Symantec™ ApplicationHA 6.2 agent for DB2 Configuration Guide - Linux on KVM

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Symantec™ ApplicationHA Agent for DB2 Configuration Guide

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Contents

Chapter 1

Introducing the Symantec ApplicationHA agent for DB2

This chapter includes the following topics:

About the Symantec ApplicationHA agent for DB2

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

The Symantec ApplicationHA agent for DB2 provides high availability, controlling, and monitoring for DB2 instances.

Symantec agents do the following:

- Monitor specific resources within an enterprise application.
- Determine the status of these resources.

- Start or stop the resources according to external events.

The agents include resource type definitions and agent executables. The agent for DB2 monitors the DB2 server processes, brings them online, and takes them offline.

About installing and removing the ApplicationHA agent for DB2

When you install or uninstall Symantec ApplicationHA, the ApplicationHA agent for DB2 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 DB2 is automatically installed or removed. For more information, see the *Symantec ApplicationHA Agent Pack Installation Guide*.

Supported software

The Symantec ApplicationHA agent for DB2 supports the following software versions:

- Symantec ApplicationHA agent for DB2 can be installed and run inside virtual machines that have Symantec ApplicationHA 6.2 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 DB2 versions that Symantec ApplicationHA 6.2 currently supports on virtual machine.

Table 1-1 Supported application versions

Application	Version
DB2	9.5, 9.7, 10.1, and 10.5

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 6.2.

Table 1-2 Supported guest operating systems

Operating systems	Levels	Kernel version
Red Hat Enterprise Linux 6	Updates 3, 4, and 5	2.6.32-279.el6 2.6.32-358.el6 2.6.32-431
Red Hat Enterprise 7	-	3.10.0-123

Note: Only 64-bit operating systems are 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.

How the agent makes DB2 highly available

The Symantec ApplicationHA agent for DB2 continuously monitors the DB2 database processes to verify they function properly.

See "DB2 agent functions" on page 13.

The agent provides the following levels of application monitoring:

- Primary or Basic monitoring
  Basic monitoring includes Process check monitoring. With the Process check, the agent verifies that the DB2 process is present in the process table. Process check cannot detect whether process is in a hung state or a stopped state.

When a DB2 process terminates abnormally, the agent faults the DB2 resource of the corresponding DB2 instance.

The agent reports DB2 resource as offline if you gracefully bring down DB2 resource using the following command:

```
# hares -offline DB2_Resource_Name -sys System_Name
```

Note: ApplicationHA commands reside in the /opt/VRTS/bin directory. Add this directory to your PATH environment variable before running the ApplicationHA commands. See "Setting the PATH variable" on page 34.

The DB2 agent also supports IMF (Intelligent Monitoring Framework) in the process check mode of basic monitoring. IMF enables intelligent resource monitoring. The DB2 agent is IMF aware and uses asynchronous monitoring framework (AMF) kernel driver for resource state change notifications.

- Secondary or Detail monitoring

  In detail monitoring, the agent runs a perl script that executes commands against the database to verify its status in detail. Secondary or Detailed monitoring is disabled, by default. You can enable the same using the following command:

  ```
  # hares -modify DB2_Resource_Name IndepthMonitor 1
  ```

The agent detects application failure if the monitoring routine reports an improper function of the DB2 processes. When this application failure occurs, the agent attempts to restart the DB2 processes. After a configurable number of attempts, if the application services do not start, the agents consider this as an application failure and report the status to VCS. Depending on the configuration, VCS can then restart the virtual machine. After the machine restarts, the agent starts the application services and brings the configured resources online. The agent thus ensures high availability for the DB2 database server process.

Note: You can use the ApplicationHA wizards to configure only primary or basic monitoring, with Intelligent Monitoring Framework enabled. To configure secondary or detailed monitoring, use CLI/Veritas Operations Manager (VOM).

How the DB2 agent supports intelligent resource monitoring

With intelligent monitoring framework (IMF), ApplicationHA supports intelligent resource monitoring in addition to poll-based monitoring. Poll-based monitoring

polls the resources periodically whereas intelligent monitoring performs asynchronous monitoring. You can enable or disable the intelligent resource monitoring functionality of the VCS agents for DB2.

When an IMF-enabled agent starts up, the agent initializes the asynchronous monitoring framework (AMF) kernel driver. After the resource is in a steady state, the agent registers the details that are required to monitor the resource with the AMF kernel driver. For example, the DB2 agent registers the PIDs of the processes with the AMF kernel driver using its own imf_register function. The agent's imf_getnotification function waits for any resource state changes. When the AMF kernel driver module notifies the imf_getnotification function about a resource state change, the agent framework runs the monitor agent function to ascertain the state of that resource.The agent notifies the state change to ApplicationHA which then takes appropriate action.

DB2 agent functions

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

Table 1-3 lists the DB2 agent functions.

Table 1-3 DB2 agent functions

Agent operation	Description
Online	Starts the DB2 database process by using the following command: `db2start`
Offline	Stops the DB2 database process with the specified options by using the following command: `db2stop`
Monitor	Verifies the status of the DB2 database server processes. The DB2 agent provides two levels of monitoring: basic and detail. See "Monitor options for the DB2 agent" on page 14.
imf_init	Initializes the agent to interface with the AMF kernel driver, which is the IMF notification module for DB2 agent. This function runs when the agent starts up.
imf_ getnotification	Gets notification about resource state changes. This function runs after the agent initializes with the AMF kernel module. This function continuously waits for notification and takes action on the resource upon notification.

Table 1-3 DB2 agent functions *(continued)*

Agent operation	Description
imf_register	Registers or unregisters resource entities with the AMF kernel module. This function runs for each resource after the resource goes into steady state (online or offline).
Clean	Forcibly stops the DB2 database by using the following command: `db2stop force` If the process does not respond to the `db2stop force` command, then the agent does the following: ■ Scans the process table for the processes that are associated with the configured instance ■ Kills the processes that are associated with the configured instance ■ Cleans the IPC resources that the DB2 instance creates using the ipcclean utility provided by DB2

Monitor options for the DB2 agent

The DB2 agent provides two levels of monitoring: basic and detail. By default, the agent does a basic monitoring.

Table 1-4 describes the monitoring options.

Table 1-4 Monitoring options

Option	Description
0 (Default)	Basic monitoring (Process check) The agent scans the process table for the db2sysc process to verify that DB2 is running.
1	Detail monitoring Detail monitoring provides a higher level of confidence in the availability of the instance or partition and its database. It sends additional queries to the database, to verify whether the database is available. For information about the IndepthMonitor attribute, you can refer to the following section: See "Attribute definition for the DB2 agent" on page 28.

Note: ApplicationHA wizards configure DB2 for Basic monitoring, with Intelligent Monitoring Framework enabled. To enable detailed monitoring, use CLI/Veritas Operation Manager (VOM).

How the agent handles DB2 error codes during detail monitoring

The Symantec ApplicationHA agent for DB2 comes with enhanced ability to handle DB2 errors during detail monitoring. The agent classifies DB2 errors according to their severity and associates predefined actions with each error code. You can create a custom error handling file, db2error.dat. The file lists the DB2 errors and the associated actions that the agent should take when it encounters an error.

The file stores information in the following format:

```
SQL_error_string:action_to_be_taken
```

For example:

```
SQL1034N: IGNORE
SQL1039N: WARN
```

Table 1-5 lists the predefined actions that the agent takes when a DB2 error is encountered.

Table 1-5 Predefined agent actions for DB2 errors

Action	Description
IGNORE	Ignores the error.
UNKNOWN	Marks the resource state as UNKNOWN and sends a notification if the Notifier resource is configured. For more information about VCS notification, refer to the *Symantec Cluster Server Administrator's Guide*. This action is typically associated with configuration errors.
WARN	Marks the resource state as ONLINE and sends a notification if the Notifier resource is configured. This action is typically associated with low-severity errors.

About setting up DB2 in a ApplicationHA virtual machine

Tasks involved in setting up DB2 in an ApplicationHA environment include:

- Setting up an ApplicationHA virtual machine

Refer to *Symantec ApplicationHA Installation Guide* for more information on installing and configuring ApplicationHA.

- Installing DB2 in an ApplicationHA environment
  See "Installing DB2 in an ApplicationHA environment" on page 17.
- Configuring application monitoring with ApplicationHA
  See "Configuring application monitoring for DB2" on page 21.

Chapter 2

Installing and configuring DB2

This chapter includes the following topics:

Before you install DB2 in an ApplicationHA environment

Make sure you meet the following prerequisites:

- Verify that all virtual machines have adequate resources to run DB2 and ApplicationHA.
- Verify that the network supports the TCP/IP protocol.
- Make sure that you meet the ApplicationHA requirements to install DB2.

Installing DB2 in an ApplicationHA environment

This section demonstrates how to install DB2 in an ApplicationHA environment.

To install DB2 in ApplicationHA environment

1. Set shared memory parameters. Refer to the relevant IBM DB2 UDB guide to make sure that memory requirements are met.
2. Install the binaries. Install the DB2 UDB system binaries on local disks. You can use IBM's db2setup tool.

   Note: For installing DB2, Symantec recommends that you follow the installation procedure in the relevant IBM DB2 UDB guide.

3. Install the database instances on the local disks. You can use IBM's db2setup tool.

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 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
- After configuring DB2 for monitoring, if you create another DB2 instance, this new instance is 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 DB2

Ensure that you complete the following tasks before configuring application monitoring for DB2 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 20.
- 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 DB2

Perform the following steps to configure monitoring for DB2 on a virtual machine.

To configure application monitoring for DB2

1. In the Symantec High Availability view of the VOM 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. On the Application Selection page, click **DB2 Database Server** in the Supported Applications list.

Note: The wizard configures ApplicationHA to monitor DB2 instances with Intelligent Monitoring Framework (IMF).

---

4 On the DB2 instance Selection panel, review the information on the listed DB2 instances.

DB2 Instance Home	Home directory of the created DB2 instance.
DB2 Instance Owner	Owner of the DB2 Database instance.
Partition Number	Partition number or node number of the db2sysc process.

5 On the DB2 Instance Selection screen, select the partition number of the DB2 instances that you want to monitor and then click **Configure**.

6 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 **Diagnostic information** to check the details of the failure.

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

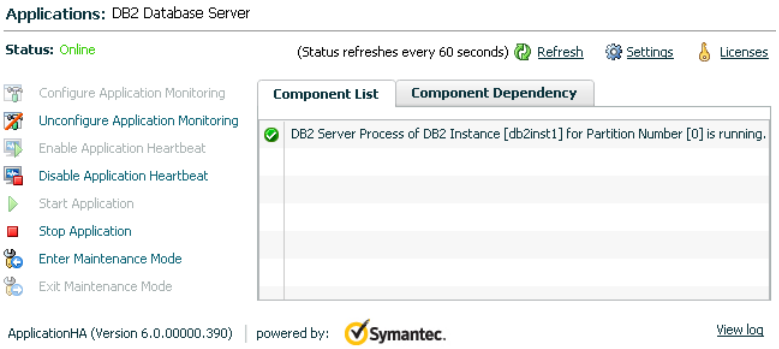
---

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

This completes the application monitoring configuration.

8 To view the status of the configured application on a virtual machine, on the VOM Management Server console, right-click the appropriate virtual machine and then click **Manage ApplicationHA**.

The Symantec High Availability view appears.

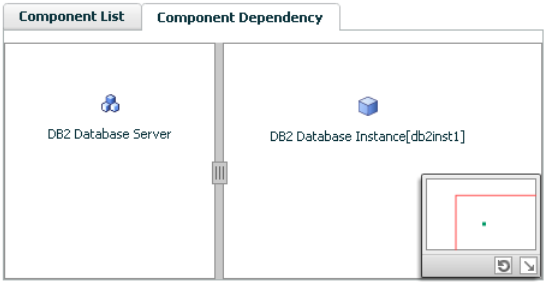


By default, the Component List tab appears. The tab lists each component of the configured application and the status description of each component.

For more information on viewing and administering applications through the Veritas Operations Manager, see the *Symantec ApplicationHA User's Guide*.

9 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 Symantec ApplicationHA agent for DB2

This chapter includes the following topics:

About troubleshooting ApplicationHA agent for DB2

Review the information on the error logs that you must access:

- To check the ApplicationHA log file, you must access:

  `/var/VRTSvcs/log/AppControlOperations_A.log`

  `/var/VRTSvcs/log/engine_A.log`

- To check the ApplicationHA DB2 agent log file, you must access:

  `/var/VRTSvcs/log/Db2udb_A.log`

These files contain all the actions that the ApplicationHA engine and the agent for DB2 perform.

Error messages specific to the DB2 agent

Table 4-1 lists the error messages for the ApplicationHA agent for DB2 with the description and a recommended solution, if available.

Table 4-1 DB2 agent error messages

Message	Description and solution
Custom monitor script monitor_custom_db2inst1_0 does not exist. Sample custom monitor script can be found in /etc/VRTSagents/ha/conf/Db2udb/sample_db2udb directory.	The custom monitor script cannot be found in the agent installation directory /opt/VRTSagents/ha/bin. Solution: Copy the custom monitor script "monitor_custom_db2inst1_0" from /etc/VRTSagents/ha/conf/Db2udb/sample_db2udb into the agent directory /opt/VRTSagents/ha/bin/Db2udb.
Custom online script online_custom_db2inst1_0 does not exist. Sample custom online script can be found in /etc/VRTSagents/ha/conf/Db2udb/sample_db2udb directory.	The custom online script cannot be found in the agent installation directory /opt/VRTSagents/ha/bin. Solution: Copy the custom online script "online_custom_db2inst1_0" from /etc/VRTSagents/ha/conf/Db2udb/sample_db2udb into the agent directory /opt/VRTSagents/ha/bin/Db2udb.
Custom offline script offline_custom_db2inst1_0 does not exist. Sample custom offline script can be found in /etc/VRTSagents/ha/conf/Db2udb/sample_db2udb directory.	The custom offline script cannot be found in the agent installation directory /opt/VRTSagents/ha/bin. Solution: Copy the custom offline script "offline_custom_db2inst1_0" from /etc/VRTSagents/ha/conf/Db2udb/sample_db2udb into the agent directory /opt/VRTSagents/ha/bin/Db2udb.

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 the DB2 agent

The ApplicationHA agent for DB2 is represented by the DB2 resource type in ApplicationHA.

```
type Db2udb (
        static str AgentDirectory = "/opt/VRTSagents/ha/bin/Db2udb"
        static str AgentFile = "/opt/VRTSagents/ha/bin/Db2udb/Db2udbAgent"
        static keylist SupportedActions = {
        VRTS_GetInstanceName,
        VRTS_GetRunningServices }
        static int CleanTimeout = 240
        static int MonitorTimeout = 240
        static int OfflineTimeout = 240
        static int OnlineRetryLimit = 2
        static int OnlineTimeout = 180
```

```
        static int OnlineWaitLimit = 1
        static int RestartLimit = 3
        static int ToleranceLimit = 1
        static str ArgList[] = {
        DB2InstOwner, DB2InstHome, IndepthMonitor,
        DatabaseName, NodeNumber, StartUpOpt, ShutDownOpt,
        AgentDebug, Encoding, WarnOnlyIfDBQueryFailed,
        LastWarningDay, UseDB2start }
        static int IMF{} = { Mode=2, MonitorFreq=5, RegisterRetryLimit=3 }
        static str IMFRegList[] = { DB2InstOwner, DB2InstHome }
        str DB2InstOwner
        str DB2InstHome
        int IndepthMonitor
        str DatabaseName
        int NodeNumber
        str StartUpOpt = START
        str ShutDownOpt = STOP
        boolean AgentDebug = 0
        str Encoding
        boolean WarnOnlyIfDBQueryFailed = 1
        temp str LastWarningDay
        boolean UseDB2start = 0
)
```

Attribute definition for the DB2 agent

Review the description of the DB2 agent attributes. The agent attributes are classified as required, optional, and internal.

Table A-1 shows the required attributes for the agent for DB2, you must assign values to required attributes.

Table A-1 Required attributes for the agent for DB2

Required attributes	Description
DB2InstHome	Path to DB2 UDB instance home directory that contains critical data and configuration files for the DB2 instance. Type and dimension: string-scalar

Table A-1 Required attributes for the agent for DB2 *(continued)*

Required attributes	Description
DB2InstOwner	User ID of Instance Owner that starts a DB2 UDB instance. Each instance requires a unique user ID. Type and dimension: string-scalar **Warning:** Incorrect changes to this attribute can result in DB2 entering an inconsistent state.

Table A-2 shows the optional attributes for the agent for DB2.

Table A-2 Optional attributes for the agent for DB2

Optional attributes	Description
DatabaseName	Name of the database for detail monitoring; required if detail monitoring is enabled (IndepthMonitor = 1). Be careful when you change the DatabaseName attribute as you can fault all the partitions in the database. Do not change the DataBaseName attribute to an invalid or an incorrect value. **Note:** Make sure the database with the provided DatabaseName has been created in the same partition for which the Db2udb agent resource has been configured. Type and dimension: string-scalar
NodeNumber	Node number or partition number of the database. Used when monitoring a specific database partition. Default: 0 Type and dimension: integer-scalar

Table A-2 Optional attributes for the agent for DB2 *(continued)*

Optional attributes	Description
StartUpOpt	Provides start up options. The allowed values are: START, ACTIVATEDB, or CUSTOM. Review the following options: ■ START (default) Starts the DB2 instance or partition. ■ ACTIVATEDB Performs activate database command after db2 processes start. ■ CUSTOM The agent leaves all the online function completely to the user when the StartUpOpt attribute is set to CUSTOM. It looks for a file named start_custom_$db2instance_$nodenum in the /opt/VRTSagents/ha/bin/Db2udb directory. If this file exists and is executable, it executes this customized online file instead. Example: To customize the online function for partition/nodenum 1 for the db2 instance named db2inst1, the agent for DB2 runs this customized file start_custom_db2inst1_1. It runs this file under the /opt/VRTSagents/ha/bin/Db2udb directory. Type and dimension: string-scalar

Table A-2 Optional attributes for the agent for DB2 *(continued)*

Optional attributes	Description
ShutDownOpt	The allowed values for this attribute are STOP and CUSTOM. Review the following options: ■ STOP Shuts the DB2 instance or partition down in the usual way. ■ CUSTOM Leaves all the offline function completely to the user when the ShutDownOpt is set to CUSTOM. It looks for a file named stop_custom_$db2instance_$nodenum in the /opt/VRTSagents/ha/bin/Db2udb directory. If this file exists and is executable, it executes this customized offline file instead. Example: You want to customize the offline function for partition/nodenum 0 for the db2 instance named db2inst1. You have the agent for DB2 run this customized file: stop_custom_db2inst1_0. The file is in the /opt/VRTSagents/ha/bin/Db2udb directory. Type and dimension: string-scalar
IndepthMonitor	Set the value of the IndepthMonitor attribute to 1 to enable in-depth monitoring. The agent now looks for the monitor_custom_$db2instance_$nodenum file in the /opt/VRTSagents/ha/bin/Db2udb directory. It executes the customized in-depth monitor file if the file exists and is executable. You can find samples of custom monitor scripts in the sample_db2udb directory. Type and dimension: string-integer
Encoding	Specifies the operating system encoding corresponding to DB2 UDB encoding for display of DB2 UDB output. Type and dimension: string-scalar
AgentDebug	When the value of this attribute is 1, it causes the agent to log additional debug messages. Type and dimension: boolean-scalar

Table A-2 Optional attributes for the agent for DB2 *(continued)*

Optional attributes	Description
WarnOnlyIfDBQueryFailed	This attribute either logs SQL errors, or checks the errors to handle them specially. Set the value of the WarnOnlyIfDBQueryFailed attribute to 1 to enable it. When this attribute is enabled, it ignores all SQL errors and logs a warning message in the agent log once a day. Set the value of the WarnOnlyIfDBQueryFailed attribute to 0 to disable it. When disabled, it checks if an error code needs to be handled specially in the db2error.dat file. If the error code does not exist in the db2error.dat file, then it returns OFFLINE for monitor. Otherwise, it follows the action of that particular error code in the db2error.dat file. Type and dimension: boolean-scalar
UseDB2start	Enables you to choose an alternate way to start DB manager. The agent executes the db2start when UseDBStart is set to 1, whereas it uses db2gcf when UseDBStart is set to 0. Type and dimension: boolean-scalar Default: 0

Table A-3 shows the internal attributes for the agent for DB2.

Table A-3 Internal attribute for the agent for DB2

Internal attributes	Description
IMF	This resource-type level attribute determines whether the DB2 agent must perform intelligent resource monitoring. 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 Default: 2 ■ 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: 5 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 theAMF 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, then intelligent monitoring is disabled until the resource state changes or the value of the Mode key changes. Default: 3

Appendix B

Detail monitoring

This appendix includes the following topics:

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 a DB2 instance

Primary or basic monitoring of a DB2 instance involves checking the exit status of the `db2gcf` command. In contrast, detail monitoring provides a higher level of confidence in the availability of the instance or partition and its database. It makes additional queries to the database to verify whether the database is available.

You can dynamically configure detail monitoring. Symantec recommends that you successfully run DB2 with the agent's default monitoring before you start the detail monitoring. You need to have custom monitoring scripts.

For information on the IndepthMonitor attribute:

See “Attribute definition for the DB2 agent” on page 28.

To start the detail monitoring for a given instance

1 Make the ApplicationHA configuration writable:

```
# haconf -makerw
```

2 Freeze the service group so ApplicationHA does not perform actions automatically based on an incomplete reconfiguration:

```
# hagrp -freeze Db2_ServiceGroup
```

3 Enable detail monitoring using the command:

```
# hares -modify Db2_resource DatabaseName Database_name

# hares -modify Db2_resource IndepthMonitor 1
```

4 Unfreeze the service group:

```
# hagrp -unfreeze Db2_ServiceGroup
```

5 Make the ApplicationHA configuration read-only:

```
# haconf -dump -makero
```

For example:

```
# haconf -makerw
# hagrp -freeze Db2_1_SG
# hares -modify Db2_1_res DatabaseName SAMPLE
# hares -modify Db2_1_res IndepthMonitor 1
# hagrp -unfreeze Db2_1_SG
# haconf -dump -makero
```

To disable detail monitoring

- Set the IndepthMonitor attribute to 0.

```
# hares -modify Db2_resource IndepthMonitor 0
```