

HP SiteScope

for the Windows, Solaris and Linux operating systems

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Failover Guide

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Welcome to This Guide

Welcome to the HP *SiteScope Failover Guide*. SiteScope is designed as a versatile solution for monitoring the availability of systems and servers. An important part of SiteScope's versatility is that you can customize the behavior of SiteScope to meet the needs of specific environments and organizational requirements. This guide is intended to help you understand and use the SiteScope Failover configuration to provide a backup SiteScope server to enable infrastructure monitoring availability after a SiteScope server failure.

This guide is written for SiteScope 10.00. However, most of the information in this guide is also applicable to earlier versions of SiteScope Failover. Some earlier releases were known as SiteScope High Availability.

For a general description of SiteScope, as well as for details on administering SiteScope, see the SiteScope Help.

This chapter includes:

- ▶ How This Guide Is Organized on page 7
- ▶ Who Should Read This Guide on page 8
- ▶ Getting More Information on page 8

How This Guide Is Organized

This guide contains the following parts:

Chapter 1 Introduction to SiteScope Failover

Describes the SiteScope Failover functionality and environment.

Chapter 2 Installing SiteScope Failover

Describes how to install the SiteScope Failover environment.

Chapter 3 Configuring SiteScope Failover

Describes the SiteScope Failover configuration files and settings, Failover Preferences, and Failover group monitors and alert configurations.

Chapter 4 SiteScope Failover Reference

Describes how to work with SiteScope Failover on general operations, configuration settings, and reintegrate monitor data after a failover event.

Chapter 5 Troubleshooting SiteScope Failover

Describes how to troubleshoot problems with SiteScope operations and mirroring.

Who Should Read This Guide

This guide is for the following users of SiteScope:

SiteScope administrators

Readers of this guide should be knowledgeable about enterprise system administration and SiteScope.

Getting More Information

For a complete list of all online documentation included with HP SiteScope, additional online resources, information on acquiring documentation updates, and typographical conventions used in this guide, see the *HP SiteScope Deployment Guide* PDF.

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Introduction to SiteScope Failover

HP SiteScope Failover is a special version of SiteScope that includes automated mirroring and failover functionality. It enables you to implement failover capability for infrastructure monitoring by provisioning for backups, redundant, and failover mechanisms.

This chapter includes:

- About SiteScope Failover on page 9
- The SiteScope Failover Implementation Process on page 10
- Multiple Failover Installations on page 15
- SiteScope Failover Considerations and Limitations on page 17

About SiteScope Failover

A failover is a backup operation that automatically switches the functions of a primary system to a standby server if the primary system fails or is temporarily taken out of service. Provisioning for a failover is an important fault tolerance function for mission-critical systems that require high availability. Ideally, a failover system automatically and transparently transfers the service provided by the failed system to the backup system. The backup system "mirrors" the services of the primary system.

SiteScope Failover is a special SiteScope build that you use to create a failover system for infrastructure monitoring. It should be used only for monitoring the primary system and not for creating new monitor groups and monitors anywhere in Failover sitescope. However, you can edit the Failover group by customizing alerts and scheduling for the Fail Over monitor.

SiteScope Failover provides the following:

- ▶ Automated, periodic mirroring of monitoring configurations from the primary SiteScope installation to the failover installation.
- ▶ Automated monitoring of the availability of the primary SiteScope installation.
- ▶ Automated enabling and disabling of mirrored monitors based on the availability of the primary SiteScope.

Note: Earlier versions of SiteScope Failover were called **SiteScope High Availability**, which is sometimes referred to as **SiteScopeHA**. This name and reference may still appear during installation and use of the product.

The SiteScope Failover Implementation Process

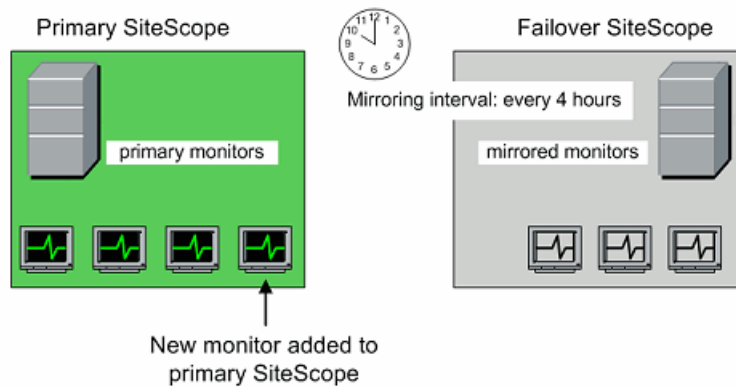
This section gives an overview of the SiteScope Failover functionality and concepts. It contains the following:

- ▶ Mirroring Configurations
- ▶ Monitoring Primary Availability
- ▶ Failover Transition

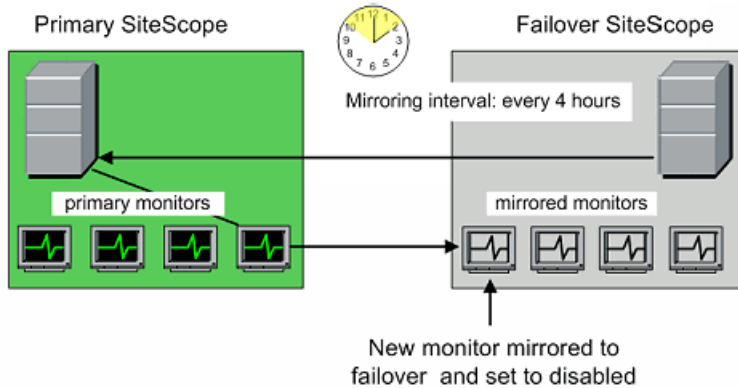
Mirroring Configurations

An important part of failover functionality is mirroring. Mirroring is an operation by which configuration data is replicated from the primary system to the failover system. For example, in mirroring a Web server, the failover server mirrors the primary server such that any transition to the failover system provides the same content and services to users as the primary system. SiteScope Failover mirrors monitor configurations so that the failover can provide the same infrastructure monitoring in the event that the primary SiteScope is unavailable.

As a system management tool, SiteScope can have a dynamic configuration state. The SiteScope Failover installation periodically mirrors (copies) configuration data from the primary SiteScope to stay current with any changes to the monitoring configurations. The following figures display the mirroring operation between a primary SiteScope and the SiteScope Failover machine. The first figure shows that a new monitor instance has been added to the primary SiteScope.



As installed, SiteScope Failover is set to query the primary SiteScope every four hours. The following figure illustrates the automated mirroring operation which copies the configurations to include the newly added monitor to the failover machine. You can configure the frequency of the mirroring on the failover installation.

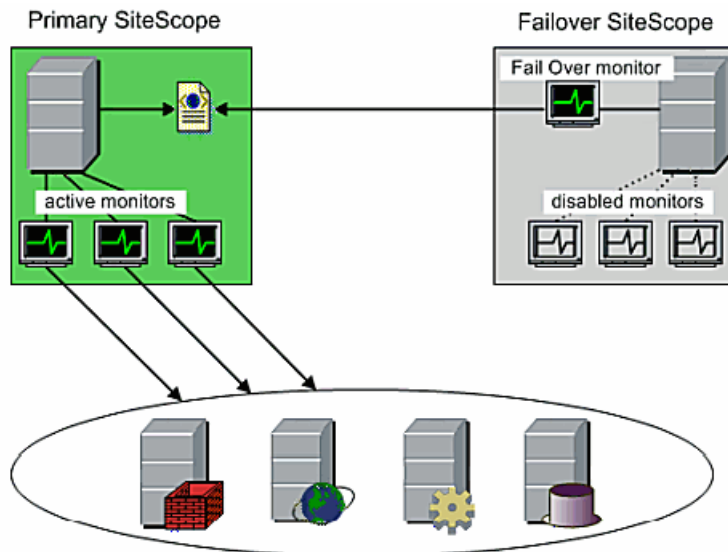


Note: You should not make monitor or alert configuration changes on the failover server as they are not copied back to the primary machine. Configurations are only mirrored from the primary SiteScope to the SiteScope Failover installation.

Monitoring Primary Availability

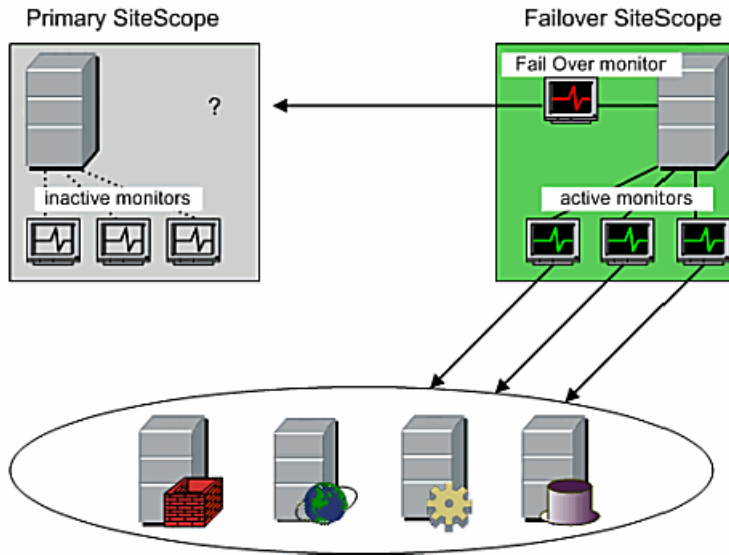
While the primary system is operational, failover systems are generally in standby mode. SiteScope Failover monitors the availability of the primary SiteScope by requesting the Progress Report page from the primary. This is a "heartbeat" indicator that the primary system is running. This is the only failover monitor that is active in the standby mode. In the event that the SiteScope Failover monitor fails to get the Progress Report page from the primary system, SiteScope Failover activates itself as the failover system and starts running all of the monitors most recently mirrored from the primary SiteScope. The failover system continues running all the monitors while it also checks for the Progress Report page from the primary. When the failover detects that the primary SiteScope is again functioning, the failover automatically disables the mirrored monitors and returns to standby mode.

The following two figures illustrate the concept of the automated failover operation. The first figure represents normal operation with the primary SiteScope providing monitoring of the IT infrastructure and the failover in standby mode.



Failover Transition

When the failover monitor detects that the primary SiteScope is unresponsive, the SiteScope Failover installation activates (enables) the mirrored monitors and begins running them, as indicated by the following figure.



The failover continues to run its heartbeat monitor to watch for reactivation of the primary SiteScope. When it detects that the primary is again operational, the failover automatically disables the mirrored monitors and returns to standby mode.

Since the transition is not completely transparent, if the primary SiteScope is unavailable, you need to redirect your Web browsers to the address of the failover SiteScope server to view monitoring results.

There may also be a delay in viewing monitor results immediately after failover activation. On the SiteScope Failover machine, monitors that have recently been activated continue to be displayed with a disabled status until the monitors are updated for the first time. The time it takes to update the monitors is generally based on their update frequency.

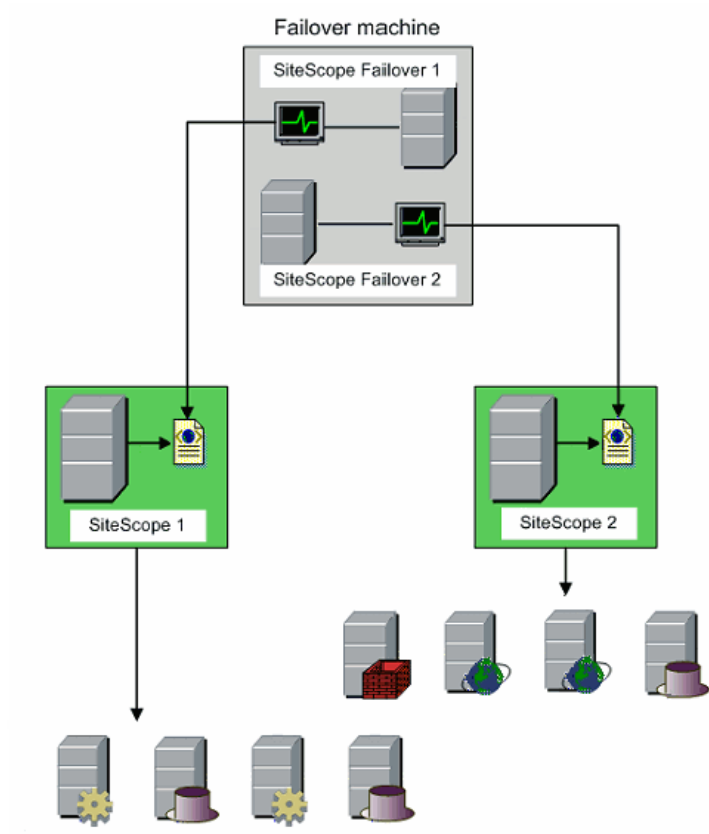
SiteScope Failover updates monitors in ascending order of update frequency. This means that monitors with the shortest frequency interval are run first after the failover is activated. For example, monitors that are configured to run every minute will be run before monitors scheduled for every ten minutes. Monitors with longer update intervals are initially displayed as disabled until their respective update intervals have past.

Multiple Failover Installations

Since SiteScope is not licensed by the number of instances or servers on which it is installed, you can run multiple SiteScopes within your IT environment to scale your infrastructure monitoring. When there is a requirement to provide failover capability for multiple SiteScopes, you can install a SiteScope Failover instance for each primary SiteScope. This normally requires that you provision one failover machine for each SiteScope Failover installation.

Because the failover function is to provide temporary monitoring continuity in the event of the failure of a primary SiteScope, the data storage requirements for SiteScope Failover may be significantly less than for a primary SiteScope. SiteScope Failover is designed so that multiple installations of SiteScope Failover can be run on a single machine. This is also based on the probability that two or more primary SiteScopes are not likely to fail at the same time. Therefore, it is not likely that more than one Failover will be active at any given time.

The following figure illustrates the concept of running multiple failover instances on a single machine.



For more information on the requirements for installing multiple failovers on a single machine, see “Installing Multiple Failover Instances on a Single Server” on page 31.

SiteScope Failover Considerations and Limitations

This section describes other considerations and limitations when using SiteScope Failover.

- ▶ To have continuity of report data across the failover period, you have to merge the data from the failover system to your primary server after it has recovered. For more information on merging failover data files, see “Reintegrating Data Logs” on page 62.

Important: You should not make configuration or monitor changes on the SiteScope Failover server while the failover is active. Such actions are not supported and may cause unpredictable results. In addition, such changes are not replicated to the primary SiteScope server.

- ▶ If a primary SiteScope server is configured to report to HP Business Availability Center, when a SiteScope Failover instance takes control, it automatically resumes reporting to Business Availability Center when its monitors start running after the transition. When the primary SiteScope restarts, the Failover server automatically discontinues reporting to Business Availability Center. When SiteScope Failover is in standby mode, it does not indicate that it is configured to report to Business Availability Center in the BAC Preferences page of SiteScope.

Note: You should not make configuration or monitor changes using the SiteScope Failover server. This may confuse Business Availability Center during reporting, and such changes are lost when control is switched back to the primary SiteScope server.

- ▶ Unable to monitor the primary SiteScope from the failover server for monitors configured to target the SiteScope Server. If you configure a monitor on the primary SiteScope server to target the SiteScope Server (either by accepting the default **SiteScope Server** in the **Server** field of the Monitor Settings area, or by typing the IP address of the SiteScope server machine), when the monitor settings are copied to the failover machine, the monitor targets the SiteScope Failover server instead of the primary SiteScope server.
- ▶ During a failover period, report configurations are not mirrored from the primary to the failover server. In addition, Management Reports are not run. For details on how to manually re-integrate data, see “Reintegrating Monitor Data” on page 57.
- ▶ Upgrading from SiteScope 8.x to SiteScope 10.00 is not supported for SiteScope Failover. This means that you cannot install SiteScope 10.00 and transfer monitor configurations from an existing SiteScope installation. However, since SiteScope Failover mirrors the configuration from the SiteScope primaries, there is not much value in keeping the old configuration when upgrading. Instead, you simply uninstall SiteScope High Availability 8.x and install SiteScope Failover 10.00.

Note: When you uninstall SiteScope Failover, you lose the failover settings (primary address, username, password, and so forth) and any Failover group customizations you are using such as alerts (where such customizations are supported).

- The table below lists the services, features and monitors that are not supported or tested in the SiteScope Failover environment:

SiteScope Failover Support Limitations	
Not supported by the SiteScope Failover	<ul style="list-style-type: none"> ➤ LDAP authentication ➤ Database Driven Configuration (DDC) ➤ Any Application monitors that use what is called the "Dispatcher" interface. This includes the Tuxedo Monitor and Sybase Monitor as of SiteScope version 8.0. The SAP Monitor, Oracle DB Monitor, DB2 Monitor and MAPI Monitor are also in this category for earlier versions of SiteScope. ➤ Some Integration (EMS) monitor types
Not tested in the SiteScope Failover environment	<ul style="list-style-type: none"> ➤ Dispatcher type monitors ➤ Logging SiteScope monitor data to an external database ➤ Use of a proxy ➤ SSL connectivity ➤ SSH for connecting to remote servers

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Installing SiteScope Failover

This chapter describes the installation requirements and setup procedures for using SiteScope Failover.

This chapter includes:

- About Installing SiteScope Failover on page 21
- Requirements for SiteScope Failover on page 22
- Installing SiteScope Failover on Windows Platforms on page 23
- Installing SiteScope Failover on UNIX on page 26
- Installing Multiple Failover Instances on a Single Server on page 31
- Additional Installation Actions on page 32

About Installing SiteScope Failover

Installing SiteScope Failover is similar to a regular SiteScope installation. Most of the actions required for the initial SiteScope Failover setup are automated and are performed as part of the installation procedure or when you first access the server. Additional actions may be required depending on the configuration of the primary SiteScope. You can install SiteScope Failover on a Windows or UNIX platform, and install multiple failover instances on a single server.

Requirements for SiteScope Failover

The following outlines the basic requirements for installing and using SiteScope Failover:

- ▶ Primary SiteScope and failover SiteScope both require the same version of SiteScope Failover. If you have upgraded the primary SiteScope, you must upgrade the failover with the corresponding SiteScope Failover version. Contact your HP sales representative to obtain the version of SiteScope Failover that you require.
- ▶ Primary SiteScope and failover SiteScope should be installed on separate machines in the same relative drive and directory path. For example, if the primary SiteScope is installed in C:\SiteScope on the primary machine, you should install SiteScope Failover in C:\SiteScope on the failover machine. The reason is that your primary SiteScope may have monitors that refer to files within its SiteScope home directory. Installing SiteScope Failover in the same home directory ensures integrity in such file references.
- ▶ SiteScope Failover needs be installed on a server with similar or identical server resources (processor speed and memory) as the primary SiteScope server. Since the failover is not intended to store monitor data for extended periods of time, the available disk space need not be as large as for the primary SiteScope.
- ▶ SiteScope Failover needs to installed and run using the same SiteScope account as the primary SiteScope.

Installing SiteScope Failover on Windows Platforms

SiteScope Failover for Windows platforms is provided as a self-extracting executable. Perform the following steps to install SiteScope Failover on Windows platforms.

To install SiteScope Failover on Windows platforms:

- 1** Obtain a SiteScope Failover License. Contact your HP sales representative for assistance.
- 2** Download the SiteScope Failover installation executable file **setup.exe**, and copy it to the server that you are using as the failover.
- 3** Make a note of the installation path of the SiteScope installation that is the primary or production installation. For example, C:\SiteScope.
- 4** Run the SiteScope Failover **setup.exe** program on the failover server.
- 5** The Welcome screen opens. Click **Next**.
- 6** The license agreement screen opens. Read the license agreement. To accept the terms of the agreement, select **I accept the terms of the license agreement**.
Click **Next**.
- 7** The installation directory screen opens. Accept the default location or click **Browse** to select another directory. It is strongly recommended that you install the failover in the same relative location on the server as the primary SiteScope that is to be mirrored.

Click **Next** to continue.

Note: The installation path must end with a folder named **SiteScope**. There must not be any spaces in the installation path. If you did not use the correct case, that is to say, you typed **sitescope**, you must first change the destination folder to an invalid folder name to reset the InstallShield destination folder mechanism, click **Next**, and then click **Back**, and then enter the correct folder name.

8 The SiteScope setup type screen opens. Select **HP SiteScope Failover**, and then click **Next**.

9 The port and e-mail definition screen opens.

Enter the port number the SiteScope Failover service will listen on, or accept the default port 8888. If you install more than one SiteScope Failover instance on this server, enter a port number that is not being used by any other SiteScope Failover instances installed on this server.

Enter the e-mail address that SiteScope should use to send e-mail alerts to the SiteScope administrator. It is recommended that you use the same e-mail address as used for the primary SiteScope to be mirrored by this SiteScope Failover installation.

Note:

- ▶ You do not need to enter an e-mail address at this point to install SiteScope. You can enter this information later using the E-mail Preferences settings in SiteScope.
- ▶ If the mail server uses NTLM authentication, this administrator e-mail address must be a legal e-mail address.

Click **Next** to continue.

10 A summary information screen opens. Check that the information is correct and click **Next** to continue, or **Back** to return to previous screens to change your selections.

11 The SiteScope installation process starts and an installation progress screen opens. When the installation process is complete, a message about the successful installation opens. Click **Next** to continue.

If the installation program determines that the server must be restarted, the restart procedure is executed. After the server is restarted and you log on, the installation wizard performs other needed setup procedures and starts the SiteScope server. The Open SiteScope page opens.

- 12** Click the **Open SiteScope** link to proceed. The SiteScope Web interface opens. Log on to SiteScope.
- 13** In the left panel, click the **Preferences** menu, and click **General Settings**. In the **Main Panel** section, enter the SiteScope Failover (High Availability) license key in the **License number** box.
- 14** In the preferences menu section, click **Failover Preferences**. The Failover Preferences page opens. Enter the name or IP address and port of the primary SiteScope server and the login credentials as described in “Configuring Failover Preferences” on page 37.
- 15** Click **Mirror Configuration Now** to continue. SiteScope copies all the files over from the primary machine and restarts when the mirroring operation is complete.
- 16** After the failover has restarted, refresh your Web browser or redirect your browser to the SiteScope Failover address. If there are SiteScope user names and passwords defined on the primary SiteScope, enter the same user names and passwords to access the failover.

After successfully mirroring the primary SiteScope, SiteScope Failover can be accessed using the SiteScope interface. A copy of all of the groups from the primary SiteScope is displayed along with a new group called **Failover**. Only the Failover group is enabled initially; the other groups are displayed as disabled (blue icon) until the failover is activated.

Installing SiteScope Failover on UNIX

SiteScope Failover uses a multi-platform InstallShield® package for installing on UNIX platforms. Depending on the system configuration and requirements, you can use the GUI (graphic user interface) executable or the command line console mode.

Installing SiteScope Failover Using the GUI Installer

Perform the following steps to install SiteScope Failover on UNIX platforms using the GUI installer.

Note: To install SiteScope Failover on UNIX platforms using the GUI installer, you must have access to certain X Windows libraries that may not be available on all systems. If the installer indicates that it cannot run, use the console mode to install SiteScope Failover.

To install SiteScope Failover using the GUI installer:

- 1 Obtain a SiteScope Failover License. Contact your HP sales representative for assistance.
- 2 Download the SiteScope Failover archive file **setup.jar**, and copy it to the server that you are using as the failover.
- 3 Make a note of the installation path of the SiteScope installation that is the primary or production installation. For example, `/opt/SiteScope`.
- 4 Extract the contents of the SiteScope Failover archive file to an appropriate location on the failover server. You can use the following command line in a console window:

```
gzip -dc setup.jar | tar xvf -
```

The extraction creates a subdirectory called **SiteScopeInstall** that contains the files and scripts used for the installation.

- 5 The Welcome screen opens. Click **Next**.

- 6 Run the SiteScope Failover installation script on the failover server. You can run the script using the following syntax in a console window:

```
SiteScopeInstall/inst
```

The installation environment is initialized.

- 7 The license agreement screen opens. Read the license agreement. To accept the terms of the agreement, select **I accept the terms of the license agreement**.

Click **Next**.

- 8 The installation directory screen opens. Accept the default location or click **Browse** to select another directory. It is strongly recommended that you install the failover in the same relative location on the server as the primary SiteScope that is to be mirrored.

Click **Next** to continue.

Note: The installation path must end with a folder named **SiteScope**. There must not be any spaces in the installation path.

- 9 The SiteScope setup type screen opens. Select **HP SiteScope Failover**, and then click **Next**.

- 10 The port and e-mail definition screen opens.

Enter the port number the SiteScope Failover service will listen on or accept the default port 8888. If you install more than one SiteScope Failover instance on this server, enter a port number that is not being used by any other SiteScope Failover instances installed on this server.

Enter the e-mail address that SiteScope should use to send e-mail alerts to the SiteScope administrator. It is recommended that you use the same e-mail address as used for the primary SiteScope to be mirrored by this SiteScope Failover installation.

Note:

- ▶ You do not need to enter an e-mail address at this point to install SiteScope. You can enter this information later using the E-mail Preferences settings in SiteScope.
 - ▶ If the mail server uses NTLM authentication, this administrator e-mail address must be a legal e-mail address.
-

Click **Next** to continue.

- 11** A summary information screen opens. Check that the information is correct and click **Next** to continue, or **Back** to return to previous screens to change your selections.
- 12** When the installation process is completed, the SiteScope Failover process is started and a confirmation dialog opens. Click **OK** to continue and exit the installer.
- 13** Open a Web browser and direct it to open the SiteScope Failover instance on the port number selected during the installation. For example, <http://localhost:8888/SiteScope>.
- 14** In the left panel, click the **Preferences** menu, and click **General Settings**. In the **Main Panel** section, enter the SiteScope Failover (High Availability) license key in the **License number** box.
- 15** In the preferences menu section, click **Failover Preferences**. The Failover preferences page opens. Enter the name or IP address and port of the primary SiteScope server and the login credentials as described in “Configuring Failover Preferences” on page 37. Click **OK** to save the settings.
- 16** Click **Mirror Configuration Now** to continue. SiteScope copies all the files over from the primary machine and restarts when the mirroring operation is complete.

- 17 After the failover has restarted, refresh your Web browser or redirect your browser to the SiteScope Failover address. If there are SiteScope user names and passwords defined on the primary SiteScope, enter the same user names and passwords to access the failover.

After successfully mirroring the primary SiteScope, the SiteScope Failover can be accessed using the SiteScope interface. A copy of all of the groups from the primary SiteScope should be displayed along with a new group called **Failover**. Only the Failover group is enabled initially; the other groups are displayed as disabled (blue icon) until the failover is activated.

Installing SiteScope Failover Using the Console Mode

Perform the following steps to install SiteScope Failover on UNIX platforms using the command line console mode.

To install SiteScope Failover using the console mode installer:

- 1 Obtain a SiteScope Failover License. Contact your HP sales representative for assistance.
- 2 Download the SiteScope Failover archive file **setup.jar**, and copy it to the server that you are using as the failover.
- 3 Make a note of the installation path of the SiteScope installation that is the primary or production installation. For example, `/opt/SiteScope`.
- 4 Extract the contents of the SiteScope Failover archive file to an appropriate location on the failover server. You can use the following command line in a console window:

```
gzip -dc setup.jar | tar xvf -
```

The extraction creates a subdirectory called **SiteScopeInstall** that contains the files and scripts used for the installation.

- 5 Run the SiteScope Failover installation script on the failover server using the following syntax in a console window: `SiteScopeInstall/install.sh -console`
- 6 The installation environment is initialized and the SiteScope Failover welcome message is displayed. Press 1 to continue.
- 7 The installer displays the license agreement. Press ENTER to read the license agreement, and then press 1 to accept the license agreement. Press 0 to continue and then press 1 again to continue.

- 8** The installer prompts for an installation location. Enter the installation path for the SiteScope Failover instance. It is strongly recommended that you install the failover in the same relative location on the server as the primary SiteScope that is to be mirrored. The directory path must end with a folder called **SiteScope**. Press 1 to continue.
- 9** The installer prompts for a SiteScope setup type. Press 2 to select SiteScope Failover, and then press 1 again to continue.
- 10** The installer prompts for a SiteScope Administrator e-mail. Enter the e-mail address that SiteScope Failover should use to send administrative messages. It is recommended that you use the same e-mail address as used for the primary SiteScope to be mirrored by this SiteScope Failover installation. You do not need to enter an e-mail address to continue the installation. Press 1 to continue.
- 11** The installer prompts for a port number. Enter the port number the SiteScope Failover service will listen on. The default port number is 8888. If you install more than one SiteScope Failover instance on this server, enter a port number that is not being used by any other SiteScope Failover instances installed on this server. Press 1 to continue.
- 12** The installer displays the installation settings for review. Confirm the selection and press 1 to continue. The installation process is started.
- 13** When the installation process is completed, the SiteScope Failover process is started and a confirmation message is displayed. Press 1 to continue and exit the installer.
- 14** Open a Web browser and direct it to open the SiteScope Failover instance on the port number selected during the installation. For example, <http://localhost:8888/SiteScope>.
- 15** In the left panel, click the **Preferences** menu, and click **General Settings**. In the **Main Panel** section, enter the SiteScope Failover (High Availability) license key in the **License number** box.
- 16** In the preferences menu section, click **Failover Preferences**. The Failover preferences page opens. Enter the name or IP address and port of the primary SiteScope server and the login credentials as described in “Configuring Failover Preferences” on page 37. Click **OK** to save the settings.

- 17 Click **Mirror Configuration Now** to continue. SiteScope copies all the files over from the primary machine and restarts when the mirroring operation is complete.
- 18 After the failover has restarted, refresh your Web browser or redirect your browser to the SiteScope Failover address. If there are SiteScope user names and passwords defined on the primary SiteScope, enter the same user names and passwords to access the failover.

After successfully mirroring the primary SiteScope, the SiteScope Failover can be accessed using the SiteScope interface. A copy of all of the groups from the primary SiteScope should be displayed along with a new group called **Failover**. Only the Failover group is enabled initially; the other groups are displayed as disabled (blue icon) until the failover is activated.

Installing Multiple Failover Instances on a Single Server

You can install and run multiple instances of SiteScope Failover on a single server. The following is additional information for installing and operating multiple failover instances on a single machine.

- Each installation of SiteScope Failover must be installed in a location with a directory called **SiteScope** as the root for the installation. This generally requires that you install SiteScope Failover at least one level deeper than the default location proposed by the install executable or on separate disk partitions. For example, on Windows platforms, the default installation location is C:\SiteScope. On UNIX, the default location is /opt/SiteScope. You can change the path during the installation to be, for example, C:\SiteScopeHA1\SiteScope for the first failover and C:\SiteScopeHA2\SiteScope for the second installation.
- Each installation of SiteScope Failover must be configured to answer on a unique port number. The installation executable includes a step where you specify a port number. The default port number is 8888.

- ▶ On Windows platforms, you must specify a unique service name for each instance of SiteScope Failover. The installation executable includes a step where you specify a service name. The name you select is used as the display name in the Windows Services control panel. For example, you can change the service name to include a naming convention that identifies which primary SiteScope installation is being mirrored by that failover.

Multiple Failover Limitations

The following are some limitations to using multiple SiteScope Failover instances on a single machine:

- ▶ SiteScope monitor types that use MDRV libraries have a conflict if multiple SiteScopes are on the same machine and both need to use these monitor types. This includes the SiteScope Tuxedo Monitor and Sybase Monitor types. One possible solution is to have all monitoring of the subject systems performed by a single primary SiteScope. Then only a single failover SiteScope will need to use the associated MDRV libraries.
- ▶ Scripts that use relative directory paths may need to be changed if the failover is installed in a different relative path than the primary SiteScope.

Additional Installation Actions

The following are additional actions you may need to perform depending on the configuration of the primary SiteScope. In some cases, you may need to restart the SiteScope Failover installation for the changes to take effect. See the corresponding sections of the SiteScope Help documentation for more information.

- ▶ Make changes to the Windows registry on the failover system to match any changes made on the primary SiteScope server.
- ▶ Copy SSL certificates to the failover system.
- ▶ The login user to be used by the SiteScope Failover service to access remote servers must be configured the same as that used by the primary SiteScope.
- ▶ ODBC database connections must be set up on the failover machine to match those on the primary SiteScope.

- JDBC drivers must be copied, installed, and set up on the failover machine to match any Database monitoring being performed on the primary SiteScope.
- Secure Shell (SSH) servers must be copied, installed, and set up on the failover machine to match any SSH logins and monitoring performed on the primary SiteScope .
- Client libraries, custom scripts, and other API "helper" programs for any Application monitors on the primary SiteScope (for example, BroadVision, WebLogic, WebSphere, and so forth) must be installed and set up on the failover machine.
- DHCP library files must be copied from the primary to failover machine in order to enable the DHCP monitor type.

3

Configuring SiteScope Failover

This chapter describes the SiteScope Failover configuration files and settings, Failover Preferences on the SiteScope Failover server, and the default Failover group monitors and alert configurations.

This chapter includes:

- SiteScope Failover Configuration Files and Variables on page 35
- Configuring Failover Preferences on page 37
- Failover Group Monitors and Alert Configurations on page 38

SiteScope Failover Configuration Files and Variables

SiteScope Failover uses configuration files and settings not used by regular SiteScope. This section describes several of these files and some of the key configuration settings used for SiteScope Failover.

master.config

SiteScope Failover uses a master configuration file in the same way as a primary SiteScope. This file is located in the **<SiteScope root directory>\groups** directory on the failover server. In addition to the parameters used in all SiteScope versions, SiteScope Failover includes the following special configuration parameter:

Parameter	Description
_Installed	The presence of this parameter indicates that it is a Failover version of SiteScope. This also signals SiteScope to look for and use the special mirror.config file.

mirror.log

This is an error log file for SiteScope Failover mirroring operations. Entries are made to this file if the SiteScope Failover is scheduled to mirror configurations from the primary SiteScope but is unable to connect to the primary. Entries are also made to this file if individual mirroring operations fail or encounter errors. This file is located in the **<SiteScope root directory>\logs** directory on the failover server.

Configuring Failover Preferences

This section describes the settings for the Failover Preferences on the SiteScope Failover server. You use these settings to indicate a primary SiteScope to be mirrored and set how often the configurations should be mirrored to the failover SiteScope installation.

GUI Element	Description
Host	Enter the name or IP address of the server that you want this SiteScope Failover server to mirror configurations from.
Port	Enter the SiteScope port of the server that you want this SiteScope Failover server to mirror configurations from. Default value: 8888
Use SSL	When this box is checked, the mirror server contacts the primary SiteScope server via HTTPS. Default value: Not selected
Admin login	The login name used to access the administrator login account for the primary SiteScope instance. If no administrator login has been configured on the target machine, leave this box blank.
Admin password	The password used to access the administrator login account for the primary SiteScope instance. If no SiteScope administrator login has been configured on the primary SiteScope, leave this box blank.
Mirror every (hours)	The schedule for synchronizing (mirroring) configuration data to the failover SiteScope from the primary SiteScope. This is used to make sure that the SiteScope Failover configuration reflects updates and changes to the monitoring configuration on the primary SiteScope server. Values for this box should be between 1 to 23 hours. Enter values as whole numbers. Default value: 4 hours
Last mirror time	The time and date of the most recent mirroring operation.

GUI Element	Description
Next mirror time	The time and date of the next scheduled mirroring operation.
Mirror Configuration Now	Click to mirror the primary SiteScope configuration data now.

Note: SiteScope Failover restarts itself after each mirroring operation.

Failover Group Monitors and Alert Configurations

After primary SiteScope is mirrored for the first time, a group called **Failover** is created along with several alert configurations. The monitors in the Failover group perform predefined actions including detecting the need to activate or disable monitors on the failover server, as well as housekeeping tasks during failover events and recoveries. The alerts are configured to enable and disable monitors in the Failover group based on logic related to the status reported by the default Fail Over monitor. You can create custom alerts and also customize the Fail Over monitor's schedule. Previously, neither of these functions was permitted. For more information, see “Customizing Failover Group Settings” on page 56.

Note: If you customize Failover group alerts and monitor schedule settings, these settings are maintained on SiteScope Failover after the failover system mirrors services of the primary system. This means that you cannot rollback you settings and recreate the failover group after each mirroring.

Failover Group Monitors

The following table provides an overview of the default monitors configured on a SiteScope Failover installation.

Monitors in the Failover Group	Description
Fail Over	This monitor is used to detect if the primary SiteScope is available. It does this by monitoring the Progress Report page from the primary server. By default, it is the only monitor that is actively running on the failover. This monitor is used as a trigger to activate the failover and enable the mirrored monitors. It is also used as a trigger for several alert actions.
Restart HP Business Availability Center Reporting upon Primary Failure Servers	This monitor is used to restart the reporting engine used to forward SiteScope data to Business Availability Center if the failover is activated. This monitor is disabled by default.

Monitors in the Failover Group	Description
<p>Reset HP Business Availability Center upon Primary Startup</p>	<p>This monitor is used to reset the connection parameters for HP Business Availability Center integration and stop the reporting engine used to forward SiteScope data to Business Availability Center. This is a specially configured URL Sequence monitor that interacts with the SiteScope Failover installation itself. This monitor is disabled by default.</p> <p>Note: It is important to disable data reporting from the SiteScope Failover installation when the primary SiteScope become available and resumes data reporting to Business Availability Center.</p>
<p>Copy Config upon Primary Startup</p>	<p>This monitor is used to trigger a new mirroring of configuration data from the primary SiteScope to the failover SiteScope if the primary was unavailable and then becomes available again. This monitor is disabled by default.</p> <p>Important: Enabling this monitor may have undesired consequences. For example, if the primary SiteScope goes down because of a problematic monitor configuration that causes the primary SiteScope to become unresponsive, the use of this monitor may replicate the problematic monitor configuration to the failover if the primary SiteScope is restarted as part a troubleshooting operation.</p>

For more information on the failover monitors, see “Using Failover Monitors” on page 47.

Failover Group Alerts

The following table provides an overview of the default alerts configured on a SiteScope Failover installation. These alerts are all associated with monitors in the Failover group.

Note: When you mirror configurations from a primary SiteScope, any alerts configured on the primary are added to the alerts on the failover.

Trigger Condition	For Monitor	Do Action
good	Fail Over	Enable Copy Config upon Primary Startup
error	Fail Over	Enable Restart HP Business Availability Center Reporting upon Primary Failure
good	Fail Over	Enable Reset HP Business Availability Center upon Primary Startup
good	Copy Config upon Primary Startup	Disable Copy Config upon Primary Startup
good	Restart HP Business Availability Center Reporting upon Primary Failure	Disable Restart HP Business Availability Center Reporting upon Primary Failure
good	Reset HP Business Availability Center upon Primary Startup	Disable Reset HP Business Availability Center upon Primary Startup

For more information on the failover group alerts, see “Understanding Failover Alerts” on page 52.

4

SiteScope Failover Reference

This section includes information about working with SiteScope Failover on general operations, configuration settings, customization settings, and reintegrating monitor data after a failover event.

This chapter includes:

- Working with SiteScope Failover on page 44
- Using Failover Monitors on page 47
- Understanding Failover Alerts on page 52
- Customizing Failover Group Settings on page 56
- Reintegrating Monitor Data on page 57

Working with SiteScope Failover

You activate the SiteScope Failover by installing SiteScope Failover and entering a valid SiteScope Failover license key. The license key is entered as the general license in the General Preferences. No special license key is needed for primary SiteScopes in order for them to be mirrored by a failover. SiteScope Failover can mirror and provide failover functionality for any regular SiteScope installation of the same version number.

Network Protocols used by SiteScope Failover

Replication or mirroring of a primary SiteScope copies configuration files in the **SiteScope\groups** directory from the primary to the failover SiteScope server. This data is transferred from the primary SiteScope to the failover SiteScope using HTTP. The failover heartbeat monitoring of the primary SiteScope also uses HTTP. Both monitor replication and heartbeat monitoring use port 8888 by default. You specify the port number for connecting to the primary SiteScope using the Failover Preferences page on the failover server. You can configure SiteScope Failover to use HTTPS to communicate with the primary. For more information, see “Configuring Failover Preferences” on page 37.

Frequency of Configuration Mirroring

SiteScope Failover replicates or mirrors configuration settings from the primary SiteScope at regular intervals (by default, every 4 hours. You can change the mirroring frequency in the **Mirror every (hours)** box in the Failover Preferences page. You may want to reduce the frequency if your primary SiteScope configurations are well established and operating as intended, or use a more frequent interval if you are actively making configuration changes to the primary SiteScope. SiteScope Failover is programmed to restart itself after each mirroring operation.

Changing the mirroring frequency setting reschedules mirroring time from the moment you save the change. For example, if you change the mirror interval to 2 hours, the next mirroring will occur 2 hours after you save the change.

Heartbeat Monitoring of the Primary SiteScope

The SiteScope Failover monitors the primary SiteScope's Progress Report page. The failover uses a URL monitor that checks the availability of the primary SiteScope's as a heartbeat. The frequency of the monitoring is defined by the **Frequency** setting on the Fail Over monitor that executes the heartbeat. The status of this monitor is used to activate the failover operation.

By default, the Fail Over monitor runs every 10 minutes. Depending on your monitoring environment and requirements for failover performance, you may need to set this monitor to run more frequently. SiteScope Failover only activates the mirrored monitors when the Fail Over monitor indicates an error in retrieving the Progress Report page of the primary. With the default run frequency of 10 minutes, it is possible that you could experience up to a 10 minute gap in infrastructure monitoring should the primary SiteScope become unavailable.

Generally, you should set the frequency of the Fail Over monitor to match the frequency of the majority of the monitors or the most critical monitors on the primary. For example, if you run several monitors on the primary at one minute intervals, you should consider setting the frequency of the Fail Over monitor to run every minute. This way you can minimize potential monitoring gaps in the event of a failure of the primary SiteScope.

Testing SiteScope Failover

The best way to verify that SiteScope Failover is operational and is functioning is to remove its ability to retrieve the Progress Report page from the primary SiteScope. One way to do this without interrupting the operation of the primary SiteScope is to temporarily change the Failover Preferences on the SiteScope Failover server.

To test failover functionality:

- 1 Open a Web browser and direct it to open the SiteScope Failover instance. For example, <http://localhost:8888/SiteScope>.
- 2 In the monitor tree, click the **Failover** group to expand the failover monitors.

- 3 Click the **Fail over** monitor and in the **URL** box, change the IP or server address to some address other than the primary SiteScope.
- 4 Click **Save** to update the failover with the new value.
- 5 In the Dashboard, the status icon for the Failover group should change to the red error icon. The other mirrored monitors should start to change from disabled status to active status, and the group status icon should change from the disabled icon to the green or red icons. It may take a couple of minutes for the mirrored monitors to change their statuses from disabled to active.

There are several possible reasons for this:

- ▶ The failover SiteScope does not mirror any historical monitor status information from the primary. This means SiteScope Failover does not know the status of the mirrored monitors when they were last run on the primary. Depending on the shortest run frequency of the mirrored monitor configurations, some monitors may not be run for two or more minutes after the failover is activated.
 - ▶ The SiteScope interface updates itself every 60 seconds. You can click the **Refresh** button on your browser to force an update to the SiteScope main page.
- 6 After you have verified that the failover is functional, reset the Fail over monitor in the **URL** box to use the actual server address of the intended primary SiteScope.
 - 7 Click **Save** to complete the action.

SiteScope Failover and HP Business Availability Center Integration

If a primary SiteScope is configured with a failover and is reporting to Business Availability Center and the failover SiteScope is activated, SiteScope Failover configures itself to report to Business Availability Center under the same profile as the primary. Secondary profiles do not have to be created for the Business Availability Center database.

Note: Failover SiteScope will report to Business Availability Center if at least one mirroring occurred after primary SiteScope was registered to Business Availability Center.

Using Failover Monitors

The SiteScope Failover installation process automatically configures four specially configured monitors used to activate and deactivate the failover functionality. This section describes more information about working with default monitors in the Failover group.

The Failover group uses a **Failover.dyn** file in the **SiteScope\groups** directory. If you delete the Failover group on the failover server, restarting the SiteScope Failover service or process recreates the monitors in their original configuration. After this, you may need to modify the configurations as described in the following sections.

Fail Over Monitor

This monitor is used to detect if the primary SiteScope is available. It is a URL monitor type configured to monitor the Progress Report page of the primary server. The URL of the Progress page is in the format:

```
http://<SiteScope_host_name>:8888/SiteScope/htdocs/Progress.html
```

The frequency of the monitoring is defined by the Frequency setting on the Fail Over monitor that executes the heartbeat. The status of this monitor is used to activate the failover operation. By default, the Fail Over monitor runs every 10 minutes. Depending on your monitoring environment and requirements for failover performance, you may need to set this monitor to run more frequently. SiteScope Failover only activates the mirrored monitors when the Fail Over monitor indicates an error in retrieving the Progress Report page of the primary.

With the default run frequency of 10 minutes, it is possible that you could experience up to a 10 minute gap in infrastructure monitoring should the primary SiteScope become unavailable. Generally, you should set the frequency of the Fail Over monitor to match the frequency of the majority of the monitors or the most critical monitors on the primary. For example, if you run several monitors on the primary at one minute intervals, you should consider setting the frequency of the Fail Over monitor to run every minute. This way you can minimize potential monitoring gaps in the event of a failure of the primary SiteScope.

The monitor is configured without any content matching. This means that it simply needs to successfully retrieve a page from the primary SiteScope.

Note: Editing configuration settings of the Fail Over monitor instance may adversely affect failover event transitions. The following are situations in which you may need to modify this monitor:

- ▶ If the update interval for the Fail Over Monitor is too long. You can select a shorter interval, however, it is not recommended to set the Failover monitor update interval to less than 1 minute. If the primary SiteScope has a large number of monitors running on it, it may take up to a minute for the primary SiteScope to deliver the Progress Report Page to the SiteScope Failover server.
 - ▶ If the primary SiteScope is configured with an administrator login and password, the failover cannot retrieve the Progress Report page even though the primary SiteScope is operating. You must edit the Fail Over monitor to add the applicable authentication information. To add user authentication, enter the login name and password in the **Authorization User Name** and **Authorization Password** fields and update the monitor. If the primary SiteScope is configured to only respond to HTTPS (SSL) requests, you might need to change the URL of the Fail Over monitor to include the `https://` protocol prefix.
-

Other Monitors in the Failover Group

The other monitors in the Failover are configured to perform actions on the failover itself rather than interacting with the primary SiteScope.

Restart HP Business Availability Center Reporting upon Primary Failure

This is a specially configured URL monitor that interacts with the SiteScope Failover installation itself. This monitor requests a page and operation that signals the failover to start the HP Business Availability Center reporting engine when a failover event is detected. The reporting engine is not running while SiteScope Failover is in standby mode and is not automatically activated in a failover event, even if monitors mirrored from the primary were configured to report data to HP Business Availability Center.

Reset HP Business Availability Center upon Primary Startup

This is a specially configured URL Sequence monitor that interacts with the SiteScope Failover installation itself. This monitor performs this action by requesting a sequence of pages and operations that clear the connection parameters for HP Business Availability Center integration on the failover server. This has the effect of stopping the reporting engine used to forward SiteScope data to HP Business Availability Center.

The action performed by this monitor resets all the configuration parameters for reporting data to HP Business Availability Center. The failover must successfully perform a mirroring operation from the primary SiteScope to restore the parameters associated with this feature. As noted for the **Restart HP Business Availability Center Reporting upon Primary Failure** monitor above, the BAC reporting engine is inactive on the failover until it is started by that monitor.

Note: You should not attempt to modify the steps of this monitor with the exception of adding user authentication as necessary.

Copy Config upon Primary Startup

This is a specially configured URL monitor that interacts with the SiteScope Failover installation itself. This monitor requests a page and operation that signals SiteScope Failover to request a new copy of the monitor configuration data from the primary SiteScope server when the Fail Over monitor detects that the primary is active again.

Note: Editing configuration settings of the monitors in the Failover group may adversely affect failover event transitions. The following are situations in which you may need to modify these monitor:

- ▶ If you set up your SiteScope Failover server to accept HTTPS requests only. In this case, change the two other monitors in the Failover group, as they contain URLs to certain pages in the failover server using the non-secure HTTP protocol. Edit each monitor and change any URL that looks like `http://<hostname:..>` to `https://<hostname:..>`.
 - ▶ If the SiteScope Failover is configured with an administrator login and password, these failover monitors cannot retrieve or access the URLs needed to execute their actions. Edit the monitors to add the applicable authentication information. To add user authentication, enter the login name and password in the **Authorization User Name** and **Authorization Password** fields and update the monitor.
 - ▶ If you are running your Failover SiteScope on a port other than the one used when it was configured after installation. The same URLs above contain port numbers that correspond to the installation port. If you are no longer using the original port number, edit these two monitors and change the port number `nnnn` wherever you see a URL that looks like `http://localhost:nnnn`.
-

Understanding Failover Alerts

During installation and activation, SiteScope Failover creates six alert configurations that are used as part of the failover operation. When you configure the failover SiteScope to mirror a primary SiteScope, the mirroring operation copies any alert configurations from the primary to the failover server. This section describes the six alerts used with the monitors in the Failover group. The alerts used for the Failover group monitors can be categorized based on the status condition used to trigger them and the chain of actions taken.

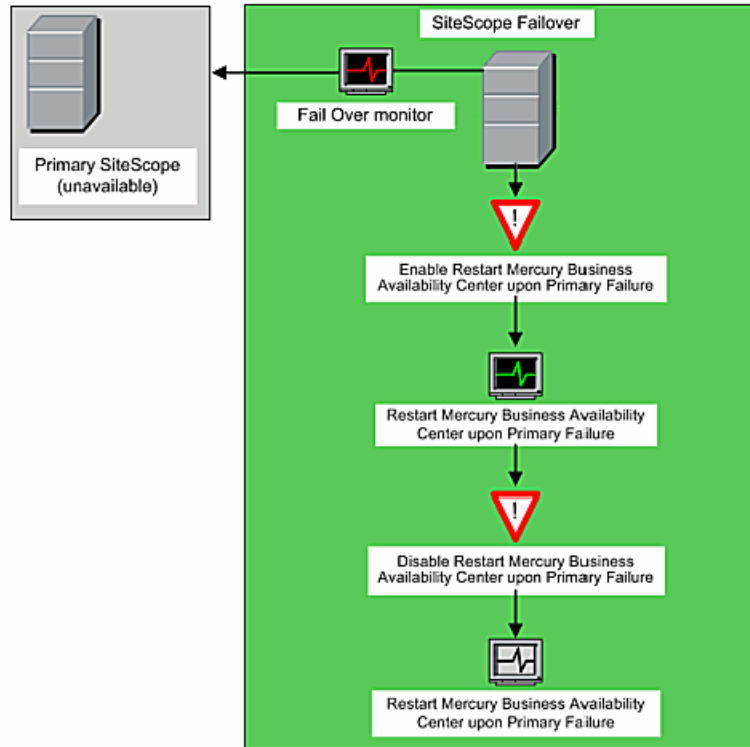
- ▶ **Alerts on Primary Failure.** Alert actions triggered when the failover detects that the primary SiteScope has become unavailable. For details, see “Alerts on Primary Failure” on page 52.
- ▶ **Alerts on Primary Recovery.** Alert actions triggered when the failover detects that the primary SiteScope has recovered and is available again. For details, see “Alerts on Primary Recovery” on page 54.

Alerts on Primary Failure

The following table describes the two alerts that are triggered by this event:

For Monitor	Do Action	Description
Fail Over	Enable Reset HP Business Availability Center upon Primary Startup	Enables the Reset HP Business Availability Center upon Primary Startup monitor when the Failover monitor has detected that the primary SiteScope is again available.
Reset HP Business Availability Center upon Primary Startup	Disable Reset HP Business Availability Center upon Primary Startup	Triggered by the Reset HP Business Availability Center upon Primary Startup monitor when it has detected that the primary SiteScope is again available by successfully executing the reset URL sequence. Once the associated monitor runs successfully, this alert disables the monitor so that it only runs once. Used in conjunction with the Fail Over -Enable Reset HP Business Availability Center upon Primary Startup alert.

The following figure shows the sequence of actions and relationships with the applicable monitors in the Failover group for alerts triggered by failure of the primary SiteScope. As noted in the table above, the **Reset Business Availability Center upon Primary Startup** monitor is run only once and is then disabled by an alert action.

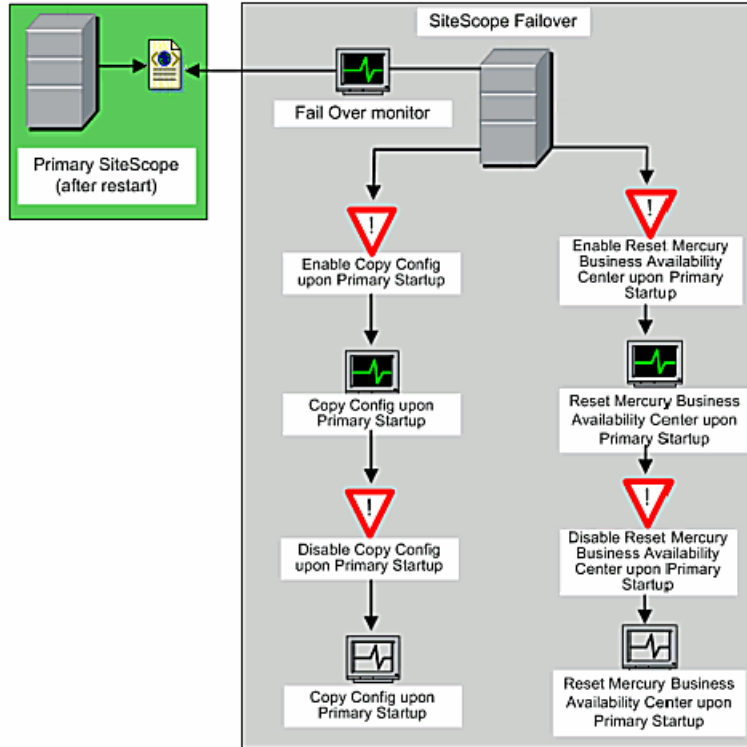


Alerts on Primary Recovery

The second category of alert actions are triggered when the failover detects that the primary SiteScope has recovered and is again available. The following table describes the four alerts that are triggered by this event:

For Monitor	Do Action	Description
Fail Over	Enable Copy Config upon Primary Startup	Enables the Copy Config upon Primary Startup monitor to run when the Failover monitor detects that the primary SiteScope is again available.
Fail Over	Enable Restart Business Availability Center Reporting upon Primary Failure	Enables the Restart Business Availability Center Reporting upon Primary Failure monitor when the Failover monitor has detected that the primary SiteScope is unavailable.
Copy Config upon Primary Startup	Disable Copy Config upon Primary Startup	Triggered by the Copy Config upon Primary Startup monitor when it has detected that the primary SiteScope is again available by successfully mirroring configurations from the primary SiteScope. Once the associated monitor runs successfully, this alert disables the monitor. Used in conjunction with the Fail Over - Enable Copy Config upon Primary Startup alert.
Restart Business Availability Center Reporting upon Primary Failure	Disable Restart Business Availability Center Reporting upon Primary Failure	Triggered by the Restart Business Availability Center Reporting upon Primary Failure monitor after the Failover has detected that the primary SiteScope is unavailable. Once the associated monitor runs successfully, this alert disables the monitor so that it only runs once. Used in conjunction with the Fail Over - Enable Restart Business Availability Center Reporting upon Primary Failure alert.

The following diagrams shows the sequence of actions and relationships with the applicable monitors in the Failover group for alerts triggered by failure of the primary SiteScope. As noted in the table above, the **Copy Config upon Primary Startup** and **Restart Business Availability Center Reporting upon Primary Failure** monitors are run only once and then disabled by alert actions.



Customizing Failover Group Settings

You can customize Failover group alerts and monitor schedule settings.

Note: In previous versions of SiteScope, customized settings were overwritten after each mirroring. Since SiteScope 8.6, customized settings are maintained on SiteScope Failover after the failover system mirrors services of the primary system. This means that you cannot rollback your settings and recreate the failover group after each mirroring.

Customizing Failover Alerts

You can customize alerts used for the Failover group monitors. This means that you can set up your own alerts to notify you when a failover occurs. For example, you can configure a Failover group alert to receive e-mail notification when the primary SiteScope goes down. You can also disable some of the predefined failover alerts so that the failover machine does not report to Business Availability Center after the primary SiteScope goes down, even if the appropriate settings were copied.

Customizing the Failover Monitor Schedule

You can also customize the monitor schedule for SiteScope Failover and tune it to the "heartbeat" of primary SiteScope. For example, if primary SiteScope runs on weekdays only and is down on weekends, similarly you can schedule the Fail Over monitor to run on weekdays only. This prevents the failover system copying monitors on weekends and triggering failover alerts during this time.

Reintegrating Monitor Data

SiteScope uses log files to store monitor measurement results. During a failover event, the logging of measurement data by the primary SiteScope is interrupted (and in addition, Management Reports are not run). At this time, the SiteScope Failover activates the mirrored monitors and begins logging measurements into the file system on the failover server. When the primary SiteScope is recovered or restored to operation, the data logged during the failover event is not available on the primary SiteScope. This can impact reports (reports are not mirrored from the primary to the failover server because the logs are not mirrored). To overcome this, you can manually re-integrate data from the SiteScope Failover with data on the primary SiteScope using text editing tools.

The following is an overview of the steps you use to manually reintegrate data from the SiteScope Failover:

- 1** Identify the failover period.
- 2** Back up the corresponding daily log file on the primary SiteScope.
- 3** Locate the failover event period in the primary log file and in the corresponding failover log file.
- 4** Copy the failover data from the failover to the primary log file.
- 5** Replace the log file on the primary with the reintegrated log file.

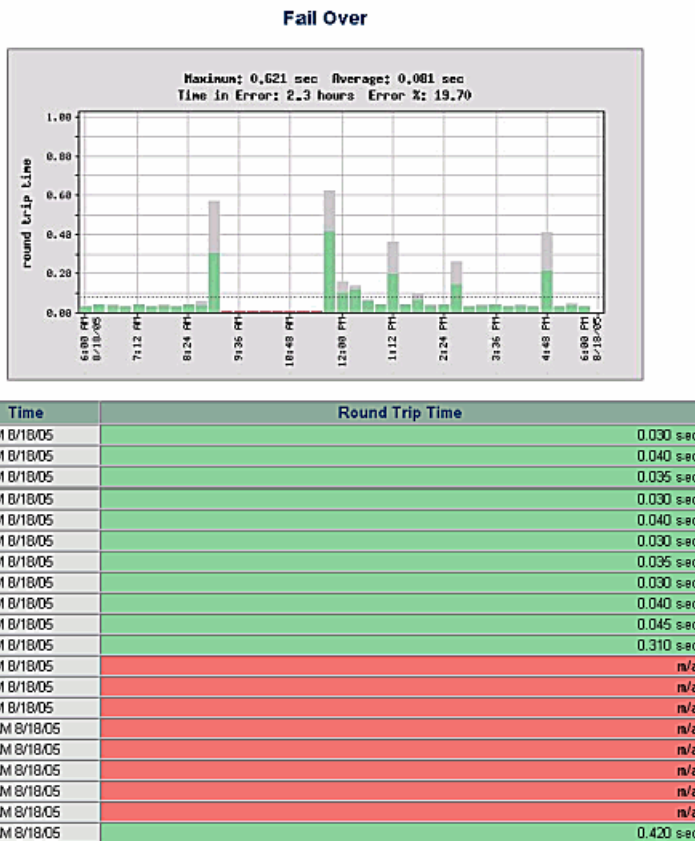
Note: If the primary SiteScope is reporting to Business Availability Center, SiteScope Failover keeps reporting data to Business Availability Center when it takes control, so there should not be data gaps in System Availability Management reports.

- 6** However, primary SiteScope reports will have the gaps in the data unless you reintegrate the missing data from SiteScope Failover.

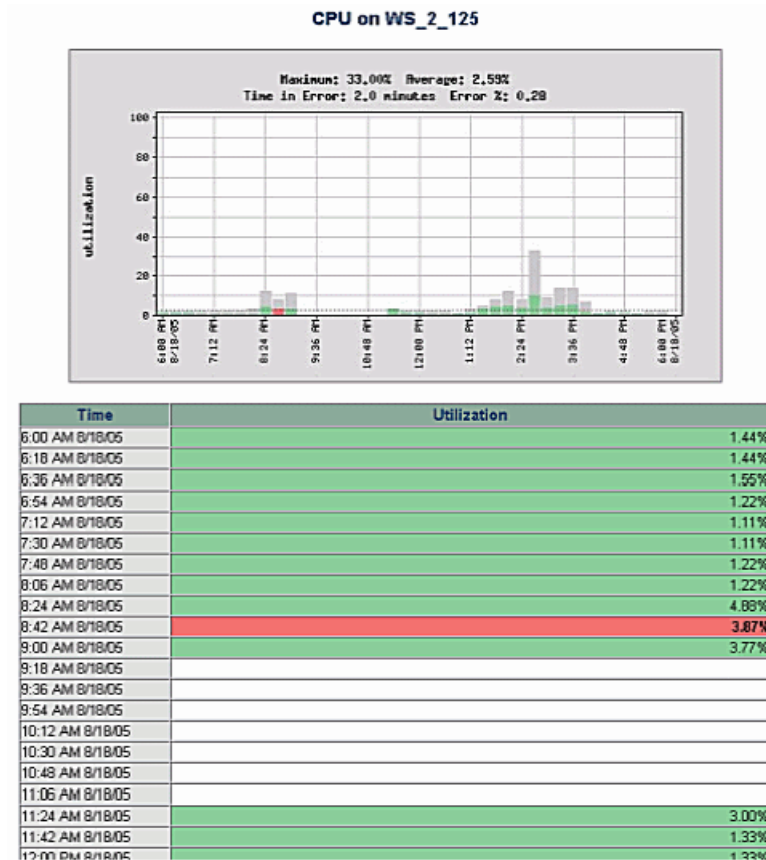
Identifying the Failover Period

You can use reports on the primary and failover SiteScope to identify the time periods when the failover was activated. You can then use this information to find the segments of log data to be reintegrated to the primary SiteScope.

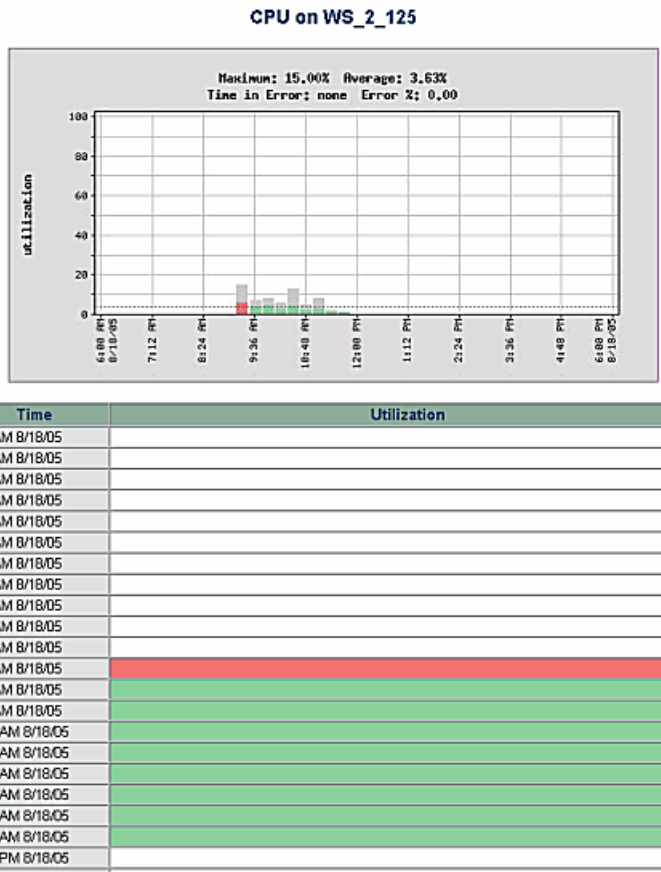
The following figure is an example report for the Fail Over monitor on the SiteScope Failover server. The entries in the table of readings that are highlighted in red indicate the monitor was unable to retrieve the Progress Report page from the primary SiteScope at about 9:18 AM on 8/18/05. This triggered a failover event.



Generating a report for a single monitor on the primary SiteScope at some time after failover and after the primary has become operational again shows blank entries in the bar chart and table of readings for the monitor. The following figure shows an example of a report for a CPU monitor on the primary SiteScope after recovery from a failover event. The report period is selected as the same time period as the report shown in the figure above. The blank lines in the table of readings indicates the periods that the primary SiteScope was unavailable or offline.



Generating a report for the same monitor on the SiteScope Failover instance shows blank entries in the bar chart and table of readings except for the time during which the failover was active. The following figure shows an example of a report for the same CPU monitor as in the report above on the failover SiteScope. The report period is selected as the same time period as the other reports in this example. You can see that this report shows three entries for the monitor while the report from the primary shows only one blank entry. This may not occur in all cases depending on a number of factors.



Using information about the date and time of a failover event, you can identify the monitor log data to be used for reintegrating the measurement data to the primary SiteScope.

You can identify failover periods by examining the monitor data logs on the SiteScope Failover server. Based on the example used for the figures above, the log file would have the filename of SiteScope2005_08_18.log. The following is an excerpt from the log file with the entries showing the transition to the failover. The first three entries are measurements logged by the Fail Over monitor. The status of ok indicates that the primary SiteScope was active at that time. The next entry shows the Fail Over monitor was unable to reach the primary SiteScope which triggers the activation of the mirrored failover monitors. The other entries include data from the mirrored monitors. This is data that can be reintegrated to the primary SiteScope.

```

00:33:59 08/18/2005    good  Failover    Fail Over    0.04 sec    4:39    200    40    ok
08:43:59 08/18/2005    good  Failover    Fail Over    0.06 sec    4:40    200    60    ok
08:53:59 08/18/2005    good  Failover    Fail Over    0.03 sec    4:41    200    30    ok
09:04:02 08/18/2005    good  Failover    Fail Over    0.57 sec    4:42    200    570   ok
09:13:59 08/18/2005    good  Failover    Fail Over    0.05 sec    4:43    200    50    ok
09:24:00 08/18/2005    error  Failover    Fail Over    unable to connect to server 4:44    -998
09:24:03 08/18/2005    good  Failover    Restart Mercury Business Availability Center Reporting upon Fri
09:24:50 08/18/2005    error  WS_2_125   CPU on WS_2_125 rd data 1.44    n/a    3    failure
09:25:26 08/18/2005    good  Health    Monitor Load Checker    Current Monitors Run Per Minute 3.0. Cu
09:25:49 08/18/2005    good  WS_2_125   Memory on WS_2_125    20% used, 994MB free, 32.24 pages/sec
09:26:50 08/18/2005    good  WS_2_125   CPU on WS_2_125 15% used    1:45    15    15
09:27:06 08/18/2005    good  Health    Monitor Load Checker    Current Monitors Run Per Minute 2.0. Cu
**  **  **  **  **

```

It may be useful to understand more about the failure of the primary SiteScope. SiteScope records information about its own operation and internal errors in an error log found in the **SiteScope\logs** directory. The following is an excerpt from the **error.log** on a primary SiteScope. This is the pattern and syntax of the log entries that are associated with SiteScope restarting. The date and time data at the beginning of the entries identify when the primary became operational again. The log entries prior to this set of entries will vary depending on what caused the primary SiteScope to be unavailable and can be useful in identifying the cause of the failure.

```

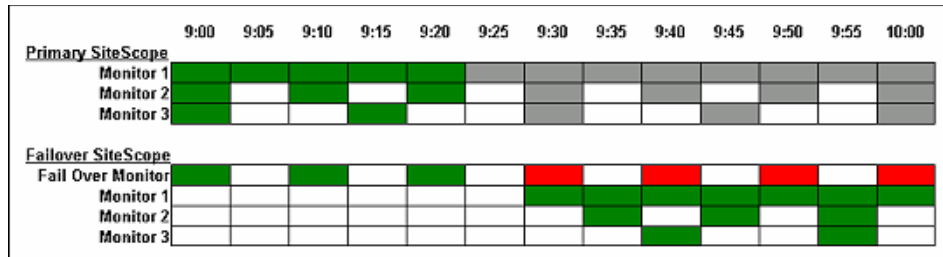
Thu Aug 18 11:38:39 2005    starting monitoring process: 1400, result: 1
2005-08-18 11:39:32.133 [SiteScope Main Thread] (SiteScopeSupport.java:862) INFO - -----
2005-08-18 11:39:32.243 [SiteScope Main Thread] (SiteScopeSupport.java:863) INFO - starting SiteScope...
2005-08-18 11:40:13.262 [SiteScope Main] (SiteScopeGroup.java:1772) INFO - starting HTTP server...
2005-08-18 11:40:14.033 [SiteScope Main] (SiteScopeGroup.java:1374) INFO - starting maintenance scheduler...
2005-08-18 11:40:19.441 [SiteScope Main] (SiteScopeGroup.java:1475) INFO - starting monitor scheduler...
2005-08-18 11:40:19.441 [SiteScope Main] (SiteScopeGroup.java:1478) INFO - starting report scheduler...
2005-08-18 11:40:19.441 [SiteScope Main] (SiteScopeGroup.java:1481) INFO - starting dynamic update scheduler...
2005-08-18 11:40:19.661 [SiteScope Main] (SiteScopeSupport.java:938) INFO - SiteScope process started: 8.0.0.0

```

Reintegrating Data Logs

Daily monitor logs are created as date coded files in the **SiteScope\logs** directory. You will need to have access to this directory on both installations to reintegrate data from a failover SiteScope to a primary SiteScope.

Due to the mechanism for scheduling monitors on the SiteScope Failover when it is activated, there is some discontinuity in measurement data and offset in frequency intervals of monitors between the primary and failover SiteScopes. There may also be some overlap of measurement data for monitors that are run close to the time that the primary SiteScope becomes operational again. The data gaps and offset are dependent on a combination of factors such as the run frequency of the Fail Over Monitor on the SiteScope Failover installation. The following figure illustrates a simplified monitor run pattern during an example failover event.



In the figure above, the upper table represents three monitors running on a primary SiteScope. Monitor 1 runs every five minutes, Monitor 2 runs every ten minutes and Monitor 3 runs every 15 minutes. At some time between 9:20 and 9:25, the primary SiteScope became unavailable. The grey squares indicate what would have been the monitor runs executed if the primary had not failed. These are included to illustrate the measurement data gap and offset.

On the failover SiteScope (represented in the lower table of the figure), the Fail Over Monitor is set to run every ten minutes (the default setting). This monitor ran just prior to the failure of the primary SiteScope. It does not run again until 9:30, at which time it detects that the primary is unavailable. The failover SiteScope then activates the mirrored monitors 1, 2 and 3. Monitor 1 is the first monitor to run on the failover because it has the smallest run frequency interval (in this example, five minutes). It does not necessarily run immediately when the failover is activated. SiteScope Failover assumes that each mirrored monitor completed a run prior to failover activation. Failover monitors are then queued according to their run frequency with the shortest run frequency monitors scheduled first.

In the example used here, Monitor 3 runs 15 minutes after the failover is activated. From the example used here, there is a measurement data gap between approximately 9:20 and 9:45, depending on the monitor. Similarly, when the primary becomes active again, there may be an overlap of measurement data since the monitors on the failover in this example will continue to run for up to ten minutes after the primary has become operational.

Note: You should perform reintegration of failover data at least one day after a failover event. This means that you will be working with historical log files rather than the log files actively being used to record the current day's monitoring data.

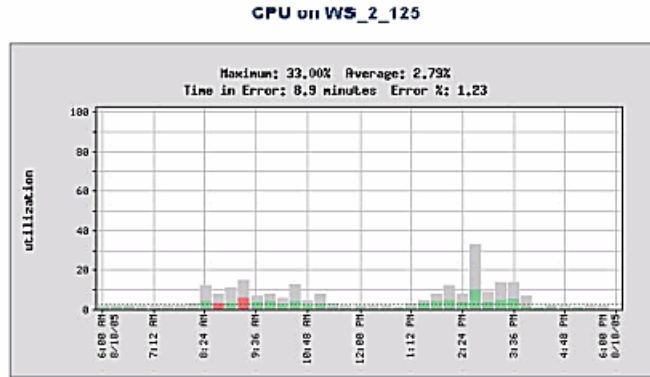
Important: SiteScope is sensitive to the syntax and format of its log files. If you use a word processor application to edit and reintegrate SiteScope log data, you must use care that the word processor does not automatically reformat the content of or add markup data to the log files. The files must be manipulated and saved as plain text files.

To reintegrate Failover data to a primary SiteScope:

- 1** Identify the time period of the failover event. Use the reports and log files as outlined in the section Identifying the Failover Period.
- 2** On the primary SiteScope, locate the daily monitor log in the **SiteScope\logs** directory that contains the failover period. Make a backup copy of this file. This backup will serve to restore the current data if there are problems with the reintegration.
- 3** On the primary SiteScope, make an additional copy of the log file containing the failover period. Use this copy as the working copy for the data reintegration.
- 4** Open the working copy of the primary log file using a text editor.
- 5** On the failover SiteScope, locate the daily monitor log in the **SiteScope\logs** directory that contains the failover period corresponding with the primary. Make a working copy of this file.
- 6** Open the working copy of the failover log file using a text editor.
- 7** In the primary log file, locate the entries corresponding to the time period of the failover event. Normally, there are no empty entries in the log file so you need to search the date and time entries to find the location for the missing data. Place the cursor at the beginning of the log entry representing the first entry made after the primary became operational again.
- 8** In the failover log file, locate the entries corresponding to the time period of the failover event. Use the status entries of the Fail Over monitor to help locate the transition to the failover server.
- 9** Copy the block of log entries from the failover log file up to the entry that indicates that the Fail Over monitor was again able to connect with the primary SiteScope (when the status of the Fail Over monitor changes to good).
- 10** Paste this block of log entries into the primary log file at the location of the cursor. If necessary, delete any blank lines added by the paste operation. If necessary, add a linefeed or carriage return to make all the entries match the correct syntax with the date and time at the beginning of each line.
- 11** Save the changes to the working copy of the primary log file.

- 12** Replace the original log file on the primary SiteScope with a copy of the reintegrated log file.

After this procedure, you can test the reintegration by regenerating a report on the primary SiteScope using the a time period that includes the failover event. The following is an example of the report for the sample CPU monitor used in the examples above after the data is reintegrated from the failover log.



Time	Utilization
6:00 AM 8/18/05	1.44%
6:18 AM 8/18/05	1.44%
6:36 AM 8/18/05	1.55%
6:54 AM 8/18/05	1.22%
7:12 AM 8/18/05	1.11%
7:30 AM 8/18/05	1.11%
7:48 AM 8/18/05	1.22%
8:06 AM 8/18/05	1.22%
8:24 AM 8/18/05	4.88%
8:42 AM 8/18/05	3.87%
9:00 AM 8/18/05	3.77%
9:18 AM 8/18/05	6.20%
9:36 AM 8/18/05	4.33%
9:54 AM 8/18/05	4.55%
10:12 AM 8/18/05	3.11%
10:30 AM 8/18/05	4.88%
10:48 AM 8/18/05	2.66%
11:06 AM 8/18/05	3.33%
11:24 AM 8/18/05	1.60%
11:42 AM 8/18/05	1.30%
12:00 PM 8/18/05	1.33%
12:18 PM 8/18/05	1.22%

5

Troubleshooting SiteScope Failover

This chapter describes procedures for diagnosing and troubleshooting problems that may occur when working with SiteScope Failover.

This chapter includes:

- ▶ Failover Activation Issues on page 67
- ▶ Mirroring Issues on page 73

Failover Activation Issues

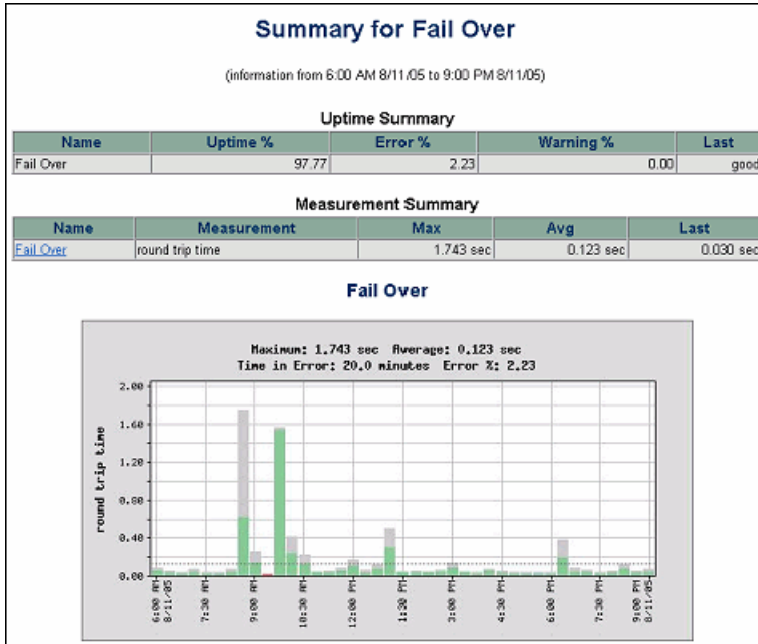
The following troubleshooting suggestions are for issues relating to SiteScope Failover activation and general operations.

Detecting if a SiteScope Failover was Activated

When a failover event occurs, there are several ways to tell if a SiteScope Failover has been activated.

- ▶ Generate a report for the Fail Over monitor in the Failover group. Any entries showing this monitor is in error indicate that SiteScope Failover was activated.
- ▶ Look in the daily log for monitor runs from groups other than Failover. The log file is located at **SiteScope\logs\SiteScopeYYYY_MM_DD.log**. Since all other monitors are disabled by default, looking for an active run of mirrored monitors shows that SiteScope Failover was activated.

The following are examples of a report generated for the Fail Over monitor in the Failover group showing a short time period when the failover server was unable to retrieve the Progress Report Page from the primary SiteScope. The first figure show the top of a summary report with the bar graph chart showing one short red bar in the first one third of the report period.



The other tables on the chart give a more explicit indication of the failover activation event. The following figure is an example of the listing of error readings made by the Fail Over monitor. This table is normally displayed in the lower portion of the report page.

Errors from 6:00 AM 8/11/05 to 9:00 PM 8/11/05		
Time	Monitor	Status
9:24 AM 8/11/05	Fail Over	unable to connect to server
9:34 AM 8/11/05	Fail Over	unable to connect to server

SiteScope Failover Monitors Remain Active

The SiteScope Failover server is running all of the mirrored monitors, even though the primary is also running.

If the license is other than a SiteScope Failover license, the failover will try to operate as a regular SiteScope installation.

To resolve a SiteScope Failover license:

- 1** Check the license key entered on the SiteScope Failover server by opening the **General Preferences** page. If the license does not start with the letters **HA** then it is the incorrect license type.
- 2** Contact your HP Sales person to obtain a valid SiteScope Failover license.
- 3** Enter the new license on the SiteScope Failover server.
- 4** Restart the SiteScope Failover service. On Windows platforms, the default service name is **SiteScopeHA**.

After entering a valid Failover license and restarting the service or process, SiteScope Failover disables the mirrored monitors as long as it can detect the primary SiteScope.

SiteScope Failover stops copying configurations from Primary SiteScope

The SiteScope Failover initially mirrored the monitor configurations from the primary server but other updates to the primary are not being mirrored to the failover.

This can be caused by a problem with the automated reset operation after SiteScope Failover is activated and then it is deactivated when the primary becomes operational again. To resolve this, update the **Reset HP Business Availability Center upon Primary Startup** monitor on the failover using the following steps.

To update the monitor:

- 1** Open a Web browser and access the SiteScope Failover server.
- 2** Open the **Failover** group by clicking on the name of the group or the group container.
- 3** Click the URL Sequence monitor titled **Reset HP Business Availability Center upon Primary Startup**, and in the **Advanced Settings** section, perform the following:
 - Locate the setting **Resume at step, if error**. Update the value in this box to the number 4.
 - Select the **Execute resume step and remaining steps** check box.
- 4** Click **Save** to save the changes to the monitor.

SiteScope Failover monitors in error after primary SiteScope becomes operational

The **Restart HP Business Availability Center Reporting upon Primary Failure** or the **Reset HP Business Availability Center upon Primary Startup** monitors in the Failover group stays in error when the primary SiteScope server becomes operational after a failover event. The Tools link for the monitors also report the error.

This error can be caused by an user authentication problem with the monitors on the SiteScope Failover instance. When the SiteScope Failover mirrors the primary SiteScope, the SiteScope user account settings are copied to the failover server and activated. However, the monitors in the Failover group are not automatically configured with any user authentication credentials. This means the **Restart HP Business Availability Center Reporting upon Primary Failure** or **Reset HP Business Availability Center upon Primary Startup** monitors do not have the proper account information for accessing the SiteScope Failover server to perform their actions. The following describes the steps you use to add the necessary information to the monitor configurations.

To add an Authorization User Name and Password to failover monitors:

- 1** Open a Web browser and access the SiteScope Failover server.
- 2** Click the **Failover** group to expand the failover monitors.
- 3** Click the monitor reporting the error, and in the Advanced Settings section, enter the **Authorization User Name** and **Authorization Password** required to access the SiteScope Failover server. For the **Reset HP Business Availability Center upon Primary Startup** Monitor, enter this data for each step of the URL sequence.
- 4** Click **Save** to save the changes to the monitor. If the user authorization is correct, the monitor status will be updated to good.
- 5** Click **Mirror Configuration** to mirror the primary SiteScope.

SiteScope Failover restarting with the message -"restarting monitoring process, process not responding"

This message is displayed on the SiteScope Failover server at regular intervals for example, every 30 minutes.

This occurs if you are running a SiteScope Failover with a general SiteScope license instead of an specific SiteScope Failover (High Availability) license. This causes SiteScope to restart every half hour. If this is the case, an empty **mirror.config** file is created in the groups directory. There are two options to correct this situation:

- ▶ If you intend to use the subject SiteScope installation as a failover, you must obtain a valid SiteScope Failover (High Availability) license and update the SiteScope Failover with the license information. Contact your HP Sales representative for a SiteScope Failover (High Availability) license.
- ▶ If you do not intend to use the subject SiteScope installation as a failover but instead want to run a general use SiteScope, download a standard, non-SiteScope Failover version of SiteScope from the HP Web site (www.hp.com/go/software) and install and use that version with a valid general SiteScope license instead.

Error: "Your Failover (High Availability) SiteScope server has lost it's configuration file"

SiteScope is generating e-mails with the message: "Your high availability SiteScope server has lost it's configuration file." However, the SiteScope that is generating the error messages is a primary or standalone instance of SiteScope and not a failover instance of SiteScope. This problem can occur if the **master.config** file contains an entry `_halninstalled=true`.

To eliminate this message:

- 1** Make a backup copy of the **SiteScope\groups\master.config** file.
- 2** Open the **master.config** file with a text editor.
- 3** Search for the text string `_halinstall` for SiteScope versions 7.9.0.0 and later, or `_halninstalled` for earlier versions. Delete this line.
- 4** Save the changes to the **master.config** file.

- 5 Stop and restart the SiteScope process or service.
- 6 Check the **master.config** file to see that the `_halnstalled` entry no longer appears in the file.

Mirroring Issues

The following are errors and conditions that are associated with the mirroring of monitor configurations from the primary SiteScope to the failover.

SiteScope Failover not updated with changes from primary

The SiteScope Failover server is not mirroring monitor configuration changes made on the primary SiteScope server.

Check that the license key entered on the SiteScope Failover server and make sure it is a SiteScope Failover (High Availability) license. If you have a general SiteScope license entered on the failover server and not a SiteScope Failover license, the failover server runs as a general version of SiteScope. It does not automatically mirror monitor configurations from the primary SiteScope. A SiteScope Failover (High Availability) license key must be used to enable the automated failover and mirroring capabilities.

To check the license key on SiteScope Failover:

- 1 Open a Web browser and access the SiteScope Failover server.
- 2 In the left menu tree, click the **Preferences** menu and click **General Preferences**.
- 3 In the **Main Panel** section, verify that the license key starts with the letters **HA** or **HX**. This prefix indicates that it is a SiteScope Failover (High Availability) key. If the license string begins with any other letters, contact your salesperson to generate a new key, or to resend your original HA key. If the license appears to be a valid SiteScope Failover key but the failover fails to mirror configuration changes from the primary SiteScope, contact HP Software Support for assistance.

SiteScope Failover Server restarts itself frequently

The SiteScope Failover server automatically restarts more than once during a 24-hour period. What can be the cause?

SiteScope Failover normally restarts itself automatically at the same frequency as the mirroring time. The SiteScope Failover server sets its own **_restartDelayconfiguration** parameter to the same value that the failover server has been set to synchronize with or mirror the primary SiteScope server. For example, if the SiteScope Failover Preferences are set to mirror every hour, SiteScope is set to restart as part of that process and thus sets the **_restartDelay** on the failover SiteScope service to 1 hour.

To change the mirroring frequency:

- 1** Open a Web browser and access the SiteScope Failover server.
- 2** In the left menu tree, click the **Preferences** menu and click **Failover Preferences**. The Failover Preferences page opens.
- 3** In the **Mirror every (hours)** box, change the value to an appropriate value to minimize the frequency of restarts. The default value is 4 hours. If the primary SiteScope configuration is not expected to change frequently from one day to the next, set the **Mirror every (hours)** value for the failover to a number larger than 6 and as high as 23.
- 4** Click **Save** to update the failover with the new value.

Log File monitor resets on SiteScope Failover

The file position pointer for Log File monitors mirrored on SiteScope Failover may reset occasionally. When Log File monitors run on SiteScope Failover (High Availability) systems, log entries that have been previously processed by the corresponding Log File monitor on the primary SiteScope system may be re-evaluated even if the monitor is configured to only check new log file entries. This may cause duplicate alerts to be sent for items for which alerts have previously been sent by the primary SiteScope.

When the SiteScope Failover (High Availability) service restarts, the configuration files from the primary SiteScope are copied to the failover server. The configuration files copied include **.mg** and **.config** files, but not the **.dyn** files. If the Failover is activated (when SiteScope restarts or is otherwise unavailable), Log File monitors behave as follows:

- ▶ On the monitor's initial run, the only action that takes place is for the `lastFilePosition` variable in the corresponding **.dyn** file on the Failover machine to be set.
- ▶ Once this value has been set, subsequent runs of the same Log File monitors, are evaluated from the `lastFilePosition` forward. Because SiteScope Failover does not mirror the **.dyn** files for monitor groups, certain dynamic state data is not available on the failover. The current solution is to write a script that will regularly copy the applicable **.dyn** files from the primary SiteScope to the failover machine. The **.dyn** files are stored in the **SiteScope\groups** directory and must be copied to the same location on the SiteScope Failover server.

Once you have created a script to copy the files, there are several ways to schedule the execution of the script:

- ▶ Add a Script monitor to the Failover group to run a script that copies all the **.dyn** files over from the primary SiteScope to the SiteScope Failover machine at regular intervals.
- ▶ Add or modify the **SiteScope\groups\master.config** file to include a `_startupScript=` parameter and a corresponding script path. Each time that SiteScope Failover restarts (daily restarts plus restarts after each mirroring update), the script is executed and the **.dyn** files are copied.
- ▶ Create a scheduled task or job using operating system tools to execute the script at regular intervals.

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