Cluster Server 7.3.1 Agent for Sybase Installation and Configuration Guide - AIX

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Chapter 1

Introducing the Cluster Server agent for Sybase

This chapter includes the following topics:

- About the Cluster Server agent for Sybase
- Supported software for the VCS agent for Sybase
- How the agent makes Sybase highly available
- How the Sybase and SybaseBk agents support intelligent resource monitoring
- About the Sybase agent functions
- Monitoring options for the Sybase agent
- Action function for the VCS agent for Sybase
- Typical Sybase configuration in a VCS cluster

About the Cluster Server agent for Sybase

The Cluster Server agent for Sybase brings the configured Sybase servers online, monitors them, and takes them offline.

For Sybase ASE enterprise edition, the following agents work together to make Sybase highly available in a VCS cluster.

- Agent for SQL Server- Sybase
- Agent for Backup Server- SybaseBk

The agents include type declarations and agent executables, and are represented with Sybase and SybaseBk resource types, respectively.

Note: For ASE Enterprise Edition, the VCS agent for Sybase provides "active/passive" support. For "active/active" support for ASE Enterprise Edition, contact Sybase for their agent.

Supported software for the VCS agent for Sybase

Refer to the *Veritas InfoScale 7.3.1 Release Notes* for information on supported software and platform versions.

Refert to the Sybase agent support matrix at https://www.veritas.com/support/en_US/article.000126342.

How the agent makes Sybase highly available

The Cluster Server agent for Sybase continuously monitors the Sybase database and SybaseBk processes to verify whether they function properly.

The agent for Sybase can perform different levels of monitoring and different actions which you can configure.

- Primary or Basic monitoring: In the basic monitoring mode, the agent monitors the configured Sybase server process, and fails over or restarts the group during an application failure.
- Detail monitoring: In the optional detail monitoring mode, the agent detects application failure if it cannot perform a transaction in the test table in the Sybase database server.
- Intelligent monitoring framework (IMF): The Sybase agent is IMF-aware and uses asynchronous monitoring framework (AMF) kernel driver for resource state change notifications.

See "How the Sybase and SybaseBk agents support intelligent resource monitoring " on page 9.

For ASE Enterprise edition when the agent detects that the configured Sybase server is not running on a system, the Sybase service group is failed over to the next available system in the service group's SystemList. The configured Sybase servers are started on the new system, thus ensuring high availability for the Sybase server and data.

How the Sybase and SybaseBk agents support intelligent resource monitoring

With intelligent monitoring framework (IMF), VCS supports intelligent resource monitoring in addition to the 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 Sybase and SybaseBk using `haimfconfig` script or manually.

See "Enabling and disabling intelligent resource monitoring (IMF) for agents" on page 42.

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 Sybase agent registers the PIDs of the processes with the AMF kernel driver. The agent's `imf_getnotification` function waits for any resource state changes. When the AMFkernel 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 VCS which takes the appropriate action.

See the *Cluster Server Administrator's Guide* for more information.

About the Sybase agent functions

The functions an agent performs are called entry points. The Cluster Server agent for Sybase can perform different operations or functions on the database. These functions are online, offline, monitor, clean, and action.

Review the functions for the following agents that are part of the Cluster Server agent suite for Sybase:

- Sybase (SQL server) agent functions
  See "Sybase agent functions " on page 9.
- SybaseBk (Backup Server) agent functions
  See "SybaseBk agent functions" on page 12.

Sybase agent functions

The agent for Sybase starts a Sybase ASE dataserver, monitors the server processes, shuts down the server, and restarts the server processes..

The Sybase agent is IMF-aware.

Table 1-1 lists the Sybase agent for SQL server functions.

Table 1-1 Sybase agent functions

Agent function	Description
Online	Starts the Sybase ASE dataserver by using the following command. `startserver -f $SYBASE/$SYBASE_ASE/install/RUN_$Server` where $Server is the instance_name, and `$SYBASE/$SYBASE_ASE/install/RUN_$Server` is the default location of the Run server file. If you specify the value of the Run_ServerFile attribute, then the value that you specify is used instead of the default location. If the WaitForRecovery attribute is enabled, the agent waits either till recovery has been completed and all databases that can be made online are brought online. The agent queries the recovery status by connecting to the `isql` session. The OnlineTimeout attribute must be set to a sufficiently large value so that the recovery completes before the OnlineTimeout is reached. By default, the WaitForRecovery attribute is not enabled. If the interfaces file location is specified using the interfaces_File attribute, agent uses [-I interfaces file] option while connecting to the isql session. When DelayAfterOnline attribute is set, the monitor function is invoked after completion of online function, and after the number of seconds specified in DelayAfterOnline attribute have elapsed.
Monitor	In the basic monitoring mode, agent scans the process table for the dataserver process. In the detail monitoring mode, agent runs the script that is specified in MonScript as an option. See "Monitoring options for the Sybase agent" on page 15.

Table 1-1 Sybase agent functions *(continued)*

Agent function	Description
Offline	Stops the Sybase SQL server by using the `isql` command in the following manner. If interfaces file location is specified using the interfaces_File attribute, agent uses the specified file while connecting to isql session. The agent first executes the `shutdown with wait` command. Sybase agent uses the `timeout` option during shutdown of Sybase dataserver if this option is supported. For Sybase ASE Enterprise edition the timeout option for shutdown command is supported for versions 12.5.4 and 15.0.2 onwards. If this timeout option is not supported for Sybase ASE Enterprise edition, the offline script waits in a loop till the dataserver completely stops. The agent waits for up to the OfflineTimeout duration. If the process is still running, the offline script issues a `shutdown with nowait` command. When DelayAfterOffline attribute is set, the monitor function is invoked after completion of offline function and after the number of seconds specified in DelayAfterOffline attribute have elapsed.
imf_init	Initializes the agent to interface with the AMF kernel driver, which is the IMF notification module for Sybase agent. This function runs when the agent starts up.
imf_register	Registers or unregisters resource entities with the AMF kernel module. This function runs for each resource after the resource goes into steady state (online or offline).
imf_getnotification	Gets notification about resource state changes. This function runs after the agent initializes with the AMF kernel module. This function continuously waits for notification and takes action on the resource upon notification.

Table 1-1 Sybase agent functions *(continued)*

Agent function	Description
Clean	Forcefully stops the Sybase SQL server by using the `isql` command in the following manner. The agent first executes the `shutdown with wait` command. For Sybase ASE Enterprise edition, if the `isql` command fails, the clean script executes the `shutdown with nowait` command. If the process does not respond to the `shutdown` command, the agent kills the Sybase dataserver process.
Action	Performs the predefined actions on a resource. See "Action function for the VCS agent for Sybase" on page 15.

SybaseBk agent functions

The agent for SybaseBk starts a Sybase Backup server, monitors the server process, and shuts down the server.

The SybaseBk agent is IMF-aware.

Table 1-2 lists the Sybase agent for Backup server functions.

Table 1-2 Sybase agent for Backup server functions

Agent operation	Description
Online	Starts the Sybase Backup server by using the following command. `startserver -f $SYBASE/$SYBASE_ASE/install/RUN_$BackupServer` Where `$SYBASE/$SYBASE_ASE/install/RUN_$BackupServer` is the default location of the Run server file. If you specify the value of the Run_ServerFile attribute, then the value that you specify is used instead of the default location.
Monitor	Scans the process table for the backupserver process.

Table 1-2 Sybase agent for Backup server functions *(continued)*

Agent operation	Description
Offline	Stops the Sybase Backup server by using the `isql` command in the following manner. If interfaces file location is specified using the interfaces_File attribute, agent uses the specified file while connecting to `isql` session. The agent first executes the command `shutdown SYB_BACKUP with wait`. If this command fails, the offline script executes `shutdown SYB_BACKUP with nowait`.
Clean	Forcefully stops the Sybase Backup server by using the `isql` command in the following manner. The agent first executes the command `shutdown SYB_BACKUP with wait`. If this command fails, the clean script executes `shutdown SYB_BACKUP with nowait`. If the process does not respond to the `shutdown` command, the agent scans the process table for the processes that are associated with the configured Sybase Backup server and kills them.
imf_init	Initializes the agent to interface with the AMF kernel driver, which is the IMF notification module for SybaseBk agent. This function runs when the agent starts up.
imf_ register	Registers or unregisters resource entities with the AMF kernel module. This function runs for each resource after the resource goes into steady state (online or offline).
imf_getnotification	Gets notification about resource state changes. This function runs after the agent initializes with the AMF kernel module. This function continuously waits for notification and takes action on the resource upon notification.

Using the IPC Cleanup feature for the Sybase agent

When the Adaptive Server starts, it creates shared memory files in $SYBASE to store information about the shared memory segments that it uses. Adaptive Server start-up parameter -M can be used to change the location of directory that stores shared memory files. The start-up parameter -M should be updated in RUN_$Server file.

If the Sybase home directory is unmounted, the Sybase clean script cannot access the shared memory files and does not clean the IPC resources that are allocated by the Sybase processes. Hence, the agent requires shared memory files to be present in the following directory on local system `/var/tmp/sybase_shm/$Server`.

In the $SYBASE/$SYBASE_ASE/install directory, edit the RUN_$Server file. Change the location of the directory that stores shared memory files to /var/tmp/sybase_shm/$Server using the -M option.

For example, the file RUN_Sybase_Server resembles the following before the change:

```
/home/sybase/ASE-15_0/bin/dataserver \

-sSybase_Server \

-d/home/sybase/data/master.dat \

-e/home/sybase/ASE-15_0/install/Sybase_Server.log \

-c/home/sybase/ASE-15_0/Sybase_Server.cfg \

-M/home/sybase/ASE-15_0 \
```

After the replacement, the file resembles:

```
/home/sybase/ASE-15_0/bin/dataserver \

-sSybase_Server \

-d/home/sybase/data/master.dat \

-e/home/sybase/ASE-15_0/install/Sybase_Server.log \

-c/home/sybase/ASE-15_0/Sybase_Server.cfg \

-M/var/tmp/sybase_shm/Sybase_Server \
```

Here Sybase_Server is the name of the Adaptive server.

Note: Make sure you create the /var/tmp/sybase_shm/Sybase_Server directory with proper permissions.

Monitoring options for the Sybase agent

The VCS agent for Sybase provides two levels of application monitoring: basic and detail.

In the basic monitoring mode, the agent for Sybase monitors the Sybase dataserver processes to verify whether they are running.

In the detail monitoring mode, the agent performs a transaction on a test table in the database to ensure that Sybase server is funtioning properly. The test table should be created by the user, and the table is specified in the attribute Table for the Sybase agent. The agent uses this test table for internal purposes. Veritas recommends that you do not perform any other transaction on the test table.

See "About setting up detail monitoring for the agent for Sybase" on page 39.

For the Sybase ASE Enterprise edition, when the agent detects that the configured Sybase server is not running on a system, the Sybase service group is failed over to the next available system in the service group's SystemList. The configured Sybase servers are started on the new system, thus ensuring high availability for the Sybase server and data.

Action function for the VCS agent for Sybase

The agent for Sybase supports the Action function, which enables you to perform predefined actions on a resource.

To perform an action on a resource, type the following command:

```
# hares -action res token [-actionargs arg1 ...] \
[-sys system] [-clus cluster]
```

You can also add custom actions for the agent.

For more information, refer to the *Cluster Server Agent Developer's Guide*.

Table 1-3 describes the agent's predefined action.

Table 1-3 Predefined agent action

Action	Description
checkpoint_all	Performs "checkpoint all" for the Sybase dataserver by connecting to isql session.

Typical Sybase configuration in a VCS cluster

In a typical configuration, VCS is configured in a two node cluster. The Sybase data is installed on shared disks. The Sybase server binaries can be installed locally on both nodes or on shared disks. The agent for Sybase is installed on both the nodes. The shared disks can be managed using Veritas Volume Manager (VxVM).

Figure 1-1 illustrates a sample configuration in which the Sybase servers, including binaries and data are installed completely on shared disks or shared cluster disk groups managed using VxVM.

Figure 1-1 Sybase binaries and data on shared disks

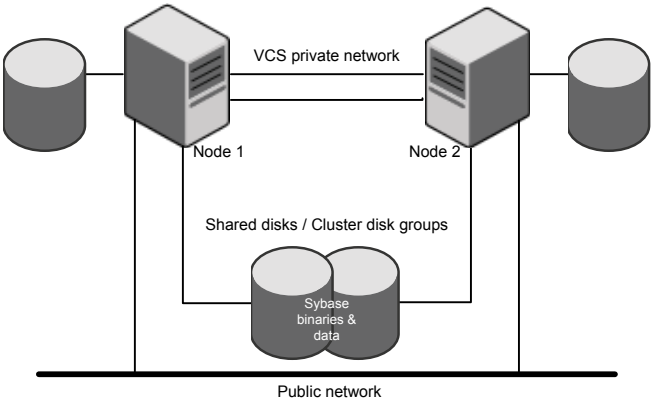
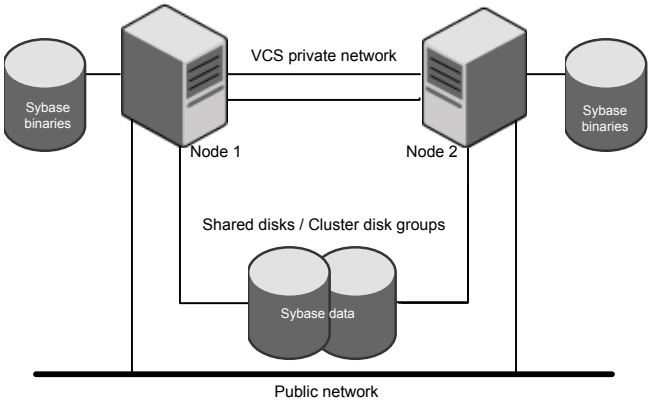


Figure 1-2 illustrates a sample configuration in which Sybase binaries are installed locally on each node in the cluster and the Sybase data is on shared disks or shared cluster disk groups managed using VxVM.

Figure 1-2 Binaries on local disk and Sybase data on shared disks



Chapter 2

Installing and configuring Sybase

This chapter includes the following topics:

- VCS requirements for installing Sybase
- Installing Sybase in a VCS environment
- Configuring Sybase for detail monitoring

VCS requirements for installing Sybase

Review the following requirements before you install Sybase in a VCS cluster. Before installing Sybase, make sure that the systems in the cluster have adequate resources to run Sybase and VCS.

Sybase installation directory

The Sybase installation directory can be located on a local disk or a shared storage.

Review the following prerequisites:

- If the Sybase binaries are installed on a local disk, verify that the installation path is same on all the nodes in the cluster. Make sure the Sybase configuration files are identical on all the nodes in the cluster.
- If the Sybase binaries are installed on shared disks, make sure the mount points for the shared disks are same on all the nodes. The Sybase installation directory is specified by the environment variable $SYBASE. Create the same $SYBASE mount points on each system.

SYBASE directory on shared disks

All database devices, including master devices, sybsystemprocs, and information about Sybase user must be located on shared disks. If the database devices are created on file systems, the file systems must also be located on shared disks. Create the same file system mount points on each system to access the shared disks.

System Group and User for Sybase home directory

Make sure you have a system group and user, with the same name and ID, on all cluster nodes. Also, the system user should have the ownership of the Sybase home directory on the shared disk. Type the following commands:

```
# mkgroup  id=group_id group_name
# useradd -u user_id  -g group_name user_name
# chown -R user_name:group_name $SYBASE
```

Database dbspaces

If you use shared disks for dbspaces, change the permissions, or access mode on the disk groups that store the Sybase data. Change the permissions for sybase to 660.

For example, if you use Veritas Volume Manager, type

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

Transparent TCP/IP failover

For Sybase server failover to be transparent to Sybase clients, create an IP address as part of the Sybase service group. This IP address must match the dataserver and backup server entries in the $SYBASE/interfaces file.

For information on the format for adding entries to the $SYBASE/interfaces file, refer to the Sybase documentation.

Changes required in Sybase RUN_Server file for AMF offline monitoring

On AIX platform, the pattern registered with AMF kernel driver for offline monitoring must appear within first 79 characters of the process command line. Due to this AMF kernel driver limitation, the changes required in Sybase RUN_Server file for AMF offline monitoring are described below.

For offline IMF monitoring, Sybase agent registers the Sybase server binary name (dataserver/backupserver) and instance name with the AMF kernel driver. Hence for IMF offline monitoring to provide event notification correctly, Sybase instance name must appear in first 79 character of the process command line.

A process having a longer pathname is truncated in the table, making it unrecognizable. However, the Sybase home directory ($SYBASE) may have such a long pathname. In this case, you can create a soft link to the $SYBASE directory and use the same soft link instead of the long pathname in the appropriate Sybase installation files. Therefore, using a soft link pathname avoids the problems that arise due to the long pathname.

After creating the soft link on each system, you must edit the following files by making the appropriate substitutions.

- The file RUN_Server in the directory `$SYBASE/$SYBASE_ASE/install`.
- The file RUN_Server_back in the directory `$SYBASE/$SYBASE_ASE/install`.

If you are using RUN_Server files from non-default location, edit the respective files.

The following example demonstrates how to replace a $SYBASE pathname with a soft link.

To replace a $SYBASE pathname with a soft link:

1 On each system in the cluster, create a soft link to the long pathname.

For example:

```
# ln -s /opt/apps/sybase/home/directory/is/longer/than\
eighty/characters/sybase /opt/link_to_longpath
```

The process gets invoked with the short pathname of the soft link.

2 Example: The file RUN_Server resembles the following before the change:

```
/opt/apps/sybase/home/directory/is/longer/than/eighty
/characters/sybase/ASE-12_5/bin/dataserver\
-d/dev/vx/rdsk/db_dg1/vol2\
-e/opt/apps/sybase/home/directory/is/longer
/than/eighty /characters/sybase/install/fw17i.log\
-M/opt/apps/sybase/home/directory/is/longer/than/eighty
/characters/sybase\
-sfw17i\
```

After the replacement, the file resembles as follows:

```
/opt/link_to_longpath/ASE-12_5/bin/dataserver\
-sfw17i\
-d/dev/vx/rdsk/db_dg1/vol2\
-e/opt/link_to_longpath/install/fw17i.log\
-M/opt/link_to_longpath\
```

3 Make sure that the -s option and its argument (fw17i in the example) are the first to be listed. It must be placed within the first 79 characters of the file.

For example, if you do not put the -s option and the argument in the first 79 characters, the command string that will be considered is as follows:

```
/opt/apps/sybase/home/directory/is/longer/than/eighty
/characters/sybase/ASE-12_5/
```

In this case, the -s option is omitted and the AMF kernel driver fails to match the registered pattern and does not notify the process creation event. However, if you move the -s to be the first option, the first 79 characters of the command string for the same example will be as follows:

```
/opt/link_to_longpath/ASE-12_5/bin/dataserver\
-sfw17i\
-d/dev/vx/rdsk/db_dg1/vol2
```

In this case, the -s option is among the first 79 characters.

Language settings for the Sybase agent

For the VCS agent for Sybase to function with the desired locale, make sure that the Sybase installation has the correct localization files. For example, if the Sybase server requires 'LANG=en_US.UTF-8' environment variable, verify that the localization files corresponding to language 'en_US.UTF-8' are installed with Sybase.

Also, edit the file $VCS_HOME/bin/vcsenv to contain the following:

```
LANG=en_US.UTF-8
export LANG

LC_CTYPE=en_US.UTF-8
export LC_CTYPE

LC_ALL=en_US.UTF-8
export LC_ALL
```

This change affects all the agents that are configured on the nodes.

AMF kernel driver limitation for process offline event notification

On AIX platform , the pattern registered with AMF kernel driver for offline monitoring must appear within first 79 characters of the process command line. For offline IMF monitoring, Sybase agent registers the Sybase server binary name (dataserver/backupserver) and instance name with the AMF kernel driver. hence

for IMF offline monitoring to provide event notification correctly, Sybase instance name must appear in the first 79 characters of the process command line.

A process having a longer pathname is truncated in the table, making it unrecognizable. The Sybase home directory ($SYBASE) could possibly have such a long pathname. In this case, you can create a soft link to the $SYBASE directory and use it in place of the long file name in the appropriate Sybase installation files.

Using a soft link pathname avoids the problems that arise due to the long pathname.

After creating the soft link on each system, you must edit the following files by making the appropriate substitutions:

- The file RUN_Server in the directory $SYBASE/$SYBASE_ASE/install.
- The file RUN_Server_back in the directory $SYBASE/$SYBASE_ASE/install.

If you are using RUN_Server files from non-default location, edit the respective files.

The following example demonstrates how to replace a $SYBASE pathname with a soft link.

To replace a $SYBASE pathname with a soft link

1 On each system in the cluster, create a soft link to the long path name.

```
# ln -s /opt/apps/sybase/home/directory/is/longer/than\
eighty/characters/sybase /opt/link_to_longpath
```

Now the process is invoked with the short pathname of the soft link.

2 Edit the RUN_Server file.

Example: The file RUN_Server resembles the following before the change:

```
/opt/apps/sybase/home/directory/is/longer/than/eighty
/characters/sybase/ASE-12_5/bin/dataserver\
-d/dev/vx/rdsk/db_dg1/vol2\
-e/opt/apps/sybase/home/directory/is/longer
/than/eighty /characters/sybase/install/fw17i.log\
-M/opt/apps/sybase/home/directory/is/longer/than/eighty
/characters/sybase\
-sfw17i\
After the replacement, the file resembles as follows:
/opt/link_to_longpath/ASE-12_5/bin/dataserver\
-sfw17i\
-d/dev/vx/rdsk/db_dg1/vol2\
-e/opt/link_to_longpath/install/fw17i.log\
-M/opt/link_to_longpath\
```

3 Make sure that the -s option and its argument (fw17i in the example) are the first to be listed. It must be placed within the first eighty characters of the file.

For example, if you do not put the -s option and the argument in the first eighty characters, the command string that will be considered is as follows:

```
/opt/apps/sybase/home/directory/is/longer/than/eighty
/characters/sybase/ASE-12_5/
```

In this case, the -s option is omitted and the AMF kernel driver fails to match the registered pattern and does not notify the process creation event. However, if you move the -s to be the first option, the first 80 characters of the command string for the same example appear as follows:

```
/opt/link_to_longpath/ASE-12_5/bin/dataserver\
-sfw17i\
-d/dev/vx/rdsk/db_dg1/vol2
```

In this case, the -s option is among the first eighty characters.

Installing Sybase in a VCS environment

For information on how to install Sybase, refer to Sybase documentation.

Configuring Sybase for detail monitoring

This section describes the tasks to be performed to configure a Sybase server for detail monitoring.

See "About setting up detail monitoring for the agent for Sybase" on page 39.

Note: The steps that are described here are specific to the sample script, SqlTest.pl, provided with the agent. If you use a custom script for detail monitoring, you must configure the Sybase database accordingly.

Perform these steps only once in a Sybase cluster.

To configure Sybase for detail monitoring

1 Source the SYBASE.sh file or SYBASE.csh file (depending on the user shell) to set the $SYBASE and $SYBASE_ASE environment variables.

2 Start the Sybase server.

```
# startserver -f ./$SYBASE/$SYBASE_ASE/install/RUN_server_name
```

3 Start the Sybase client on any cluster node.

```
# isql -Usa -SSYBASE_SERVER_NAME
```

Enter the administrator password when prompted to do so.

4 Connect to the master database.

```
# use master
# go
```

5 Create a Sybase user account.

```
# sp_addlogin user_name, password
# go
```

The detail monitor script should use this account to make transactions on the database.

6 Create a database.

```
# create database database_name
# go
```

The detail monitor script should make transactions on this database.

7 If required, restrict the size of the log file for the database.

```
# sp_dboption database_name, "trunc log on chkpt", true
# go
```

8 Connect to the database that is created in step 6.

```
# use database_name
# go
```

9 Associate the user created in step 5 with the database created in step 6.

```
# sp_adduser user_name
# go
```

10 Change the user to the one created in step 5.

```
# setuser "user_name"
# go
```

11 Create a table in the database.

```
# create table table_name (lastupd datetime)
# go
```

The detail monitor script should make transactions on this table.

If you use the SqlTest.pl for detail monitoring, make sure you create a table with a lastupd field of type datetime.

12 Verify the configuration by adding an initial value to the table.

```
# insert into table_name (lastupd) values (getdate())
# go
```

13 Exit the database.

```
# exit
```

Chapter 3

Installing, upgrading, and removing the agent for Sybase

This chapter includes the following topics:

- Before you install or upgrade the agent for Sybase
- Installing the agent for Sybase
- Disabling the agent for Sybase
- Removing the agent for Sybase
- Upgrading the agent for Sybase

Before you install or upgrade the agent for Sybase

Ensure that you meet the following prerequisites to install the VCS agent for Sybase:

- Verify that VCS is installed and configured. If required, review the *Cluster Server Installation Guide*.
- Verify that Sybase is installed and configured on all cluster nodes on which you will install the agent. Review the Sybase documentation for more information.
  See "VCS requirements for installing Sybase" on page 18.
- Verify that the sybase account is valid and identical on all cluster systems that will run Sybase. Verify that the sybase user account has permissions to execute Sybase binaries.
  See "System Group and User for Sybase home directory" on page 19.

Installing the agent for Sybase

The agent binaries for Cluster Server agent for Sybase are a part of the VRTSvcsea fileset. The VRTSvcsea fileset is already installed if you chose to install all packages or recommended packages during VCS installation. You must manually install the VRTSvcsea fileset if you installed minimal packages during VCS installation.

You can also install the Cluster Server agent for Sybase from the product disc.

Install the agent for Sybase on each node in the cluster.

To install the agent on AIX systems

1. Log in as superuser.
2. Make sure that the agent is not already installed.

   Navigate to /opt/VRTSagents/ha/bin and list the contents of the directory. If the command returns the VCS agents for Sybase, you can skip this procedure.
3. Find the device access name of the disk drive, using the following commands:

   ```
   # cd /dev
   # lsdev -C -c cdrom
   ```

   The system output resembles the following:

   ```
   cd0 Available 10-60-00-4,0 16 Bit SCSI Multimedia
   CD-ROM Drive
   ```

   Note: In this example, cd0 is the device access name of the disk.
4. Insert the disk with the VCS software into the drive that is connected to the node.
5. Use the following command to mount the software disk using the device access name found in 3.

   ```
   # mkdir -p /dvdrom
   # mount -V cdrfs -o ro /dev/cd0 /dvdrom
   # cd /dvdrom
   ```

6 To navigate to the directory containing the filesets and then to install the agent, run the following commands:

```
# cd pkgs
```

Caution: The VRTSvcsea fileset includes the agent binaries for the Sybase agent. The fileset also installs the VCS agents for DB2 and Oracle.

```
# installp -ac -d VRTSvcsea.rte.bff VRTSvcsea
```

7 Copy the file SybaseTypes.cf from /etc/VRTSagents/ha/conf/Sybase/ directory to /etc/VRTSvcs/conf/config directory.

Disabling the agent for Sybase

To disable the agent on a system, you must first change the Sybase service group to an OFFLINE state. You can stop the application completely, or switch the service group to another system.

To disable the agent

1 Determine if the service group is online. At the prompt, type:

```
# hagrp -state service_group -sys system_name
```

2 If the service group is online, switch the service group to another system or take it offline. At the prompt, type:

```
# hagrp -switch service_group -to system_name
```

Or

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

3 Stop the agent on the system. At the prompt, type:

```
# haagent -stop Sybase -sys system_name
# haagent -stop SybaseBk -sys system_name
```

4 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 verify that the agent has stopped.

5 When the agent has stopped, you can remove the system, the service group, or the resource type from the VCS configuration.

For more information, refer to the chapter on reconfiguring VCS from the command line in *Cluster Server Upgrade Guide*.

Removing the agent for Sybase

This section provides steps to remove the agent from the cluster.

Warning: The VRTSvcsea fileset includes the VCS agents for Oracle, Sybase, and DB2. So, the following procedure to remove the VCS agent for Sybase removes all the other agents also.

To remove the agent for Sybase

1 Take the Sybase and SybaseBk resources offline.

2 Stop the agent for Sybase.

```
# haagent -stop Sybase -sys system_name
```

Perform this step on all nodes on which the agent for Sybase is running.

3 Stop the agent for SybaseBk.

```
# haagent -stop SybaseBk -sys system_name
```

Perform this step on all nodes on which the agent for SybaseBk is running.

4 Type the following command to remove the agent from all nodes in the cluster. Answer prompts accordingly.

```
# installp -u VRTSvcsea
```

Upgrading the agent for Sybase

This section describes the procedure to upgrade the VCS agent for Sybase in a Cluster Server (VCS) cluster. Execute the following steps on each node of the VCS cluster.

Note: You can upgrade the VCS agent for Sybase from versions 5.0, 5.1, 6.0.1, to 7.0.0 or later. See "Installing the agent for Sybase" on page 28.

To upgrade the VCS agent for Sybase

1. Save the VCS configuration and stop the VCS engine.

```
# haconf -dump -makero
# hastop -all -force
```

2. Back up the configuration file, main.cf to a location on the cluster node.
3. Based on your current VCS agent version for Sybase, perform the appropriate steps on all systems that have the agent installed:

To	Perform the following steps

Upgrade the VCS agent from a version earlier than 5.1	1. Remove the VCS agent for Sybase, by using the following command:
	`# installp -u VRTSvcssy`
	2. Move the old SybaseTypes.cf file:
	`# mv /etc/VRTSvcs/conf/config/SybaseTypes.cf /etc/VRTSvcs/conf/config/SybaseTypes.cf.bkp`
	3. Install the Cluster Server Agent for Sybase.
	4. Navigate to the directory that contains the packages:
	`# cd pkgs`
	5. Apply the package by running the following command:
	Caution: If you run the following command, the VCS agents for Oracle and DB2 are also upgraded.
	`# installp -ac -d VRTSvcsea.rte.bff VRTSvcsea`

To	Perform the following steps

Upgrade the VCS agent from 5.1 or later	**1** Remove the VCS agent for Sybase using the following command:
	`# installp -u VRTSvcsea`
	2 Take backup of SybaseTypes.cf
	`# mv /etc/VRTSvcs/conf/config/SybaseTypes.cf /etc/VRTSvcs/conf/config/SybaseTypes.cf_bkp`
	3 Install the Cluster Server Agent for Sybase.
	4 Navigate to the directory that contains the packages:
	`# cd pkgs`
	5 Apply the package by running the following command:
	Caution: If you run the following command, the VCS agents for Oracle and DB2 are also upgraded.
	`# installp -ac -d VRTSvcsea.rte.bff VRTSvcsea`

4 Make sure that you have copied the SybaseTypes.cf file from the `/etc/VRTSagents/ha/conf/Sybase directory to /etc/VRTSvcs/conf/config` directory.

Make sure to update the newly copied SybaseTypes.cf file with all the type-level changes that you had made to the older SybaseTypes.cf file.

For example, if you had changed the value of the MonitorInterval attribute from the default 60 to 120 seconds, the SybaseTypes.cf file gets updated. You must apply these type-level changes manually to the newly copied SybaseTypes.cf file.

5 Copy the main.cf file from the backed up location to /etc/VRTSvcs/conf/config directory.

6 Verify the configuration.

```
# cd /etc/VRTSvcs/conf/config
# hacf -verify .
```

7 Start VCS on the local node.

8 Start VCS on the other nodes.

Chapter 4

Configuring VCS service groups for Sybase

This chapter includes the following topics:

- About configuring service groups for Sybase
- Before configuring the service group for Sybase
- Configuring the service groups for Sybase
- Configuring the service group for Sybase from Cluster Manager (Java console)
- Configuring the service group for Sybase using the command line
- Encrypting passwords for Sybase
- About setting up detail monitoring for the agent for Sybase
- Enabling and disabling intelligent resource monitoring (IMF) for agents
- Administering the AMF kernel driver

About configuring service groups for Sybase

Configuring the Sybase service group involves configuring service group resources and defining attribute values for the configured resources. You must have administrator privileges to create and configure a service group. Before you configure the agent, review the Sybase resource types and their attributes.

Before configuring the service group for Sybase

Before you configure the Sybase service group, you must meet the following prerequisites:

- Verify that VCS is installed and configured on all nodes in the cluster where you plan to configure the service group. For more information on configuring VCS see the *Cluster Server Configuration and Upgrade Guide*.
- Verify that Sybase is installed and configured identically on all nodes in the cluster.
  See "VCS requirements for installing Sybase" on page 18.
- Verify that the Cluster Server agent for Sybase is installed on all nodes in the cluster.
  See "Installing the agent for Sybase" on page 28.
- Verify the type definition for Cluster Server agent for Sybase is imported into the VCS engine.
  See "Importing the SybaseTypes.cf file" on page 34.

Note: From VCS 6.0 onwards, you need not encrypt passwords if you use the VCS Cluster Manager (Java Console) to configure attributes. It automatically encrypts the passwords.

Importing the SybaseTypes.cf file

Before you configure the Sybase service group, you must import the SybaseTypes.cf file to the VCS engine.

To import the SybaseTypes.cf file using the Cluster Manager (Java Console)

1. On one of the nodes in the cluster, start the Cluster Manager (Java Console).
2. Log in to the cluster and wait for the Cluster Explorer to launch.
3. From the **File** menu select **Import Types**. Switch to the read/write mode if prompted.
4. In the Import Types dialog box, select the file:

   ```
   /etc/VRTSagents/ha/conf/Sybase/SybaseTypes.cf
   ```

5. Click **Import** and wait for the file to import.
6. Save the configuration.

To import the SybaseTypes.cf file using the command line

1. Log in to a cluster system as superuser.
2. Make the cluster configuration as read-only. This action ensures that all changes to the existing configuration have been saved and 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. Leave the resources that are available online.

   ```
   # 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 to include the SybaseTypes.cf file.

   ```
   # include "/etc/VRTSagents/ha/conf/Sybase/SybaseTypes.cf"
   ```

   The Sybase types definition is imported to the VCS engine. The agent for Sybase can be configured without interrupting or stopping VCS.

Configuring the service groups for Sybase

You can configure the service groups for Sybase using the following methods:

- By using VCS Cluster Manager (Java Console) to edit a resource group template for the agent.
  See "Configuring the service group for Sybase from Cluster Manager (Java console)" on page 36.
- By using the types configuration files and directly editing the sample main.cf file supplied with the agent. This method requires you to restart VCS before the configuration takes effect.
  See "Configuring the service group for Sybase using the command line" on page 37.
- By using the Veritas Operations Manager (VOM).
  For more information, see VOM documentation.

Configuring the service group for Sybase from Cluster Manager (Java console)

A template for the Sybase resource groups is automatically installed with the VCS agent for Sybase. Using the VCS cluster Manager (Java console), you can view the template, which displays the Sybase service group, its resources and their attributes. You can dynamically modify the attributes' values as necessary for your configuration.

To configure a service group from the Java console

1. Make sure that the Sybase type definition file SybaseTypes.cf is imported in your configuration.
2. Launch the Cluster Configuration wizard using any of the following ways:
   - From the Cluster Explorer menu, select **Tools > Configuration Wizard**.
   - If no service groups exist on the system, Cluster Explorer prompts you to launch the Cluster Configuration wizard. Click **Yes** when prompted.

   The Loading Templates Information window appears, and launches the wizard.
3. Review the information in the Welcome dialog box and click **Next**.
4. Specify the name of the service group and the target systems on which the service group is configured.
   - Enter the name of the service group.
   - From the **Available Systems** box, select the systems on which to configure the service group.
   - Click the right arrow to move the selected systems to the **Systems for Service Group** box. To remove a system from the box, select the system and click the left arrow.
   - Specify system priority for the service group to failover. System priority is numbered sequentially, with the lowest assigned number denoting the highest priority.
   - Select the **Service Group Type** as Failover and click **Next**.
5. On the **Would you like to use a template to configure the service group?** dialog box, click **Next** to configure the service group using a template.
6. Select the **SybaseGroup** template to configure a Sybase service group.

   If applicable, a window opens to notify that names of some resources within the new service group are already in use. Resolve the name clashes, if any and click **Next**.

7 Click **Next** to create the service group that is based on the selected template.

A progress indicator displays the percentage of the commands that are executed to create the service group. The actual commands are displayed at the top of the indicator.

8 After the service group is created, click **Next** to edit the attributes of the resources.

The left pane in the dialog box lists all the resources for the Sybase service group. Select a resource from the left pane to list the attributes on the right pane. The attributes in bold denote mandatory attributes. You can modify the attribute values as given in the procedure that follows.

9 Click **Finish** to accept the default values and complete the configuration.

To edit the Sybase service group resource attributes

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

2 Select the attribute to be modified and click the edit icon in the **Edit** column.

3 In the Edit Attribute dialog box, enter the attribute values. To modify the scope of the attribute, choose the **Global** or **Local** option.

4 Click **OK**.

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

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

Caution: For added security, you must always provide a secure value for passwords. The password may contain letters (a-z), numbers (0-9), or special characters.

See "Encrypting passwords for Sybase" on page 39.

Configuring the service group for Sybase using the command line

The VCS agent for Sybase contains a sample configuration file that can be used as reference to directly modify your present configuration file. This method requires you to restart VCS before the configuration takes effect.

To configure a service group for Sybase from the command line

1. Log in to a cluster system as superuser.
2. Make sure the Sybase type definition is imported into VCS engine.

   See "Configuring the service groups for Sybase" on page 35.
3. Edit the main.cf file at `/etc/VRTSvcs/conf/config/main.cf`. For reference, use the sample files at `/etc/VRTSagents/ha/conf/Sybase`.
   - Create a Sybase service group.
   - Create the Sybase and SybaseBk resources.
     See "Sybase resource type" on page 48.
     See "SybaseBk resource type" on page 56.
   - Edit the default attributes to match the parameters in your configuration.
     For added security, you must always provide a secure value for passwords.
     See "Encrypting passwords for Sybase" on page 39.
   - Assign dependencies to the newly created resources. Refer to the sample file at `/etc/VRTSagents/ha/conf/Sybase/`.
     See the *Cluster Server Upgrade Guide* for more information on assigning dependencies.
4. Save and close the file.
5. Verify the syntax of the file `/etc/VRTSvcs/conf/config/main.cf`

   ```
   # cd /etc/VRTSvcs/conf/config
   # hacf -verify .
   ```
6. Start VCS on the local node.

   ```
   # hastart
   ```
7. Start VCS on the other nodes.
8. If the system is listed in AutoStartList attribute of the Sybase service group, verify that all Sybase service group resources are brought online.

   ```
   # hagrp -state
   ```
9. Take the service group offline and verify that all the resources are stopped.

   ```
   # hagrp -offline service_group -sys system_name

   # hagrp -state
   ```

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

```
# hagrp -online service_group -sys system_name

# hagrp -state
```

11 Switch the Sybase service group to the other node.

```
# hagrp -switch service_group -to system_name
```

12 Verify that all Sybase service group resources are brought online on the other node.

```
# hagrp -state
```

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

```
/var/VRTSvcs/log/engine_A.log
/var/VRTSvcs/log/Sybase_A.log
/var/VRTSvcs/log/SybaseBk_A.log
```

Encrypting passwords for Sybase

VCS provides a utility *vcsencrypt* to encrypt user passwords. Encrypt passwords before specifying them for Sybase and SybaseBk resource type definition.

The `vcsencrypt` utility also allows you to encrypt the agent passwords using a security key. The security key supports AES (Advanced Encryption Standard) encryption which creates a secure password for the agent. See the *Cluster Server Administrator's Guide* for more information.

About setting up detail monitoring for the agent for Sybase

The VCS agent for Sybase provides two levels of application monitoring: basic and detail. In basic monitoring, Sybase resource monitors the Sybase dataserver processes to verify that they are continuously active.

In detail monitoring, the Sybase resource performs transactions on a test table in the database to ensure that the Sybase server functions properly. The agent uses this test table for internal purposes. Veritas recommends that you do not perform any other transaction on the test table. The agent uses the script that is defined in

the attribute Monscript of the Sybase resource. During detail monitoring, the agent executes the specified script. If the script successfully executes, the agent considers the database available. You can customize the default script according to your configurations.

To activate detail monitoring, the LevelTwoMonitorFreq attribute must be set to a positive integer and User, UPword, Db, and Table attributes must not be empty (""). The attribute Monscript, which contains the path of the detail monitor script, must also exist and must have execute permissions for the root.

Enabling detail monitoring for the agent for Sybase

Perform the following steps to enable detail monitoring on a database.

Note: All Sybase resources in the cluster gets modified when you enable detail monitoring for agents.

To enable detail monitoring

1. Make sure the Sybase server is configured for detail monitoring.

   See "Configuring Sybase for detail monitoring" on page 24.

2. Make the VCS configuration writable.

   ```
   # haconf -makerw
   ```

3 Enable detail monitoring for Sybase.

```
# hatype -modify Sybase LevelTwoMonitorFreq <value>
# hares -modify Sybase_resource User user_name
# hares -modify Sybase_resource UPword encrypted-password
# hares -modify Sybase_resource Db database_name
# hares -modify Sybase_resource Table table_name
# hares -modify Sybase_resource Monscript
"/opt/VRTSagents/ha/bin/Sybase/SqlTest.pl"
```

Note: To enable detail monitoring, the LevelTwoMonitorFreq attribute must be set to a positive value. You can also override the value of this attribute at the resource level.

4 Save the configuration.

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

Note: If detail monitoring is configured and the database is full, the SQL queries take considerable time to commit the results. In such a case, the monitor routine for the agent fails and attempts to fail over the service group. This issue is not encountered if detail monitoring is not configured.

Disabling detail monitoring for the agent for Sybase

1 Make the VCS configuration writable with:

```
# haconf -makerw
```

2 To disable detail monitoring for Sybase run the following command:

```
# hatype -modify Sybase LevelTwoMonitorFreq 0
```

Note: If the LevelTwoMonitorFreq attribute is overridden at resource level, then use `hares` command and set the LevelTwoMonitorFreq attribute to 0 at resource level.

3 Save the configuration with:

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

Enabling and disabling intelligent resource monitoring (IMF) for agents

Review the following procedures to enable or disable intelligent resource monitoring manually. The intelligent resource monitoring feature is enabled by default. The IMF resource type attribute determines whether an IMF-aware agent must perform intelligent resource monitoring.

Note: VCS provides `haimfconfig` script to enable and disable IMF for agents. You can use the script when VCS is running or when VCS is stopped. Use the script to enable or disable IMF for the IMF-aware bundled agents, enterprise agents, and custom agents.

For additional information, refer to *Enabling and disabling IMF for agents by using script* section in *Cluster Server Administrator's Guide*.

See "How the Sybase and SybaseBk agents support intelligent resource monitoring " on page 9.

Note: All Sybase resources in the cluster gets modified when you enable or disable IMF monitoring for agents.

To enable intelligent resource monitoring

1 Make the VCS configuration writable.

```
# haconf -makerw
```

2 Run the following command to enable intelligent resource monitoring.

- To enable intelligent monitoring of offline resources:

```
# hatype -modify resource_type IMF -update Mode 1
```

- To enable intelligent monitoring of online resources:

```
# hatype -modify resource_type IMF -update Mode 2
```

- To enable intelligent monitoring of both online and offline resources:

```
# hatype -modify resource_type IMF -update Mode 3
```

You can also change the values of the MonitorFreq key and the RegisterRetryLimit key of the IMF attribute.

See "Attribute definitions for the Sybase agent" on page 49.

See "Attribute definitions for the SybaseBk agent" on page 57.

3 Save the VCS configuration

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

4 Make sure that the AMF kernel driver is configured on all nodes in the cluster.

- `/etc/init.d/amf.rc status`

5 Restart the agent. Run the following commands on each node.

```
# haagent -stop agent_name -force -sys sys_name
# haagent -start agent_name -sys sys_name
```

To disable intelligent resource monitoring

1 Make the VCS configuration writable.

```
# haconf -makerw
```

2 To disable intelligent resource monitoring for all the resources of a certain type, run the following command:

```
# hatype -modify Sybase IMF -update Mode 0
```

3 To disable intelligent resource monitoring for a specific resource, run the following command:

```
# hares -override resource_name IMF
# hares -modify resource_name IMF -update Mode 0
```

4 Save the VCS configuration.

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

Administering the AMF kernel driver

Perform the following procedures to start or stop the IMF kernel driver.

To start the AMF kernel driver

1 Set the value of the AMF_START variable to 1 in the following file:

```
# /etc/default/amf
```

2 Start the AMF kernel driver. Run the following command:

```
# /etc/init.d/amf.rc start
```

To stop the AMF kernel driver

1 Set the value of the AMF_STOP variable to 1 in the following file:

```
# /etc/default/amf
```

2 Run the following command:

```
# /etc/init.d/amf.rc stop
```

Chapter 5

Administering VCS service groups for Sybase

This chapter includes the following topics:

- About administering service groups for Sybase
- Bringing the Sybase service group online
- Taking the Sybase service group offline
- Switching the Sybase service group
- Modifying the Sybase service group configuration
- Viewing the agent log for Sybase

About administering service groups for Sybase

You can administer service groups with the Cluster Manager (Java Console), the Veritas InfoScale Operations Manager, or from the command line. The following procedures use the Cluster Manager (Java Console).

Bringing the Sybase service group online

Perform the following steps to bring a service group online. Note that in the initial few cycles of bringing a service group online, the memory usage by the agent can spike.

To bring a service group online

1. From Cluster Explorer, click the **Service Groups** tab in the configuration tree.
2. Right-click the service group and click **Enable Resources** to enable all the resources in this group.
3. Right-click the service group, hover over **Enable**, and select either the node or all the nodes where you want to enable the service group.
4. Save and close the configuration. Click **File > Save Configuration**, then **Close Configuration**.
5. Right-click the service group, pause over Online, and select the system where you want to bring the service group online.

Taking the Sybase service group offline

Perform the following procedure from Cluster Manager (Java Console) to take the service group offline.

To take a service group offline

1. In the Cluster Explorer configuration tree with the Service Groups tab selected, right-click the service group that you want to take offline.
2. Choose **Offline**, and select the appropriate system from the pop-up menu.

Switching the Sybase service group

The process of switching a service group involves taking it offline on its current system and bringing it online on another system. Perform the following procedure from Cluster Manager (Java Console) to switch the service group.

To switch a service group

1. In the Cluster Explorer configuration tree with the Service Groups tab selected, right-click the service group.
2. Choose **Switch To**, and select the appropriate system from the pop-up menu.

Modifying the Sybase service group configuration

You can dynamically modify the Sybase agent using several methods, including the Cluster Manager (Java Console), Veritas InfoScale Operations Manager, and the command line.

Viewing the agent log for Sybase

The VCS agent for Sybase logs messages to the following files:

/var/VRTSvcs/log/engine_A.log

/var/VRTSvcs/log/Sybase_A.log

/var/VRTSvcs/log/SybaseBk_A.log

Appendix A

Resource type definitions for Sybase

This appendix includes the following topics:

- About the resource type and attribute definitions for Sybase
- Sybase resource type
- SybaseBk resource type

About the resource type and attribute definitions for Sybase

The resource type represents the VCS configuration definition of the agent. It also specifies how the the configuration file, main.cf, defines the agent. Configuring the agent involves assigning values to the resource type attributes.

For the resource type attributes:

See "Attribute definitions for the Sybase agent" on page 49.

See "Attribute definitions for the SybaseBk agent" on page 57.

For the sample main.cf configuration files:

See "Sample configuration for a Sybase service group on AIX systems" on page 64.

Sybase resource type

The type definitions and attribute definitions for the Sybase resource type are described as follows.

Type definition for the Sybase agent

The resource type definition for the agent for Sybase is as follows.

```
type Sybase (
        static boolean AEPTimeout = 1
        static keylist SupportedActions = { "Storage checkpoint_all" }
        str Server
        str Owner
        str Home
        str Version
        str SA
        str SApswd
        str Run_ServerFile
        str User
        str UPword
        str Db
        str Table
        str Monscript = "/opt/VRTSagents/ha/bin/Sybase/SqlTest.pl"
        boolean WaitForRecovery = 0
        str interfaces_File
        int ShutdownWaitLimit = 60
        int DelayAfterOnline = 10
        int DelayAfterOffline = 2
        static int ToleranceLimit = 1
        static str ArgList[] = { Server, Owner, Home, Version, SA,
        SApswd, User, UPword, Db, Table, Monscript,
        WaitForRecovery, Run_ServerFile, State, in terfaces_File,
        ShutdownWaitLimit, DelayAfterOnline, DelayAfterOffline }
        static int IMF{} = { Mode=3, MonitorFreq=5, RegisterRetryLimit=3 }
        static str IMFRegList[] = { Server, Owner }
        static str AgentDirectory = "/opt/VRTSagents/ha/bin/Sybase"
 )
```

Attribute definitions for the Sybase agent

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

Table A-1 lists the required attributes.

Table A-1 Required attributes

Required Attributes	Definition
Home	The $SYBASE path to Sybase binaries and configuration files. Type and dimension: string-scalar Default value: No default value
Owner	Sybase user as the defined owner of executables and database files in any of the sources (such as NIS+, /etc/hosts, and so on) specified in the /etc/nsswitch.conf file for passwd entry. The Sybase executables and database files are accessed in the context of this user. Type and dimension: string-scalar See "System Group and User for Sybase home directory" on page 19.
Quorum_dev	The quorum device manages the cluster membership, stores cluster configuration data, and contains information shared among server instances and nodes. The quorum device is a disk that is accessible to all the nodes in the cluster. Specify a fully qualified quorum device name. Type and dimension: string-scalar Default value: No default value Note: This attribute should be specified only for the cluster edition. **Note:** If you do not set the Quorum_dev attribute for Sybase Cluster Edition, the Sybase agent does not perform the qrmutil-based checks. This error in configuration may lead to undesirable results. For example, if qrmutil returns failure pending, the agent does not panic the system.
SA	Sybase database administrator. This attribute is required to connect to the ASE for shutdown. Type and dimension: string-scalar Default value: No default value

Table A-1 Required attributes *(continued)*

Required Attributes	Definition
SApswd	Encrypted password for Sybase database administrator. This password is required to connect to the ASE for shutdown. Type and dimension: string-scalar Default value: No default value See "Encrypting passwords for Sybase" on page 39. **Note:** You need not specify a value for this attribute if the SA user does not require a password.
Server	The $DSQUERY ASE name. Only one server should be configured in a Sybase service group. The advantage of configuring Sybase resources in a separate service group is, each Sybase data server can failover independently. When multiple Sybase resources are configured in a single service group, even if one of the "n" data servers fail, the entire service group will be failed over. Type and dimension: string-scalar Default value: No default value

Table A-2 lists the optional attributes.

Table A-2 Optional attributes

Optional Attributes	Definition
DetailMonitor	Specifies whether the Sybase server is monitored in detail. A positive integer value indicates that the resource monitors the Sybase server in detail. Value 0 denotes it does not. **Note:** This attribute has been removed from the agent version 6.1.0 onwwards. Default is 0. Type and dimension: int-scalar **Note:** The DetailMonitor attribute is deprecated in VCS 7.3.1. Instead, LevelTwoMonitorFreq attribute at the Sybase resource type level may be used.

Table A-2 Optional attributes *(continued)*

Optional Attributes	Definition
LevelTwoMonitorFreq	Specifies the frequency at which the agent for this resource type must perform second-level or detailed monitoring. This is a resource type level attribute. You can override the value of this attribute at the resource level. The default value of LevelTwoMonitorFreq attribute is 0 (zero). If required, the value of LevelTwoMonitorFreq attribute can be overridden at resource level.
User	The database user, in the context of which, the transactions are performed on the database. You must specify a value for this attribute if LevelTwoMonitorFreq is set to a positive integer value. Type and dimension: string-scalar Default value: No default value
UPword	Encrypted password for the database user. You must specify a value for this attribute if LevelTwoMonitorFreq is set to a positive integer value. However, you need not specify a value for this attribute if the database user does not require a password. See "Encrypting passwords for Sybase" on page 39. intercType and dimension: string-scalar Default value: No default value
Db	Name of the database used for detailed monitoring. The table used by the detail monitor script resides in this database. You must specify a value for this attribute if LevelTwoMonitorFreq is set to a positive integer value. Type and dimension: string-scalar Default value: No default value
Table	Name of the table on which the detail monitoring script performs the transactions. You must specify a value for this attribute if LevelTwoMonitorFreq is set to a positive integer value. Type and dimension: string-scalar Default value: No default value

Table A-2 Optional attributes *(continued)*

Optional Attributes	Definition
Monscript	The path to the detail monitor script; the default value for this attribute is the path for the script, SqlTest.pl, provided with the agent. You must specify a value for this attribute if LevelTwoMonitorFreq is set to a positive integer value. Type and dimension: string-scalar Default value: No default value **Note:** By default, SqlTest.pl script has the execute permission set. If you specify custom detail monitor script, ensure that custom detail monitor script also has the execute permissions set.
WaitForRecovery	The recovery procedures rebuild the server's databases from the transaction logs. This boolean attribute indicates if the agent should wait during Online agent function, till recovery has been completed and all databases that can be made online are brought online. This feature is not supported for pre-12.5.1 Sybase ASE server. Type and dimension: boolean-scalar Default value: 0
Run_ServerFile	Specifies the location of the RUN_SERVER file for the Sybase instance. The default location of this file is used if no value is specified for this attribute. Type and dimension: string-scalar Default value: No default value

Table A-2 Optional attributes *(continued)*

Optional Attributes	Definition
IMF	This resource-type level attribute determines whether the Sybase agent must perform intelligent resource monitoring. You can also override the value of this attribute at resource-level. This attribute includes the following keys: ■ Mode: Define this attribute to enable or disable intelligent resource monitoring. Valid values are as follows: ■ 0—Does not perform intelligent resource monitoring ■ 1—Performs intelligent resource monitoring for offline resources and performs poll-based monitoring for online resources ■ 2—Performs intelligent resource monitoring for online resources and performs poll-based monitoring for offline resources ■ 3—Performs intelligent resource monitoring for both online and for offline resources Default: 3

Table A-2 Optional attributes *(continued)*

Optional Attributes	Definition
IMF (cont.)	■ MonitorFreq: This key value specifies the frequency at which the agent invokes the monitor agent function. The value of this key is an integer. Default: 5 You can set this key to a non-zero value for cases where the agent requires to perform both poll-based and intelligent resource monitoring. If the value is 0, the agent does not perform poll-based process check monitoring. After the resource registers with the AMF kernel driver, the agent calls the monitor agent function as follows: ■ After every (MonitorFreq x MonitorInterval) number of seconds for online resources ■ After every (MonitorFreq x OfflineMonitorInterval) number of seconds for offline resources ■ RegisterRetryLimit: If you enable intelligent resource monitoring, the agent invokes the sybase_imf_register agent function to register the resource with the AMFkernel 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 See "Enabling and disabling intelligent resource monitoring (IMF) for agents" on page 42. Type and dimension: Integer-association.
interfaces_File	Specifies the location of interfaces file, including the directory name and the file name for the Sybase instance. If this attribute is configured, [-I interfaces file] option is used when connecting to the isql session. If this attribute is not configured, the agent does not use the -I option. Type and dimension: string-scalar Default value: No default value For example: /sybase/my_interfaces_file **Note:** It is assumed that you have modified the RUN_ServerFile with the non-default interface file location if the interfaces_File attribute is configured.

Table A-2 Optional attributes *(continued)*

Optional Attributes	Definition
DelayAfterOnline	Specifies the number of seconds that elapse after the Online entry point is complete and before the next monitor cycle is invoked. Type and dimension: integer-scalar Default value: 10
DelayAfterOffline	Specifies the number of seconds that elapse after the Offline entry point is complete and before the next monitor cycle is invoked. Type and dimension: integer-scalar Default value: 2
ShutdownWaitLimit	Maximum number of seconds for which the agent waits for the Sybase instance to stop after issuing the `shutdown with wait` command, and before attempting to issue the `kill -15 <data server-pid>` command, if required. Type and dimension: integer-scalar Default value: 60
Run_ServerFile	Specifies the location of the RUN_SERVER file of the Sybase instance. The default location of the file is used if no value is specified for this attribute. Type and dimension: String-scalar Default value: No default value

SybaseBk resource type

Type definition for the SybaseBk agent

The resource type definition for the agent for Sybase is as follows.

```
type SybaseBk (
        str Backupserver
        str Owner
        str Home
        str Version
        str Server
        str SA
```

```
        str SApswd
        str Run_ServerFile
        str interfaces_File
        static str ArgList[] = { Backupserver, Owner, Home, Version,
        Server, SA, SApswd, Run_ServerFile, interfaces_File }
        static int IMF{} = { Mode=3, MonitorFreq=5, RegisterRetryLimit=3 }
        static str IMFRegList[] = { Backupserver, Owner }
        static str AgentDirectory = "/opt/VRTSagents/ha/bin/SybaseBk"
)
```

Attribute definitions for the SybaseBk agent

Review the description of the SybaseBk agent attributes. The agent attributes are classified as required and internal.

Table A-3 lists the required attributes for SybaseBk resource.

Table A-3 Required attributes

Required Attributes	Definition
Server	The $DSQUERY Backup name. Only one server should be configured in a Sybase service group. The advantage of configuring Sybase resources in a separate service group is, each Sybase data server can failover independently. When multiple Sybase resources are configured in a single service group, even if one of the “n” data servers fail, the entire service group will be failed over. Type and dimension: string-scalar
Owner	Sybase user as the defined owner of executables and database files in any of the sources (such as NIS+, /etc/hosts, and so on) specified in the /etc/nsswitch.conf file for passwd entry. The Sybase executables and database files are accessed in the context of this user. Type and dimension: string-scalar
Home	The $SYBASE path to Sybase binaries and configuration files. Type and dimension: string-scalar
Version	Version of Sybase Backup Server. Type and dimension: string-scalar
Backupserver	The $BACKUP SYBASE Backup Server name. Type and dimension: string-scalar

Table A-3 Required attributes *(continued)*

Required Attributes	Definition
SA	Sybase database administrator. This attribute is required to connect to the ASE for shutdown. Type and dimension: string-scalar
SApswd	Encrypted password of Sybase database administrator. This password is required to connect to the ASE for shutdown. Type and dimension: string-scalar See "Encrypting passwords for Sybase" on page 39. **Note:** You need not specify a value for this attribute if the SA user does not require a password.

Table A-4 lists the optional attribute for SybaseBk agent.

Table A-4 Optional attribute

Optional attribute	Definition
Run_ServerFile	Specifies the location of the RUN_SERVER file for the Sybase instance. The default location of this file is used if no value is specified for this attribute. Type and dimension: String-scalar Default value: No default value
interfaces _File	Specifies the location of interfaces file for the Sybase instance. If this attribute is configured, [-I interfaces file] option is used when connecting to the isql session. If this attribute is not configured, the agent does not use the -I option. Type and dimension: string-scalar Default value: No defalult value For example: /sybase/my_interfaces_file **Note:** It is assumed that you have modified the RUN_ServerFile with the non-default interface file location if the interfaces_File attribute is configured.

Table A-4 Optional attribute *(continued)*

Optional attribute	Definition
IMF	

Table A-4 Optional attribute *(continued)*

Optional attribute	Definition
	This resource-type level attribute determines whether the Sybase agent must perform intelligent resource monitoring. You can also override the value of this attribute at resource-level. This attribute includes the following keys: ■ Mode: Define this attribute to enable or disable intelligent resource monitoring. Valid values are as follows: ■ 0—Does not perform intelligent resource monitoring ■ 1—Performs intelligent resource monitoring for offline resources and performs poll-based monitoring for online resources ■ 2—Performs intelligent resource monitoring for online resources and performs poll-based monitoring for offline resources ■ 3—Performs intelligent resource monitoring for both online and for offline resources Default: 3 ■ MonitorFreq: This key value specifies the frequency at which the agent invokes the monitor agent function. The value of this key is an integer. Default: 5 You can set this key to a non-zero value for cases where the agent requires to perform both poll-based and intelligent resource monitoring. If the value is 0, the agent does not perform poll-based process check monitoring. After the resource registers with the AMF kernel driver, the agent calls the monitor agent function as follows: ■ After every (MonitorFreq x MonitorInterval) number of seconds for online resources ■ After every (MonitorFreq x OfflineMonitorInterval) number of seconds for offline resources ■ RegisterRetryLimit: If you enable intelligent resource monitoring, the agent invokes the oracle_imf_register agent function to register the resource with theAMFkernel 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

Table A-4 Optional attribute *(continued)*

Optional attribute	Definition
	Type and dimension: Integer-association.

Table A-5 lists the internal attribute for SybaseBk agent.

This attribute is for internal use only. recommends not to modify the value of this attribute.

Table A-5 Internal attribute

Internal attribute	Definition
AgentDirectory	Specifies the location of the binaries, scripts, and other files related to the agent for SybaseBk. Type and dimension: static-string

Appendix B

Sample configurations for Sybase

This appendix includes the following topics:

- About the sample configuration for the Sybase agent
- Resource dependency graph for the Sybase agent
- Sample configuration for a Sybase service group on AIX systems

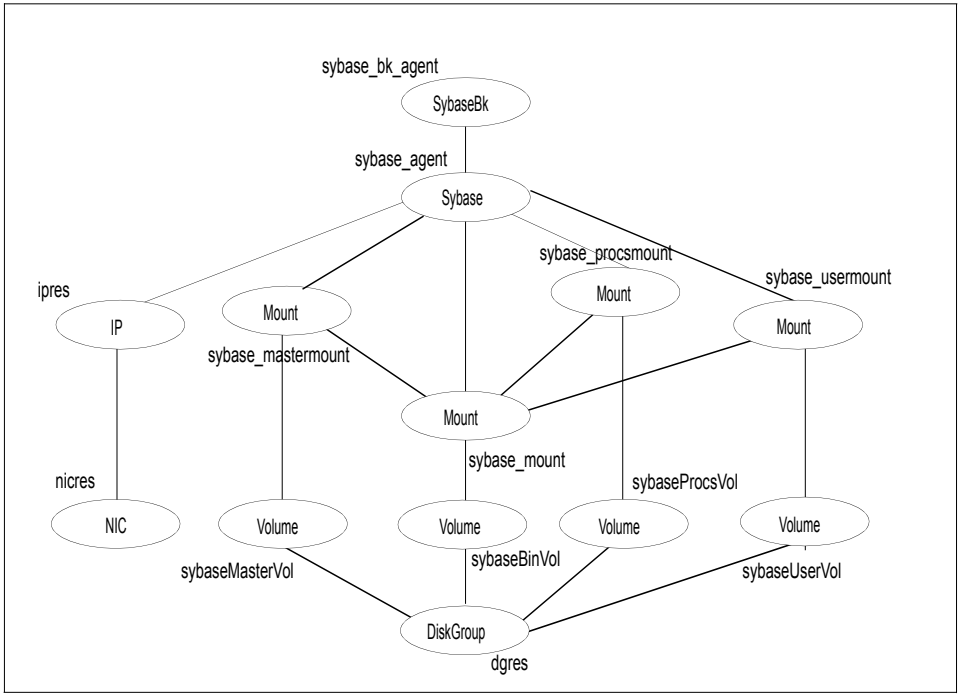
About the sample configuration for the Sybase agent

After Sybase agent installation, several sample `main.cf` file types can be viewed in the `/etc/VRTSagents/ha/conf/Sybase`. This appendix describes a typical service group that is configured to monitor the state of Sybase servers in a VCS cluster. The sample configuration graphically depicts the resource types, resources, and resource dependencies within the service group. Review these dependencies carefully before you configure the agent. For more information about these resource types, see the *Cluster Server Bundled Agents Reference Guide*.

Resource dependency graph for the Sybase agent

Figure B-1 illustrates the configuration's dependency graph for AIX.

Figure B-1 Dependency graph for AIX



The dependency graph depicts a single Sybase instance configuration. The configuration contains a disk group with a single volume. The volume is monitored using a Volume resource and mounted using a Mount resource. The Mount resource requires Volume resource, which in turn requires the DiskGroup resource. The service group IP address for Sybase server is monitored using the IP and NIC resource types. The Sybase server can be started after each of these resources are brought online. The Backup Server is started after the Sybase SQL Server is online.

Note: If your configuration does not use Veritas Volume Manager, use the LVMVolumeGroup, LVMLogicalVolume, and DiskReservation resource types to configure shared storage instead of DiskGroup and Volume resource types.

Sample configuration for a Sybase service group on AIX systems

The following sample depicts a basic configuration with a Sybase service group configured with one NIC, one database instance configured with detail monitoring, and one backup instance.

```
include "types.cf"
include "SybaseTypes.cf"

cluster vcscluster (
UserNames = { admin = anoGniNkoJooMwoInl }
Administrators = { admin }
CounterInterval = 5
)

system system1 (
)

system system2 (
)

group Sybase_group (
SystemList = { system1 = 0, system2 = 1 }
AutoStartList = { system1, system2 }
)

DiskGroup dgres (
    DiskGroup = sybase
    )

IP ipres (
    Device = en0
    Address = "16.9.1.9"
    NetMask = "255.255.0.0"
    )

NIC nicres (
    Device = en0
    NetworkHosts = { "16.9.10.3", "16.9.10.4" }
    )
```

```
Mount sybase_mastermount (
    MountPoint = "/sybdb"
    BlockDevice = "/dev/vx/dsk/sybase/sybdb"
    FSType = vxfs
    MountOpt = rw
    FsckOpt = "-n"
    )
Mount sybase_mount (
    MountPoint = "/sybbin"
    BlockDevice = "/dev/vx/dsk/sybase/sybbin"
    FSType = vxfs
    MountOpt = rw
    FsckOpt = "-n"
    )

Mount sybase_procsmount (
    MountPoint = "/sybprocsdb"
    BlockDevice = "/dev/vx/dsk/sybase/sybprocsdb"
    FSType = vxfs
    MountOpt = rw
    FsckOpt = "-n"
    )

Mount sybase_usermount (
    MountPoint = "/sybuserdb"
    BlockDevice = "/dev/vx/dsk/sybase/sybuserdb"
    FSType = vxfs
    MountOpt = rw
    FsckOpt = "-n"
    )

Sybase sybase_agent (
    Server = SYBASE_SERVER
    Owner = sybase
    Home @system1 = "/sybbin"
    Home @system2 = "/sybbin"
    Version @system1 = sybase15
    Version @system2 = sybase15
    SA = sa
    SApswd = GUJuPStSHsUUkSLsJ
    LevelTwoMonitorFreq = 1
    User = sa
    UPword = GUJuPStSHsUUkSLsJ
```

```
    Db = vcsdb
    Table = vcstable
    Monscript = "/opt/VRTSagents/ha/bin/Sybase/SqlTest.pl"
    WaitForRecovery = 1
    Run_ServerFile = "/sybbin/RUN_SYBASE_SERVER"
    interfaces_File = "/newfs/interfaces"
    )

SybaseBk sybase_bk_agent (
    Backupserver = SYBASE_SERVER_BS
    Owner = sybase
    Home @system1 = "/sybbin"
    Home @system2 = "/sybbin"
    Version @system1 = sybase15
    Version @system2 = sybase15
    Server = SYSTEM1
    SA = sa
    SApswd = GUJuPStSHsUUkSLsJ
    Run_ServerFile = "/sybbin/RUN_SYBASE_SERVER_BS"
    interfaces_File = "/newfs/interfaces"
    )

Volume sybaseBinVol (
    Volume = sybbin
    DiskGroup = sybase
    )

Volume sybaseMasterVol (
    Volume = sybdb
    DiskGroup = sybase
    )

Volume sybaseProcsVol (
    Volume = sybprocsdb
    DiskGroup = sybase
    )

Volume sybaseUserVol (
    Volume = sybuserdb
    DiskGroup = sybase
    )

ipres requires nicres
```

```
sybaseBinVol requires dgres
sybaseMasterVol requires dgres
sybaseProcsVol requires dgres
sybaseUserVol requires dgres
sybase_agent requires ipres
sybase_agent requires sybase_mastermount
sybase_agent requires sybase_mount
sybase_agent requires sybase_procsmount
sybase_agent requires sybase_usermount
sybase_bk_agent requires sybase_agent
sybase_mastermount requires sybaseMasterVol
sybase_mastermount requires sybase_mount
sybase_mount requires sybaseBinVol
sybase_procsmount requires sybaseProcsVol
sybase_procsmount requires sybase_mount
sybase_usermount requires sybaseUserVol
sybase_usermount requires sybase_mount
```

Appendix C

Changes introduced in previous releases

This appendix includes the following topics:

- Changes introduced in the previous release

Changes introduced in the previous release

The enhancements in the previous releases of Cluster Server Agent for Sybase are as follows:

The VCS agent for Sybase includes the following new or enhanced features:

- The VCS agents for Sybase and SybaseBk now support intelligent resource monitoring. See "How the Sybase and SybaseBk agents support intelligent resource monitoring " on page 9.
- Intelligent monitoring framework (IMF) is enabled by default in VCS 6.0 release.
- The VCS agent for Sybase introduces the following new Sybase agent attributes:
  - interfaces_File
  - ShutdownWaitLimit (default value 60)
  - DelayAfterOnline (default value 10)
  - DelayAfterOffline (default value 2)
    See "Attribute definitions for the Sybase agent" on page 49.
- The VCS agent for Sybase introduces the following new SybaseBk agent attribute:
  - interfaces_File
    See "Attribute definitions for the SybaseBk agent" on page 57.

- The DetailMonitor attribute is deprecated in VCS 6.0. Instead, LevelTwoMonitorFreq attribute of Sybase agent may be used. The default value of LevelTwoMonitorFreq attribute is 0 (zero).
- The default value of ToleranceLimit attribute is set to 1 (one) for Sybase agent.
- The long pathname limitation for $SYBASE is resolved.
- With VCS 7.3.1 release, using VCS Cluster Manager (Java Console), Sybase and SybaseBk agents encrypt the password by default. Sybase and SybaseBk agents support both plain text and encrypted password. If required, the plain text value can be specified for agent attributes using the command line on by editing the configuration file.
- Sybase agent uses new timeout option during Shutdown of Sybase data server used instead of `shutdown with nowait`.
- For Sybase ASE Enterprise edition, the timeout option for `shutdown` command is supported for versions 12.5.4 and 15.0.2 onwards.
- The agent supports a new optional attribute Run_ServerFile. The attribute specifies the location of the Run_ServerFile for a Sybase instance. If this attribute is not specified, the default location of this file is accessed while starting Sybase server instances.
- The VCS agent binaries for Sybase are now part of VRTSvcsea fileset. This fileset also includes the VCS agent binaries for DB2 and Oracle.
- If you installed the VCS agent binaries using the installer program, the program updates the `main.cf` file to include the appropriate agent `types.cf` files.
- The Sybase agent supports the IPC cleanup feature.
- The agent supports a new attribute WaitForRecovery. If this attribute is enabled, during the online function, the agent waits till recovery has been completed and all databases that can be made online are brought online.
- The agent supports a new action called checkpoint_all. Performs "checkpoint_ all" for the Sybase dataserver by connecting to an isql session.
- The agent supports a new optional attribute Run_ServerFile. The attribute specifies the location of the `RUN_SERVER` file for a Sybase instance. If this attribute is not specified, the default location of this file is accessed while starting Sybase server instances.

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