

- Veritas Operations Manger 5.0. If you are upgrading from an earlier version, see the *Veritas Operations Manager Management Server Installation Guide* for instructions.
- VRTSsfmh 5.0. For instructions, see the *Veritas Cluster Server Installation Guide*.
- VBS Availability Add-on 5.0. See “[Upgrading VBS Availability Add-on to 5.0](#)” on page 96.
- VRTSvbs 6.0.1. See “[Upgrading the VRTSvbs package using Veritas Operations Manager](#)” on page 97.

Upgrading VBS Availability Add-on to 5.0

You can upgrade VBS Availability Add-on to 5.0.xxx.0 (where xxx is the build number for the release) using the Veritas Operations Manager console. Before you upgrade, you need to download and unzip the `VRTSBEopr-5.0.xxx.0.sfa` package from the SORT Web site or the Fileconnect Web site , and upload it to the repository. You need not remove the existing version of VBS Availability Add-on before the upgrade.

You need domain administrator privileges to upgrade the add-on.

To upgrade VBS Availability Add-on to 5.0.xxx.0

- 1 In the Veritas Operations Manager console, click **Settings > Deployment**.
- 2 In the **Deployment Management** view, under the **Repository** tab, do one of the following:
 - Click **Actions > Upload**.
 - Right-click in the table, and from the submenu select **Upload**.
- 3 In **Upload to Repository** panel, click **Browse** and select the add-on package that you downloaded to upload.
- 4 Click **Upload**, to upload the solution to the repository, and click **Close**.
- 5 In the **Deployment Management** view, under the **Repository** tab, do one of the following:
 - Select VBS Availability Add-on 5.0.xxx.0, and click **Actions > Install**.
 - Right-click VBS Availability Add-on 5.0.xxx.0 to display the shortcut menu, and select **Install**.

- 6 Click **Install**.
- 7 Click **Finish**. You are logged out of Management Server.
- 8 Log in to Management Server. The Web server is restarted automatically.

Upgrading the VRTSvbs package using Veritas Operations Manager

Skip this section if you installed or upgraded to VCS 6.0.1 or SFHA 6.0.1. Perform these steps if you installed an earlier supported version of VCS or SFHA. You must upgrade the VRTSvbs package on each host of each cluster that you want to manage. VRTSvbs is not supported on the Management Server.

Before you upgrade the VRTSvbs package on a managed host, ensure that the VRTSsfmh package version 4.1 or higher is installed on the host. If VRTSsfmh 4.1 or higher is not installed, installation of VRTSvbs fails.

Note: When you upgrade VRTSvbs from 6.0 to 6.0.1 through Management server, the vbsapp resource that is online on the managed host is brought offline and restarted after the upgrade is successfully completed. However, on Solaris 11 systems, the vbsapp resource is not taken offline and brought online automatically. Before you upgrade VRTSvbs on Solaris 11 systems, you must manually take the vbsapp resource on the managed hosts offline by using `HA` commands or through the Veritas Operations Manager console. After the upgrade is complete, you must manually bring the vbsapp resource online.

To upgrade the VRTSvbs package using Veritas Operations Manager

- 1 Download the VRTSvbs package to a temporary directory on your computer from the following location:
<https://sort.symantec.com/vom>
The package is available for download from Symantec FileConnect and Trialware too.
- 2 In the Veritas Operations Manager console, select **Settings > Deployment**.
- 3 Upload the package to the repository by using the **Actions > Upload** option in the Deployment Management view. You need to upload the VRTSvbs package for each platform that you want to deploy VBS on.
- 4 Select VRTSvbs package, and then do one of the following:
 - Click **Actions > Install**.

- Right-click VRTSvbs package and then select **Actions > Install**.

If you installed the VRTSvbs package on a host manually, the Management Server might not show that the VRTSvbs is installed on the host. To work around this issue, navigate to **Settings > Host Management**, and click the host on which you installed VRTSvbs manually. Click **Actions > Refresh Host(s)**.

- 5 In the Install Solution panel, select the required option (**Hosts** or **Platform**). Select the hosts or platforms on which to install the VRTSvbs package and deploy Virtual Business Services.
- 6 Click **Actions > Install**.
- 7 In the Result panel, click **OK**.

Uninstalling VRTSvbs

This chapter includes the following topics:

- [Uninstalling the VRTSvbs package](#)

Uninstalling the VRTSvbs package

To uninstall VRTSvbs

- 1 Remove all service groups corresponding to the cluster on which you are uninstalling VRTSvbs from all the Virtual Business Services that include any of those service groups.

For example, if you uninstall the VRTSvbs package from cluster C2 and C2:g2 is part of Virtual Business Services v1 and v2, you must remove C2:g2 from v1 and v2.

- 2 On the node on which you need to uninstall VRTSvbs, take the vbsapp resource offline.

```
# hares -offline vbsapp -sys local_node
```

- 3 Delete the vbsapp resource from the ClusterService group.

```
# hares -delete vbsapp
```

- 4 On each node of the cluster, uninstall the VRTSvbs package.

On UNIX systems, you can uninstall the VRTSvbs package on a managed host only from the command line interface on the host. On Windows systems, you must uninstall VRTSvbs from the Control Panel.

AIX # **installp -u VRTSvbs**

HP-UX # **swremove VRTSvbs**

Linux # **rpm -e VRTSvbs**

Solaris # **pkgrm VRTSvbs**

Windows When you uninstall SFHA or VCS, VRTSvbs does not get uninstalled. You must remove the VRTSvbs package by using **Programs and Features** (Windows 2008) or **Add or Remove Programs** (Windows 2003) from the Windows Control Panel.

- 5 If the ClusterService group is configured as a part of Virtual Business Service configuration and is not currently used by GCO, delete the ClusterService group.

Note: If you are upgrading an earlier supported version of VCS or SFHA (that has VRTSvbs installed) to VCS 6.0 or SFHA 6.0, you can use any of the upgrade procedures that are supported in VCS 6.0 or SFHA 6.0. For more information, see the installation guide for these products. If you want to remove VRTSvbs before upgrading, you must perform the steps in the procedure for uninstalling VRTSvbs.

Recovery Plan

This chapter includes the following topics:

- [About Recovery Plan](#)
- [Creating a Recovery Plan](#)
- [Editing a Recovery Plan](#)
- [Deleting a Recovery Plan](#)
- [Running a Recovery Plan](#)

About Recovery Plan

You can use Recovery Plans to, enhance active-active disaster recovery capabilities for the objects in your datacenter. This automation lets you group multiple Virtual Business Services (VBS) and service groups, and run the predefined tasks on these entities in the desired sequence. This feature is provided with the VBS Availability Add-on.

You can specify the following tasks in a Recovery Plan:

- Start VBS or and stop VBS
- Bring a service group online, or take a service group offline.
- Run custom scripts.

You can run the custom scripts on the managed hosts that are a part of the Recovery Plan. Every time a script is run, it should return a value. If the script does not return a value within five minutes or takes more than five minutes to run, then the task is marked as a failure. Script returning a value as 'zero' means that the task is a success. You can add multiple such custom scripts to your Recovery Plan. Each script cycle that runs is considered as a step of the Recovery Plan.

Using the Veritas Operations Manager console, you can create, edit, delete, and run the Recovery Plans. While creating the Recovery Plan, you can also specify additional information. For example, whether a step is critical or not. The Veritas Operations Manager console provides the progress, and the status of a Recovery Plan.

You cannot create a Recovery Plan if either the Management Server version, or the managed host version, or the VBS Availability Add-on version is prior to version 5.0.

Note: Only domain administrators can create, edit, delete, and run the Recovery Plan. Other VBS administrators can only run the Recovery Plan.

Creating a Recovery Plan

In Veritas Operations Manager, you can create a Recovery Plan and view the list of Virtual Business Services, service groups, or custom scripts. You can start or stop the Virtual Business Services, bring the service groups online, or offline. You can also specify whether the task is critical or not. While running a custom script, the name of the custom script and on which host it would be run needs to be specified.

To create a Recovery Plan

- 1 In the Veritas Operations Manager console, select **Manage > Recovery Plan**.
- 2 In the **Recovery Plan** view, do one of the following:
 - Select **Actions > Create Recovery Plan**.
 - Right-click on any existing Recovery Plan to display the shortcut menu, and select **Create Recovery Plan**.
- 3 In the **Specify name and description for the Recovery Plan** panel, specify the name and description of the Recovery Plan. Click **Next**.
See [“Specify name and description for the Recovery Plan panel options”](#) on page 103.
- 4 In the **Specify tasks for Recovery Plan** wizard panel, specify the tasks for the Recovery Plan. Click **Finish**.
See [“Specify tasks for the Recovery Plan panel options”](#) on page 103.
- 5 On the **Result** panel, verify that the Recovery Plan has been successfully created. Click **OK**.

See [“Editing a Recovery Plan”](#) on page 104.

See [“Deleting a Recovery Plan”](#) on page 104.

See [“Running a Recovery Plan”](#) on page 105.

Specify name and description for the Recovery Plan panel options

Use this wizard panel to specify a name and description for the recovery plan.

See [“Creating a Recovery Plan”](#) on page 102.

See [“Editing a Recovery Plan”](#) on page 104.

Specify tasks for the Recovery Plan panel options

Use this wizard panel to specify tasks for the recovery plan. You can perform the following operations to specify the tasks:

- **Add:** Click to add recovery plan(s).
- **Delete:** Click to delete recovery plan(s).
- **Move Up:** Click to change the order of the recovery plan(s) upwards.
- **Move Down:** Click to change the order of the recovery plan(s) downwards.

Table 10-1 Specify tasks for Recovery Plan

Field	Description
Type	Select the type of recovery plan object from the drop-down list.
Name	Specify the name of the recovery plan object selected.
Action	Select an action from the drop-down list.
Critical	Select the criticality of the recovery plan. If a task is marked as critical and it fails, then the recovery plan is stopped during execution and the remaining tasks are not run. If the task is marked as not critical, then even if the task fails, the recovery plan execution is not stopped.

See [“Creating a Recovery Plan”](#) on page 102.

See [“Editing a Recovery Plan”](#) on page 104.

Editing a Recovery Plan

In Veritas Operations Manager, you can edit a Recovery Plan and view the list of Virtual Business Services or service groups, or custom scripts. You can start or stop the Virtual Business Services, bring the service groups online, or offline. You can also specify whether the task is critical or not and also run custom scripts. While running a custom script, the name of the custom script and on which host it would be run needs to be specified. You can also add, delete, or change the order of the tasks displayed in the Recovery Plan(s) from the list displayed.

To edit a Recovery Plan

- 1 In the Veritas Operations Manager console, select **Manage > Recovery Plan**.
 - 2 In the **Recovery Plans** view, do one of the following:
 - Select **Actions > Edit Recovery Plan**.
 - Right-click on any existing Recovery Plan to display the shortcut menu and select **Edit Recovery Plan**.
 - 3 In the **Specify name and description for the Recovery Plan** panel, specify the name and description of the Recovery Plan. Click **Next**.
- See “[Specify name and description for the Recovery Plan panel options](#)” on page 103.
- 4 In the **Specify tasks for Recovery Plan** wizard panel, specify the tasks for the Recovery Plan. Click **Finish**.
- See “[Specify tasks for the Recovery Plan panel options](#)” on page 103.
- 5 On the **Summary** panel verify that the Recovery Plan has been successfully edited, click **OK**.

See “[Creating a Recovery Plan](#)” on page 102.

See “[Deleting a Recovery Plan](#)” on page 104.

See “[Running a Recovery Plan](#)” on page 105.

Deleting a Recovery Plan

In Veritas Operations Manager, you can delete an existing Recovery Plan if it is not required.

To delete a Recovery Plan

- 1 In the Veritas Operations Manager console, select **Manage > Recovery Plan**.
- 2 In the **Recovery Plans** view, select the Recovery Plan and do one of the following:

- Select the Recovery Plan and click **Actions > Delete Recovery Plan**.
 - Right-click on the Recovery Plan to display the shortcut menu and select **Delete Recovery Plan**.
- 3 In the **Delete Recovery Plan** panel, confirm that you want to delete the Recovery Plan. Click **Yes**.
See [“Delete Recovery Plan panel options”](#) on page 105.
 - 4 On the **Result** panel, verify that the Recovery Plan(s) have been successfully deleted. Click **OK**.
See [“Creating a Recovery Plan”](#) on page 102.
See [“Editing a Recovery Plan”](#) on page 104.
See [“Running a Recovery Plan”](#) on page 105.

Delete Recovery Plan panel options

Use this wizard panel to delete the Recovery Plan(s).

See [“Deleting a Recovery Plan”](#) on page 104.

Running a Recovery Plan

In Veritas Operations Manager, you can run a Recovery Plan. If you do not have permission to run a task specified in the Recovery Plan, then the task fails to run. Appropriate error messages are logged. You can view the errors. After resolving the errors, you can run the Recovery Plan again and choose to skip the completed tasks.

To run a Recovery Plan

- 1 In the Veritas Operations Manager console, select **Manage > Recovery Plan**.
- 2 In the **Recovery Plans** view, do one of the following:
 - Select the Recovery Plan and click **Actions > Execute Recovery Plan**.
 - Right-click on the Recovery Plan and select **Execute Recovery Plan**.
- 3 In the **Review tasks for the Recovery Plan** panel, confirm the Recovery Plan that you want to run. Also, indicate if any of the tasks need to be skipped. Click **Finish**.
See [“Review tasks for Recovery Plan panel”](#) on page 106.
- 4 On the **Result** panel, verify that the Recovery Plan was run successfully. Click **OK**.

See [“Creating a Recovery Plan”](#) on page 102.

See [“Editing a Recovery Plan”](#) on page 104.

See [“Deleting a Recovery Plan”](#) on page 104.

Review tasks for Recovery Plan panel

Use this wizard panel to review tasks for the Recovery Plan. You can also indicate if any of the tasks need to be skipped.

Table 10-2 Review tasks for Recovery Plan

Field	Description
Type	Select the type of Recovery Plan from the drop-down list.
Name	Specify the name of the Recovery Plan.
Action	Select an action from the drop-down list.
Critical	Select the criticality of the Recovery Plan.
Skip	Select to skip task execution from current run.

See [“Running a Recovery Plan”](#) on page 105.

Command reference

This appendix includes the following topics:

- [Virtual Business Services commands](#)

Virtual Business Services commands

You can run the Virtual Business Service command line interface from nodes of the clusters that have service groups configured as part of a Virtual Business Service.

[Table A-1](#) lists the Virtual Business Service commands and their usage.

Table A-1 Virtual Business Services commands

Operation	Command syntax and examples
View the information about the Virtual Business Services that are configured.	<pre>vbssvc -display [service_name(s)]</pre> <p>Examples</p> <pre># vbssvc -display service1 service2</pre> <p>Displays information about <i>service1</i> and <i>service2</i>.</p> <pre># vbssvc -display</pre> <p>The command displays information about the Virtual Business Services that consist of service groups from the local cluster.</p>

Table A-1 Virtual Business Services commands (*continued*)

Operation	Command syntax and examples
<p>View the states of the global service groups or remote clusters.</p> <p>The command output also shows the option that will be used to bring the global service group online when you start the Virtual Business Service.</p>	<pre>vbssvc -showplan <i>service_name</i></pre> <p>Example</p> <pre># vbssvc -showplan <i>service1</i></pre> <p>Displays the state of the global service groups or remote clusters.</p>
<p>View the availability status of Virtual Business Services.</p>	<pre>vbssvc -state [<i>service_name(s)</i>]</pre> <p>Examples</p> <pre># vbssvc -state <i>service1</i></pre> <p>Displays the availability status of <i>service1</i>.</p> <pre># vbssvc -state</pre> <p>The command displays availability status of the Virtual Business Services that consist of service groups from the local cluster.</p>
<p>View the parent-child dependencies and fault policies for a Virtual Business Service.</p>	<pre>vbssvc -grpdep [<i>service_name(s)</i>]</pre> <p>Example</p> <pre># vbssvc -grpdep <i>service1</i></pre> <p>Displays the parent-child relationships and fault policies that are defined for the Virtual Business Service <i>service1</i></p>
<p>View states of all the service group for a given Virtual Business Service.</p>	<pre>vbssvc -grpstate <i>service_name</i></pre> <p>Example</p> <pre># vbssvc -grpstate <i>service1</i></pre> <p>Displays the states of all the service groups that are part of the Virtual Business Service <i>service1</i>.</p>
<p>Start a Virtual Business Service.</p>	<pre>vbssvc -start <i>service_name</i></pre> <p>Example</p> <pre># vbssvc -start <i>service1</i></pre> <p>Starts the Virtual Business Service <i>service1</i> by bringing its service groups online in the required order.</p>

Table A-1 Virtual Business Services commands (*continued*)

Operation	Command syntax and examples
Stop a Virtual Business Service.	<pre>vbssvc -stop [-force] service_name</pre> <p>Example</p> <pre># vbssvc -stop service1</pre> <p>Stops the business service <i>service1</i> by taking its service groups offline in the required order.</p> <p>The <code>-force</code> option lets you stop a Virtual Business Service though one or more of its components might be shared with other Virtual Business Services.</p>
Flush a Virtual Business Service.	<pre>vbssvc -flush service_name</pre> <p>Example</p> <pre># vbssvc -flush service1</pre> <p>Flushes the start or stop operation that was initiated on the Virtual Business Service from the command line. The command allows cancellation of the start or stop operation if it becomes unresponsive.</p>
View the <code>vbssvc</code> usage list.	<pre>vbssvc [-help]</pre>
View the parent-child dependencies and fault policies between service groups.	<pre>vbsgrp -dep <cluster_name:group_name>(s)</pre> <p>Example</p> <pre># vbsgrp -dep clus1:sg1 clus2:sg2</pre> <p>Displays the parent-child relationships and fault policies that are defined for service group <i>sg1</i> from cluster <i>clus1</i> and for service groups <i>sg2</i> from cluster <i>clus2</i> as part of any Virtual Business Service that is managed by the Management Server.</p> <p>Note: All dependencies for given service groups defined in the Management Server might not be visible. The command displays dependencies defined for service groups that are part of Virtual Business Services that involve the local cluster (the cluster from where the command is executed).</p>

Table A-1 Virtual Business Services commands (*continued*)

Operation	Command syntax and examples
View the states of service groups.	<pre>vbsgrp -state [<cluster_name:group_name>(s)]</pre> <p>Example</p> <pre># vbsgrp clus1:sg1</pre> <p>Displays the state of the service group <i>sg1</i> in the cluster <i>clus1</i>.</p> <p>Note: To view the states of service groups belonging to a particular Virtual Business Service, refer to the <code>vbssvc -grpstate</code> command.</p>
View the <code>vbsgrp</code> usage list.	<pre>vbsgrp [-help]</pre>
View the virtual machine information.	<pre>vbssvc -vminfo [<vbs(s)>]</pre> <p>Example</p> <pre># vbssvc -vminfo vbsA</pre> <p>Displays information about the service groups on the virtual machine and the virtual machine. Virtual machine information such as name, type of the virtual machine, and the enabled or disabled status of the start and stop option selected in Veritas Operations Manager is displayed.</p>
View the state of the virtual machine.	<pre>vbssvc -grpstate [-vmstate] <vbs></pre> <p>Example</p> <pre># vbssvc -grpstate -vmstate vbsA</pre> <p>Displays information about the state of the service groups on the virtual machine. In addition, displays information about the state of the virtual machine.</p>
Enable debug logs for the VBS daemon.	<pre>vbslog -addtags tag1 [tag2 tag3]</pre> <p>You can enable the <code>DBG_MSG</code>, <code>DBG_POLICY</code>, <code>DBG_SECURITY</code>, and <code>DBG_PING</code> tags.</p>
Disable debug logs for the VBS daemon.	<pre>vbslog -deltags tag1 [tag2 tag3]</pre>
View the <code>vbslog</code> usage list.	<pre>vbslog [-help]</pre>

Troubleshooting and recovery

This appendix includes the following topics:

- [Troubleshooting Virtual Business Services](#)
- [Virtual Business Services log files](#)

Troubleshooting Virtual Business Services

This section includes error messages associated with Virtual Business Services and provides descriptions and the recommended action.

Command line cannot connect to the VBS daemon

When you run a command from the Virtual Business Services command line, the system might display the following message:

```
Cannot connect to VBS daemon
```

The error might occur due to one of the following conditions:

- The vbsapp resource is not online.
- In case the virtual IP is set for this cluster, then verify that the ClusterAddress attribute is set.
- In case the virtual IP is set for this cluster, then verify that the ClusterAddress attribute is reachable.

Workaround: Bring the vbsapp resource online. Verify that the ClusterAddress attribute is set correctly.

Virtual Business Service state is unknown

If a Virtual Business Service goes into an unknown state, perform the following tasks in sequence till the issue is resolved.

- Run the Veritas Operations Manager Policy Check with the VBS Availability Configuration signature. Verify whether your configuration conforms to predefined standards and take appropriate corrective action.
- Check states of the individual service groups from the VBS command line. If some of the remote clusters are not reachable, perform the corrective actions, such as rectifying cluster or node failures, network communication failure, firewall issues, or configuration issues..

See [“Viewing the Virtual Business Service status from the command line”](#) on page 74.

- Refresh the hosts of the cluster whose service groups are in unknown state. You can refresh the hosts from the Management Server or by running the following command from a managed host.

```
UNIX: # /opt/VRTSsfmh/bin/mh_ctl.pl --family VCS --refresh
```

```
Windows: C:\Program Files\Veritas\VRTSsfmh\bin>perl.exe mh_ctl.pl  
--family VCS --refresh
```

- If you reinstalled only the Management Server and did not reinstall the managed hosts, re-create the Virtual Business Service and rescan by running the following command from the Management Server.

```
UNIX: # /opt/VRTSsfmh/bin/xprt1c -l \  
https://localhost:5634/admin/cgi-bin/vbs_configurator.pl -d \  
rescan=all
```

```
Windows: C:\Program Files\Veritas\VRTSsfmh\bin>xprt1c.exe -l  
https://localhost:5634/admin/cgi-bin/vbs_configurator.pl -d  
rescan=all
```

- If you moved a managed host that has fault management enabled from one Management Server to another Management Server, run the following command from the new Management Server. The command makes the credentials available to the managed host.

```
UNIX: # /opt/VRTSsfmh/bin/xprt1c -l \  
https://localhost:5634/admin/cgi-bin/vbs_configurator.pl -d \  
rescan=cred
```



```
Windows: C:\Program Files\Veritas\VRTSsfmh\bin>xprt1c.exe -l
https://localhost:5634/admin/cgi-bin/vbs_configurator.pl -d
rescan=cred
```

- If the ClusterAddress of any of the tiers is not set, ensure that all the tiers are upgraded to 6.0.1 VBS version and the hosts in the participating clusters can communicate with one another.

Disaster recovery of a Virtual Business Service fails

When you try to bring a Virtual Business Service online at the DR site, the `vbssvc -start` command fails if the global service groups have any VCS-level dependency.[2489965]

Workaround: To start the Virtual Business Service at the DR site, take the Virtual Business Service offline at the production site and then bring it online at the DR site.

Virtual Business Services log files

[Table B-1](#) lists the log files that you can use for troubleshooting issues with Virtual Business Services.

Table B-1 Log files for Virtual Business Services

Log file	Location
VBSD log Logs of the VBS daemon	UNIX: /var/VRTSvbs/log/vbsd_A.log Windows: C:\Program Files\Veritas\VRTSvbs\log\vbsd_A.log
VBS deployment log Logs of Configure Fault Management operation	UNIX: /var/VRTSvbs/log/vbsdeploy.log Windows: C:\Program Files\Veritas\VRTSvbs\log\vbsdeploy.log
VBS configuration update log Logs of configurations propagated from Management Server to local nodes and their delivery to the VBS daemon	UNIX: /var/VRTSvbs/log/notify_config_update.log Windows: C:\Program Files\Veritas\VRTSvbs\log\notify_config_update.log

Table B-1 Log files for Virtual Business Services (*continued*)

Log file	Location
Access log	UNIX: /var/VRTSvbs/log/access.log
Logs of HTTP connections	Windows: C:\Program Files\Veritas\VRTSvbs\log\access.log
Error log	UNIX: /var/VRTSvbs/log/error.log
Logs of errors with the VBS daemon	Windows: C:\Program Files\Veritas\VRTSvbs\log\error.log
Manged host log	UNIX: /var/opt/VRTSsfmh/VCS/log/mh.log
Logs of success or failure of VCS discovery which feeds information to the local VBS daemon	Windows Server 2008: C:\ProgramData\Symantec\VRTSsfmh\VCS\log\mh.log Windows Server 2003: C:\Documents and Settings\All Users\Application Data\Symantec\VRTSsfmh\VCS\log\mh.log
VBS configuration log on managed host	UNIX: /var/opt/VRTSsfmh/logs/vbs_config.log
Logs of configuration files and credentials received by the managed hosts from the Management Server	Windows Server 2008: C:\ProgramData\Symantec\VRTSsfmh\logs\vbs_config.log Windows Server 2003: C:\Documents and Settings\All Users\Application Data\Symantec\VRTSsfmh\logs\vbs_config.log
Configurator log on Management Server	UNIX: /var/opt/VRTSsfmcs/logs/vbs_configurator.log
Logs of configuration files and credentials sent to the managed hosts	Windows Server 2008: C:\ProgramData\Symantec\VRTSsfmcs\logs\vbs_configurator.log Windows Server 2003: C:\Documents and Settings\All Users\Application Data\Symantec\VRTSsfmcs\logs\vbs_configurator.log

Known issues and limitations

This appendix includes the following topics:

- [Known issues and limitations](#)

Known issues and limitations

This section covers the known issues and limitations in this release.

Changes to service groups in Virtual Business Services not visible in Veritas Operations Manager interface instantly

For example, if you add a service group to a cluster that is part of a Virtual Business Service, the modified Virtual Business Service might be visible in the Veritas Operations Manager interface after a short delay. [2433135]

This issue is fixed in VBS Availability Add-on 4.1.x.0.

The `csgconfig` command might throw error messages when Japanese locale is set

If Japanese locale is set, execution of `csgconfig` script might throw error messages such as:

```
Message catalog can't be opened/accessed for language  
ja_JP.eucJP
```

You can ignore these messages because they do not affect the functionality of the Virtual Business Service.

Incorrect state logged for Virtual Business Services

The state of a Virtual Business Service may not be correctly logged in the log files of all participating clusters. In clusters where the state information is not correctly logged, the state appears as UNKNOWN or UNKNOWN | ATTN. [2574476]

Workaround: To get the correct state of the Virtual Business Service, view the Virtual Business Service logs from the Management Server.

See [“Viewing the logs of a Virtual Business Service”](#) on page 76.

Lag time for configurations with VCS-type dependencies

Assume that a VCS-level dependency is set between two service groups from the same cluster that have a VBS-level dependency. When you use the `vbssvc -grpdep` command, the new dependency is not updated immediately. It might take up to thirty minutes for the new dependency to show up. [2604219]

Fault management considerations when a host is added to another Management Server

Assume that a host has fault management enabled on one Management Server. The host is added to another Management Server and fault management is enabled on that server too. [2609156]

Workaround: To enable fault management on the first Management Server, you must disable fault management and enable it again from the first Management Server.

Fault recovery may fail to propagate to parent service groups

After a faulted child service group comes online, the fault recovery may fail to propagate to the parent service groups. The failure in fault recovery propagation affects the fault management behavior. [2587044]

Workaround: Refresh the cluster node where the service group is recovered.

Faults in multiple tiers are not handled

Assume that a parent service group faults and comes online on another node. If a child tier faults or recovers, the fault or recovery may not propagate up from the parent service group tier. [2616799]

As a workaround, run the `hagrp -clear group_name` command from the VCS or ApplicationHA command line to clear the fault on the parent service group.

See the *Veritas Cluster Server Administrator's Guide* for details on the `hagrp` command.

Complete cluster fault is not handled

Complete cluster fault is not handled by Virtual Business Services. If one of the participating clusters in a Virtual Business Service is not available due to network outage, failure of the High Availability daemon, or failure of the VBS daemon, fault management might not work. The failed cluster might be a multi-node cluster or a single node ApplicationHA cluster.

Fault propagation for shared service groups

In case of shared service groups, fault events and recovery events may not be propagated for all affected Virtual Business Services if the faulted group was not the shared group.

Consider a case where the middle tier is shared between more than one Virtual Business Service. If the bottom tier of one Virtual Business Service faults, the fault may not be propagated up the dependency tree of the other Virtual Business Services.

Fault propagation for virtual machines

If a virtual machine goes offline or faults outside VBS control, fault propagation does not take place for the tiers that are part of the VBS.

Failure of VBS daemon when command line operation or fault propagation is in progress

If the VBS daemon faults or fails over when a fault management operation or command line operation is in progress, that operation fails to complete.

Windows Control Panel lists Virtual Business Services as VRTSvbs

The **Add or Remove Programs** listing or the **Programs and Features** listing in Windows systems shows the installed instance of Virtual Business Services under an entry named VRTSvbs. This entry is necessary for the Veritas Operations Manager discovery framework to work correctly.

Disaster recovery limitations

The following limitations apply:

- Disaster recovery fire drill operations are not supported.
- Configurations that provide disaster recovery for Symantec ApplicationHA through VMware Site Recovery Manager (SRM) are not supported.

Considerations for renaming a cluster

Veritas Operations Manager does not support renaming of clusters. If you want to rename a cluster that is part of a Virtual Business Service, perform the following tasks:

1. Update the Virtual Business Service definitions to remove the objects from the cluster and then remove the cluster nodes from Veritas Operations Manager Management Server.
2. Rename the cluster.
3. Add the renamed cluster back to the Veritas Operations Manager Management Server.
4. Add the deleted objects from the cluster back to the Virtual Business Service definition.
5. If the host is managed by multiple Management Servers, run the following command to overwrite the credentials on the host.

```
UNIX: # /opt/VRTSsfmh/bin/xprt1c -l \  
https://localhost:5634/admin/cgi-bin/vbs_configurator.pl -d \  
rescan=cred
```

```
Windows: C:\Program Files\Veritas\VRTSsfmh\bin>xprt1c.exe -l  
https://localhost:5634/admin/cgi-bin/vbs_configurator.pl -d  
rescan=cred
```

6. To make the credentials available to all the managed hosts, run the following command.

```
UNIX: # /opt/VRTSsfmh/bin/xprt1c -l \  
https://localhost:5634/admin/cgi-bin/vbs_configurator.pl -d \  
rescan=all
```

```
Windows: C:\Program Files\Veritas\VRTSsfmh\bin>xprt1c.exe -l  
https://localhost:5634/admin/cgi-bin/vbs_configurator.pl -d  
rescan=all
```

Veritas Operation Manager displays stale status for Virtual Business Service [2573158]

This issue occurs with the virtual machines where Symantec ApplicationHA is configured to monitor applications. In ApplicationHA, if the Virtual Machine auto-recovery is configured, the virtual machine is restored if the application being monitored fails to start after a configurable number of attempts. If the Virtual Machine auto-recovery is triggered, the last successful virtual machine snapshot is restored from the backup. It also restores the applications running on the virtual machine. However, Veritas Operations Manager fails to discover the restored application status, and continues to display the application as faulted.

Workaround: To display the current application status, refresh the Veritas Operations Manager console.

The CLI command to refresh the Veritas Operations Manager console is as follows:

■ Unix:

```
# /opt/VRTSsfmh/bin/mh_ctl.pl --rescan
```

■ Windows:

```
C:\Program Files\Veritas\VRTSsfmh\bin> "C:\Program Files\Veritas\VRTSsfmh\bin\perl.exe" "C:\Program Files\Veritas\VRTSsfmh\bin\mh_ctl.pl" --rescan
```

The csgconfig command fails on HP-UX 5.0.1 clusters

On HP-UX 5.0.1 clusters, the `csgconfig` command returns errors such as:

```
Adding IP resource (csgip) to group ClusterService command  
/opt/VRTSvcs/bin/hares -modify csgnic Protocol IPv4 returned 256  
[2626992]
```

Workaround:

1. Set the Device attribute of the IP resource to the appropriate value:

```
# hares -modify csgip Device device_name\  
-sys system_name
```

2. Link the IP resource and the NIC resource:

```
# hares -link csgip csgnic
```

3. Set the ClusterAddress attribute to the IP address used in csgconfig:

```
# haclus -modify ClusterAddress ip_address
```

4. Enable the resources in ClusterService group:

```
# hagrps -enableresources ClusterService
```

No support to online and offline multiple virtual machines using the Virtual Business Service start and stop operations (2177421)

This issue is applicable to the hybrid service groups and parallel service groups that are configured on the virtual machines in a Virtual Business Service (VBS). For the VBS start and stop operations, the VBS Availability Add-on does not start or stop multiple virtual machines. You can online or offline the service groups on all systems. However, you cannot start or stop all virtual machines. Currently, the VBS Availability Add-on is not intended to start or stop multiple virtual machines.

Virtual Business Service start operation does not validate the service group's resource criticality (2169223)

Using VBS Availability Add-on, when you start a Virtual Business Service (VBS), the start operation does not validate whether the service group has any non-critical resource. So, the operation does not detect any fault that occurs while bringing these resources online, nor does it detect if such resources are already faulted when the VBS start is attempted. If such faults exist, Veritas Operations Manager waits for the VBS to start completely, and, eventually times out aborting the VBS start operation. You can choose to abort the operation. As a preventive step, configure all the resources of a service group as critical.

Unable to start the Virtual Business Service (VBS) if the virtual machine hosting the service groups of the VBS is already down

This issue is observed when you have configured a VBS's Service Group on a virtual machine, and virtual machine "auto-start" and "auto-stop" options are selected while configuring the service groups dependencies using the VBS Availability Add-on. If the virtual machine is turned-off, the Veritas Operations Manager still displays the service group's state as Online on the Veritas Operations Manager console. It happens because it captures the last state of the service group in the Veritas Operations Manager database. If you try to online the VBS, the Veritas Operations Manager notifies the user that the VBS is already online.

This issue is fixed in VBS Availability Add-on 4.1.x.0.

Veritas Operations Manager does not validate if the cluster node is managed by the Management Server during the VBS start operation (2566050)

When you perform the Virtual Business Service (VBS) start operation, Veritas Operations Manager does not check whether Management Server manages the cluster node. Veritas Operations Manager brings the service group online using the `-any` option on the available systems for that service group.

Workaround:

Although there is no functional loss, it is recommended that you add all the cluster nodes to the Management Server domain.

Child service group fault missed in case of firm dependency (2745323)

In case of firm dependency if the child service group has faulted the parent service group is brought offline. Subsequently when the child service group recovers, the parent service group is brought online. However, if the child service group faults again before the parent has recovered, this new child fault event is missed. This could happen if the parent recovery takes time. As a result the parent service group may remain online.

Workaround: No workaround.

VM Start/Stop is not functional unless virtualization configuration is discovered (27492451)

If a VMware configuration is not discovered by the control host, the VM Start/Stop feature cannot be made functional through Veritas Operations Manager.

Workaround: Allow the control host to complete the discovery of the virtualization configuration.

ClusterService group having vbsapp resource does not link vbsapp to newly created gcoip (2713002)

If GCO is configured in a cluster using `gcoconfig` which already has vbsapp resource configured as a part of CLusterService group, vbsapp does not get linked to the newly created gcoip resource.

Workaround: Run the following commands to link the resource manually:

```
# haconf - makerw  
# hares -link vbsapp gcoip  
# haconf -dump -makero
```

Veritas Operations Manager and VMware virtual center must be up and running for VM Start/Stop to work (2728394)

The VM Start/Stop feature has a dependency on Veritas Operations Manager and VMware virtual center to control the VM in a VBS. The applications and service groups inside the VM as well as the VM itself cannot be started or stopped as a part of the VBS service group if Veritas Operations Manager and VMware virtual center are down.

CLI command returns incorrect state of the virtual machine in VBS (2789621)

The CLI command to elicit the state of the virtual machine in a VBS may display incorrect state of the VM. This is observed when VM takes a long time to go offline and vbsd fetches the state of VM even before the VM has gone offline.

For example, sometimes, the `vbssvc -grpstate -vmstate <VBS name>` returns the following incorrect information for the virtual machine state:

```
<group name> |<sg_state>| <VM name> |<VM state>|
```

Workaround: Run `$MH_HOME/perl $VBS_HOME/bin/vmware_client.pl <VM name>`, where `<VM name>` can be obtained from the CLI command mentioned before. This updates the latest state of the VM from VC in VBS. Subsequently, `vbssvc -grpstate -vmstate <VBS_Name>` displays the correct state of the VM, where:

- `MH_HOME` is the bin directory of VRTSsfmh (`/opt/VRTSsfmh`)
- `VBS_HOME` is the bin directory of VRTSvbs (`/opt/VRTSvbs`)

VBS dependencies get deleted during the upgrade of ApplicationHA or SFWHA configured in a VBS [2832599]

VBS dependencies get deleted when you upgrade the ApplicationHA or SFWHA configured under VBS to any of its later versions. This is particularly observed if you have upgraded SFMH on the nodes to version 5.0 to enable VBS 6.0.1 functionalities.

Workaround: Stop and disable SFMH before the upgrade and start it after the upgrade is complete. You can also recreate the VBS dependencies through the Veritas Operations Manager console.

VBS start operation may fail from Veritas Operations Manager when VM start/stop is enabled [2848118]

VBS start operation may fail with the following error when the start operation is performed through the Veritas Operations Manager console with VM start/stop is enabled.

```
org.xml.sax.SAXParseException;invalid encoding name "PLAIN".
```

This is observed only on Windows.

Workaround: Bring the tiers and service groups online manually.

VBS Availability option not listed after a Management Server upgrade (2835480)

If you created a Virtual Business Service and then upgraded the Management Server from version 4.1 to version 5.0, the **VBS Availability** option is not listed under **Actions** in the **Manage > BusinessEntities > Virtual Business Services** menu.

Workaround: Do one of the following:

- Select **Manage > BusinessEntities** and under **BusinessEntities**, select the Virtual Business Service. The **VBS Availability** option is listed under **Actions**.
- Upgrade the VBS Availability Add-on to version 5.0.

Clusters running on SFWHA 5.1SP1 or 5.1SP2 configured with virtual IP addresses cannot migrate to VIP-less communication (2845412)

If you have already configured clusters running on SFWHA 5.1SP1 or SFWHA 5.1SP2 with virtual IP addresses, these clusters are not able to participate in VIP-less communication by setting the ClusterAddress attribute to null.

See [“Configuring auto discovery for each cluster in VBS”](#) on page 59.

Workaround: No workaround.

VM start and stop from command line fails if the virtual machine name contains special characters (2813445)

If the virtual machine name contains non-ASCII special characters, the starting or stopping of virtual machines as part of VBS start and stop operations does not work from the command line.

Workaround: Perform the start and stop operations from the Veritas Operations Manager console.

Though VM start-stop is enabled, VM stop fails when VBS daemon is down (2728624)

VBS stop operation performed on a virtual machine using VBS command line does not stop the virtual machine if the VBS daemon has stopped though VM start-stop is enabled on it.

Workaround: Start the VBS daemon on the virtual machine.

Veritas Operations Manager shows incorrect VBS state when one tier is on a VM cluster and the VM goes offline (2861143)

If a VBS includes a service group on a virtual machine single node cluster and VM start-stop is configured, when the virtual machine goes offline, the Management Server shows the VBS state with a [STALE] flag. The command line shows the VBS state depending on the state of other service groups in the VBS.

VM start-stop takes the virtual machine offline even when non-VBS service groups are online (2867720)

This issue might occur in a VBS that consists of only single node ApplicationHA clusters and VM start-stop is enabled for the virtual machine. In some cases, even though service groups that are not part of the VBS are online, the virtual machine might be taken offline when you perform the VBS stop operation.

Workaround: No workaround.

VBS command line becomes unresponsive if IP address is unplumbed (2865609)

In a VBS consisting of single node clusters or virtual machines, if you unplumb an IP address, the VBS command line becomes unresponsive.

Workaround: Manually run the discovery from the host where the IP address was unplumbed:

UNIX:

```
# /opt/VRTSsfmh/bin/mh_ctl.pl --family VCS --refresh
```

Windows:

```
C:\Program Files\Veritas\VRTSsfmh\bin>perl.exe mh_ctl.pl  
--family VCS --refresh
```

Virtual machines having fault management enabled might show incorrect status (2870827)

Virtual machines that are part of a VBS having fault management enabled might sometimes show the fault management status as Not Enabled after the virtual machine is stopped or started. This discrepancy causes a drift between the VBS configurations on the virtual machine and on Veritas Operations Manager.

Workaround: Rescan the Managed host by running the following command:

UNIX:

```
# /opt/VRTSsfmh/bin/mh_ctl.pl --rescan
```

Windows:

```
C:\Program Files\Veritas\VRTSsfmh\bin>"C:\Program Files\  
Veritas\VRTSsfmh\bin\perl.exe" "C:\Program Files\Veritas\VRTSsfmh\  
bin\mh_ctl.pl" --rescan
```

Though VM start-stop is enabled, VM stop fails when VC is down (2859491)

Though VM start-stop is enabled, VBS stop operation from the VBS command line does not stop the virtual machine if the VC has stopped. The command line invokes a stale request to stop the VM, unaware that the VC is down.

Workaround: No workaround.

VBS uninstallation exits with error on Windows 2008 (2872716)

On Windows 2008 systems, if fault management is enabled and you uninstall VBS when the VBS daemon is running, the uninstallation of VBS from the **Control Panel > Add or Remove Programs** menu exits with an error message that is behind the installation screens. You must manually bring the focus to the error message window to read it.

```
vbsd.exe is running on your system. Please stop this process and retry un-  
installation, uninstallation wizard will exit now.
```

Workaround: Take the vbsapp resource offline on cluster nodes and then uninstall VBS.

Events generated for VBSD lack correct description (2833160)

On Windows systems configured under a Virtual Business Service, the Event Viewer does not have appropriate description for the events generated by event source VBSD.

Workaround: Check the `vbsd_A.txt` log file inside the `C:\Program Files\Veritas\VRTSvbs\log\` folder for error messages.

Add/Remove programs option fails to uninstall VRTSvbs msi [2946523]

If fault management is enabled and VBSD process is running on a node where VBS is installed, the Add/Remove program fails to uninstall VBS. On Windows 2003, a `Fatal Error during installation` is displayed, while on Windows 2008 the uninstallation exits abruptly.

Workaround: You must manually offline the VBSD process using:

```
# hares -offline vbsapp -sys <hostname>
```

Subsequently, use the Add/Remove program to uninstall VBS from the node.

Fixed issues

This appendix includes the following topics:

- [Fixed issues](#)

Fixed issues

[Table D-1](#) lists the fixed issues for Virtual Business Services.

Table D-1 Virtual Business Services fixed issues

Incident	Description
2728583	If a virtual machine contained two service groups, the <code>vbssvc -stop</code> command took the virtual machine offline too, along with the service groups.
2789621	If a virtual machine took considerable time to stop, its latest state was not reflected in the output of the <code>vbssvc -state</code> command.
2850910	If you ran the <code>vbssvc -start</code> command immediately after running the <code>vbssvc -stop</code> command, the Virtual Business Service went into a partial state.
2646789	Fault propagation did not work correctly if the parent service group was in FAULTED state on one or more nodes.
2848151	The Virtual Business Service stop operation failed to stop the virtual machine if the VCSInfra service group was online.
2848109	On Windows systems, the Virtual Business Service stop operation failed to stop the virtual machine if application failover was configured.

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