VERITAS™

VERITAS Cluster Server Enterprise Agent 4.1 for Informix

Installation and Configuration Guide

HP-UX

N16821G

June 2005

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Preface

This document provides information on how to install and configure the VERITAS Cluster Server Agent for Informix. For information about VCS, refer to the *VERITAS Cluster Server User's Guide.*

Getting Help

For technical assistance, visit the VERITAS Technical Services Web site at http://support.veritas.com. From there you can:

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Conventions

Typeface/Font	Usage
bold	names of screens, windows, tabs, dialog boxes, options, buttons
italic	new terms, book titles, emphasis, variables in tables or body text
Courier	computer output, command references within text
Courier (bold)	command-line user input, keywords in grammar syntax
Courier (bold, italic)	variables in a command
Symbol	**Usage**
#	superuser prompt (for all shells)

Introduction 1

The Informix enterprise agent monitors specific Informix Dynamic Server resources within an enterprise application, determines the status of these resources, and starts or stops them according to external events. The process of monitoring is common to all agents, but the way they are performed varies according to the enterprise application being monitored.

The agent includes VCS type declarations and agent executables, and is represented by the Informix resource type. When the agent detects an application failure, the Informix service group is failed over to another system in the cluster.

About the Informix Agent

The Informix agent monitors the Informix database processes. Specific agent operations include:

◆ Online—Starts the Informix database by using the following command:

```
oninit
```

◆ Offline—Stops the Informix database by using the following command:

```
onmode-ky
```

◆ Monitor— Scans process table for `oninit` and, optionally, uses `MonScript`.

Detecting an Application Failure

By default, the agent faults if the monitor process cannot find an `oninit` process in the process table. By configuring the `MonScript` attribute to the provided `OnstatTest.p1`, the agent will fault if the monitor process does not detect the word "online" from the output of the command `onstat -`. When this happens, the entire database server service group switches to the next available system listed in the service group's `SystemList` attribute.

Supported Software

The VCS enterprise agent for Informix, version 4.1, supports Informix Dynamic Server (formerly Informix-Online Dynamic Server), versions 7.1 - 9.40 on HP-UX 11iv2 04/09.

Prerequisites for Installing Informix   **2**

This chapter describes the sample configuration to install and configure Informix and its components in a VCS cluster. The prerequisites required for installation are also discussed. For more information on installing Informix, refer to the Informix documentation for HP-UX.

Typical Informix Configuration in a VCS Cluster

In the following example, VCS is configured on a two-system cluster (sysa and sysb), and Informix Dynamic Server is installed on shared disks.
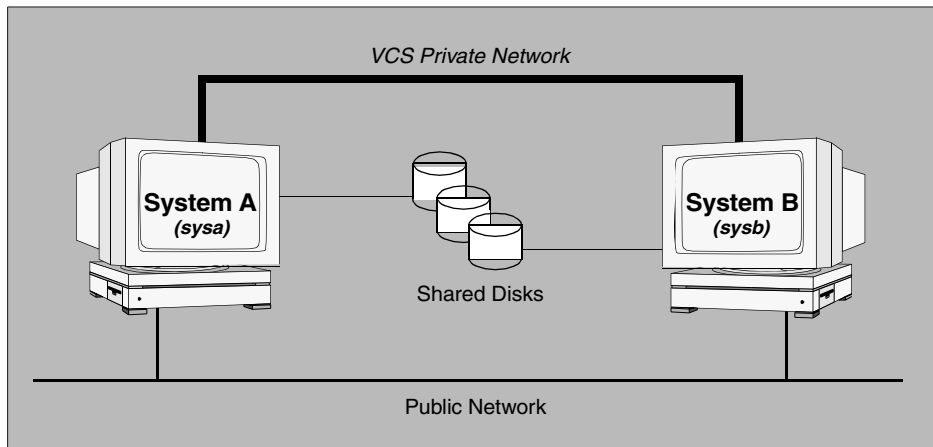
The strategy for installing Informix in a VCS environment is aimed at ensuring that installations on all cluster systems are uniform. The location of the Informix can be on the shared storage or on the local disk. The data must be on the shared storage.

Prerequisites

The following are the prerequisites for installing Informix.

✔ Verify that all systems have enough resources, such as shared memory, to run the Informix Dynamic Server and VCS.

✔ Install and configure the application. (If necessary, review the Informix Dynamic Server documentation.)

✔ If a previous version of the Informix agent exists, uninstall it.

✔ Verify that the informix account is a valid and identical UNIX account on all systems that will run Informix Dynamic Server.

Points to Note Before Installing Informix

The following sections discuss some important tasks that need to be noted before you install Informix.

$INFORMIXDIR Directory

◆ On Shared Disks:

When Informix Dynamic Server is installed on shared disks ($INFORMIXDIR), each system must have the same mount point directory for the shared file system. If multiple Informix database servers are defined for a single cluster configuration, each database server must have its own disks and unique mount point directories.

◆ On Non-Shared Disks:

If the $INFORMIXDIR directories are located on local or non-shared disks, the $INFORMIXDIR/etc/sqlhosts file on each system must contain entries for all Informix database servers.

$ONCONFIG File

◆ The $ONCONFIG file must be available on each system.

◆ If the configuration is supporting multiple database servers on a single host, the SERVERNUM defined in the file $INFORMIXDIR/etc/$ONCONFIG must be unique for each server.

Informix Dynamic Server Libraries

The following procedure is not necessary for Informix Dynamic Server version 9.2 or later.

Informix Dynamic Server libraries must be linked from /usr/lib to the libraries in the $INFORMIXDIR/lib directory, and on all machines within the Informix service group's SystemList. Perform the following steps to verify that all libraries have symbolic links.

1. To get a list of the Informix Dynamic Server libraries, look in Informix's /lib directory. For example, if $INFORMIXDIR is /informix, type the following command to find a list of libraries:

```
# ls /informix/lib
```

Output resembles:

```
ipldd07a.so  ismdd07b.so  sqlrm
```

2. For each file in that directory, verify that a link from /usr/lib exists. If a link does not exist, you must create it. The following example shows that a link from /usr/lib exists for the file ipldd07a.so:

```
# ls -l /usr/lib/ipldd07a.so
```

Output resembles:

```
lrwxrwxrwx   1 root other 25 Mar 21 15:01
/usr/lib/ipldd07a.so -> /informix/lib/ipldd07a.so
```

If the link is nonexistent, use the following command to create it:

```
# ln -s /informix/lib/ipldd07a.so /usr/lib/ipldd07a.so
```

Database Dbspaces

◆ All database dbspaces of each system, including root and user, must be located on the Informix database server's own set of shared disks.

◆ If the dbspaces are created using regular (UFS or VxFS) files, the file systems containing these files must be located on shared disks. Create the same file system mount points on each system.

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

Transparent Informix Dynamic Server Failover

◆ To enable Informix Dynamic Server clients to reconnect after a system switch without reconfiguring, include at least one IP resource in the service group for the Informix resource. The hostname mapping the IP address of this resource must be used for the Hostname field in the file $INFORMIXDIR/etc/sqlhosts.

◆ If you are using the TCP/IP protocol for Informix Dynamic Server client/server communication, verify that the file /etc/services on each system defined in the service group's SystemList attribute contains entries for the service name of the Informix database server. The service name is the fourth field in the file $INFORMIXDIR/etc/sqlhosts, and must match one entry in the /etc/services file. For details on sqlhosts and adding entries to the service name, see the Informix Dynamic Server documentation.

Installing the Agent   3

The VCS enterprise agent for Informix is installed from the CD. Install the Informix agent on the required systems in the cluster and add the Informix resource type to your configuration.

Prerequisites

✔ Install and configure VCS. For more information see the *VERITAS Cluster Server Installation Guide.*

✔ If a previous version of the agent is installed, uninstall it.

✔ Install and configure the Informix Server for HP-UX. For more information see the Informix documentation.

✔ Verify that the VERITAS high availability engine (HAD) is running on all systems in the cluster.

✔ Verify that all systems have enough resources, such as shared memory, to run the Informix server.

Installing the Agent Software

1. Insert the CD in the CD-ROM drive installed on your local system.

2. Log in as `root`.

3. Set the display permission on your workstation:

> # **xhost +myws**

4. Configure the shell environment variable `DISPLAY` on your workstation. For example, if your workstation has the name "myws," type:

> For Bourne or Korn shell (`sh` or `ksh`):
>
> > # **DISPLAY=myws:0.0**
> > # **export DISPLAY**
>
> For C shell (`csh` or `tcsh`):
>
> > # **setenv DISPLAY myws:0.0**

Setting the DISPLAY environment variable in this way enables you to use the SD-UX graphical interface.

5. Create a mount point directory, `/cdrom`, if it does not exist. The directory must have read/write permissions.

6. Determine the block device file for the CD-ROM drive. The device file should have the form `/dev/dsk/c#t#d#`. Enter:

> # **ioscan -fnC disk**

For example, the listing may indicate the CD-ROM drive's block device is `/dev/dsk/c1t2d0`; make a note of the device file as it applies to your system.

7. Run the following commands to start PFS (Portable File System):

> # **nohup pfs_mountd &**
> # **nohup pfsd &**

8. Mount the CD. For example, to mount the CD to the mount point `/cdrom`, enter:

> # **/usr/sbin/pfs_mount -t rrip /dev/dsk/clt2d0 /cdrom**

Where `/dev/dsk/c1t2d0` is the drive's block device file.

9. Type the following command to install the agent:

```
swinstall -s /cdrom/informix_agent/VRTSvcsix
```

10. Repeat step 1 through step 9 on each system that will become part of the Informix service group.

Configuring the Agent 4

Configuring the Informix enterprise agent involves creating the Informix service group, configuring its resources, and defining attribute values for the configured resources. You must have administrator privileges to create and configure a service group. VCS provides the Cluster Manager Java Console, the Cluster Manager Web Console, and command line to configure an enterprise agent.

Prerequisite

Install and configure Informix identically on all cluster systems. (For more information, see Chapter 2.)

Before Configuring the Agent

Before configuring the agent, review the Informix resource type, its attribute definitions, and the sample agent configuration. The resource type represents the VCS configuration definition of the agent, and specifies how an agent is defined in the configuration file `main.cf`. The Attribute Definition table explains the attributes associated with the agent. The sample configuration graphically depicts the resource types, resources, and the resource dependencies required to create the Informix service group.

Informix Resource Type

```
type Informix (
  static str ArgList[] = { Server, Home, ConfigFile,
                          Version, MonScript }
  NameRule = resource.Server
  str Server
  str Home
  str ConfigFile
  str Version
  str MonScript
  )
```

Attribute Definitions

This table describes attribute values for the Informix agent.

Table 1

| Attributes	Type and Dimension	Definition
Server	string-scalar	Name of the Informix database server (`$INFORMIXSERVER`) as defined in the `ConfigFile` attribute.
Home	string-scalar	The `$INFORMIXDIR` path to Informix Dynamic Server executables.
ConfigFile	string-scalar	The Informix Dynamic Server configuration file `$INFORMIXDIR/etc/$ONCONFIG`. This file contains the definition for the database server.
Version	string-scalar	The version of Informix database server executables.
MonScript (optional)	string-scalar	Pathname to a secondary monitor script provided for in-depth monitoring; the default (shallow monitoring) is to monitor the database PID only. The pathname to the supplied secondary monitoring script is `$VCS_HOME/bin/Informix/OnstatTest.pl`.

Sample Dependency Graphs

The following example describes a typical service group configured to monitor the state of Informix in a VCS cluster.

```
Informix INF (
  Server = learn_online
  Home = "/opt/Informix"
  ConfigFile = "onconfig.learn"
  Version = "7.3"
  MonScript = "./bin/Informix/OnstatTest.pl"
  )
```

The sample configuration has been provided for clusters using HP-UX logical volumes to manage cluster disk groups. The sample configuration graphically depicts the resource types, resources, and resource dependencies within the service group. For more information about VCS bundled agents, see the *VERITAS Cluster Server Bundled Agent's Reference Guide*. For more information about resources and resource types, see the *VERITAS Cluster Server User's Guide.*

This configuration has two volume groups, with a logical volume created on each. One logical volume is for the Informix Dynamic Server, and one is for the database. The Mount resources require the LVMLogicalVolume and LVMVolumeGroup resources. The service group IP address for the server is configured using the IP and NIC resource types. Informix Dynamic Server can be started after each of these resources is brought online. See the appendix for the "Sample Configuration File" on page 23
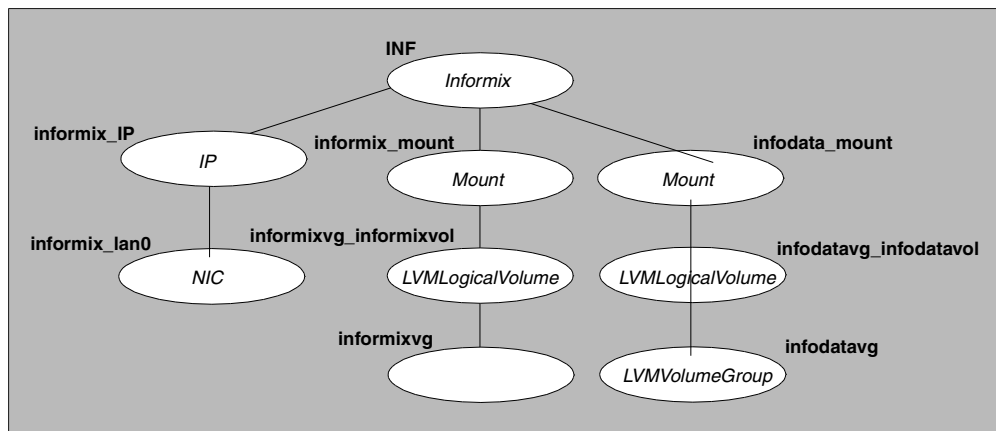
Configuring the Agent

You can configure the Informix agent using the following methods:

◆ By using VCS Cluster Manager (the VCS graphical user interface) to edit a resource group template for the Informix agent. See "Configuring the Agent Using Cluster Manager (Java Console)" on page 14, or,

◆ By directly editing the sample main.cf file supplied with the Informix agent (see "Configuring Informix Agent by Editing the Configuration Files" on page 17). This method requires that VCS be stopped and restarted before the configuration takes effect.

Configuring the Agent Using Cluster Manager (Java Console)

A template for the Informix resource groups is automatically installed when you install the Informix enterprise agent. Using the VCS Cluster Manager, you can view the template, which displays the Informix service group, its resources and their attributes. You can dynamically modify the attribute values as necessary for your configuration.

Importing the InformixTypes.cf File

To use the Informix template, import the InformixTypes.cf file to the VCS engine by using Cluster Manager:

1. Start Cluster Manager.

2. Click on the File menu and select Import Types.

3. In the Import Types dialog box, select the file:

    /etc/VRTSvcs/conf/sample_Informix/InformixTypes.cf

4. Import the types file for Informix.

5. Save the configuration.

At this point, the Informix types have been imported to the VCS engine. The Informix agent can be configured without interrupting or stopping VCS.

For detailed information about using the VCS Cluster Manager, refer to the chapter on administering VCS from Cluster Manager (Java Console or Web Console) in the *VERITAS Cluster Server User's Guide*.

Creating a New Service Group Using Cluster Manager (Java Console)

To create a new service group, import the `InformixTypes.cf` file and then download the InformixGroup template by starting the Service Group Configuration Wizard from the Cluster Manager.

Creating an Informix Service Group

1. Launch the cluster configuration wizard in one of the following ways:

    ◆   Select Tools>Configuration wizard from the Cluster Explorer menu.

    ◆   If no service groups exist on the system, the **Cluster Explorer** prompts you to launch the **Cluster Configuration wizard.** Click Yes when prompted.

    The Loading Templates Information window appears and launches the wizard.

2. Read the **Welcome** screen and click **Next**.

3. Specify the name of the service group and the target systems on which it is to be configured.

    a. Enter the name of the service group.

    b. In the **Available Systems** box, select the systems in the cluster on which you want to configure the service group.

    c. Click the right arrow to move the selected systems to the **Systems for Service Group** table. To remove a system from a table, select the system and click the left arrow.

    d. Indicate whether you want the service group to become online automatically when VCS starts, by clicking on the **Startup** checkbox beside the system name. Specify the order in which you want the systems to fail over by assigning priorities to the cluster systems.

    e. Click **Next**.

4. In the **Would you like the service group to be based on a template?** window, click **Next**.

5. In the **Select Templates** dialog box, select the Informix template (InformixGroup) on which to base the service group.

If the names that you specified for some resources for the new service group are already in use, a window opens notifying you of this. This window also includes a list of alternative names. You can select an alternative name, or modify the name. Click Next after resolving the name clashes.

6. Click **Next** to create the service group based on the selected template. A window opens indicating that the commands are being sent to the add group, its resources, and the attributes and dependencies specified in the template. A progress indicator displays the percentage of the commands fired. The actual commands are displayed at the top of the indicator.

7. Click **Next** when prompted that the service group has been successfully created.

8. A window opens listing the service group's resources and their associated attributes. Click **Finish** to accept the default values and complete the configuration.

You can modify the default values of the resources according to your specific configuration requirements. For details see the following section.

Editing the Resource attributes

This section describes the procedure to edit attributes using the Cluster Manager. For a list of attributes that must be configured for the Informix service group, refer to attribute definitions for the Informix resource type on page 12.

1. Select a resource from the list on the left. Its attributes appear in the right pane.

2. Select the attribute to be modified.

3. Click the edit icon in the **Edit** column.

4. Enter attribute values in the **Edit Attribute** window. To modify the scope of the attributes, select either **Global** or **Local** option. For non-scalar values, use the + or the X buttons to add or delete values, respectively.

5. Click **OK**.

6. Repeat the procedure for each resource and its attributes and click Finish. Edit the attributes for all the resources according to your configuration.

7. Follow the wizard instructions to complete the configuration. Click **Finish** to quit the wizard.

Configuring Informix Agent by Editing the Configuration Files

The VCS enterprise agent for Informix comes with a sample configuration file that can be used as reference to directly modify your present configuration file. When you use this method, you must stop and restart VCS to implement the configuration.

Follow the instructions below to configure the agent using the sample configuration file:

1. Log in to sysa as `root`.

2. Ensure that all changes to the existing configuration have been saved and that further changes are prevented while you modify `main.cf`:

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

3. To ensure that VCS is not running while you edit `main.cf`, issue the following command to stop the VCS engine on all systems and leave the resources available:

   ```
   # hastop -all force
   ```

4. Make a backup copy of the `main.cf` file:

   ```
   # cd /etc/VRTSvcs/conf/config
   # cp main.cf main.cf.orig
   ```

5. Edit the `main.cf` file. The file `/etc/VRTSvcs/conf/sample_Informix/main.cf` can be used for reference (see the "Sample Configuration File" on page 23):

   a. Add an "include" line for the `InformixTypes.cf` file:

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

   b. Create the a service group for Informix resources; refer to the "Sample Configuration File" on page 23.

   c. Include all resources in the service group, including the Informix, IP, NIC, Mount, LVMLogicalVolume, and LVMVolumeGroup resources, and assign values to the attributes for the resources to match the parameters of your configuration.

      Refer to the table of "Attribute Definitions" on page 12 as well as the sample configuration file. Refer also to the *VERITAS Cluster Server Bundled Agents Reference Guide* for information about the IP, NIC, Mount, LVMLogicalVolume, and LVMVolumeGroup resources.

   d. Assign dependencies to the newly created resources. See the VCS User's Guide for more information on assigning dependencies.

6. Save and close the file.

7. Copy the Informix types configuration file into place:

```
# cp /etc/VRTSvcs/conf/sample_Informix/InformixTypes.cf
    /etc/VRTSvcs/conf/config/InformixTypes.cf
```

8. Verify the syntax of the file /etc/VRTSvcs/conf/config/main.cf:

```
# hacf -verify config
```

9. Start the VCS engine on sysa:

```
# hastart
```

10. Type the command hastatus:

```
# hastatus
```

11. When "Local_Build" is listed in the message column, you can start sysb:

```
# hastart
```

12. Verify that all Informix service group resources are brought online:

```
# hagrp -display
```

13. Take the service group offline and verify that all resources are stopped:

```
# hagrp -offline service_group -sys system_name
# hagrp -display
```

14. Bring the service group online again and verify that all resources are available:

```
# hagrp -online service_group -sys system_name
# hagrp -display
```

15. Switch the Informix service group to sysb:

```
# hagrp -switch service_group -to sysb
```

16. Verify that all Informix service group resources are brought online on sysb:

```
# hagrp -display
```

17. On all the systems, look at the following log files for any errors or status:

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

Modifying the Agent Configuration

Dynamic Configuration

To dynamically configure the VCS enterprise agent for Informix, see the chapter on reconfiguring VCS from the command line in the *VERITAS Cluster Server User's Guide.*

Changing Resource Attribute Values

It may be necessary to change the values of the resource attributes. For example, the default values for the OnlineTimeout and OfflineTimeout resource attributes may not be sufficient for your configuration. To change the values of these attributes, refer to the *VERITAS Cluster Server User's Guide.*

Disabling or Removing the Informix Agent **5**

This chapter describes removing or disabling the Informix agent.

Disabling the Agent

To disable the agent on a system, you must first switch the Informix service group to an OFFLINE state. This stops the application completely, or switches the agent to another system.

1. To remove a system from the service group's `SystemList`, check if the service group is online:

    # **hagrp -state** *service_group* **-sys** *system_name*

2. If the service group is online, take it offline by entering one of the following commands:

    # **hagrp -switch** *service_group* **-to** *system_name*

        or:

    # **hagrp -offline** *service_group* **-sys** *system_name*

3. Stop the agent on a system by entering:

    # **haagent -stop** *agent*

    When you get the message "`Please look for messages in the log file`," check the file `/var/VRTSvcs/log/engine_A.log` for a message confirming the agent has stopped.

    You can also use the `ps` command to confirm the agent is stopped.

    You can now remove the system, service group, or resource type from the VCS configuration. See the chapter on reconfiguring VCS from the command line in the *VERITAS Cluster Server User's Guide* for more information.

Removing the Agent

Type the following command on each system to remove the agent. Answer prompts accordingly:

```
# swremove VRTSvcsix
```

Sample Configuration File   **A**

After the agent is installed, the sample configuration file can be found in the file:
`/etc/VRTSvcs/conf/sample_Informix/main.cf`.

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

cluster vcs (
)

system sysa
system sysb

group informix (
    SystemList = { sysa, sysb }
    AutoStartList = { sysa }
    AutoStart = 0
    Parallel = 0
    )

    IP informix_IP (
        Device = lan0
        Address = "172.98.14.90"
        NetMask = "255.255.255.0"
        Options = ""
        )

    NIC informix_lan0 (
        Device = lan0
        NetworkType = ether
        NetworkHosts = { "172.98.13.101", "172.98.16.89" }
        )
```

```
Informix INF (
     Server = learn_online
     Home = "/opt/Informix"
     Configfile = "onconfig.learn"
     Version = "7.3"
     MonScript = "./bin/Informix/OnstatTest.pl"
     )
LVMLogicalVolume informixvg_informixvol (
     LogicalVolume = informixvol
     VolumeGroup = informixvg
     )

LVMVolumeGroup informixvg (
     VolumeGroup = informixvg
     )

Mount informix_mount (
     MountPoint = "/opt/Informix"
     BlockDevice = "/dev/informixvg/informixvol"
     FSType = vxfs
     FsckOpt = "-y"
     )

LVMLogicalVolume infodatavg_infodatavol (
     LogicalVolume = infodatavol
     VolumeGroup = infodatavg
     )

LVMVolumeGroup infodatavg (
     VolumeGroup = infodatavg
     )

Mount infodata_mount (
     MountPoint = "/informix/Infodata"
     BlockDevice = "/dev/infodatavg/infodatavol"
     FSType = vxfs
     FsckOpt = "-y"
     )

INF requires informix_mount
INF requires infodata_mount
INF requires informix_IP
informix_IP requires informix_lan0
informix_mount requires informixvg_informixvol
infodata_mount requires infodatavg_infodatavol
informixvg_informixvol requires informixvg
infodatavg_infodatavol requires infodatavg
```

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