Veritas™ High Availability Agent for IBM Informix Dynamic Server Installation and Configuration Guide

AIX, HP-UX, Linux, Solaris

5.0

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Veritas High Availability Agent for IBM Informix Dynamic Server Installation and Configuration Guide

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Chapter 1

Introducing the Veritas High Availability Agent for IBM Informix Dynamic Server

This chapter includes the following topics:

About the Veritas agent for IBM Informix Dynamic Server

The Veritas agent for Informix Dynamic Server provides high availability for all Informix Dynamic Servers in a cluster.

See the following Technical Support TechNote for the latest updates or software issues for this agent:

http://seer.entsupport.symantec.com/docs/282004.htm

Features of the Veritas agent for IBM Informix Dynamic Server

The following are the features of the Veritas agent for IBM Informix Dynamic Server:

- Support for validation of attributes that are based on agent functions.
  The agent can validate attributes in each agent function before the actual data processing starts.
- Support for First Failure Data Capture (FFDC)
  In case of a fault, the agent generates a huge volume of the debug logs that enable troubleshooting of the fault.
- Support for Fast First Level Monitor (FFLM)
  The agent maintains PID files based on search patterns to expedite the monitoring process.
- Support for external user-supplied monitor utilities
  The agent enables user-specified monitor utilities to be plugged in, in addition to the built-in monitoring logic. This enables administrators to completely customize the monitoring of the application.
- Delayed agent function
  The agent manages the first monitor after online for slow initializing applications.

What's new in this agent

The old Enterprise Agent for IBM Informix bundled along with VCS 3.5 has been phased out and replaced by this ACCLib based agent. Hence the following attributes are no longer applicable:

- Server
- Home
- ConfigFile
- Version
- MonScript

For more information on applicable attributes,

See "Informix Dynamic Server agent attributes" on page 23.

Supported software

The Veritas agent for Informix Dynamic Server supports the following software versions:

Veritas Cluster Server	VCS 4.0, 4.1, 5.0
ACC Library	5.1.4.0 and later
Operating Systems	AIX 5.3 on pSeries
	HP-UX 11iv2 on PA-RISC
	Red Hat Enterprise Linux 4.0, 5.0 on Intel
	Solaris 8, 9, 10 on SPARC
Informix Dynamic Server	7.31, 9.21, 9.30, 9.40, 10.0, 11.10, 11.50
	and all intermediate minor versions such as 7.31.UD10, 11.50.FC1, and so on.

About the Informix Dynamic Server

Informix Dynamic Server is a multithreaded relational database server that exploits symmetric multiprocessor (SMP) and uniprocessor architectures. The Dynamic Server is a database server that processes requests for data from client applications. The client is an application program that you run to request information from a database.

The database server accesses the requested information from its databases and sends back the results to the client applications. Accessing the database includes activities such as coordinating concurrent requests from multiple clients, performing read and write operations to the databases, and enforcing physical and logical consistency on the data.

The Dynamic Server provides the following features:

- Client/Server architecture
- Scalability
- High performance
- Fault tolerance and high availability
- Dynamic system administration
- Distributed data queries
- Database server security

Informix Dynamic Server agent functions

The agent consists of resource type declarations and agent executables. The agent executables implement the online, offline, monitor and clean operations.

Online

The online operation performs the following tasks:

- Verifies that the required attributes are set correctly.
- Verifies whether the Informix Dynamic Server instance is not already online. If the instance is online, the online operation exits immediately.
- Executes the following command in context of the user 'informix', to remove any existing IPC resources associated with the Database Server instance:

  ```
  $ InformixDir/bin/onmode -ky
  ```

- Executes the following command, in context of the user 'informix', to start the Informix Dynamic Server instance:

  ```
  $ InformixDir/bin/oninit -y 1> /dev/null 2>&1
  ```

- Verifies whether the Informix Dynamic Server is completely functional.
- Returns the control to HAD.

Offline

The offline operation performs the following tasks:

- Verifies that the required attributes are set correctly.
- Verifies that the Informix Dynamic Server instance is not offline. If the instance is already offline, the operation exits immediately.
- Executes the following command, in context of the user 'informix' to stop the Informix Dynamic Server instance.

  ```
  $ InformixDir/bin/onmode -ky
  ```

- Performs the following actions, if the execution of the offline script fails:
  - Kills any existing processes that belong to this instance of Informix Dynamic Server.
  - Removes any shared memory resources associated with the existing Informix Dynamic Server instance.
- Returns the control to HAD.

Monitor

The monitor operation monitors the states of the Informix Dynamic Servers on all nodes within the cluster.

The operation performs the following tasks:

- Conducts a first level check to determine that the Informix Dynamic Server processes are running on the system in the cluster. If the first level check does not find these processes running on the node, the check exits immediately, and reports the instance as offline.
- Conducts a second level check if the SecondLevelMonitor attribute is set to a value greater than 0.
  During this check agent executes the following command in context of the user 'informix' to verify that the Informix Dynamic Server is completely functional.
  ```
  $ InformixDir/bin/onstat -
  ```
- Depending upon the MonitorProgram attribute, the monitor operation performs a customized check using a user-supplied monitoring utility.
  See "Executing a customized monitoring program" on page 25.

Clean

The clean operation performs the following tasks in the event of a failure or an unsuccessful attempt to bring an Informix Dynamic Server instance online or take it offline:

- Attempts to gracefully shut down the Informix Dynamic Server instance, using the following command in context of the user 'informix'.
  ```
  $ InformixDir/bin/onmode -ky
  ```
- Performs the following actions, if the instance does not shut down normally:
  - Kills the remaining processes pertaining to this instance of the Informix Dynamic Server.
  - Removes any shared memory resources associated with the existing Informix Dynamic Server instance.
- Returns the control to HAD.

Chapter 2

Installing, upgrading, and removing the agent for IBM Informix Dynamic Server

This chapter includes the following topics:

Before you install the Veritas agent for IBM Informix Dynamic Server

You must install the Veritas agent for IBM Informix Dynamic Server on all the systems that will host an IBM Informix Dynamic Server service group. Ensure that you meet the following prerequisites to install the agent for IBM Informix Dynamic Server.

- Install and configure Veritas Cluster Server.
- Remove the old Informix agent, if installed.
- Install the latest version of ACC Library.

To install or update the ACC Library package, locate the library and related documentation on the agentpack disc.
See "About ACC Library" on page 16.

- Ensure that the 'informix' login belonging to the group 'informix', with identical user and group ids exist on all systems that host the Informix Dynamic Server.
- Ensure that all the systems have sufficient shared memory to run the Informix Dynamic Server.

Prerequisites for installing the agent to support Solaris zones

Ensure that you meet the following prerequisites to install the agent for IBM Informix Dynamic Server:

- Install Informix to support Solaris zones. For details refer to the Informix user documentation.
- Install and configure the VCS 5.0 environment to support Solaris zones. Refer to the VCS user documentation for details.
- Install the required version of ACC Library.

About ACC Library

The operations for the Veritas agent for IBM Informix Dynamic Server depend on a set of Perl modules known as the ACC library. The library must be installed on each system in the cluster that will run the agent for IBM Informix Dynamic Server. The ACC library contains common, reusable functions that perform tasks, such as process identification, logging, and system calls.

Installing the ACC library

Install the ACC library on each system in the cluster that runs an agent that depends on the ACC library.

To install the ACC library

1. Log in as superuser.
2. Navigate to the pkgs directory (the pkgs directory on the CD).

AIX	*cd_mount*/aix/application/acc_library/vcs/*version*_library/pkgs
HP-UX	*cd_mount*/hpux/generic/application/acc_library/vcs/*version*_library/pkgs
Linux	*cd_mount*/linux/generic/application/acc_library/vcs/*version*_library/rpms
Solaris	*cd_mount*/solaris/*dist_arch*/application/acc_library/vcs/*version*_library/pkgs where *dist_arch* is sparc or sol_x64.

3. Install the package. Enter **Yes** if asked to confirm overwriting of files in the existing package.

AIX	`# installp -ac -d VRTSacclib.rte.bff VRTSacclib.rte`
HP-UX	`# swinstall -s 'pwd' VRTSacclib`
Linux	`# rpm -i \` `VRTSacclib-VersionNumber-GA_GENERIC.noarch.rpm`
Solaris	`# pkgadd -d . VRTSacclib`

4. For HP-UX, install the HP-UX patch PHCO_29042 if it is not already installed.

Installing the agent in a VCS environment

Install the agent for IBM Informix Dynamic Server on each node in the cluster.

To install the agent

1. Log in as superuser.
2. Navigate to the directory containing the package for the platform running in your environment.

   AIX
   ```
   cd_mount/aix/database/informix_agent/
   vcs_version/version_agent/pkgs
   ```

   HP-UX
   ```
   cd_mount/hpux/generic/database/informix_agent/
   vcs_version/version_agent/pkgs
   ```

   Linux
   ```
   cd_mount/linux/generic/
   database/informix_agent/vcs_version/
   version_agent/rpms
   ```

   Solaris
   ```
   cd_mount/solaris/dist_arch/database/
   informix_agent/vcs_version/version_agent/pkgs
   ```
   Where *dist* is the Solaris distribution and *arch* is the architecture.

3. Install the package.

   AIX
   ```
   # installp -ac -d VRTSinformix.rte.bff VRTSinformix.rte
   ```

   HP-UX
   ```
   # swinstall -s 'pwd' VRTSinformix
   ```

   Linux
   ```
   # rpm -ihv \
   VRTSinformix-AgentVersion-GA_GENERIC.noarch.rpm
   ```

   Solaris
   ```
   # pkgadd -d . VRTSinformix
   ```

Removing the agent in a VCS environment

You must uninstall the agent for IBM Informix Dynamic Server from a cluster while the cluster is active.

To uninstall the agent in a VCS environment

1. Log in as a superuser.
2. Set the cluster configuration mode to read/write by typing the following command from any node in the cluster:

   ```
   # haconf -makerw
   ```

3. Remove all IBM Informix Dynamic Server resources from the cluster. Use the following command to verify that all resources have been removed:

   ```
   # hares -list Type=Informix
   ```

4. Remove the agent type from the cluster configuration by typing the following command from any node in the cluster:

   ```
   # hatype -delete Informix
   ```

   Removing the agent's type file from the cluster removes the include statement for the agent from the main.cf file, but the agent's type file is not removed from the cluster configuration directory. You can remove the agent's type file later from the cluster configuration directory.
5. Save these changes. Then set the cluster configuration mode to read-only by typing the following command from any node in the cluster:

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

6. Use the platform's native software management program to remove the agent for IBM Informix Dynamic Server from each node in the cluster.

   Execute the following command to uninstall the agent:

AIX	`# installp -u VRTSinformix.rte`
HP-UX	`# swremove VRTSinformix`
Linux	`# rpm -e VRTSinformix`
Solaris	`# pkgrm VRTSinformix`

Removing the ACC library

Perform the following steps to remove the ACC library.

To remove the ACC library

1. Ensure that all agents that use ACC library are removed.
2. Run the following command to remove the ACC library package.

AIX	`# installp -u VRTSacclib.rte`
HP-UX	`# swremove VRTSacclib`
Linux	`# rpm -e VRTSacclib`
Solaris	`# pkgrm VRTSacclib`

Upgrading the agent for IBM Informix Dynamic Server

To upgrade the agent, first remove the older version of the agent.

See "Removing the agent in a VCS environment" on page 18.

Then, follow the instructions to install the new agent software.

See "Installing the agent in a VCS environment" on page 17.

Chapter 3

Preparing to configure the agent for IBM Informix Dynamic Server

This chapter includes the following topics:

About configuring the Veritas agent for IBM Informix Dynamic Server

After installing the Veritas agent for IBM Informix Dynamic Server, you must import the agent type configuration file. After importing this file, you can create and configure an IBM Informix Dynamic Server resource. Before you configure a resource, review the attributes table that describes the resource type and its attributes.

To view the sample agent type definition and service groups configuration.

See "About sample configurations for the agent for IBM Informix Dynamic Server" on page 39.

Importing the agent types files for VCS

To use the agent for IBM Informix Dynamic Server, you must import the agent types file into the cluster.

To import the agent types file using the Veritas Cluster Server graphical user interface

1. Start the Veritas Cluster Manager and connect to the cluster on which the agent is installed.
2. Click **File > Import Types**.
3. In the Import Types dialog box, select the following file:

VCS 4.x	/etc/VRTSvcs/conf/sample_Informix/InformixTypes.cf
VCS 5.0	/etc/VRTSagents/ha/conf/Informix/InformixTypes.cf
VCS 5.0 under Solaris zones support	/etc/VRTSagents/ha/conf/Informix/InformixTypes_zones.cf

4. Click **Import**.
5. Save the VCS configuration.

   The IBM Informix Dynamic Server agent type is now imported to the VCS engine.

   You can now create IBM Informix Dynamic Server resources. For additional information about using the VCS GUI, refer to the *Veritas Cluster Server User's Guide*.

To import the agent types file using the Veritas Cluster Server command line interface (CLI), perform the following steps.

1. Log on to any one of the systems in the cluster as the superuser.
2. Create a temporary directory.

```
# mkdir ./temp

# cd ./temp
```

3 Copy the sample file Types.cf from the following location:

VCS 4.x	/etc/VRTSvcs/conf/sample_Informix/InformixTypes.cf
VCS 5.0	/etc/VRTSagents/ha/conf/Informix/InformixTypes.cf
VCS 5.0 under Solaris zones	/etc/VRTSagents/ha/conf/Informix/InformixTypes_zones.cf

The following example assumes VCS 5.0 is installed:

```
# cp /etc/VRTSagents/ha/conf/Informix/InformixTypes.cf .
```

4 Create a dummy main.cf file:

```
# echo 'include "InformixTypes.cf"' > main.cf
```

5 Create the Informix Server resource type as follows:

```
# hacf -verify .

# haconf -makerw

# sh main.cmd

# haconf -dump
```

The IBM Informix Dynamic Server agent type is now imported to the VCS engine.

You can now create IBM Informix Dynamic Server resources. For additional information about using the VCS CLI, refer to the *Veritas Cluster Server User's Guide*.

Informix Dynamic Server agent attributes

Refer to the required and optional attributes while configuring the agent for Informix.

Table 3-1 lists the required attributes for the Informix agent.

Table 3-1 Required attributes

Required attributes	Description
ResLogLevel	Specifies the logging detail performed by the agent for the resource. The valid values are as follows: ■ ERROR: Only logs error messages. ■ WARN: Logs above plus warning messages. ■ INFO: Logs above plus informational messages. ■ TRACE: Logs above plus trace messages. TRACE is very verbose and should only be used during initial configuration or for troubleshooting and diagnostic operations. Default: INFO Example: INFO
DBServerName	Specifies the unique name of this instance of the Database Server. This is identical to the environment variable INFORMIXSERVER needed to start the instance. It is also known by the DBSERVERNAME variable specified in the ONCONFIG configuration file. Default: "" Example: oasis_mumbai
EnvFile	Full path for the file to be sourced before executing the Database Server management programs. Symantec recommends to save the file on a shared disk with InformixDir. The shell environments supported are: ksh, sh, and csh. Default: "" Example: /space/infxll.50/envfile_demo_on
InformixDir	Absolute path name of the directory in which the Database Server is installed. Default: "" Example 1: /space/infxll.50 Example 2: /usr/infx9.40

Table 3-2 lists the optional attributes for the Informix agent.

Table 3-2 Optional attributes

Optional attribute	Description
MonitorProgram	Absolute path name of an external, user-supplied monitor executable. If specified, the monitor function executes this file to perform an additional state check of the server. There are no restrictions for what actions the external monitor program performs to determine the state of the server. For information about setting this attribute: See "Executing a customized monitoring program" on page 25. Default: "" Example 1: /space/infx11.50/bin/myMonitor.pl Example 2: /space/infx11.50/bin/monitor_demo.pl *arg1 arg2*
SecondLevelMonitor	Used to enable second-level monitoring. Second-level monitoring is a deeper, more thorough state check of the Informix Database Server. The numeric value specifies how often the monitoring routines must run. 0 means never run the second-level monitoring routines, 1 means run routines every monitor interval, 2 means run routines every second monitor interval. This interpretation may be extended to other values. **Note:** Exercise caution while setting SecondLevelMonitor to large numbers. For example, if the MonitorInterval is set to 60 seconds and the SecondLevelMonitor is set to 100, then the second level check is executed every 100 minutes, which may not be as often as intended. For maximum flexibility, no upper limit is defined for SecondLevelMonitor. Default: 0 Example: 5

Executing a customized monitoring program

You can configure the monitor function to execute a custom monitor utility to perform a user-defined Informix Server state check. The utility is executed in the context of the user 'informix'. The environment is set by sourcing the file specified in the EnvFile attribute.

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

- The MonitorProgram attribute value is set to a valid executable utility.

- The first level process check indicates that the IBM Informix Dynamic Server instance is online.
- The SecondLevelMonitor attribute is set to 1 and the second level check returns the server state as "online" or the SecondLevelMonitor attribute is set to a value greater than 1, but the second level check is deferred for this monitoring cycle.

The monitor function interprets the program exit code as follows:

110 or 0	IBM Informix Dynamic Server instance is online
100 or 1	IBM Informix Dynamic Server instance is offline
Any other value	IBM Informix Dynamic Server instance is unknown

To ensure that the custom monitor utility is always available to the agent, Symantec recommends storing the file in the directory where the IBM Informix Dynamic Server is installed.

Configuring IBM Informix Dynamic Server resources for Solaris zones support

To enable the agent for IBM Informix Dynamic Server to support Solaris zones, ensure that you perform the following configuration steps:

- Install each IBM Informix Dynamic Server on a dedicated Solaris zone.
- Import the `InformixTypes_zones.cf` file for Solaris zone support.
- Preferrably, follow the Symantec recommendation of installing zones on a shared disk for convenient configuration, failover, and maintenance.
- Make sure that the name of the Solaris zone is the same as the virtual host name that you use to install and configure the IBM Informix Dynamic Server.
- Ensure that you have set the value of ContainerName attribute to the name of the Solaris zone.
  By default the agent function executes in the Global zone.

Chapter 4

Clustering IBM Informix Dynamic Server

This chapter includes the following topics:

Basic resources to cluster an IBM Informix Dynamic Server

A service group containing all resources that can support an IBM Informix Dynamic Server instance in a clustered environment forms a basic setup to cluster the server.

The required resources are as follows:

Disk Group	A disk group contains a volume and a file system, which is a mount resource containing the IBM Informix Dynamic Server installation files. Use the DiskGroup resource type to create this resource. Also, create the resource on a shared disk so that you can import the group into any system in the cluster.
Mount	The mount resource mounts, monitors, and unmounts the file system that is dedicated to the IBM Informix Dynamic Server installation files. Use the Mount resource type to create this resource.

Network Interface	The Network Interface resource monitors the Network Interface Card (NIC) through which the IBM Informix Dynamic Server instances communicates with the other services. Use the NIC resource type to create this resource.
Virtual IP	The Virtual IP resource configures the virtual IP address dedicated to the IBM Informix Dynamic Server instance. The external services, programs and clients use this address to communicate with this instance. Use the IP resource type to create this resource.
Informix	The Informix resource starts, stops, and monitors the IBM Informix Dyanmic Server instance. Use the Informix resource type to create this resource.

Virtualizing IBM Informix Dynamic Server

To ensure that your IBM Informix Dynamic Server can function properly on any node of the cluster, you need to virtualize all the parameters that could be dependent on a particular node.

Review the following basic notes for virtualization:

Host names	When installing and configuring the IBM Informix Dynamic Server, ensure that you enter the virtual host name associated with the IP address used to configure the IP resource. This ensures that if the application needs to be migrated, you are not tied down by the physical IP address given to the IBM Informix Dynamic Server. The following is an excerpt from an INFORMIXSQLHOSTS file. `demo_on ontlitcp  infxsrvr.vxindia.veritas.com  sqlexec` 'infxsrvr.vxindia.veritas.com' refers to the hostname associated with this instance (demo_on) of the Dynamic Server. Ensure that you use a virtual hostname for this value. The IP address associated with this hostname would then be configured within VCS using an IP resource type that can be failed over. If the last column of this entry (sqlexec) describes a service registered via the `/etc/services` file, ensure this entry is present in the `/etc/services` file of each failover node configured for this instance. This ensures the availability of the service on the failover node.

Path names

Ensure that your application gets installed on a shared disk so that it is not constrained by anything that is local to the node. If this is not possible every time, make sure that the local data is available on each configured node.

If you are using raw devices on the shared disks for dbspaces, change the permissions (for the user “informix” to 660), or access mode, on the disk groups storing the Informix Dynamic Server data.

For example, if you are using VERITAS Volume Manager™, type:

```
# vxedit -g diskgroup_name \
set group=informix user=informix mode=660 \
volume_name
```

Virtualizing Informix Dynamic Server libraries

For the server utilities to work, the following versions of Informix Dynamic Server (IDS) need their libraries to be linked symbolically from /usr/lib to the libraries under *InformixDir* directory.

- Informix Dynamic Server 7.31 on UNIX
- Informix Dynamic Server 9.x and later on HP-UX PA-RISC

These symbolic links are created during IDS installation, on the node on which IDS was installed. To ensure that an application successfully boots on another node after a failover, you must manually create these links on all configured failover nodes, within the Informix service group's SystemList.

Informix Dynamic Server 7.31 on UNIX

For Informix Dynamic Server 7.31, libraries must be linked from /usr/lib to the libraries in the *InformixDir*/lib directory, on all machines within the Informix service group’s SystemList. This is applicable for all Unices.

To ensure all libraries have symbolic links, perform the following steps.

1 Locate the libraries.

```
# ls –l InformixDir/lib
total 1947
-rw-r--r--  1 informix informix   36496 Oct 31 13:39 cdrapi.a
drwxr-xr-x  2 informix informix      96 Oct 31 13:39 csm
-rwxr-xr-x  1 informix informix    3126 Aug  5  2006 iosm07a.so
-rwxr-xr-x  1 informix informix   10971 Aug  5  2006 ipldd07a.so
-rwxr-xr-x  1 informix informix    1980 Aug  5  2006 ismdd07b.so
-r-xr-xr-x  1 informix informix 1198415 Aug  5  2006 libbsa.so
-rwxr-xr-x  1 informix informix  739573 Oct 31 13:39 sqlrm
```

The files with .so extension are the library files that should have symbolic links from /usr/lib.

On the node where IDS was installed, the links can be located as follows:

```
# cd /usr/lib
# ls -ltac | grep informix
lrwxrwxrwx  1 root root 29 Nov  4 18:03 ismdd07b.so.20081031
-> InformixDir/lib/ismdd07b.so
lrwxrwxrwx  1 root root 29 Nov  4 18:02 ismdd07b.so
-> InformixDir/lib/ismdd07b.so
lrwxrwxrwx  1 root root 29 Nov  4 18:02 ipldd07a.so
-> InformixDir/lib/ipldd07a.so
lrwxrwxrwx  1 root root 28 Nov  4 18:02 iosm07a.so.20081031
-> InformixDir/lib/iosm07a.so
lrwxrwxrwx  1 root root 28 Nov  4 18:01 iosm07a.so
-> InformixDir/lib/iosm07a.so
```

2 Create the symbolic links on each configured node, if fail to exist.

```
# cd /usr/lib
# ln –s InformixDir/lib/iosm07a.so iosm07a.so
# ln –s InformixDir/lib/ipldd07a.so ipldd07a.so
# ln –s InformixDir/lib/ismdd07b.so ismdd07b.so
# ln –s InformixDir/lib/libbsa.so libbsa.so
```

Where, *InformixDir* is INFORMIXDIR, the installation directory of IDS.

Informix Dynamic Server 9.x and later on HP-UX PA-RISC

To ensure all libraries have symbolic links, perform the following steps.

1 Locate the JRE library.

```
/usr/lib/informix/IDS.version-JREjavarel
```

For example, for Informix Dynamic Server version 11.50.FC1 the following link exists on the installation node.

```
# ls -ltac /usr/lib/informix/IDS.11.50.FC1-JRE1.5
lrwxr-xr-x 1 root sys 33 Nov  8 18:51 /usr/lib/informix/
IDS.11.50.FC1-JRE1.5 -> InformixDir/extend/krakatoa/jre
```

2 Create the symbolic link, if fail to exists.

```
# mkdir /usr/lib/informix
# cd /usr/lib/informix
# ln –s InformixDir/extend/krakatoa/jre /usr/lib/informix/
IDS.version-JREjavarel
```

Where,

InformixDir is INFORMIXDIR, the installation directory of the IDS.

version is the version of the IDS.

javarel is the version of the associated JRE release.

Chapter 5

Troubleshooting the agent for IBM Informix Dynamic Server

This chapter includes the following topics:

Using correct software and operating system versions

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

See "Supported software" on page 11.

Meeting prerequisites

Before installing the agent for IBM Informix Dynamic Server, double check that you meet the prerequisites.

For example, you must install the ACC library on VCS before installing the agent for IBM Informix Dynamic Server.

See "Before you install the Veritas agent for IBM Informix Dynamic Server" on page 15.

Configuring IBM Informix Dynamic Server resources

Before using a IBM Informix Dynamic Server resource, ensure that you configure the resource properly. For a list of attributes used to configure all IBM Informix Dynamic Server resources, refer to the agent attributes.

Verifying virtualization

Verify that your application does not use anything that ties it down to a particular node of the cluster.

See "Virtualizing IBM Informix Dynamic Server " on page 28.

Starting the IBM Informix Dynamic Server instance outside a cluster

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 IBM Informix Dynamic Server instance independent of the cluster framework. Refer to the cluster documentation for information about disabling a resource.

You can then restart the IBM Informix Dynamic Server instance 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.

Execute the following commands to start, stop or monitor the IBM Informix Dynamic Server outside the cluster framework.

You must execute these commands as user 'informix', after sourcing the environment file specified by the EnvFile agent attribute.

To start `$ InformixDir/bin/oninit -y`

To stop

```
$ InformixDir/bin/onmode -ky
```

To monitor

First verify whether the Informix 'oninit' parent process is running as the user 'informix'. This process forks off other helper 'child' processes.

For example,

```
# ps -ef | grep oninit | grep  -v grep
informix  3657     1   1 16:33:36 ?   0:00 oninit -y
    root  3750  3660   0 16:33:39 ?   0:00 oninit -y
    root  3756  3660   0 16:33:42 ?   0:00 oninit -y
    root  3710  3660   0 16:33:38 ?   0:00 oninit -y
    root  3753  3660   0 16:33:41 ?   0:00 oninit -y
    root  3752  3660   0 16:33:41 ?   0:00 oninit -y
    root  3679  3660   0 16:33:37 ?   0:00 oninit -y
    root  3751  3660   0 16:33:40 ?   0:00 oninit -y
    root  3660  3657   0 16:33:36 ?   0:00 oninit -y
    root  3661  3660   0 16:33:36 ?   0:00 oninit -y
    root  3755  3660   0 16:33:42 ?   0:00 oninit -y
    root  3754  3660   0 16:33:41 ?   0:00 oninit -y
```

In the above example the process with PID 3657 is the parent ‘oninit’ process. The agent essentially monitors this process.

Now, execute the following command and verify the exit code.

```
$ InformixDir/bin/onstat -
$ echo $?
5
```

An exit code of 5 implies that the Database Server is online and healthy.

An exit code of 255 implies that the Database Server is offline.

For all other exit codes the agent reports the application status as unknown.

Reviewing error log files

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

The common reasons for issues are as follows:

Insufficient Privileges

Files that need to be created, written to, would be created as user 'informix'. Check if necessary privileges have been set.

Incorrect port, environment or parameter settings	Verify that ports have been properly configured and declared. Typically, ports from 1 through 1024 are reserved for the superuser. Also ensure that parameters to the agent are correctly defined.
Expired licenses	Check the application log files for any error messages related to expired licenses. Ensure the license keys/files have been placed at the appropriate location, as needed by the application.
Broken symlinks, missing files, and libraries	Verify your installation. Make sure nothing is broken, and all dependencies for the executables are met.
Insufficient disk space or system parameters	Ensure that the file-system has sufficient space for creation of temporary files that the application might need. Verify that the kernel has been tuned for sufficient IPC resources, file descriptors and meets the hardware requirement. Consult your product documentation for these details.

Using IBM Informix Dynamic Server log files

If the Informix Dynamic Server is facing problems, you can access the server log files to further diagnose the problem.

The MSGPATH variable in the ONCONFIG file describes the location where the log file for an instance of the Database Server gets created.

For example, following is an excerpt from an ONCONFIG file

```
MSGPATH /space/infx11.50/demo2/server/online.log
```

Consult your application expert if needed.

Reviewing cluster log files

In case of problems while using the agent for IBM Informix Dynamic Server, you can access the engine log file for more information about a particular resource. The engine log file is located at /var/VRTSvcs/log/engine_A.log.

Using trace level logging

The ResLogLevel attribute controls the level of logging that is written in a cluster log file for each IBM Informix Dynamic 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.

Note: Starting with version 5.1.1.0 of the ACC library, the TRACE level logs for any ACCLib based agent are generated locally at the location /var/VRTSvcs/log/*Agent*_A.log.

To localize ResLogLevel attribute for a resource

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

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

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

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

4. Test the identified resource. The function reproduces the problem that you are attempting to diagnose.
5. Set the ResLogLevel attribute back to INFO for the identified resource:

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

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

   You can also contact Symantec support for more help.

Appendix A

Sample Configurations

This appendix includes the following topics:

About sample configurations for the agent for IBM Informix Dynamic Server

The sample configuration graphically depicts the resource types, resources, and resource dependencies within the service group. Review these dependencies carefully before configuring the agent for IBM Informix Dynamic Server. For more information about these resource types, see the *Veritas Cluster Server Bundled Agents Reference Guide*.

Sample agent type definition

This section lists the sample agent type definition files for IBM Informix Dynamic Server agent on different versions of VCS.

For VCS 4.x

```
type Informix (
        static str ArgList[] = { ResLogLevel, State, IState, EnvFile,
        InformixDir, DBServerName, SecondLevelMonitor, MonitorProgram }
        str ResLogLevel = INFO
        str EnvFile
        str InformixDir
        str DBServerName
        int SecondLevelMonitor = 0
        str MonitorProgram
)
```

For VCS 5.0

```
type Informix (
        static str AgentFile = "/opt/VRTSvcs/bin/Script50Agent"
        static str AgentDirectory = "/opt/VRTSagents/ha/bin/Informix"
        static str ArgList[] = { ResLogLevel, State, IState, EnvFile,
        InformixDir, DBServerName, SecondLevelMonitor, MonitorProgram }
        str ResLogLevel = INFO
        str EnvFile
        str InformixDir
        str DBServerName
        int SecondLevelMonitor = 0
        str MonitorProgram
)
```

Sample agent type definition with Solaris zone support

This section lists the sample agent type definition files with Solaris zone support, for IBM Informix Dynamic Server agent.

```
type Informix (
      static str ContainerType = Zone
      static str AgentFile = "/opt/VRTSvcs/bin/Script50Agent"
      static str AgentDirectory = "/opt/VRTSagents/ha/bin/Informix"
      static str ArgList[] = { ResLogLevel, State, IState, EnvFile,
      InformixDir, DBServerName, SecondLevelMonitor, MonitorProgram }
      str ResLogLevel = INFO
      str EnvFile
      str InformixDir
      str DBServerName
      int SecondLevelMonitor = 0
```

```
        str MonitorProgram
        str ContainerName
)
```

Sample configuration

This section provides a sample configuration for IBM Informix Dynamic Server agent.

```
include "types.cf"
include "InformixTypes.cf"

cluster infx11sol (
 UserNames = { admin = bIJbIDiFJeJJhRJdIG }
 Administrators = { admin }
        CredRenewFrequency = 0
        CounterInterval = 5
 )

system nodeA (
 )

system nodeB (
 )

group InformixDemo (
 SystemList = { nodeB = 0, nodeA = 1 }
 )

 DiskGroup infx11_dg (
  DiskGroup = infx11dg
  )

 IP infx11_ip (
  Device = bge0
  Address = "10.209.73.109"
  NetMask = "255.255.252.0"
  )

 Informix infx11_srvr (
  EnvFile = "/space/infx11.50/envfile_demo_on2"
  InformixDir = "/space/infx11.50"
  DBServerName = demo_on2
```

```
 SecondLevelMonitor = 1
 )

Mount infx11_mnt (
 MountPoint = "/space/infx11.50"
 BlockDevice = "/dev/vx/dsk/infx11dg/infx11vol"
 FSType = vxfs
 MountOpt = largefiles
 FsckOpt = "-y"
 SecondLevelMonitor = 1
 )

NIC infx11_nic (
 Device = bge0
 )

infx11_ip requires infx11_nic
infx11_mnt requires infx11_dg
infx11_srvr requires infx11_ip
infx11_srvr requires infx11_mnt


// resource dependency tree
//
// group InformixDemo
// {
// Informix infx11_srvr
//     {
//     Mount infx11_mnt
//         {
//         DiskGroup infx11_dg
//         }
//     IP infx11_ip
//         {
//         NIC infx11_nic
//         }
//     }
// }
```

Sample configuration with Solaris zone support

This section provides a sample configuration with Solaris zone support for IBM Informix Dynamic Server agent.

```
include "types.cf"
include "InformixTypes_zones.cf"

cluster infx115 (
 UserNames = { admin = bIJbIDiFJeJJhRJdIG }
 Administrators = { admin }
 HacliUserLevel = COMMANDROOT
 )

system nodeA (
 )

system nodeB (
 )

group InformixZone (
 SystemList = { nodeB = 0, nodeA = 1 }
 Administrators = { z_infx115_zone_nodeB, z_infx115_zone_nodeA }
 )

 DiskGroup infx115_dg (
  DiskGroup = infx115dg
  )

 Informix infx115_srvr (
  EnvFile = "/space/infx11.50/envfile_demo_on2"
  InformixDir = "/space/infx11.50"
  DBServerName = demo_on2
  SecondLevelMonitor = 1
  ContainerName = infx115
  )

 Mount infx115_mnt (
  MountPoint = "/space/zones/infx115"
  BlockDevice = "/dev/vx/dsk/infx115dg/infx115vol"
  FSType = vxfs
  MountOpt = largefiles
  FsckOpt = "-y"
```

```
 SecondLevelMonitor = 1
 )

NIC infx115_nic (
 Device = bge0
 )

Zone infx115_zone (
 ZoneName = infx115
 )

infx115_mnt requires infx115_dg
infx115_srvr requires infx115_zone
infx115_zone requires infx115_mnt
infx115_zone requires infx115_nic


// resource dependency tree
//
// group InformixZone
// {
// Informix infx115_srvr
//     {
//     Zone infx115_zone
//         {
//         Mount infx115_mnt
//             {
//             DiskGroup infx115_dg
//             }
//         NIC infx115_nic
//         }
//     }
// }
```

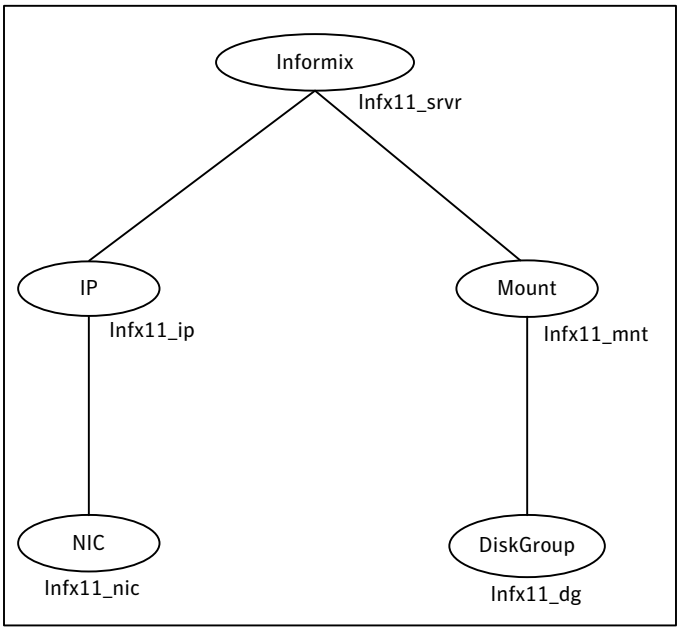
Sample service group configuration

This section includes sample service groups configurations in a VCS environment.

Figure A-1 shows a service group with an Informix Dynamic Server instance running in a VCS environment.

The service group includes a DiskGroup resource, a NIC resource, an IP resource and Mount resource, along with an Informix Dynamic Server resource.

Figure A-1 Sample service group for an Informix Dynamic Server instance



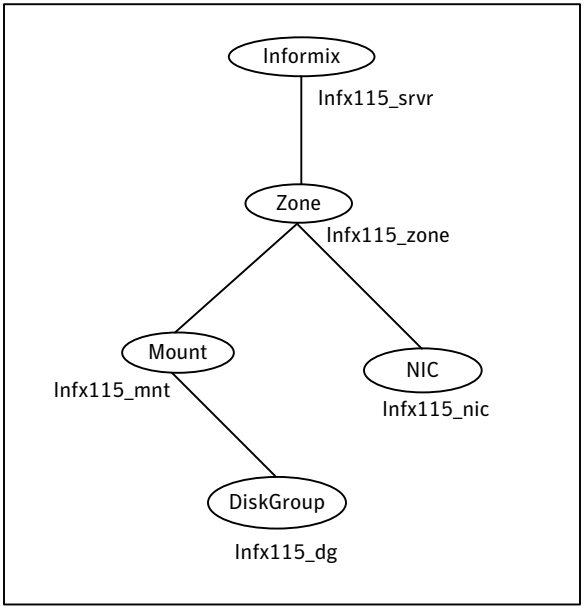
Sample service group configuration with Solaris zone support

This section includes sample service groups with Solaris zone support.

Figure A-2 shows a service group with an Informix Dynamic Server instance running in a local zone, if the zone binaries are present on a shared disk.

The Dynamic Server itself is installed locally within the Solaris zone.

Figure A-2 Sample service group with an Informix Dynamic Server instance



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