Symantec™ ApplicationHA Agent for JBoss Application Server Configuration Guide

Linux on KVM

6.1

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Symantec

Symantec™ ApplicationHA Agent for JBoss Application Server Configuration Guide

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Chapter 1

Introducing the Symantec ApplicationHA Agent for JBoss Application Server

This chapter includes the following topics:

- About the Symantec ApplicationHA agent for JBoss Application Server
- About installing and removing the ApplicationHA agent for JBoss Application Server
- Supported software
- Agent functions
- Uniquely identifying JBoss Application Server Configurations

About the Symantec ApplicationHA agent for JBoss 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 JBoss Application Server provides high availability for one or more JBoss Application Server Configuration.

About installing and removing the ApplicationHA agent for JBoss Application Server

When you install or uninstall Symantec ApplicationHA, the ApplicationHA agent for JBoss Application Server is automatically installed or removed. For more information, see the *Symantec ApplicationHA Installation and Upgrade Guide*.

When you run the installer or uninstall program that accompanies the quarterly agent pack release of high availability agents from Symantec, the latest version of the ApplicationHA agent for JBoss Application Server is automatically installed or removed. For more information, see the *Symantec ApplicationHA Agent Pack Installation Guide*.

Supported software

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

- Symantec ApplicationHA agent for JBoss Application Server can be installed and run inside virtual machines that have Symantec ApplicationHA 6.1 installed.
- The following versions of the Veritas Operations Manager components are supported:
  - Veritas Operations Manager Management Server 6.0 or later
  - Veritas Operations Manager managed host for Linux: 6.0 or later

Supported application versions

Table 1-1 lists the JBoss Application Server versions that Symantec ApplicationHA 6.1 currently supports on virtual machine.

Table 1-1 Supported application versions

Application	Version
JBoss Application Server	5.x and 6.x

Note: Install all JBoss Application Server components including JBossWS-CXF.

Supported virtualization environments

Symantec ApplicationHA can be installed and run inside virtual machines in a KVM virtualization environment, running Red Hat Enterprise Linux (RHEL) 6, Update 3 and 4 in the physical host.

Supported operating systems on virtual machines

Table 1-2 shows the supported operating systems for Symantec ApplicationHA 6.1.

Table 1-2 Supported guest operating systems

Operating systems	Levels	Kernel version
Red Hat Enterprise Linux 5	Updates 5, 6, 7, 8, 9	2.6.18-194.el5 2.6.18-238.el5 2.6.18-274.el5 2.6.18-308.el5 2.6.18-348.el5
Red Hat Enterprise Linux 6	Updates 3 and 4	2.6.32-279.el6 2.6.32-358.el6

Note: 64-bit operating systems are only supported.

If your system is running a lower level of Red Hat Enterprise Linux, than indicated in Table 1-2, you must upgrade it before attempting to install Symantec ApplicationHA. Consult the Red Hat documentation for more information on upgrading or reinstalling your operating system.

Symantec supports only Red Hat distributed kernel binaries.

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

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

When you click **Start Application**, ApplicationHA ensures that the JBoss Application Server Configurations are running.

Offline

When you click **Stop Application**, ApplicationHA ensures that the resource is given enough time to go offline successfully. The offline function uses a wait period that the OfflineTimeout attribute specifies. This enables the JBoss Application Server Configuration to complete the offline sequence before allowing further probing of the resource.

Monitor

The monitor function conducts a first level check on the JBoss Application Server Configuration to ensure that the process of JBoss Application Server Configuration is running. The agent identifies the process for the JBoss Application Server component by applying the pattern matching on command lines of processes running in the system.

In JBoss Application Server version 5.x, second level check uses the `twiddle.sh` utility.

In JBoss Application Server version 6.x, second level check uses the `jboss-cli.sh` utility.

Clean

The clean function attempts to gracefully shut down the JBoss Application Server Configuration. If the shut down is not successful, then the agent identifies the server configuration process and kills it.

Uniquely identifying JBoss Application Server Configurations

You can configure one or more JBoss Application Server Configurations running on a single virtual host but the Application HA agent must be able to identify each configuration separately. This is done using the installation path of the JBoss Application Server and the server configuration name. The installation path is given by the attribute JBossHome and the ServerConfig attributes gives the server configuration name. It is important that the agent for JBoss Application Server can uniquely identify a configuration on a node that is hosting more than one

simultaneous JBoss Application Server Configurations. The agent must identify the server configuration process before the agent kills the process of a non-responsive or a failed configuration.

See “Attribute definition” on page 29. for more details about the attributes.

Chapter 2

Configuring application monitoring with Symantec ApplicationHA

This chapter includes the following topics:

- About configuring application monitoring with ApplicationHA
- Before configuring application monitoring for JBoss Application Server
- Accessing the Symantec High Availability view
- Configuring application monitoring for JBoss Application Server

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 Symantec ApplicationHA Configuration Wizard.
- The Symantec ApplicationHA Configuration Wizard is launched when you click **Configure Application Monitoring** in the Symantec High Availability view of the Veritas Operations Manager (VOM) Management Server console.
- 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 Symantec Cluster Server (VCS) commands.
  For more information read the following technote:
  http://www.symantec.com/docs/TECH159846
- If you are using the Symantec ApplicationHA Configuration Wizard to configure JBoss Application Server, note that only JBoss Application Server version 5.x is supported.

Before configuring application monitoring for JBoss Application Server

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

- Install Veritas Operations Manager (VOM) Management Server. For more information on working with VOM, see the *Symantec ApplicationHA User's Guide*. For information on accessing the Symantec High Availability view: See "Accessing the Symantec High Availability view " on page 15.
- Install ApplicationHA guest components on the virtual machine that you need to monitor.
- 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 Guide* for a list of ports and services used.

Accessing the Symantec High Availability view

To administer an application on a virtual machine that is running in the KVM environment, you must access the Symantec High Availability view of the Veritas Operations Manager (VOM) Management Server console.

From the Symantec High Availability view, you can perform administrative actions such as:

- Start an application
- Stop an application
- Configure application monitoring
- Unconfigure application monitoring
- Enable application heartbeat
- Disable application heartbeat
- Enter maintenance mode
- Exit maintenance mode

To access the Symantec High Availability view

1. Log on to the VOM Management Server console.
2. Select the Server perspective and expand Manage in the left pane.
3. Expand the Organization, or Uncategorized Hosts to navigate to the virtual machine.
4. Right-click the required virtual machine, and then click **Manage ApplicationHA**.

   The Symantec High Availability view appears.

Configuring application monitoring for JBoss Application Server

Perform the following steps to configure monitoring for JBoss Application Server on a virtual machine.

1. In the Symantec High Availability view of the Veritas Operations Manager Management Server Console, click **Configure Application Monitoring**.

   This launches the Symantec ApplicationHA Configuration Wizard.
2. Review the information on the Welcome screen and then click **Next**.

   The wizard lists all the supported applications for the system.
3. Select **JBoss Application Server** and then click **Next**.

   The JBoss Application Server Specification screen appears.

4 On the JBoss Application Server Specification page, enter the JBoss Home Directory and the Server Configuration Base Directory. Then click **Next**.

The JBoss Application Server Configuration screen appears.

Note: In JBoss Application Server version 5.x, the server configurations which have no bootstrap beans to load into the micrcontainer and no deployments, are not shown in the list of server configurations on Application Inputs page. For example, `minimal`.

To verify the bootstrap beans loaded into the micrcontainer with server deployment, the ApplicationHA framework checks for the presence of the files `jboss-beans.xml` and `bootstrap.xml`, located at:

ServerBaseDir/*ServerConfig*/deployers/jbossws.deployer/META-INF/jboss-beans.xml

ServerBaseDir/*ServerConfig*/conf/bootstrap.xml

Note: In JBoss Application Server version 6.x, only standalone mode configuration is supported. The ApplicationHA framework checks for the presence of the `standalone.xml` file inside the configuration directory located at:

ServerBaseDir/configuration/standalone.xml.

If the standalone.xml file is not present, use ConfigurationDir (optional attribute) to specify the location of the configuration file.

---

5 Select the various JBoss Application Server configurations that you want to monitor. The various configurations are shown in a list on the left side. You can enable one or more configurations to monitor.

For each JBoss Application Server version 5.x configuration, enter the following fields:

User	System User under which the JBoss Application Server is executed.
Administrative User	Administrative user within JBoss Application Server.
Administrative Password	Password of Administrative user within JBoss Application Server.
Startup Arguments	Startup arguments to pass the startup script of JBoss Application Server (optional).
Environment File	Optional environment file to source before starting JBoss Application Server (optional).
Binding Set	The name of the set of bindings to use for the JBoss Application Server Configuration. Every server configuration has unique binding set like default-port, port-01 or port-02, and so on
JNDI Url	Modify the default value of the IP address and the port in the link which appears by default in the JNDI Url field according to your JBoss Application Server settings. `jnp://`*`ipaddress`*`:`*`port`*

For each JBoss Application Server version 6.x configuration, enter the following fields:

User	System User under which the JBoss Application Server is executed.
Component	Component or mode for which the resource is being configured. ApplicationHA supports the Standalone mode.
Management Address	A combination of an IP address and port number that is used to specify the management bind address and the controller address. Specify this combination in the format IP:Port, where, IP is the management bind address and Port is the controller parameter that is used when executing the `jboss-cli.sh` utility.
Server Configuration File	The filename of the configuration file that the agent must use. Ensure that you specify only the filename of the configuration file here; use ConfigurationDir (optional attribute) to specify the location of the configuration file.

Configuration Directory	The absolute path of the configuration XML file. For the Standalone mode, the value of this attribute is passed as the command-line parameter '-Djboss.server.config.dir' to the startup script.
Environment file	Optional environment file to source before starting JBoss Application Server.

6 Click **Next**

The wizard will proceed to configure the resources and display their status.

7 Select **JBoss Application Server Configuration**, specify the settings, and then click **Next**.

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

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

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

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

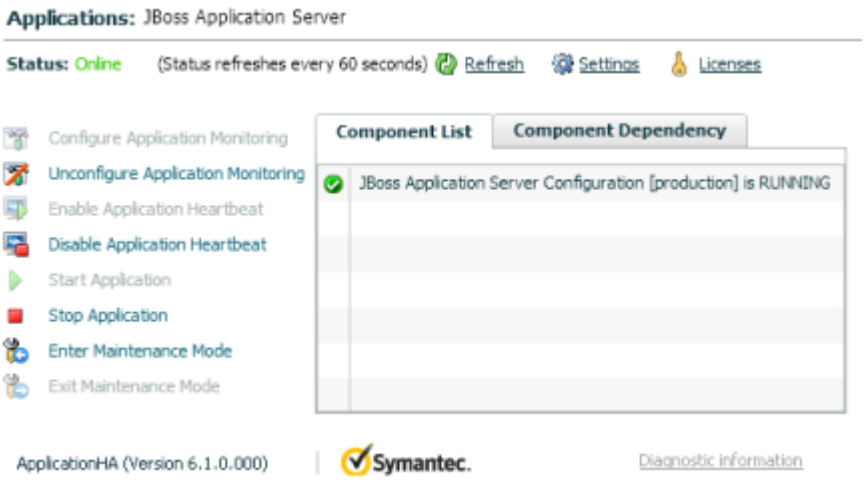
---

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, on the Veritas Operations Manager Management Server console, right-click the appropriate virtual machine and then click **Manage ApplicationHA**.

The Symantec High Availability view appears.

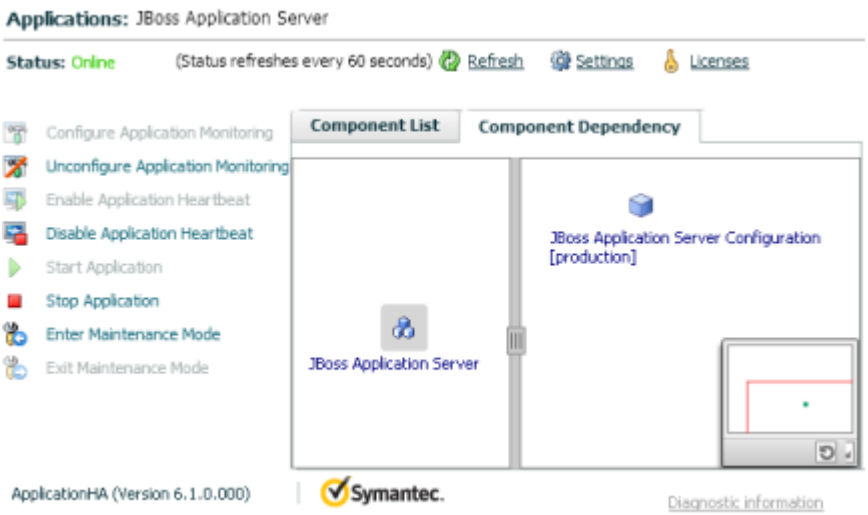


By default, the Component List tab appears. The tab lists each component of the configured application and the status description of each component.

For more information on viewing and administering applications through the Veritas Operations Manager, 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.



By default, the component dependency graph shows the configured resources. 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 3

Troubleshooting the agent for JBoss Application Server

This chapter includes the following topics:

- Starting the JBoss Application Server Configuration outside the Symantec ApplicationHA environment
- Reviewing error log files

Starting the JBoss Application Server Configuration outside the Symantec ApplicationHA environment

If you face problems while working with a resource, you must disable the resource within the cluster framework. A disabled resource is not under the control of the cluster framework, and so you can test the JBoss Application Server Configuration independent of the cluster framework. Refer to the cluster documentation for information about disabling a resource.

You can then restart the JBoss Application Server Configuration outside the cluster framework..

Note: Use the same parameters that the resource attributes define within the cluster framework while restarting the resource outside the cluster framework.

A sample procedure to start a JBoss Application Server Configuration outside the ApplicationHA environment, is illustrated as follows.

JBoss Application Server version 5.x

To start a JBoss Application version 5.x server configuration outside the ApplicationHA environment

1. Log in as superuser onto the host on which the JBoss Application Server Configuration to run.
2. Use the values defined in the agent attributes to initiate the start program.

   For example, assume that the following values are assigned:

Attribute	Value
User	root
JBossHome	/usr/local/EnterprisePlatform-5.1.2/jboss-eap-5.1/jboss-as
AdminUser	admin
AdminPassword	admin
ServerConfig	`production`
ServerBaseDir	/usr/local/EnterprisePlatform-5.1.2/jboss-eap-5.1/jboss-as/server
BindingSet	ports-01
StartArgs	“”

   In the example below, the IP address used is 127.0.0.1.
3. Go to the bin directory inside the directory specified by JBossHome:

   ```
   /usr/local/EnterprisePlatform-5.1.2/jboss-eap-5.1/jboss-as/bin
   ```

4 Start the JBoss Application Server with the following command:

```
./run.sh -c production \
  -Djboss.server.base.dir=/usr/local/EnterprisePlatform-5.1.2/ \
  jboss-eap-5.1/jboss-as/server \
  -Djboss.server.base.url=file:/usr/local/EnterprisePlatform-5.1.2/ \
  jboss-eap-5.1/jboss-as/server \
  -Djboss.service.binding.set=ports-01 \
  -Djava.rmi.server.hostname=127.0.0.1 \
  -Djboss.bind.address=127.0.0.1
```

5 Ensure that the JBoss Application Server Configuration starts successfully.

If the JBoss Application Server Configuration works properly outside the ApplicationHA framework, you can attempt to implement the server within the framework.

JBoss Application Server version 6.x

To start a JBoss Application version 6.x server configuration outside the ApplicationHA environment

1 Log in as superuser onto the host on which the JBoss Application Server Configuration to run.

2 Use the values defined in the agent attributes to initiate the start program. For example, assume that the following values are assigned:

Attribute	Value
Version	6.0
Component	Standalone
ServerConfig	standalone.xml
User	root
JBossHome	/jboss-eap-6.2
ManagementAddress	127.0.0.1
ServerBaseDir	/jboss-eap-6.2/standalone
ConfigurationDir	/jboss-eap-6.2/standalone/configuration

In the example below, the IP address used is 127.0.0.1.

3 Go to the bin directory inside the directory specified by JBossHome:

```
/jboss-eap-6.2/bin
```

4 Start the JBoss Application Server with the following command:

```
/jboss-eap-6.2/bin/standalone.sh
-Djboss.server.config.dir=/jboss-eap-6.2/standalone/configuration
-Djboss.server.base.dir=/jboss-eap-6.2/standalone
-Djboss.bind.address.management=127.0.0.1 -c standalone.xml
```

5 Ensure that the JBoss Application Server Configuration starts successfully.

If the JBoss Application Server Configuration works properly outside the ApplicationHA framework, you can attempt to implement the server within the framework.

Reviewing error log files

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

Using JBoss Application Server log files

If the JBoss Application Server is facing problems, access the log files of the JBoss Application Server to further investigate the problem. The log files are located as follows:

- *<ServerBaseDir>*/*<ServerConfig>*/log/server.log
- *<ServerBaseDir>*/*<ServerConfig>*/log/boot.log

Reviewing ApplicationHA log files

In case of problems while using the agent for JBoss Application Server, you can access the ApplicationHA log files at the following location:

```
/var/VRTSvcs/log/JBoss_A.log
```

Reviewing cluster log files

In case of problems while using the agent for JBoss Application Server, you can also access the engine log file for more information about a particular resource. The engine log files are located at the following location:

The VCS engine log file is /var/VRTSvcs/log/engine_A.log.

Using trace level logging

The ResLogLevel attribute controls the level of logging that is written in an ApplicationHA log file for each JBoss Application Server resource. You can set this attribute to TRACE, which enables very detailed and verbose logging.

If you set ResLogLevel to TRACE, a very high volume of messages are produced. Symantec recommends that you localize the ResLogLevel attribute for a particular resource.

To localize ResLogLevel attribute for a resource

1. Make the ApplicationHA configuration writable:

   ```
   # haconf -makerw
   ```

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

   ```
   # /opt/VRTS/bin/hares -local JBoss_<count>_res \
   ResLogLevel
   ```

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

   ```
   # /opt/VRTS/bin/hares -modify JBoss_<count>_res \
   ResLogLevel TRACE -sys SysA
   ```

5. Note the time before you begin to operate the identified resource.
6. Test the identified resource. The function reproduces the problem that you are attempting to diagnose.
7. Note the time when the problem is reproduced.
8. Set the ResLogLevel attribute back to INFO for the identified resource:

   ```
   # /opt/VRTS/bin/hares -modify JBoss_<count>_res \
   ResLogLevel INFO -sys SysA
   ```

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

Using agent for JBoss Application Server log files

In case of problems while using the agent for JBoss Application Server, you can access the agent log files for more information. The agent saves output of every operation process in the temporary folder of the resource system. If the temporary folder is /tmp, the log files are saved using the following naming format:

`/tmp/.VRTS`*`AgentName`*`/`*`ResourceName_EntryPointName`*`.out`

Let the resource name be JBoss_1_res. For example:

```
/tmp/.VRTSJBoss/JBoss_1_res_online.out
/tmp/.VRTSJBoss/JBoss_1_res_offline.out
/tmp/.VRTSJBoss/JBoss_1_res_clean.out
/tmp/.VRTSJBoss/JBoss_1_res_monitor.out
```

Note: These files are overwritten each time you execute the corresponding operation process. In case you want to save the information, make a copy of the files to another location.

Appendix A

Resource type definitions

This appendix includes the following topics:

- About the resource type and attribute definitions
- Resource type definition

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

The following is a sample agent type definition file:

```
type JBoss (
        static boolean AEPTimeout = 1
        static str AgentFile = "/opt/VRTSvcs/bin/Script50Agent"
        static str AgentDirectory = "/opt/VRTSagents/ha/bin/JBoss"
        static str ArgList[] = { ResLogLevel, State, IState,
         MonitorProgram, User, Version, JBossHome, Component,
         ServerConfig, ServerBaseDir, ConfigurationDir, \
         ManagementAddress, MasterHCAddress, ServerName, EnvFile,
         AdminUser, AdminPassword, StartArgs, StopArgs, BindingSet,
         JNDIUrl, SecondLevelMonitor }
        str ResLogLevel = INFO
        str MonitorProgram
        str User
        str Version
```

```
        str JBossHome
        str Component
        str ServerConfig
        str ServerBaseDir
        str ConfigurationDir
        str ManagementAddress
        str MasterHCAddress
        str ServerName
        str EnvFile
        str AdminUser
        str AdminPassword
        str StartArgs
        str StopArgs
        str BindingSet
        str JNDIUrl
        int SecondLevelMonitor = 0
)
```

Attribute definition

Refer to the required and optional attributes while configuring the agent for JBoss Application Server.

Table A-1 lists the required attributes for the JBoss Application Server agent.

Table A-1 Required attributes

Attribute	Description
ResLogLevel	Specifies the logging detail that the agent performs for the resource. The valid values are as follows: ■ ERROR: Only logs error messages. ■ WARN: Logs error messages and warning messages. ■ INFO: Logs error messages, warning messages, and informational messages. ■ TRACE: Logs error messages, warning messages, informational messages, and trace messages. TRACE is very verbose and should be used only during initial configuration or for troubleshooting and diagnostic operations. Type and dimension: string-scalar Default Value: INFO Example: INFO

Table A-1 Required attributes *(continued)*

Attribute	Description
Version	Specifies the version of the JBoss Application Server. You can set this attribute to the following values: ■ 6.0: For JBoss Application Server 6.x ■ 5.0: For JBoss Application Server 5.x Default Value: "" Example: 6.0, 5.0
Component	Specifies the component or mode for which the resource is being configured. In this release, the agent supports the Standalone mode. This attribute is applicable to JBoss Application Server 6.x. Default Value: "" Example: Standalone
ServerConfig	For JBoss Application Server 6.x, this attribute specifies the filename of the configuration file that the agent must use. Ensure that you specify only the filename of the configuration file here; you may use the ConfigurationDir optional attribute to specify the location of the configuration file. Example: standalone.xml For JBoss Application Server 5.x, this attribute specifies the name of the Server Configuration that the agent must use. Example: production, web Default Value: ""
User	The UNIX user name used to start and stop the JBoss Application Server Configuration. If MonitorProgram is specified, the agent uses the credentials of this user to run the defined program. You must synchronize the user name across the systems within the cluster. This user name must resolve to the same UID and have the same default shell on each system in the cluster. The agent operations use the getpwnam (3C) function system call to obtain UNIX user attributes. Hence you can define the user name locally or in a common repository such as NIS, NIS+, or LDAP. Type and dimension: string-scalar Default Value: "" Example: root

Table A-1 Required attributes *(continued)*

Attribute	Description
AdminUser	The administrative user of the JBoss Application Server configuration. This user name is specified during the installation of JBoss Application Server. This attribute is applicable to JBoss Application Server 5.x. Default Value: "" Example: admin
AdminPassword	The password of the user of the JBoss Application Server. This password is specified during the installation of JBoss Application Server. The password is encrypted using the VCS encrypt utility, vcsencrypt (1m). This attribute is applicable to JBoss Application Server 5.x. **Note:** You need not encrypt the password if you are using the VCS GUI to enter the password. VCS GUI automatically encrypts the password. Default Value: "" Example : jxmXkvVvkVnvWvsVx

JBossHome	The absolute path of the JBoss home directory. The bin directory is present under this directory. This directory is required to access the startup scripts.
	Note: This is a directory name used in pattern matching for running process; do not keep extra trailing forward slashes (/) in the directory name.
	Default Value: none
	Examples:
	`/opt/EnterprisePlatform-5.1.2/jboss-eap-5.1/jboss-as`
	`/opt/jboss/EAP-6.0.0.GA/jboss-eap-6.0`

Table A-1 Required attributes *(continued)*

Attribute	Description
ManagementAddress	A combination of an IP address and port number that is used to specify the management bind address and the controller address. Specify this combination in the format IP:Port, where, IP is the management bind address and Port is the controller parameter that is used when executing the `jboss-cli.sh` utility. To specify an IPv6 address, use [], as per the standard IPv6 syntax. For example: "[::1]:9999", "[2001:db8:85a3:8d3:1319:8a2e:370:7348]:9999" Default Value: "" Example: 192.168.1.100:12345, myhostname:6789, myhostname.mydomain.com:7890

ServerBaseDir	The absolute path of the server's base directory.
	Note: This is a directory name used in pattern matching for running process; do not keep extra trailing forward slashes (/) in the directory name.
	For JBoss Application Server 6.x in standalone mode, the value of this attribute is passed as the command line parameter '-Djboss.server.base.dir' to the startup script.
	Default Value: None
	If no value is specified for JBoss Application Server 6.x in standalone mode, the agent uses the value *JBossHome*/standalone.
	Examples:
	`/opt/EnterprisePlatform-5.1.2/jboss-eap-5.1/jboss-as/server`
	`/opt/jboss/EAP-6.0.0.GA/jboss-eap-6.0/standalone`

BindingSet	The name of the set of bindings to use for the JBoss Application Server Configuration. Every server configuration must use a different binding set. This attribute is applicable to JBoss Application Server 5.x. Default Value: "" Example: ports-default, ports-01, ports-02, and so on.

Table A-1 Required attributes *(continued)*

Attribute	Description
JNDIUrl	The JNDI Url field according to the BindingSet. As per the default installation, each binding set increases the port value by hundred. This attribute is applicable to JBoss Application Server 5.x. Default Value: "" For example: ■ ports-default corresponds to jnp://127.0.0.1:1099 ■ ports-01 corresponds to jnp://127.0.0.1:1199 ■ ports-02 corresponds to jnp://127.0.0.1:1299.

Table A-2 lists the optional attributes for the JBoss Application Server agent.

Table A-2 Optional attributes

Attribute	Description
EnvFile	Specifies the full path to the file that the agent sources to set the environment before starting the server configuration. Typically, this attribute can be used to set environment variables like JAVA_HOME to make JBoss Application Server use the correct Java Runtime Environment. Symantec recommends storing the file on the shared disk. This ensures that the same file is available on each failover node. The shell environments supported are ksh, sh, and csh. Default Value: "" Example: /home/jboss/myenv.sh
MonitorProgram	Absolute path name of an external, user-supplied monitor executable. Default Value: "" Example: /home/jboss/mymonitorprogram.sh
ConfigurationDir	The absolute path of the configuration XML file. For the Standalone mode, the value of this attribute is passed as the command-line parameter '-Djboss.server.config.dir' to the startup script. Default: none If no value is specified for JBoss Application Server 6.x in standalone mode, the agent uses the value *JBossHome*/standalone/configuration. Example: `/opt/jboss/EAP-6.0.0.GA/jboss-eap-6.0/standalone/configuration`

Table A-2 Optional attributes *(continued)*

Attribute	Description
SecondLevelMonitor	This attribute has been deprecated. To enable second-level monitoring, use the type-level attribute LevelTwoMonitorFreq.
LevelTwoMonitorFreq	A type-level attribute that specifies the frequency at which the agent for this resource type must perform second-level or detailed monitoring. You can also override the value of this attribute at the resource level. The value indicates the number of monitor cycles after which the agent monitors the JBoss Application Server Configuration in detail. For example, the value 5 indicates that the agent monitors the JBoss Application Server Configuration in detail after every five online monitor intervals. The software-provided tool 'jboss-cli.sh' is used to query the running JBoss Application Server to perform an in-depth health-check. Type and dimension: integer-scalar Default: 0
StartArgs	Additional startup arguments to pass to the JBoss Application Server startup script. The most common requirement could be the use of '-b 0.0.0.0' to enable remote administration. This attribute is applicable to JBoss Application Server 5.x.
StopArgs	Additional shutdown arguments to pass to the JBoss Application Server shutdown script. This attribute is applicable to JBoss Application Server 5.x.

Table A-2 Optional attributes *(continued)*

Attribute	Description
IMF	This resource type-level attribute determines whether the JBoss Application Server agent must perform intelligent resource monitoring. You can override the value of this attribute at the resource level. This attribute includes the following keys: ■ Mode: Define this attribute to enable or disable intelligent resource monitoring. Valid values are as follows: ■ 0: Does not perform intelligent resource monitoring ■ 1: Performs intelligent resource monitoring for offline resources and performs poll-based monitoring for online resources ■ 2: Performs intelligent resource monitoring for online resources and performs poll-based monitoring for offline resources ■ 3: Performs intelligent resource monitoring for both online and for offline resources. Type and dimension: integer-association Default value: 0 ■ MonitorFreq: This key value specifies the frequency at which the agent invokes the monitor agent function. The value of this key is an integer. Default: 1 You can set this key to a non-zero value for cases where the agent requires to perform both poll-based and intelligent resource monitoring. If the value is 0, the agent does not perform poll-based process check monitoring. After the resource registers with the AMF kernel driver, the agent calls the monitor agent function as follows: ■ After every (MonitorFreq x MonitorInterval) number of seconds for online resources ■ After every (MonitorFreq x OfflineMonitorInterval) number of seconds for offline resources ■ RegisterRetryLimit: If you enable intelligent resource monitoring, the agent invokes the `imf_register` agent function to register the resource with the AMF kernel driver. The value of the RegisterRetryLimit key determines the number of times the agent must retry registration for a resource. If the agent cannot register the resource within the limit that is specified, intelligent monitoring is disabled until the resource state changes or the value of the Mode key changes. Default: 3.

Table A-2 Optional attributes *(continued)*

Attribute	Description
IMFRegList	An ordered list of attributes whose values are registered with the IMF notification module. You can override the value of this attribute at the resource level. Type and dimension: string-vector Default: None

Appendix B

Detail monitoring

This appendix includes the following topics:

- Setting the PATH variable
- Setting up detail monitoring for ApplicationHA agent for JBoss Application Server

Setting the PATH variable

ApplicationHA 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 JBoss Application Server

This section describes the procedure to enable and disable detail monitoring for JBoss Application Server.

To enable detail monitoring for JBoss Application Server

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 JBoss_1_SG
```

3 Enable detail monitoring for JBoss Application Server resources by using the following ApplicationHA commands:

```
# hares -modify JBoss_1_res LevelTwoMonitorFreq frequency
```

Note: See "Attribute definition" on page 29. for more information about the LevelTwoMonitorFreq attribute.

4 Save the configuration and unfreeze the service group.

```
# hagrp -unfreeze JBoss_1_SG

# haconf -dump -makero
```

To disable detail monitoring for JBoss Application Server

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 JBoss_1_SG
```

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

```
# hares -modify JBoss_1_res LevelTwoMonitorFreq 0
```

4 Save the configuration and unfreeze the service group.

```
# hagrp -unfreeze JBoss_1_SG

# haconf -dump -makero
```