Symantec™ ApplicationHA Agent for SAP Web Application Server Configuration Guide

Linux on VMware

6.0

July 2013

Symantec

Symantec™ ApplicationHA Agent for SAP Web Application Server Configuration Guide

The software described in this book is furnished under a license agreement and may be used only in accordance with the terms of the agreement.

Agent version: 5.0.9.0

Document version: 5.0.9.0.0

Legal Notice

Symantec Corporation
350 Ellis Street
Mountain View, CA 94043

http://www.symantec.com

Technical Support

Symantec Technical Support maintains support centers globally. Technical Support's primary role is to respond to specific queries about product features and functionality. The Technical Support group also creates content for our online Knowledge Base. The Technical Support group works collaboratively with the other functional areas within Symantec to answer your questions in a timely fashion. For example, the Technical Support group works with Product Engineering and Symantec Security Response to provide alerting services and virus definition updates.

Symantec's support offerings include the following:

- A range of support options that give you the flexibility to select the right amount of service for any size organization
- Telephone and/or Web-based support that provides rapid response and up-to-the-minute information
- Upgrade assurance that delivers software upgrades
- Global support purchased on a regional business hours or 24 hours a day, 7 days a week basis
- Premium service offerings that include Account Management Services

For information about Symantec's support offerings, you can visit our website at the following URL:

www.symantec.com/business/support/index.jsp

All support services will be delivered in accordance with your support agreement and the then-current enterprise technical support policy.

Contacting Technical Support

Customers with a current support agreement may access Technical Support information at the following URL:

www.symantec.com/business/support/contact_techsupp_static.jsp

Before contacting Technical Support, make sure you have satisfied the system requirements that are listed in your product documentation. Also, you should be at the computer on which the problem occurred, in case it is necessary to replicate the problem.

When you contact Technical Support, please have the following information available:

- Product release level

- Hardware information
- Available memory, disk space, and NIC information
- Operating system
- Version and patch level
- Network topology
- Router, gateway, and IP address information
- Problem description:
  - Error messages and log files
  - Troubleshooting that was performed before contacting Symantec
  - Recent software configuration changes and network changes

Licensing and registration

If your Symantec product requires registration or a license key, access our technical support Web page at the following URL:

www.symantec.com/business/support/

Customer service

Customer service information is available at the following URL:

www.symantec.com/business/support/

Customer Service is available to assist with non-technical questions, such as the following types of issues:

- Questions regarding product licensing or serialization
- Product registration updates, such as address or name changes
- General product information (features, language availability, local dealers)
- Latest information about product updates and upgrades
- Information about upgrade assurance and support contracts
- Information about the Symantec Buying Programs
- Advice about Symantec's technical support options
- Nontechnical presales questions
- Issues that are related to CD-ROMs or manuals

Support agreement resources

If you want to contact Symantec regarding an existing support agreement, please contact the support agreement administration team for your region as follows:

Asia-Pacific and Japan	customercare_apac@symantec.com
Europe, Middle-East, and Africa	semea@symantec.com
North America and Latin America	supportsolutions@symantec.com

About Symantec Connect

Symantec Connect is the peer-to-peer technical community site for Symantec's enterprise customers. Participants can connect and share information with other product users, including creating forum posts, articles, videos, downloads, blogs and suggesting ideas, as well as interact with Symantec product teams and Technical Support. Content is rated by the community, and members receive reward points for their contributions.

http://www.symantec.com/connect/storage-management

Documentation

Product guides are available on the media in PDF format. Make sure that you are using the current version of the documentation. The document version appears on page 2 of each guide. The latest product documentation is available on the Symantec website.

https://sort.symantec.com/documents

Your feedback on product documentation is important to us. Send suggestions for improvements and reports on errors or omissions. Include the title and document version (located on the second page), and chapter and section titles of the text on which you are reporting. Send feedback to:

doc_feedback@symantec.com

For information regarding the latest HOWTO articles, documentation updates, or to ask a question regarding product documentation, visit the Storage and Clustering Documentation forum on Symantec Connect.

https://www-secure.symantec.com/connect/storage-management/forums/storage-and-clustering-documentation

Contacting Technical Support

Customers with a current support agreement may access Technical Support information at the following URL:

www.symantec.com/business/support/contact_techsupp_static.jsp

Before contacting Technical Support, make sure you have satisfied the system requirements that are listed in your product documentation. Also, you should be at the computer on which the problem occurred, in case it is necessary to replicate the problem.

When you contact Technical Support, please have the following information available:

- Product release level
- Hardware information
- Available memory, disk space, and NIC information
- Operating system
- Version and patch level
- Network topology
- Router, gateway, and IP address information
- Problem description:
  - Error messages and log files
  - Troubleshooting that was performed before contacting Symantec
  - Recent software configuration changes and network changes

Licensing and registration

If your Symantec product requires registration or a license key, access our technical support Web page at the following URL:

www.symantec.com/business/support/

Customer service

Customer service information is available at the following URL:

www.symantec.com/business/support/

Customer Service is available to assist with non-technical questions, such as the following types of issues:

- Questions regarding product licensing or serialization
- Product registration updates, such as address or name changes
- General product information (features, language availability, local dealers)
- Latest information about product updates and upgrades

- Information about upgrade assurance and support contracts
- Information about the Symantec Buying Programs
- Advice about Symantec's technical support options
- Nontechnical presales questions
- Issues that are related to CD-ROMs or manuals

Support agreement resources

If you want to contact Symantec regarding an existing support agreement, please contact the support agreement administration team for your region as follows:

Asia-Pacific and Japan	customercare_apac@symantec.com
Europe, Middle-East, and Africa	semea@symantec.com
North America and Latin America	supportsolutions@symantec.com

Documentation

Product guides are available on the media in PDF format. Make sure that you are using the current version of the documentation. The document version appears on page 2 of each guide. The latest product documentation is available on the Symantec website.

https://sort.symantec.com/documents

Your feedback on product documentation is important to us. Send suggestions for improvements and reports on errors or omissions. Include the title and document version (located on the second page), and chapter and section titles of the text on which you are reporting. Send feedback to:

doc_feedback@symantec.com

For information regarding the latest HOWTO articles, documentation updates, or to ask a question regarding product documentation, visit the Storage and Clustering Documentation forum on Symantec Connect.

https://www-secure.symantec.com/connect/storage-management/forums/storage-and-clustering-documentation

About Symantec Connect

Symantec Connect is the peer-to-peer technical community site for Symantec's enterprise customers. Participants can connect and share information with other product users, including creating forum posts, articles, videos, downloads, blogs and suggesting ideas, as well as interact with Symantec product teams and

Technical Support. Content is rated by the community, and members receive reward points for their contributions.

http://www.symantec.com/connect/storage-management

Contents

Chapter 1

Introducing the ApplicationHA Agent for SAP Web Application Server

This chapter includes the following topics:

About the Symantec ApplicationHA agent for SAP Web Application Server

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

The Symantec ApplicationHA agent for SAP Web Application Server provides high availability for SAP NetWeaver 7.1 and 7.3 in a virtual machine. The agent for SAP Web Application Server is designed to support a wide range of SAP NetWeaver environments which include SAP NetWeaver CE 7.1, SAP NetWeaver Mobile 7.1, SAP NetWeaver PI 7.1, and SAP NetWeaver 7.3.

The Symantec ApplicationHA agent for SAP Web Application Server brings SAP instances online, monitors the instances, and brings the instances offline. The agent monitors the system processes and server states, and can shut down the server in case of a fault.

The agent supports the following SAP instance types:

- Central Services Instance
- Application Server Instance
- Enqueue Replication Server Instance

The agent supports the following SAP Web Application Server Usage Types:

- ABAP
- Java
- Add-In (ABAP + Java)

About installing and removing the ApplicationHA agent for SAP Web Application Server

For instructions on installing and uninstalling the ApplicationHA agent for SAP Web Application Server, refer to the README file.

Supported software

The Symantec ApplicationHA agent for SAP Web Application Server supports the following software versions:

- Symantec ApplicationHA agent for SAP Web Application Server can be installed and run inside virtual machines that have Symantec ApplicationHA 6.0 installed.
- The following versions of the Veritas Operations Manager components are supported:
  - Veritas Operations Manager Management Server 4.1 or later
  - Veritas Operations Manager managed host for Linux: 4.1 or later

- Veritas Operations Manager Add-on for Symantec ApplicationHA Management

Note: For information on the application versions that the agent for SAP Web Application Server supports, see the Symantec Operations Readiness Tools (SORT) site: https://sort.symantec.com/agents.

Supported VMware versions

The following VMware Servers and management clients are currently supported:

- VMware ESX Server version 4.0 (for ApplicationHA initiated reboot only), 4.1, 4.1 Update 1
- VMware ESXi Server version 4.0, 4.1, 5.0
- VMware vCenter Server version 4.0, 4.1, 4.1 Update 1, 5.0

  Note: VMware Fault Tolerance is not supported in case of vCenter Server 4.1

- VMware vSphere Client version 4.0, 4.1, 5.0

Supported guest operating systems

Table 1-1 shows the supported operating systems for this release.

Table 1-1 Supported guest operating systems

Operating systems	Levels	Kernel version
Oracle Enterprise Linux 5	U3 or later	2.6.18-128.0.0.0.1.el5
Red Hat Enterprise Linux 5	U3 or later	2.6.18-128.el5
Red Hat Enterprise Linux 6	Base or later	2.6.32-71.el6
SUSE Linux Enterprise 10	SP4 or later	2.6.16.60-0.75.1
SUSE Linux Enterprise 11	Base or later	2.6.32.12-0.7-default

Note: 64-bit operating systems are only supported.

If your system is running a lower level of either Red Hat Enterprise Linux, SUSE Linux Enterprise Server, or Oracle Enterprise Linux, than indicated in Table 1-1,

you must upgrade it before attempting to install Symantec ApplicationHA. Consult the Red Hat, SUSE, or Oracle documentation for more information on upgrading or reinstalling your system.

Symantec supports only Oracle, Red Hat, and SUSE distributed kernel binaries.

Symantec products operate on subsequent kernel and patch releases provided the operating systems maintain kernel ABI (application binary interface) compatibility.

How Symantec ApplicationHA makes SAP Web Application Server highly available

The Symantec ApplicationHA agent for SAP Web Application Server 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 are present in the process table. Process check cannot detect whether processes are in hung or stopped states.
- Secondary or Detail monitoring
  In this mode, the agent runs a utility to verify the status of an SAP instance. The agent detects application failure if the monitoring routine reports an improper function of the SAP instance processes. When this application failure occurs, the ApplicationHA agent for SAP tries to restart the SAP instance. If it further fails, a virtual machine reboot is triggered. Thus, the agent ensures high availability for the SAP instance.

Note: By default, the ApplicationHA wizard configures any SAP instance for basic monitoring. To enable secondary monitoring, use CLI / Veritas Operations Manager. For more information,

---

Agent functions

The agent consists of resource type declarations and agent executables. The agent executables are organized into online, offline, monitor, and clean functions.

Online

The online function performs the following tasks:

- Performs a preliminary check to ensure that the SAP instance is not online on the specified node in the cluster.
- Removes any SAP processes that remain because of an unclean shutdown as follows:
  - If the SAP instance is APPSERV or ENQREP, the cleanipc utility gets executed. Otherwise, the agent kills all relevant SAP processes.
  - If the kill.sap and shutdown.sap file exists in the /usr/sap/SAPSID/InstName/work directory, the function removes the file from the directory.
- Removes the SE and CO locks files from the /usr/sap/SAPSID/InstName/data directory.
- Initiates the standard SAP error log process.
- Starts the sapstartsrv process for Web-based SAP Management console.
- Starts the SAP instance using the sapstart command.
- Ensures that the instance is fully initialized.

Offline

The offline function performs the following tasks:

- Checks if the SAP Instance is already offline.
- Executes kill.sap and/or shutdown.sap, if exists.
- Sends a SIGINT signal to the sapstart process, if the process exists. Otherwise, the function sends a SIGINT signal to all running processes that are relevant to the specified SAP instance.
- Waits for the SAP instance to go offline successfully.
- Ensures that no relevant SAP processes are running. If any processes remain, the operation kills the remaining processes using a SIGKILL signal.
- If the kill.sap and/or shutdown.sap file exists in the /usr/sap/SAPSID/InstName/work directory, the operation removes the file from the directory.
- Removes the SE and CO locks files from the /usr/sap/SAPSID/InstName/data directory.

- If the SAP instance is APPSERV or ENQREP the operation executes the cleanipc utility.
- Augments the SAP log, with the shutdown information.

Monitor

The monitor function monitors the state of the SAP instance on all nodes in the cluster. The function performs the following tasks:

- Depending upon the search criteria that the ProcMon attribute specifies, the monitor function scans the process table to verify the SAP instance processes are running. For more information about setting the ProcMon attribute: See "Monitoring an SAP instance" on page 23.
- If the SecondLevelMonitor attribute is greater than 0, the monitor function performs a thorough health check of the SAP instance as follows:
  - For APPSERV instances, the function uses the following utilities to perform this check:

Server type	SAP utility used
SAPWeb Application Server as ABAP	sapinfo
SAPWeb Application Server as Java	sapcontrol
SAPWeb Application Server as Add-In	sapinfo and sapcontrol

  - For Enqueue Server and Enqueue Replication Server instances, the function uses the ensmon and msprot utilities.
- The monitor function executes a custom monitor utility. See "Executing a customized monitoring program" on page 19.

Clean

The clean function performs the following tasks:

- Sends a SIGINT signal to the sapstart process, if the process exists. Otherwise, the function sends a SIGINT signal to all running processes that are relevant to the specified SAP instance.
- Ensures that no relevant SAP processes are running. If any processes remain, the operation kills all the remaining processes using a SIGKILL signal.

- If the kill.sap and/or shutdown.sap file exists in the /usr/sap/SAPSID/InstName/work directory, the operation removes the file from the directory
- Removes the SE and CO lock files from the /usr/sap/SAPSID/InstName/data directory.
- If the SAP Instance is APPSERV or ENQREP, the operation executes the cleanipc utility.
- Augments the SAP log.

Typical SAP server configuration in a VMware virtualization scenario

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

- The sapmnt directory is installed on shared storage and mounted on the virtual machines via Network File System (NFS).
- The SAP NetWeaver application server instance binaries are installed locally.

Executing a customized monitoring 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 SecondLevelMonitor attribute is set to greater than 1, but the second level check is deferred for this monitoring cycle.

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

Setting up SAP Web Application Server for ApplicationHA

Follow the steps below to set up SAP NetWeaver in virtualization scenario for ApplicationHA:

- Set up a virtualization environment for ApplicationHA. Refer to the *Symantec ApplicationHA Installation and Upgrade Guide* for more information on installing and configuring ApplicationHA.
- Install and configure SAP Web Application Server for ApplicationHA.

Chapter 2

Installing and configuring SAP Web Application Server for high availability

This chapter includes the following topics:

About SAP Web Application Server

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 Web Application Server:

- SAP Web Application Server ABAP (ABAP only)
- SAP Web Application Server Java (Java only)
- SAP Web Application Server Add-In (ABAP and Java)

Depending on the SAP NetWeaver component to be installed, the WebApplication Server installation type is determined. For example, SAP NetWeaver PI requires SAP Web Application Server 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)
- Network File System (NFS) or Common Internet File System (CIFS) services

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

Uniquely identifying SAP Web Application Server instances

You can virtualize an SAP instance using a cluster. Using shared disk and virtual IP addresses, you can manage a large set of SAP Web Application Server instances in a single cluster. For multiple instances running concurrently on a single node, the agent must be able to uniquely identify each SAP Web Application Server instance on that system.

Each instance has a unique instance name. The instance names may follow the conventional form. For example, additional application server instances begin with 'D', and primary application server instances are typically named DVEBMGS.

Instance names often include an instance ID suffix which is an integer between 00-99. For example, an application server instance with an instance ID = 00 may have an instance name of DVEBMGS00.

The SAPSID and InstName form a unique identifier that can identify the processes running for a particular instance.

Some examples of SAP instances are given as follows:

InstName	InstType
DVEBMGS00	SAP Application Server - ABAP (Primary)
D01	SAP Application Server - ABAP (Additional)
ASCS02	SAP Central Services - ABAP
J03	SAP Application Server - Java

InstName	InstType
SCS04	SAP Central Services - Java
ERS05	SAP Enqueue Replication Server
DMDA97	Solution Manager Diagnostics Agent

Differentiating SAP instances is important to identify each instance uniquely. When the agent kills the processes of a non-responsive or failed instance in the absence of unique names for each server, the agent may kill processes for more than one SAP instance during a clean operation.

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 installation type	SAP instance type	Value of ProcMon attribute
ABAP	APPSERV	dw ig co se gwrd icman are optional
ABAP	ENQUEUE	en ms
ABAP	ENQREP	er
Java	APPSERV	jc ig is optional
Java	ENQUEUE	en ms
Java	ENQREP	er
Add-In (ABAP +Java)	APPSERV	dw jstart ig co se gwrd icman are optional
Add-In (ABAP +Java)	Enqueue Server - ABAP	en ms

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

SAP installation type	SAP instance type	Value of ProcMon attribute
Add-In (ABAP +Java)	Enqueue Server - Java	en ms
Add-In (ABAP +Java)	Enqueue Rep - ABAP	er
Add-In (ABAP +Java)	Enqueue Rep - Java	er

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 UNIX processes. If any process is missing, the operation declares the SAP instance as offline, and bypasses further monitor operations.

About installing SAP Web Application Server for ApplicationHA

You can install SAP Web Application Server in the following ways, in a virtual machine.

- SAP instance on a shared disk
  Install the SAP instance binaries and sapmnt on shared disks.
- SAP instance on a local disk
  Install the SAP instance binaries on each node and sapmnt on shared disks.

Note: sapmnt includes the global directory, profile directory, and the exe directory for the SAP system. When installing SAP Web Application Server, ensure that the login_id, id_name, group_id, and group_name for the sidadm are the same on all the nodes. The user sidadm and the group ‘sapsys’ must be local users and not Network Information Service (NIS and NIS+) users. 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 ApplicationHA

This chapter describes the steps to configure application monitoring with ApplicationHA in a virtualization environment.

Consider the following points before you proceed:

- You configure an application for monitoring on a virtual machine using the Application Monitoring Configuration Wizard.
- The Application Monitoring Configuration Wizard is launched when you click **Configure Application Monitoring** on the ApplicationHA tab of the VMware vSphere Client.
- In this release, the wizard allows you 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.

- After you have configured monitoring for an application using the wizard, you can configure monitoring for other applications residing in the same virtual machine, using Veritas Cluster Server (VCS) commands.
  For more information read the following technote:
  http://www.symantec.com/docs/TECH159846
- After configuring SAP for monitoring, if you create another SAP application server instance, these new components are not monitored as part of the existing configuration.
  In such a case, you must first unconfigure the existing configuration and then reconfigure the application using the wizard. You can then select all the instances for monitoring.

Before configuring application monitoring for SAP

Ensure that you complete the following tasks before configuring application monitoring for SAP on a virtual machine:

- Install ApplicationHA Console.
- Install ApplicationHA guest components on the virtual machine that you need to monitor.
- Install VMware Tools on the virtual machine. Install a version that is compatible with VMware ESX server.
- Install the VMware vSphere Client.
- Assign ApplicationHA - Configure Application Monitoring (Admin) privileges to the logged-on user on the virtual machine where you want to configure application monitoring.
- Install the application and the associated components that you wish to monitor on the virtual machine.
- If you have configured a firewall, ensure that your firewall settings allow access to ports used by ApplicationHA installer, wizards, and services.
  Refer to the *Symantec ApplicationHA Installation and Upgrade Guide* for a list of ports and services used.

Configuring application monitoring for SAP

Perform the following steps to configure monitoring for SAP on a virtual machine.

To configure application monitoring for SAP

1. Launch the VMware vSphere Client and connect to the VMware vCenter Server that hosts the virtual machine.

   The vSphere Client is used to configure and control application monitoring.

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.

3. From the vSphere Client's Management view in the right pane, click the **ApplicationHA** tab.

   The ApplicationHA view displays the status of all the supported applications that are installed on the selected virtual machine.

4. In the ApplicationHA view, click **Configure Application Monitoring**.

   This launches the Application Monitoring Configuration Wizard.

5. Review the information on the Welcome screen and then click **Next**.

   The wizard lists all the supported applications for the system.

6. Select SAP, and then click **Next**.

   The SAP Instance Selection screen appears.

7. Select the SAP instances that you want to monitor and then click **Next**.

8. The wizard performs the application monitoring configuration tasks. The ApplicationHA Configuration screen displays the status of each task.

   After all the tasks are complete, click **Next**.

   Note: If the configuration tasks fail, click **View Logs** to check the details of the failure.

   You then have to run the wizard again to configure the application monitoring.

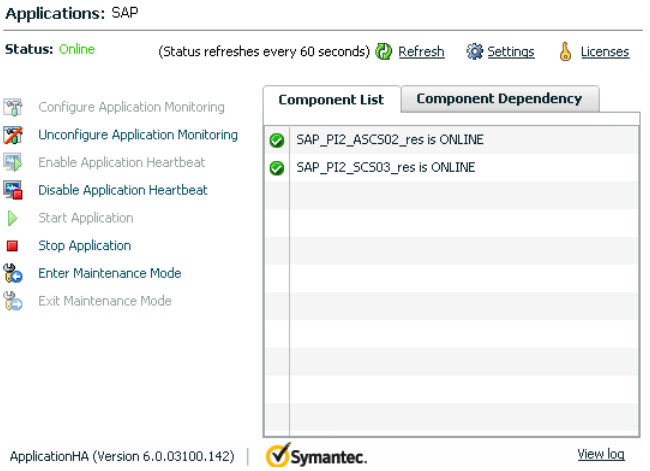
   ---

9. Click **Finish** to complete the wizard.

   This completes the application monitoring configuration.

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

The ApplicationHA view appears.

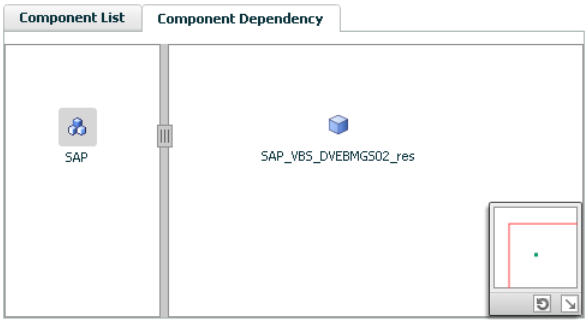


By default, the Component List tab appears. The tab lists each component of the configured application and the status description of each component.

For more information on viewing and administering applications by using the vSphere Client, see the *Symantec ApplicationHA User's Guide*.

11 To view component dependency for the monitored application, click the **Component Dependency** tab.

The component dependency graph appears.



The graph 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 component dependency for any configured application, see the *Symantec ApplicationHA User's Guide*.

Chapter 4

Troubleshooting the agent for SAP Web Application Server

This chapter includes the following topics:

Using the correct software and operating system versions

Ensure that no issues arise due to incorrect software and operating system versions. For the correct versions of operating system and software to be installed on the resource systems:

Reviewing error log

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.

Using SAP server log files

If a SAP server is facing problems, you can access the server log files to further diagnose the problem. The SAP log files are located in the `/usr/sap/SAPSID/InstName/work` directory.

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 `/var/VRTSvcs/log` directory.

Using trace level logging

The ResLogLevel attribute controls the level of logging that is written in a cluster log file for each SAP server resource. You can set this attribute to TRACE, which enables very detailed and verbose logging.

Note: The TRACE level logs are generated locally at the location `/var/VRTSvcs/log/SAPNWebAS71_A.log`.

Warning: You may consider temporarily increasing the timeout values for SAPNWebAS71 for debugging purposes. After the debugging process is complete, you can revert back to the original timeout values. To change the timeout value, use CLI/Veritas Operation Manager. For more information, refer to the Veritas Cluster Server documentation.

To localize ResLogLevel attribute for a resource

1. Identify the resource for which you want to enable detailed logging.
2. Localize the ResLogLevel attribute for the identified resource:

   ```
   # hares -local Resource_Name ResLogLevel
   ```

3. Set the ResLogLevel attribute to TRACE for the identified resource:

   ```
   # hares -modify Resource_Name ResLogLevel TRACE -sys SysA
   ```

4. Note the time before you begin to operate the identified resource.
5. Test the identified resource. The function reproduces the problem that you are attempting to diagnose.
6. Note the time when the problem is reproduced.

7 Set the ResLogLevel attribute back to INFO for the identified resource:

```
# hares -modify Resource_Name ResLogLevel INFO -sys SysA
```

8 Review the contents of the log file. Use the time noted in Step 4 and Step 6 to diagnose the problem.

You may also contact your support provider for more help.

Appendix A

Resource type definitions

This appendix includes the following topics:

About the resource type and attribute definitions

The resource type represents the configuration definition of the agent and specifies how the agent is defined in the configuration file. The attribute definitions describe the attributes associated with the agent. The required attributes describe the attributes that must be configured for the agent to function.

Resource type definition for SAP Web Application Server

After importing the agent types into the cluster, if you save the configuration on your system disk using the `haconf -dump` command, you can find the SAPWebAS71Types.cf file in the /etc/VRTSvcs/conf/config cluster configuration directory.

An excerpt from this file follows.

```
type SAPWebAS71 (
static str AgentFile = "/opt/VRTSvcs/bin/Script50Agent"
static str AgentDirectory = "/opt/VRTSagents/ha/bin/SAPWebAS71"
static str ArgList[] = { ResLogLevel, State, IState, EnvFile,
SAPAdmin, InstProfile, InstType, ProcMon, EnqSrvResName,
SecondLevelMonitor, MonitorProgram }
```

```
str ResLogLevel = INFO
str EnvFile
str SAPAdmin
str InstProfile
str InstType = APPSERV
str ProcMon
str EnqSrvResName
int SecondLevelMonitor = 0
str MonitorProgram
)
```

SAP Web Application Server agent attributes

Table A-1 shows the required attributes for configuring a SAP Web Application Server instance.

Note: In a virtual environment, all the required attributes are discovered by the Symantec High Availability Configuration wizard.

Table A-1 Required attributes

Required attributes	Description
EnqSrvResName	The name of the VCS resource for SAP Central Services (A)SCS Instance. This attribute is used by Enqueue and Enqueue Replication Server. Using this attribute the Enqueue server queries the Enqueue Replication Server resource state while determining the fail over target and vice a versa. Type and dimension: string-scalar Default: "" Example: SAP71-PI1SCS_sap

Table A-1 Required attributes *(continued)*

Required attributes	Description
EnvFile	The absolute path to the file that must be sourced with the UNIX shell. You must source this file to set the environment before executing SAP scripts for online, offline, monitor, and clean operations. Supported shell environments are ksh, sh, and csh. **Note:** Ensure that the syntax of this file is in accordance with the user shell that the SAPAdmin attribute specifies. Review the information on how to generate environments file for SAP. Symantec recommends that you store this file on shared disk so that the file is always available to an online system. Type and dimension: string-scalar Default: "" Example: /usr/sap/PI1/DVEBMGS00/sappi1.env
InstType	An identifier that classifies and describes the SAP server instance type. Valid values are: ■ APPSERV: SAP Application Server ■ ENQUEUE: SAP Central Services ■ EBQREP: Enqueue Replication Server ■ SMDAGENT: Solution Manager Diagnostics Agent **Note:** The value of this attribute is not case-sensitive. Type and dimension: string-scalar Default: APPSERV Example: ENQUEUE
ProcMon	The list of SAP processes to monitor. The entries in this list are separated using space and can be specified in any order. Review the information about how the monitor operation uses this attribute: Type and dimension: string-scalar Default: "" Example: dw se jstart

Table A-1 Required attributes *(continued)*

Required attributes	Description
ResLogLevel	The logging detail performed by the agent for the resource. Valid values are: ERROR: Only logs error messages. WARN: Logs above plus warning messages. INFO: Logs above plus informational messages. TRACE: Logs above plus 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
SAPAdmin	SAP System administrator for SAPSID. This user name is usually a concatenation of the SAPSID attribute and the adm string 'sidadm'. Storing SAPAdmin in system naming services is not supported, for example: NIS, NIS+ and LDAP servers. The agent functions use this user name to execute their respective core subroutines. Type and dimension: string-scalar Default: "" Example: pi1adm
InstProfile	The full path to the SAP Instance profile. The *SAPSID* is found in /usr/sap/*SAPSID*/SYS/profile directory. The value of the instance is SAPSID_*InstName_hostname*. The hostname must resolve into a valid IP address that is used to cluster the SAP instance. Type and dimension: string-scalar Default: "" Example: /usr/sap/PI1/SYS/profile/PI1_DVEBMGS00_sappi1pas

Table A-2 lists the optional attributes.

Table A-2 Optional attributes

Optional attribute	Description
MonitorProgram	Absolute path name of an external, user-supplied monitor executable. See "Executing a customized monitoring program" on page 19. Type and dimension: string-scalar Default: "" Example 1: /usr/sap/PI1/DVEBMGS00/work/myMonitor.sh Example 2: /usr/sap/PI1/DVEBMGS00/work/myMonitor.sh arg1 arg2
SecondLevelMonitor	Used to enable second-level monitoring. Second-level monitoring is a deeper, more thorough state check of the SAP instance. The numeric value specifies how often the monitoring routines must run. 0 means never run the second-level monitoring routines, 1 means run routines every monitor interval, 2 means run routines every second monitor interval, and so on. **Note:** Exercise caution while setting SecondLevelMonitor to large numbers. For example, if the MonitorInterval is set to 60 seconds and the SecondLevelMonitor is set to 100, then sapinfo is executed every 100 minutes, which may not be as often as intended. For maximum flexibility, no upper limit is defined for SecondLevelMonitor. Type and dimension: integer-scalar Example: 1 Default: 0

Appendix B

Detail monitoring

This appendix includes the following topics:

Setting the PATH variable

SAP Web Application Server commands reside in the `/opt/VRTS/bin` directory. Add this directory to your PATH environment variable.

To set the PATH variable

- Perform one of the following steps:

  For the Bourne Shell (sh or ksh), type:

  ```
  $ PATH=/opt/VRTS/bin:$PATH; export PATH
  ```

  For the C Shell (csh or tcsh), type:

  ```
  $ setenv PATH :/opt/VRTS/bin:$PATH
  ```

Setting up detail monitoring for ApplicationHA agent for SAP

This section describes the procedure to enable and disable detail monitoring for SAP.

To enable detail monitoring for SAP

1. Make the ApplicationHA configuration writable:

   ```
   haconf -makerw
   ```

2. Freeze the service group to avoid automated actions by ApplicationHA in case of an incomplete configuration:

   ```
   hagrp -freeze SAP_<SAPSID>_SG
   ```

3. Enable detail monitoring for SAP resources by using the following ApplicationHA commands:

   ```
   hares -modify SAP_<SAPSID>_res SecondLevelMonitor <frequency>
   ```

   Note: For more information on SecondLevelMonitor attributes:

4. Save the configuration and unfreeze the service group.

   ```
   haconf -dump -makero
   ```

   ```
   hagrp -unfreeze SAP_<SAPSID>_SG
   ```

To disable detail monitoring for SAP

1. Make the ApplicationHA configuration writable:

   ```
   haconf -makerw
   ```

2. Freeze the service group to avoid automated actions by ApplicationHA in case of an incomplete configuration:

   ```
   hagrp -freeze SAP_<SAPSID>_SG
   ```

3. Enable detail monitoring for SAP resources by using the following ApplicationHA commands:

   ```
   hares -modify SAP_<SAPSID>_res SecondLevelMonitor 0
   ```

4. Save the configuration and unfreeze the service group.

   ```
   haconf -dump -makero
   ```

   ```
   hagrp -unfreeze SAP_<SAPSID>_SG
   ```