

CMVC frequently asked questions: How to perform typical operations with Sybase 11

Document Number TR 29.3284

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REVISION:

February 2001: Add handling of development components.

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ABSTRACT

This technical report provides a collection of hints and tips for CMVC family administrators that use the Sybase database management system (DBMS), Version 11. Some of the scenarios are:

- Installing and configuring Sybase
- Starting and stopping Sybase.
- Creating a CMVC family under Sybase.
- Backup and restore of Sybase databases.
- Accessing the CMVC tables.
- Error messages and how recover from them.

ITIRC KEYWORDS

CMVC
Sybase

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INTRODUCTION

This technical report provides a collection of hints and tips for CMVC family administrators that use the Sybase database management system (DBMS), version 11.

The chapters in this TR are organized in the expected sequence of utilization of Sybase from a CMVC point of view:

Chapter "Installing Sybase" on page 5 provides some overall recommendations for installing Sybase.

Chapter "Starting and stopping the Sybase servers" on page 13 describes how to start, stop, query the status, and find out the version of the Sybase DBMS. Chapter "Creating a database for a CMVC family" on page 19 describes how to create a CMVC family under Sybase.

Chapter "Configuring Sybase" on page 23 describes how to perform configuration activities for Sybase to properly create and support CMVC 2.3.1 families.

Chapter "Backup and restore" on page 29 describes how to perform a backup of the database and how to restore it.

Chapter "Accessing the Sybase database tables" on page 33 provides procedures for accessing the database tables and views used by CMVC.

Chapter "Common error messages with Sybase" on page 39 describes the most common error messages that a CMVC family administrator may encounter when working with Sybase, and how to recover from them.

USER ROLES IN SYBASE AND CMVC

In this TR, we will use the same terminology for the user roles as explained in the Chapter "Overview" of the Sybase manual:

Operating System Administrator (root).

This user maintains the operating system with superuser or "root" privileges.

System Administrator (sa)

This user maintains the Adaptive Server system; the login name is "sa". This login is specific to the Adaptive Server and is used to login to the Adaptive Server using the isql command. This login is not a UNIX login.

Sybase Login (login)

It is a UNIX login ("sybase") that owns all the Sybase installation directories and files, and performs the installation and upgrading of Adaptive Server.

CMVC family user id

It is a UNIX login that owns a particular CMVC family, including the directories and files and database, and performs maintenance activities.

UPDATES TO THE CMVC USER'S REFERENCE MANUAL

In the CMVC User's Reference manual, the note on page 53 of Chapter 7 is incorrect (section "4.4.2 Database information on CMVC Tables for queries").

The following is the correct information:

ORACLE	7	INFORMIX	SYBASE	DB2
number		integer	int	int
varchar2		varchar	varchar	varchar
long		text in table	text	long varchar

DISCLAIMERS

To avoid misunderstandings with the purpose of this technical report and to better understand its scope, the following disclaimers are in order:

This technical report is not an official publication from the CMVC group. The author is solely responsible for its contents.

This technical report was prepared when working with Sybase 11.9.2 in Solaris 2.6. Therefore, if you have a different version of the mentioned software, then you may expect some differences in the information or in the procedures described in this technical report.

This technical report covers information that the author has gathered thru the years while working with the CMVC technical support team.

It is the intention of this technical report to provide recommendations and guidelines that can be helpful to CMVC administrators when using CMVC families where the database is stored in Sybase. In some cases, the procedures will not be exhaustive, and will just show the overall sequence that has worked before, which might be different in your case.

Real values that were used in our setup will be used in this technical report. Thus, you will need to customize the commands that you issue to reflect the values that are meaningful to your setup.

It is assumed that the reader has knowledge of CMVC, Sybase and the appropriate operating system.

This technical report is not a substitute to the information provided by Sybase, CMVC and the appropriate operating system. Please refer to the appropriate documentation provided with the corresponding software.

YEAR 2000 READINESS FOR CMVC AND SYBASE

CMVC 2.3.1 provides support for the Year 2000

CMVC 2.3.1 is a new version-release-modification of CMVC (branched from CMVC 2.3.0.24) which uses 4 digits to represent the years instead of the 2 digits used in 2.3.0 and previous versions. Thus, CMVC 2.3.1 provides support for the Year 2000. For more details on CMVC and its Year 2000 readiness status, see the file:

`ftp://ftp.software.ibm.com/ps/products/cmvc/README.year2 .txt`

Sybase 11 is Year 2000 ready

Sybase 11 is Year 2000 ready, according to the information provided in:

`http://www.sybase.com/inc/corpinfo/year2 _index.html`

HOW TO GET THE MOST UP TO DATE VERSION OF THIS TECHNICAL REPORT.

The most up to date version of this technical report can be obtained from the IBM CMVC ftp site at URL:

`ftp://ftp.software.ibm.com/ps/products/cmvc/doc/tr/trcmfsyb.txt`

For the list of available technical reports, see the file:

`ftp://ftp.software.ibm.com/ps/products/cmvc/doc/tr/README.index.txt`

ACKNOWLEDGEMENTS

Many of the questions and answers that are compiled in this technical report were obtained from the CMVC forum in the IBMPC conferencing disk and from the CMVC6000 forum in the IBMUNIX conferencing disk. We want to thank the main participants in these electronic forums for their support!

We want to thank in particular the following co-workers:

Edna Wong Kyu, OEM Lab in IBM RTP, North Carolina, USA.

Keith Purcell, OEM Lab in IBM RTP, North Carolina, USA.

Lee Perlov, Websphere/VisualAge TeamConnection Services, IBM RTP, North Carolina, USA.

INSTALLING SYBASE

This chapter provides some overall recommendations when installing Sybase.

You need to consult the following manuals (or the equivalent for your operating system):

For the details on the requirements and installation steps:

```
Installing Adaptive Server  
Enterprise on Sun Solaris  
(September 1998 edition)
```

This manual will be referenced in this document as the "Sybase Installation Guide".

For the installation of the development components:

```
Installing Open Client/Server Products on UNIX Platforms
```

It is assumed that this is the first installation of Sybase in your server. That is, this TR does not explain how to perform advanced installation/upgrade tasks.

It is highly recommended that you open 2 windows, one for the tasks to be performed by root and the other for the tasks to be performed by the Sybase user id. This will help you a lot, because you have to change the userid quite frequently.

DEVELOPMENT COMPONENTS

In order to develop code that uses Sybase (such as the CMVC server for Sybase), it is necessary to install the following development components:

Open Client/C Developer's Kit (Version 11.1.11)

Embedded SQL/C (Version 11.1.0)

NUMBER OF SYBASE LICENSES NEEDED BY CMVC

The minimum number of user licenses required by Sybase to run 4 CMVC daemons and all the other CMVC tools is shown below:

```
1  license for isql to query the database  
1  license for the notify daemon  
1  license for chfield  
1  license for other CMVC tools, such as vcPath  
4  one license for each cmvcd daemon.  
---  
8  Total
```

However, the number of user licenses required depends on the number of CMVC server daemons started by the CMVC administrator. This number varies depending on the number of CMVC clients that simultaneously request service from the CMVC server.

PRE-INSTALLATION TASKS PERFORMED BY ROOT

1. Login as root.
2. Ensure that there is enough shared memory for Sybase Adaptive Server. Verify that the `/etc/system` (kernel) has at least 29 MB for the following variable:

```
set shmsys:shminfo_shmmax = YYY
```

Also ensure that there are at least 6 shared memory segments:

```
set shmsys:shminfo_shmseg = XXX
```

If you modify this file, then you need to reboot in order to pick up the latest kernel changes.

3. Change the `umask` to ensure that group and other have read and execute permissions, but not write permission:

```
umask 22
```

4. Create a new user id, such as "sybase" that belongs to the "sybase" group (you may need to create this group too). This userid will be known as the "Sybase user id" or "Sybase login".

The home directory for this user id will be `$SYBASE`:

```
/export/home/sybase
```

This directory needs to have enough space to hold the Sybase components.

5. Proceed with "Pre-installation tasks performed by the Sybase user id."

PRE-INSTALLATION TASKS PERFORMED BY THE SYBASE USER ID

1. Login as the Sybase user id.
2. Change the `umask` to ensure that group and other have read and execute permissions, but not write permission:

```
umask 22
```

3. Set environment variables in the `.profile` as shown in Figure 1 on page 7. This is only the top portion of the file.


```

#!/usr/bin/ksh

# Set up environment variables for Sybase

export SYBASE=/export/home/sybase
export DSQUERY=hostName # specify here your Sybase server

Other environment variables:

export PATH=/usr/bin:/usr/ucb:/etc:/usr/sbin:.
export PATH=$SYBASE/bin:$SYBASE/install:$PATH
export LD_LIBRARY_PATH=$SYBASE/lib:$LD_LIBRARY_PATH

export DISPLAY=hostName: . # where hostName is a valid one

set -o vi # To allow vi commands for line command retrieval

```

Figure 1. Portion of a sample .profile for the Sybase user id

4. Logout and login again to refresh the environment for the Sybase user id.
5. Proceed with "Installation tasks performed by the Sybase user id."

INSTALLATION TASKS PERFORMED BY THE SYBASE USER ID

This section describes how to unload the Sybase code from the CD-ROM into disk, by using an X-Windows Environment:

1. Login as the Sybase login.
2. Place the Adaptive Server product CD in the CD-ROM drive.

Instead of the Adaptive Server CD, you can place the CD that has the development components such as:

- Open Client/C Developer's Kit
- Embedded SQL/C

The Solaris operating system automatically mounts the CD.

The "File Manager - sybasecd" screen is displayed.

Note: Do not close this window, you will need it to eject the CD later on.

3. At the UNIX prompt, execute the following:

```
cd /cdrom
cd cdrom
./sybsetup
```

4. The "sybsetup" screen is displayed.

Choose "Unload Sybase Products".

5. The "Installation Destination" screen is displayed.

The value of the SYBASE environment variable is used in the entry field.

Click the "continue" button, which is the checkmark button.

6. The "Installation Source" screen is displayed.

Provide the device media and device location:

- a. Select CD-ROM (already selected by default). The push button should be darker, which indicates the selection.

- b. Enter:

```
/cdrom/cdrom /sybimage
```

Click continue.

7. You might be prompted to enter the "Customer Authorization" string or CAS. If so, then enter it.

Click continue.

8. The "Products Selection" screen is displayed.

At the top of the screen, verify the data in the section "Installation Information".

For the Adaptive Server

Select the products to be installed.

Version	Product Name
11.9.2	Adaptive Server Enterprise
11.9.2	Historical Server (this is the Backup Server)

For the development components

Version	Product Name
11.1.1	Open Client/C
11.1	Embedded SQL/C

Click continue.

9. The "Install Products?" screen is displayed.

Click continue to start the unloading of the products.

10. The "Installation Status" screen is displayed which will show the status of the unloading of the products.

11. At the end of the unloading process, the "Install sybsetup?" screen is displayed. It is recommended answer "Yes" to store sybsetup in \$SYBASE/bin to allow you to run sybsetup without remounting the CD.
12. The "Success" screen should be displayed.
Click OK to continue.
13. The "Installation Complete" screen is displayed.
Click on exit (the icon that shows exiting from a door).
Click on exit again.
14. When you have exited sybsetup, remove the CD from the drive by doing the following:
 - a. From the window where sybsetup was started, issue "cd /" to get out of the /cdrom directory. Otherwise, you will get an error "device busy" when trying to eject the CD.
 - b. Go to the "File Manager -sybasecd" window and select "File - Eject". This will close the File Manager application and eject the CD.
15. At this point, you have unloaded Adaptive Server onto your system, but you do not have yet a fully functional product.
To continue, see "Installing Sybase Servers."

INSTALLING SYBASE SERVERS

The easiest method for installing a Sybase server will be used, which is "Quick Start installation". This method uses the system defaults.

1. Login as the Sybase login.
2. Determine the location, type and size of each database device. In our case they will be stored in \$SYBASE.

The database devices are operating system files or portions of a disk (called raw partitions) used to store databases and database objects.

Adaptive Server requires the following database devices in a local file system. For details see the table "Adaptive Server database devices" in Chapter "Installing Sybase Servers".

Device "master" to store the system databases.

Although Sybase recommends to use a raw partition, in this example, a file will be used instead.

Device "sysprocsdev" to store the subsystemprocs database.

Device "subsystemdb" to allow the two-phase commit.

Device "sybsecurity" to allow auditing.

3. Start the "srvbuild" utility, by entering:

```
srvbuild
```

4. The "srvbuild - Select Servers to Build" screen is displayed.

Click the check boxes for the following. In this example the Sybase server box is named "oem-sn13" (this is the value for the DSQUERY environment variable).

Server type	Server name
Adaptive Server	oem_sn13
Backup Server	oem_sn13_back

Click OK to continue.

5. The "srvbuild - Server Attribute Editor" screen is displayed for the Adaptive Server.
6. Provide the values for the following fields. In this example the database devices (master and subsystemprocs) will be installed as files under \$SYBASE:

```
Master device path:          /export/home/sybase/master.dat
Subsystemprocs device path: /export/home/sybase/systemprocs.dat
```

For the other attributes, use the default values provided.

Notice that the "Interfaces file entry" has the following values in this example:

Transport type	Host name	Port number
tli tcp	oem-sn13	41

Click on OK to continue.

7. The "srvbuild question" dialog is displayed to warn you that a file is not recommended for a production Adaptive Server. In this example, this is OK. Thus, click on "yes" to continue.
8. The "srvbuild - Server Attribute Editor" screen is displayed for the Backup Server.
9. Accept the default values provided.

Notice that the "Interfaces file entry" has the following values in this example:

Transport type	Host name	Port number
tli tcp	oem-sn13	42

Click on "Build Servers!" to continue,

10. The "srvbuild - Status Output" screen is displayed, which shows the progress of building the servers.
11. The "srvbuild question" dialog is displayed with the question about to localize the Adaptive Server to use other languages. In this example, the answer is "no", because srvbuild creates an Adaptive Server with the following defaults:

```
us_english language.
iso-Latin1 character set.
```

Binary sort order.

12. Scroll to the bottom of the status output screen, and verify that "Done" is shown as the last entry. This indicates that the installation is complete.

Click exit.

13. Continue with "Post-installation tasks."

POST-INSTALLATION TASKS

1. Login as the Sybase login.
2. Verify that the servers that were installed are running, by performing one of the following:

Issue showserver:

```
$ $SYBASE/install/showserver
```

The output may look like this (notice that the lines were split in order to fit them into the available width of this document):

```
  UID  PID  PPID  C   STIME TTY   TIME CMD
sybase 7893   1   15:2 :19 pts/5  :   sh -c /export/home/sybase/bin/
      backupserver -Soem_sn13_back -e/export/home/sybase
sybase 7891 789   15:19: 3 ?      :35 /export/home/sybase/bin/dataserver
      -soem_sn13 -d/export/home/sybase/master.dat
sybase 789   1   15:19: 3 pts/5  :   sh -c /export/home/sybase/bin/
      dataserver -soem_sn13 -d/export/home/sybase/maste
sybase 7894 7893  15:2 :19 pts/5  :   /export/home/sybase/bin/
      backupserver -Soem_sn13_back -e/export/home/sybase/inst
```

For each server, enter the following command at the UNIX prompt:

```
$SYBASE/bin/isql -Usa -P -Sserver_name
```

Where server_name is "oem_sn13" for Adaptive Server or "oem_sn13_backup" for the Backup Server.

If the server is running, you will see the prompt for isql:

```
1>
```

3. Change the password for the Sybase System Administrator. In this example it is changed from the default NULL to "sybase":

```
$$SYBASE/bin/isql -Usa -P -Soem_sn13
1> sp_password null, sybase
2> go
Password correctly set.
(return status = )
1> quit
```

Note: This new password is the value for the CMVC environment variable SYBASE_SA_PASS.

4. To verify that the password is fine, login into isql again:

```
$SYBASE/bin/isql -Usa -Psybase -Soem_sn13  
1> quit
```

CONFIGURATION ITEMS TO REMEMBER

The important configuration items to remember are the following:

The location of the home directory for the Sybase login is represented by:

```
export SYBASE=/export/home/sybase
```

The Sybase server is represented by:

```
export DSQUERY=oem-sn13 # specify here your Sybase server
```

The password for the Sybase Administrator. This will be represented in the .profile for the CMVC family as:

```
export SYBASE_SA_PASS=sybase
```

STARTING AND STOPPING THE SYBASE SERVERS

This chapter describes how to start, stop, query the status, and find out the version of the Sybase servers.

Because the utilities to start and stop the Sybase Servers are in the \$SYBASE/install subdirectory, it is recommended to ensure that this directory is included in the definition for PATH, in that way you can start and stop the Sybase DBMS easier:

```
export PATH=$PATH:$SYBASE/install
```

You can start the Adaptive Server and the Backup Server from the UNIX command line by using runserver files.

Each time a server is installed, the srvbuid program creates a runserver file that contains the information required to restart that server. These files are stored in the directory \$SYBASE/install.

For Adaptive Server and Backup Server, the runserver file is named "RUN_servername", where servername is the name of the server.

STATE DIAGRAM FOR SYBASE SERVERS (ADAPTIVE AND BACKUP)

The figure Figure 2 shows the main states in which a Sybase Server (Adaptive or Backup) can be at a given point in time, and the commands that are used to trigger the state transitions.

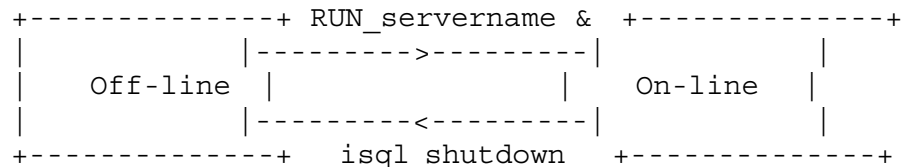


Figure 2. Stage diagram for the Sybase Adaptive Server

Notes:

1. You need to be the Sybase user id in order to issue the commands for starting or stopping the Sybase servers.

HOW TO START THE SYBASE ADAPTIVE SERVER

To start the Sybase Adaptive Server do the following:

1. Login into the Sybase user id.
2. Start the Sybase Adaptive server.

In this example to invoke the runserver files ensure that you specify the processing in the background, in that way you can exit from the Sybase window.

```
RUN_oem_sn13 &
```

Wait for the end of the startup process, which should look like this:

```
:      :      1:2    / 1/22 17:13: server    'bin_iso_1' (ID = 5 )
:      :      1:2    / 1/22 17:13: server    on top of default character set:
:      :      1:2    / 1/22 17:13: server    'iso_1' (ID = 1).
:      :      1:2    / 1/22 17:13: server    Loaded default Unilib conversion
                                         handle.
```

The state of the DBMS will move from off-line to on-line.

HOW TO START THE SYBASE BACKUP SERVER

To start the Sybase Backup Server do the following:

1. Login into the Sybase user id.
2. Start the Sybase Backup server.

In this example to invoke the runserver files ensure that you specify the processing in the background, in that way you can exit from the Sybase window.

```
RUN_oem_sn13 back &
```

Wait for the end of the startup process, which should look like this:

```
Logging Backup Server messages in file
'/export/home/sybase/install/oem_sn13_back.log'
```

The state of the Sybase Backup Server will move from off-line to on-line.

HOW TO STOP THE SYBASE ADAPTIVE SERVER

The preferred method of stopping Adaptive Server is to use the isql "shutdown" command:

1. Login into the Sybase user id.
2. Execute the following:


```

$ isql -Usa -Psybase -Soem_sn13
1> shutdown
2> go
Server SHUTDOWN by request.
The SQL Server is terminating this process.
CT-LIBRARY error:
    ct_results(): network packet layer: internal net library error:
    Net-Library operation terminated due to disconnect
CT-LIBRARY error:
    ct_cancel(): network packet layer: internal net library error:
    Net-Library operation terminated due to disconnect

```

Notice that the CT-LIBRARY errors are normal behavior.

HOW TO STOP THE SYBASE BACKUP SERVER

To stop the Backup Server, the Sybase manuals recommend to use the isql "shutdown" command as described in "How to stop the Sybase Adaptive Server" on page 14, but in this example, there was an error message:

1. Login into the Sybase user id.
2. Execute the following:

```

.
$ isql -Usa -Psybase -Soem_sn13_back
1> shutdown
2> go
No language handler installed.
Language cmd: shutdown
1> quit

```

3. Thus, if you are getting this error too, then perform this step. Identify the process id (pid) for the Backup Server, then issue the kill command:

```

$ showserver
  UID  PID  PPID  C   STIME TTY      TIME CMD
sybase 18 44 18 43   15:51:38 pts/6    :    /export/home/sybase
      /bin/backupserver -Soem_sn13_back -e/export/home/sybase/inst

$ kill 18 44

$ showserver
  UID  PID  PPID  C   STIME TTY      TIME CMD
1" + Done          RUN_oem_sn13_back &

```

HOW TO HANDLE SHARED MEMORY FILES USED BY SYBASE

When Adaptive Server starts, it creates the following files in \$SYBASE to store information about the shared memory segments that it uses:

```
SERVER_NAME.krg
```

When Adaptive Server is shut down in a normal manner, the shared memory files are automatically removed. However, if Adaptive Server crashes or is killed with the "kill -9" command, then these files are not deleted. You need read and write permissions on these files to restart Adaptive Server in order to overwrite them.

HOW TO QUERY THE STATUS OF THE SYBASE SERVERS

One way to find out if the Sybase servers are active, is by following these steps:

1. Login as the Sybase login.
2. Issue showserver:

```
$ $SYBASE/install/showserver
```

The output may look like this (notice that the lines were split in order to fit them into the available width of this document):

```
  UID  PID  PPID  C   STIME  TTY   TIME  CMD
sybase 7893   1    15:2 :19 pts/5  :    sh -c /export/home/sybase/bin/
      backupserver -Soem_sn13_back -e/export/home/sybase
sybase 7891 789    15:19: 3 ?      :35 /export/home/sybase/bin/dataserver
      -soem_sn13 -d/export/home/sybase/master.dat
sybase 789   1    15:19: 3 pts/5  :    sh -c /export/home/sybase/bin/
      dataserver -soem_sn13 -d/export/home/sybase/maste
sybase 7894 7893   15:2 :19 pts/5  :    /export/home/sybase/bin/
      backupserver -Soem_sn13_back -e/export/home/sybase/inst
```

If you do not see any processes related to Sybase, then the Sybase servers are not active.

HOW TO FIND OUT THE VERSION OF SYBASE

To find out the version of Sybase, perform the following:

1. Login into the Sybase user id.
2. Ensure that the Sybase Adaptive Server is on line.
3. Issue the following:

```
$ isql -Usa -Psybase -Soem_sn13
1> select @@version
2> go
```

The output is different for Sybase 11.0.2 and 11.9.2:

For Sybase 11.0.2:

```
SQL Server/11. .2/P/Sun_svr4/OS 5.4/1/OPT/Tue Sep 1 14: 3:23 PDT 1996
```

For Sybase 11.9.2:

```
Adaptive Server Enterprise/11.9.2/1 31/P/Sun_svr4/OS 5.5.1
```


CREATING A DATABASE FOR A CMVC FAMILY

This chapter describes how to create a CMVC family under Sybase.

This is an overview on how to create a CMVC family that uses a Sybase database. For more information see the manual CMVC Server Administration and Installation, 2.3.

This chapter also explains how to find out which devices (see "How to see what devices are defined in Sybase?" on page 23) have been defined, and how to expand them (see "How to add more DASD to SYBASE_DBDEV?" on page 25).

ACTIVITIES TO BE PERFORMED BY ROOT

1. Login as root.
2. Create the CMVC family user id, which should belong to the same group to which the Sybase user id belongs and to group 0.

In this example, the family name is "cms13syb" and it belongs to the groups "sybase" and "0".

3. Add the new CMVC family user id in /etc/hosts.
4. Add the new CMVC family user id in /etc/services.
5. (Optional) Create a directory where to store the family database device and the log device. You have to choose a place where you have enough file system space for the database. Create a directory that can be easily recognized, as "cmvc-space", and which should be owned by the Sybase user id:

```
cd /export/home2
mkdir cmvc-space
```

6. Logout as root.

ACTIVITIES TO BE PERFORMED BY THE SYBASE USER ID.

It is very important to avoid using the default system devices (which is used by the Sybase Adaptive Server itself) when creating the database for a family. This family database needs to have its own table and index database devices, and they can be created by performing the following steps.

1. Login as the Sybase user id.

2. Find out more about the devices that are defined in Sybase. See "How to see what devices are defined in Sybase?" on page 23.
3. Because a CMVC family database needs 2 Sybase device numbers that are not in use, it is necessary to identify those device numbers that are currently in use. See "How to find which device numbers are in used in Sybase?" on page 23.
4. Create the database device and the log device for the CMVC family. See "How to setup the 2 devices for a CMVC database in Sybase?" on page 23.
5. Logout as the Sybase user id.

ACTIVITIES TO BE PERFORMED BY THE CMVC FAMILY USER ID.

1. Login as the CMVC family user id.
2. Copy the sample profile for a CMVC family:


```
cp /usr/lpp/cmvc/install/profile.sybase .profile
```

The above command uses the default location for CMVC.

All the CMVC related environment variables are already listed and documented in the sample profile for a CMVC family that uses Sybase.
3. Modify the .profile. Follow the instructions in the comments in the header of the file.
4. Ensure that all the environment variables related to Sybase are defined:

```
##
## Sybase setup
##

## Specify the home directory for the Sybase user id.
export SYBASE=/export/home/sybase

## Specify the password for the CMVC family.
## It is NOT the password for the Sybase user id.
export SYBASE_PASS=year99

## Specify the password for the Sybase Administrator (not a Unix login)
## It is NOT the password for the Sybase user id.
export SYBASE_SA_PASS=sybase

## Specify the Sybase Adaptive Server name.
export DSQUERY=SYBASE

## To setup the devices, do the following and change the variables:
##   xxx (family name), YYY (file path)
##
## isql -Usa -P$SYBASE_SA_PASS -S$DSQUERY
## disk init name="cms13syb_dev",
```

```

##      physname="/export/home/sybase/cmvc_space/cms13syb_dev.dev",
##      vdevno=8, size=65536
## go
## disk init name="cms13syb_log",
##      physname="/export/home/sybase/cmvc_space/cms13syb_log.log",
##      vdevno=9, size=65536
## go
##
export SYBASE_DBDEV="cms13syb_dev=8"
export SYBASE_LOGDEV="cms13syb_log=9"

##
## Modification of PATH
##

PATH=/usr/bin:/etc:/usr/sbin:/usr/ucb:/usr/bin/X11:/sbin
PATH=$PATH:$CMVC_HOME/install:$CMVC_HOME/bin:$CMVC_HOME/samples
PATH=$PATH:$SYBASE/bin:$SYBASE/install
PATH=$PATH:$HOME/bin:.
export PATH

export LD_LIBRARY_PATH=$SYBASE/lib:$LD_LIBRARY_PATH

```

The value for the SYBASE_DBDEV and SYBASE_LOGDEV environment variables will be used to create the database for the CMVC family user id.

5. May need to setup LD_LIBRARY_PATH to \$SYBASE/lib in Solaris.

```
export LD_LIBRARY_PATH=$SYBASE/lib:$LD_LIBRARY_PATH
```

6. After editing the profile, exit your session and login again in order to have a clean environment.
7. Create the CMVC family. At this time, all the environment variables and the configuration items should be ready for creating and starting the CMVC family with 2 server daemons:
 - a. mkfamily
 - b. mkdb -d
 - c. cmvcd cms13syb 2
 - d. notifyd
 - e. You can now use the CMVC family.
 - f. To monitor the usage of the CMVC daemons do: monitor 1
Press an alphanumeric key to stop the monitor command.
 - g. To stop the CMVC daemons do: stopCMVC cms13syb

CONFIGURING SYBASE

This chapter describes some configuration tasks for Sybase in order to properly create and support CMVC 2.3.1 families.

HOW TO SEE WHAT DEVICES ARE DEFINED IN SYBASE?

You can do the following in isql:

```
$ isql -U sa -P sybase
1> sp_helpdevice
2> go
```

You may need to use the sybaseScript to redirect the output to a file, for better reading. See “Korn shell script: sybaseScript” on page 36.

Also, see “How to find which device numbers are in used in Sybase?”

HOW TO FIND WHICH DEVICE NUMBERS ARE IN USED IN SYBASE?

You can do the following in isql:

```
$ isql -U sa -P sybase
> select distinct low/16777216 from sysdevices order by low
> go
```

The output may look like this:

```
1
```

```
(2 rows affected)
```

HOW TO SETUP THE 2 DEVICES FOR A CMVC DATABASE IN SYBASE?

Before you can setup the two devices that are needed for a CMVC database in Sybase, you need to know which device numbers are already in use and then you can select a number that is not already in use; see “How to find which device numbers are in used in Sybase?” for more details.

To setup the devices, do the following and change the variables:

```

isql -U sa -P sybase -S$DSQUERY
1> disk init name="cms13syb_dev",
2>     physname="/export/home/sybase/cms13syb_dev.dev",
3>     vdevno=4, size=2 48
4> go
1> disk init name="cms13syb_log",
2>     physname="/export/home/sybase/cms13syb_log.log",
3>     vdevno=5, size=2 48
4> go
1> quit

```

Then you can export the following variables in the .profile of the CMVC family:

```

export SYBASE_DBDEV="cms13syb_dev=4"
export SYBASE_LOGDEV="cms13syb_log=5"

```

The details for "disk init" are:

This command allocates space for the device; you can use either a "cooked" (a file system) or a "raw" physical device (such as /dev/syb_dev). In the example above it is a cooked device.

Specify a number for "vdevno" that has not been used before.

The size is specified in 512-byte blocks.

HOW TO DUMP THE TRANSACTION LOG IN SYBASE?

Problem

In case that you get the following error:

```

1 - 61 Database error, 11 5 (Can't allocate space for object '' in
database 'tempdb' because the 'system' segment is full. If you ran out
of space in syslogs, dump the transaction log. Otherwise, use
ALTER DATABASE or sp_extendsegment to increase the size of the
segment.), has occurred.

```

Action

1. Login into the family account.
2. Stop the cmvc daemons for the family.
3. Perform the following (first check the database space then dump)

```
isql -Usa -P$SYBASE_SA_PASS
```

```
1> sp_spaceused
```

```
2> go
```

```
1> dump transaction your_db_name_that_report_full with no_log
```

```
2> go
```

You may get a warning message about the syslog being dumped. This is OK.

4. Exit isql

```
1> quit
```

5. Start the CMVC family daemons.

HOW TO MOVE THE TRANSACTION LOG TO A NEW DEVICE IN SYBASE?

1. Run:

```
sp_logdevice dbName, device_name
```

2. Process enough transactions to fill current log.

3. Wait until all currently active transactions are done.

4. Run:

```
dump transaction
```

5. To verify, run:

```
sp_helplog
```

HOW TO ADD MORE DASD TO SYBASE_DBDEV?

Login as the Sybase user id.

```
isql -Usa -Psybase
```

Dump the transaction log (replace "familyName"):

```
dump transaction familyName with no_log
```

```
go
```

Display the usage of database space:

```
use familyName
```

```
go
```

```
sp_spaceused
```

```
go
```

For example, extend the database "cms13syb" on device "cms13syb_dev" by 2 MB:

```
use master
go
alter database cms13syb on cms13syb_dev=2
go

exit
```

HOW TO DROP A DEVICE IN SYBASE?

You can use:

```
sp_dropdevice deviceName
```

You cannot drop a device that is in use by a database.

HOW TO DROP A NORMAL DATABASE IN SYBASE?

You can use:

```
isql -U sa -P password
> drop database databaseName
> go
```

HOW TO DROP A SUSPECT DATABASE IN SYBASE?

You can use:

```
isql -U sa -P password
> dbcc dbrepair (databaseName, dropdb)
> go
```

HOW TO FIND OUT HOW MUCH SPACE IS USED IN THE SYSLOG IN SYBASE?

From the desired database, run:

```
isql -U sa -P password
> dbcc checktable(syslogs)
> go
```

HOW TO CREATE A DATABASE IN SYBASE?

Determine how much space you will need and search the devices to find out if there is space in them for the database. If there is not enough space in master, then you will need to specify a different device; for details see “How to setup the 2 devices for a CMVC database in Sybase?” on page 23.

Once you have identified the device to use, then use the appropriate device number in the following command:

```
create database dbName on some_device_name=3 log on another_device_name=2
```

The above will create a database named dbName on a device previously created called some_device_name which is 3 Mb in size (this command does not take 512-byte blocks).

The log parameter will place the database log on a device named another_device_name and will allocate 2 Mb for it.

BACKUP AND RESTORE

This chapter describes how to perform a backup of the database and how to restore it.

BACKUP OF SYBASE DATABASES

This section describes how to create a dump device by using the **sp_addumpdevice**. and how to use the **dump database** command to dump the database to the device recently created.

For more details see the Sybase documentation, section "Dumping and Loading: SQL Server Scheme".

1. Login as the CMVC family administrator (\$LOGNAME):

2. Stop the CMVC family:

```
stopCMVC $LOGNAME
```

3. Create a directory where to store the backup files:

```
$ $HOME/backup  
$ chmod 777 $HOME/backup
```

4. If using Sybase 11 you must start the Backup Server:

- a. login as the Sybase user id
- b. cd install
- c. RUN_SYB_BACKUP &

5. Invoke isql:

```
$ isql -Usa -P$SYBASE_SA_PASS
```

6. Run the following command to back up the family database. You need to replace **family** with the name of your family and specify the actual directory where you want the backup file to be saved.

For Sybase 4.9 or 10

```
sp_addumpdevice "disk", dobackup,  
"/export/home/family/backup/family.bak", 2  
go  
dump database family to dobackup  
go
```

Where the number 2 in `sp_addumpdevice` is the control type.

For Sybase 11

```
sp_addumpdevice "disk", dobackup,  
"/export/home/family/backup/family.bak"  
go  
dump database family to dobackup  
go
```

Wait until you get the following message that indicates that the backup procedure is done:

```
Backup Server: 3.42.1.1: DUMP is complete (database familyName).
```

Now you have a backup copy of your database in the file
/export/home/family/backup/family.bak.

Notes:

1. You can also dump the database to a tape device by changing "disk" to "tape",
"/home/family/backup/family.bak" to the device name of the tape and the controller number
parameter 2 to another number which must be between 3 and 8 (tape volume) in the
above command.
2. Use **sp_dropdevice deviceName** to drop dump devices.

RESTORE OF SYBASE DATABASES

Use the **load database** command to restore the database for the CMVC family.

For more details see the Sybase documentation, section "Dumping and Loading: SQL Server Scheme".

1. Always make sure that the destination database must be large enough to hold the amount
of storage space that was actually allocated to the dumped database.

2. Login as the CMVC family administrator (\$LOGNAME):

3. Stop the CMVC family:

```
stopCMVC $LOGNAME
```

4. If appropriate, simulate the loss of the database and then recreate the basic one:

```
$ rmdb  
$ mkdb -d
```

5. If using Sybase 11 you must start the Backup Server:

- a. login as the Sybase user id
- b. cd install
- c. RUN_SYB_BACKUP &

6. Ensure that you have the appropriate dump device defined in Sybase. This dump device should have the backup of the database of the CMVC family.

7. Run the following command to restore the Sybase database:

```
$ isql -Usa -P$SYBASE_SA_PASS  
1> load database family from dobackup  
2> go
```

Where family is the name of the CMVC family.

8. In Sybase 11, wait for the following message that indicates that the restore was completed:

```
Backup Server: 3.42.1.1: LOAD is complete (database familyName).
```

9. In Sybase 11, you need to have stop and restart the SYBASE servers in order to change the status from offline to online.

Then you can restart the CMVC family.

ACCESSING THE SYBASE DATABASE TABLES

This chapter provides procedures for accessing the database tables and views used by CMVC. The concrete example of adding a new host list entry is shown; although we discourage the manual modification of the database, in some situations (such as after renaming the hostName) it is necessary to add a host list entry directly into the database.

The section “How to use a script to execute SQL commands” on page 35 shows a Korn shell script that can be used to query the database.

HOW TO USE ISQL TO GAIN ACCESS TO THE DATABASE

Sometimes it is necessary to access the Sybase database used by the CMVC family in order to query the entries for a certain table or view.

To gain access to the Sybase database, do the following:

1. Login to the CMVC family user id.
2. Enter the following, where \$SYBASE_PASS is the password for the CMVC family user id, and not the Sybase Administrator, nor the Sybase user id.

```
$SYBASE/bin/isql -U $LOGNAME -P $SYBASE_PASS
```

3. After this, you will see the prompt:

```
1>
```

4. Now you can enter other SQL commands. You do not need to add a semicolon; but you need to use the keyword "go" in order to commit the transaction.
5. Use "quit" to exit from isql.

HOW TO INSERT A NEW HOST ENTRY INTO THE HOSTS TABLE

1. Login to the CMVC family.
2. isql -U\$LOGNAME -P\$SYBASE_PASS
3. Perform the following statements via isql:

```
1> insert into Hosts (userId, name, login, address)
2> values (1, 'example.cary.ibm.com', 'loginId', )
3> go
```

Notes:

- a.
 - b. The userId value of 1 is the id associated with the original CMVC_SUPERUSER.
 - c. During mkdb, the value for "name" (with a value shown here of 'example.cary.ibm.com') is \$HOSTNAME, where this value is obtained by means of executing:

```
/usr/bin/hostname $CLIENT_HOSTNAME
```
 - d. During mkdb, the value for "login" is obtained from \$CLIENT_LOGIN
4. Continue with "How to look at the contents of Hosts table for first user."

HOW TO LOOK AT THE CONTENTS OF HOSTS TABLE FOR FIRST USER

1. Perform the following statements inside isql:

```
1> select name,login from Hosts where userId=1
2> go
```

Notes:

- a. Refer to the CMVC User's Reference, Chapters 6 and 7 for the field names and sizes.
 - b. Sybase is case sensitive for names of objects. The headers are always shown in the case that was used to create them.
2. An example of the Output from the SQL command:

```
login
      name
-----
-----
cms13syb
      oem-sn13

loginId
      example.cary.ibm.com
```

This mean that the host name is example.cary.ibm.com and that the login is loginId.

3. Continue with "How to exit from the database" on page 35.

HOW TO EXIT FROM THE DATABASE

1. Perform the following statements from isql:

```
1> quit
```

HOW TO USE A SCRIPT TO EXECUTE SQL COMMANDS

The Korn shell script shown in “Korn shell script: sybaseScript” on page 36 can be used to interact with the Sybase isql tool to issue SQL commands and to store the output in an output file.

In this example, the following SQL command will be executed (show all users, sorted by login):

```
select    from Users where login like '%' order by login
```

Actually, the above command needs to be specified between 2 specific lines in the Korn script; each line contains the delimiter !!!.

The following lines show the correct location; notice that the select statement does not terminate with a semicolon, but you need to use the keyword "go" in order to commit the transaction and to allow multiple SQL commands to be issued in the same script:

```
isql -U $1 -P$SYBASE_PASS >> $LOG 2>&1 <<!!!  
select    from Users where login like '%' order by login  
go  
!!!
```

Once the script is ready, you can execute it as follows (you need to specify the CMVC family name):

```
sybaseScript familyName
```

There are 2 outputs:

The messages displayed in the screen:

```
sybaseScript: Starting script cms13syb
```

```
sybaseScript: Please see the following log for the details  
                of the execution of the Sybase commands: sybaseScript.out
```

```
sybaseScript: End of script
```

The file sybaseScript.out that contains the results.

Korn shell script: sybaseScript

The sybaseScript Korn shell script is shown below:

```
#!/usr/bin/ksh
#
# Name:    sybaseScript familyName
#
# Purpose: This is a sample shell script that shows
#          how to issue a set of Sybase command lines.
#
# Note:    It uses the environment variable $SYBASE_PASS
#          which has the password for the CMVC family.

# Process the proper number if input parameters

if [ "$#" -ne 1 ]
then
    print -u2 'usage: sybaseScript familyName'
    exit 1
else
    print 'sybaseScript: Starting script ' $1
fi

fi

export LOG=sybaseScript.out

##### Customization notes #####
# Place the actual Sybase commands inside the begin and end !!!
# Remember to specify 'go' at the end of each logical statement
#####

isql -U $1 -P$SYBASE_PASS >> $LOG 2>&1 <<!!!
select    from Users where login like '%' order by login
go
!!!
# The above !!! indicates the end of the long series of Sybase commands

print ' '
print 'sybaseScript: Please see the following log for the details'
print '          of the execution of the Sybase commands: ' $LOG
print ' '
print 'sybaseScript: End of script'

exit

# end of file
```

HOW TO USE ISQL WITH A FILE WITH SQL COMMANDS

Some times you may want to interact with isql by using a batch file with SQL commands. In this case, you can do the following:

1. Create a file with the data manipulation or SQL commands, such as cmdfile.txt, that has the following lines (show all users, sorted by login). Notice that the select statement does not terminate with a semicolon, but you need to use the keyword "go" in order to commit the transaction and to allow multiple SQL commands to be issued in the same script:

```
select    from Users where login like '%' order by login
go
```

2. Issue:

```
cat cmdfile.txt | isql -U$CMVC_FAMILY -P$SYBASE_PASS
```

3. The result will show the output from the Users table.

COMMON ERROR MESSAGES WITH SYBASE

This chapter describes the most common error messages that a CMVC family administrator may encounter when working with Sybase, and how to recover from them.

To avoid duplication, this chapter describes those error messages that are not described in the other chapters in this TR.

SERVER ERROR 4002 WHEN STARTING CMVCD

Problem:

When trying to start the cmvcd daemons for a family, the following error message is displayed:
Database initialization failed (Family: cms13syb - year99)!

Then, in the /var/adm/messages (this location is specified in /etc/syslog.conf) the following errors are displayed:

```
Jan 19 12:26:54 oem-sn13 cmvcd: cms13syb: 1 - 61 Database error, -19 (
    SQL Server Error 4 2, Severity 14, Status 1. Login failed.),
    has occurred.
Jan 19 12:26:54 oem-sn13      If the error is a result of an invalid
    column name,
Jan 19 12:26:54 oem-sn13      then check the syntax of the command.
    If you cannot
Jan 19 12:26:54 oem-sn13      resolve the problem, contact the
    family administrator.
Jan 19 12:26:54 oem-sn13 cmvcd: cms13syb: 1 - 62 The database cannot
    be initialized.
Jan 19 12:26:54 oem-sn13      To solve the database problem, contact
Jan 19 12:26:54 oem-sn13      the family administrator.
```

Answer:

The problem is that there is NO database for the family. You need to restore a CMVC family database in case that you have a backup; if not, then you need to perform rmdb, rmfamily, mkfamily, mkdb; then start the CMVC family.

SQL RUN-TIME ERROR -22 WHEN EXECUTING STOPCMVC

Problem:

When executing stopCMVC, the following entries are shown in the syslog:

```
Jan 19 12:29:22 oem-sn13 cmvcd: cms13syb: 1 - 61 Database error, -22 (
    Embedded SQL Run-Time Error -22. Attempt to execute a query when
    no CONNECT has yet been executed.), has occurred.
Jan 19 12:29:22 oem-sn13      If the error is a result of an invalid
                             column name,
Jan 19 12:29:22 oem-sn13      then check the syntax of the command.
                             If you cannot
Jan 19 12:29:22 oem-sn13      resolve the problem, contact the
                             family administrator.
```

Answer:

These are just warning messages (and not errors), because the termination (killing) of the daemons is not done in the proper sequence inside stopCMVC.

If you want, you could modify stopCMVC to reverse the killing process of a parent id and the child id.

SQL SMG 1801: DATABASE ALREADY EXISTS WHEN USING MKDB

Problem:

When using mkdb, the following error messages are displayed:

```
Creating the cms13syb SYBASE database, login and alias.
Msg 18 1, Level 16, State 1:
Line 1:
Database 'cms13syb' already exists
Msg 17262, Level 16, State 1:
Procedure 'sp_addlogin', Line 118:
A user with the specified login name already exists.
(return status = 1)
Msg 17234, Level 16, State 1:
Procedure 'sp_addalias', Line 1 9:
The specified user name is already aliased.
(return status = 1)
```

Answer:

The problem is that the database already exists, and the CMVC family administrator is trying to recreate it via mkdb. At this point, there is no need to execute mkdb again.

HOW TO DUMP THE TRANSACTION LOG IN SYBASE DUE TO NOTIFYD

Problem:

The Sybase log segment fills up because CMVC notifyd is doing a BEGIN TRANSACTION and is not rolling it back or committing it. The open transaction prevents Sybase from truncating the log when a dump tran database_name to the device is issued. This results in the logsegment filling up over time which causes cmvcd to hung daemons for Sybase 10 or terminate daemons for Sybase 4.9.

Answer:

When notifyd attaches to Sybase a begin transaction is issued. The transaction is kept open during the entire life span of notifyd, and this pending transaction prevents Sybase from truncating the transaction log at the time of doing a transaction dump. Because the transaction log is not truncated, then the disk space is consumed until all the space for the log device has been used up.

We implemented a fix for this problem in CMVC 2.3.0.14. However, if for other reasons, the problem persists, then see the workaround below.

Workaround:

This workaround is a significant deviation from normal practices. The workaround is to run a cron job which:

1. Kill notifyd for a given family.
2. Perform transaction dump.
3. Restart notifyd.

This will allow Sybase to dump the transaction log. The only exposure is that during the interval when notifyd is down there will be no mail notification; to reduce this exposure window, it is recommended to perform this workaround at times of low user activity during the day.

AFTER CHANGING IP ADDRESS OR HOSTNAME OF HOST, SERVER DOES NOT START

Problem:

After changing the IP address or the hostname of the host, the Sybase Adaptive Server does not start anymore, and the following entries are present in \$SYBASE/install/SYBASE.err:

```
DATE kernel ninit: t_bind, Cannot assign requested address
DATE kernel ninit: All master network listeners have failed
    Shutting down.
```

Answer:

Sybase hardcodes the IP address in hexadecimal in a file named "interfaces" under the \$HOME of the Sybase Login user id. Although this file is in text format, the IP address is coded in hexadecimal, and thus, it is not recommended to modify directly this file.

Login as the Sybase Login user id and execute the command "dsedit" which will allow you to delete the old network definitions and to add new ones.

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