

# Symantec™ ApplicationHA 6.2 agent for DB2 Configuration Guide - AIX on IBM PowerVM

# Symantec™ ApplicationHA Agent for DB2 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: 6.2

Document version: 6.2 Rev 1

## Legal Notice

Copyright © 2014 Symantec Corporation. All rights reserved.

Symantec, the Symantec Logo, the Checkmark Logo, Veritas, Veritas Storage Foundation, CommandCentral, NetBackup, Enterprise Vault, and LiveUpdate are trademarks or registered trademarks of Symantec Corporation or its affiliates in the U.S. and other countries. Other names may be trademarks of their respective owners.

The product described in this document is distributed under licenses restricting its use, copying, distribution, and decompilation/reverse engineering. No part of this document may be reproduced in any form by any means without prior written authorization of Symantec Corporation and its licensors, if any.

THE DOCUMENTATION IS PROVIDED "AS IS" AND ALL EXPRESS OR IMPLIED CONDITIONS, REPRESENTATIONS AND WARRANTIES, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT, ARE DISCLAIMED, EXCEPT TO THE EXTENT THAT SUCH DISCLAIMERS ARE HELD TO BE LEGALLY INVALID. SYMANTEC CORPORATION SHALL NOT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES IN CONNECTION WITH THE FURNISHING, PERFORMANCE, OR USE OF THIS DOCUMENTATION. THE INFORMATION CONTAINED IN THIS DOCUMENTATION IS SUBJECT TO CHANGE WITHOUT NOTICE.

The Licensed Software and Documentation are deemed to be commercial computer software as defined in FAR 12.212 and subject to restricted rights as defined in FAR Section 52.227-19 "Commercial Computer Software - Restricted Rights" and DFARS 227.7202, "Rights in Commercial Computer Software or Commercial Computer Software Documentation", as applicable, and any successor regulations, whether delivered by Symantec as on premises or hosted services. Any use, modification, reproduction release, performance, display or disclosure of the Licensed Software and Documentation by the U.S. Government shall be solely in accordance with the terms of this Agreement.

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](http://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](http://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/](http://www.symantec.com/business/support/)

## Customer service

Customer service information is available at the following URL:

[www.symantec.com/business/support/](http://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	<a href="mailto:customercare_apj@symantec.com">customercare_apj@symantec.com</a>
Europe, Middle-East, and Africa	<a href="mailto:semea@symantec.com">semea@symantec.com</a>
North America and Latin America	<a href="mailto:supportsolutions@symantec.com">supportsolutions@symantec.com</a>

## 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](mailto: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

Technical Support .....	4	
Chapter 1	Introducing the Symantec ApplicationHA agent for DB2 .....	9
	About the Symantec ApplicationHA agent for DB2 .....	9
	About installing and removing the ApplicationHA agent for DB2 .....	10
	Supported software .....	10
	Supported application versions .....	10
	Supported virtualization environments .....	11
	Supported operating systems on managed LPARs .....	11
	How the agent makes DB2 highly available .....	11
	How the DB2 agent supports intelligent resource monitoring .....	12
	DB2 agent functions .....	13
	Monitor options for the DB2 agent .....	14
	How the agent handles DB2 error codes during detail monitoring .....	15
	About setting up DB2 in a ApplicationHA managed LPAR .....	15
Chapter 2	Installing and configuring DB2 .....	17
	Before you install DB2 in an ApplicationHA environment .....	17
	Installing DB2 in an ApplicationHA environment .....	17
Chapter 3	Configuring application monitoring with Symantec ApplicationHA .....	19
	About configuring application monitoring with ApplicationHA .....	19
	Before configuring application monitoring for DB2 .....	20
	Accessing the Symantec High Availability view .....	20
	Configuring application monitoring for DB2 .....	21
Chapter 4	Troubleshooting Symantec ApplicationHA agent for DB2 .....	25
	About troubleshooting ApplicationHA agent for DB2 .....	25
	Error messages specific to the DB2 agent .....	26

Appendix A	Resource type definitions .....	27
	About the resource type and attribute definitions .....	27
	Resource type definition for the DB2 agent .....	27
	Attribute definition for the DB2 agent .....	28
Appendix B	Detail monitoring .....	34
	Setting the PATH variable .....	34
	Setting up detail monitoring for a DB2 instance .....	34



# Introducing the Symantec ApplicationHA agent for DB2

This chapter includes the following topics:

- [About the Symantec ApplicationHA agent for DB2](#)
- [About installing and removing the ApplicationHA agent for DB2](#)
- [Supported software](#)
- [How the agent makes DB2 highly available](#)
- [How the DB2 agent supports intelligent resource monitoring](#)
- [DB2 agent functions](#)
- [About setting up DB2 in a ApplicationHA managed LPAR](#)

## 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 managed LPARs 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 AIX: 6.0 or later

## Supported application versions

[Table 1-1](#) lists the DB2 versions that Symantec ApplicationHA 6.2 currently supports on managed LPAR.

**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 managed LPARs in a IBM PowerVM virtualization environment, having:

- HMC version 7.7.0 and above
- VIOS version 2.2.0.0 and above

## Supported operating systems on managed LPARs

This section lists the supported operating systems for Symantec ApplicationHA 6.2.

[Table 1-2](#) shows the supported operating systems for this release.

**Table 1-2** Supported guest operating systems

Operating systems	Levels	Chipsets
AIX 7.1	7100-02-03-1334 or later	Any chipset that the operating system supports
AIX 6.1	6100-08-03-1339 or later	Power 7, Power 6, or earlier

**Note:** Ensure that the latest technology levels and service pack levels of AIX are installed on the managed LPARs. APAR IV48325 is recommended.

## 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 managed LPAR. 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: <code>db2start</code>
Offline	Stops the DB2 database process with the specified options by using the following command: <code>db2stop</code>
Monitor	Verifies the status of the DB2 database server processes. The DB2 agent provides two levels of monitoring: basic and detail. See <a href="#">“Monitor options for the DB2 agent”</a> on page 14.
<code>imf_init</code>	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.
<code>imf_getnotification</code>	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.
<code>imf_register</code>	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).

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

Agent operation	Description
Clean	<p>Forcibly stops the DB2 database by using the following command:</p> <pre>db2stop force</pre> <p>If the process does not respond to the <code>db2stop force</code> command, then the agent does the following:</p> <ul style="list-style-type: none"> <li>■ Scans the process table for the processes that are associated with the configured instance</li> <li>■ Kills the processes that are associated with the configured instance</li> <li>■ Cleans the IPC resources that the DB2 instance creates using the <code>ipcclean</code> utility provided by DB2</li> </ul>

## 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)	<p>Basic monitoring (Process check)</p> <p>The agent scans the process table for the <code>db2sysc</code> process to verify that DB2 is running.</p>
1	<p>Detail monitoring</p> <p>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.</p> <p>For information about the <code>IndepthMonitor</code> attribute, you can refer to the following section:</p> <p>See <a href="#">“Attribute definition for the DB2 agent”</a> on page 28.</p>

---

**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 <i>Symantec Cluster Server Administrator's Guide</i> . 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 managed LPAR

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

- Setting up an ApplicationHA managed LPAR  
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.



# Installing and configuring DB2

This chapter includes the following topics:

- [Before you install DB2 in an ApplicationHA environment](#)
- [Installing DB2 in an ApplicationHA environment](#)

## Before you install DB2 in an ApplicationHA environment

Make sure you meet the following prerequisites:

- Verify that all managed LPARs 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.

# Configuring application monitoring with Symantec ApplicationHA

This chapter includes the following topics:

- [About configuring application monitoring with ApplicationHA](#)
- [Before configuring application monitoring for DB2](#)
- [Accessing the Symantec High Availability view](#)
- [Configuring application monitoring for DB2](#)

## 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 managed LPAR 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 managed LPAR.

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 managed LPAR, 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 managed LPAR:

- 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 managed LPAR that you need to monitor.
- Assign ApplicationHA - Configure Application Monitoring (Admin) privileges to the logged-on user on the managed LPAR where you want to configure application monitoring.
- Install the application and the associated components that you wish to monitor on the managed LPAR.
- 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 managed LPAR that is running in the IBM PowerVM 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 managed LPAR.
- 4 Right-click the required managed LPAR, 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 managed LPAR.

**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.

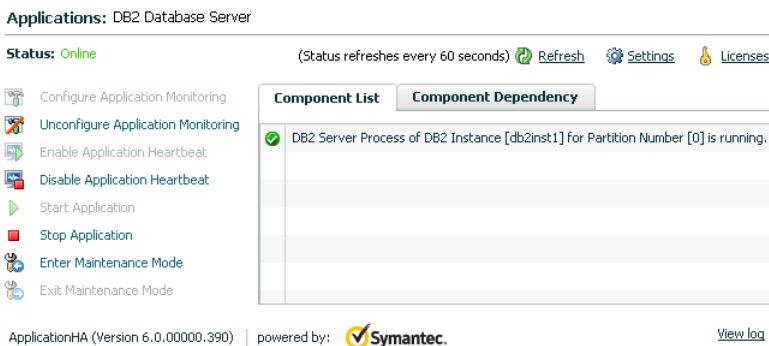
You then have to run the wizard again to configure the application monitoring.

---

- 7 Click **Finish** to complete the wizard.  
This completes the application monitoring configuration.

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

The Symantec High Availability view appears.

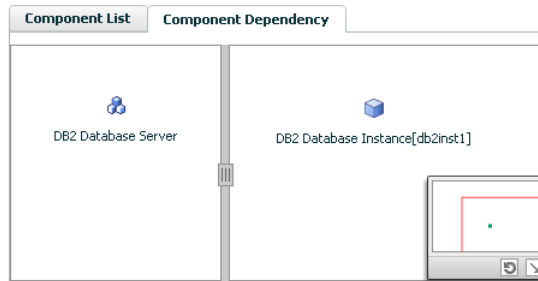


By default, the Component List tab appears. The tab lists each component of the configured application and the status description of each component.

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*.



# Troubleshooting Symantec ApplicationHA agent for DB2

This chapter includes the following topics:

- [About troubleshooting ApplicationHA agent for DB2](#)
- [Error messages specific to the DB2 agent](#)

## 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.

# Resource type definitions

This appendix includes the following topics:

- [About the resource type and attribute definitions](#)
- [Resource type definition for the DB2 agent](#)
- [Attribute definition for the DB2 agent](#)

## 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  <b>Warning:</b> 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.  <b>Note:</b> 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	<p>Provides start up options. The allowed values are: START, ACTIVATEDB, or CUSTOM.</p> <p>Review the following options:</p> <ul style="list-style-type: none"><li>■ START (default) Starts the DB2 instance or partition.</li><li>■ ACTIVATEDB Performs activate database command after db2 processes start.</li><li>■ 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 <code>start_custom_\${db2instance}_\${nodenum}</code> in the <code>/opt/VRTSagents/ha/bin/Db2udb</code> directory. If this file exists and is executable, it executes this customized online file instead.</li></ul> <p>Example:</p> <p>To customize the online function for partition/nodenum 1 for the db2 instance named db2inst1, the agent for DB2 runs this customized file <code>start_custom_db2inst1_1</code>. It runs this file under the <code>/opt/VRTSagents/ha/bin/Db2udb</code> directory.</p> <p>Type and dimension: string-scalar</p>

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

Optional attributes	Description
ShutDownOpt	<p>The allowed values for this attribute are STOP and CUSTOM. Review the following options:</p> <ul style="list-style-type: none"> <li>■ STOP Shuts the DB2 instance or partition down in the usual way.</li> <li>■ 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.</li> </ul> <p>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.</p> <p>Type and dimension: string-scalar</p>
IndepthMonitor	<p>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.</p> <p>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.</p> <p>Type and dimension: string-integer</p>
Encoding	<p>Specifies the operating system encoding corresponding to DB2 UDB encoding for display of DB2 UDB output.</p> <p>Type and dimension: string-scalar</p>
AgentDebug	<p>When the value of this attribute is 1, it causes the agent to log additional debug messages.</p> <p>Type and dimension: boolean-scalar</p>

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

Optional attributes	Description
WarnOnlyIfDBQueryFailed	<p>This attribute either logs SQL errors, or checks the errors to handle them specially.</p> <p>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.</p> <p>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.</p> <p>Type and dimension: boolean-scalar</p>
UseDB2start	<p>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.</p> <p>Type and dimension: boolean-scalar</p> <p>Default: 0</p>

[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	<p>This resource-type level attribute determines whether the DB2 agent must perform intelligent resource monitoring.</p> <p>This attribute includes the following keys:</p> <ul style="list-style-type: none"> <li>■ <b>Mode:</b> Define this attribute to enable or disable intelligent resource monitoring. Valid values are as follows: <ul style="list-style-type: none"> <li>■ 0—Does not perform intelligent resource monitoring</li> <li>■ 1—Performs intelligent resource monitoring for offline resources and performs poll-based monitoring for online resources</li> <li>■ 2—Performs intelligent resource monitoring for online resources and performs poll-based monitoring for offline resources</li> <li>■ 3—Performs intelligent resource monitoring for both online and for offline resources</li> </ul>                     Default: 2                 </li> <li>■ <b>MonitorFreq:</b> 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</li> </ul> <p>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.</p> <p>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:</p> <ul style="list-style-type: none"> <li>■ After every (MonitorFreq x MonitorInterval) number of seconds for online resources</li> <li>■ After every (MonitorFreq x OfflineMonitorInterval) number of seconds for offline resources</li> </ul> <ul style="list-style-type: none"> <li>■ <b>RegisterRetryLimit:</b> If you enable intelligent resource monitoring, the agent invokes the <code>imf_register</code> 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, then intelligent monitoring is disabled until the resource state changes or the value of the Mode key changes. Default: 3</li> </ul>

# Detail monitoring

This appendix includes the following topics:

- [Setting the PATH variable](#)
- [Setting up detail monitoring for a DB2 instance](#)

## 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:

```
# hagrps -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:

```
# hagrps -unfreeze Db2_ServiceGroup
```

- 5 Make the ApplicationHA configuration read-only:

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

For example:

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

**To disable detail monitoring**

- ◆ Set the IndepthMonitor attribute to 0.

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