Symantec™ ApplicationHA Generic Agents Guide

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Symantec

Symantec™ ApplicationHA Generic Agents Guide

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Chapter 1

Symantec ApplicationHA agents

This chapter includes the following topics:

- About the Symantec ApplicationHA infrastructure agents
- About the Heartbeat agent
- About the MountMonitor agent
- About the ServiceMonitor agent
- About the GenericService agent
- About the Process agent
- About the FileNone agent
- About the ElifNone agent
- About the FileOnOff agent
- About the FileOnOnly agent

About the Symantec ApplicationHA infrastructure agents

Agents are processes that manage applications and resources of predefined resource types on a system. The agents are installed when you install Symantec ApplicationHA. A system has one agent per resource type that monitors all resources of that type. For example, a single GenericService agent manages all services that are configured using the GenericService resources. When the agent starts, it obtains the necessary configuration information from the resources and

then monitors the configured applications. The agents then periodically update Symantec ApplicationHA with the resource and application status.

Agents perform the following operations:

- Bring resources online
- Take resources offline
- Monitor resources and report state changes

Symantec ApplicationHA agents are classified as Infrastructure agents and Application agents.

Infrastructure agents are packaged (bundled) with the base software and include agents for mount points, generic services and processes. These agents are immediately available for use after you install Symantec ApplicationHA.

Application agents are used to monitor third party applications such as Microsoft SQL Server, Oracle, and Microsoft Exchange. These agents are packaged separately and are available in the form of an agent pack that can be installed after you have installed Symantec ApplicationHA.

An agent pack is released on a quarterly basis. The agent pack includes support for new applications as well as fixes and enhancements to existing agents. You can install the agent pack on an existing ApplicationHA guest components installation.

Refer to the Symantec Operations Readiness Tools (SORT) Web site for information on the latest agent pack availability:

https://sort.symantec.com

The following sections provide details about the infrastructure agents. For more details about an application agent, refer to the application-specific configuration guide.

About the Heartbeat agent

The Heartbeat agent monitors the configured application service group. When you configure application monitoring using the Symantec ApplicationHA Configuration Wizard, the wizard also creates a separate service group containing a resource for this agent. This resource verifies the status of the configured application service group. A single resource is used for monitoring all the application service group created on the virtual machine.

The heartbeat agent is represented by the VMAppMonHB resource type.

Hearbeat agent function

Monitor	Verifies that the specified service group is online.

Hearbeat agent state definitions

ONLINE	Indicates that the configured resource is online.
OFFLINE	Indicates that the service group specified in the resource has faulted.
UNKNOWN	Indicates that the agent encountered errors while monitoring the VMAppMonHB resource.

Hearbeat agent resource type definition

```
type VMWAppMonHB (
    static int MonitorInterval = 10
    static int OfflineMonitorInterval = 10
    static int NumThreads = 1
    static str ArgList[] = { DelayBeforeAppFault, ServiceGroupName,
    VMGracefulRebootAttempts, VMGracefulRebootTimeSpan,
    VMGracefulRebootPolicy, VMGracefulRebootCmd, backuprestore,
    vmrestoretimeout }
    static str Operations = None
    str ServiceGroupName[]
    int DelayBeforeAppFault = 300
    int VMGracefulRebootAttempts = 1
    int VMGracefulRebootTimeSpan = 1
    int VMGracefulRebootPolicy = 0
    str VMGracefulRebootCmd = "shutdown -t 0 -f"
    str backuprestore {}
    int vmrestoretimeout = 5
)
```

Hearbeat agent attribute

Table 1-1 describes the Heartbeat agent attributes.

Table 1-1 Heartbeat agent attributes

Required attribute	Description
ServiceGroupName	The name of the service group that is being monitored. This attribute contains the name of the service group created when you run the Symantec ApplicationHA Configuration Wizard. If you configure additional application service groups using the command line, this attribute contains the names of all those service groups.
DelayBeforeAppFault	The number of seconds the agent must wait for the healthy application service groups on the computer to go offline, before communicating application fault to VMware HA. This attribute can take a value between 0 to 600 seconds. Default is 300 seconds.
VM.GracefulRebootPolicy	Use this option to enable or disable ApplicationHA-initiated virtual machine restart policy. This option defines whether or not ApplicationHA restarts the virtual machine in response to application and component failures. When a configured application or component fails, ApplicationHA attempts to restart the failed components. If the component fails to start, ApplicationHA then takes the next corrective action. If this policy is disabled, ApplicationHA stops sending the heartbeat to VMware HA. As a result VMware HA can then restart the virtual machine. If this policy is enabled, ApplicationHA itself invokes a native operating system command to restart the virtual machine. VM.GracefulRebootPolicy value can be Enabled (1) or Disabled (0). The default value is Disabled.

Table 1-1 Heartbeat agent attributes *(continued)*

Required attribute	Description
VM.GracefulRebootAttempts	This option defines the number of times ApplicationHA attempts to restart the virtual machine gracefully if the configured application or component becomes unresponsive. The number of restart attempts is time bound and is defined by the option VM.GracefulRebootTimeSpan. The restart attempts count is reset after the reboot time span elapses. For example, if the reboot attempts value is 4, the time span value is 60 minutes, and ApplicationHA has restarted the virtual machine once, then the restart attempt count is 3 (initial set value of 4 minus one reboot) for the remaining period of the 60-minute interval. The restart attempts count is reset to 4 at the beginning of the next 60-minute span. If the restart attempts are exhausted and the application or component fails within the reboot time span again, ApplicationHA stops the application heartbeat and communicates the fault to VMware HA. Depending on the configuration, VMware HA may then restart the virtual machine. VM.GracefulRebootAttempts value can be between 1 and 10. The default value is 1.
VM.GracefulRebootTimeSpan	This option defines the time interval, in hours, during which ApplicationHA can gracefully restart the virtual machine for the number of times defined by the option VM.GracefulRebootAttempts. VM.GracefulRebootTimeSpan value can be between 1 and 24. The default value is 1 hour.

Table 1-1 Heartbeat agent attributes *(continued)*

Required attribute	Description
vmrestoretimeout	The number of minutes for which heartbeat agent must wait for VMwareHA to reset the virtual machine. If the VMwareHA does not reset the virtual machine within this time, Heartbeat agent triggers a request for backup restore. The ApplicationHA Console receives this request and verifies if the virtual machine is configured for auto-recovery and re-directs the request to the Backup Exec Media Server. **Note:** In case of VMware ESX Server version 4.0, the request for virtual machine restore is triggered after the graceful reboot attempt. The default value for vmrestoretimeout is 5 minutes. The vmrestoretimeout value must always be greater than the VMwareHA configuration settings.

About the MountMonitor agent

The MountMonitor agent monitors the mount path of the configured storage. It is independent of how the underlying storage is managed. The mount path can be a drive letter or a folder mount.

When configuring a directory to host the mount, verify the following conditions:

- The configured path exists.
- The directory is empty.
- The volume on which the directory resides is NTFS-formatted.

This agent is represented by the MountMonitor resource type.

MountMonitor agent function

Online	Mounts the configured mount path (drive letter or folder) on the system.
Monitor	Verifies that the specified mouth path (drive letter or folder) is mounted.

MountMonitor agent state definitions

ONLINE	Indicates the system can access the configured mount path.
OFFLINE	Indicates the system cannot access the configured mount path.
UNKNOWN	Indicates the agent cannot determine the status of the resource.

MountMonitor agent resource type definition

```
type MountMonitor (
    static i18nstr ArgList[] = { MountPath, VolumeName }
    static str Operations = OnOnly
    str MountPath
    str VolumeName
    )
```

MountMonitor agent attributes

Table 1-2 describes the MountMonitor agent attributes.

Table 1-2 MountMonitor agent required attributes

Required attributes	Description
MountPath	The drive letter or path to an empty NTFS folder where a partition is mounted. The attribute can be specified as X, X:, X:\, X:\Directory, X:\Directory\. When configuring a directory to host the mount, verify the following conditions: ■ The configured path exists. ■ The directory is empty. ■ The volume on which the directory resides is NTFS-formatted. Type and dimension: string-scalar
VolumeName	The GUID of the volume to be mounted.

About the ServiceMonitor agent

The ServiceMonitor agent monitors a service or starts a user-defined script and interprets the exit code of the script. A service is an application type supported by Windows that conforms to the interface rules of the Service Control Manager

(SCM). The agent can be configured to monitor a service using the SCM or through a user-defined script.

When configured to monitor using the SCM, the agent queries the SCM database for the status of the service. When configured to monitor using a script or an executable, the agent executes the script on each system, once every monitor cycle. The agent returns ONLINE, OFFLINE, or UNKNOWN depending on the exit code of the script. You can monitor a service or run a script in a user-context by specifying the user name, password, and domain.

Note: The ServiceMonitor resource cannot be made dependent on other resources.

ServiceMonitor agent functions

Online	Not applicable.
Offline	Not applicable.
Monitor	If the agent is configured to monitor a service, the agent queries the SCM for the status of the service. If the agent is configured to start a script, the agent spawns the specified script and interprets the exit code of the script.

ServiceMonitor agent state definitions

ONLINE	Indicates the specified service is running, or that the configured script returned an online exit code.
OFFLINE	Indicates the specified service is not running, or that the configured script returned an offline exit code.
UNKNOWN	Indicates the agent cannot determine the state of the resource.

ServiceMonitor agent resource type definition

The Service Monitor agent is represented by the ServiceMonitor resource type.

```
type ServiceMonitor (
    static i18nstr ArgList[] = {MonitorService, ServiceOrScriptName,
    MonitorProgTimeout, UserAccount, Password, Domain }
    boolean MonitorService = 1
    i18nstr ServiceOrScriptName
```

```
    int MonitorProgTimeout = 30
    i18nstr UserAccount
    str Password
    i18nstr Domain
)
```

ServiceMonitor agent attributes

Table 1-3describes the ServiceMonitor agent required attributes.

Table 1-3 ServiceMonitor agent required attributes

Required Attribute	Description
ServiceOrScriptName	The name of the service to be monitored or script to be spawned for monitoring the service. You must specify the complete path of the script, including any command-line arguments. This attribute can take localized values. **Note:** The exit code of the script must conform to ApplicationHA conventions: 110 for `ONLINE` and 100 for `OFFLINE`. For exit values outside the range 100-110, the status is considered `UNKNOWN`. Type and dimension: string-scalar

Table 1-4describes the ServiceMonitor agent optional attributes.

Table 1-4 ServiceMonitor agent optional attributes

Optional Attributes	Description
Domain	The domain to which the user belongs, as specified by the attribute UserAccount. If the domain name is not specified, the agent assumes the user to belong to the local computer. **Note:** This attribute can take localized values.
MonitorProgTimeout	The maximum wait time, in seconds, for the agent to receive a return value from the monitor script. This attribute is ignored if the MonitorService attribute is set to 1. Default is 30 seconds.

Table 1-4 ServiceMonitor agent optional attributes *(continued)*

Optional Attributes	Description
MonitorService	Defines whether the agent monitors a service or starts a script. If set to 1, the agent monitors a service specified by the attribute ServiceOrScriptName. If set to 0 the agent starts a script specified by the attribute ServiceOrScriptName. Default is 1.
Password	The password for the user account, encrypted using the ApplicationHA Encrypt utility. This attribute is valid only if the MonitorService is set to 0 and UserAccount is not empty.
UserAccount	A valid user account in whose context the service will be monitored. Username can be of the form *username@domain.com* or *domain.com\username*. If you do not specify a value for this attribute, then the user account of the service in the SCM is ignored. To monitor service under built-in accounts, you must provide explicit values. For example: On Windows 2003: User Account="LocalSystem", "Local Service", or "Network Service". Domain="NT Authority". The 'NT Authority' domain is not applicable for the 'LocalSystem' account. **Note:** This attribute can take localized values.

About the GenericService agent

The GenericService agent brings services online, takes them offline, and monitors their status. A service is an application type that is supported by Windows, and conforms to the interface rules of the Service Control Manager (SCM).

Services are configured as resources of type GenericService. You can configure the GenericService agent to monitor multiple services by defining a resource for each service to be monitored. You can monitor a service in a user-context by specifying the user name, password, and domain.

Note: The service to be configured using the GenericService agent must not be in a disabled state.

This agent is represented by the GenericService resource type.

GenericService agent functions

Online	Starts the configured service.
Offline	Stops the configured service.
Monitor	Retrieves the current state of the configured service. It also verifies the user context, if applicable.

GenericService agent state definitions

ONLINE	Indicates that the service being monitored is running.
OFFLINE	Indicates that the service being monitored is stopped.
UNKNOWN	Indicates the service operation is in a pending state, or that the agent cannot determine the state of the resource.

GenericService agent resource type definition

```
type GenericService (
    static i18nstr ArgList[] = { ServiceName, DelayAfterOnline,
    DelayAfterOffline, UserAccount, Password, Domain, service_arg }
    i18nstr ServiceName
    int DelayAfterOnline = 10
    int DelayAfterOffline = 10
    i18nstr UserAccount
    str Password
    i18nstr Domain
    str service_arg[]
    )
```

GenericService agent attributes

Table 1-5 describes the GenericService agent required attributes.

Table 1-5 GenericService agent required attributes

Required attribute	Description
ServiceName	Name of the service to be monitored. The service name can be the Service Display Name or the Service Key Name. Type and dimension: string-scalar

Table 1-6 describes the GenericService agent optional attributes.

Table 1-6 GenericService agent optional attributes

Optional attributes	Description
DelayAfterOffline	Number of seconds the offline routine waits for the service to go offline. Default is 10 seconds. Type and dimension: integer-scalar
DelayAfterOnline	Number of seconds the online routine waits for the service to go online. Default is 10 seconds. Type and dimension: integer-scalar
Domain	The domain name to which the user specified in the UserAccount attribute belongs. If the UserAccount attribute is empty or contains a built-in service account, this attribute is ignored. Type and dimension: string-scalar
Password	The password of the user, in whose context, the service would be started. Encrypt the password using the VCSEncrypt utility. If the UserAccount attribute is empty or contains a built-in service account, this attribute is ignored. Type and dimension: string-scalar
service_arg	An array of arguments passed to the service. Type and dimension: string-vector

Table 1-6 GenericService agent optional attributes *(continued)*

Optional attributes	Description
UserAccount	A valid user account in whose context the service will be monitored. The user name can be of the form *username@domain.com* or *domain.com\username*. If the startup type of the configured service is set to Automatic, then the user account you specify here must be the same as that specified in the Windows Service Control Manager (SCM). If you do not specify a value for this attribute, then the user account of the service in the SCM is ignored. To monitor service under built-in accounts, you must provide explicit values. For example: On Windows 2003: UserAccount='LocalSystem', 'Local Service', or 'Network Service'. Domain='NT Authority'. The 'NT Authority' domain is not applicable for the 'LocalSystem' account. Type and dimension: string-scalar

About the Process agent

The Process agent brings processes online, takes them offline, and monitors their status. You can specify different executables for each process routine. The processes are monitored in the context of the LocalSystem account by default. You can run a process with user privileges by specifying the user name, password, and domain.

This agent is represented by the Process resource type.

Process agent functions

Online	Starts the process configured as the start program.
Offline	Terminates the process, or starts the process configured as the stop program.
Monitor	Verifies the status of the process, or starts the process configured as the monitor program.

Process agent state definitions

ONLINE	Indicates the process being monitored is running properly.
OFFLINE	Indicates the process being monitored is not running properly.
UNKNOWN	Indicates the agent cannot determine the status of the resource.

Process agent resource type definition

```
type Process (
    static i18nstr ArgList[] = { StartProgram, StopProgram,
    MonitorProgram, UserName, Password, Domain,
    MonitorProgramTimeout,InteractWithDesktop, CleanProgram,
    StartupDirectory, StopProgramTimeout, CleanProgramTimeout }
    i18nstr StartProgram
    i18nstr StartupDirectory
    i18nstr StopProgram
    i18nstr CleanProgram
    i18nstr MonitorProgram
    i18nstr UserName
    str Password
    i18nstr Domain
    int MonitorProgramTimeout = 30
    boolean InteractWithDesktop = 0
    int StopProgramTimeout = 30
    int CleanProgramTimeout = 30
)
```

Process agent attributes

Table 1-7 describes the Process agent required attributes.

Table 1-7 Process agent required attributes

Required Attribute	Description
StartProgram	The process to be monitored by the agent. You must specify the complete path of the executable, its file extension, and command-line arguments, if any. If you define the start program as a batch file or a script to launch another program, you must specify the monitor program in the configuration file. If you define the start program as a script (a batch file, a Perl script, or a vbs script), the start program should be the program that interprets the script (cmd.exe, or perl.exe, or cscript.exe) and the script itself should be passed as an argument. Type and dimension: string-scalar

Table 1-8 describe the Process agent optional attributes.

Table 1-8 Process agent optional attributes

Optional Attributes	Description
CleanProgram	The full path of the clean process that is launched when the resource needs a forceful offline. If no value is specified for this attribute, for a clean operation the agent kills the process indicated by the StartProgram attribute. Type and dimension: string-scalar
CleanProgramTimeout	The maximum time, in seconds, that the agent must wait before killing the process specified in the CleanProgram attribute. This attribute is ignored if the clean program is not specified. The default value is 30 seconds. Type and dimension: integer-scalar
Domain	The domain in which the user specified by the attribute UserName exists. This attribute is ignored if the user name is not specified. Type and dimension: string-scalar

Table 1-8 Process agent optional attributes *(continued)*

Optional Attributes	Description
InteractWithDesktop	Defines whether the configured process interacts with the desktop. Enabling desktop interaction enables user intervention for the process. The value 1 indicates the process will interact with the desktop. The value 0 indicates it will not. Default is 0. Type and dimension: boolean-scalar
MonitorProgram	A program that monitors the process specified as the start program. You must specify the complete path of the executable, its file extension, and command-line arguments, if any. If you do not specify a value for this attribute, Symantec ApplicationHA monitors the start program. However, if the start program is a batch file or a script to launch another program, you must specify a monitor program. Type and dimension: string-scalar **Note:** The monitor program is spawned every monitor cycle and must return before the program specified in MonitorProgram times out. The return values for the monitor program must conform to Symantec ApplicationHA conventions: 110 for ONLINE and 100 for OFFLINE. For exit values outside the range 100-110, the status is considered UNKNOWN. Refer to the *VCS Agent Developers Guide* for more information.
MonitorProgramTimeout	The maximum wait time, in seconds, for the agent to receive a return value from the monitor routine. This attribute is ignored if the monitor program is not specified. Default is 30 seconds. Type and dimension: integer-scalar
Password	The encrypted password of the user specified by the UserName. Note that the password must be encrypted using the VCSEncrypt utility. This attribute is ignored if the user name is not specified. Type and dimension: string-scalar Refer to the *VCS Administrator's Guide* for more information about the VCSEncrypt utility.

Table 1-8 Process agent optional attributes *(continued)*

Optional Attributes	Description
StartupDirectory	The startup directory for the process indicated by the StartProgram attribute. Type and dimension: string-scalar
StopProgram	A program that stops the process specified as the start program. You must specify the complete path of the program, its file extension, and command-line arguments, if any. If you do not specify a value for this attribute, Symantec ApplicationHA stops the start program. Type and dimension: string-scalar **Note:** If successful, the StopProgram returns a positive value. The Monitor routine is called after those many seconds, as returned by StopProgram. Also, while writing a stop program, make sure to stop all the processes launched by the start program.
StopProgramTimeout	The maximum time, in seconds, that the agent must wait before killing the process specified in the StopProgram attribute. The default value is 30 seconds. Type and dimension: integer-scalar
UserName	The user name with whose privileges the configured process executes. User name can be of the form *username@domain.com* or *domain.com\username*. If a user name is not specified, the configured process runs in the context of the local system account. Type and dimension: string-scalar

Note: When defining the StartProgram, StopProgram, or MonitorProgram attributes, enclose the path of the executable file and its arguments in double quotes.

About the FileNone agent

The FileNone agent monitors a file. The monitor routine returns online if the specified file exists.

This agent is represented by the FileNone resource type.

FileNone agent function

Monitor	Verifies that the specified file exists.

FileNone agent state definitions

ONLINE	Indicates the specified file exists.
OFFLINE	Indicates the specified file does not exist.
UNKNOWN	Indicates that the value of the PathName attribute does not contain a valid file name.

FileNone agent resource type definition

```
type FileNone (
    static i18nstr ArgList[] = { PathName }
    static int OfflineMonitorInterval = 60
    static str Operations = None
    i18nstr PathName    )
```

FileNone agent attribute

Table 1-9 describes the FileNone agent required attributes.

Table 1-9 FileNone agent required attribute

Required Attributes	Description
PathName	The complete path of the file to be monitored. Type and dimension: string-scalar

About the ElifNone agent

The ElifNone agent monitors a file. The monitor routine returns online if the specified file does not exist.

This agent is represented by the ElifNone resource type.

ElifNone agent function

Monitor	Verifies that the specified file exists.

ElifNone agent state definitions

ONLINE	Indicates the specified file does not exist.
OFFLINE	Indicates the specified file exists.
UNKNOWN	Indicates that the value of the PathName attribute does not contain a valid file name.

ElifNone agent resource type definition

```
type ElifNone (
    static i18nstr ArgList[] = { PathName }
    static int OfflineMonitorInterval = 60
    static str Operations = None
    i18nstr PathName
    )
```

ElifNone agent attribute

Table 1-10 describes the ElifNone agent required attributes.

Table 1-10 ElifNone agent required attribute

Required Attributes	Description
PathName	The complete path of the file to be monitored. Type and dimension: string-scalar

About the FileOnOff agent

The FileOnOff agent creates, removes, and monitors files.

This agent is represented by the FileOnOff resource type.

FileOnOff agent functions

Online	Creates an empty file with the specified name, if the file does not already exist.
Offline	Removes the specified file.
Monitor	Verifies that the specified file exists.

FileOnOff state definitions

ONLINE	Indicates the specified file exists.
OFFLINE	Indicates the specified file does not exist.
UNKNOWN	Indicates that the value of the PathName attribute does not contain a valid file name.

FileOnOff agent resource type definition

```
type FileOnOff (
    static i18nstr ArgList[] = { PathName }
    i18nstr PathName
    )
```

FileOnOff agent attribute

Table 1-11 describes the FileOnOff agent required attribute.

Table 1-11 FileOnOff agent required attribute

Required Attributes	Description
PathName	The complete path of the file to be monitored. Type and dimension: string-scalar

About the FileOnOnly agent

The FileOnOnly agent creates and monitors a file.

This agent is represented by the FileOnOnly resource type.

FileOnOnly agent functions

Online	Creates the specified file.
Monitor	Verifies that the specified file exists.

FileOnOnly state definitions

ONLINE	Indicates the specified file exists.
OFFLINE	Indicates the specified file does not exist.
UNKNOWN	Indicates that the value of the PathName attribute does not contain a valid file name.

FileOnOnly agent resource type definition

```
type FileOnOnly (
    static i18nstr ArgList[] = { PathName }
    static str Operations = OnOnly
    i18nstr PathName
    )
```

FileOnOnly agent attribute

Table 1-12 describes the FileOnOnly agent required attribute.

Table 1-12 FileOnOnly agent required attribute

Required Attributes	Description
PathName	The complete path of the file to be monitored. Type and dimension: string-scalar

Chapter 2

Configuring application monitoring with Symantec ApplicationHA

This chapter includes the following topics:

- About configuring application monitoring with Symantec ApplicationHA
- Before configuring application monitoring
- Configuring application monitoring for services, processes, and mount points
- Administering application monitoring using the ApplicationHA tab

About configuring application monitoring with Symantec ApplicationHA

This chapter describes the steps to configure application monitoring for services, processes, and mount points with Symantec ApplicationHA in a VMware virtualization environment.

For information on configuring applications such as Microsoft SQL Server 2005 and 2008, Microsoft Exchange 2010 and Microsoft IIS, refer to the respective agent configuration guide.

Consider the following before you proceed:

- You can configure application monitoring on a virtual machine using the Symantec ApplicationHA Configuration Wizard. The wizard is launched when you click **Configure Application Monitoring** on the ApplicationHA tab in VMware vSphere Client.

- Apart from the Symantec ApplicationHA Configuration Wizard, you can also configure application monitoring using the Veritas Cluster Server (VCS) commands. For more information, refer to the following Technote: http://www.symantec.com/docs/TECH159846
- Symantec recommends that you first configure application monitoring using the wizard before using VCS commands to add additional components or modify the existing configuration.
  Apart from the application monitoring configuration, the wizard also sets up the other components required for Symantec ApplicationHA to successfully monitor the applications.
- You can use the wizard to configure monitoring for only one application per virtual machine.
  To configure another application using the wizard, you must first unconfigure the existing application monitoring configuration.
- After configuring services, processes, and mount points for monitoring, if you create another service, process, or mount point, then these new components are not monitored as part of the existing configuration.
  In this case, you can either use the VCS commands to add the components to the configuration or unconfigure the existing configuration and then run the wizard again to configure all the components.

Note: When you configure or unconfigure application monitoring, it does not affect the state of the application. The application runs unaffected on the virtual machine. This also does not require any additional steps on the vCenter Server.

- If a configured application fails, Symantec ApplicationHA attempts to start the application on the computer. If the application does not start, Symantec ApplicationHA communicates with VMware HA to take corrective action. Symantec ApplicationHA then stops the other configured applications in a predefined order. This avoids the other applications from getting corrupted due to a computer restart.
  A single failed application can bring down other healthy applications running on the virtual machine. You must take this behavior into consideration while configuring application monitoring on a virtual machine.

Before configuring application monitoring

Note the following prerequisites before configuring application monitoring for services, processes, and mount points on a virtual machine:

- Verify that you have installed Symantec ApplicationHA (console and guest components) in your VMware environment.
  For information about installing Symantec ApplicationHA, refer to the *Symantec™ ApplicationHA Installation and Upgrade Guide*.
- Verify that VMware Tools is installed on the virtual machine.
  Install the version that is similar to or later than that available with VMware ESX 4.1.
- Verify that you have installed VMware vSphere Client. The vSphere Client is used to configure and control application monitoring.
  You can also perform the application monitoring operations directly from a browser window using the following URL:

  ```
  https://<virtualmachineNameorIPaddress>:5634/vcs/admin/
  application_health.html?priv=ADMIN
  ```

- Verify that the logged-on user has administrative privileges on the virtual machine where you want to configure application monitoring.
- If you want to monitor storage managed using Storage Foundation for Windows (SFW), ensure that the volumes and mount points are created on dynamic disk groups.
  Symantec ApplicationHA does not support monitoring for volumes and mount points created on cluster disk groups.
- If you have configured a firewall, ensure that your firewall settings allow access to ports used by Symantec ApplicationHA installer, wizard, and services.
  For information about the ports that are used, refer to the *Symantec™ ApplicationHA Installation and Upgrade Guide*.
- If you are configuring application monitoring in a disaster recovery environment, ensure that you are using the disaster recovery solution VMware vCenter Site Recovery Manager (SRM). For more information, refer to the *Symantec™ ApplicationHA User's Guide*.

Configuring application monitoring for services, processes, and mount points

Perform the following steps to configure monitoring for services, processes, and mount points on a virtual machine using the Symantec ApplicationHA Configuration Wizard.

Note: You can configure monitoring for multiple services and processes in a single wizard workflow. However, you cannot configure multiple applications simultaneously. To configure another application, run the wizard again.

To configure application monitoring for services, processes, and mount points

1. Launch the vSphere Client and connect to the vCenter Server that manages the virtual machine.
2. From the vSphere Server's Inventory view in the left pane, select the virtual machine where you want to configure application monitoring, and then in the right pane select the **ApplicationHA** tab.
3. Skip this step if you have already configured the single sign-on during the guest installation.

   On theApplicationHA tab, specify the credentials of a user account that has administrative privileges on the virtual machine and then click **Configure**. The ApplicationHA Console sets up a permanent authentication for the user account.

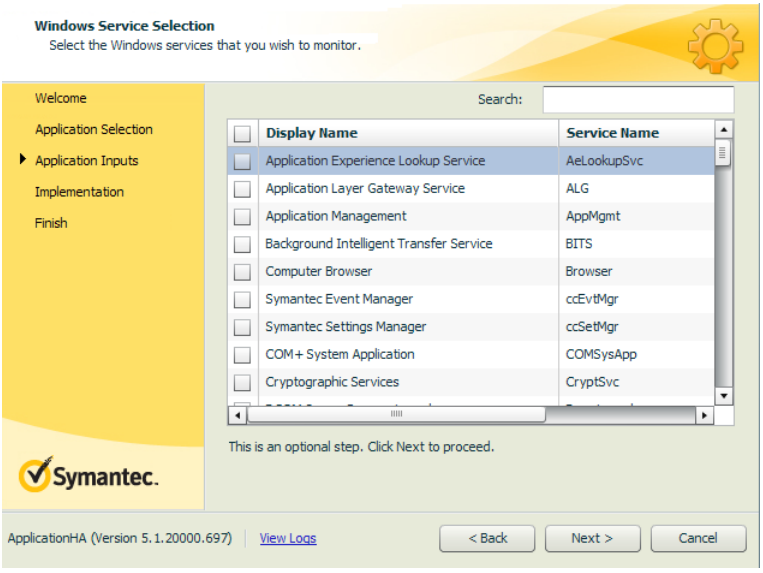
   For more information about single sign-on, refer to the *Symantec™ ApplicationHA User's Guide*.

   After the authentication is successful, the ApplicationHA tab refreshes and displays the application health view.
4. Click **Configure Application Monitoring** to launch the Symantec ApplicationHA Configuration Wizard.
5. Review the information on the Welcome panel and then click **Next**.
6. On the Application Selection panel, click **Custom Application** in the Supported Applications list.

   You can use the Search box to find the application and then click **Next**.

7 On the Windows Service Selection panel, select the services that you want to monitor.

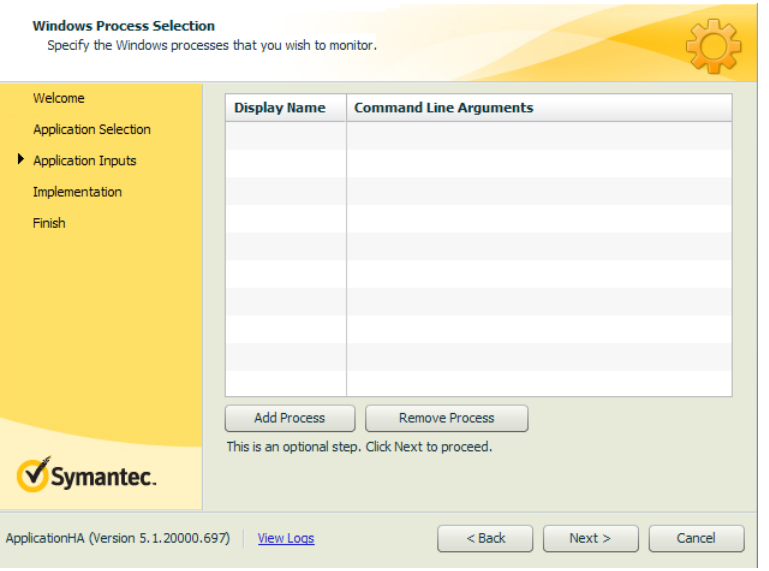
The wizard automatically discovers the services on the virtual machine.



If a selected service depends on some other services, you must also select those services. You can define the dependencies between those services on the Start-Stop panel later.

If you do not want to configure any services, click **Next**.

8 On the Windows Process Selection panel, specify the processes that you want to monitor.



Perform the following steps to add a process:

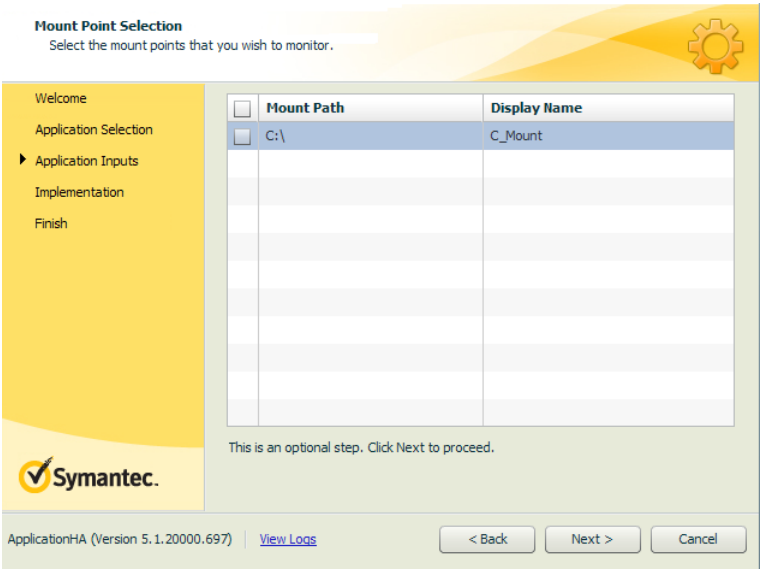
- Click **Add Process** to display the Process Parameters dialog box.
- In the Process Full Path field type the complete path of the process executable file including its extension.
  If you define the process as a script (a Perl script, or a vbs script), specify the full path of the program that interprets the script (perl.exe, or cscript.exe) in the Process Full Path field and specify the full path of the script itself in the Arguments field.
  For example, to specify Perl.exe, type the path as follows:
  `C:\Program Files\Perl\Perl.exe.`
  This presumes that Perl is installed at the mentioned path.
- In the Arguments field, type the command line arguments for the process, if any.
- The specified process runs in the context of the local system account by default. To run the process in a different user's context, check the **Run process using specified credentials** check box and then specify the user name and password in the respective fields.
  The user name must be in the format *user@domain.com* or *domain.com\username*.

Note: Ensure that you specify a valid user name and that the user name has adequate privileges on the guest virtual machine where you want to configure application monitoring. Otherwise, application monitoring may fail.

- Click **OK**.
  The process that you add is displayed on the wizard page.
  Repeat these steps for all the processes that you want to configure for monitoring.

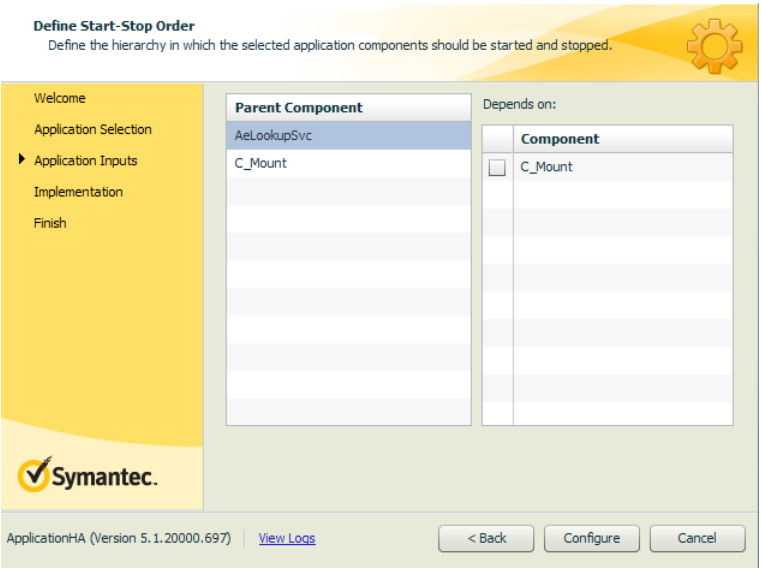
If you do not want to configure any processes, click **Next**.

9 On the Mount Point Selection panel, select the mount points that you want to monitor.



If you do not want to monitor any mount points, click **Next**.

10 On the Define Start-Stop Order panel, specify the order in which you want the configured services, processes, and mount points to be started or stopped and then click **Configure**.



Perform the following steps to define the dependency between the components:

- Click on an application component name in the Parent Component box on the left.
- Then check the component check box in the Resources box on the right. While starting the service or process, the components are brought online in the defined order. For example, if a service is dependent on a mount point, then while starting the service the mount point is first brought online and then the service itself.

11 The wizard performs the application monitoring configuration tasks, creates the required resources, and enables the application heartbeat that communicates with VMware HA.

   The panel displays the status of each task. After all the tasks are complete, click **Next**.

   If the configuration tasks fail, click **View Logs** to check the details of the failure. Rectify the cause of the failure and run the wizard again to configure the application monitoring.

12 On the Finish panel, click **Finish** to complete the wizard.

   This completes the application monitoring configuration. You can view the application status in the ApplicationHA tab.

   The view displays the application as configured and running on the virtual machine. The Description box displays the details of the configured components.

   If the application status shows as not running, click **Start Application** to start the configured components on the computer.

Administering application monitoring using the ApplicationHA tab

Note: You can administer application monitoring in two ways. One, using the ApplicationHA tab as described below and two, using the Symantec ApplicationHA Dashboard. Using the ApplicationHA dashboard, you can administer application monitoring in a graphical user interface (GUI). For information about the latter, refer to the *Symantec™ ApplicationHA User's Guide*.

Symantec ApplicationHA provides an interface, the ApplicationHA tab, to configure and control application monitoring. The ApplicationHA tab is integrated with the VMware vSphere Client.

Use the ApplicationHA tab to perform the following tasks:

- configure and unconfigure application monitoring
- start and stop configured applications
- enable and disable application heartbeat
- enter and exit maintenance mode

To view the ApplicationHA tab, launch the VMware vSphere Client, select a virtual machine from the Inventory pane, and in the Management pane on the right, click the **ApplicationHA** tab.

If you have not configured single sign-on for the virtual machine, specify the user credentials of a user that has administrative privileges on the virtual machine.

Note: You can also perform the application monitoring operations directly from a browser window using the following URL:

`https://<virtualmachineNameorIPaddress>:5634/vcs/admin/application_health.html?priv=ADMIN`

To configure or unconfigure application monitoring

Use the ApplicationHA tab to configure or delete an application monitoring configuration from the virtual machine. This may be required in case you want to re-create the configuration or configure another application using the wizard.

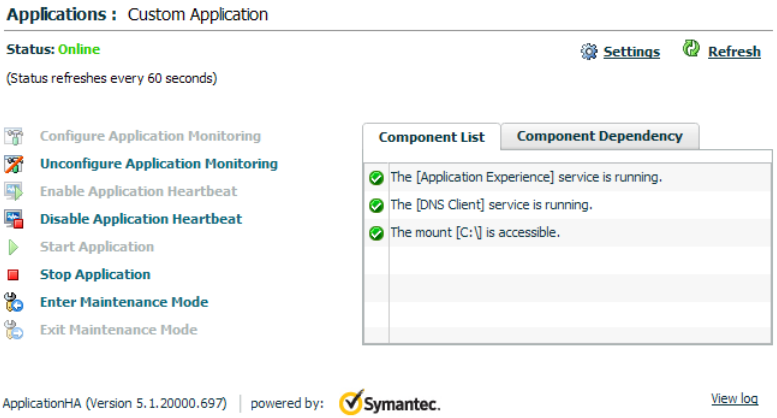
You can use the following buttons:

- Click **Configure Application Monitoring** to launch the Symantec ApplicationHA Configuration Wizard. Use the wizard to configure application monitoring.
- Click **Unconfigure Application Monitoring** to delete the application monitoring configuration from the virtual machine.
  Symantec ApplicationHA removes all the configured resources for the application and its services.
  Note that this does not uninstall Symantec ApplicationHA from the virtual machine. This only removes the configuration. The unconfigure option removes all the application monitoring configuration resources from the virtual machine. To monitor the application, you have to configure them again.

To view the status of configured applications

Note: To view applications at a component level and their dependencies, see the Component Dependency tab under the ApplicationHA tab. For more information, refer to the *Symantec™ ApplicationHA User's Guide*.

Under the ApplicationHA tab, the Component List tab displays the status of the configured services, processes, and mount points.



For example, if you have configured monitoring for services and mount points, the Component List tab displays the following information:

```
The [service] service is running.

The mount [mount point] is accessible.
```

Where, *mount point* and *service* are, respectively, the names of the mount point and the service configured on the virtual machine.

The Component List tab also displays the state of the configured application and its components. The following states are displayed:

online	Indicates that the services and processes are running on the virtual machine.
offline	Indicates that the services and processes are not running on the virtual machine.
partial	Indicates that either the services and processes are being started on the virtual machine or ApplicationHA was unable to start one or more of the configured services or processes.
faulted	Indicates that the configured services or components have unexpectedly stopped running.

Click **Refresh** to see the most current status of the configured components. The status is refreshed every 60 seconds by default.

Click **Settings** to change ApplicationHA settings for the configured application and the virtual machine.

To start or stop applications

Use the following options on the ApplicationHA tab to control the status of the configured application and the associated components:

- Click **Start Application** to start a configured application.
  Symantec ApplicationHA attempts to start the configured application and its components in the required order. The configured resources are also brought online in the appropriate hierarchy.
- Click **Stop Application** to stop a configured application that is running on the virtual machine.
  Symantec ApplicationHA begins to stop the configured application and its components gracefully. The configured resources are also taken offline in the predefined order.

To enable or disable application heartbeat

The VMware virtual machine monitoring feature uses the heartbeat information that VMware Tools captures as a proxy for guest operating system availability. This allows VMware HA to automatically reset or restart individual virtual machines that have lost their ability to heartbeat. You can select VM and Application Monitoring if you also want to enable application monitoring.

ApplicationHA tab lets you control the application heartbeat on the virtual machines.

Use the following options on the ApplicationHA tab to control the status of the configured application heartbeat:

- Click **Enable Application Heartbeat** to enable the heartbeat communication between the configured applications running on the virtual machine and VMware HA.
  The application heartbeat is enabled by default when an application is configured for monitoring.
- Click **Disable Application Heartbeat** to disable the heartbeat communication between the configured applications running on the virtual machine and VMware HA.
  Disabling the application heartbeat does not instruct VMware HA to restart the virtual machine. This option disables the application monitoring feature in the VMware virtual machine monitoring settings.

To suspend or resume application monitoring

After configuring application monitoring you may want to perform routine maintenance tasks on those applications. These tasks may or may not involve

stopping the application but may temporarily affect the state of the applications and its dependent components. If there is any change to the application status, Symantec ApplicationHA may try to restore the application state. This may potentially affect the maintenance tasks that you intend to perform on those applications.

If stopping the application is not an option, you can suspend application monitoring and create a window for performing such maintenance tasks. When application monitoring is suspended, ApplicationHA freezes the application configuration, disables the application heartbeat, and stops sending the heartbeat to VMware HA.

The ApplicationHA tab provides the following options:

- Click **Enter Maintenance Mode** to suspend the application monitoring for the applications that are configured on the virtual machine. During the time the monitoring is suspended, Symantec ApplicationHA does not monitor the state of the application and its dependent components. The ApplicationHA tab does not display the current status of the application. If there is any failure in the application or its components, ApplicationHA takes no action.
- Click **Exit Maintenance Mode** to resume the application monitoring for the applications configured on the virtual machine. You may have to click the **Refresh** link in the ApplicationHA tab to see the current status of the application.

  When application monitoring is restarted from a suspended state, ApplicationHA does not enable the application heartbeat. Click **Enable Application Heartbeat** to enable it.

  If you have made changes that include database addition or change in the underlying storage mount point that was being monitored, then those changes may not reflect in the application monitoring configuration. In such cases, you may have to unconfigure and reconfigure the application monitoring.