Symantec™ ApplicationHA Agent for SAP Web Application Server Configuration Guide

Windows Server 2003 (x64), Windows Server 2008 (x64), Windows Server 2008 R2

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Symantec™ ApplicationHA Agent for SAP Web Application Server Configuration Guide

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Contents

Chapter 1

Introducing the Symantec ApplicationHA agent for SAP Web AS

This chapter includes the following topics:

About the Symantec ApplicationHA agents

Agents are processes that manage applications and resources of predefined resource types configured for applications and components on a system. The agents are installed when you install Symantec ApplicationHA. These agents start, stop, and monitor the corresponding resources configured for the applications and report state changes.

Symantec ApplicationHA agents are classified as follows:

- Infrastructure 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.

For more details about the infrastructure agents, refer to the *Symantec™ ApplicationHA Generic Agents Guide*.

- Application agents

  Application agents are used to monitor third party applications such as Oracle, Microsoft SQL Server, and Microsoft Exchange. These agents are packaged separately and are available in the form of an agent pack that gets installed when you install 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 agent for SAP Web Application Server.

  For more details about other application agents, refer to the application-specific configuration guide.

About the Symantec ApplicationHA agent for SAP Web AS

The Symantec ApplicationHA agents monitor specific resources within an enterprise application, determine the status of these resources, and start or stop them according to external events.

The ApplicationHA agent for SAP Web AS provides monitoring and control for SAP NetWeaver 7.1 in a virtual machine. The agent is designed to support a wide range of SAP NetWeaver environments which include SAP NetWeaver CE 7.1, SAP NetWeaver Mobile 7.1, and SAP NetWeaver PI 7.1.

The agent for SAP Web AS brings SAP instances online, monitors the instances, and takes the instances offline. The agent monitors the system processes and server states, and can shut down the instance in case of a fault.

The supported SAP instance types are as follows:

- Central Services Instance
- Application Server Instance

The agent supports the following SAP Web AS Usage Types:

- ABAP

- Java
- Add-In (ABAP + Java)

Agent functions

The functions of the ApplicationHA agent for SAP Web AS include the following:

Online
- Validates the values of the agent attributes required to bring the SAP instance online.
- Performs a preliminary check to ensure that the SAP instance is not running.
- Starts the SAP Windows service SAP*SAPSID_InstID*, where *InstID* is the last two characters of the InstName attribute.
- Starts the SAP instance using the startsap.exe utility.
- Ensures that the instance is initialized successfully.

Offline
- Validates the values of the agent attributes required to bring the SAP instance offline.
- Performs a preliminary check to ensure that the SAP instance is not already offline.
- Stops the SAP instance using the stopsap.exe utility.
- Stops the SAP Windows service. SAP*SAPSID_InstID*, where *InstID* is the last two characters of the InstName attribute.
- Kills any remaining SAP instance processes to ensure that the instance processes are removed completely.

Monitor
- Validates the values of the agent attributes required to monitor the SAP instance.
- Performs a first-level monitor check as follows:
  - The function verifies that the SAP Windows service SAP*SAPSID_InstID* is running, where InstID is the last two characters of the InstName attribute.
  - Verifies that all processes that the ProcMon attribute lists are running.
- If the MonitorProgram attribute specifies a custom monitor program, the monitor function executes the specified program.

Clean — In case of a fault event or an unsuccessful attempt to bring a resource online or offline, the clean function removes any remaining SAP instance processes. The clean function performs the following tasks:

- Uses SAP's sapsrvkill.exe utility to stop all processes of the particular SAP instance.
- Stops SAP*SAPSID_InstID*, the SAP Windows service for the instance.
- The clean function identifies and kills any remaining SAP instance processes using the unique combination of the SAPSID attribute and InstID, that is the last two characters of the InstName attribute. All these processes must also belong to the SAPService*SAPSID* or *sapsid*adm user.

Executing a custom monitor program

The monitor function can execute a customized monitoring utility to perform an additional SAP server state check.

The monitor function executes the utility specified in the MonitorProgram attribute if the following conditions are satisfied:

- The specified utility is a valid executable file.
- The first level process check indicates that the SAP server instance is online.

The monitor function interprets the utility exit code as follows:

110 or 0	SAP server instance is online
100 or 1	SAP server instance is offline
99	SAP server instance is unknown
Any other value	SAP server instance is unknown

Resource type definition

The resource type definition for the ApplicationHA agent for SAP Web AS is as follows:

```
type SAPWebAS (
 static i18nstr ArgList[] = { ResLogLevel, SAPAdmin, SAPAdminDomain,
 SAPAdminPassword, SAPHome, SAPHost, SAPMonHome, SAPServiceUser,
 SAPSID, InstName, InstProfile, InstType, ProcMon, EnqSrvResName,
 MonitorProgram, SecondLevelMonitor}
 str ResLogLevel = INFO
 str SAPAdmin
```

```
 str SAPAdminDomain
 str SAPAdminPassword
 str SAPHome
 str SAPHost
 str SAPMonHome
 str SAPServiceUser
 str SAPSID
 str InstName
 str InstProfile
 str InstType = APPSERV
 str ProcMon[]
 str EnqSrvResName
 str MonitorProgram
 int SecondLevelMonitor = 0
)
```

Agent attribute definitions

Review the following information to familiarize yourself with the agent attributes for an SAP Web AS instance. This information will assist you during the agent configuration.

Table 1-1 lists the attributes that are required for configuring an SAP Web AS instance.

Table 1-1 Required Attributes

Required attributes	Description
InstName	Uniquely identifies an SAP server instance, along with the SAPSID attribute. The last two characters of this attribute specify the value of the InstID attribute. The InstID and SAPSID attributes together uniquely identify an SAP instance. Some examples include the following: ■ ASCS03: SAP Central Services (ABAP) ■ SCS07: SAP Central Services (Java) ■ DVEBMGS00: SAP Primary Application Server (ABAP) ■ D05: SAP Additional Application Server (ABAP) ■ J06: SAP (Primary/Additional) Application Server (Java) Type and dimension: string-scalar Example: DVEBMGS00 Default: ""

Table 1-1 Required Attributes *(continued)*

Required attributes	Description
InstProfile	Full path to the instance profile of the SAP server instance. Typically, the instance profile is located in the <drive>:\usr\sap*SAPSID*\SYS\profile directory. The format of the profile name is *SAPSID_InstName_HOSTNAME*. Path names following the Unified Naming Convention (UNC) are also valid for this attribute. Type and dimension: string-scalar Default: "" Example: c:\usr\sap\EP1\SYS\profile\EP1_SCS02_SAPEP1SCS
InstType	String identifier that classifies and describes the SAP server instance type. The InstType values are not case sensitive. The valid values are: ■ APPSERV: SAP Application Server ■ ENQUEUE: SAP Central Services Type and dimension: string-scalar Default: APPSERV Example: ENQUEUE
ProcMon	The list of SAP processes that the monitor function must monitor during a first-level check of an SAP instance. See "Monitoring an SAP instance" on page 20. Type and dimension: vector Default: "" Example: disp+work.exe msg_server.exe
ResLogLevel	The logging detail performed by the agent for SAP Web AS for the resource. Valid values include the following: INFO: Logs error messages. TRACE: Logs error and trace messages. TRACE is very verbose and should only be used during initial configuration or for troubleshooting and diagnostic operations. Type and dimension: string-scalar Default: INFO Example: TRACE

Table 1-1 Required Attributes *(continued)*

Required attributes	Description
SAPAdmin	Windows user name used to start the SAP instance. This user must be dedicated to all the SAP instances within an SAP system. The format is *sapsid*adm. Type and dimension: string-scalar Default: "" Example: ec4adm
SAPAdminDomain	Windows domain name to which the SAPAdmin user belongs. Type and dimension: string-scalar Default: "" Example: VRTSGPS
SAPAdminPassword	Password for the SAPAdmin user. Use the `vcsencrypt -agent` command to encrypt the password. Type and dimension: string-scalar Default: "" Example: vxfgh28skbsj
SAPHost	Hostname under which the SAP instance is to run. Type and dimension: string-scalar Default: "" Example: sap04smscsaw
SAPHome	The absolute path to the SAP base directory. This attribute is used to locate programs that the agent for SAP Web AS uses for start, stop, and clean functions. Type and dimension: string-scalar Default: "" Example 1: c:\usr\sap\EC4\SYS\exe\run Example 2: c:\usr\sap\EC4\ASCS01\exe

Table 1-1 Required Attributes *(continued)*

Required attributes	Description
SAPServiceUser	Windows user name used to start the SAP Windows service for an SAPSID. This user must be dedicated to all the SAP services under one SAP system, and must not be used by any other SAP service or instance under a different SAP system. **Note:** Do not include the domain name in the value for this attribute. Use the SAPAdminDomain attribute to specify domain information. Type and dimension: string-scalar Default: "" Example: SAPServiceEC4
SAPSID	SAP system name. This attribute starts with an alphabetic character and is exactly 3 characters in length. Ensure that the alphabetic characters used in this attribute are in uppercase only. SAPSID is defined during the SAP installation. Type and dimension: string-scalar Default: "" Example: EC4

Table 1-2 shows the optional attributes for configuring an SAP Web AS instance.

Table 1-2 Optional attributes

Optional attributes	Description
MonitorProgram	The full pathname and command-line arguments for an externally provided monitor program. Type and dimension: string-scalar Default: "" Example 1: <drive>:\usr\sap\EC4\ASCS00\work\myMonitor.exe Example 2: <drive>:\usr\sap\EC4\ASCS00\work\myMonitor.exe arg1 arg2

Table 1-2 Optional attributes *(continued)*

Optional attributes	Description
EnqSrvResName	Specifies the SAP Central Services instance resource name. This attribute is set for only Enqueue Replication Server (ERS) and will be used by both Enqueue and Enqueue Replication Servers to query others status during startup and failover. Type and dimension: string-scalar Default: No default Example: SAPPI1SCS_scs

Supported software

The Symantec ApplicationHA agent for SAP Web AS is supported in the following environments:

Symantec ApplicationHA	5.1 Service Pack 2 or later
SAP Web AS	7.1
SAP applications	NetWeaver PI 7.1, Mobile 7.1, and CE 7.1 **Note:** All Enhancement Packages (EhP) for PI 7.1, Mobile 7.1 and CE 7.1 are supported.

How the ApplicationHA agent makes SAP Web AS highly available

The Symantec ApplicationHA agent for SAP Web AS continuously monitors the SAP instance processes to verify that they function properly. The agent provides the following level of application monitoring:

- Primary or Basic monitoring
  This mode has Process check and Health check monitoring options. With the default Process check option, the agent verifies that the SAP instance processes makes SAP Web AS highly available are present in the process table. Process check cannot detect whether processes are in hung or stopped states.

How the ApplicationHA agent monitors SAP Web AS

The SAP Web AS agent monitors the configured resources, determines the status of these resources, brings them online, and takes them offline. The agent detects an application failure if the configured service becomes unavailable. The agent attempts to start the service for a configurable number of attempts. If the services do not start, the agent considers this as an application failure and reports the status to VMware HA.

Depending on the configuration, VMware HA can then restart the virtual machine. After the machine restarts, the agent starts the application services and brings the configured resources online on the system.

Typical SAP server configuration in a VMware virtualization scenario

A typical SAP server configuration in a VMware virtualization scenario has the following characteristics:

- The `<Drive:> \usr\sap` directory is shared by default on SAP Global host with name sapmnt; this directory is accessed from the Application Server node (VM).
- The SAP Web AS instance binaries are installed locally.

Chapter 2

Installing and configuring SAP Web AS for ApplicationHA

This chapter includes the following topics:

About SAP Web AS

All SAP NetWeaver components (example, PI, CE) run on top of the SAP Web Application Server.

The following three usage types are possible with SAP WebAS:

- SAP WebAS ABAP (ABAP only)
- SAP WebAS Java (Java only)
- SAP WebAS Add-In (ABAP and Java)

Depending on the SAP NetWeaver component to be installed, the Web Application Server installation type is determined. For example, SAP NetWeaver PI requires SAP WebAS Add-In (ABAP + Java) usage type.

SAP system components

An SAP application instance has multiple services or components which are typically deployed across multiple servers. SAP identifies the following services

as critical to the application environment, representing potential single points of failure:

- Database Instance
- Central Services Instance (SCSxx or ASCSxx)
- Enqueue Replication Server (ERSxx)

Where xx takes the value of an SAP Instance number ranging from 00 to 99.

Note: ApplicationHA SAP agent supports only High Availability SAP systems.

The ApplicationHA SAP agent supports only application servers (Central and Dialog) and standalone Enqueue servers.

The ApplicationHA SAP agent does not support Enqueue Replication Servers.

Monitoring an SAP instance

The monitor operation performs process level check to ensure the proper functioning of an SAP instance.

The ProcMon attribute specifies the processes that must be running successfully for a particular SAP instance type. The monitor operation uses this list of processes to scan the process table, and verify that the processes are running successfully.

Table 2-1 lists valid values of the ProcMon attribute

Table 2-1 Values of ProcMon attribute

SAP usage type	SAP instance type	Value of ProcMon attribute
Java	APPSERV	Mandatory: jstart.exe Optional: igswd.exe, icman.exe
Java	ENQUEUE	Mandatory: enserver.exe Optional: msg_server.exe, gwrd.exe
Add-In (ABAP + Java)	APPSERV	Mandatory: disp+work.exe, jstart.exe Optional: igswd.exe, icman.exe and gwrd.exe are optional

Table 2-1 Values of ProcMon attribute *(continued)*

SAP usage type	SAP instance type	Value of ProcMon attribute
Add-In (ABAP +Java)	ENQUEUE (ABAP)	Mandatory: enserver.exe Optional: msg_server.exe
Add-In (ABAP +Java)	ENQUEUE (Java)	Mandatory: enserver.exe Optional: msg_server.exe, gwrd.exe

The monitor operation takes a snapshot of the running processes table. The operation compares the processes that the ProcMon attribute specifies, to the set of running processes. If any process is missing, the operation declares the SAP instance as offline, and bypasses further monitor operations.

About installing SAP Web AS for ApplicationHA

To install SAP Web AS for ApplicationHA on a virtual machine, you can install the SAP instance binaries on local disk or shared disk.

Note: If SAP binaries are installed on a shared disk, ensure that the shared disks get auto mounted during the operating system boot. By default, ApplicationHA does not monitor mount resources. To add mount resources for monitoring, use CLI / Veritas Operation Manager. For more information about mount resource attributes, refer to the Veritas Cluster Server documentation.

Note: If you specify the virtual hostname and IP address while configuring a SAP Application Server instance for monitoring, then ensure the following:

– The IP address is correctly plumbed when the system boots up

– The virtual hostname can be pinged from the virtual machine.

For more details refer to the product documentation.

Chapter 3

Configuring application monitoring with Symantec ApplicationHA

This chapter includes the following topics:

About configuring application monitoring with Symantec ApplicationHA

This chapter describes the steps to configure application monitoring for SAP Web AS with ApplicationHA in a VMware virtualization environment.

Consider the following points before you proceed:

- You can configure application monitoring on a virtual machine using the Symantec ApplicationHA Configuration Wizard. To launch this wizard, click **Configure Application Monitoring** on the ApplicationHA tab in VMware vSphere Client.
- You can also configure application monitoring using Veritas Cluster Server (VCS) commands. Refer to the following technote for additional information: http://www.symantec.com/docs/TECH159846.

- Symantec recommends that you first configure application monitoring using the configuration 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. For example, if you have configured monitoring for SAP Web AS, you cannot run the wizard again to configure another application on that virtual machine. To configure another application using the wizard, you must first unconfigure the existing application monitoring configuration.
- 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 for SAP

Note the following prerequisites for configuring application monitoring for SAP Web AS on a virtual machine:

- Ensure that you have installed Symantec ApplicationHA (Console and guest components) in your VMware environment.
- Ensure that VMware Tools is installed on the virtual machine. Install the version that is the similar to or later than that available with VMware ESX 4.1.
- Ensure 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 have configured a firewall, ensure that your firewall settings allow access to ports used by Symantec ApplicationHA installer, wizards, and services.

Configuring application monitoring for SAP

Perform the following steps to configure monitoring for SAP on a virtual machine. After you finish configuring application monitoring, you can view the status of the configured SAP application and component dependency for the configured application.

Note: You can configure monitoring for only one application in a single wizard workflow.

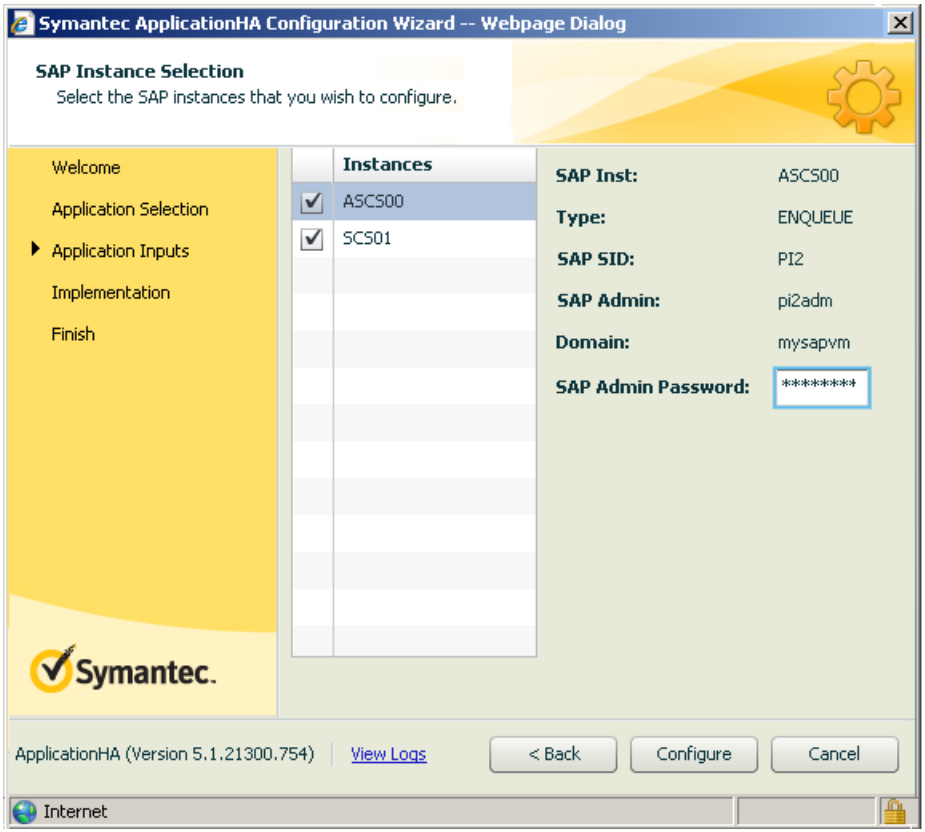
To configure application monitoring for SAP

1. Launch the vSphere Client and connect to the vCenter Server that manages the virtual machine.
2. From the vSphere Client's Inventory view in the left pane, select the virtual machine where you want to configure application monitoring for SAP 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. 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 page, click **SAP** in the Supported Applications list and then click **Next**.

7 On the SAP Instance Selection panel, select the SAP Instance you want to configure, enter the value of the SAPAdminPassword attribute, and then click **Configure**.



Note: Ensure that you enter a valid password. The wizard accepts incorrect or invalid passwords, but does not start the application

The wizard performs the application monitoring configuration tasks. The wizard creates the required resources and enables the application heartbeat that communicates with VMware HA. The panel displays the status of each task.

8 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.

9 On the Finish panel, click **Finish** to complete the application monitoring configuration.

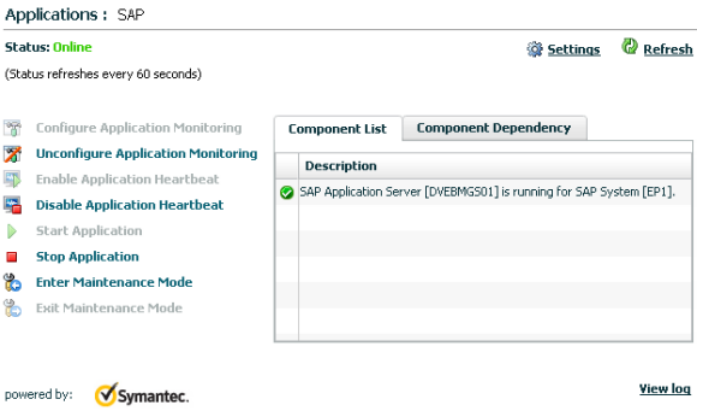
10 To view the status of the configured application, in the inventory view of the vSphere Client, click the appropriate virtual machine, and then click the ApplicationHA tab.

In the ApplicationHA view, the Status field displays the status of the configured SAP application. The following states are displayed:

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

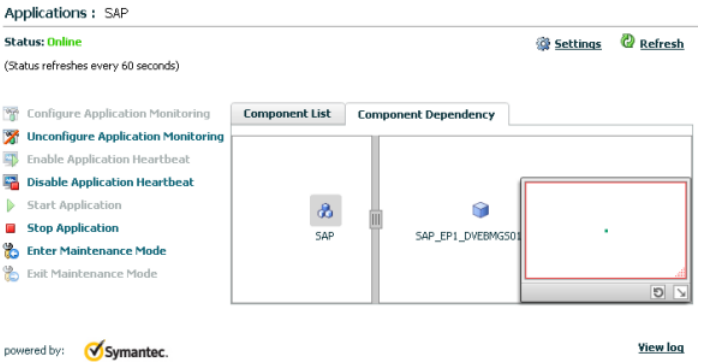
11 On the Component List tab, the Description box lists the following information for the configured SAP instances.

```
SAP Application Server [Instance Name] is running
for SAP System [SAP SID]
```



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

12 Click the **Component Dependency** tab.



The component dependency graph that appears illustrates the dependencies between a selected component group (an application or a group of inter-related components) and its components for the configured application. The left pane displays component groups and/or configured applications. The right pane displays components of the selected component group or application

For more information on viewing the status of a configured application and viewing the component dependency for a configured application, see the *Symantec™ ApplicationHA User's Guide*.

Note: Use the Settings option to change the App.StartStopTimeout value to suit your environment. Increasing the App.StartStopTimeout value allows the SAP application to start or stop completely. For example, you can set App.StartStopTimeout to 300 seconds.

Administering application monitoring

To configure and control application monitoring, you can perform the following administrative tasks through the vSphere Client:

- configure and unconfigure application monitoring
- view the status of configured applications
- view the component dependency
- start and stop configured applications
- enable and disable application heartbeat
- enter an application into maintenance mode

- bring an application out of maintenance mode

For more information, refer to the *Symantec™ ApplicationHA User's Guide*.

Chapter 4

Troubleshooting the agent for SAP Web AS

This chapter includes the following topics:

Reviewing error log files

If you face problems while using SAP server or the agent for SAP, use the log files described in this section to investigate the problems.

Reviewing ApplicationHA log files

In case of problems while using the agent for SAP, you can access log files. The ApplicationHA log files are located in the following directory:
`C:\ProgramData\Symantec\ApplicationHA\Logs\ApplicationHA.log`.