CONVERSANT® Voice Information System

Version 3.1 Operations

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- Answered by the called station
- Answered by the attendant
- Routed to a recorded announcement that can be administered by the CPE user

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RECYCLED PAPER

Contents

Contents

Contents

Contents

Figures

Tables

FACE Features

A

FACE Overview

This chapter provides information on the FACE (Framed Access Command Environment) interface. Through the AT&T FACE screen, you can execute a variety of administrative procedures including, disk operations, user login setup, and peripherals setup.

Each option is reviewed in this appendix. Refer to the UNIX *System V/386 Release 3.2 FACE User's/Administrator's Guide* for further details regarding FACE operations.

From the CONVERSANT VIS VERSION 3.1 screen, highlight AT&T FACE and press [ENTER] to open the AT&T FACE screen (Figure A-1).

```
        ┌────────────────────────────────┐
        │         AT&T FACE              │
        ├────────────────────────────────┤
        │   Office of <login>            │
        │   Printer Operations           │
        │   Programs                     │
        │   System Administration        │
        │   UNIX System                  │
        │    Exit                        │
        │                                │
        └────────────────────────────────┘
```

Move to an item with arrow keys and strike the ENTER key to select.

| HELP | | ENTER | PREV-FRM | NEXT-FRM | CANCEL | CMD-MENU | |

Figure A-1. AT&T FACE Screen

Office of <Login>

This area contains access to your Filecabinet, a Wastebasket feature, other users, and Office Preferences (color attributes, file permissions etc).

Printer Operations

From the AT&T FACE screen, highlight Printer Operations and press [ENTER] to open the Printer Operations screen (Figure A-2).

Printer Operations

Available Forms and Formats	Re-start Print Scheduler
Change Default Printer	Start Printing Requests
Mount a Form or Printwheel	Stop Printing Requests
Move Print Requests	Unmount a Form or Printwheel
Printer Queue	User Priorities
Printer Status	

Move to an item with arrow keys and strike the ENTER key to select.

HELP		ENTER	PREV-FRM	NEXT-FRM	CANCEL	CMD-MENU	

Figure A-2. Printer Operations Screen

The Printer Operations entry allows you to:

- Display a list of current jobs queued to the printers

- Restart the printers

- Display status information for the printers

There are other options available through the Printer Operations screen, however these three features are the ones used most with the CONVERSANT Voice Information System (VIS).

⇒ **NOTE:**
   If your parallel or serial printer has not been set up in advance, you will receive a warning message. This set up is performed through the System Administration option under the AT&T FACE screen.

Printer Queue — Displaying Queued Jobs

To display printer queue information, use the following procedure.

1. Select Printer Queue and press [ENTER] to open the Printer Queue screen. The Printer Queue screen includes the following information:

   ■ Printer name

   ■ Job ID number

   ■ User login of the user that queued the job

   ■ Time stamp of when the job was submitted

   ■ Which job is currently printing

2. Once you have seen the print jobs in the queue, press [CANCEL] to return to the Printer Operations screen without deleting any jobs.

   ⇒ **NOTE:**
      Only 30 print jobs can be confirmed at one time.

Printer Queue — Canceling a Print Job

You can use the Printer Queue screen to cancel a job that is queued to print. To cancel a print job, use the following procedure.

1. From the Printer Operations screen, highlight Printer Queue and press [ENTER] to display the printer queue.

2. Highlight the print jobs you want to cancel by moving the cursor to the job with the cursor-control key. Press [MARK] for each selection.

   ⇒ **NOTE:**
   Pressing [ENTER] while the cursor rests on a print job display causes you to leave the print job display. Use the cursor-control keys to move to the print job you want to delete. Then you must use [MARK] to mark jobs to be deleted.

3. Repeat Step 2 until you have selected all the print jobs you want to cancel and press [ENTER].

4. After you have marked the items to delete from the printer queue (this prevents the specified jobs from being printed) and pressed [ENTER], you receive a confirmation form.

5. If you want to delete the jobs listed on the confirmation form, press [CONT]. If you do not want to delete the jobs listed, press [CANCEL].

Restart Printer Scheduler

When you set up a printer, the software for it is started automatically. If you are having trouble getting something to print on your printer, you may need to restart the parallel or serial printer scheduler.

⟹ **NOTE:**
If you have trouble with printer output, be sure the power is turned on for the printer. Also check to see if the printer cable is plugged in securely and the printer is "On Line" or "Ready."

When the same printer is restarted, the jobs queued to this printer resume printing.

To restart the printer, use the following procedure.

1. At the Printer Operations screen, highlight Printer Restart and press [ENTER] to display the Printer Name form.

2. In the Printer Name screen, press [CHOICES] to see a list of the printers you have previously set up via Printer Setup. Select the printer you want to restart and press [SAVE]. You receive a confirmation message that the printer you specified has been restarted.

3. Press [CONT] to erase this screen and display the Printer Operations screen. Press [CANCEL] to close this screen and make the Printer Operations screen active. The printer resumes printing or is ready to print.

Printer Status

You can use the printer status form to display a list of the printers currently set up and information about those printers, including:

■ Printer name

■ Interface connection; that is, parallel or serial

■ UNIX system port

■ Whether the printers are currently accepting requests

■ Which printer has been set up as the default destination

⟹ **NOTE:**
If you have trouble with printer output, make sure the power is turned on for the printer. Also check to see if the printer cable is plugged in securely and the printer is "On Line" or "Ready."

To display current printer status, use the following procedure:

1. From the Printer Operations screen, highlight Printer Status and press [ENTER] to display the Printer Status screen.

2. At the Printer Status screen, highlight either Change Status or Display Status and press [ENTER].

3. If you selected Change Status, the Change Printer Status form appears. If there is only one printer associated with the system, the status for that printer is displayed.

   If there is more than one printer, the printer status form is empty. Press [CHOICES] for a list of printers. Hightlight the printer for which you want to change the status and press [ENTER]. The status of that printer is displayed and can be changed at this time.

4. If you selected Display Status, the Printer Status form appears. If there is only one printer associated with the system, the status for that printer is displayed.

   If there is more than one printer, the Printer Status form is empty. Press [CHOICES] for a list of printers. Hightlight the printer for which you want to change the status and press [ENTER]. The status of that printer is displayed.

5. Once you have seen the information you requested, press [CONT] or [CANCEL] to return to the Printer Status screen.

6. Press [CANCEL] to return to the Printer Operations screen.

A-7

Programs

The Mail Setup screen item allows you to give your system a node name so that other systems can send mail to your system and you can send mail to other systems.

To exchange electronic mail or files with another system, you and the other system user must set up and exchange some information. In general, you must do the following:

- Install the physical communication line to be used.

- Network (connect) the systems together with a modem, direct connection, or data switch.

    Exchange system names, mail names, password, data phone numbers if using a modem, and data communication line speeds.

- Assign a mail name to your system.

- Assign the mail login a password so that only other trusted systems can log in to your system.

- Provide the users of other systems with your mail name and mail login password.

- Enter information about the system receiving your mail (information you receive from the other system administrator).

Set Up the Communication Line

Before sending or receiving mail, you must configure the port using the Serial Ports Setup from the Peripherals Setup screen located under the System Administration screen.

Configure the serial port for a modem, computer, or other device (for example, data switch) depending on the physical connection between your system and the other system.

Set Up Your System to Receive Mail

To set up your system to receive mail from other systems, use the following procedure:

1. From the AT&T FACE screen, highlight System Administration and press [ENTER].

2. At the System Administration screen, highlight Mail Setup and press [ENTER] to display the Mail Setup screen.

3. At the Mail Setup screen, highlight This System and press [ENTER] to display the System Mail Name form.

4. With the cursor resting on the Your system's name field, type the name you want to call your system and press [ENTER]. The system name must be alphanumeric characters only, contain a maximum of eight characters, and cannot be the same name as another system.

5. With the cursor resting on the Mail login name field, type the mail login name for your system and press [ENTER]. The mail login must be alphanumeric characters only and contain a maximum of eight characters.

6. With the cursor resting on the Should mail have a password? field, select YES or NO or press [CHOICES] to make a selection from a screen.

   The mail password applies to the mail login that other systems use to call your system. If you change the password, but do not change the login, the password will apply to the mail login that currently appears on the form.

7. Press [SAVE] when you complete the form.

8. The following confirmation message appears:

   ```
   If you strike CONT to confirm, other systems will
   be able to send mail to you on your system, <system
   name>.

   To send or receive mail, a serial port connection
   must be setup first. This may be done by selecting
   Serial Ports Setup in the Peripherals Setup screen.
   ```

9. If you answered YES to Should mail have a password? the screen clears when you press [CONT] and you are prompted for the mail password. If your system previously has a password, you are prompted for the old password, then for the new password. The new password must differ from the old password by at least three characters and must not be a reversed or circular shift of the mail login.

10. After you give the new password, the Mail Setup screen becomes active.

A-9

Set Up This System to Send Mail to Other Systems

Set up your system to send mail to other systems by using the following procedure:

1. From the AT&T FACE screen, highlight System Administration and press [ENTER].

2. At the System Administration screen, highlight Mail Setup and press [ENTER] to display the Mail Setup screen.

3. At the Mail Setup screen, highlight Other Systems and press [ENTER] to display the Functions for Other Systems screen.

4. Highlight Add and press [ENTER]. This adds information to the systems file about the system with which you want to communicate.

    The Add System screen appears.

5. With the cursor resting on the System's name field, enter the name of the other system. You can get the system's name from users of the other system. The system name must be alphanumeric characters only, contain a maximum of eight characters, and cannot be the same name as another system.

6. With the cursor resting on the Device name field, enter the name of the device.

7. With the cursor resting on the Mail login name field, enter the mail login name. Users of the other system should provide you with the mail login name. The mail login name is actually the **uucp** login for the other system. The mail login name must be alphanumeric characters only and contain a maximum of eight characters.

8. With the cursor resting on the Mail password field, enter the system's mail password. Users of the other system should provide you with the mail password. This is actually the **uucp** password for the other system. The mail password must be alphanumeric characters only and contain a maximum of eight characters.

9. With the cursor resting on the Data phone number field, enter the phone number of the other system if your systems are connected by a modem and telephone lines. The phone number cannot contain any spaces between the numbers. The format of the Data phone number could be as follows:

    ```
    9=1209329329-
    ```

    The first 9 is used to dial a number outside of the building. The "=" pauses for a dial tone. The next three digits (120) are the area code. The last seven digits are the telephone number. The "-" causes the system to delay before hanging up. This is useful for long distance calls since it might take some time to make the connection.

    If your systems are connected by a data switch or a direct line, enter the system name instead of the telephone number.

10. With the cursor resting on the Communication data speed field, press [CHOICES] and select the desired data line speed from the screen.

    ⇒ **NOTE:**
    The Communication data speed must be the same as the device speed for the serial port that you set up through Peripherals Setup.

11. With the cursor resting on the Days when calls are permitted field, press [CHOICES] and select the desired days from the screen. Calls will only be made to the other system on the days that you specify.

12. With the cursor resting on the Hours when calls are permitted field, press [CHOICES] and select the desired hours from the screen. Calls will only be made to the other system during the hours that you specify.

13. Press [SAVE] when you have completed the form.

14. When the confirmation form appears, showing the information you entered, check to make sure the information is correct.

15. Press [CONT] to continue or press [CANCEL] to cancel the mail setup.

A-11

Change Set Up for Other Systems

To change other systems, use the following procedure:

1. From the AT&T FACE screen, highlight System Administration and press [ENTER].

2. At the System Administration screen, highlight Mail Setup and press [ENTER] to display the Mail Setup screen.

3. At the Mail Setup screen, highlight Other Systems and press [ENTER] to display the Functions for Other Systems screen.

4. Highlight Change and press [ENTER] to display the Change System form.

5. With the cursor resting on the System's name field, press [CHOICES], then select the system to be changed from the list on the screen.

   If you type the name of a system that does not exist, the following message is displayed:

   ```
   That system does not exist. Type another system
   name.
   ```

   Once you have selected a system name, the remaining fields on the form are filled with the existing values.

6. With the cursor resting on the "Device name" field, press [CHOICES], then select the device to be changed from the list on the screen.

7. If the other system's mail login name has changed, you need to change the mail login name. Move the cursor to the Mail login name field and enter the changed mail login name. The mail login name must be alphanumeric characters only and contain a maximum of eight characters.

8. If the other system's mail password has changed, you need to change the mail password. Users of the other system should provide you with the new mail password. Move the cursor to the Mail password field and enter the system's mail password. The mail password must be alphanumeric characters only and contain a maximum of eight characters.

9. If the phone number has changed for the other system, you need to change the data phone number if your systems are connected by modems and telephone lines. Move the cursor to the Data phone number field and enter the phone number of the other system. The phone number cannot contain any spaces between numbers. The format of the Data phone number could be as follows:

```
9=1209329329-
```

The first 9 is used to dial a number outside of the building. The "=" pauses for a dial tone. The next three digits (120) are the area code. The last seven digits are the telephone number. The "-" causes the system to delay before hanging up. This is useful for long distance calls since it might take some time to make the connection.

If your systems are connected by a data switch or a direct line and the system's name has changed, enter the new system name in the Data phone number field.

10. If the speed of the modem (as provided by user's of the other system) changes, you need to change the data communications speed. Move the cursor to the Communication data speed field, press [CHOICES] and select the desired data line speed from the screen.

11. To change the days when calls are permitted, move the cursor to the Days when calls are permitted field, press [CHOICES] and select the desired days from the screen. Calls will only be made to the other system on the days that you specify.

12. To change the hours when calls are permitted, move the cursor to the Hours when calls are permitted field, press [CHOICES] and select the desired hours from the screen. Calls will only be made to the other system during the hours that you specify.

13. Press [SAVE] when you have changed all appropriate fields.

A-13

Delete Other Systems (Previously Set Up)

To delete other systems, use the following procedure:

1. From the AT&T FACE screen, highlight System Administration and press [ENTER].

2. At the System Administration screen, highlight Mail Setup and press [ENTER] to display the Mail Setup screen.

3. At the Mail Setup screen, highlight Other Systems and press [ENTER] to display the Functions for Other Systems screen.

4. Highlight Delete and press [ENTER] to display the Delete System form.

5. With the cursor resting on the System's name field, press [CHOICES] and select the system from the screen.

   If less than three systems have been added previously, the system name appears in the field. Toggle through the choices until the appropriate one is in the field and press [SAVE].

6. When the confirmation form appears to show the system you chose, check to make sure the information is correct.

7. Press [CONT] if the information is correct. The system you chose is deleted.

   If the information is not correct, press [CANCEL] to stop the process and return to the Mail Setup screen.

A-14

Display Other Systems (Previously Set Up)

To display information about other systems set up for mail, use the following procedure:

1. From the AT&T FACE screen, highlight System Administration and press [ENTER].

2. At the System Administration screen, highlight Mail Setup and press [ENTER] to display the Mail Setup screen.

3. At the Mail Setup screen, highlight Other Systems and press [ENTER] to display the Functions for Other Systems screen.

4. Highlight Display and press [ENTER] to display the Display System form.

5. With the cursor on the System's name field, press [CHOICES]. If you have more than three systems, a list of systems appears. Select a system and the remaining fields on the form are filled in. If you have added three or fewer systems, you can toggle between the system names until the appropriate one is displayed.

   You can change the values of the fields, but no changes are made in the systems file.

6. When you are finished, press [CONT] to continue to the Mail Setup screen.

A-15

System Administration

From the AT&T FACE screen, highlight System Administration and press
[ENTER] to open the System Administration screen (Figure A-3).

```
┌────────────────────────────────────────────────────────────────┐
│                    System  Administration                       │
├────────────────────────────────────────────────────────────────┤
│                                                                  │
│   Backup to Removable Media      Restore from Removable Media    │
│   Change  Password               Schedule  Automatic  Task       │
│   Date and Time                  Shutdown                        │
│   Disk  Operations               Software  Setup                 │
│   File System Operations         System  Information             │
│   Mail Setup                     Tape  Operations                │
│   Peripherals  Setup             User Logins                     │
│                                                                  │
│                                                                  │
└────────────────────────────────────────────────────────────────┘
```

Move to an item with arrow keys and strike the ENTER key to select.

HELP			ENTER	PREV-FRM	NEXT-FRM	CANCEL	CMD-MENU	

Figure A-3. System Administration Screen

Through the System Administration screen, you can perform many VIS
administrative functions, including password changes, media backups and
restores, and peripheral setups, to name just a few.

Backup

⟹ **NOTE:**
The AT&T FACE administration package provides backup and restore
features. However, instead of the using the UNIX backup and restore
procedure, it is strongly recommended that you use the System Backup
and Restore procedures set forth in Chapter 4, "Common Maintenance
Procedures," of *CONVERSANT Voice Information System Version 3.1
Maintenance, 585-350-105.* In addition, you should not attempt to backup
Script Builder applications via the AT&T FACE administration package.

Use the backup procedure to insure that a current copy of the UNIX system file
system and directories exists on floppy disks or cartridge tape. It is necessary to
backup the system on a scheduled basis so if a system failure occurs or the file
systems are corrupted, a backup copy of the software can be loaded into the
system. It is also necessary to back up application code when new software is
added.

To backup the entire contents of the mounted file systems on the disk, use the System Backup procedure given later in this chapter.

The frequency of backup depends on the type of applications being handled by the VIS. If you make many changes to files, it is recommended that a backup be performed on a daily or weekly basis. It is advisable to back up when the system is lightly loaded — possibly late at night or early in the morning.

You can back up all files (system and user), only the files updated since the last backup, an individual user's files, or selected files or directories.

When you back up to floppy disk, the system tells you the approximate number of formatted floppy disks you need and the approximate time it takes to do the backup.

The Backup History function can be used to determine when the last system backup and the last incremental backups were done or if they were ever done.

The ways in which you can backup your system are as follows:

- Personal Backup

   All the files in the user's home directory are copied to the floppy or tape.

- Personal Backup

   You can use this function to specify file names (directories or files) that are located in the user's home directory to back up.

- System Backup

   The system backup requires system administration privileges. All system and user files that have been modified or created since the system was installed are backed up to floppies or tape. The installation date is the date of the last file that was installed at installation time. The search for files to back up starts from "/" (the root file system) and includes all mounted file systems.

Currently, the contents of certain system directories (for example */usr/bin)* are not normally backed up. If you want to back up these directories, use the **touch** command on the directory contents. This command causes the specified directories to be backed up even though they have not been modified or created since the system was installed. If you do not use **touch** on these directories, then only system files that are modified after system installation (for example */etc/passwd)* are backed up and later restored.

When backing up to floppy disk, several formatted floppy disks may be required, depending on the amount of information you have on your system.

⇒ **NOTE:**
Copying only the files that have been modified or created since installation prevents overwriting the contents of system directories like **/usr/bin** or **/etc/bin** because the contents of these directories (especially the commands) are not normally modified after installation. This means that if the contents of these system directories are lost, the lost files must be recovered from the system installation floppies.

- Incremental System Backup

  The incremental system backup requires system administration privileges. All the system and user files that have been modified or created since the last system or incremental backup are copied to the floppy or tape.

- System Backup of Users

  User files are backed up to the floppy or tape. You have the option to back up all user files or to back up one or more selected user files.

- Selective System Backup

  Regular files or the contents of directories may be backed up. The path name specified may be anywhere on a mounted file system.

  ⇒ **NOTE:**
  Since any file(s) may be specified (including system directories like **/bin),** on restore, you are asked if you want to overwrite the existing file. The default is **no** because, by default, a file on disk with a date newer than the restore file will not be overwritten. Again, this is a safeguard to prevent you from running into problems while doing a restore after system upgrade.

A-18

- Speech Backup
  Speech files are backed up to floppy disk or tape. You have the option to
  back up all talk files and phrases or selected talk files and phrases.

  ⟹ **NOTE:**
     If you are backing up speech associated with a specific application,
     use the procedure given in Chapter 2, "Application Administration."

Backup History

You should follow a regular schedule for performing backup. When you back up
your system, a record of the date and time is made. The Backup History form
displays the last date and time you performed a system or incremental backup.

To check the Backup History, use the following procedure.

1. From the AT&T FACE screen, highlight System Administration and press
   [ENTER] to display the System Administration screen.

2. From the System Administration screen, highlight Backup to Removable
   Media and press [ENTER] to display the Backup to Removable Media
   screen.

3. From the Backup to Removable Media screen, highlight Backup History
   and press [ENTER] to display the Backup History form.

   The date and time the last system and/or incremental backups were
   performed are displayed in the Backup History form. A sample Backup
   History form is shown below.

   ```
   The last system backup was done on
       Thu June 4 10:31:12 EST 1992.

   The last incremental backup was done on
       Fri June 5 08:30:12: EST 1992.
   ```

   If you have never done a system or incremental backup, the Backup
   History form displays the following message:

   ```
   No complete backup has been done.
   No incremental backup has been done.
   ```

4. Press [CANCEL] to close this frame and return to the Backup to Removable
   Media screen.

A-19

Personal Backup

To copy all files in your home directory to the removable media, use the Backup Files under <user's home directory> function where <user's home directory> is the name of your home directory. You cannot backup other user's files using Personal Backup. The following example assumes your home directory is **/usr/abc.**

1. From the AT&T FACE screen, highlight System Administration and press [ENTER] to display the System Administration screen.

2. From the System Administration screen, highlight Backup to Removable Media and press [ENTER] to display the Backup to Removable Media screen.

3. From the Backup to Removable Media screen, highlight Personal Backup and press [ENTER]. The Personal Backup screen is displayed.

4. From the Personal Backup screen, highlight Backup Files under /usr/abc and press [ENTER] to display the Select Removable Media screen.

5. Depending on what options are available on your system and what your needs are, select the drive that you want to use for this backup procedure by highlighting one of the three choices (floppy disk drive 0, floppy disk drive 1, or cartridge tape) and pressing [ENTER]. Once you have selected the media, you will receive the following message:

   ```
   Calculating approximate number of <floppies, tapes>
   required. Please wait.
   ```

Your system estimates the number of floppies or tapes needed to hold all the files to be backed up and how much time the backup will take. Then, follow the instructions displayed on the screen on how to insert and remove the previously formatted floppy disks or tapes and how to number them in sequence.

The following is an example of these instructions:

```
The backup will need approximately:

    1 formatted 1.44 Mbyte 3.5" floppy disk(s) or

    1 formatted 720 Kbyte 3.5" floppy disk(s)

    and will take no more than 1 minute.

    Please insert the first floppy disk. The floppy
    disks(s) you are using for the backup MUST be
    formatted. Be sure to number the floppy disks
    consecutively in the order they will be
    inserted.  Strike [ENTER]when  ready.
```

A-20

6. Insert a blank, formatted floppy disk or a cartridge tape and press
   [<u>ENTER</u>].

   ⟹ **NOTE:**
   Tapes do not have to be formatted.

   The floppy disks used to back up your system must be formatted in
   UNIX system format. Refer to the "Format UNIX System Floppy
   Disk" procedure later in this appendix.

   Once the backup is in progress, you will receive the following instruction:

   ```
   Backup in progress. Do not remove the floppy/tape.
   ```

7. In addition, if the backup spans multiple floppies or tapes, you will be
   notified when to remove the current floppy or tape and insert the next one
   in sequence.

   When the contents of floppy 1 have been backed up, for example, the
   following instructions appear:

   ```
   You may remove floppy number 1.
   To exit, please press 'q' followed by [ENTER].

   To continue, insert floppy number 2
   and strike the [ENTER]key.
   ```

   If you type **q** to exit, the following message is displayed:

   ```
   You have canceled the Backup to Removable Media.
   ```

   ⟹ **NOTE:**
   As you remove each floppy disk or tape, attach a label containing
   subject, date, and the number of the floppy disk or tape. File the
   floppy disk in its envelope. If you write on a label already attached
   to the floppy disk, only use a felt-tip or nylon-tip pen. Do not use a
   ball-point pen to write on a label already attached; this can cause
   damage to the floppy disk.

8. Continue inserting, removing, and labeling floppies or tapes until a
   message appears indicating the backup is complete:

   ```
   Backup is now done. You may remove the floppy.
   ```

9. Remove the last floppy disk or tape when the system informs you that it
   has completed the backup.

A-21

Selective Personal Backup

You may back up selected files and directories under your home directory. The following procedure assumes your home directory is **/usr/abc.** You cannot back up files located outside your home directory using this function.

1. From the Backup to Removable Media screen, highlight Personal Backup and press [ENTER] to display the Personal Backup screen.

2. From the Personal Backup screen, highlight Selective Backup of Files under /usr/abc and press [ENTER].

3. The Select Removable Media screen appears. Enter the file names or directories to be copied (shell metacharacters can be used for the file or directory names) and press **SAVE.**

4. Depending on what options are available on your system and what your needs are, select the drive that you want to use for this backup procedure by highlighting one of the three choices (floppy disk drive 0, floppy disk drive 1, or cartridge tape) and pressing [ENTER]. Once you have selected the media, you will receive the following message:

   ```
   Calculating approximate number of <floppies, tapes>
   required. Please wait.
   ```

   Your system estimates the number of floppies or tapes needed to hold all the files to be backed up and how much time the backup will take. Then, follow the instructions displayed on the screen on how to insert and remove the previously formatted floppy disks or tapes and how to number them in sequence.

   The following is an example of these instructions:

   ```
   The backup will need approximately:

       1 formatted 1.44 Mbyte 3.5" floppy disk(s) or

       1 formatted 720 Kbyte 3.5" floppy disk(s)

   and will take no more than 1 minute.

   Please insert the first floppy disk. The floppy
   disks(s) you are using for the backup MUST be
   formatted. Be sure to number the floppy disks
   consecutively in the order they will be
   inserted. Strike [ENTER]when  ready.
   ```

5. Insert a blank, formatted floppy disk or a cartridge tape and press
   [<u>ENTER</u>].

   ⟹ **NOTE:**
   The floppy disks used to back up your system must be formatted in
   UNIX system format. Refer to the "Format UNIX System Floppy
   Disk" procedure later in this appendix.

   Once the backup is in progress, you will receive the following instruction:

   ```
   Backup in progress. Do not remove the floppy/tape.
   ```

6. In addition, if the backup spans multiple floppies or tapes, you will be
   notified when to remove the current floppy or tape and insert the next one
   in sequence. When the contents of floppy 1 have been backed up, for
   example, the following instructions appears:

   ```
   You may remove floppy number 1.
   To exit, please press 'q' followed by [ENTER].

   To continue. insert floppy number 2
   and strike the [ENTER]key.
   ```

   If you type **q** to exit, the following message is displayed:

   ```
   You have canceled the Backup to Removable Media.
   ```

   ⟹ **NOTE:**
   As you remove each floppy disk or tape, attach a label containing
   subject, date, and the number of the floppy disk or tape. File the
   floppy disk in its envelope. If you write on a label already attached
   to the floppy disk, only use a felt-tip or nylon-tip pen. Do not use a
   ball-point pen to write on a label already attached; this can cause
   damage to the floppy disk.

7. Continue inserting, removing, and labeling floppies or tapes until a
   message appears indicating the backup is complete:

   ```
   Backup is now done. You may remove the floppy.
   ```

8. Remove the last floppy disk or tape when the system informs you that it
   has completed the backup.

Backup Users

The backup users function allows you to back up the users' files in the user's home directory to floppy disk or cartridge tape. You have the option to:

■ Back up all users

■ Back up one or more selected users

You must have system administration privileges to use this function. Only user logins are allowed to be backed up.

Use the following procedure to back up user's files.

1. From the Backup to Removable Media screen, highlight System Backup and press [ENTER] to display the System Backup screen.

2. From the System Backup screen, highlight Backup Users and press [ENTER]. The Select Removable Media screen appears.

3. Depending on what options are available on your system and what your needs are, select the drive that you want to use for this backup procedure by highlighting one of the three choices (floppy disk drive 0, floppy disk drive 1, or cartridge tape) and pressing [ENTER]. Once you have selected the media, you will receive the following message:

```
Computing the number of files to be backed up.
Please wait.
```

Your system estimates the number of floppies or tapes needed to hold all the files to be backed up and how much time the backup will take. Then, follow the instructions displayed on the screen on how to insert and remove the previously formatted floppy disks or tapes and how to number them in sequence.

4. Assume the user logins **abc** and **jab** have been added to your system. The following is a sample Backup Users screen that appears.

```
All
install
abc
jab
```

5. You may need to press [CHOICES] to display the pop-up screen of login names. If you do not, you receive a list of user login names automatically. Choose a login name from the list of login names. Move to an item with the arrow key and press [MARK] to select login names. When you are finished marking the user login names, press [ENTER].

You can also select logins by typing the login name with the cursor resting on the User's login name field. If you enter an invalid login name, you receive the following error message:

```
<User's login name> is not a valid login name.
```

6. Insert a blank, formatted floppy disk or a cartridge tape and press [<u>ENTER</u>].

> ⟹ **NOTE:**
> The floppy disks used to back up your system must be formatted in UNIX system format. Refer to the "Format UNIX System Floppy Disk" procedure later in this appendix.

Once the backup is in progress, you will receive the following instruction:

```
Backup in progress. Do not remove the floppy/tape.
```

7. In addition, if the backup spans multiple floppies or tapes, you will be notified when to remove the current floppy or tape and insert the next one in sequence. When the contents of floppy 1 have been backed up, for example, the following instructions appears:

```
You may remove floppy number 1.
To exit, please press 'q' followed by [ENTER].
```

Once the backup is in progress, you will receive the following instruction:

```
Backup in progress. Do not remove the floppy/tape.
```

8. In addition, if the backup spans multiple floppies or tapes, you will be notified when to remove the current floppy or tape and insert the next one in sequence. When the contents of floppy 1 have been backed up, for example, the following instructions appears:

```
You may remove floppy number 1.
To exit, please press 'q' followed by [ENTER].

To continue, insert floppy number 2
and strike the [ENTER]key.
```

If you type **q** to exit, the following message is displayed:

```
You have canceled the Backup to Removable Media.
```

> ⟹ **NOTE:**
> As you remove each floppy disk or tape, attach a label containing subject, date, and the number of the floppy disk or tape. File the floppy disk in its envelope. If you write on a label already attached to the floppy disk, only use a felt-tip or nylon-tip pen. Do not use a ball-point pen to write on a label already attached; this can cause damage to the floppy disk.

A-**25**

9. Continue inserting, removing, and labeling floppies or tapes until a message appears indicating the backup is complete:

```
Backup is now done. You may remove the floppy.
```

10. Remove the last floppy disk when the system informs you that it has completed the backup.

Backup UNIX System

The system backup function backs up all system and user files (in all mounted file systems) that have been modified or created since the system was installed.

⟹ **NOTE:**
The System Backup function does not back up a complete image of your entire file system. Only the system and user files that have been modified or created since the system was last installed are backed up.

You must have system administrator privileges to use this function.

Use the following procedure to do a system backup.

1. From the Backup to Removable Media screen, highlight System Backup and press [ENTER] to display the System Backup screen.

2. From the System Backup screen, highlight Backup System and press [ENTER] to display the Select Removable Media screen.

3. Depending on what options are available on your system and what your needs are, select the drive that you want to use for this backup procedure by highlighting one of the three choices (floppy disk drive 0, floppy disk drive 1, or cartridge tape) and pressing [ENTER]. Once you have selected the media, you will receive the following message:

```
Calculating approximate number of <floppies, tapes>
required. Please wait.
```

Your system estimates the number of floppies or tapes needed to hold all the files to be backed up and how much time the backup will take. Then, follow the instructions displayed on the screen on how to insert and remove the previously formatted floppy disks or tapes and how to number them in sequence.

The following is an example of these instructions:

```
The backup will need approximately:

    1 formatted 1.44 Mbyte 3.5" floppy disk(s) or

    1 formatted 720 Kbyte 3.5" floppy disk(s)

    and will take no more than 1 minute.

    Please insert the first floppy disk. The floppy
    disks(s) you are using for the backup MUST be
    formatted. Be sure to number the floppy disks
    consecutively in the order they will be
    inserted. Strike [ENTER]when ready.
```

A-27

4. Insert a blank, formatted floppy disk or a cartridge tape and press
[ENTER].

➡ **NOTE:**
The floppy disks used to back up your system must be formatted in
UNIX system format. Refer to the "Format UNIX System Floppy
Disk" procedure later in this appendix.

Once the backup is in progress, you will receive the following instruction:

```
Backup in progress. Do not remove the floppy/tape.
```

5. In addition, if the backup spans multiple floppies or tapes, you will be
notified when to remove the current floppy or tape and insert the next one
in sequence. When the contents of floppy 1 have been backed up, for
example, the following instructions appear:

```
You may remove floppy number 1.
To exit, please press 'q' followed by [ENTER].

To continue, insert floppy number 2
and strike the [ENTER]key.
```

If you type **q** to exit, the following message is displayed:

```
You have canceled the Backup to Removable Media.
```

➡ **NOTE:**
As you remove each floppy disk or tape, attach a label containing
subject, date, and the number of the floppy disk or tape. File the
floppy disk in its envelope. If you write on a label already attached
to the floppy disk, only use a felt-tip or nylon-tip pen. Do not use a
ball-point pen to write on a label already attached; this can cause
damage to the floppy disk.

6. Continue inserting, removing, and labeling floppies or tapes until a
message appears indicating the backup is complete:

```
Backup is now done. You may remove the floppy.
```

7. Remove the last floppy disk when the system informs you that it has
completed the backup.

A-28

Incremental UNIX System Backup

The incremental system backup function backs up only those files in all mounted file systems that have been modified or created since the last system or incremental backup. An incremental system backup differs from a system backup because a system backup backs up only those files in all mounted file systems that have been modified or created since the system was installed.

You must have system administration privileges to use this function.

Use the following procedure to do an incremental system backup.

1. From the AT&T FACE screen, highlight System Administration and press [ENTER]. The System Administration screen is displayed.

2. At the System Administration screen, highlight Backup to Removable Media screen and press [ENTER]. The Backup to Removable Media screen appears.

3. From the Backup to Removable Media screen, highlight System Backup and press [ENTER]. The System Backup screen appears.

4. From the System Backup screen, highlight Incremental System Backup and press [ENTER]. The Select Removable Media screen appears.

5. Depending on what options are available on your system and what your needs are, select the drive that you want to use for this backup procedure by highlighting one of the three choices (floppy disk drive 0, floppy disk drive 1, or cartridge tape) and pressing [ENTER]. Once you have selected the media, you will receive the following message:

    ```
    Calculating approximate number of <floppies, tapes>
    required. Please wait.
    ```

    Your system estimates the number of floppies or tapes needed to hold all the files to be backed up and how much time the backup will take. Then, follow the instructions displayed on the screen on how to insert and remove the previously formatted floppy disks or tapes and how to number them in sequence.

A-29

The following is an example of these instructions:

```
The backup will need approximately:

    1 formatted 1.44 Mbyte 3.5" floppy disk(s) or

    1 formatted 720 Kbyte 3.5" floppy disk(s)

    and will take no more than 1 minute.

    Please insert the first floppy disk. The floppy
    disks(s) you are using for the backup MUST be
    formatted. Be sure to number the floppy disks
    consecutively in the order they will be
    inserted.  Strike [ENTER]when  ready.
```

6. Insert a blank, formatted floppy disk or a cartridge tape and press
   [ENTER].

   ⟹ **NOTE:**
   The floppy disks used to back up your system must be formatted in
   UNIX system format, Refer to the "Format UNIX System Floppy
   Disk" procedure later in this appendix.

   Once the backup is in progress, you will receive the following instruction:

   ```
   Backup in progress. Do not remove the floppy/tape.
   ```

7. In addition, if the backup spans multiple floppies or tapes, you will be
   notified when to remove the current floppy or tape and insert the next one
   in sequence. When the contents of floppy 1 have been backed up, for
   example, the following instructions appears:

   ```
   You may remove floppy number 1.
   To exit, please press 'q' followed by [ENTER].

   To continue, insert floppy number 2
   and strike the [ENTER]key.
   ```

   If you type **q** to exit, the following message is displayed:

   ```
   You have canceled the Backup to Removable Media.
   ```

   ⟹ **NOTE:**
   As you remove each floppy disk or tape, attach a label containing
   subject, date, and the number of the floppy disk or tape. File the
   floppy disk in its envelope. If you write on a label already attached
   to the floppy disk, only use a felt-tip or nylon-tip pen. Do not use a
   ball-point pen to write on a label already attached; this can cause
   damage to the floppy disk.

8. Continue inserting, removing, and labeling floppies or tapes until a message appears indicating the backup is complete:

```
Backup is now done. You may remove the floppy.
```

9. Remove the last floppy disk when the system informs you that it has completed the backup.

Selective UNIX System Backup

The selective system backup function backs up specified files or contents of directories in mounted file systems. The full path name must be specified.

You must have system administration privileges to use this function.

Use the following procedure to do a selective system backup.

1. From the AT&T FACE screen, highlight System Administration and press [ENTER]. The System Administration screen is displayed.

2. At the System Administration screen, highlight Backup to Removable Media. The Backup to Removable Media screen is displayed.

3. At the Backup to Removable Media screen, highlight System Backup and press [ENTER]. The System Backup screen appears.

4. From the System Backup screen, highlight Selective System Backup and press [ENTER]. The Select Removable Media screen appears.

5. Depending on what options are available on your system and what your needs are, select the drive that you want to use for this backup procedure by highlighting one of the three choices (floppy disk drive 0, floppy disk drive 1, or cartridge tape) and pressing [ENTER]. The selective system backup form appears.

6. Enter one or more files or directories separated by spaces and press **SAVE.** If the file or directory cannot be found, you will receive the following message:

       <File name> cannot be found.

Once you have selected the files or directories, you receive the following message:

       Calculating approximate number of <floppies, tapes>
       required. Please wait.

Your system estimates the number of floppies or tapes needed to hold all the files to be backed up and how much time the backup will take. Then, follow the instructions displayed on the screen on how to insert and remove the previously formatted floppy disks or tapes and how to number them in sequence.

The following is an example of these instructions:

       The backup will need approximately:

           1 formatted 1.44 Mbyte 3.5" floppy disk(s) or

           1 formatted 720 Kbyte 3.5" floppy disk(s)

           and will take no more than 1 minute.

```
Please insert the first floppy disk. The floppy
disks(s) you are using for the backup MUST be
formatted. Be sure to number the floppy disks
consecutively in the order they will be
inserted.  Strike [ENTER]when  ready.
```

7. Insert a blank, formatted floppy disk or a cartridge tape and press
    [ENTER].

    ➡ **NOTE:**
    The floppy disks used to back up your system must be formatted in
    UNIX system format. Refer to the "Format UNIX System Floppy
    Disk" procedure later in this appendix.

    Once the backup is in progress, you will receive the following instruction:

    ```
    Backup in progress. Do not remove the floppy/tape.
    ```

8. In addition, if the backup spans multiple floppies or tapes, you will be
    notified when to remove the current floppy or tape and insert the next one
    in sequence. When the contents of floppy 1 have been backed up, for
    example, the following instructions appears:

    ```
    You may remove floppy number 1.
    To exit, please press 'q' followed by [ENTER].

    To continue, insert floppy number 2
    and strike the [ENTER]key.
    ```

    If you type **q** to exit, the following message is displayed:

    ```
    You have canceled the Backup to Removable Media.
    ```

    ➡ **NOTE:**
    As you remove each floppy disk or tape, attach a label containing
    subject, date, and the number of the floppy disk or tape. File the
    floppy disk in its envelope. If you write on a label already attached
    to the floppy disk, only use a felt-tip or nylon-tip pen. Do not use a
    ball-point pen to write on a label already attached; this can cause
    damage to the floppy disk.

9. Continue inserting, removing, and labeling floppies or tapes until a
    message appears indicating the backup is complete:

    ```
    Backup is now done. You may remove the floppy.
    ```

10. Remove the last floppy disk when the system informs you that it has
    completed the backup.

A-**33**

Speech Backup

⟹ **NOTE:**
The following backup procedure and the associated restore procedure do not check to see if the talkfile number is already used by another application. This can cause speech on the disk to be overwritten. It is therefore highly recommended that you back up speech associated with a specific application by selecting Speech in the Backup Components screen. Refer to Chapter 2, "Application Administration," for information on backing up an application.

⟹ **NOTE:**
If the VIS is co-resident with AUDIX Voice Power, refer to Chapter 5, "Upgrade Procedures," of *AUDIX Voice Power R2.1.1 Installation and Maintenance Guide* for information on backing up AUDIX Voice Power speech files.

The speech database backup function backs up the entire speech database or specific phrases. You must be logged in as **root** to use this function.

Use the following procedure to perform a speech backup.

1. From the AT&T FACE screen, highlight System Administration and press [ENTER]. The System Administration screen is displayed.

2. From the System Administration screen, highlight Backup to Removable Media and press [ENTER]. The Backup to Removable Media screen is displayed.

3. From the Backup to Removable Media screen, highlight Speech Backup and press [ENTER]. The Speech Backup screen is displayed.

4. From the Speech Backup screen, highlight Backup all Talkfiles/Phrases or Selective Backup of Talkfiles/Phrases and press [ENTER].

5. If you selected Backup All Talkfiles/Phrases, the Select Removable Media screen appears.

    Depending on the options available on your system and your needs, select the appropriate media for storing your file(s) by highlighting cartridge tape and pressing [ENTER].

6. If you selected Selective Backup of Talkfiles/Phrases, a form appears. Type the names of the speech files and phrases you want to back up. When all speech file and phrase names are entered, press [ENTER].

7. Insert a formatted floppy disk and follow the instructions displayed on the screen to insert and remove the previously-formatted floppy disks or tapes and how to number them in sequence.

8. The following message is displayed after you insert the first floppy or tape:

   ```
   Computing the number of files to be backed up.
   Please wait.
   ```

   Your system estimates the number of floppies or tapes needed to hold all the files to be backed up and how much time the backup takes.

9. If the backup spans multiple floppies or tapes, you are notified when to remove the current floppy or tape and insert the next one in sequence. When the contents of floppy 1 have been backed up, for example, the following instructions are displayed:

   ```
   Please remove the disk and label it as disk #1.

   Please insert new disk...then type <Enter> to
   continue.
   ```

   ⟹ **NOTE:**
   As you remove each floppy disk or tape, attach a label containing the subject, date, and the number of the floppy disk or tape. File the floppy disk in its envelope. If you write on a label already attached to a floppy disk, only use a felt-tip or nylon-tip pen. Do not use a ball-point pen to write on a label already attached to a floppy disk; this can cause damage to the disk.

10. Continue inserting, removing, and labeling floppies or tapes until a message appears indicating that the backup is complete.

11. Remove the last floppy disk when the system informs you that it has completed the backup.

Change Password

A password is a code word that should be known only by its creator. The password secures your login so no unauthorized person can enter the system and have access to your files. Once a password has been assigned, it must be entered with your login when you want to use the system.

After you have responded to the `login:` prompt, the password prompt appears on the screen. When you type in your password, it does not appear on the screen. This prevents your password from being seen by someone else.

Each password is required to be at least six characters or longer. The password must have two alphabetic characters and at least one numeric character in the first eight characters.

Choose a password that is not common and is hard to guess. Your password should be changed from time to time to safeguard its secrecy.

You can only change passwords for your own login name.

Changing Your Own Password

To change the password that is associated with your login, use the following procedure.

1. Log in using the login name associated with the password you want to change.

2. From the AT&T FACE screen, highlight System Administration and press [ENTER].

3. From the System Administration screen, highlight Change Password and press [ENTER]. The screen clears and the UNIX system **passwd** command is executed. At the top of the screen, the following message is displayed:

   ```
   Strike BREAK or DEL to return to AT&T
   Administration without changing your password.
   ```

4. When prompted for your current password (Old password:), type the password you used when you logged in.

5. When prompted for the new password (New Password:), enter the new password.

   The password you enter is not displayed on the screen.

6. When prompted to repeat the new password (Reenter new password:), type your new password again.

   If the two password entries are the same, the password is assigned. If the two password entries do not match, the following message is displayed:

   ```
   They don't match; try again.
   New password:
   ```

   You receive an error message if:

   — You enter the old password incorrectly

   — The new password is not six characters long

   — The new password does not have two alphabetic characters and at least one special character in the first eight

   — The password resembles the login name by being a reverse or circular shift

   — The new password does not differ from the old password by three or more characters

   — The new password includes a space or a colon (:).

7. After you reenter the new password, you are prompted to press [ENTER] to continue. Press [ENTER] to return to the System Administration screen.

A-37

Date and Time

The system clock can be changed using the Date and Time feature. You can use the Date and Time form to display the current setting, change a value, and verify that the appropriate changes have been made. You must have system administration privileges to use this feature.

Before resetting the date or time, notify all users that the date will be reset. Changing the date and/or time may disrupt **make, cron,** a compile, or any campaigns that rely on the current date, thus disturbing other users' work.

To set the system clock, use the following procedure.

1. From the AT&T FACE screen, highlight System Administration and press [ENTER]. The Sytem Administration screen is displayed.

2. From the System Administration screen, highlight Date and Time and press [ENTER]. The Change Date and Time form appears.

3. Use the arrow keys to move the cursor to the field you want to change.

4. Once the cursor is resting on the field to be changed, press [CHOICES].

   If only two or three choices are available, the choice toggles when [CHOICES] is pressed. If more than three choices are available for you to enter into each field, a screen appears. Use the arrow keys to move to the appropriate entry, then press [ENTER].

5. The date fields are months of the year, day of the month, and year. Valid values are:

months:	January — December
days:	1 — 31
years:	1987 — 1999

   The time fields are hours of the day and minutes of the hour. Valid values are:

hours:	1 — 12
minutes:	00 — 59

   The remaining fields on the form are AM/PM, Time Zone (which can be Eastern, Central, Mountain, Pacific, or GMT), and Daylight Savings Time.

   If you type an invalid value for these fields, an error message is displayed. An error also occurs when month, day, and year are in an impossible combination.

A-**38**

6. Press [SAVE] after you have changed the required fields on the Date and Time form.

   A message appears confirming that the system set the new time and date. The following is a sample confirmation message:

   ```
   The date is June 15, 1992, time is 1:35, time zone
   Eastern.
   ```

7. Press [CONT] to change the date and time on the system clock, or press [CANCEL] to cancel without changing the date and time.

   ⟹ **NOTE:**
   You must log off and log back on again to see the effects of changing either the time zone or the use of Daylight Savings Time.

Disk Operations

The Disk Operations function allows you to:

■ Format floppy disks

■ Copy the contents of one floppy to another floppy disk

Format UNIX System Floppy Disk

Format all new floppy disks before you use them with the system. Formatting a floppy disk prepares it to accept the directories and files you want to store on it.

You can also reformat an old floppy disk. Be sure you do not need the information stored on it any longer.

⚠ CAUTION:

Do not format a floppy disk that contains information you want to keep. Formatting a floppy disk destroys any information stored on it.

To format a floppy disk, use the following procedure.

1. If you are in the Voice System Administration windows, press the [CANCEL] until you are in the CONVERSANT VIS Version 3.1 main menu.

2. At the VIS main menu, highlight AT&T Face and press [ENTER].

3. At the AT&T FACE menu, highlight System Administration and press [ENTER]. The System Administration menu is displayed.

4. At the System Administration menu, highlight Disk Operations and press [ENTER]. The Disk Operations menu appears.

5. At the Disk Operations menu, highlight Format UNIX System Floppy Disk and press [ENTER]. The Format Floppy form appears.

6. At the Format Floppy form, select the density of the floppy you wish to format.

A-**40**

7. Insert the floppy disk you want to format and press [CONT]. You may see the following message:

    The floppy cannot be formatted.

The possible reasons include:

— There is no floppy inserted.

— The floppy is inserted improperly.

— The floppy is write protected.

The system also asks you the density of the floppy to be formatted: 1.44 MB or 1.2 MB

Check that you inserted a floppy disk. Take the floppy out and check if the disk is write-protected. If it is, write-enable it and reinsert the floppy. If the floppy is the incorrect density, insert a floppy of the correct density.

You might also get a message that tells you explicitly that the floppy is the wrong density. Remove the floppy and insert one of the correct density.

If no error conditions are encountered, the following message is displayed:

    Formatting of floppy is in progress.

After the floppy disk is formatted, the Remove Formatted Floppy form appears.

8. Remove the floppy disk from the disk drive and press [CONT].

Format any other floppy disks by following the same procedure for each floppy disk.

9. Press [CANCEL] to exit when you are finished.

Floppy-to-Floppy Copy

For safekeeping, you can store important information on more than one floppy disks by copying the information from one floppy disk to another. You can copy only using disks of the same size (3.5-inch).

The floppy disk containing the files you want to copy is called the *source floppy disk* and the floppy disk to which you want to copy the information is called the *destination floppy disk.* Remember to format the destination floppy disk before you start.

⚠ CAUTION:

It is recommended that the source and destination floppy disks be the same density; that is, for 20 MHz machines, both should be 1.44 Mbyte floppy disks. Note that 3.5-inch drives support only 1.44 Mbyte floppy disks.

While a floppy is being copied, *do not* remove the floppy disk from the disk drive. Wait for the message to insert or remove the appropriate floppy disk.

To copy the contents from a source floppy disk to a destination floppy disk, use the following procedure.

1. From the AT&T FACE screen, highlight System Administration and press [ENTER] to display the System Administration screen.

2. At the System Administration screen, highlight Disk Operations and press [ENTER] to open the Disk Operations screen.

3. At the Disk Operations screen, highlight Floppy-to-Floppy Copy and press [ENTER]. The Floppy-to-Floppy Copy screen appears.

4. Confirm the following:

   ■ Source and destination floppy disks are the same density

   ■ Destination floppy is formatted

   ■ It is all right to overwrite the destination floppy

   Once you are sure these conditions exist, press [CONT]. The Copy Source Floppy form appears.

5. Insert the source floppy disk and close the latch.

6. Press [CONT].

   If you get an error message, the source floppy cannot be copied. The following are possible causes for an error message:

   ■ There is no floppy inserted in the floppy disk drive.

   ■ The floppy is inserted improperly.

   ■ The latch is not turned down.

   ■ The floppy is not readable because it is not formatted or is formatted incorrectly.

   If you get an error message, check to make sure that you put the floppy in the drive and that the latch is turned down. Try reinserting the floppy disk. Also, verify that the floppy disk is the one you intended to copy.

7. When the floppy is inserted properly and is being read, the following message is displayed:

   ```
   Please wait while source floppy is being copied.
   ```

   [CANCEL] does nothing if you press it at this time. The system now is copying the files from the source floppy disk onto the hard disk. If your system does not have enough space to copy this floppy, you receive an error message. If you receive such a message, you must delete some files on the hard disk before trying to copy the floppy again.

   ⟹ **NOTE:**
   If you press [CANCEL] while the source floppy is being copied, the copy is not affected. However, the rest of the task (that is, copy to the destination floppy) is canceled. You are returned to the Disk Operations screen.

   When copying is complete, the Remove Source Floppy form appears.

8. Remove the source floppy disk and press [CONT].

9. The Copy to Destination Floppy form appears.

10. Insert the destination floppy disk and press [CONT]. You may receive the following message:

    ```
    The destination floppy cannot be copied to. The
    possible reasons include: there is no floppy
    inserted; the floppy is inserted improperly; the
    latch is not turned down; or the floppy is not
    writable because it has a write protect tab or it
    is unformatted or formatted incorrectly.
    ```

A-43

11. Check that you inserted a floppy disk and closed the latch. Take the floppy out and check for a write protect tab. If it has one, remove it or insert a different formatted floppy. If you suspect the floppy may not be formatted, insert one that you know is formatted.

You also might mistakenly insert a 1.44 Mbyte floppy disk when you should have inserted a 720 Kbyte floppy disk. In this case, you should remove the floppy and insert the appropriate floppy disk.

If no errors are encountered, the following message is displayed:

```
Please wait while floppy is being written.
```

When the write from hard disk to destination floppy is finished, the Remove Destination Floppy form appears.

12. Remove the destination floppy disk and press [CONT].

After you press [CONT], the Additional Floppies form appears.

13. If you do not need another copy, press [CANCEL] to exit from this procedure.

14. If you want to make another copy, press [CONT] and follow the screen instructions to repeat this procedure.

15. When you are finished, press [CANCEL] to return to the Disk Operations screen.

Allocating Speech on the Second Hard Disk Drive

After your second hard disk has been low-level formatted, it may be partitioned to store speech data. Disks are divided into partitions or slices to allow the system administrator to use various parts of the disk for different purposes. The command **addspdisk** will partition the second disk into at most 2 partitions according to the following rules:

■ If a speech partition exists on disk 0 — slice 4, then a disk partition of the same size will be created on disk 1 — slice 4. The remainder of disk 1 will be allocated as a speech partition on slice 3.

■ If the size of disk 0 — slice 4 partition is greater than all of disk 1, then a single speech slice will be created on disk 1 — slice 3.

■ If disk 0 — slice 4 is not a speech slice, then 2 speech partitions of approximately equal size will be created on disk 1 — slices 3 and 4.

A-44

These rules are guided by the following rationale: Disk 1 is partitioned under these rules to balance the load between the two disks. The voice system writes speech data on the speech partition with the most free space. If the speech partition on the two disks are of equal size, and if speech is added to the system, the speech will be distributed evenly across the two disks.

To use the **addspdisk** command, follow this procedure:

1. Enter **addspdisk**

   System response:

   ```
   Adding disk 01 as a speech disk
   Setting up the partitions for disk 01
   Partitioning for disk 01 complete.
   I will create the following disk partitions for speech
       SPCH3 with 683 cylinders
       SPCH4 with 337 cylinders
   Is this acceptable (y/n)
   ```

2. Enter **n**

   System response:

   ```
   Would you like to specify the partitions? (y/n):
   ```

3. Enter **y**

   At this time you are asked to specify your requirements for disk 1 — slice 3.

   System response:

   ```
   Enter number of cylinders for disk 1 slice 3:
   ```

4. Enter the number of cylinders.

   System response:

   ```
   Scanning for bad tracks
       This will take several minutes
   Bad track scanning complete
   Making the /etc/partitions file
   New /etc/partitions entry for disk01 added.
   Creating the following entries in /vs/data/fslist
       /dev/rdsk/ls3 5805
       /dev/rdsk/ls4 2864
   /vs/data/fslist entries create
   addspdisk for disk 01 completed at Mon Nov 14 16:33:12
   EST 1993
   ```

A-**45**

Alternative Disk Drive Usage

There are several "sophisticated" ways to use your second hard disk drive:

- It is possible to convert the speech partitions created through **addspdisk** to UNIX file system. Use the command **spch3unix.** Refer to the *CONVERSANT Voice Information System Version 3.1 Command Reference, 585-350-203,* book for more information.

- If is possible to create additional partitions on the second hard disk. Consult the *UNIX System Administrator's Guide* and the *UNIX System Administrator's Reference* book for more information.

- FACE also provides a simple interface to add UNIX file systems to the second hard disk. These file systems may be then be converted to speech partitions using the command **buildfs.** To create the UNIX file systems using FACE:

    1. At the UNIX prompt #, enter **face.** The system responds by opening the AT&T FACE screen.

    2. Highlight System Administration and press [ENTER]. The system opens the System Administration screen.

    3. Highlight Peripherals Setup and press [ENTER]. The system opens the Peripherals Setup screen.

    4. Highlight Second Hard Disk Setup and press [ENTER]. From this point the the second hard disk is added to the system, and up to 4 UNIX partitions will be created with the sizes you specify. Once these partitions have been created, they may be converted to speech partitions using the **buildfs** command. For example, if **/dev/dsk/1s4** is a UNIX file system, it can converted into a speech partition by entering:

        buildfs -s /dev/rdsk/1s4

        Make sure you indicate the raw disk (rdsk *not* dsk).

        ⚠ **CAUTION:**
        *Do not attempt to run **buildfs** on the root or /usr file systems!*

File System Operations

The file systems you create are an independent collection of files and directories. The File System Operation function allows you to:

- Create a file system on floppy disk

- Mount a file system on both hard disk and floppy disk

- Mount a file system on a second hard disk, if one is installed

- Unmount a previously mounted file system

Before a floppy disk file system can be accessed through the UNIX system, it must be attached to a directory that is already a part of the file system on the integral hard disk. This is referred to as mounting a file system. The location in the file system where the **mount** command attaches the mounted file system is called the mount point.

Therefore, a file system is brought under UNIX system control by mounting the file system. To release the file system so that it can be removed from the UNIX system, the file system must be unmounted.

To perform any of these functions, you must be at the File System Operations screen. To get to this screen:

1. From the AT&T FACE screen, highlight System Administration and press [ENTER] to display the System Administration screen.

2. At the System Administration screen, highlight File System Operations and press [ENTER] to display the File System Operations screen.

Create a File System

A 1K UNIX system file system is created on a floppy disk. After the file system is created, it is marked with a file system name and optional file system label that can be mounted later.

Use the following procedure to create a file system on a floppy disk.

1. At the File System Operations screen, highlight Create File System and press [ENTER] to display the Create File System form.

2. You must enter the file system name (the label is optional) and press [SAVE]. By defaults the label is "none." You may change this label to any other name (up to six alphanumeric characters).

A-47

You will receive an error message if your file system or label name is longer than six characters.

The Insert Floppy form appears.

3. Insert the floppy disk, close the latch, and press [CONT]. You are asked to wait while the file system is created.

If a write error to the floppy occurs, the following warning message appears:

```
Cannot write to the floppy. Possible reasons
include: floppy disk has write-protect tab on it
please remove tab), floppy disk is not formatted,
disk is not inserted or is inserted improperly,
latch is not closed or the floppy disk is
unreadable. Please check the disk and try again.
```

4. If the warning message appears, try the following:

   ■ Remove the floppy from the drive

   ■ Check for a write-protect tab

   ■ Reinsert the floppy and close the latch, then press [CONT]

If the error persists, try another formatted disk.

Another possible error is trying to create a file system on a mounted floppy. If the floppy on the device has a mounted file system, you are not allowed to create a new file system on this floppy. This error is detected and you are notified by the following message:

```
The floppy on this drive is currently mounted and
in use. A "Create File System" operation, at this
time, would overwrite the contents of a currently
active file system. Please make sure this floppy
is unmounted by using the "Unmount File System"
screen and removed from the drive before attempting
a "Create File System" operation on your floppy.
```

5. If the previous warning message appears, unmount the floppy and restart the operation by pressing [CONT] or [CANCEL].

6. If no errors are encountered, the confirmation form appears.

7. Press [CONT].

The floppy file system is created and left unmounted.

⇒ **NOTE:**
Remember to mount the file system using the Mount File System function before trying to use it.

Mount a File System

Floppy file systems, as well as file systems on a second hard disk, can be mounted. You must specify the mount directory name where you want to mount the file system. A write protected floppy must be mounted as read-only. When the operation is completed, the system gives you a confirmation message that the file system has been mounted.

You must have system administration privileges to use the Mount File System function.

Use the following procedure to mount a file system on a floppy disk.

1. At the File System Operations screen, highlight Mount File System, then press [ENTER] to display the Mount File System form.

2. With the cursor at the Mount Directory Name field, enter the name of the mount directory.

    You must specify the directory you select for the mount point as a full path name. If you select a directory that does not exist, it is created. If you select a directory that exists and has contents, the current contents of that directory are not accessible after the file system is mounted.

3. With the cursor resting on the Do you want to mount the file system read-only? field, press [CHOICES] and toggle (Yes or No) until your choice appears in the field.

4. When the form is complete, press [SAVE]. The Insert Floppy form appears.

5. Insert the floppy, close the latch, and press [CONT].

    When the file system is mounted, you receive the following confirmation message:

    ```
    The file system is mounted.
    Do not remove the medium until it is unmounted.
    ```

Mount File System Warning Messages

One of the following warning messages may appear while attempting to mount a file system.

■ Directory Not Empty

If the mount point is not empty, a warning message similar to the following appears:

```
Warning: /usr/jab/mnt exists and is not empty.
Contents
will not be accessible while disk is mounted.
```

■ Mount Directory in Use

If another file system (for example, a hard disk file system) is already mounted using the same mount directory, a warning message similar to the following appears and the file system is not mounted:

```
/mnt currently has a file system mounted.
This directory cannot be used to mount your disk.
Please select another directory name.
```

■ Write-Protected Disk (only applies to floppy file systems)

If you attempt to mount a write-protected floppy disk (that is, the floppy has the write-protected tab on it) as read/write, the following warning message appears:

```
You have inserted a write-protected disk.
This disk needs to be mounted read-only.
```

■ Floppy Mounted (only applies to floppy file systems)

If the floppy disk is already mounted (presumably by somebody else), the following warning message appears:

```
The floppy on the drive is already mounted. The
floppy may be in use by someone else. Please make
sure this floppy is unmounted by using the "Unmount
File System" screen and removed from the drive
before attempting the "Mount File System" operation
on your floppy.
```

■ Hard Disk File System Already Mounted

If a file system on a second hard disk is already mounted, the following warning message appears:

```
This file system is already mounted.
```

■ Directory Is a Standard UNIX System Directory

If the directory you specify is one of the standard UNIX system directories **(/dev, bin, /lib, /usr, and tmp),** a warning message similar to the following appears:

```
The directory name selected  /lib is a standard UNIX
system directory. If you overlay the contents of
this directory, unpredictable things may happen to
your system. If you do intend to overlay this
directory, then continue. Otherwise CANCEL the
operation and try again by selecting a different
directory name to mount your disk.
```

Unmount a File System

You may unmount a previously mounted UNIX system file system on a floppy
disk or a second hard disk. When completed, the system gives you a
confirmation message that the file system is unmounted.

Use the following procedure to unmount a file system on a floppy disk.

1. At the File System Operations screen, highlight Unmount File System and
   press [ENTER]. The Unmount File System form appears.

2. At the Mount Directory Name field, enter the name of the mount directory
   in which the file system to be unmounted is stored and press [ENTER].

   The following confirmation message appears:

   ```
   The file system is unmounted.
   You may remove the medium from the drive.
   ```

3. Press [CONT] to close this frame and make the File System Operations
   screen active.

Unmount File System Warning Messages

■ File System in Use

   If the file system cannot be unmounted because the file system is in use,
   the following warning message is displayed:

   ```
   The file system is currently in use. You cannot
   unmount this file system at this time. Make sure
   all current activity has stopped before trying to
   unmount this file system again.
   ```

■ File System Not Previously Mounted

   If you attempt to unmount a file system not previously mounted, the
   following warning message appears:

   ```
   The file system on <device> is not currently
   mounted.
   ```

Press [CONT] to close this screen.

Restore from Removable Media

If files are lost due to operator error, system failure, or some other cause, you may be able to restore the files using the latest floppy disk or cartridge tape backup. Remember, you can only restore files that have been backed up. Any changes made since the last backup are lost. Also, any file that is in use at the time of restore cannot be restored.

There are three main types of restore operations:

— Personal restore is used to restore all files (directories or regular files) or selectively restore particular files backed up on floppy disk or tape to the hard disk.

— System restore is used to restore all files from floppy disk or tape to hard disk. The system restore function provides you with the ability to do a restore (from system backup), a selective system restore, or restore other user files (not just your own). The selective system restore function can be used to restore specific files. The files on the floppy disk or tape are displayed on the screen and you can select the ones you want to restore.

— Speech restore is used to restore all talk files and phrases backed up to floppy disk or tape.

To restore the entire contents of the disk, use the "System Backup and Restore" procedure given later in this chapter.

To restore your system, you must select the type of restore you need as explained above and follow the procedure for that type.

If you are restoring speech associated with a specific application, use the procedure given in Chapter 2, "Application Administration."

⟹ **NOTE:**
Before attempting a restore, be sure the hard disk on your system has enough space for all the information you want to restore to it.

A-53

Personal Restore

To restore all files in your home directory, use the following procedure. The following procedure assumes your home directory is **/usr/abc.**

1. From the AT&T FACE screen, highlight System Administration and press [ENTER] to display the System Administration screen.

2. At the System Administration screen, highlight Restore from Removable Media and press [ENTER] to open the Restore from Removable Media screen.

3. At the Restore from Removable Media screen, highlight Personal Restore and press [ENTER] to display the Personal Restore screen.

4. From the Personal Restore screen, highlight Restore Files under /usr/abc and press [ENTER]. The Select Removable Media screen appears.

5. Depending on what options are available on your system and what your needs are, select the drive that you want to use for this restore procedure by highlighting one of the three choices (floppy disk drive 0, floppy disk drive 1, or cartridge tape) and pressing [ENTER].

6. The Disk Restore form asks if existing files on disk should be overwritten with restored files.

   Choose YES or NO by pressing [CHOICES] and toggling between YES and NO. The default is NO.

   If you choose YES, all files on the floppy disk or tape are transferred to your file system, overwriting any files with the same name regardless of whether the file on the hard disk is newer than the one on the floppy disk or tape.

   If you choose NO, files on the hard disk that are newer (that is, have been modified after the last backup) are not overwritten.

7. Press [SAVE].

   A restore confirmation message appears telling you to insert the floppy disk or tape containing the files you want to restore.

8. Insert the floppy disk or tape containing the specified files and press [ENTER].

   Once the restore is in progress, the following instruction is displayed:

   ```
   Restore in progress. Do not remove the floppy/tape.
   ```

9. In addition, if the restore spans multiple floppy disks or tapes, you are notified when to remove the current floppy or tape and insert the next one in sequence. When the contents of floppy 1 have been restored, for example, the following instructions would appear:

```
You may remove floppy number 1
To exit, please press 'q' followed by [ENTER].

To continue, insert floppy number 2
and strike the [ENTER]key.
```

If you type **q** to exit, the following message is displayed:

```
You have canceled the Restore from Removable Media.
```

10. Make sure the floppy disks or tapes are in numerical order. Continue inserting and removing the disks or tapes until a message appears indicating the restore is complete:

```
Restore is done. You may remove the floppy.
```

11. Remove the last floppy disk when the system informs you that it has completed the restore.

A-**55**

Selective Personal Restore of Files

To restore only some of the files in your home directory, use the following procedure *(/usr/abc* is assumed to be your home directory).

1. From the AT&T FACE screen, highlight System Administration and press [ENTER].

2. At the System Administration screen, highlight Restore from Removable Media and press [ENTER] to display the Restore from Removable Media screen.

3. At the Restore from Removable Media screen, highlight Personal Restore and press [ENTER] to open the Personal Restore screen.

4. From the Personal Restore screen, highlight Selective Restore of Files under /usr/abc and press [ENTER]. The Select Removable Media screen appears.

5. Depending on what options are available on your system and what your needs are, select the drive that you want to use for this restore procedure by highlighting one of the three choices (floppy disk drive 0, floppy disk 1, or cartridge tape) and pressing [ENTER].

6. The Disk Restore form asks if existing files on disk should be overwritten with restored files.

   Answer YES or NO by pressing [CHOICES] and toggling between YES and NO. The default is NO.

   If you choose YES, all files on the floppy disk or tape are transferred to your file system, overwriting any files with the same name regardless of whether the file on the hard disk is newer than the one on the floppy disk or tape.

   If you choose NO, files on the hard disk that are newer (that is, have been modified after the last backup) are not overwritten.

7. Press [SAVE].

   ⟹ **NOTE:**
   This procedure reads the media set twice: once to read the list of files that you can choose and then again to execute the restoring of the files that you chose.

8. You are prompted to insert the floppy or tape. The Show Contents screen appears.

⟹ **NOTE:**
   If you do not wish to restore any files at this time, press [CANCEL].

9. Select the files you want to restore with [MARK] until you have marked all the files you want to restore.

10. Press [ENTER] to restore the marked files.

   A restore confirmation message appears telling you to insert the floppy disk or tape containing files you want to restore.

11. Insert the floppy disk or tape containing the specified files and press [ENTER].

   Once the restore is in progress, the following instruction is displayed:

   ```
        Restore in progress. Do not remove the floppy/tape.
   ```

12. In addition, if the restore spans multiple floppy disks or tapes, you are notified when to remove the current floppy or tape and insert the next one in sequence. When the contents of floppy 1 have been restored, for example, the following instructions would appear:

   ```
       You may remove floppy number 1.
       To exit, please press 'q' followed by [ENTER].

       To continue, insert floppy number 2
       and strike the [ENTER]key.
   ```

   If you type **q** to exit, the following message is displayed:

   ```
       You have canceled the Restore from Removable Media.
   ```

13. Make sure you insert the floppy disks or tapes in numerical order. Continue inserting and removing the disks or tapes until a message appears indicating the restore is complete:

   ```
       Restore is done. You may remove the floppy.
   ```

14. Remove the last floppy disk when the system informs you that it has completed the restore.

A-**57**

System Restore

To restore system and user files from a system or incremental backup, use the following procedure. You must have system administration privileges to use this function.

1. From the AT&T FACE screen, highlight System Administration and press [ENTER].

2. At the System Administration screen, highlight Restore from Removable Media and press [ENTER] to display the Restore from Removable Media screen.

3. At the Restore from Removable Media screen, highlight System Restore and press [ENTER] to open the System Restore screen.

4. From the System Restore screen, highlight Restore System and press [ENTER]. The Select Removable Media screen appears.

5. Depending on what options are available on your system and what your needs are, select the drive that you want to use for this restore procedure by highlighting one of the three choices (floppy disk drive 0, floppy disk drive 1, or cartridge tape) and pressing [ENTER].

6. The Disk Restore form asks if existing files on disk should be overwritten with restored files.

   Answer YES or NO by pressing [CHOICES] and toggling between YES and NO. The default is NO.

   If you choose YES, all files on the floppy disk or tape are transferred to your file system, overwriting any files with the same name regardless of whether the file on the hard disk is newer than the one on the floppy disk or tape.

   If you choose NO, files on the hard disk that are newer (i.e., have been modified after the last backup) are not overwritten.

7. Press [SAVE].

   A restore confirmation message appears telling you to insert the floppy disk or tape containing files you want to restore.

8. Insert the floppy disk or tape containing the specified files and press [ENTER].

   Once the restore is in progress, the following instruction is displayed:

   ```
   Restore in progress. Do not remove the floppy/tape.
   ```

A-**58**

9. In addition, if the restore spans multiple floppy disks or tapes, you are notified when to remove the current floppy or tape and insert the next one in sequence. When the contents of floppy 1 have been restored, for example, the following instructions would appear:

```
You may remove floppy number 1.
To exit, please press 'q' followed by [ENTER].

To continue, insert floppy number 2
and strike the [ENTER]key.
```

If you type **q** to exit, the following message is displayed:

```
You have canceled the Restore from Removable Media.
```

10. Make sure you insert the floppy disks or tapes in numerical order. Continue inserting and removing the disks or tapes until a message appears indicating the restore is complete:

```
Restore is done. You may remove the floppy.
```

11. Remove the last floppy disk when the system informs you that it has completed the restore.

Selective System Restore

To restore only some of the system or user files from the system or incremental backup of floppy or tape, use the following procedure. You must have system administration privileges to use this function.

⟹ **NOTE:**
If the backup was performed using the **mkimage** command, you cannot use the AT&T FACE menu to restore the data. Instead, you have to perform the restore using the **cpio** command. Perform the following steps to selectively restore files/directory from the **mkimage** backup:

1. Insert the tape or floppy into the drive,

2. If restoring from tape, enter:

   cpio -icvdaml/dev/rmt/c0s0 -C 204800 *'<file_name>'*

   If restoring from floppy diskette, enter:

   cpio -icdvaml/dev/rdsk/fx *'<file_name>'*

   where *fx* is either f0 or f1 and *<file_name>* is contained in single quotes and specifies the full path name (for example, directory, use a "*" (asterisk) as the file name. For example, if file_name is **'/oracle/dbs/*',** then all files in the **/oracle/dbs** directory will be restored.

1. From the AT&T FACE screen, highlight System Administration and press [ENTER].

2. At the System Administration screen, highlight Restore from Removable Media and press [ENTER] to display the Restore from Removable Media screen.

3. At the Restore from Removable Media screen, highlight System Restore and press [ENTER].

4. At the System Restore screen, highlight Selective System Restore and press [ENTER].

5. Depending on what options are available on your system and what your needs are, select the drive that you want to use for this restore procedure by highlighting one of the three choices (floppy disk drive 0, floppy disk drive 1, or cartridge tape) and pressing [ENTER].

6. The Disk Restore form asks if existing files on disk should be overwritten with restored files.

   Answer YES or NO by pressing [CHOICES] and toggling between YES and NO. The default is NO.

   If you choose YES, all files on the floppy disk or tape are transferred to your file system, overwriting any files with the same name regardless of whether the file on the hard disk is newer than the one on the floppy disk or tape.

   If you choose NO, files on the hard disk that are newer (that is, have been modified after the last backup) are not overwritten.

7. Press [SAVE].

   ⟹ **NOTE:**
   This procedure reads the media set twice: once to read the list of files from which you choose and then again to execute the restoring of the files that you chose.

8. You are prompted to insert the floppy or tape. The Show contents screen then appears.

   ⟹ **NOTE:**
   If you do not wish to restore any files at this time, press [CANCEL].

9. Select the files you want to restore and press [MARK] until you have marked all the files you want to restore.

10. Press [ENTER] to restore the marked files.

   A restore confirmation message appears telling you to insert the floppy disk or tape containing files you want to restore.

11. Insert the floppy disk or tape containing the specified files and press
[<u>ENTER</u>].

Once the restore is in progress, the following instruction is displayed:

```
Restore in progress. Do not remove the floppy/tape.
```

12. In addition, if the restore spans multiple floppy disks or tapes, you are
notified when to remove the current floppy or tape and insert the next one
in sequence. When the contents of floppy 1 have been restored, for
example, the following instructions would appear:

```
You may remove floppy number 1.
To exit, please press 'q' followed by [ENTER].

To continue, insert floppy number 2
and strike the [ENTER]key.
```

If you type **q** to exit, the following message is displayed:

```
You have canceled the Restore from Removable Media.
```

13. Make sure you insert the floppy disks or tapes in numerical order.
Continue inserting and removing the disks or tapes until a message
appears indicating the restore is complete:

```
Restore is done. You may remove the floppy.
```

14. Remove the last floppy disk when the system informs you that it has
completed the restore.

Speech Restore

⇒ **NOTE:**
This restore procedure does not check to see if the talkfile number is already used by another application. This can cause speech on the disk to be overwritten. If you are backing up speech associated with a specific application, use the procedure given in Chapter 2, "Application Administration."

To restore speech files, use the following procedure.

1. At the System Administration screen, highlight Restore from Removable Media and press [ENTER] to display the Restore from Removable Media screen.

2. At the Restore from Removable Media screen, highlight Speech Restore and press [ENTER] to open the Speech Restore screen.

3. From the Speech Restore screen, highlight either Restore All Talkfiles/Phrases or Selective Restore of Talkfiles/Phrases and press [ENTER].

   If you choose to Restore specific files and phrases, a form appears. List the speech files and phrases you want to recover.

   When you have listed all the phrases, press [CANCEL]. The Select Removable Media screen appears.

   If you choose to Restore all speech, the Select Removable Media screen appears.

4. Depending on the options available on your system and your needs, select the appropriate media from which to restore your data by highlighting cartridge tape and pressing [ENTER].

5. Insert the floppy disk or tape containing the specified files and press [ENTER].

   If the restore spans multiple floppy disks or tapes, remove the floppy or tape when the files on it have been restored and insert the next one in sequence.

   To discontinue the restore procedure at any time, press [DELETE].

6. Make sure the floppy disks or tapes are in numerical order. Continue inserting and removing the disks or tapes until the restore is complete.

7. Remove the last floppy disk or tape when the restore is complete.

A-63

Schedule Automatic Task

The Schedule Automatic Task function allows you to set up a program to perform certain tasks at a specific time. For example, you may want to run backups at 3 a.m. every Monday.

⇒ **NOTE:**
    If you are not logged in as root or do not have root permissions, you will not be able to use the schedule automatic task function. To get root permissions, ask the system administrator to add your user login to the /usr/lib/cron/cron.allow file.

Add to Automatic Task Schedule

1. From the AT&T FACE screen, highlight System Administration and press [ENTER] to display the System Administration screen.

2. At the System Administration screen, highlight Schedule Automatic Task and press [ENTER] to open the Schedule Automatic Task screen.

3. At the Schedule Automatic Task screen, highlight Add and press [ENTER] to display the Add Automatic Task form.

4. With the cursor on the Month(s) of the Year field, press [CHOICES]. A screen showing the twelve months is displayed. One at a time, highlight the months in which you want the task executed and press [MARK]. When all the desired months are marked, press [ENTER].

    If you enter nothing in this field, the system sets the value to the default value of All.

5. Move the cursor to the Day(s) of the Month field and press [CHOICES]. A screen showing the numbers 1-31 is displayed. One at a time, highlight the days on which you want the task executed and press [MARK].

    When all the desired days are marked, press [ENTER]. If you enter nothing in this field, the system sets the value to the default value of All.

6. Move the cursor to the Day(s) of the Week field and press [CHOICES]. A screen showing the days of the week is displayed. One at a time, highlight the days on which you want the task executed and press [MARK]. When all the desired days are marked, press [ENTER].

    If you enter nothing in this field, the system sets the value to the default value of All.

7. Move the cursor to the Hour(s) of the Day field and press [CHOICES]. A screen showing the hours of the day is displayed. One at a time, highlight the hours for which you want the task executed and press When all the desired hours are marked, press [ENTER].

   If you enter nothing in this field, the system sets the value to the default value of All.

8. Move the cursor to the Minute(s) Past the Hour field and press [CHOICES]. A screen showing the minutes 00-59 is displayed. One at a time, highlight the minute mark at which you want the task executed and press [MARK]. When all the desired times are marked, press [ENTER].

   If you enter nothing in this field, the system sets the value to 00.

9. Move the cursor to the Task field and enter the task you want executed.

10. When the form is completed, press [SAVE]. A confirmation screen displays the information you listed on the form.

    Press [SAVE] to add this task to the Automatic Task Schedule or press [CANCEL] to discard the information and return to the System Administration screen.

Change Automatic Task Schedule

1. From the AT&T FACE screen, highlight System Administration and press [ENTER] to open the System Administration screen.

2. At the System Administration screen, highlight Schedule Automatic Task and press [ENTER] to open the Schedule Automatic Task screen.

3. At the Schedule Automatic Task screen, highlight Change and press [ENTER] to display the Change Automatic Task screen.

4. The Change Automatic Task screen lists the tasks already scheduled. Highlight the tasks that you want to change and press [ENTER]. The information about that task is displayed.

5. Move the cursor to the field you want to change and press [CHOICES] to see the valid choices for that field.

   Highlight each choice and press [MARK]. When all your choices are marked, press [ENTER].

   Continue changing information until you are satisfied with the new information in the form.

6. Press [SAVE]. A confirmation screen appears that displays the new information for the task.

   If you want to activate this information, press [CONT]. If you want to cancel the changes you made, press [CANCEL].

Delete an Automatic Scheduled Task

1. From the AT&T FACE screen, highlight System Administration and press [ENTER] to open the System Administration screen.

2. At the System Administration screen, highlight Schedule Automatic Task and press [ENTER] to open the Schedule Automatic Task screen.

3. At the Schedule Automatic Task screen, highlight Delete and press [ENTER] to open the Delete Automatic Task screen.

    The Delete Automatic Task screen lists the tasks already scheduled. [MARK] the tasks that you want to delete and press [ENTER].

4. A confirmation screen is displayed, asking if you want to delete all the tasks you marked. If you want to delete them, press [CONT]. If you want to save them, press [CANCEL].

Display an Automatic Scheduled Task

1. From the AT&T FACE screen, highlight System Administration and press [ENTER] to open the System Administration screen.

2. At the System Administration screen, highlight Schedule Automatic Task and press [ENTER] to display the Schedule Automatic Task screen.

3. At the Schedule Automatic Task screen, highlight Display and press [ENTER] to open the Display Automatic Task screen.

    The Display Automatic Task screen lists all the scheduled tasks. Use the arrow keys on the right side of the keyboard to scroll up and down through the listing.

4. Press [CANCEL] or [CONT] to return to the Schedule Automatic Task screen.

Shutdown

The shutdown function allows you to bring down the VIS and UNIX system software before turning off the power or rebooting the system.

You must have system administration privileges and be at the console to use shutdown.

⚠ **CAUTION:**
Always stop the VIS before you execute a shutdown. Shutting down the system without stopping the VIS may corrupt the software. Use the Stop Voice System option under System Control in the Configuration Management screen.

When you perform this function, the system asks you to specify how much time (in seconds) to wait for users to finish whatever they are doing (that is, the grace period).

All users are notified that a shutdown will start in however many seconds you specified to allow them to finish their work and log off. At the end of the grace period, users who are still logged on receive another message notifying them that the shutdown is starting. Next, all processes are stopped. You are notified when the shutdown is complete. You may then turn off the machine or press the RESET button to reboot the machine.

Refer to "Shutting Down the Operating System" in Chapter 4, "Common Maintenance Procedures," of *CONVERSANT Voice Information System Version 3.1 Maintenance, 585-350-705,* for the procedure to shut down your system.

Peripherals Setup

This section describes how to set up and administer the system peripherals, including printer, serial ports, and modem.

Printer Software Setup

To setup a printer, you must tell the system the type of printer (printer model) you are connecting.

➡ **NOTE:**
If you installed a AT&T 473 printer, the printer software is set up automatically because the 473 is the default setting, and you can skip this procedure.

➡ **NOTE:**
The UNIX and VIS application software must be installed before printer software can be set up.

1. At the UNIX prompt #, enter **face.** The system responds by displaying the AT&T FACE screen.

2. Highlight System Administration and press [ENTER]. The system responds by displaying the System Administration screen.

3. Highlight Peripherals Setup and press [ENTER]. The system responds by displaying Peripherals Setup screen.

4. Highlight Printer Setup and press [ENTER]. The system responds by displaying the Printer Setup screen.

5. Highlight the Parallel Printer Port Setup and press [ENTER]. The system responds by displaying the Parallel Printer Port Setup form.

    You can press [CHOICES], function key 2 for a list of choices for each field.

6. Use the arrow keys to move the cursor to the first field, Port Number.

A-**69**

7. Select a valid port number. If no add-on multiport card has been installed, port 01 is the only valid port number. If you have installed the multiport card, there are two additional valid port numbers.

    The default value for the Port Number: field is 01. If this value is appropriate, go to Step 8.

    If you want to configure a port other than port 01, press [CHOICES]. If a multiport card has been installed, the Parallel Port Number screen appears.

8. Select the appropriate port number and press [ENTER].

9. Use the arrow keys to move the cursor to the second field, Device Currently On Port. If a device has been configured for this port, the name of the device is displayed here. If no device has been configured for the port, "none" is displayed.

10. Use the arrow keys to move the cursor to the third field, Printer Type. If a printer is already set up for your parallel port, that name appears in this field. If you want to set up a different or new printer, press [CHOICES] for a list of printers that can be used with the system.

    Use the arrow keys to scroll through the list of printers.

11. Highlight the name of the printer model you are connecting and press [ENTER]. The system responds by displaying the name of the printer model you selected in the Printer Type: field.

12. Use the arrow keys to move the cursor to the fourth field, Printer Name. Enter the name you wish to use for the printer.

13. The next field prompts you to enter yes or no to the prompt: Should filter be used. Select either yes or no, depending on whether the printer output needs to be filtered for your printer type. You can also press [CHOICES] and toggle (yes or no) until your choice appears in the field and press [ENTER].

    ⟹ **NOTE:**
    In most cases, the answer to this prompt is yes. The only cases where you may need to answer no is where the application itself is doing its own printer filtering.

14. Press [SAVE], function key 3. The system responding by displaying a confirmation message to inform you the printer you selected is set up on the port you selected. Also, the printer is set up as your default printer destination.

15. Press [CANCEL], function key 6, 4 consecutive times to return to the AT&T FACE screen.

16. Highlight Exit and press [ENTER].

17. Press [CONT], function key 3, to exit.

A-70

Serial Ports Setup

To enable/disable a serial port (COM1 or COM2) following the steps below:

1. Enter **face.** The system displays the AT&T FACE screen.

2. Highlight System Administration and press [ENTER]. The system displays the System Administration screen.

3. Highlight Peripherals Setup and press [ENTER]. The system displays the Peripherals Setup screen.

4. Highlight Serial Ports Setup and press [ENTER]. The system displays the Serial Ports Setup form.

5. Press [CHOICES], function key 2 to see a list of choices for each field in the form.

6. Fill in the form and press [SAVE], function key 3.

7. Press [CANCEL], function key 6, 4 consecutive times to return to the AT&T FACE screen.

8. Highlight Exit and press [ENTER].

9. Press [CONT], function key 3, to exit.

A-**71**

Modem UUCP Link Setup

The following steps are required to set up a uucp link with the AT&T 2224CEO modem:

1. At the UNIX system prompt (#), enter **cd /usr/lib/uucp/Dialers.**

2. Enter **vi.**

3. Edit this file to change the entry for the ATT2224CEO modem as follows:

   ⟹ **NOTE:**
   This is a single-line command. Do *not* enter it on multiple lines.

   att2224CEO =+-, "" atzod,o12=y,o4=n,\\n3\\c1\\j0\\q3\\g0\r\c
   \006 atT\T\r\c Connected

4. Power cycle the 2224CEO modem by unplugging the transformer from the power outlet and then plugging it in again.

5. Place a call out of the 2224CEO modem to the remote machine.

   After following these steps, a uucp link to the VIS with a 2224CEO modem can be set up.

Software Setup

The Software Setup screen offers the following options:

- Display Installed Software

- Install UNIX System Application

- Program Administration

- Remove Installed Software

Highlight the action you want to perform, then press [ENTER]. The Display Installed Software action lists all software packages installed on the system.

For the remaining actions, follow the prompts displayed on the monitor.

A-72

System Information

The System Information text screen displays the following user information for the system:

- System name

- UNIX system version

- Hard disk space

- Floppy disk space

- Mounted file system space

- Device that is on serial ports (default is "Not setup via AT&T Administration")

- Device that is on parallel ports (default is "Not setup via AT&T Administration")

- Date of last backup (default is "No backup was ever performed via AT&T Administration")

- A listing of users currently logged in to the system (including login names, user's full names, and their device connection to the system)

To access the System Information form, use the following procedure.

1. From the AT&T FACE screen, highlight System Administration and press [ENTER].

2. At the System Administration screen, highlight System Information and press [ENTER] to display the System Information text screen.

   ⟹ **NOTE:**
   System Information only reports on ports that have been setup via "Peripheral Setup" and backups that have been done through FACE.

   If ports were not setup through FACE, the following message appears:

   ```
   Not setup via AT&T FACE.
   ```

   If a backup was never performed through FACE, the following message appears:

   ```
   No backup was performed via AT&T FACE.
   ```

   If you have mounted a floppy disk, the System Information frame reports space on the floppy.

3. Press [CONT] or [CANCEL] to close the System Information screen and return to the AT&T FACE screen.

A-73

Tape Operations

The Tape Operations function allows you to erase, retension, rewind, or reset the streaming tape. Highlight the action you want to perform, press [ENTER], then follow the prompts on the monitor. For each action, the prompts ask you to insert the tape, then press [CONT] to continue or [CANCEL] to stop. If you press [CONT], the system displays a message when the action is complete.

SCSI Cartridge Tape Compatibility

With the new SCSI cartridge tape drive, there are some compatibility issues of which you must be aware.

Read compatibility is transparent; the drive reads at the density with which the tape was written. To write to a tape that can be read on an older tape drive requires an appropriate device node. All of the device nodes supported for the SCSI cartridge tape drive are listed below:

/dev/rmt/c0t3d0s0	60 Mbyte format — rewind on close
/dev/rmt/c0t3d0s0n	60 Mbyte format — no rewind on close
/dev/rmt/c0t3d0s1	120 Mbyte format — rewind on close
/dev/rmt/c0t3d0s1n	120 Mbyte format — no rewind on close
/dev/rmt/c0t3d0s3	320/525 Mbyte format — rewind on close
/dev/rmt/c0t3d0s3n	320/525 Mbyte format — no rewind on close

For an example:

To write an archive readable by a 120 Mbyte or higher density tape drive, you need to enter:

find . -print I cpio -occvlmBO /dev/rmt/c0t3d0s1

The resulting tape is readable on any 120 Mbyte or higher density tape drive.

User Logins

The User Logins Administration function provides a method for:

- Adding user logins

- Changing user logins

- Deleting user logins

- Displaying user logins

You must have system administration privileges to add, change, or delete a user login. However, any user can display user login information.

A login identifies the user and helps prevent unauthorized people from using your system. But a login alone cannot prevent unauthorized access to your work. Assigning a password to your login helps guard against unauthorized use.

When a login name is no longer needed, it should be removed. Each login has a login directory, or home, assigned to it. This directory is named **/usr/login_name** where login_name is the name used when you originally added the login (assuming you used the default directory).

When you remove a login, you are asked if you want the files in the login directory removed. To save these files before you delete them, back them up with the Backup to Removable Media function explained earlier in this chapter.

VIS Security

Prior to working with the VIS, you and others who will be interfacing with the system must have VIS Security privileges. These security privileges allow the user to access the various VIS components.

The three security classes are: VIS Administration, Operations, and Applications. *VIS Administration* allows you to access and interface all VIS components (Configuration Management, Feature Packages, Reports, Script Builder Applications, Switch Interfaces, and System Monitor).

The *Operations* class allows you to access the following VIS components: Configuration Management, Reports, and System Monitor. This class does not allow you to access Switch Interfaces, Feature Packages, or Script Builder Applications.

The *Applications* class allows you to access and interface with the Application Administration component (including **DEFINE)** as well as Configuration Management, Reports Administration, Script Builder Applications, and System Monitor.

Creating VIS Logins

Once the VIS software is loaded, use the FACE feature, User Logins, to create a login for VIS administration. A VIS Security Class field appears in each of the form screens when adding, changing, or displaying user logins. This field is where you designate the desired VIS class.

When a new user is added to the VIS and given one of the three VIS classes, one of two screens appears. Depending on whether or not FACE is executed at the time of login, the user will either see the CONVERSANT VIS VERSION 3.1 screen or the Voice System Administration screen. The former is generated by the program **/vs/bin/cvis_mainscreen** and the later by the program **/vs/bin/cvis_screen.** These programs are called by the user's **.profile.** By default, the program displays the CONVERSANT VIS VERSION 3.1 screen.

When the VIS software package is removed from the VIS, the **/vs/bin/cvis_mainscreen** and **/vs/bin/cvis_screen** programs are removed from the user's **.profile.** The AT&T FACE screen returns to its previous appearance and functionality, before VIS software was added.

You must have system administration privileges to give users VIS Security privileges. These privileges are assigned when users are added to the system. Remember, the **root** login always has system administration and VIS privileges. However, the CONVERSANT VIS VERSION 3.1 and Voice System Administration screens do not automatically appear when logged in as root. To access these screens, enter **/vs/bin/cvis_mainscreen** or **/vs/bin/cvis_screen** from the UNIX system prompt.

Add User Logins

You must have system administration privileges to add a new user login name to your computer. These privileges are assigned when users are added to the system. Use lowercase letters and numbers when assigning logins.

When adding a new user login, the User Logins screen automatically does the following:

- Creates a home directory **(/usr/login_name)**

- Chooses the next available uid (user identification number) greater than 100

- Assigns the default gid (group identification number)

- Creates a default **.profile** file

⟹ **NOTE:**
Only user logins that are created with the Administration utility can be administered through the interface.

To add a login, use the following procedure.

1. From the AT&T FACE screen, highlight System Administration and press [ENTER].

2. At the System Administration screen, highlight User Logins and press [ENTER] to displayer the User Logins screeen. The User Logins screen offers the following choices:

    - Add

    - Change

    - Delete

    - Display

    The Add User Logins is a special administrative function that requires the user invoking it to have special system administration privileges.

    A validation check against the login you are currently using determines if you have system administration privileges. If you do not have system administration privileges, you receive a warning message.

3. Highlight Add from the User Logins screen and press [ENTER]. The Login Name and Full Name form appears.

4. With the cursor resting on the "Login Name" field, type the new login name to be added (up to eight characters in lowercase letters) and press [ENTER].

If you press [SAVE] without giving a login name, the following error message is displayed:

```
You must provide a login name to add a user.
```

The login name you type must be different from all other login names on the system. You can check the other login names using the Display selection of the User Logins function. If you try to add a login name that already exists, the following message appears on the message line:

```
That login name already exists on your system.
Type another login name.
```

Login names should only be lowercase letters and they cannot contain spaces or a colon (:). If you include one of these characters, the following message appears on the message line:

```
Only numbers and lower case letters are permitted
in a login name.
```

5. With the cursor resting on the "Full Name" field, type the user's full name.

⟹ **NOTE:**
    You must provide a full name to add a user. You cannot use a colon (:) in the user's full name.

6. With the cursor resting on the Login ID Number field, type the user's login ID number. FACE gives a default number.

7. A default home directory is generated when the user login name is given. You can change the home directory by positioning the cursor on the HOME Directory field and typing a new directory name. Do not enter a colon (:) in the HOME directory field.

If you specify a home directory that already exists, you receive the following message:

```
<directory name> already exists.
Type another HOME directory.
```

8. With the cursor resting on the System Administration Privileges field, press [CHOICES]. Toggle the system administration privileges to Yes or No as appropriate. The system administration privileges field always defaults to "No."

9. With the cursor resting on the VIS Security Class field, type the desired VIS class or press [CHOICES] to make a selection from a screen. Valid choices are Administration, Operations, Applications, and None. Select Administration to access and interface with all VIS components (Configuration Management, Feature Packages, Reports, Script Builder Applications, Switch Interfaces, and System Monitor). Select Operations to access Configuration Management, Reports, and System Monitor. Select Applications to access and interface with Application Administration, Configuration Management, Reports Administration, Script Builder Applications, and System Monitor. Select None to access none of the VIS components.

The default value for the VIS Security Class field is "Administration."

10. Press [SAVE] when you complete the form.

11. The user login information entered is displayed as follows. Make sure the information is correct before proceeding.

```
Login Name:  jas
Full Name:  Jane A. Smith
Login ID Number:  101
HOME Directory:  /usr/jas
System Administration Privilege:  No
VIS Security Class:  VIS Administration
```

12. Press [CONT] if the information is correct. If the information is not correct, press [CANCEL].

13. After you press [CONT], you are prompted for a password.

Respond to the prompts to assign a password for the new user login name. When you have assigned a password, press [ENTER].

14. After you provide a password, the confirmation screen is displayed. Press [CONT].

A-**79**

Change User Logins

To change user login information, use the following procedure.

⟹ **NOTE:**
You must have system administration privileges to change a user login.

1. From the AT&T FACE screen, highlight System Administration and press [ENTER].

2. From the System Administration screen, highlight User Logins and press [ENTER].

3. Highlight Change from the User Logins screen and press [ENTER] to display the Change User Login form.

4. If you do not wish to change the login name, go to Step 6.

   To select a login to be changed, move the cursor to the "Login Name" field, press [CHOICES] and select the desired login from the screen of user logins. Press [ENTER]. The login to be changed is now entered in the login name field.

   ⟹ **NOTE:**
   If there are fewer than four logins on the computer, the form automatically cycles through the existing logins when you press [CHOICES].

   You could type the login name, rather than select it from the [CHOICES] menu. If you type the login name incorrectly, the following message appears:

   ```
   This is not a valid login name.
   Strike CHOICES for valid choices.
   ```

   When you provide a login name, the interface fills in the remaining values on the form except for New Login name.

   You can give new values for the Full Name and System Administration Privileges, but you cannot use the Login Name field to change the Login name. You must use the New Login Name field.

5. With the cursor resting on the New Login Name field, type the new login name. If the new login name is not unique, the following message appears on the message line:

```
That login name already exists on your system. Type
another login name.
```

➡ **NOTE:**
   The contents of the old home directory are retained. The new login name is assigned automatically as the owner of all the former login name's files. If you wish to change the name of the home directory to coincide with the new login name, you must create a new directory and move the files from the old to the new directory **(mvdir old-dir new-dir)** without the help of the interface. You must also change the user's entry in **/etc/passwd** to reflect the change.

6. If you do not wish to change the user's Full Name, move the cursor to the System Administration Privileges and go to Step 8.

   With the cursor resting on the Full Name field, type the user's new full name, if any (a full name must be entered). If the user's full name is deleted, the old full name is used.

7. With the cursor resting on the System Administration Privileges field, press [CHOICES] and toggle between "Yes" and "No" until the appropriate choice is made.

8. With the cursor resting on the VIS Security Class field, type the desired VIS class or press [CHOICES] to make a selection from a screen. Valid choices are VIS Administration, Operations, Applications, and None. Select VIS Administration to access and interface with all VIS components (Configuration Management, Feature Packages, Reports, Script Builder Applications, Switch Interfaces, and System Monitor). Select Operations to access Configuration Management, Reports, and System Monitor. Select Applications to access and interface with Application Administration, Configuration Management, Reports Administration, Script Builder Applications, and System Monitor. Select None to access none of the VIS components.

9. Press [SAVE] when you complete the form.

10. Check the confirmation form that appears to make sure the information is correct.

11. If the information is correct, press [CONT] to close the Confirm Login form and make the User Logins screen active. If the information is not correct, press [CANCEL].

A-81

Delete User Logins

When you no longer need a login, it should be removed using the following
procedure.

1. From the AT&T FACE screen, highlight System Administration and press
   [ENTER].

2. At the System Administration screen, highlight User Logins and press
   [ENTER].

3. From the User Logins screen, highlight Delete and press [ENTER].

   ⟹ **NOTE:**
   A validation check determines if you have special system
   administration privileges. If you do not, you receive a warning
   message. You must have special system administration privileges
   to delete a login, even if it is your own.

4. While the cursor is resting on the Login Name field, press [CHOICES] and
   select the desired login from the screen displaying user logins. Move to
   an item with the arrow key and press [ENTER] to select it. The login to be
   deleted is now entered into the Login Name field.

   You can also type in the login name that you want to delete. If you type
   the login name incorrectly, the following message appears on the
   message line:

   ```
   That is not a valid login name.
   Strike CHOICES for valid choices.
   ```

   If the user you select is currently logged on, you receive a warning
   message. The user is able to continue working if you delete the login, but
   cannot login again.

5. Press [SAVE].

6. When you delete a user login name, you must decide if you want to remove all the files from the user's home directory. The Remove Files of <user login> form appears.

7. The default option is Yes. Toggle with [CHOICES] between Yes and No until the appropriate choice is displayed.

   Press [SAVE].

   If you respond Yes to delete the files, the following confirmation message appears:

   ```
   User <user_login> will be deleted and <user_login>
   files will be moved to /lost+found.
   ```

   The files are stored temporarily in */lost+found.* Then they are deleted.

   If you respond No to delete the files, the following confirmation message appears:

   ```
   User <user_login> will be deleted but <user_login>
   files will not be deleted.
   ```

8. Press [CONT] if you are sure you want to delete the login. If you do not want to delete the login, press [CANCEL].

   When you press [CONT], the confirmation message closes and the User Logins screen becomes active. You can remove another login, if desired, or go to another screen.

A-83

Display User Logins

Any user can display login information for other user's logins. To display user login information, use this procedure.

1. From the AT&T FACE screen, highlight System Administration and press [ENTER].

2. At the System Administration screen, highlight User Logins and press [ENTER] to display the User Logins screen.

3. At the User Logins screen, highlight Display and press [ENTER] to open the Display User Information form.

4. While the cursor is resting on the Login Name field, press [CHOICES] and select the desired login from the screen of user logins. Press [ENTER]. The Display User Information form displays the information for the login name selected.

   ⟹ **NOTE:**
   If there are fewer than four logins on the computer, the form automatically cycles through the existing logins when you press [CHOICES].

   You can type the login name, but if you type it incorrectly, the following message appears:

   ```
   This is not a valid login name.
   Strike CHOICES for valid choices.
   ```

   After you select the login name, the other fields of the form display the information for that login.

5. Press [CONT] to make the User Logins screen active, [CANCEL] to return to the System Administration screen, or repeat selection of Login Names to display other logins.

UNIX System Basics

B

UNIX System Basics Overview

This chapter describes UNIX system computer hardware and software basics. Specifically, the use of the UNIX system commands and the vi editor are covered.

The purpose of this appendix is to:

- Define the functions of a computer

- Describe the purpose and functions of the UNIX operating system

- Describe how to use selected UNIX system commands

- Describe how to use the vi editor

- Describe the UNIX system shell

- Describe commands relating to the Voice System

UNIX System Basics

Computer Overview

Computers are made up of two major components: hardware and software.

Hardware consists of the physical devices, cabinets, and electrical parts of the computer.

Software is a collection of instructions, called programs, used to make the hardware perform the required functions.

In general the computer has four basic functions:

1. Input
2. Store
3. Process
4. Output

A computer must be given information, called data, and a set of instructions to follow, called a program, in order to accomplish the assigned task. This data is input from a keyboard or read in from an auxiliary storage device such as a disk.

Once the computer receives the data input, it stores the data in main memory along with the program instructions. The computer processes the instructions from the program, and along with the data, produces an output. The output is sent to an output device such as a terminal, a printer, or an auxiliary storage device like a disk.

Software consists of programs that allow the user to have two-way communication with the computer through the input and output devices.

There are four general types of software for most systems.

1. System programs necessary to run the hardware and interpret the decisions which must be made.
2. Library programs needed for system usage.
3. Prepackaged programs written by system programmers for specialized tasks.
4. User-developed programs written by individual users of the system for specific tasks.

UNIX Operating System

The UNIX operating system is a software package developed to control and coordinate the operation performed by a computer. It is a multi-user, multi-tasked operating system with a structured file system layout for easy file access. The UNIX system was designed as an interface between the user and the computer, making it easy for the user to interact with the system.

UNIX Operating System File Structure

The UNIX system file is a collection of data written to an auxiliary storage device, such as a disk. Each file has two distinct components. One component is the name which identifies the file for the user. The other is the contents of the file.

A file name can have up to 14 characters, but should not contain any special characters or have the same name as any system command. The file name can have no embedded spaces between characters.

The UNIX system file has three types of files, each differing in content, format, and usage.

Three file types are:

■ Directory files are the building blocks of the UNIX system file structure. They contain the reference to related files.

■ Ordinary files are executable or informational files. Executable files are the commands that a computer interprets and executes.

■ Special files are those files which identify the system hardware devices and the device driver programs.

File System Structure

The UNIX operating system file structure is a hierarchical, tree-like structure of directories that contain the names of files.

The UNIX system **root** directory is the source of all other directories, and is symbolically defined with a slash (/). Directories may contain other directories called sub-directories.

A specific file can be reached by using a *fully qualified path name.* A path name is a sequence of file names, separated by slashes (/), that describe the route or path that the system must follow to locate a specific file within the file system.

A fully qualified path name begins with the **root** slash (/).

Do not confuse the delimiters between file name with the slash for the root directory name.

B-3

UNIX System Commands

A command is a line of text that identifies a particular function you want the system to perform.

The following is an example of a UNIX system command line:

$ command [-or+ options] [arguments] [ENTER]

Each command line contains four elements. The command, the options, the arguments, and the terminator. The command is entered after the UNIX system prompt, ($). Press [ENTER] to execute the command. The options enhance or modify the command. Each option must be preceded by a plus (+) or minus (-) sign followed immediately by the option name. Multiple options can be entered on the command line. The arguments may specify the file name upon which the command operates. Each element must be separated by a space.

The following are commonly used UNIX system commands:

■ The **cd** command changes working directory.

The purpose of the cd command is to change from the current working directory to another working directory. An example of the cd command line is:

cd paul

The command is entered after the UNIX system prompt and is terminated by a carriage return.

cd is the command and **paul** is the directory name as the argument. There is no option field for the cd command.

■ The **ls** command lists the contents of directories.

The purpose of the ls command is to list the directories and/or files in the tree. An example of the ls command line is:

ls

The command is entered after the UNIX system prompt and is terminated by a carriage return.

If the command line is:

ls/students

The command is ls and /students is the directory name where the list of the tree would start. There are many options for the ls command. The -x which gives a multi-column output is most commonly used.

■ The **pwd** command prints the working directory to the screen.

The purpose of the pwd command is to display the current working directory. An example of the pwd command line is:

pwd

The command is entered after the UNIX system prompt and is terminated by a carriage return.

There are no arguments or options for the pwd command.

■ The **mkdir** command creates a new directory.

The purpose of the mkdir command is to create a new directory in which to add files. An example of the mkdir command line is:

mkdir temp

The command is entered after the UNIX system prompt and is terminated by pressing [ENTER].

mkdir is the command and **temp** is the new directory name to be created as the argument. There are no options for the mkdir command.

A new directory named **temp** is created as a branch from the tree sprouting from the / directory.

■ The **cat** command catalogs or obtains the contents of a file.

The purpose of the cat command is to obtain a display of the text contained in the named file. An example of the cat command line is:

cat /brian/projects/sched

The command is entered after the UNIX system prompt and is terminated by pressing [ENTER].

cat is the command and **/brian/projects/sched** is the selected path file name as the argument. There are two arguments for the cat command, but neither are necessary for normal usage.

If the file you cat is over one page in length, the screen scrolls the text off the screen and displays only the last page of text.

B-5

■ The **pg** command prints contents of a file one page at a time.

The purpose of the pg command is to display the text contained in the named file (the same as the cat command) one page at a time. To display the next page, press the space bar. An example of the pg command line is:

pg /andi/reports

The command is entered after the UNIX system prompt and is terminated by pressing [ENTER].

pg is the command and **/andi/reports** is the selected path file name as the argument. There are no options for the pg command.

■ The **cp** command copies the contents of a file.

The purpose of the cp command is to copy the contents of the file in argument 1 to the file named in argument 2. An example of the cp command line is:

cp /paul/sched /andi/temp

The command is entered after the UNIX system prompt and is terminated by pressing [ENTER].

The first argument is the source file from which you are copying. The second argument is the destination file to which your copy is moved. There are no options for the cp command.

When the **cp** command is executed, you have two files with the same text under two distinct named files.

■ The **rm** command removes a file from the system.

The purpose of the rm command is to remove the contents of the file named in the argument. An example of the rm command line is:

rm /paul/students/stu2

The command is entered after the UNIX system prompt and is terminated by pressing [ENTER].

Note that **rm** is the command and **/paul/students/stu2** is the file named as the argument. There are three options available for usage with the **rm** command. Only the -*i* option is of value to you. The -*i* option returns a question mark (?) when the **rm** command is executed. The question mark will give you the choice to respond with *y* if you DO want to remove the file, or *n* if you DO NOT want to remove the named file.

■ The **passwd** command changes the current password.

The purpose of the passwd command is to change your current system access password. An example of the passwd command line is:

> **passwd**

The command is entered after the UNIX system prompt and is terminated by pressing [ENTER]. There are no options for the passwd command.

When the **passwd** command is executed, you are prompted to enter your OLD password. Next, you are prompted to enter your NEW password TWICE. You now have a new password for entering the system.

■ The **grep** command searches for a pattern match.

The purpose of the grep command is to search for the string named in the argument and match that string in the filename. When a match occurs, the line of text in which the string appears is printed on your screen. An example of the grep command line is:

> **grep day sched**

The command is entered after the UNIX system prompt and is terminated by pressing [ENTER].

Note **grep** is the command, with *day* as the argument and *sched* as the filename.

When the **grep** command is executed the screen displays the line of text that contained the string *day* if a match of *day* occurred in the filename *sched.*

■ The **pipeline** command connects output of one program to input of another.

The purpose of the I (pipeline) command is to take the output from one program and use it as the input to another program. An example of the command line is:

> **ls I sort**

The command is entered after the UNIX system prompt and is terminated by pressing [ENTER].

In the example, the **ls** command output is used by the I (pipeline) command as the input to the *sort* command.

The results displayed are a listing of the current directory files in alphabetical order.

B-7

■ The **vi** command invokes the UNIX system visual editor.

The purpose of the vi command is to invoke the UNIX system visual editor program. An example of the vi command line is:

vi newfile

The command is entered after the UNIX system prompt and is terminated by a carriage return.

Note **vi** is the command and *newfile* is the file to be edited. There are many options available for the **vi** command. The following chapter deals with vi editor.

UNIX System vi Editor

The vi editor is used to add, modify, or delete text that is required during the usage of the Script Builder.

The *VI User's Handbook* is used for reference throughout this appendix.

Invoking the vi Editor

Refer to the *VI User's Handbook* for details about the purpose and usage of the editor commands to invoke **vi.**

The command **vi** *filename,* allows you to open a new file or edit an existing file. This is the most common means of accessing a file for modification by the vi editor.

Exiting from the vi Editor

Refer to the *VI User's Handbook* for details about the purpose and usage of the editor commands to exit *vi.*

The *wq* and *ZZ* commands are used to write and exit the *vi* editor.

File Manipulation

Refer to the *VI User's Handbook* for details about the purpose and usage of the editor commands for manipulating text.

The file manipulation commands are the *w, w filename,* and the *w! filename* commands used for writing to the current file and the *r* command for reading text from other files.

Text Scrolling

Refer to the *VI User's Handbook* for details about the purpose and usage of the editor commands for scrolling through text.

The control key, along with the use of other selected keys, allows you to scroll the text on your screen. Those commands are [CTRL][d] (scroll down), [CTRL][u] (scroll up), [CTRL][f] (page forward), [CTRL][b] (page backward), and [CTRL][l] (refresh screen).

Cursor Movement

Refer to the *VI User's Handbook* page 17 for details about the purpose and usage of the editor commands for cursor movement.

Cursor movement up, down, right, or left can be controlled by special characters or with the arrow keys. Moving the cursor over words requires the *w* command for moving forward one word, and *b* for moving the cursor back one word.

Searching for Text

Refer to the *VI User's Handbook* page 21 for details about the purpose and usage of the editor commands for text searching.

You can search for text by either using the character within a word or by using a word or phrase itself. Enter a slash (/) followed by the characters you wish to search for. The string search command may be repeated by using the *n* command.

Adding Text

Refer to the *VI User's Handbook* page 25 for details about the purpose and usage of the editor commands for adding text to a file.

There are three methods for adding text to new or existing files. You can append text with the **a** commands, insert text with the **i** commands, or open a new line of text with the **o** commands.

Deleting or Changing Text

Refer to the *VI User's Handbook* for details about the purpose and usage of the editor commands for deleting or changing text.

The **x, dw,** and **dd** commands are used to delete text while the **cw** and **C** commands are used to change existing text.

Undoing Changes

Refer to the *VI User's Handbook* for details about the purpose and usage of the editor commands for undoing the last change that was made to the text.

The **u** command allows you to undo the last command that you executed.

UNIX System Shell

Shell Command Usage

The UNIX system shell is more than just the UNIX system command interpreter. The Shell provides the user with a very powerful programming tool.

The Shell provides your terminal with the "$" prompt and awaits your keyboard input. When you have completed your input by typing a carriage return, the Shell will classify that input as a command line. Each item in the command line will be evaluated and the proper action will be taken.

Shell Program Examples

Greeting Shell Program

The following is an example of a Shell program that will evaluate the date and then display the greeting "Good Morning", "Good Afternoon", or "Good Evening" based on the hour of the day.

Greeting Shell Program Example

```
hour='date I cut -c12-13'
if [ $hour -ge 0 -a $hour -lt 12 ]
then
echo "Good Morning"
elif [ $hour -ge 12 -a $hour -lt 18 ]
then
echo "Good Afternoon."
else
echo "Good Evening."
fi
```

B-11

Shell Program Examples (cont.)

Phone Number Lookup

The following is an example of a Shell program which will examine a file and extract a specified name, if available, and display a message with the results.

Lookup Name in Phone List Example

```
if [ $# -ne 1 ]
then
echo "Usage: lookup name"
else
cd
output=`grep "$1" phon_lst`
if [ -z "$output" ]
then
echo "Couldn't find $1 in phone list."
else
echo "$output"
fi
fi
```

Table B-1 describes the usage of the UNIX commands as they relate to similar MS-DOS* commands.

Table B-1. Conversion Between UNIX and MS-DOS Commands

Description	UNIX	DOS
Examine text	cat	type
Long directory	ls -la	dir
Page directory	ls -la I pg	dir /p
Short directory	ls -x	dir /w
Copy file	cp	copy
Remove file	rm	del or erase
Change File Name	mv	ren
Show File type	file	—
Make directory	mkdir	md or mkdir
Remove directory	rmdir	rmdir or rd
Return to home directory	cd	cd \
Current location	pwd	cd
Regular slash example	cd/usr/go	cd\usr\go
Dash example	ls -la	dir /p
Paging	cat tmp I pg	type tmp I more

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* Registered trademark of the Microsoft Corporation.

Bibliography

The following manuals may be of assistance for individuals who would like additional information regarding the topics covered in this appendix.

UNIX and C Reference Material

The following manuals may be ordered from:

AT&T Customer Information Center
Customer Service representative
P.O. Box 19901
Indianapolis, IN 46219
1-800-432-6600

UNIX System V Release 3.2
User's Reference manual
Order Code 307-232 and 305-649 (update)

UNIX System V Release 3.2
Programmer's Reference Manual and update
Order Code 307-226 and 305-663 (update)

UNIX System V Release 3.2
User Guide and update
Order Code 307-231 and 305-660 (update)

The following books may be purchased at local bookstores.

UNIX Programming Environment
Kernighan and Pike
Prentice-Hall ISBN 0-13-937681-X

Exploring the UNIX System
Kochan and Woods
Hayden Books ISBN 0-8104-6268-0

Programming in C
Kochan
Hayden Books ISBN 0-8104-6261-3

C Programming Language
Kernighan and Richie
Prentice-Hall ISBN 0-13-110163-3

The Vi User's Handbook
Bolsky
Prentice-Hall ISBN 0-13-941733-8

Database Environment

C

Database Environment Overview

Call data information is stored and organized in the ORACLE relational database management system (ORACLE RDBMS). The DBMS offers a high degree of flexibility in retrieving information which is contained in several data tables. With the DBMS, you can generate your own custom tailored call data reports.

Information is organized in a series of tables, containing rows of data. Each table serves as the "framework" to house the rows of information. A row is the actual data record.

This chapter describes how to determine database space requirements. In addition, this chapter reviews SQL*PLUS software program, a tool used to access the ORACLE RDBMS.

For information on how to install the ORACLE software package, refer to Chapter 3, "Installing the Base System Software," of *CONVERSANT Voice Information System Version 3.1 Software Installation and Upgrade, 585-350-104.*

Tables Associated with Call Handling Reports

During the installation of the base ORACLE software package, the following tables are created to record detail call handling data:

- CCA — Call classification analysis data (contains one record for each attempted transfer or outdial)

- CCASUM — Summary data for the CCA table (contains one record per hour, phone number, and result code)

- CDH — Call detail handling data (contains one record per call)

- CDHSUM — Summary data for the CDH table (contains one record per hour and script)

- EVENTS — Event data defined in all applications (contains one record per event)

- EVSUM — Summary data for the EVENTS table (contains one record per hour and event number)

- TRASUM — Overall traffic summary data (contains one record per hour and channel)

Following is field (column) information for each of these tables. Note that the data type of each field is the ORACLE data type, not the data type used in Script Builder.

The VIS provides four different reports using the data accumulated in these tables. Refer to Chapter 4, "Reports Administration," for additional information on the reports available from the System Reports screen.

If you are interested in generating your own customized report or would like to query these system tables directly, refer to the *SQL*Plus User's Guide and Reference* manual. Note that all these tables are created and owned by the sqlplus user **sti/sti.**

If you would like to verify the definition of a table (for example, the CCA table):

1. Enter:

   sqlplus sti/sti

   to start the sqlplus session.

2. Enter:

   describe CCA

   System response:

   The current definition of the CCA table will be displayed similar to the following:

   ```
   Name                 Null?   Type
   -------------------  ------  -----
   START_TIME                   DATE
   PHONE_NUM                    CHAR(16)
   RESULT_CODE                  CHAR(1)
   ```

3. Enter:

   quit

   to exit sqlplus.

CCA Table

The CCA table contains the following rows of data:

- START_TIME is a date field that specifies the starting time of each attempted transfer or outdialed call.

- PHONE_NUM is a character field that specifies the phone number of an attempted transfer or outdialed call. This field can be up to 16 characters in length.

- RESULT_CODE is a character field that indicates the disposition of the call. This field can be 1 character in length.

CCASUM Table

The CCASUM table contains the following rows of data:

- PHONE_NUM is a character field that specifies the phone number of an attempted transfer or outdialed call. This field can be up to 16 characters in length.

- START_TIME is a date field that specifies the starting time of the call summary period.

- END_TIME is a date field that specifies the ending time of the call summary period.

- SUM_TOT is a numeric field that indicates the number of calls transferred or outdialed in this period with this disposition and associated phone number.

- RESULT_CODE is a character field that indicates the disposition of the call. This field can be 1 character in length.

Note that records are generated on per hour, per telephone number and per result_code basis.

C-4

CDH Table

The CDH table contains the following rows of data:

- ID is a numeric field that specifies a unique identification number that joins one CDH.ID to multiple EVENTS.ID.

- CHANNEL is a numeric field that specifies a channel number on which the script was running. This field can be up to 3 numbers in length.

- SCRIPT is a character field that indicates the script name. This field can be up to 16 characters in length.

- START_TIME is a date field that specifies the starting time of each call.

- END_TIME is a date field that specifies the ending time of each call.

CDHSUM Table

The CDHSUM table contains the following rows of data:

- ID is a numeric field that specifies a unique identification number joins CDHSUM.ID to EVSUM.ID. Note that this field is not related to the ID field in CDH table but that it is related to the ID field in the EVSUM table.

- SCRIPT is a character field that specifies the script name. This field can be up to 16 characters in length.

- START_TIME is a date field that specifies the start of the hour (for example 10:00:00).

- END_TIME is a date field that indicates the end of this hour.

- DURATION is a numeric field that specifies the sum of script run times during this hour in seconds.

- CALL_TOT is a numeric field that indicates the total number of calls during a one-hour period for this script.

⟹ **NOTE:**
Records are generated on per hour and per script basis.

EVENTS Table

The EVENTS table contains the following rows of data:

- ID is a numeric field that specifies a non-unique identification number. Note that each call will result in a certain number of events records being created, depending on the number of events defined. All events records associated with this call will have the same ID number as the ID field of the corresponding CDH record.

- EVENT_NUMBER is a numeric field that is an internal mapping number of each of the defined events. Their values can be found in the **<appl.>D=** file in the **/att/trans/sb/ <appl>** directory.

- EVENT_CNT is a numeric field that contains the field value if the event type is a number in Script Builder.

- EVENT_TM is a date field that contains the field value if the event type is the time or date format in Script Builder.

- EVENT_STR is a field that contains the field value if the event type is the character string in Script Builder. The value stored in, count, time, or string will be the value of the Script Builder event variable when the script terminates.

EVSUM Table

The EVSUM table contains the following rows of data:

- ID is a numeric field that specifies a unique identification number. Note that the values in this field are not related to the ID values in the EVENTS table but are related to the ID values in table CDHSUM.

- EVENT_NUMBER is a numeric field that specifies the internal mapping between the event and an internal number.

- SUM_TOT is a numeric field that indicates the total number of occurrences for this event. Note that for the number type of event, the value in this field is the sum of the values of this event field of all the calls. For example, if an event NUM_TRANS is defined to keep track of the number of transactions for each call. Each call may result in a different value of NUM_TRANS. This SUM_TOT field will then contain the sum of NUM_TRANS for all calls during this period of time. On the other hand, if the event type is not number, each call will result into the SUM_TOT incrementing by one, that is, count.

⇒ **NOTE:**
Records are generated on per hour and per event_number basis.

TRASUM Table

The TRASUM table contains the following rows of data:

- START_TIME is a date field that specifies the start of hour (for example 10:00:00).

- END_TIME is a date field that specifies the end of hour (for example 10:59:59).

- CHANNEL is a numeric field that indicates the channel number. This field can be up to 3 numbers in length.

- CALL_TOT is a numeric field that specifies the total number of calls.

- DUR_TOT is a numeric field that specifies the total duration in seconds.

⇒ **NOTE:**
Records are generated on per hour and per channel basis. No calls during this hour on this channel result in no record.

Database Space Requirements

The amount of space needed for the database should be decided at the initial software load because the size of the database can affect the disk partition sizes (the database is stored in *root* partition). The formulas that will be discussed in this chapter help to determine the sizing requirement.

⇒ **NOTE:**
Once the disk partitions are specified, they can be changed only by reloading the software.

A substantial amount of "growth factor" space must also be allocated for expansion purposes (approximately 30%). The following information describes how to determine the database space sizing requirements.

Database Sizing

The following database sizing formulas are only estimates and are not meant to be exact calculations of the database space allocations on the disk. Furthermore, the following formulas are intended to represent the maximum values that may be attained in sizing the database. Consequently, the database space calculations derived from these formulas is not necessary in every case. You may adjust your calculations to fit your own database sizing needs.

Local Database Sizing

Database space is allocated in 512 byte blocks. The database requires approximately 2500 blocks of overhead space.

Each table requires approximately 5 blocks of initial overhead space for the table definition and the list of data extents. A 512 byte block requires an average of 22 bytes of overhead. Each row requires an average of 5 bytes of overhead. Every column (field) present in a row requires 1 byte of overhead. Columns that contain no data (NULL column) still requires this 1 byte of overhead.

Use the following formula to calculate the number of bytes required for a row in a table:

5+ (# of columns × 1) + (the sum of average column sizes)

This formula provides an estimate of the number of bytes required for a row in a table. Multiply this by the number of estimated rows to obtain the space requirement for a table:

$((A \times W)/(512-22)) + 5$ = size of the table in 512 byte blocks

where:
  A = number of rows
  W = number of bytes in a row

This formula calculates the size of a sequential database table. A sequential database table (the default used by Script Builder) means records are retrieved by searching the table, starting at the first record and continuing down the table until a match is found. An indexed table requires 33% more storage than a sequential table. If you index a table, then you should multiply the previous formula by 1.3.

Example of Calculating Local Database Table Size

An application uses two Local Database Tables. The first table has the following makeup.

⇒ **NOTE:**
Characters (characters) are bytes in the descriptions below:

Table #1 has the following fields:

> Name(24 characters)
> SSN(9 characters)
> DOBirth(Date field, 10 characters)
> Sex(1 character)

Table #2 has the following fields:

> Policy(10 characters)
> Description(30 characters)

Assuming there are 5000 records (or rows) in Table #1, and 500 in Table #2, the calculations would be:

Table #1

$((A \times W)/(512 - 22)) + 5$ = size of table in 512 byte blocks

where:
$$A = \text{number of rows} = 5000$$
$$W = \text{number of bytes in a row} = 24 + 9 + 10 + 1 = 44$$

$((5000 \times 44)/(490)) + 5 = 454$ blocks

Factor in indexing,

$$454 \times 1.3 = 590 \text{ blocks required for Table \#1}$$

Table #2

$((A \times W)/(512 - 22)) + 5$ = size of table in 512 byte blocks

where:
$$A = \text{number of rows} = 500$$
$$W = \text{number of bytes in a row} = 10 + 30 = 40$$

$((500 \times 40)/(490)) + 5 = 46$ blocks

Total Local Database space = Table #1 + Table #2 = 590 + 46 = 636 blocks

VIS Database Sizing

There are 7 tables used by all applications loaded on your system. The tables store information about each call. The data stored in these tables are used to generate the reports on the system. With the exception of the tables EVENTS and EVSUM, only the number of days of storage (X) and the expected daily call volume for all applications (Y) are needed. Use the formulas provided in Figure C-1 to determine the amount of space (512 byte blocks) required by each of the seven call data tables. Note that for the formulas shown in Figure C-1, W = 5 + (number of columns $\times$ 1) + (sum of average column sizes); X = 1 + number of days of data to keep as specified in /vs/bin/util/croncdh (default is 7); Y = calls per day; and Z = number of call data events in all scripts used on the system.

$$CDH = \left(\left(\frac{X \times Y \times 51}{512\text{-}22} \right) +5 \right) 1.3$$

$$CDHSUM = \left(\left(\frac{24 \times Y \times 55}{512\text{-}22} \right) +5 \right) 1.3$$

$$EVENTS = \left(\left(\frac{W \times X \times Y \times Z}{512\text{-}22} \right) +5 \right) 1.3$$

$$EVSUM = \left(\left(\frac{24 \times X \times Z \times 19}{512\text{-}22} \right) +5 \right) 1.3$$

$$CCA = \left(\left(\frac{X \times Y \times 34}{512\text{-}22} \right) +5 \right) 1.3$$

$$CCASUM = \left(\left(\frac{24 \times 365 \times 47}{512\text{-}22} \right) +5 \right) 1.3$$

$$TRASUM = \left(\left(\frac{24 \times X \times 35}{512\text{-}22} \right) +5 \right) 1.3$$

Figure C-1. Call Data Table Formulas

C-11

When call data events are captured by the application, the events table uses the most space of the seven call data tables. Therefore, you must calculate the value of W very carefully for the EVENTS table.

For example, if an application captures two 10-character event strings, three 15-character event strings, a total of five application events, the formula for W is that provided in Figure C-2.

$W = 5 + (\text{number of columns} \times 1) + (\text{sum of average column sizes})$

$$W = 5 + (5 \bullet 1) + \left(5 + 2 + 2 + 0 + \left(\frac{(10+10+15+15+15)}{5}\right)\right)$$

$$W = 5 + 5 + (5 + 2 + 2 + 0 + 13)$$

$$W = 32$$

Figure C-2. Events Calculations

The events table has 5 columns or fields:

- ID_EVENT is the internal call data ID and is always 5 characters.

- EVENT_NUM is the event number assigned by Script Builder of the event and is fixed at 2 characters.

- EVENT_CT is the running total of the number of events tracked and is fixed at 2 characters.

- EVENT_TM is a date field that is not currently used but must be accounted for.

- EVENT_STR is a string variable that stores any event strings the developer has established.

⟹ **NOTE:**
Information on each of the fields in the events table is provided in this chapter in the section on "Tables Associated with Call Handling Reports."

In this example, the events table consists of four columns: ID_EVENT (average size is 5 characters), EVENT_NUM (average size is 2 characters), EVENT_CT (average size is 2 characters), and EVENT_STR (the average of 2 10 character strings and 2 15 character strings). The field EVENT_TM is set to 0 since it is not used. The average column sizes was used in the above example in calculating the value for W.

The database also contains a rollback segment which records actions which should be undone in specific cases. The size of the rollback segment grows dynamically. It is recommended that the space to hold call data for one day or 20% of the database, whichever is larger, be allocated to the rollback segment. To find the space to hold call data for 1 day, set X=1 in the calculations you just performed and recalculate the total database size by summing up all the tables. Then, compare that number to 20% of the total database size calculated previously. Use the larger of the two numbers as the 'rollback segment' in the two-line formula below.

The total space allocated to the ORACLE database must take into account any database tables, call data tables, rollback segment, and the 30% growth factor mentioned earlier.

(local database tables + total database + 2500 overhead + rollback segment) $\times 1.3 \times .000512$ = Total Mbyte allocated to the ORACLE database.

Example of calculating Database Size Required

Using the formula above, the total space required for the ORACLE database can be calculated. The calculations shown earlier for the local database tables will be used and thus will not be duplicated here.

Assume that you want to store the default 7 days of call data on the system, expect 12500 calls per day on the system, and collect 20 events per call. Assume all of the 20 events are numbers (not event strings). The calculations would use the following variables:

- $X = 1$ + number of days of storage = 8

- $Y =$ calls per day = 12500

- $Z =$ number of call events in script = 20

- $W = 5$ + (number of columns) + (sum of average column sizes) = 5 + 5 + (5 + 2 +2 + 0 + 0). Notice the average column sizes for both EVENT_TM and EVENT_STR are 0 because neither event dates or event strings are being used. W = 19.

C-13

The database table sizes would be:

- CDH = $(((8 \times 12500 \times 51)/492) + 5) \times 1.3 = 13482$

- CDHSUM = $(((24 \times 8 \times 55)/492) + 5) \times 1.3 = 34$

- EVENTS = $(((19 \times 8 \times 12500 \times 20)/492) + 5) \times 1.3 = 100413$

- EVSUM = $(((24 \times 8 \times 20 \times 19)/492) + 5) \times 1.3 = 199$

- CCA = $(((8 \times 12500 \times 34)/492) + 5) \times 1.3 = 8990$

- CCASUM = $((24 \times 365 \times 47)/492) + 5 \times 1.3 = 791$ (this table is fixed in size)

- TRASUM = $(((24 \times 8 \times 35)/492) + 5) \times 1.3 = 24$

The database size then is CDH + CDHSUM + ... = 123933 (in blocks).

The rollback segment is calculated as either 20% of 123933 (24786) or the space to hold call data for 1 day, whichever is larger. The space to hold call data for 1 day (substitute 1 for X in above calculations) is:

- CDH = $(((1 \times 12500 \times 51)/492) + 5) \times 1.3 = 1690$

- CDHSUM = $(((24 \times 1 \times 55)/492) + 5) \times 1.3 = 10$

- EVENTS = $(((19 \times 1 \times 12500 \times 20)/492) + 5) \times 1.3 = 12557$

- EVSUM = $(((24 \times 1 \times 20 \times 19)/492) + 5) \times 1.3 = 31$

- CCA = $(((1 \times 12500 \times 34)/492) + 5) \times 1.3 = 1129$

- CCASUM = $((24 \times 365 \times 47)/492) + 5 \times 1.3 = 791$ (this table is fixed in size)

- TRASUM = $(((24 \times 1 \times 35)/492) + 5) \times 1.3 = 9$

The space to hold call data for one day is CDH + CDHSUM + ... = 16217. Since 24786 is larger than 16217, then the number used for the rollback segment is 24786.

The total space required for the ORACLE database is:

(local database tables + total database + 2500 overhead + rollback) $\times$
$$1.3 \times .000512 = .000512 =$$

$(636 + 123933 + 2500 + 24786) \times 1.3 \times .000512 = 101$ Mbyte

Increasing the Database Size

If the size allocated for the database after the installation of the CONVERSANT VIS DBMS Base ORACLE package is inadequate for your applications, use the following procedure to increase the database size.

1. Login as **oracle.**

2. Type **su -** and then press [ENTER]. Enter the root password when prompted to do so, then press [ENTER].

3. Confirm that the database system is up and running.

   ⟹ **NOTE:**
   There is no need to stop the voice system while resizing the database.

4. Type **/vs/bin/util/dbfrag.**

5. Note the number of free blocks and multiply the number by 4 to get the actual number of free 512 byte blocks.

6. Type **df** to show the number of free blocks available in the root partition. Space will be taken from this partition for the ORACLE database.

7. Calculate the number of bytes you want to add to the database.

   ⟹ **NOTE:**
   Note that you may not decrease the database size without reloading the software. Consequently, you should be careful when calculating the number of bytes to add to the database size.

   a. Perform the "Database Sizing" Calculations provided in this chapter to determine the proper database size (in megabytes).

   b. Multiply the proper database size (in megabytes) to bytes by multiplying by 1,000,000.

   c. Subtract the current size of the database from the proper database size.

   ⟹ **NOTE:**
   If there is not enough space in root, you will need to repartition the system.

C-**15**

8. Type **/oracle/bin/sqldba** and then [ENTER] to enter sqldba mode.

9. Type the following commands in the order shown, pressing [ENTER] after each command:

   ➤ **connect internal**

   ➤ **alter tablespace system**

      add datafile '/oracle/dbs/dbsA2.dbf'

      size *<number>;*

      (where *<number>* is the previously calculated number of bytes that you wish to add to the database)

   ➤ **exit**

      ⟹ **NOTE:**
      The file name 'dbsA2.dbf' is a recommended name. If this file is already in existence in this directory, you can use dbsA3.dbf etc.

      The 1000K is an example of the additional space needed by the database. It is 1000 $\times$ 1024 bytes).

   ➤ Type **/vs/bin/util/dbfrag** again to verify that the number of free blocks has been increased as desired.

   ➤ Type **exit** to return to user oracle.

   ➤ Type **exit** to log off.

C-**16**

Database Optimization

For large databases, you can use indexes on key fields to greatly reduce the time necessary to search the tables. Think of database indexes as you would the index to a book. If you want to find information on a subject, checking the index first helps you to locate the information in the book much more quickly than paging through the book. The same is true for finding data in the database.

⟹ **NOTE:**
Modify operations take longer if the table is indexed.

Indexed fields can be especially important in applications that require a "lookup" from a large table based on user input (data) to the script. This input generates a SQL statement for accessing the database that has the following form:

SELECT * from "table_name" where "field1" = 'data';

If FIELD1 has an index created for it in the database, all records that match the criteria specified in the select statement are located much faster than if there is no index.

FIELD1 is a **key** field in this example because it is the field that is used to specify selection criteria. Indexes only decrease read time when they are created on key fields. A SQL statement may have more than one key field, as in the following example:

SELECT * from "table_name" where "field1" = 'data1' AND "field2" = 'data2';

In this example, FIELD1 and FIELD2 are key fields. Creating indexes for each of these fields will enhance system performance.

C-**17**

Creating Unique Indexes

Unique indexes on fields enforce uniqueness of the data in that field across the entire table of records. A good example of a field for which you might create a unique index is one that contains a social security number (SSN). A unique index on an SSN field insures that only one record with a given SSN can exist in the table. Attempts to add records with that SSN will fail.

To create a unique index on a field called **field1** in a table called **table_name,** log in to ORACLE through SQL*PLUS using **SQL*Plus sti/sti,** then type:

create unique index field1_iname on "table_name" ("field1");

Creating Non-Unique Indexes

Non-unique indexes do not prevent the same data from appearing in that field in several records in the same table. For example, if a field contains the area code of a telephone number and an index is created for that field, it must be a non-unique index since other records may require the same number in their area code field.

To create non-unique indexes on fields called **field1** and **field2** in a table called **table_name,** log into ORACLE through SQL*PLUS, then type:

create index field1_iname on "table_name" ("field1");
create index field2_iname on "table_name" ("field2");

Bibliography

The following manuals may be of assistance for individuals who would like additional information regarding databases and other topics covered in this appendix.

ORACLE Reference Material

The following manuals may be ordered from:

AT&T Customer Information Center
Customer Service representative
P.O. Box 19901
Indianapolis, IN. 46219
1-800-432-6600

ORACLE Pro*C documentation set
Order Code 106713670

ORACLE SQL and RDBMS documentation set
Order Code 106673510

ORACLE SQL*FORMS documentation set
Order Code 106673528

ORACLE SQL*MENU (includes *SQL*Menu User's Guide and Reference Version 5.0)*
Order Code 106673544

ORACLE SQL*NET (includes *SQL*Net TCP/IP User's Guide Version 1.2)*
Order Code 106651730

ORACLE SQL*REPORTWRITER (includes *SQL*ReportWriter Reference Manual Version 1.0)*
Order Code 106673536

Access to SQL*PLUS Software Program

The SQL*PLUS software program is a tool used to access the ORACLE RDBMS. It is included in the CONVERSANT VIS DBMS Base ORACLE package. This tool can be used to review database information without having to access the Voice System directly. The SQL*PLUS software program allows you to go directly to the database information you need.

At the system prompt, type **sqlplus sti/sti,** then press [ENTER] to access Script Builder database tables or type **sqlplus system/manager** for SQL administrative tasks.

⚠ **CAUTION:**
*Exercise caution when using SQL*PLUS sti/sti or sqlplus system/manager to access Script Builder database tables. Do not alter any data, schema, logins, or passwords using SQL*PLUS. Doing so may corrupt the VIS and Script Builder software and result in non-warranty maintenance. The ORACLE right-to-use license is restricted solely to CONVERSANT VIS applications.*

Application table manipulation (creation, drop, or schema change) is best administered using VIS Script Builder software. If you have to use SQL*Plus to drop a table or change a table schema, make sure that the applications referring to this table are re-verified and reinstalled each time a table is dropped. Without re-verifying and reinstalling the applications after the referred tables are dropped or schema-changed, the applications may not be able to communicate with the database correctly.

Note that Script Builder and SQL*PLUS have different conventions for naming tables and columns. Script Builder is case sensitive; table or column names may use either uppercase or lowercase characters in Script Builder. By comparison, SQL*PLUS is not case sensitive; table or column names using lowercase characters are interpreted to uppercase characters. Consequently, if you use lowercase characters while naming a table or column in Script Builder, when later executing SQL*PLUS, you must enclose the lowercase references (including table names and columns) in double quotes ("). An easy way to avoid this confusion would be to use upper case letters on all tables and columns in Script Builder.

For example, if you create a table named "tab_1" which has a column "col_1" in Script Builder, the query of this table running SQL*PLUS should be as follows:

select "col_1" from "tab_1" where "col_1" = 'xxx';

However, if you type **select col_1 from tab_1 where col_1 = 'xxx';** the command will be interpreted by SQL*PLUS as *select COL_1 from TAB_1 where COL_1 = 'xxx';.* If table TAB_1 and column COL_1 do not exist, the query will fail. Note that this query will fail even if table tab_1 and column col_1 exist.

ORACLE creates a trace file in the /oracle/rdbms/log directory each time the system is rebooted. These trace files are not automatically removed by ORACLE and must be removed by the user or administrator if the files are no longer wanted. In addition, ORACLE creates a log file /oracle/tcp/log/orasrv.log that contains all the remote login information which is automatically created and appended by ORACLE. This log file is not automatically removed by ORACLE and may be removed or truncated by the user or administrator.

If you would like additional information on the ORACLE RDBMS or SQL*PLUS, contact your AT&T representative or the AT&T CIC (Customer Information Center).

Database DIP Timeout

> **⚠ WARNING:**
> *Always be sure to stop the voice system before shutting down the remote machine to avoid an unexpected interruption of service. The VIS and remote ORACLE connection is established during the start voice system procedure on the VIS. After the connection is established, the VIS does not keep track of the status change of the remote machine. A shutdown and reboot operation on the remote machine drops the original database connection between the VIS machine and the remote machine. If the remote machine is shut down and rebooted while the voice system is still active, the VIS detects this status change only when calls come in to the system that involve remote database operation for call processing. The VIS will take 20 to 45 seconds to reestablish the remote connection and will not be able to process calls during this time period.*

In certain cases, the CONVERSANT database DIP (oraldb) may not receive a timely response from the server machine. This may be due to a variety of factors, such as the server machine is down, the server machine is operating slowly, an application query of a large non-indexed table, network congestion, etc. While the DIP is waiting for a response from the server machine, the message queue of the DIP may back up. If the message queue backs up to the current maximum number of messages (255), performance problems on the VIS may result. In order to prevent this, the DIP is equipped with a timeout mechanism. By default, the DIP will timeout every 45 seconds while waiting for a response. After the timeout, the DIP will delete the messages currently queued and continue to wait for the response. The DIP will continue to timeout every 45 seconds and to empty the message queue. After the default of 300 seconds, the DIP will automatically respawn and reinitialize. It is sometimes necessary for the DIP to respawn in order to recover certain abnormal situations.

Note that the 45 and 300 seconds timeout values can be altered in file **/vs/data/ldbdip.rc.** This file is included with the generic package and contains the following default values:

        FIRST_TMOUT=45
        SECOND_TMOUT=300

You may change this default value to any number that is appropriate. Note that you must use the **stop_vs** and **start_vs** commands to activate the new timeout values. If the ldbdip.rc file is missing, the DIP will use the default timeout values of 45 and 300 seconds.

Database Access Limitations

The script accesses the database through a single database interface process (DIP). This database DIP connects to the database and provides the only interface between the script and the database.

An internal data structure called a database cursor is used to keep track of the point from which the DIP is reading in a specific table. One cursor is allocated for each read of each database table by each channel running a script that requires access to the database. The cursor remains assigned to that table until the script ends on the channel for which the cursor was allocated.

The VIS has an upper limit of 240 per user on the number of cursors that can be in use at any given time. Once this limit is reached, database transactions will not complete successfully; that is, reads may fail and inserts or updates may not occur.

To insure the integrity and consistency of the data in the database, you must keep this limiting factor in mind when you design scripts. Use the following formula to determine the number of database tables that my be accessed by a script with the VIS Version 3.1:

$$ch \times read \times 1 < 240$$

where:

— ch = Number of channels running scripts with database access

— read = Number of Read Table operations performed on different tables by scripts (per channel)

⟹ **NOTE:**
Multiple reads of the same table use only one cursor.

C-23

The following are sample calculations using various configurations and numbers of Read Table operations.

■ If you have a 24-channel system running a script that performs four Read Table operations on four different tables per channel, the calculation is:

$$24 \times 4 \times 1 = 96$$

Since 96 is less than 240, the database operations will proceed properly.

■ If you have a 36-channel system running a script that performs four Read Table operations on the same table per channel, the calculation is:

$$36 \times 1 \times 1 = 36$$

Since 36 is less than 240, the database operations will proceed properly.

■ If you have a 48-channel system running a script with five Read Table operations on five different tables per channel, the calculation is:

$$48 \times 5 \times 1 = 240$$

In this case, if all 48 channels are performing five Read Table operations, some database operations will fail.

■ A script developer wants to develop a script that executed three Read Table operations on three different tables per channel:

$$240 / (3 \times 1) = 80$$

Therefore, the script can run on up to 80 channels before it encounters database access problems.

■ A script developer wants to develop a script to run on 36 channels simultaneously:

$$240 / (36 \times 1) = 6.666$$

Therefore, the script can perform up to six Read Table operations on up to six different tables per channel before it encounters database access problems.

Monitoring the Database

The following commands may be used to monitor database space utilization. Refer to the *ORACLE RDBMS Database Administrator's Guide* for information on SQLDBA and other commands that may be used to monitor the database.

1. The **dbcheck** command checks space usage and rollback segment growth. The **dbcheck** command has three different usages. The *-i* option installs cron entries and error messages. The cron job can be placed in either the root cron file or added to the end of **/vs/bin/util/croncdh** job that runs once a day. This is prompted for interactively. The *-i* option also asks if you want new error messages added to the att errors file along with explanations used with the **explain** command. This installation only needs to be run if you want the warnings to show up in the system message log or you want to schedule automatic checking at regular intervals. The **-r** option removes any cron entry set up by the **-i** option.

   The third usage of **dbcheck** is [-w *n[,m]*][-s][-e][-m *user[~user...]*]. This usage actually checks database space against user set water marks. The following occurs:

   1. Free space is checked against the user set threshold *n,* 15% default

   2. Rollback segment growth is checked against the user set threshold *m,* 20% default

   When executed, the **dbcheck** command will generate the appropriate warnings (below) if the database falls below *n* percent free or if the rollback segments grow to be more than *m* percent of the total database size.

   The command, by default, will send warning messages to the error log indicating a threshold has been exceeded (the *-i* option must be run first). The *-e* option will disable entries from going into the log file. The *-s* option will print the warning messages to standard output. The *-m user* option allows for the messages to be mailed to *user.* Multiple users can be sent the mail by separating the user names with ~. Following are sample outputs:

(Output to error log when less than 13% available or more than 23% used by rollback)

 # dbcheck -w13,23

```
*   Mon Feb 15 16:35:06 1993 dbcheck logTest.c:418
DBC001   -- -- --- Database 10 percent free, 3072 Blocks of 30720 available.
             Reason: Low DB Space.
*   Mon Feb 15 16:35:06 1993 dbcheck logTest.c:418
DBC002   -- -- --- Extents low, 100 used of 121, on object MY_TABLE
             Reason: Low DB Extents
*   Mon Feb 15 16:35:06 1883 dbcheck logTest.c:418
DBC003   -- -- --- Rollback segments=7680 blocks, 25 percent of total space.
             Reason: High Rollback Usage.
```

Figure C-3. dbcheck Output Example

This command could be set up to run out of cron a few times a day. The **dbcheck** program returns the following values:

- ■　0 — Success (no limits exceeded)

- ■　1 — Threshold exceeded

- ■　2 — Processing error

- ■　3 — Database is not running

C-26

2. The **dbfree** command is a shell script that lists the amount of free space in the database by free contiguous blocks. The result will be a detailed listing of each free memory area followed by the sum of each tablespace. The free blocks listed are in 2048 bytes/block(ORACLE blocks). There is also a column that lists the same information in Mbytes. The **-h** option will remove the column headers. Following is a sample output using this command.

Contiguous extents

TABLE SPACE NAME	FILE_ID	START_BLOCK	MBYTES FREE	ORACLE BLOCKS FREE
SYSTEM	1	5142	.02	12
SYSTEM	1	5560	.03	13
SYSTEM	1	4892	.04	18
SYSTEM	1	7892	.04	19
SYSTEM	1	4164	.05	28
:	:	:	:	:
:	:	:	:	:
SYSTEM	1	5598	.73	375
SYSTEM	1	8946	4.00	2048
SYSTEM	1	12650	4.45	2277
SYSTEM	1	25179	10.00	5120
SYSTEM	1	14939	20.00	10240
sum			47.18	24070

29 rows selected.

Figure C-4. dbfree Output Example

The **dbfree** program will return either a 0 indicating success or a 1 indicating a processing error.

3. The **dbfrag** command is a shell script that reports on database allocation, usage, and fragmentation. The block size reported is in ORACLE blocks (2048 bytes). You can request the information to be reported in Mbytes with the *-b* option. This tool is useful to get a quick check on database usage and provides a shell interface into some key ORACLE statistics. This tool only reports on information in the **'SYSTEM'** tablespace. With the *-h* option, the listing will be printed without a header. This option is useful if you want to parse this output to get select a specific field.

(Report information in mega-bytes, -b)

 # dbfrag -b

SYSTEM Tablespace, Space is in Mega-Bytes

ALLOCATED	FREE	% FREE	AVG/FRAG	LARGEST	FRAGMENTS	DB_FILES	ROLLBACK
129.00	108.88	84.40	5.44	108.12	20	1	7.91

Figure C-5. dbfrag Output Example

Following is an example of **dbfrag** that may be used to get the largest contiguous ORACLE space available:

dbfrag -hlawk 'length>1 {print $5}'
10240

The **dbfrag** program will return either a 0 indicating success or a 1 indicating a Processing Error.

C-28

4. The **dbused** command provides database use by Oracle user. The following are options for the **dbused** command:

> -h — Skip header messages (Useful if parsing)
> -s — Only produce summary information
> -u uid/passwd — Specify oracle user id and password
>   (default sti/sti, *all* for all users)

The **dbused** command is a shell script that shows the amount of space used by each object for a given user. Objects are tables, indexes, clusters, rollback, and cache. The default user is sti/sti. The -s option will report summary information grouped by objects. The special user *"all"* will report for the entire database.

Following is an output summary for user all.
> # **dbused -su all**

Usage summary for "all"

dbused -su all Usage for user all

Space allocated to objects. Oracle blocks (2048 Bytes/Block)

TYPE	BLOCKS	MBYTES	EXTENTS	OBJECTS
CACHE	18	.04	1	1
CLUSTER	2843	5.55	41	8
INDEX	1530	2.99	200	113
ROLLBACK	4049	7.91	24	3
TABLE	1860	3.63	172	102
sum	10300	20.12	438	227

Figure C-6. dbused Output Example

Following is an output summary for user sti/sti.
> **# dbused**

Usage "sti/sti"

Space allocated to objects. Oracle blocks (2048 Bytes/Block)

NAME	TYPE	BLOCKS	MBYTES	EXTENTS	MAX_EXTENTS
C1	INDEX	5	.01	1	99
CCA	TABLE	5	.01	1	99
CCASUM	TABLE	5	.01	1	99
CDH	TABLE	5	.01	1	99
CDHSUM	TABLE	5	.01	1	99
E2	TABLE	5	.01	1	99
EVENTS	TABLE	5	.01	1	99
EVSUM	TABLE	5	.01	1	99
LDBCOLS	TABLE	5	.01	1	99

Figure C-7. sti Output Example

The **dbused** program will return either a 0 indicating success or a 1 indicating a Processing Error.

Information for Advanced Users

D

What's in This Chapter

This chapter contains information about the more sophisticated aspects of the CONVERSANT Voice Information System (VIS). The procedures discussed here should be used only by advanced users who are very familiar with the VIS.

The topics included in this chapter are:

- Call data information storage in the ORACLE database

- Rollback segment

- Transmission level plan

- Signal processor circuit card troubleshooting

- IBM 3270 host interface troubleshooting

- CLEO Data Talker 3270 U/X

Call Data Information Storage in the ORACLE Database

The VIS provides access to call classification reports, call data detail reports, and call data summary reports. This information is stored in the ORACLE database. By default, seven days worth of data for both the call classification and the call data detail are kept in the database. Approximately seven days worth of call data summary and a year of call classification summary data are maintained.

This section discusses the ways you can minimize the storage space you need. Before you implement any of these, however, make sure you understand the potential impact on your application. For example, if you reduce the storage space by reducing the days for which you keep data, you may lose information you will need later.

Sizing Your Database

Refer to Appendix C, "Database Environment" for information on calculating how big your database should be to meet your needs. Refer to Appendix E, "Performance Information" for information on commands that may be used to monitor database space utilization.

Minimizing Storage Space Needed

There are several ways to minimize the storage space you need for call data: reducing the days of information you store or storing fewer Call Data Events.

Storing Fewer Days of Data

One way to minimize the amount of storage required for the call classification and the call data detail information is to store less than seven days worth of data. The VIS knows how many days of data to archive by reading the contents of the **croncdh** file in the **/vs/bin/util** directory. The following is a sample croncdh file:

```
# Start the ORACLE DBMS

VSUTIL=/vs/bin/util
ORACLE_SID=A;export  ORACLE_SID
ORACLE_HOME='/usr/lbin/dbhome  $ORACLE_SID'
PATH=$PATH:$ORACLE_HOME/bin;export  PATH
if /usr/lbin/orastat -s >/dev/null
then
  :
else
  ior w pfile=$ORACLE_HOME/dbs/init$ORACLE_SID.ora
fi

# perform the cron jobs

$VSUTIL/cdhsum
$VSUTIL/cdhdel
$VSUTIL/ccasum
$VSUTIL/ccadel
```

This croncdh file is the default file installed with the generic software. It automatically stores seven days worth of call classification and call data detail information.

To change the number of days of data stored, use the following syntax in the croncdh file:

```
$VSUTIL/cdhdel -x
$VSUTIL/ccadel -x
```

where **x** is the number of days of data to archive. If the "cdhdel" commands do not have any arguments, then the default of seven days is used, as illustrated in the default "croncdh" file.

D-**3**

To archive two days worth of call data detail information, and four days of call classification data, your "croncdh" would look as follows:

```
# Start the ORACLE DBMS

VSUTIL=/vs/bin/util
ORACLE_SID=A;export  ORACLE_SID
ORACLE_HOME='/usr/lbin/dbhome  $ORACLE_SID';export  ORACLE_HOME
PATH=$PATH:$ORACLE_HOME/bin;export   PATH
if /usr/lbin/orastat -s >/dev/null
then
  :
else
  ior  w
f i

# perform the cron jobs

$VSUTIL/cdhsum
$VSUTIL/cdhdel  -2
$VSUTIL/ccasum
$VSUTIL/ccadel  -4
/vs/bin/util/dbcheck -w  15,20
```

Currently, the only report produced in the System Reports for the call classification data is the call classification summary report. Therefore, saving zero days worth of call classification data will save space without affecting the reports produced by the VIS. Storing zero days worth of data means that only the call classification data for the current day will be available until the clean up and summary programs run each night after midnight. The current day's data always is maintained.

Note that if you want to write a cron job that generates your own ORACLE database reports, you will need to include the following ORACLE environment variables in the shell script.

```
# beginning of ORACLE environment variable definition
ORACLE_SID=A;export ORACLE_SID
ORACLE_HOME=/oracle;export ORACLE_HOME
PATH=$PATH:$ORACLE_HOME/bin;export PATH
ulimit 2113674
# end of ORACLE environment variable definition
```

Increasing the ORACLE Database Size

If saving fewer days of data, or fewer call data messages, does not free enough space, then you must allocate more space for the ORACLE database. Space is allocated to ORACLE during the installation of the CONVERSANT VIS DBMS Base ORACLE package. The space that ORACLE uses is in the root partition (/). If root does not contain enough space, the system must be repartitioned and reloaded with software.

If you find that your database needs to be larger than the VIS default of 14,000 blocks, DO NOT follow the hard disk space allocations in the *CONVERSANT Voice Information System Version 3.1 Software Installation and Upgrade, 585-350-104.* These values assume that your database is 14,000 blocks. If your database is larger, then you need to allocate the additional space in the root partition.

For example, for a VIS with a 20,000 block database, you must add 6,000 blocks to the root partition specified in the *CONVERSANT Voice Information System Version 3.1 Software Installation and Upgrade.* Using the following equation, calculate how much space you need to add to the root partition:

$(6{,}000 \text{ blocks}) \times (512 \text{ bytes/block}) / (1024 \text{ bytes/Kbyte}) = 3000 \text{ Kbyte} = 3 \text{ Mbyte}$

Therefore, you must add approximately 3 Mbyte of space to the root partition and take 3 Mbyte from another partition, such as usr2, the speech partition.

Rollback Segment

The installation of the CONVERSANT Voice Information System DBMS Base ORACLE package creates one rollback segment (R1). This section provides information on verifying and reducing the size of this rollback segment, which records actions that should be undone under certain circumstances. As with database tables, the rollback segment will grow as needed as long as there is free space in the database. However, the rollback segment will not automatically decrease in size and some ORACLE operations can cause the rollback segment to grow drastically in size. Consequently, you may wish to restore the rollback segment to the original size by dropping and recreating the rollback segment.

Verifying or Reducing the Size of the Rollback Segment

⟹ **NOTE:**

The procedure to *reduce the size* of the R1 rollback segment requires that the voice system and the database system be stopped. If at all possible, you should avoid reducing the size of the rollback segment when call traffic is heavy. Note that the procedure to *verify* the size of the rollback segment does not require that the voice system and the database system be stopped. Consequently, you may verify the size of the rollback segment at any time.

You can verify or reduce the size of the rollback segment using the following procedure:

1. Login as **root.**

2. Type **/vs/bin/util/rb_init** and then [ENTER] to display the current size of the rollback segment R1.

   The screen will display a message similar to the following:

   ```
   Rollback segment R1 is currently 653312 bytes in
   size, would you like to reduce the size of this
   rollback segment? (y/n)
   ```

   The original size of the rollback segment was set to 653312 bytes. If the current size is close to this number or if it is less than 1/4 of your total database size, you do not need to reduce the size of the rollback segment.

3. To terminate the rb_init command without reducing the size of the rollback segment, type **n** at the prompt. To execute the rb_init command and reduce the size of the rollback segment, type **y** at the prompt.

D-6

4. If you typed **y** to the prompt and the voice system is currently running, you will receive the following message:

```
The voice system is running. Is it OK to stop the
voice system? (y/n)
```

Type **y** to shut down the voice system and continue with the procedure to reduce the size of the rollback segment. Type **n** to abort the rb_init procedure.

5. The following message will appear on the screen if the database system is running:

```
The database system is running. Is it OK to
shutdown the database? (y/n)
```

Type **y** to shut down the database and continue with the procedure to reduce the size of the rollback segment. Type **n** to abort the rb_init procedure.

6. Some SQL*PLUS commands and operations output will appear on the screen. When the rb_init command is finished, you will be prompted with the following message:

```
Would you like to restart the voice system? (y/n)
```

Type **y** at the prompt to restart the voice system and the database. If you do not wish to restart the voice system and the database at this point, you may do so manually at a later time.

Transmission Level Plan

A Transmission Level Plan (TLP) for a piece of telecommunications equipment is a set of specifications dictating the incoming/outgoing speech volume levels which will pass through the equipment as well as hardware and software tools for implementing those specifications. The specifications take into account the level plans of the various telephone network interfaces to which the equipment will connect. The goal of the plan is to make all speech heard by a caller be at a level which is appropriate for listening without causing oscillations in the network.

VIS Transmission Level Plan

As depicted in Figure D-1 most switch designs implement a TLP which "builds in" a -3dB gain (often called insertion loss) in each Tip/Ring loop of a station set-to-station set connection, for a total of -6dB gain from end to end. The VIS default TLP implements this same strategy; that is, the VIS default TLP will attempt to make the end-to-end gain of voice signals passing through it equal to -6dB.
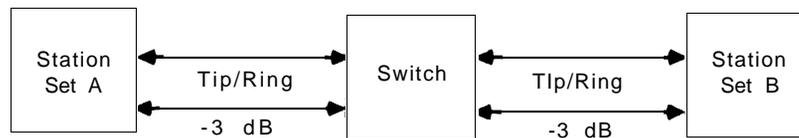
Figure D-1. Typical Switch Transmission Level Plan for Station Set-to-Station Set Connection

CONVERSANT VIS Network Interface Hardware

The VIS connects to two types of telephone network facilities: Analog (Tip/Ring) and Digital (T1).

The VIS default TLP is partially based on the following 2 facts concerning VIS network interface hardware:

1. VIS T1 Interface cards have 0dB gain built into the hardware interface.

2. VIS Tip/Ring Interface cards have nominally 0dB gain built into the hardware interface (when a perfect impedance match exists between the interface and the line to which it is connected).

Typical Network TLP Characteristics

The two types of network facilities (Tip/Ring and T1) have typical TLP characteristics associated with them. The VIS default TLP is partially based on the following typical network TLP characteristics:

1. The VIS default TLP assumes a nominal 0dB gain in each digital trunk connected to any T1 card in the system.

2. The VIS default TLP assumes a nominal -3dB gain in each analog loop connected to any Tip/Ring card in the system.

D-9

Incoming and Outgoing Speech Volume in Non-Bridging Modes

When a voice signal enters a VIS machine in a non-bridged connection, it is usually going to be coded and stored in the speech file system of the VIS machine. Before it is coded, its incoming volume can be adjusted by a parameter called IVOL.

When a voice signal stored in the speech file system is played back from a VIS machine to a caller, its outgoing volume can be adjusted by a parameter called OVOL.

The CONVERSANT VIS VERSION 3.1 screen "Switch Interfaces" option allows the user to adjust both the incoming speech volume and outgoing speech volume for analog (Tip/Ring) and digital (T1) network interfaces. Therefore, there are actually two system-wide IVOL parameters (Analog IVOL and Digital IVOL), and two system-wide OVOL parameters (Analog OVOL and Digital OVOL). The analog IVOL and OVOL parameters apply to *all* Tip/Ring cards (VRS-6, IVP-6) in the system, while the digital IVOL and OVOL parameters apply to ALL T1 cards in the system.

⟹ **NOTE:**
Even though each T1 card in the system allows specification of IVOL and OVOL, changing IVOL or OVOL for any one of the T1 cards in the system changes the digital IVOL and OVOL parameters for *all* other T1 cards in the system.

D-10

IVOL and OVOL should be thought of as volume multipliers (i.e., +/- gain) of the incoming/outgoing signal. A value of 1000 for IVOL or OVOL is equivalent to multiplying the incoming or outgoing signal volume by 1, i.e., unity gain. Each multiplication of the current IVOL or OVOL setting by a factor of .707 results in a -3dB signal volume gain from the current volume (volume 3dB lower); each multiplication of the current IVOL or OVOL setting by a factor of 1.414 results in a +3dB signal volume gain from the current volume (volume 3 dB higher).

⟹ **NOTE:**
 IVOL and OVOL affect only signals being coded or played back by the VIS. They do *not* affect end-to-end conversations in call bridge mode.

Table D-1 shows the IVOL and OVOL settings required to implement the VIS default TLP along with the actual gain in dB (shown in parenthesis) which each setting represents:

Table D-1. Default System IVOL and OVOL Settings

	IVOL	OVOL
Analog	2000(+6)	1000(0)
Digital	1414(+3)	707(-3)

Voice Coding and Playback

As described above, most switches build in -6dB of gain in a typical station set-to-station set connection. With a VIS in a non-bridging mode, station set-to-station set actually involves a signal being affected by IVOL while it is coded and stored on the disk, then affected by OVOL when it is played back. To be in accordance with the VIS TLP, the level heard by the caller during playback should be 6dB lower than the level that was spoken when the signal was coded.

Voice Coding

Figure D-2 shows how the default IVOL parameters control the level at which a voice signal is coded and stored in the VIS speech file system.

The top part of the figure shows a T1 interface connected to the VIS; the bottom part shows a Tip/Ring interface connected to the VIS. Following the signal from left to right, if the initial spoken level is 0 and all typical network TLP characteristics listed above are true, the coded level that will be stored in the speech file system will always be 0, regardless of which type of network interface is connected to the VIS.
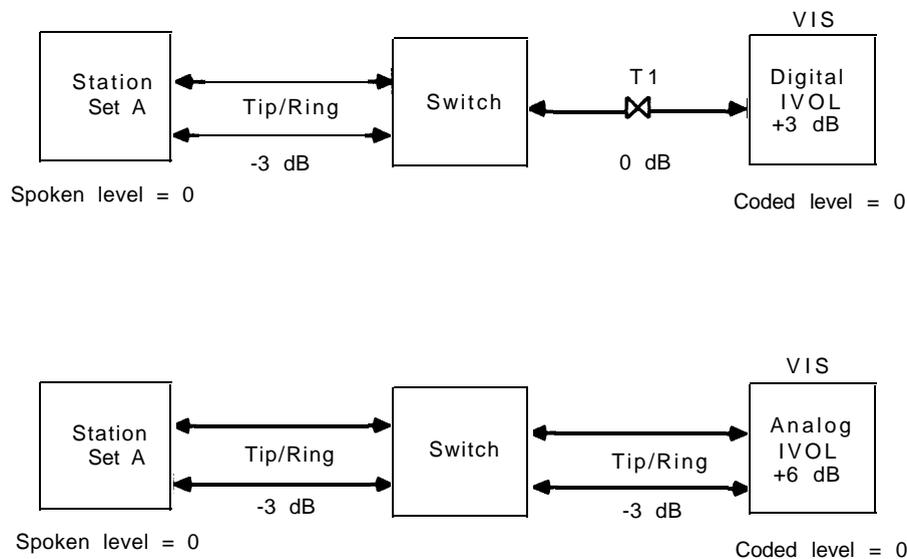
Figure D-2. Effect of IVOL Parameters on Voice Coding

Voice Playback

Figure D-3 shows how the default OVOL parameters control the level at which a previously coded voice signal stored in the VIS speech file system is played back.

The top part of Figure D-3 shows a T1 interface connected to the VIS; the bottom part shows a Tip/Ring interface connected to the VIS. Following the signal from right to left, if the signal was coded in the manner depicted in Figure D-2, the initial playback level will be 0. If all typical network TLP characteristics listed above are true, the level which will be heard at the station set will always be -6, regardless of which type of network interface is connected to the VIS. Since the initial spoken level shown in Figure D-2 was 0, the heard level of -6 is in accordance with the VIS TLP.
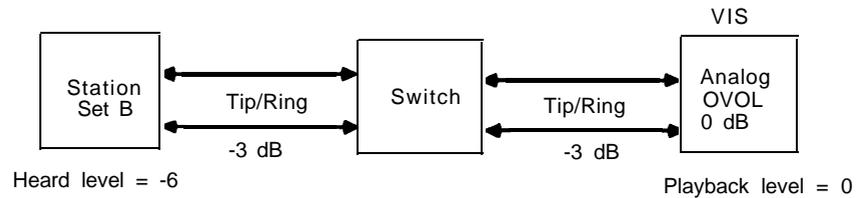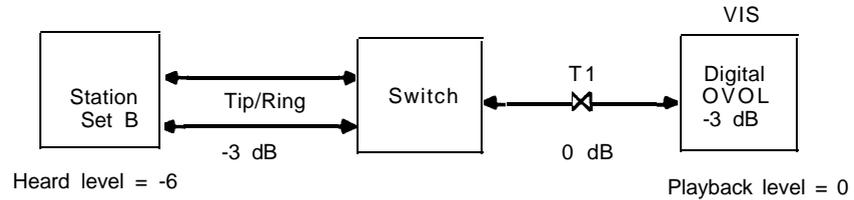
Figure D-3. Effect of OVOL Parameters on Voice Playback

Reasons for Deviating from the Default
IVOL and OVOL Settings

For most applications, the default TLP will provide callers with appropriate speech volume levels for prompts that were coded as depicted in Figure D-2.

In many cases, however, speech prompts are coded in a studio and may be coded at higher volumes than they would have been if they had been coded from a VIS network interface. In these situations, it **may** be desirable to decrease the applicable OVOL parameter (analog or digital, depending on whether playback is from Tip/Ring or T1) to decrease the volume actually heard by the caller. Note that if the system is used to code speech which will be played back with the prerecorded speech, you should increase IVOL by the same amount that you decrease OVOL to insure that speech is coded at the same level.

Also, some network lines/trunks do not abide by the typical network characteristics listed above. For example, some T1 trunks actually have insertion loss in the network. This loss can be compensated for by increasing the corresponding IVOL and OVOL parameters by an amount equal to the additional insertion loss. For example, if the digital trunks connected to a VIS actually had insertion loss of -3dB instead of 0 associated with them as the default VIS TLP assumes, the default digital IVOL and OVOL parameters could be changed to 2000 and 1000 respectively which would have the effect of adding +3dB of gain to the incoming signal before coding, and adding +3dB of gain to the outgoing signal before playback (refer to Table D-1 and accompanying explanation). Making these changes results in meeting the TLP goal of -6dB gain from end to end.

Finally, subjectivity plays a large role in the effectiveness of a TLP. What sounds appropriate to one person may sound inappropriate to another. The default IVOL and OVOL parameters have been carefully selected to provide appropriate volume levels in the majority of applications. It is highly recommended that they not be changed based on subjective evaluation. However, the flexibility is provided to tune them to whatever suits the needs of the application at hand.

Transmission Level Plan and Call Bridging

When two incoming calls are bridged together by the VIS, the callers on either end (station set A and station set B) can talk with each other through the VIS. In such a situation, the previously discussed IVOL and OVOL parameters do *not* apply. Instead, software on the VIS machine (specifically the TSM process) has built in rules for directing the VIS Network Interface cards to insert up to +6dB gain in either direction of a call bridge connection.

The rules governing the amount of gain inserted are depicted by Figures D-4 through D-7. Recall that the VIS TLP dictates that there be a -6dB gain from station set to station set. Assuming the typical network TLP characteristics for the network facilities (as discussed in the previous section), Figures D-4 through D-7 show the amount of gain (in dB) that is automatically inserted in each direction for each of the four possible call bridging scenarios.

Figure D-4 depicts analog-to-analog (Tip/Ring to Tip/Ring) call bridging.
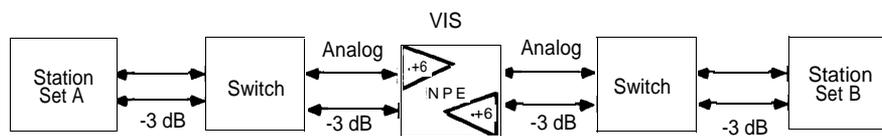
Figure D-4. Analog-to-Analog Call Bridging

Figure D-5 depicts digital-to-digital (T1 to T1) call bridging.
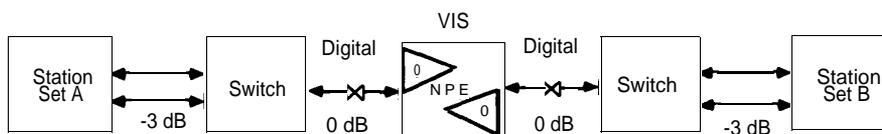
Figure D-5. Digital-to-Digital Call Bridging

D-15

Figure D-6 depicts analog-to-digital (Tip/Ring to T1) call bridging.
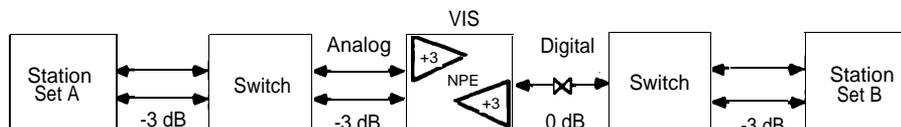
Figure D-6. Analog-to-Digital Call Bridging

Figure D-7 depicts digital-to-analog (T1 to Tip/Ring) call bridging.
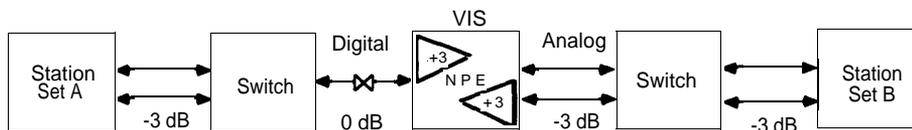
Figure D-7. Digital-to-Analog Call Bridging

Signal Processor Circuit Card Troubleshooting Guidelines

The standard 12 Mbyte version of the SP Driver will be installed by default during Signal Processor (SP) circuit card installation. To determine which version of the SP Driver is installed on your system, type the following at the system prompt:

spVrsion

⟹ **NOTE:**
The Olivetti system requires the 12 Mbyte version of the SP Driver. Business systems with more than 12 Mbytes of memory will not function with the standard version of the SP Driver.

Refer to the *CONVERSANT Voice Information System Version 3.1 Maintenance, 585-350-105,* Appendix E, "Circuit Card Settings" for information on SP circuit card switch settings.

IBM 3270 Host Troubleshooting Guidelines

This section provides information to help you to determine what may cause interface difficulties between the VIS and the 3270 environment using the 3270 Host Communications Package. Included are:

- Overview of the 3270 Host Communications package for the VIS

- Proper configuration of both the VIS and the host machine

- Introduction to typical diagnostic steps to follow and tools to use

- Discussion of typical application-level problems

This information will be most useful if you read it before you install the 3270 Host Communications package. Also use it as a reference for troubleshooting problems that may occur after installation. Refer to Chapter 2, "Trouble and Failure Indications," of *CONVERSANT Voice Information System Version 3.1 Maintenance, 585-350-105,* for additional information on host trouble resolution.

D-17

The 3270 Host Communications Package

The 3270 Host Communications Package, an optional package on the VIS, consists of a circuit card and UNIX Driver, 3270 Communication Manager, 3270 Terminal Emulator, and file transfer software (written by Cleo Communications, Inc). The circuit card may be either a PC/XL card or Emulex.

The 3270 Host Communications Package emulates an IBM 3274-41C or a 3174-01R cluster controller with up to 32 logical units (that is, 3278 Model 2 terminals) connected to it. However, it does *not* emulate the extended attributes of a 3279 terminal. The "3270 card" typically is linked to a 3725 or 3745 Front End Processor (FEP) and uses either Bisynchronous (BISYNC or BSC) or Synchronous Data Link Control (SDLC) data streams.

Standard links from the card to the FEP can be made through synchronous modems (for distances over 100 feet) and leased lines or modem eliminators (for distances under 100 feet). Note that channel attachment is *not* possible with this card. The software will support speeds up to 56K baud with the following restrictions:

■ The Emulex card can only operate at 9600 baud and below; it does not handle speeds beyond 9600 baud

■ BSC protocol is limited to 9600 baud and below

■ Speeds higher than 9600 baud are available only with the DataTalker/XL card using SDLC protocol. Note that certain line configurations are required to operate at speeds higher than 9600 baud. Refer to the information provided later in this section for assistance in operating at speeds over 9600 baud.

■ High speed connections for 56K baud operation may use modems or modem eliminators with V.35 connectors. If so, this will require an RS-232 to V.35 interface converter since the PC/XL card has only an RS-232 connector. See Chapter 1, "Preparing the Site," of the hardware installation book for your platform and Chapter 1, "An Introduction to CONVERSANT VIS," and Chapter 4, "VIS Connectivity," of *CONVERSANT Voice Information System System Description, 585-350-201,* for information about the RS-232 to V.35 interface conversion.

D-**18**

Configuration Notes

Before diagnosing any problems that might exist with the host interface, you must verify that both the IBM host and the VIS are configured correctly. The following paragraphs provide a summary of typical configuration issues that have been seen in the field. The notes in this chapter supplement the information that is given in Chapter 4, "Installing Software For Optional Features," of *CONVERSANT Voice Information System Version 3.1 Software Installation and Upgrade, 585-350-104,* for installation of the 3270 device driver software.

⟹ **NOTE:**
When you encounter host communication problems, you should contact the host system administrator. The host system administrator should be able to provide information about system generation ("sysgen"), change system generation, and host link disconnect and reconnect. For more information on diagnosing host communication problems, refer to the discussion later in this chapter under "Diagnosing Host Communication Problems."

Host Sysgen Data

The host sysgen data is the configuration information about the 3270 link in the VIS. The values of the following parameters in the host sysgen file are critical for the proper functioning of the 3270 software on the VIS:

- DLOGMOD — Should be set to D4C32782 or the system default for the IBM 3278 Model 2 terminal

- DUPLEX — Can be either HALF or FULL. On multi-drop lines (more than one terminal share the line) HALF Duplex should be used.

- MAXDATA — Determines the maximum path information unit for type2. The MAXDATA parameter should be less than or equal to 265.

- MAXOUT — Determines the maximum number of frames sent before the next polling. The MAXOUT parameter should be set to 7.

- NRZ (Non Return to Zero) — Should be noted so that the NRZ_CODE can be configured to match the host setting. This parameter can either be turned on (the line is NRZ), or turned off (the line is NRZI — Non Return to Zero Inverted).

- PU ADDR (Physical Unit Address) — Critical for host communication. For the host, this value is defined as a hexadecimal (that is, base 16) value. However, the VIS must have the decimal equivalent in its configuration file. The PU address corresponds to the SDLC_ADDR used in the **/usr/lib/3270/hostCfgN** configuration file. In the examples on the next pages, the sysgen file has the address as 0xC0 (the 0x prefix indicates a hex value) and the VIS has the SDLC_ADDR value set to 192 (dec). Note that 0xC0 is equal to 192.

D-19

- ■ PUTYPE — Sets the cluster controller type. The PUTYPE parameter should be set to 2.

- ■ SPEED — Can be any standard speed up to 56K baud that is supported by the attached modem or modem eliminator and the interface card. Make sure that it does not exceed the maximum speed of the modems or modem eliminators being used.

- ■ TYPE — Can be either SWITCHED or LEASED. It must match the setup for the modem or modem eliminator. Refer to the information provided later in this section for assistance in operating at speeds over 9600 baud.

The following is a partial sample of a working NCP (Network Control Program) gen:

```
G2SDLC    GROUP     BATCH=NO,              INTERACTIVE  PRIORITY
                    CLOCKNG=EXT,           EXTERNAL  CLOCKED  MODEM
                    DATRATE=HIGH,          DEPENDS ON MODEM SPEED
                    DIAL=NO,               LEASED OR NON/SWITCHED LINE
                    DISCNT=NO,             NO DISCONNECT AFTER LAST LU-LU
                    DLOGMOD=D4C32782,      IBM DEFAULT FOR 3278 MOD2
                    DUPLEX=FULL,           FULL DUPLEX COMMUNICATION LINE
                    IRETRY=NO,             DO NOT RETRY POLL AFTER IDLE T/O
                    ISTATUS=ACTIVE,        INITIAL STATUS IS ACTIVE
                    LNCTL=SDLC,            SDLC  PROTOCOL
                    MAXDATA=265,           MAX PIU SIZE FOR TYPE2 PU
                    MAXOUT=7,              FRAMES SENT BEFORE POLL SENT FOR RESP
                    MODETAB=ISTINCLM,      USE IBM DEFAULT LOGMODE TABLE
                    NEWSYNC=NO,            NO NEW SYNC FEATURE
                    NRZI=YES,
                    PACING=NO,             DEFAULT
                    PASSLIM=7,             MAX CONSECUTIVE PIU'S SENT
                    PAUSE=0.2,             AVERAGE DURATION OF POLLING CYCLE
                    PUTYPE=2,              PHYSICAL UNIT TYPE
                    REPLYTO=1.0,           TIMEOUT INTERVAL AFTER CPS RECEIVED
                    RETRIES=(2,3,2),       RETRY  OPTIONS
                    SERVLIM=10,            NORMAL SCANS OF SERVICE ORDER TABLE
                    SPDSEL=NO,             NO CHANGE OF MODEM DATA RATE
                    SPEED=9600,            LINE  SPEED
                    SSCPFM=USSSCS,         CHAR CODED RU'S
                    TYPE=NCP,              NCP LINE GROUP
                    USSTAB=ISTINCDT,       USE IBM DEFAULT USS TABLE
LN0A8     LINE      ADDRESS=(0A8)
          SERVICE   ORDER=(PU0A80)
PU0A80    PU        ADDR=C0
LU0A8000  L U       LOCADDR=02,
                    USSTAB=USSRMT
LU0A8001  L U       LOCADDR=03,
                    USSTAB=USSRMT
    :         :         :                     :
    :         :         :                     :
```

Operating at Speeds Over 9600 Baud

The DataTalker 3270 U/X software now supports SDLC speeds up to 56Kbyte when utilized with CLEO'S DataTalker/XL co-processor card. The Emulex Micro-channel card supports speeds up to 9600 baud. BSC protocol supports speeds up to 9600 baud on all cards.

Certain line configurations must be present to utilize SDLC baud rates above 9600 baud. Table D-2 summarizes the affected configuration parameters.

Table D-2. Configuration Parameters

Duplex	Type	Max. Baud	Comments
FULL	LEASED	56 Kbyte	Ideal environment for the highest supported baud rates.
HALF	LEASED	56 Kbyte	Typical environment for a multi-drop configuration.
HALF	SWITCHED	9600 Kbyte	This environment is not supported at line speeds above 9600 Kbyte.

The two optional configurable parameters which introduce transmission line delays, the CTS_DELAY and FRM_DELAY parameters in the host.cfgX file, should not be set to any value above zero (unless it has been specifically determined that it is necessary to do so). Setting either of these parameters to a value above zero for line speeds over 19.2 Kbyte baud will cause line transmission problems. This may result in missing received frames.

The configuration parameters, LINE_TYPE and LINE_MODE, must be set to reflect your modem environment. The two possible LINE_TYPE values are SWITCHED and LEASED. The LEASED setting indicates that a line connection will always be present. The SWITCHED setting means that one end must dial-up the other end in order for a line connection to be established.

The two possible LINE_MODE values are HALF and FULL. The HALF setting is used in most dial-up environments except when the modem is a V.32, V.22, or a V.42. HALF must also be specified in multi-drop environments. The FULL setting is used in single-drop, dedicated line environments or when V.22, V.32 and V.42 modems are being used.

Table D-3 summarizes these two configuration parameter settings. The CTS column indicates the action of the RTS modem signal. Toggled means that RTS is raised and lowered as required; Constant means that RTS is raised during protocol initialization and left high.

Table D-3. Configuration Parameters

LINE_MODE	LINE_TYPE	CTS	Situation
HALF	SWITCHED	Toggled	All dial-up modems *except* V.22, V.32 or V.42 which keep DSR constantly high
HALF	LEASED	Toggled	Multidrop environments (not dial-up)
FULL	SWITCHED	Toggled	Dial-up environments utilizing V.22, V.32 or V.42 modems which indicate line-connection via DCD
FULL	LEASED	Constant	Single-drop, dedicated line environments

D-22

VIS Host Configuration

After the host is configured properly, the VIS parameters must be set to agree with the host's parameters. This configuration information is stored in an ASCII file called **/usr/lib/3270/host.cfg** *n.* The **Define SNA Link** and **Define BISYNC Link** screen fields corresponding to these configuration parameters are in parentheses. All the possible parameters are defined in Chapter 4, "Installing Software for Optional Features," of *CONVERSANT Voice Information System Version 3.1 Software Installation and Upgrade, 585-350-104.* The more common parameters are discussed in this chapter.

SDLC/SNA Configuration

- EXEC_TYPE (Protocol) — Specifies the 3270 Communication Manager software that will be downloaded when the card is initialized. The value for this parameter must be SNA (for SNA/SDLC).

- CRT24_80 (List of LUs) — Specifies which logical units (LUs) should be defined as 3278 Mod 2 terminals. The list of device numbers can range from 2 to 255. These numbers correspond to the LUs that are defined in the host sysgen. They do *not* have to be consecutive numbers.

   There are other types of devices available; however, the typical configuration is for CRT24_80. Refer to the *CONVERSANT Voice Information System Version 3.1 Software Installation and Upgrade, 585-350-104,* for the other device types.

- SDLC_ADDR (SNAAddress) — Specifies the cluster controller address. The range of values for *address* is from 1 to 254. This address must be given as a decimal value and should be equal to the hex value for the PU ADDR parameter in the host sysgen. If this value is omitted or is incorrect, host communications will not be established.

- LINE_MODE (Line Mode) — Specifies the duplex setting for the host link. The two values for *mode* are HALF and FULL. Each line that is multi-dropped should be configured for half duplex and should have a unique SDLC_ADDR value. This parameter should match the setting in the host sysgen for the DUPLEX parameter. The default value for *mode* is HALF.

- XID (XID) — Necessary only for host links that go through dialup lines. The *xid string* is derived from the host system parameters, IDBLOCK (values can be 0x017, 0x018, or 0x03D), and IDNUM (values can range from 0x00000 to 0xFFFFF). You can get these values from the host system administrator. For example, the XID for dialing into a host with IDBLOCK of 0x017 and IDNUM of 0xC8C90 would be 017c8c90 (note the leading zero and the lowercase hex digits).

- NRZ_CODE (Code) — Specifies the data link's encoding format. This parameter should match the setting in the host sysgen for the NRZ parameter. The valid values for *code* are NRZ (Non Return to Zero) or NRZI (Non Return to Zero Inverted).

The previous parameters are downloaded to the card in binary format, along with the executable card-level files (that is, sna). The procedures for initializing the card are outlined later in this chapter.

There are other configuration parameters available which are described in the *CONVERSANT Voice Information System Version 3.1 Software Installation and Upgrade, 585-350-104.* However, they are rarely used and are not discussed here.

BISYNC Configuration

- EXEC_TYPE (Protocol) — Specifies the 3270 Communication Manager software that will be downloaded when the card is initialized. The value for this parameter must be BSC.

- CRT24_80 (List of LUs) — Specifies which logical units (LUs) should be defined as 3278 Mod 2 terminals. The list of device numbers can range from 0 to 31. These numbers correspond to the LUs that are defined in the host sysgen. They do *not* have to be consecutive numbers.

  There are other types of devices available; however, the typical configuration is for CRT24_80. Refer to the *CONVERSANT Voice Information System Version 3.1 Software Installation and Upgrade* for the other device types.

- CONTR_TYPE (Controller Type) — Indicates the cluster controller type to be emulated. The valid values for *type* are 3274, 3275, or 3276. There must be a value specified for this parameter.

- CU_ADDR (Control Unit Address) — Specifies the control unit address. The values for *address* can range from 0 to 31. There must be a value specified for this parameter.

The above parameters are downloaded to the card in binary format, along with the executable card-level files (that is, bsc). The procedures for initializing the card are outlined in the next subchapter.

There are other configuration parameters available which are described in *CONVERSANT Voice Information System Version 3.1 Software Installation and Upgrade, 585-350-104.* However, they are rarely used and are not discussed here.

Initialization Procedures

Refer to Chapter 3, "Configuration Management," for information on initializing host links. The 3270 host card may also be initialized by typing the following command at the UNIX system prompt.

```
/usr/lbin/3270_cfg 0  (to initialize card 0)
```

```
or
```

/usr/lbin/3270_cfg 1 (to initialize card 1)

The above commands will verify configuration information provided in the ASCII **/usr/lib/3270/host_cfg** n file and display a confirmation screen only if configuration information is correct. Confirm information in this screen by typing *y* or [ENTER] at the prompt. The UNIX system prompt will appear after a message indicating that download of the card is complete.

The above commands are found in the **/usr/lbin** directory. If they do not appear to work, make sure that the **/usr/lbin** directory is added to the UNIX system $PATH variable and that the 3270 package has been installed. Also confirm that administrator privileges are available.

Troubleshooting Configuration Problems

If, after configuring both the host and the VIS, communication (that is, polling) cannot be established, review the critical parameters mentioned previously. Typical descriptions of faulty host links along with the most likely causes are provided next:

- **Host polls but VIS does not respond** — Most likely, the host is sending the XID exchange information that the VIS does not recognize. Verify that the XID value in the VIS configuration file matches the value in the host sysgen file. The proper format is outlined earlier in this subchapter. Also check the CC_ADDR and the modem/modem eliminator settings. The card must be downloaded again if these parameters are changed or if the card appears to be "stuck". Use the **3270_cfg/**n or **host_cfg** and **load_bin** commands to reset the 3270 card. After the card is reset, some hosts will need to have the link to the VIS deactivated and activated. Refer to the *CONVERSANT Voice Information System Version 3.1 Command Reference, 585-350-203,* for additional information about the **host_cfg** and **load_bin** commands.

- **Communication starts but then the link is dropped** — The most likely cause of this is that the cluster controller addresses for the host and the VIS do not match. The VIS must have the *decimal* equivalent of the hex value in the host sysgen file.

- **The link appears to be polling but there is no link activity** — This can be a result of mismatched codes between the host and VIS. Check the host's sysgen for the link's encoding mode. Verify that the NRZ_CODE value in the VIS configuration file matches the NRZI value.

- **On a multi-dropped line, one VIS works but another VIS does not** — The host link must be configured for half duplex in the VIS configuration files. Also, each VIS must have a unique SDLC_ADDR.

- **Poor host response times** — Some items to check for in this situation include: mismatching duplex settings between the host and the VIS, noisy data link causing a high retransmission rate, host applications that use the 'Read Buffer' command, and applications that send a full 1920 bytes of data when only a few bytes are required. It may be necessary to consult with the host application administrators to improve some of these performance problems. For the non-application based problems, check the duplex settings and the physical link between the host and the VIS. The network administrator should be able to help you in these instances.

- **Application does not work the same as on another 3278 terminal** — The most likely cause of this problem is that the host and VIS are configured for different types of devices. Verify that the sysgen parameters are set for a 3274 cluster controller with 3278 model 2 terminals connected to it.

D-26

Cannot Establish a Polling Connection with the Host

This problem usually indicates that one of the configuration parameters has been set incorrectly. The primary suspects include the XID, SDLC_ADDR, and LINE_MODE values.

■ The XID is a string used for identification of devices connected to the host via dialup lines. The XID is not needed for systems that are connected through leased lines or modem eliminators. However, if it is set for these systems, it will not cause any damage.

   The XID consists of two host parameters: IDBLOCK and IDNUM. The IDBLOCK is a parameter that can have one of the three hexadecimal values: 0x17, 0x18, or 0x3D. The IDNUM can be any hex value from 0x00000 to 0xFFFFF. The XID format is [Leading zero][IDBLOCK][IDNUM]. For example, the XID for connecting to a host with an IDBLOCK of 0x17 and an IDNUM of 0xC8C90 would be 017c8c90 (Note the lowercase hex digits).

■ The SDCL_ADDR value in the **host.cfg0** file must be a **decimal** value that is equivalent to the hex value for PU ADDR in the host sysgen. The conversion from hex to decimal involves multiplying each hex digit by its positional weight.

   Hex digits range from 0 to 9 then continue as A (equal to a decimal 10), B (11), C (12), D (13), E (14), and F (15). The digit farthest to the right in a hex number has a weight of 1 and the next position to the left has a weight of 16. So to calculate the decimal equivalent to the hex number 0xC2, multiply C (12) by 16, then add that to the product of 2×1; that is, $C2 = 12 \times 16 + 2 \times 1 = 194$. Examples include ($0xD7 = 13 \times 16 + 7 \times 1 = 215$), ($0xA1 = 10 \times 16 + 1 \times 1 = 161$), ($0x01 = 0 \times 16 + 1 \times 1 = 1$).

■ The LINE_MODE value must be set for HALF for VIS systems on a multi-dropped line (when more than one terminal share the line). Also, each device must have a unique SDLC_ADDR that the host is aware of in order to be able to recognize each device.

Note that some of the "causes" listed above also can be the source for more than one symptom. For example, faulty device definition on the host can lead to slow host response times, interrupted link activity, and dropped host links. In other words, you should review all parameters if the suggestions above do not solve the problem.

Diagnosing Host Communication Problems

In this subchapter, standard methods used to diagnose host problems are discussed. Included for each method is the procedure, the tools, and the organizations that can help. Remember, the more on-site investigative work that is completed to identify a problem, the faster these organizations can help you to solve the problem.

Working with Host Administrators

There are two types of host administrators you may need to consult when trying to solve a host-related problem: network and application. Consult the network administrator on problems involving the VIS host configuration parameters and sysgen parameters. Consult the application administrator for host application problems. It is recommended that you make a list of contact numbers for all of the host administrators in case a host problem requires their assistance during off hours.

Network Administration Problems

When you have difficulty with the host application, first verify that the host application is up and running. Then contact the Host Administrators to determine if there has been any change in the host application or the host sysgen parameters. Even a small change in a host screen could create problems with the interaction between the VIS and the host.

Diagnostic Tools and Utilities

Once you have determined there is a problem between the VIS and the host, there are several tools available that provide valuable diagnostic information. Collecting this data *before* reporting the trouble will save time. One of the critical steps involved in solving host interface problems is identifying what part of the application is having the trouble. There are three areas of interaction between the VIS application and the host machine: the login/logout procedure, the recovery procedure, and the transaction steps in the host application. Many of the tools described below require that the problem be reproduced multiple times in order to gather the necessary data. Use the following techniques to repeat the steps within that procedure.

D-28

■ **Login/logout**

For most applications, stopping and starting the VIS (either using the System Control screen or, from the UNIX system command line, using the the **stop_vs** and **start_vs** commands) causes the host interface process to logoff from the host (stop_vs) and then to log back into the host (start_vs). The **stop_vs** command checks the LUs and logs out the application(s). The command waits up to 60 seconds (6 series of the 10 seconds each), then continues stopping the voice system. If the application was generated with Script Builder, then the commands **hlogout** and **hlogin** force the 3270 DIP to go through the logout and login procedures.

The syntax for the **hlogout** and **hlogin** commands is provided below.

■ **Recovery**

If the application has a recovery module, it can be invoked by calling into the application, then hanging up in the middle of the transaction. In other words, the recovery sequence takes over once the call has been completed (whether by hanging, completing the transaction, etc). Sometimes a test of the recovery module may require that this procedure be repeated many times in rapid succession with a single LU to the host.

■ **Transaction**

An application's transaction can be invoked by calling into the application and then going through the steps until the problem is reached.

In addition to providing diagnostic information after the problem has been identified, these methods for repeating modules of the host interface process are useful in isolating the area that is experiencing the problem.

The commands (along with the recommended syntax for those commands) that are used in gathering network diagnostic information are described below. For additional information concerning these commands, refer to the *CONVERSANT Voice Information System Version 3.1 Command Reference, 585-350-203.*

■ **sb_te {<session_number>}**

This terminal emulation program allows a user to step through the host application, including the logon, logoff, and recovery procedures of a Script Builder application. Only one session_number is accepted. This session_number is optional and ranges from 0 to 63. If no session_number is given, the command tries to open all sessions on all 3270 cards installed in the system and automatically displays the first session (use [CTRL][y] to display multiple sessions). If a session is not specified, the system assumes the value "all" for sessions 0-63 for both cards in a two card installation. Sessions numbered from 0 to 31 are mapped to Logical Unit (LU) numbers configured in card 0 and sessions numbered from 32 to 63 mapped to LUs configured in card 1. For example, session number 0 corresponds to the first LU number specified in the **Configure Host Link** screen for Link 0, while session number 1 corresponds to the second LU number in the Configure Host Link screen. Similarly, session number 32 corresponds to the first LU number specified in the Configure Host Link screen for Link 1, while session number 33 corresponds to the second LU number in the Configure Host Link screen, etc. If the first session the first card is not configured, **sb_te** automatically proceeds to the first session on the next card. For example, if session 0 on card 0 is specified and that session is not configured, a failure message is displayed and the **sb_te** command proceeds to the first session on card 1.

The sb_te command is used to verify if there have been any changes to the host application. Sometimes changes can occur on the host end that are not passed down to the VIS development end. The session number chosen must be released from the host interface process before invoking sb_te. This can be accomplished by stopping the DIP (for non-Script Builder applications) or by using the **hfree** command described later (for Script Builder applications). Refer to the *CONVERSANT Voice Information System Version 3.1 Command Reference, 585-350-203,* for additional information about the **sb_te** command.

■ **hspy [<session_number or range or all>]**

By specifying a session number (or all), this command shows what screen currently is being presented on that session. Make a note of this information; it will help to isolate what screens might be involved in the problem. Refer to the *CONVERSANT Voice Information System Version 3.1 Command Reference, 585-350-203,* for additional information about the **hspy** command.

■ **hlogin [<host application> or <session_number or range or all>]**

The **hlogin** command invokes the login procedure that is defined in the application's *host session maintenance* section. This command is often used in the system's cron table to log in early the next morning. It is a clean, convenient way to log into the host application. Note that the LU must be in the logged out state before you may use the **hlogin** command. Refer to the *CONVERSANT Voice Information System Version 3.1 Command Reference, 585-350-203,* for additional information about the **hlogin** command.

■ **hlogout [<host application> or <session_number or range or all>]**

The **hlogout** command invokes the logout procedure that is defined in the application's *host session maintenance* section. This command is often used in the system's cron table to log off of the host before it goes down at night. It is a clean, convenient way to log out of the host application. Note that the LU must be in the logged in state before you may use the **hlogout** command. Refer to the *CONVERSANT Voice Information System Version 3.1 Command Reference, 585-350-203,* for additional information about the **hlogout** command.

■ **hfree [<host application> or <session_number or range or all>]**

The **hfree** command releases LUs from their Script Builder application assignments. It is necessary to use this command to switch from the application to the terminal emulator on a given LU. Note that the **hfree** command will not automatically log out the specified LU. Refer to the *CONVERSANT Voice Information System Version 3.1 Command Reference, 585-350-203,* for additional information about the **hfree** command.

■ **hassign [hostsvc] <host application> to <Session # or range or all>**

The **hassign** command assigns applications to session numbers. It is necessary to use this command to switch from using the terminal emulator to having an application assigned to a given LU. Note that the **hassign** command will automatically log in the specified LU. Refer to the *CONVERSANT Voice Information System Version 3.1 Command Reference, 585-350-203,* for additional information about the **hassign** command.

D-31

■ **hdelete [hostsvc] <host application> from <Session # or range or all>**

The **hdelete** command invokes the logout procedure that is defined in the application's *host session maintenance* section, releases LUs from their Script Builder application assignments, and automatically removes the host application from the session. Refer to the *CONVERSANT Voice Information System Version 3.1 Command Reference, 585-350-203,* for additional information about the **hdelete** command.

■ **addboard**

The **addboard** command enables you to add or modify hardware configuration information for a single 3270 host card to the system. You may add the 3270 hardware before or after using the **addboard** command to add or modify hardware configuration information. Installing a new 3270 host card requires that the VIS be shut down and then rebooted. Consequently, after you perform the **addboard** command, you must execute **stop_vs** and then **start_vs** from the UNIX system command line to stop and restart the system and automatically activate the new hardware information for the selected 3270 host card. Confirm that you are logged in as **root** (super user) before using the **addboard** command. Refer to *CONVERSANT Voice Information System Version 3.1 Command Reference, 585-350-203,* for additional information about the **addboard** command and Chapter 2, "Trouble and Failure Indications," of *CONVERSANT Voice Information System Version 3.1 Maintenance, 585-350-105,* for troubleshooting information.

■ **rmboard**

The **rmboard** command enables you to remove hardware for a single 3270 host card from the system. After you perform the **rmboard** command, you must execute **stop_vs** and then **start_vs** from the UNIX system command line to stop and restart the system and deactivate the 3270 host card which was removed from the system. Confirm that you are logged in as **root** (super user) before using the **rmboard** command. Refer to the *CONVERSANT Voice Information System Version 3.1 Command Reference, 585-350-203,* for additional information about the **rmboard** command.

■ **lsboard**

The **lsboard** displays configuration information for every 3270 card on the system. Confirm that you are logged in as **root** (super user) before using the **lsboard** command.

D-**32**

Interface Problems with 3270 Cards and Host
Interface Process

Occasionally, you may not receive any response from some of the above administrative commands. This might occur if the 3270 hostdip process, the 3270 driver, the 3270 card software, and the host are not in sync with each other. This could be indicative of any of the following problems:

1. The hostdip 3270 process and the 3270 card software.

2. The 3270 card software and the host.

3. Both 1 and 2 (above).

A logger message indicating that "DIP0: Timed out on 3270 Driver IOCTL call, error0 = 0xNNNN" from the hostdip indicates a problem between the hostdip process and the 3270 card software. In this case, the hostdip process will automatically reset the 3270 card.

If you are troubleshooting problems between the hostdip 3270 process and the 3270 card software and/or the 3270 card software and the host, you will want to use the **r** and **d** options. If you are troubleshooting problems between the 3270 card software and the host, you will want to use the **/usr/cbin/cmgrtool -b/***N* **-t** *filename* command. If the card is "stuck," you will want to use the **/usr/lbin/3270_cfg** *n* command. Each of these commands are described in detail below.

■   **r** and **d** options

If the card is not responding to the host and the hostdip process, you may want to specify the **r** and **d** options for the hostdip 3270 process in the **/vs/data/HOST3270** and **/etc/conf/init.d/HOST3270** files. The **r** option specifies the session recovery retry count. If the count is small (close to 0), the 3270 card gets reset within a short time and the time to reset the 3270 card increases with the retry count increase. A valid argument for this option is a numeric value greater than 0. The **d** option activates the dump facility for memory segments of the card. Valid arguments for the **d** option include 0 (activates dumping for card 0), 1 (activates dumping for card 1), and 2 (activates dumping for card 0 and card 1).

The following procedures describes specifying the **r** and **d** options in the **/vs/data/HOST3270** file.

1. Log into the system as **root.**

2. Enter:

   cd /vs/data

3. Enter:

   vi HOST3270

4. Add **-r <retries>** and/or **-d <0/1/2>** following the "agdip 3270." The default for the **-r** option is 15. Specifying a large number in this field will probably never download the host card.

   ```
   CV91:4:off: /vs/bin/vrs/agdip3270 –r100 –d2
   </dev/console>/dev/console  2>&l
   ```

5. Enter:

   :wq!

   to exit the file and save the changes made.

6. Perform the *Stopping the Voice System* and *Starting the Voice System* procedures as described in Chapter 4, "Common Maintenance Procedures," of *CONVERSANT Voice Information System Version 3.1 Maintenance, 585-350-105.*

■ Enter:

   ps -ef | grep agdip3270

to make sure the change appears in the file.

The following figure shows an example of the 3270 host recovery strategy. This process is outside the customer's recovery sequence.
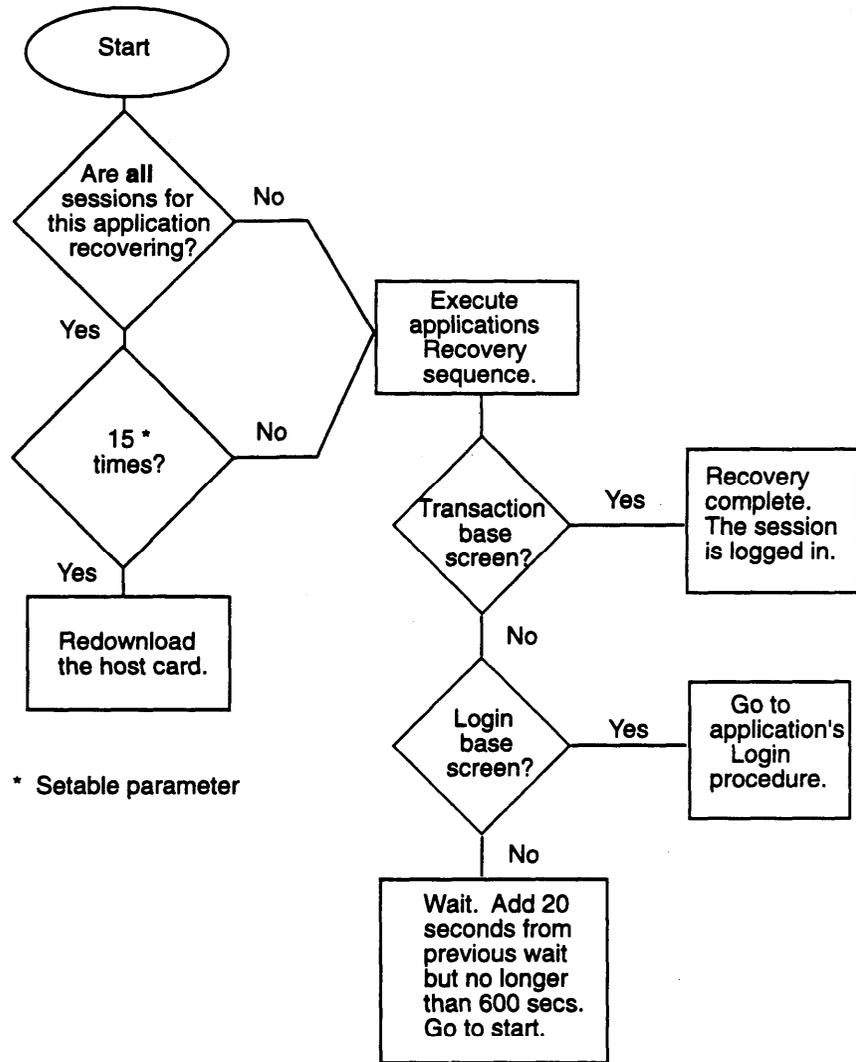
Figure D-8. VIS 3270 Host Recovery Strategy

■ **/usr/lbin/cmgrtool -b/**N **-t** *filename* **&**

If the card is not responding to the host request, use the above format for the **cmgrtool** command to capture the activity of the 3270 link N into the specified *filename.* Record the process id number displayed when this command is executed. Then, reproduce the problem or wait for the problem to occur again. The *filename* will contain all link activity that has occurred. Once the problem has occurred, stop the **cmgrtool** using [DELETE] or entering **kill -9 *<process id>.*** At this point, enter:

   /usr/lbin/cmgrtool   -bN **-m** *filename*

to dump the memory contents of the host card into filename. Use the **dscope infile out_file** command to convert the data in a readable form so that you may analyze the output for any configuration and/or protocol problem. Refer to the *CONVERSANT Voice Information System Version 3.1 Command Reference, 585-350-203,* for additional information on the **cmgrtool** and **dscope** commands.

■ **/usr/lbin/cmgrtool -b**/N **- v**

This command displays the version of the SNA or BSC software currently installed on the system.

■ **/usr/lbin/3270_cfg** *n*

The **/usr/lbin/3270_cfg** command recompiles the configuration data and downloads all of the necessary software to the card, thereby resetting the 3270 card and all the LUs. The value for *n* is either 0 (card 0) or 1 (card 1). Note that the host link is disconnected and will have to be reconnected. This command is useful when testing new configuration parameters or new card-level software. This command may also be useful if the card ever gets "stuck."

These tools are part of the standard procedure that AT&T uses to diagnose and solve host communications difficulties. The more familiar you are with these tools, the easier it will be to solve any host interface problems.

Tracing Host Links

If the tools discussed previously do not identify the problem, you must trace the host link activity. Traces of the host link activity often prove to be the critical factor in resolving faulty VIS-host communications. Typical steps involved in obtaining such a trace include the following:

■ Notify the host system network administrator that you need to trace the host link.

■ Use a data scope to provide the captured frames in a paper printout. Since there are many different types of scopes with many different storage formats and mediums, a paper printout of the captured data is generally the most useful method of transferring the information.

■ After the scope has been placed on the link, repeat the steps that are involved in reproducing the problem. Methods for repeating specific modules of the host interface process are outlined earlier in this chapter.

■ After the problem has been successfully repeated, get the printout of the results from the scope. You probably will have to FAX this to one of the support groups.

If the network administrator does not notice anything unusual in the trace, contact the Technical Support Center (TSC) at 1-800-344-9670 and inform them of the problem. They will need an accurate description of the symptoms and any possible causes of the problem as well as the data collected so far (for example, the link trace, DIP traces, etc.).

Application-Level Problems

During the course of application development, most applications experience difficulties in the host interface sections. Problems in this area of the application may have causes ranging from system limitations to lack of understanding of the VIS-host interaction. The following information is provided to help you isolate and solve difficulties that may occur during application development.

Host Interface Process Not Responding Message

If this message is returned after submitting a request **(hfree, hassign, hlogin,** etc.) to the host interface process. the 3270 DIP is stuck in a state that prevents it from reading its queue. This can occur if the application causes the DIP to stay in a 'tight loop'. A tight loop is one in which the application causes the same module to be executed many times very quickly.

The most common method of invoking this condition is to continually go to the top of the recovery module from another statement within recovery. For example, if an initial attempt to recover from an aborted call fails and the application's reaction is to 'Goto recovery', then a tight loop may be started. This practice is unnecessary because as long as the host interface process is not at the Transaction Base Screen after Recovery, it waits and repeats that module automatically. The time intervals between retries increase from two minutes, to four, to six, up to 10 minutes, so loops are not needed.

Although this type of loop is most common in the recovery procedure, it is by no means limited to that section. Any portion of an application that reacts to a failure by immediately jumping to itself may cause tight loops. More suitable responses to such situations are to wait for the host screens to settle down, increase the number of retries or the timeout value before a failure status is returned, or use specific commands or keys that can be sent to force certain screens to appear (for example, the **CLEAR** key).

By producing more robust code for the host interface portions of the application, the developer can allow for a greater variance of host behavior. Typically, this type of problem surfaces on days when the host is slow in sending back screens, causing the application to timeout on reading that screen. After timing out, the application may transfer the caller and enter the recovery procedure which, due to the slow host response time, may induce a tight loop. In other words, under normal conditions, this problem may never appear. However, certain abnormal conditions may uncover the faulty code in an application.

D-38

In order to return the system to normal after locking up the host interface process, stop and then start the VIS. You may stop and restart the voice system by performing the stop voice system and restart voice system procedures described in Chapter 4, "Common Maintenance Procedures," of *CONVERSANT Voice Information System Version 3.1 Maintenance, 585-350-105,* or by using the System Control screen as described in Chapter 3, "Configuration Management."

Unrecognized Screen Errors

This error can appear in the logger or in a trace of an LU that the application is using. This messages indicates either that some of the host screens in the Script Builder application are not properly defined (identifiers, or actual screen names) or that the host application has changed, resulting in a different screen being sent. There also may be other non-application dependent causes, which are identified later in this chapter.

In order to isolate this problem, use the terminal emulator program, *sb_te,* to log into the host application to verify that the screens are correct. The Script Builder program may be needed to capture new screens or to define new identifiers.

Send Screen or Input Inhibited Errors

Typically, these errors occur when the sequence of Get Screen and Send Screen commands are out of order. The host must be expecting a screen from the VIS when a Send Screen command is issued; otherwise, an *Input Inhibited* error is produced. The only way for the application to make sure that the host is expecting a screen is to Get the previous screen. Thus, executing two Send Screens in a row without a Get Screen causes the 'send failed' error. The non-application dependent causes for these errors also are described later in this chapter.

Miscellaneous Host Interface Problems

The following paragraphs include all of the known problems with the IBM 3270 Host Communications Package. The work-arounds (if known) also are provided.

File /dev/host0 Fails to Open

This problem occurs when the 3270 card is stuck in an inactive state. It typically is caused by an error between the VIS and the host (dropped host link, power hit on the VIS, etc.). The only way to reset a card in this state is to stop the VIS, shutdown the CPU, power down, then power up again. In some previous instances of this error, the card has had to be reseated in its slot.

Parity Error — Address of Add-on Card Unknown

This problem usually indicates a faulty 3270 card. One solution is to remove the card (after being properly grounded), reseat the memory components on the card, then replace the card in the slot. This usually causes the parity error to disappear. However, a new 3270 may be required. Contact the support hotline if this problem persists.

3270 Software Version Number Incompatibility

Because there have been many patches to the 3270 software, there are some incompatibilities between the card level software versions and the driver software versions. These incompatibilities can prevent the VIS from communicating with the host. In most cases, even the card is inaccessible to the user. If you invoke **sb_te** when this problem occurs, the following error is returned: *Devices either not configured or in use.* (Note that this message also appears if the LU being requested by the **sb_te** command is already being used by a Script Builder application).

Incompatible 3270 card-level and driver software also can cause the 3270 DIP to get stuck. Contact the support hotline for the latest versions of the software.

D-40

Script Builder Login/Logout/Recovery
Procedures Not Working

These sections of the *Host Session Maintenance* module do not treat labels (other than **login, logout,** and **recover)** in the same manner as the *Transaction* module. Each label indicates the closing and the opening of a *sequence.* For example, the **logout** label closes the **login** sequence and opens the **logout** sequence. The point to remember is that if additional labels are needed in the **login** or **recovery** routines, the developer must make sure that control is directed from one sequence to the next. This can be done by using a **Goto {label name}** command as the last line in a sequence; that is, the line before {label name}.

CLEO DataTalker 3270 U/X

The CLEO DataTalker 3270 (U/X) communications products enable up to 32 UNIX system users to access host computers through emulation of an IBM 3270 terminal on a single card. In addition to the standard 3270 terminal features, this software provides for file transfer capabilities between the VIS and a host which has installed the **IND$FILE** file transfer program.

The DataTalker hardware processes all 3270 communications so that your system is not slowed down by the communication line traffic. The communications card contains at least 256k bytes of dedicated memory.

Starting Terminal Emulation

To begin a host session via the Terminal Emulator, follow the procedures outlined below.

1. Turn on the modem or modem eliminator.

2. Start the 3270 Terminal Emulation software directly by typing the following command.

    sb_te {<session_number>} and [ENTER]

    Note that the **sb_te** command can be entered from any level, but it is typically entered from the /vs/bin/util directory.

    ⟹ **NOTE:**
    Mapping between Session numbers and LU numbers is performed by the 3270 software in the following manner: Sessions numbered from 0 to 31 occur over host link 0 (card 0), while sessions numbered from 32 to 63 occur over host link 1 (card 1). The session corresponding to the LU that is being used for Terminal Emulation will not be available for any service assignment.

    The Terminal Emulator Initialization screen will appear. From the Terminal Emulator Initialization screen, press any key to begin terminal emulation.

D-42

3. If the host is active, the Terminal Emulator screen will display the current screen. If the host is inactive, the screen will display the last host screen.

4. The 3270 status line appears at the bottom of the screen. Figure D-9 shows an example of what a status line might look like. Note that the LU number at the bottom right of the status line corresponds to the session number. Refer to Table D-4 for additional information on the meanings for status line indicators generated during terminal emulator operations. Mapping from session numbers to LU numbers is performed by the 3270 software.

```
-----------------------------------------------------------------------------------------
 4 ?                      -z_                                                       LU:2
```

Figure D-9. Terminal Emulator Status Line

5. Connect with the host computer by dialing the telephone number of the host (dial-up connections). If you have direct connect (leased-line) connections rather than dial-up connections, the host will probably identify itself soon after the communications card is loaded.

6. You will now be able to interact with the host in emulation mode.

Status Line Indicators

Table D-4 lists the status line values and meanings for status line indicators generated during terminal emulator operations. Unless otherwise noted, these status lines are located on the bottom left side of the screen.

Table D-4. Terminal Emulator Status Line Indicators

Status Line	Meaning
4	Host card is emulating a 3270 controller.
?	Host session (LU) has not been actuated by the host.
O	Host connected to SSCP (SNA-only).
■	Host connected to a host application (LU-LU).
X SYSTEM	Keyboard has been disabled (host will not respond to input). System lock.
X (<)	Keyboard has been disabled (host will not respond to input). System busy.
X =.=	Keyboard has been disabled (host will not respond to input). Printer busy.
X=-	Keyboard has been disabled (host will not respond to input). Printer not working.
X < -t>	The keyboard is locked. You are attempting to input into a protected field. Press the key configured as Reset on the 3270 host to unlock the keyboard. *Do not* press the PC master [RESET] to unlock the keyboard.
X -f	The keyboard is locked. The function key you pressed is unavailable. Press the key configured as Reset on the 3270 host to unlock the keyboard. *Do not* press the PC master [RESET] to unlock the keyboard.

Continued on next page

D-44

Table D-4. Terminal Emulator Status Line Indicators *(continued)*

Status Line	Meaning
X t>	The keyboard is locked due to field overflow (too much data input). Press the key configured as Reset on the 3270 host to unlock the keyboard. *Do not* press the PC master [RESET] to unlock the keyboard.
X ?+	The keyboard is locked. Input ignored because keyboard is disabled. Press the key configured as Reset on the 3270 host to unlock the keyboard. *Do not* press the PC master [RESET] to unlock the keyboard.
^	Insert mode (toggles on and off with Insert key).
=-=	Printing.
-z_	Broken communication link; that is, there is no DSR signal from modem, or SDLC is in Normal Disconnect Mode, or more than 60 contiguous seconds of silence from the host. This status line indicator is located at the left center of the screen.

A real 3278 terminal also displays indicators when [SHIFT] is depressed and when [NUM LOCK] is engaged. Due to UNIX limitations, these are not displayed on the emulated status line, but most PC keyboards have lighted indicators for [NUM LOCK] and [CAPS LOCK]. A real 3278 terminal displays some of the above in different form, using the 3278 graphic capabilities ("System busy," for example, shows a miniature clock face, and "Connected to SSCP" and "Go elsewhere" show a little stick figure symbol).

D-**45**

Basic File Transfer

⟹ **NOTE:**
Before using the File Transfer feature, you must first install the 3270 File Transfer Package. Refer to Chapter 4, "Installing Software For Optional Features," of *CONVERSANT Voice Information System Version 3.1 Software Installation and Upgrade, 585-350-104,* for assistance in installing this feature.

The 3270 File Transfer Package allows you to transfer files to and from UNIX on an interactive or direct basis. Refer to Chapter 1, "User Interface," for information on interactive file transfer. File transfer may be performed directly from the UNIX command line, shell script, or a program using the **system** call. Direct file transfer information is provided below. For information on transferring Script Builder applications and software packages between host mainframe machines (IBM mainframe) running System Network Architecture and VIS machines running UNIX, refer to the information provided later in this section on Enhanced File Transfer.

Direct File Transfer

File transfers are performed directly using the **send** and **receive** programs in the directory **/usr/lbin.** The **send** and **receive** programs transfer files using a screen-buffer which interacts with the host **IND$FILE** file transfer program.

⟹ **NOTE:**
The host session must be logged in and at the system prompt before the send and receive commands can be executed. You must use the **sb_te** command to establish the host session before using the file transfer command.

D-46

send

Use the **send** program to transfer a file from the VIS to the host mainframe; that is, to upload a file. Following is an example of the **send** program:

> **send -b** *B* **-n** *N unix-file host-filename options*

-**b**

The **-b** is an argument indicating the 3270 card that will be used to send files and *B* is a value for this argument. The value for *B* is either 0 or 1 (corresponding to card number 0 and card number 1).

-**n**

The **-n** is an argument indicating the LU number that will be used to send files and the *N* is a value for this argument. The value for *N* ranges from 2 through 255 for SNA (corresponding to the LU numbers 2 through 255 on the SNA link) or from 0 through 31 for BSC (corresponding to LU numbers 0 through 31 on the BSC link).

unix-file

The **unix-file** is the name of the VIS file to be transferred. Note that the naming convention of the file follows UNIX standards. The file must be named with a full path. No directory is required if the file is in the current working directory. Refer to Table D-5 for tips on how to specify filenames when performing file transfers.

host-filename

The **host-filename** is the name of the target host mainframe file.

options

There are several **options** that may be entered to control the file transfer. File transfer options are provided in Table D-6. Note that some options are not available with all systems.

$\Longrightarrow$ **NOTE:**
Mainframe systems vary in their requirements for the options list. Some mainframes require that the option list be enclosed in parentheses, some require only the left parentheses, and others do not permit the use of parentheses. You should therefore verify the requirements of the mainframe you are using before using any of these options. All meta characters [* , ( ) etc.] must be preceded by a backslash (\) character in the **send** command line. Other characters may work, but the backslash is recommended in all cases.

D-47

receive

Use the **receive** program to transfer a file from the host mainframe to the VIS; that is, to download a file. Following is an example of the **receive** program:

> **receive -b***B* **-n** *N unix-file host-filename options*

-b

The **-b** is an argument indicating the 3270 card that will be used to receive files and *B* is a value for this argument. The value for *B* is either 0 or 1 (corresponding to card number 0 and card number 1).

-n

The **-n** is an argument indicating the LU number that will be used to receive files and N is a value for this argument. The value for N ranges from 2 through 255 for SNA (corresponding to the LU numbers 2 through 255 on the SNA link) or from 0 through 31 for BSC (corresponding to LU numbers 0 through 31 on the BSC link).

unix-file

The **unix-file** is the name of the target VIS file on download. Note that the naming convention of the file follows UNIX system standards. The file must be named with a full path. No directory is required if the file is in the current working directory. Table D-5 for tips on how to specify filenames when performing file transfers.

host-filename

The **host-filename** is the name of the host mainframe file to be transferred.

options

There are several **options** that may be entered to control the file transfer. File transfer options are provided in Table D-6. A summary of these options is provided in Table D-7. Note that some options are not available with all systems and may not all be available to Call Management System (CMS), Customer Information Control System (CICS), and Time Share Operation (TSO) systems.

⟹ **NOTE:**
Mainframe systems vary in their requirements for the options list. Some mainframes require that the option list be enclosed in parentheses, some require only the left parentheses, and others do not permit the use of parentheses. You should therefore verify the requirements of the mainframe you are using before using any of these options. All meta characters [* , ( ) etc.] must be preceded by a backslash (\) character in the **receive** command line. Other characters may work, but the backslash is recommended in all cases.

When an ASCII file is received from the host, it may have been sent with a ^Z (Ctrl-Z) at the end of the file. When you try to "vi" the file, a message may complain about an unrecognized character. You should attempt to get rid of the character in the file. This is typically a problem with TSO and VM systems.

When a binary file is received from the host, zeros (0) are added to the end of the block to make it a multiple of 80. For example, if a file of 4 bytes is sent to the host, it may contain 76 more bytes when it is returned (4 + 76 = 80).

Table D-5 provides tips on how to specify filenames when performing file transfers.

Table D-5. Filename Guidelines for File Transfer

If Filename Contains	UNIX			Host3270		
	Syntax	Examples		Syntax	Examples	
		Original	Converted		Original	Converted
| & ; < > () ' \ " ' * ? [ ] Space Tab # ~†	Precede each special character with backslash (\).	x'yy'a\bc	x\'yy\'a\\bc	Precede each special character with backslash (\).	#AB~C*DE?cde#f*h	\#AB~C*DE\?cde#f*h
$	Precede $ with backslash (\).	AB$tmp	AB\$tmp	Precede $ with backslash (\)‡.	XXyy$zz	XXyy\$zz
.	as-is	s.xx.c	s.xx.c	Enclose filename first with \'.††	s.xx.c	\'s.xx.c\'
Character not in above list	as-is	abcd	abcd	as-is	a123bcd	a123bcd

† # and - must be protected with a backslash only if they begin the filename.

‡ Protect $ with backslash only when the the file transfer is done directly with the send or receive commands. Do not protect $ when file transfer is done through the 3270 terminal emulator.

†† Protect . only if transferring files to/from a tso system and the dots in the filename is a fully qualified filename (containing the user id).

Table D-6. File Transfer Options

Parameter	Availability	Meaning
/password	TSO only	Allows the entry of a password if the TSO Data Set is password protected.
file type	CMS only	Allows the entry of the CMS file type.
file mode	CMS only	Allows the entry of the CMS file mode.
APPEND	TSO, CMS	Allows the file to be transferred to be appended to an existing file. If this parameter is not specified, the file being transferred will overwrite the existing file.
ASCII	CICS,TSO,CMS	Specifies that data format conversion between the ASCII format used by the PC and the EBCDIC format used by the mainframe be done automatically. ASCII should normally be specified for text file transfers. If this parameter is omitted, binary transfer is assumed. Binary transfer allows the transfer of data in non-readable, binary format.
BLKSIZE(n)	TSO only	Specifies the size in bytes of the TSO data set. If this parameter is omitted, the LRECL will be used. This parameter is ignored when appending to or replacing an existing data set.
CRLF	CICS,TSO,CMS	This parameter should normally be specified when text files are transferred. It directs CDI/FTS to insert carriage return/line feed characters after each record on download and strips these characters on upload.

Continued on next page

Table D-6. File Transfer Options *(continued)*

Parameter	Availability	Meaning
NOCRLF	CICS,TSO,CMS	Causes CDI/FTS to ignore carriage return/line feed characters.
LRECL(n)	TSO,CMS	Specifies the record length in bytes of the mainframe file or data set on upload. If this parameter is omitted, a record length of 80 for new files is assumed. When replacing or appending to existing files, this parameter is ignored. For variable length records, specify the largest possible record size the mainframe will accept. The actual LRECL will be the size of the largest record sent.
RECFM(F/V/U)	TSO,CMS	Specifies the format and attributes of the mainframe file or data set on upload. **F** specifies fixed-length records padded with trailing blanks up to the LRECL. **V** specifies variable-length records. **U** specifies undefined-length records. RECFM is ignored for existing files if the APPEND option is specified. The default for new files is F if CRLF is not specified and V if CRLF is specified.
SPACE(q,i)	TSO only	Specifies the disk space to be allocated on the mainframe for a data set being uploaded. The sub-parameters **q** and **i** are the quantity and increment of space to be allocated. If the SPACE parameter is not specified, the value of the BLKSIZE parameter is used to allocate space. **AVBLOCKS(value), TRACKS,** and **CYLINDERS** unit parameters may also be used with the SPACE parameter. **CYLINDERS** specifies the units to be allocated.

Table D-7 provides a quick reference to the command line parameters that can
be used for each host type when transferring files.

Table D-7. File Transfer Options Summary

Option	TSO	CMS	CICS
/password	●		
file type		●	
file mode		●	
APPEND	●	●	
ASCII	●	●	●
BLKSIZE	●		
CRLF	●	●	●
NOCRLF	●	●	●
LRECL	●	●	
RECFM	●	●	
SPACE	●		

Return Codes

Table D-8 lists the return values and meanings for return codes generated during file transfer operations. The message will be output to either **stdout** or **stderr** with a brief message describing the error.

Table D-8. CLEO File Transfer Return Codes

Return Value	Message	Meaning	Remedy
0x0000	TRANS03	File successfully transferred.	Check the information in the file to confirm that the operation was executed correctly.
0x0100	TRANS100	General failure (no **stdout** message). There are numerous possible causes, including: Host not in state to accept file transfer request, UNIX unable to run send or receive program (file not found), bad option specified on receive, etc.	Make sure the FTS software is installed correctly. Refer to Chapter 4, "Installing Software for Optional Features," of *CONVERSANT Voice Information System Version 3.1 Software Installation and Upgrade, 585-350-104.* Reinstall if necessary.
0x0400	TRANS04	File transfer completed with some records segmented. At least one record exceeded the maximum record length. The error may have resulted from using the CRLF option when the file did not contain logical records.	Check the contents of the file being uploaded and the options used. Then, try sending the file again. Alternatively, send the data to the host "as is" without interpretation. The data can then be interpreted on the host.
0x0500	TRANS05	Unix file name incorrect. No file transferred.	Use the correct UNIX file name including the full path if necessary.
0x0600	TRANS06	Command incomplete. File transfer canceled.	Review the SEND and RECEIVE command requirements.

Continued on next page

D-54

Table D-8. CLEO File Transfer Return Codes *(continued)*

Return Value	Message	Meaning	Remedy
0x0A00	TRANS10	Host has not responded within timeout period (approximately 60 seconds).	If the host screen displays the message "HOLDING," enter a host session and try to start the file transfer by pressing PF2 for CICS, Clear for CMS, or PA2 for TSO. If X SYSTEMS or X appears in the host screen, wait for the message to clear. This message indicates that the system is working slowly. If several timeout messages appear and you want to end the file transfer attempt, enter a host session and do one of the following: 1. Press [RESET] to clear operator information area. 2. Press [PF2] and [ENTER] to stop the file transfer procedure. 3. Press [CLEAR] to continue.
0x0C00	TRANS12	Error writing to disk or disk full. File transfer canceled.	Check the file system and retry the transfer.

Continued on next page

Table D-8. CLEO File Transfer Return Codes *(continued)*

Return Value	Message	Meaning	Remedy
0x1200	TRANS18	Incorrect option detected. File transfer canceled.	Correct the command to include an acceptable option and try transferring the file again.
0x1900	TRANS25	Keyboard locked. File transfer canceled.	Wait until the keyboard is free and try again. If the keyboard remains locked, switch over to the host session and analyze the problem.
0x3600	TRANS54	File transfer canceled at user request via break key.	Redo the transfer.
0x6500	TRANS101	Cannot open keyboard mapping file (zancomm.key). File transfer package improperly installed.	Remove and reinstall the File Transfer Software package. Refer to Chapter 4, "Installing Software for Optional Features," of *CONVERSANT Voice Information System Version 3.1 Software Installation and Upgrade, 585-350-104.*
0x6A00	TRANS106	Cannot initialize mainframe session. Possible causes: Board not loaded, LU not configured, LU opened by another process, LU configured as a printer.	Make sure you have fully logged into a proper user on the host system and are at a point to type commands (that is, at "READY" prompt in TSO).
0x6B00	TRANS107	Cannot open upload file.	Make sure the host file name is correct and you have permission to write to or create the file.
0x6C00	TRANS108	Cannot open download file.	Make sure the UNIX file name is correct and you have permission to write to or create the file.

Enhanced File Transfer

⟹ **NOTE:**
Before using the Enhanced File Transfer feature, you must first install the
3270 File Transfer Package. Refer to Chapter 4, "Installing Software For
Optional Features," of *CONVERSANT Voice Information System Version
3.1 Software Installation and Upgrade, 585-350-104,* for assistance in
installing this feature. Note that the Enhanced File Transfer feature must
be installed on both the remote VIS and the local VIS.

The Enhanced File Transfer feature greatly simplifies voice application upgrades
of either Script Builder applications or software packages by providing a general
purpose two-way file transfer capability between host computers running either
the System Network Architecture or Bisynchronous protocol and VIS machines
running UNIX. In addition to allowing a Script Builder application or software
package to be installed on a remote site, the Enhanced File Transfer feature
allows the host to retrieve current status or log information from a remote VIS
(via a log file) and allows the remote user to send files other than the log file to
the host (via the hsend command). The feature also provides a means for
automatically installing transferred files.

The Enhanced File Transfer Package provides a set of procedures to be performed at *both* the local VIS as well as the remote VIS. If you are working at the local VIS, you should perform the procedures provided under "Local VIS Procedures" in this chapter. If you are working at the remote VIS, you should perform the procedures provided under "Remote VIS Procedures" in this chapter.

Figure D-10 shows a sample hardware architecture for the Enhanced File Transfer feature. In this example, one local VIS and two remote VIS machines are connected to the host mainframe machine via the host3270 interface provided by the VIS. The local VIS (development VIS) is used to develop, verify, and test an application script that will be later sent and installed on the remote VIS (production VIS). The remote VIS machines handle customer calls coming from the PBX. In the example shown in Figure D-10, the developer on the local VIS machine and the remote VIS machines (remote VIS A and remote VIS B) develops, verifies, and installs a host maintenance script and then assign this script to a particular host session.

The developer on the local VIS develops, verifies, and installs an application script or software package. The local VIS developer then creates a batch file (that is, a shell script) to install the application script or software package at the remote site. If the local VIS has developed an application script, the batch file is bundled with the transaction, speech, and database portion of the application. If the local VIS has developed a software package, the batch file is bundled with this package into one cpio file. Optionally, the local VIS developer may create an APPL_FTS utility to postprocess the bundle that will be sent to the remote VIS. These procedures are described in detail later in this chapter under "Local VIS Procedures." Procedures and suggestions for batch files are described in detail later in this chapter under "Batch Files used in the Enhanced File Transfer System."

Remote VIS A and remote VIS B both poll the local VIS for the file at a time determined by the **/vs/data/fts_config** configuration file on the remote VIS machines, Optionally, the remote VIS may create an APPL_FTS utility to preprocess the bundle received from the host. These procedures are described in detail later in this chapter under "Remote VIS Procedures."

At this point, the Enhanced File Transfer system is ready to automatically transfer files from the local VIS to the host. The Enhanced File Transfer system is also ready to receive any other files sent to the host from either remote VIS.

D-58
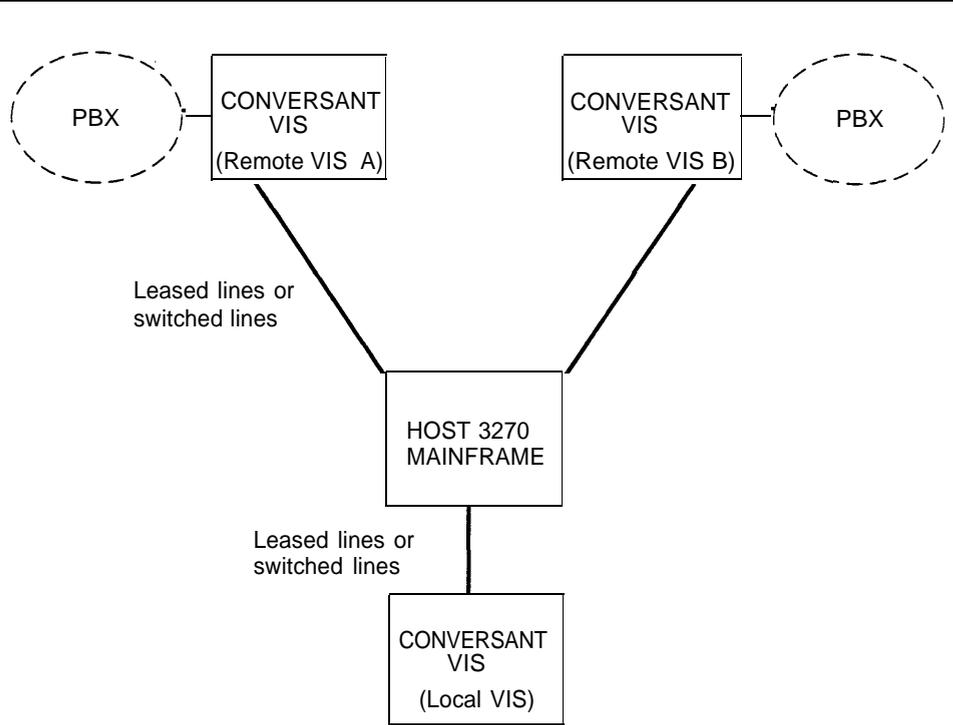
Figure D-10. Enhanced File Transfer Hardware Architecture Example

Local VIS Procedures

The user at the local VIS should do the following:

1. Develop, verify, and install a host maintenance script that initiates and maintains a host session; that is, provides procedures for login, logout, and recovery screen sequences. Note that the script should leave the host session at the host system ready prompt that will allow an interface with the host **IND$FILE** file transfer program. Refer to the *CONVERSANT Voice Information System Script Builder, 585-350-702,* for information on developing, verifying, and installing a host maintenance script.

   ⟹ **NOTE:**
   After a file transfer, the host system ready prompt may be in a different position on the screen. The recovery and logout sequences must take this into consideration. The user may need to define multiple screens for the host system ready prompt.

2. Begin the file transfer by executing the hassign command to assign the host maintenance script to the host session. Following is the format of the hassign command:

   hassign <application> to <session> [FTSCRT]

   The application is a required argument that specifies the host maintenance script for file transfer. The session is a required argument that specifies the session number or a range of session numbers. You may assign enhanced file transfer to sessions 0-31 only. The *FTSCRT* is a required argument that assigns the session for file transfer. Refer to the *CONVERSANT Voice Information System Version 3.1 Command Reference, 585-350-203,* for information on using the **hassign** command.

3. Execute the **hstatus** command to verify that the session is logged in to the proper screen for file transfer. If the session is logged in properly, hstatus will display "file transfer" as the session's status. Refer to the *CONVERSANT Voice Information System Version 3.1 Command Reference, 585-350-203,* for additional information on using the **hstatus** command.

4. If you are preparing to transfer a Script Builder application script to the remote site via the host, you must develop, verify, and install this application script using Script Builder. Refer to the *CONVERSANT Voice Information System Script Builder, 585-350-702,* for information on developing, verifying, and installing Script Builder applications.

5. If you are preparing to transfer a Script Builder application script to the remote site via the host, create a batch file to remove existing applications and install the new application script developed in the previous step. This batch file is sent with the application script to the remote VIS via the host. Once the batch file is received by the remote VIS, the remote VIS executes the commands in the batch file. The batch file can be any combination of regular UNIX commands, executable shell files, and executable program names. For example, to automatically install an application received from the host, the batch file can execute the **remove_appl, restore_appl, backup_appl,** and **install_appl** commands. Note that the name of the batch file should end with **.vb.** Procedures and suggestions for batch files are described in detail later in this chapter under "Batch Files used in the Enhanced File Transfer System." Refer to the *CONVERSANT Voice Information System Version 3.1 Command Reference, 585-350-203,* for information on the **remove_appl, restore_appl, backup_appl,** and **install_appl** commands.

6. If you are preparing to transfer a Script Builder application, execute the **backup_appl** command to create one file each for the transaction, speech, and database portion of the transaction. Next, bundle the Script Builder transaction, speech, and database files and the batch file into one bundle using the UNIX **cpio** command. If you are preparing to transfer a software package, bundle the software package and the batch file into one bundle by using the cpio command. Refer to the *CONVERSANT Voice Information System Version 3.1 Command Reference, 585-350-203,* for information on the **backup_appl** command. Refer to the *UNIX System V Release 3.2 User's Reference Manual* for information on using the UNIX cpio command.

7. Name the file to be sent to the remote VISs and, if necessary, modify the DESTINATION parameter in the configuration file **(/vs/data/fts_config)** on the local VIS machine to include this filename. The DESTINATION parameter specifies the name of the bundle on the host 3270 mainframe machine. The DESTINATION parameter is required and must be set either in the configuration file or on the **hsend** command line. Refer to the *CONVERSANT Voice Information System Version 3.1 Command Reference, 585-350-203,* for information on using the **hsend** command.

8. If necessary, create the APPL_FTS utility to postprocess the bundle (that is, a single file, a group of files, or a combination of both) that was sent to the remote VIS. APPL_FTS will be executed after the bundle is received on the remote VIS. Postprocessing is optional and may be used to customize the file transfer feature by adding header information, special files, etc. to the files that will be handled by the Enhanced File Transfer system. Note that the full path name of the postprocessing utility should be added to the APPL_FTS field in the configuration file.

9. Send the file to the remote VISs by executing the **hsend** command. The format of the **hsend** command is as follows:

hsend file=<filename> *[dest=] [opt=]*

The *<filename>* is a required argument that specifies the full path name of the UNIX file or cpio bundle to be sent to the host. Refer to Table D-5 for filename guidelines for file transfers. The *dest* is an optional argument that specifies the final destination of the file at the host. If a destination is not specified, the DESTINATION parameter from the **/vs/data/fts_config** file is used as the destination. The *opt* is an optional argument that specifies either a list of options or the letter **n** (for no options). Note that the options must be separated by a space. If an option list is provided, it is sent to the host. If the option argument value is **n,** the PARAM1, PARAM2, and PARAM3 parameter values are not appended to the host **IND$FILE** file transfer program. If this argument is missing, the PARAM1, PARAM2, and PARAM3 parameter values are used.

The local VIS is now ready to send files to the remote VIS via the host and/or receive files sent from the remote VIS via the host. The procedures for sending files from the host to the remote VIS and sending files from the host to the local VIS are discussed later in this chapter.

Remote VIS Procedures

The user at the remote VIS should do the following:

1. Develop, verify, and install a host maintenance script that initiates and maintains a host session; that is, provides procedures for login, logout, and recovery screen sequences. Note that the script should leave the host session at the host system ready prompt that will allow an interface with the host **IND$FILE** file transfer program. Refer to the *CONVERSANT Voice Information System Script Builder, 585-350-702,* for information on developing, verifying, and installing a host maintenance script.

   ⟹ **NOTE:**
   After a file transfer, the host system ready prompt may be in a different position on the screen. The recovery and logout sequences must take this into consideration. The user may need to define multiple screens for the host system ready prompt.

2. Execute the hassign command to assign the host maintenance script to the host session. Following is the format of the hassign command:

   hassign <application> to <session> [FTSCRT]

   The application is a required argument that specifies the host maintenance script for file transfer. The session is a required argument that specifies the session number or a range of session numbers. You may assign enhanced file transfer to sessions 0-31 only. The *FTSCRT* is a required argument that assigns the session for file transfer. Refer to *CONVERSANT Voice Information System Version 3.1 Command Reference, 585-350-203,* for information on using the **hassign** command.

3. Execute the **hstatus** command to verify that the session is logged in to the proper screen for file transfer. If the session is logged in properly, hstatus will display "file transfer" as the session's status. Refer to *CONVERSANT Voice Information System Version 3.1 Command Reference, 585-350-203,* for additional information on using the **hstatus** command.

4. Modify the **/vs/data/fts_config** configuration file on the remote VIS to poll the local VIS for the file. Procedures for modifying the **/vs/data/fts_config** file are described later in this chapter.

5. If necessary, create the APPL_FTS utility to preprocess the bundle received from the host. Preprocessing is optional and may be used to customize the file transfer feature by adding header information, special files, etc. to the files that will be handled by the Enhanced File Transfer system. Note that the full path name of the preprocessing file should be added to the APPL_FTS field in the configuration file.

D-63

The remote VIS is now ready to receive files sent from the local VIS to the host and/or send files to the host and the local VIS. The procedures for sending files from the host to the local VIS and sending files from the host to the remote VIS are discussed later in this chapter.

Sending Files from the Host to the Remote VIS

The Enhanced File Transfer system automatically transfers files from the host to the remote VIS. The following occurs as part of this automatic transfer procedure:

1. Poll the host at a time determined by the **/vs/data/fts_config** configuration file (POLL_START, POLL_FREQ, and POLL_END fields).

2. Receive bundles sent by the local VIS.

3. Place each bundle in a temporary directory (for example, fts_tmp1, fts_tmp2, etc.) and create a separate directory for each bundle under a directory specified in the FROM_HOST_DIR field in the **/vs/data/fts_config** file. By default, each temporary directory is created under the **/usr/tmp** default directory.

4. Create a log file containing a list of bundles successfully received along with the full path name for each bundle in the file specified in the $FROM_HOST_DIR field in the **/vs/data/fts_config** file. By default, this information sent from the host is placed in **host_log.** All batch file command outputs are appended to the log file, with each record in the log file containing the original command line and the command output.

5. Execute either the APPL_FTS (if one exists) or the UNIX **cpio** command (if an APPL_FTS file does not exist) to preprocess the bundle received from the host.

6. After preprocessing is complete, execute each batch file received from the host under each temporary directory. Note that the batch file name must end with **.vb** and must conform to UNIX standards. Refer to Appendix B, "UNIX System Basics," for information on UNIX file naming conventions.

   ### ⚠ WARNING:
   If more than one batch file is sent in a bundle, it is treated as an error and no further processing will take place for that bundle.

7. Record the status of all Enhanced File Transfer activities in the log file.

8. After executing all batch files, the Enhanced File Transfer system will send the log file to the host. At this time, the user may execute the hsend command to send other files to the host, including output files created during the execution of commands within the batch files. Refer to the information on "Sending Files to the Host" later in this chapter for information on this procedure.

9. Set the next polling time.

Sending Files from the Host to the Local VIS

The remote VIS may send files other than the log file to the host, including output files created during the execution of commands within the batch files by using the hsend command. The format of the **hsend** command is as follows:

hsend file=<filename> *[dest=] [opt=]*

The *<filename>* is a required argument that specifies the full path name of the UNIX file or cpio bundle to be sent to the host. Refer to Table D-5 for filename guidelines for file transfers. The *dest* is an optional argument that specifies the final destination of the file at the host. If a destination is not specified, the DESTINATION parameter from the **/vs/data/fts_config** file is used as the destination. The *opt* is an optional argument that specifies either a list of options or the letter **n** (for no options). Note that the options must be separated by a space. If an option list is provided, it is sent to the host. If the option argument value is **n,** the PARAM1, PARAM2, and PARAM3 parameter values are not appended to the host **IND$FILE** file transfer program. If this argument is missing, the PARAM1, PARAM2, and PARAM3 parameter values are used.

⟹ **NOTE:**
The Enhanced File Transfer system removes the log file on the remote VIS after the file is successfully transferred to the host. If the log file is not sent to the host successfully, it will be stored at FROM_HOST_DIR directory and renamed *[unix time]*.**log** where *[unix time]* indicates the current system time in seconds. It is the user's responsibility to remove the stored log file later to save disk space.

Batch Files used in the Enhanced File Transfer System

UNIX commands have two output files, stdout and sterr. Conventionally, stdout is used for expected output (often none) and sterr is used for error messages. You may discard the output of either the stout or sterr (or both) by directing it to /dev/null. Generally, a command line in a batch file should behave the same way as a command typed at a terminal; that is, the following occurs:

- Undirected sterr and stdout are collected and appended to the host log

- If stdout is redirected to /dev/null, the output will not be appended to the host log (for example, **install_sw xmas_sale > dev/null)**

- If stderr is redirected to /dev/null, the output will not be appended to the host log (for example, **install_sw xmas_sale > dev/null)**

- If both stderr and stdout are redirected to /dev/null, nothing regarding the command is written to the host log (for example, **install_sw xmas_sale > dev/null2 > &1)**

- Strings that are recognized as evidence that the user does not want the command to be logged include "space > /dev/null" and "1 > /dev/null" (for stdout) and "2 > /dev/null" (for stderr)

All batch file command outputs are appended to the log file which is created in the $FROM_HOST_DIR, with each record in the log file containing the original command line and the command output.

$\implies$ **NOTE:**
Commands that are inherently interactive or that do not terminate automatically should be avoided in batch files. Commands that are inherently interactive are difficult to execute on a non-interactive basis unless all the required responsed are known in advance. In addition, commands that do not terminate automatically are also a problem.

D-66

Configuring fts_config File for Enhanced File Transfer

The Enhanced File Transfer configuration file contains field settings that are used in configuring the **IND$FILE** file transfer program on the host.

Configuration information is stored in an ASCII file called **/vs/data/fts_config.** You should view and edit the contents of this file by performing the following procedure:

1. Login as **root.**

2. Enter:

   vi /vs/data/fts_config

   The default value for parameters in **/vs/data/fts_config** are shown in Figure D-11 .

3. To modify or edit the **/vs/data/fts_config** file, use the UNIX system vi editor. Refer to Appendix B, "UNIX System Basics," for information on using the vi editor.

```
POLL_START=-01:00
POLL_FREQ=04:00
POLL_END=24:00
DESTINATION=
ORIGINATION=
APPL_FTS=
HOST_OS=TSO
FROM_HOST_DIR=/usr/tmp
PARAM1=
PARAM2=
PARAM3=
Verbose=1
Max_receive=1
```

Figure D-11. /vs/data/fts_config Example

Following is a description of each field in the **/vs/data/fts_config** file.

POLL_START

The POLL_START field specifies the time of day at which the Enhanced File Transfer system first polls the host. The POLL_START default value is -01:00, which specifies that the Enhanced File Transfer system will never poll the host but will, instead, send files only when a request is made. If the POLL_START value is changed from the default (-01:00) to any value between 00:00 to 24:00, the Enhanced File Transfer system will use the new POLL_START value immediately after midnight.

⟹ **NOTE:**
   Note that the POLL_START field may not be set to a value greater than 24 hours (24:00). If you attempt to set the POLL_START field to a value greater than 24 hours, the value (00:00) is used.

POLL_FREQ

The POLL_FREQ field specifies the intervals at which the Enhanced File Transfer system polls the host. The POLL_FREQ default value is 04:00, which specifies that polling will occur every four hours. If the POLL_FREQ field is set to a value less than or equal to 00:00, the Enhanced File Transfer system will poll only at POLL_START. For example, if the POLL_FREQ field is set to -01:00 and the POLL_START is set to 01:00, the Enhanced File Transfer system will poll the host starting at 01:00. If the POLL_FREQ field is set to a value greater than 24 hours, the Enhanced File Transfer system polls the host at this offset from POLL_START. For example, if POLL_START is set to 02:30 and POLL_FREQ is set to 50 hours, the Enhanced File Transfer system polls the host at 4:30 a.m. on alternate days. If the POLL_FREQ field is changed just after the most recent POLL_START, the Enhanced File Transfer system changes the POLL_FREQ at the next POLL_START. For example, if POLL_FREQ is changed from 01:00 to 00:30 at 2:20 p.m., the POLL_FREQ will not change until the next polling period begins at 3:00 p.m.

POLL_END

The POLL_END field indicates the time of day after which the Enhanced File Transfer system will not poll the host. The POLL_END default value is 24:00.

⟹ **NOTE:**
   Note that the POLL_END field may not be set to a value less than or equal to 00:00 or greater than or equal to 24:00. If you attempt to set POLL_END in this manner, the default value (00:00) is used.

DESTINATION

The DESTINATION is a required field that specifies a dataset (file) name that is acceptable to the host. The DESTINATION specified in this field is used as the destination argument to the **hsend** command for sending a bundle to the host.

ORIGINATION

The ORIGINATION is a required field that indicates a dataset (file) name that is acceptable to the host. The ORIGINATION specified in this field is used as the origination argument to the **receive** command for receiving a bundle from the host.

APPL_FTS

The APPL_FTS field is used only if a program has been created to either preprocess the bundle received from the host. The APPL_FTS field specifies the full path name of this program. The APPL_FTS default value is NULL (indicating that a preprocessing program does not exist).

HOST_OS

The HOST_OS is a required field that indicates the name of a host application. You may specify either CICS, TSO, or CMS in this field. The HOST_OS default value is TSO.

FROM_HOST_DIR

The FROM_HOST_DIR field specifies the full pathname of the directory on the VIS where the Enhanced File Transfer system creates a temporary directory to receive a bundle from the host and executes the batch file from each of these temporary directories. The FROM_HOST_DIR default value is /usr/tmp.

D-69

PARAM1, PARAM2, PARAM3

PARAM1, PARAM2, PARAM3 are optional fields that are reserved for any additional parameters. Note that the parameters will be sent in the order of PARAM1, PARAM2, and PARAM3 with a space in between them (for example, PARAM1 PARAM3). Refer to Table D-6 and Table D-7 for a list of file transfer options.

Verbose

The Verbose field indicates the level of detail of the /tmp/fts_trace file. A Verbose setting of 1 indicates the most detailed level. This file is used for debugging purposes.

The Verbose default value is 1.

Max_receive

The Max_receive field specifies how many times the VIS will attempt to receive the bundles from the host during each polling cycle. The Max_receive default value is 1. A Max_receive value of -1 specifies that the VIS will never poll the host.

Changes in the configuration file take effect the next time the host is polled. In order for changes to take effect immediately, perform the ***Stopping the Voice System*** and ***Starting the Voice System*** procedures in Chapter 4, "Common Maintenance Procedures," of *CONVERSANT Voice Information System Version 3.1 Operations, 585-350-701.* Alternatively, you may cause changes to take effect by using the **hsend** command. Refer to the information on sending files to the host in this chapter for additional information on using the **hsend** command.

Following is an example of how to send a single ASCII file to the host:

    1. Enter:

hsend file=filename> *[dest=filename on the host] [opt=ASCII CRLF]*

Following is an example of how to receive a single ASCII file from the host:

    1. Enter:

vi /vs/data/fts_config

       a. Change the APPL_FTS parameter to **/usr/tmp/appl**

       b. Change the FROM_HOST_DIR parameter to **/usr/tmp**

       c. Change the PARAM1 parameter to ASCII and the PARAM2 parameter to CRLF

       d. Change the ORIGINATION parameter to the filename on the host

    2. Create the file **/usr/tmp/appl** with the following contents:

cp /usr/tmp/fts_tmp1/tmp1.pkg/usr/tmp/hostfile

where *isr/tmp/hostfile* is the file received from the host.

Following is an example to send a package to the host:

    1. Enter:

cd /tmp

    2. Enter:

mkdir /tmp/pkg

    3. Enter:

cd /tmp/pkg

    4. Insert the floppy that contains the software package to be sent into the floppy drive.

    5. Enter:

cpio -idumv < *<floppy drive device name>*

where *<floppy drive device name>* is typically **/dev/rdsk/f0.**

D-**71**

6. Enter:

find.-print I cpio -odumv > tmp.pkg

7. Enter:

vi tmp.vb

and edit it as follows:

mkdir /tmp/pkg
mv ./* /tmp/pkg
/vs/bin/remove_sw "<package name>"
/vs/bin/install_sw -p /tmp/pkg -n tmp.pkg << EOF
<any anticipated input from the installation
script of the package as the package is being installed
from floppy>
EOF

8. Enter:

Is tmp.pkg tmp.vb I cpio -odumv > tmp.bundle

9. Enter:

hsend file=tmp.bundle dest=<where tmp.bundle is being sent>

D-72

Following is an example of how to send an application to the host:

1. Enter:

> **backup_appl -n *<application name>***

If you do not want to use the default path and all three components, refer to the *CONVERSANT Voice Information System Version 3.1 Command Reference* for additional information on the **backup_appl** command.

2. Enter:

> **cd /tmp/sb/BkUpAppl/*<application_name>***

3. Create a file named **aaa.vb** with the following contents:

> **cp ./* /tmp/sb/BkUpAppl/ *<application_name>***
> **/vs/bin/remove_appl -n *<application_name>***
> **/vs/bin/restore_appl -n *<application_name>***
> **/vs/bin/install_appl -n *<application_name>***

Note that if there is no **.vb** file, the Enhanced File Transfer system does not know what to do after receiving the bundle from the host.

4. Enter:

> **ls * I cpio -odum > bbb**

5. Enter:

> **hsend file=/tmp/sbBkUpAppl/*<application_name>/bbb***
> **[dest=destination_file]**

Following is an example of how to receive an application from the host: Modify the **/vs/data/fts_config** file as follows:

1. Keep the APPL_FTS parameter blank

2. Change the FROM_HOST_DIR parameter to /usr/tmp

3. Change the ORIGINATION parameter to the *destination file* name used in the **hsend** command.

4. Change the DESTINATION parameter to a desired host file name for later use. The Enhanced File Transfer system will use this file name in sending the trace log from the **aaa.vb** execution back to the host.

D-73

Following is an example demonstrating the steps necessary to test sending an application to a host, and then receiving that same application back through the use of Enhanced File Transfer:

1. Enter:

   backup_appl -n *<appl_name>*

   This creates binary files for each component of an application, which include Transaction (Trans), Speech (Spch), and Database (Dbase).

2. Enter:

   cd /tmp/sb/BkUpAppl/ <appl_name>

   This is the directory to which the **Trans, Spch,** and **Dbase** files are copied.

3. Enter:

   vi <filename>.vb

   This is the file which will be run when it is received on the target system.

4. Enter:

   ls lcpio -oBcV > *<all_files_name>*

   This creates one file, whatever you used for *<all_files_name>* which really contains all the files bundled together and will be sent using the **hsend** command.

5. Enter:

   vi /vs/data/fts_config

   This is the file used by EFT. Update the Destination parameter with the name you want this application to be stored under on the host system. Remember, it must conform to the host file naming rules, special characters should be preceded with a backslash. Also update the POLL_SEQ with a positive value that you want to now poll the host.

6. Enter:

   hassign *<eft_appl>* to *<session number>* FTSCRT

   This assigns the Enhanced File Transfer script to a session, which gets a session to the READY prompt, ready for a file transfer. You can ensure that the session is ready by using **hstatus *<session number>*#,** which must have "file transfer" for the state.

D-74

7. Enter:

> **hsend file=/tmp/sb/BkUpAppl/ *<appl_name>/<all_files_name>***

This starts the send of the *<all_files_name>* to the host, using the session which was hassigned in Step 6.

8. Enter:

> **vi /vs/data/fts_config**

This time, set Destination to blank and set Origination to the name you stored the application under on the host in Step 5. Once the send has completed, this file be updated when the polling value is reached, and the **receive** command is initiated. Once the file is received the **<name>.vb** file is run. Some examples of what might be used in the **<name>.vb** file are **backup_appl, restore_appl,** and/or **install_appl,** to first make a backup of the original application, then to restore the new application, and to finally install the new appliction. Once the receive is complete, the dates on the appl files in **/att/trans/sb/ *<appl>*** should be close to the current time.

Automatic Reboot

When the automatic reboot feature is enabled and activated, the system automatically reboots after a UNIX panic. By default, the automatic reboot feature is turned on (enabled).

The **autoreboot** command enables and disables the autoreboot feature and changes the window, reboots, and uptime parameters. Following is an example of the **autoreboot** command:

   autoreboot disable

   or

   autoreboot window 120 uptime 10

For more information on the **autoreboot** command and the command line syntax, refer to the *CONVERSANT Voice Information System Version 3.1 Command Reference, 585-350-203.*

⟹ **NOTE:**
   The **autoreboot** command is executed from the **/vs/bin** directory and requires system administration privileges.

The automatic reboot feature includes the following optional parameters:

The *enable/disable* parameter enables or disables the automatic reboot feature. The default value for this parameter is enable.

The *reboots <number>* parameter specifies the number of unanticipated reboots "allowed" within the time period specified by the window parameter. The default value for this parameter is 5.

The *window <minutes>* parameter specifies the time period for the *reboots <number>* parameter. The default value for this parameter is 60 minutes.

The *uptime <minutes>* parameter specifies the minimum time that the system must be at run level 2, 3, or 4 before the automatic reboot feature is activated. The default value for this parameter is 5 minutes.

The *status* parameter displays the current values of the automatic reboot parameters as well as the number of unanticipated reboots occurring in the minutes preceding the most recent system boot (specified by the window parameter).

If there were fewer than *reboots* unanticipated reboots during the *window* minutes prior to the most recent system boot, the automatic reboot feature is activated *uptime* minutes after the most recent system boot.

Following is an example:

Assume the parameters associated with the **autoreboot** feature are set with default values; that is, the autoreboot feature is enabled, the reboots <number parameter is set to 5, the window <minutes> parameter is set to 60 minutes, and the uptime <minutes> parameter is set to 5 minutes. A system crash occurs (prompted by either a UNIX panic, a system restart via the reset button, or a sudden power loss). The system reboots at 8:00 a.m. If there were fewer than 5 unanticipated reboots between 7:00 a.m. and 8:00 a.m., the automatic reboot feature is activated at 8:05 a.m. Otherwise, it is activated at 9:00 a.m.

Automatic Reboot Suggestions

In determining reasonable values for the automatic reboot parameters, the main concern is the time required for the system to reboot after a system crash (such as a UNIX panic or a power failure). A number of the factors affect the recovery time. These include:

- Hardware platform

- Disk storage space

- Applications running on the system; that is, the number, types, and configurations of applications

The following procedure may be used to determine exact values for the *uptime* and the reboots parameters:

1. Stop the voice system using **stop_vs** or the **Stopping the Voice System** procedure in Chapter 4, "Common Maintenance Procedures," of *CONVERSANT Voice Information System Version 3.1 Maintenance, 585-350-105.*

2. Type **sync** to confirm that file changes are saved on the disk.

3. Type **date** to find out the current time and record the time displayed by the system.

4. Press [RESET].

5. After the voice system is started, log in and type **who -b** to show the time of the most recent system boot.

6. Type **sysmon** and observe the System Monitor screen.

7. As soon as all voice channels are INSERVE, press [CANCEL].

8. Type **date** to find out the current time and record the time displayed by the system.

9. Type **disp message id ICK004 1.** Record the time of the message that is displayed.

10. Subtract the time from step 9 from the time in step 8.

11. Set the *uptime* parameter to the number derived in Step 10, using the **autoreboot** command.

12. Subtract the time in Step 3 from the time in Step 9. Add the *uptime* to this value. The result is the approximate time for your system to recover from a system crash.

13. Divide the *window* parameter by the number derived in Step 12.

14. Set the *reboot* parameter to the number derived in Step 13 using the **autoreboot** command.

Below is an example of the procedure described above:

Assume the system is reset at 15:25:01 and all channels are in service (INSERV) by 15:36:55. The **dis message** command shows ICK004 was reported at 15:31:23. Subtracting 15:31:23 from 15:36:55 gives 5:32 and this rounded the nearest whole number yields 6. Set the *uptime* parameter to 6 using **autoreboot uptime 6.** Subtracting 15:25:01 from 15:31:23 gives 6:22. Add this to the 6 used for the *uptime* parameter yields 12:22, or 13. Dividing 60 (the default for the window parameters) by 13 gives 4.6 and this rounded down yields 4. Set the *reboots* parameter to 4 by enter **autoreboot reboots 4.**

Performance   Information

E

What's in This Chapter

This chapter describes the CONVERSANT Voice Information System (VIS) with regards to performance. Understanding the concepts in this chapter will aid in identifying and resolving performance-related problems in applications. You should use this chapter in conjunction with the repair procedure "Reducing the Load" in Chapter 4, "Common Maintenance Procedures," of *CONVERSANT Voice Information System Version 3.1 Operations, 585-350-701,* to help pinpoint the root cause of a particular performance problem.

Performance Considerations

The performance of a VIS depends greatly on factors such as amount of memory, amount of speech, size of the application or applications, call volume, etc. Since performance is a function of customer application, it is not possible to predict the performance of a given customer setup in the scope of this section. However, some general conclusions can be made based on performance and load tests done of a representative VIS.

System Architecture

Voice Processing Architecture

With respect to performance, the most important aspect of the VIS architecture is the technique used to move speech data from disk to main memory to voice processing cards (assume for simplicity voice play as opposed to voice code in which case the direction is reversed). Coded speech requires 4 kbytes of memory for every second of speech with the ADPCM32 coding algorithm. With 48 channels of voice processing activity, the main central processing unit (CPU) could be required to move up to 384 kbytes of data per second. (The figure is twice what you might expect to allow for reading from disk and writing to the voice card.) Once the data is on the speech card, the cards themselves have digital signal processors (DSP) which then convert that speech data into a form suitable for telephony.

It is important to note the significance of the buffer cache. The buffer cache is an area in memory set aside for speech data. Once speech is read off the disk it resides in the buffer cache indefinitely. Since some applications may play the same speech over many channels, the speech data only has to be read into memory once. From that point, speech data will be written directly out to the voice cards from memory and the extra step of reading the speech data off of the disk will be eliminated. Speech data is removed from the buffer cache if it is least recently used and there is not enough room in memory to accommodate new speech required by the application.

The size of the buffer cache is tunable through the nbufs parameter in the **/vs/data/spchconfig** file. It is set to 180 by default. Minimally, it should be set to 2.5 times the number of channels in the system.

Once the data is on the voice card the DSPs process the data and send it out over the telephone network.

E-2

Effect of Real Time Requirements

Speech must be played in real time. Therefore, speech data must be available when it needs to be played. With voice processing, speech cannot be sputtered on the telephone line as conventional multitasking computer systems can do with other data when sending it to an output device. If speech data is sent in this manner to the caller, the information is unintelligible and it can not be reviewed by the caller.

UNIX is a time-shared operating system as it tries to satisfy all tasks of the applications running on it on request. The UNIX system is not concerned of what gets done when from the VIS perspective. The UNIX system queues may lead to unacceptable delays in voice processing. Therefore, the CPU must act more like a *delay center* than a *single server queue.* When processes get queued on the CPU for any significant amount of time, the real-time requirement is violated. Experience has shown that when CPU occupancy rates approach 60% performance-related problems begin to appear.

Effect of Memory Requirements

The CPU is capable of satisfying 48 simultaneous requests for data at a rate of 32 kbit/s (or 200 kbytes/s) total system throughput. Additional testing shows that the CPU is capable of loads of 300 kbytes/s. Processes, if resident in memory, can satisfy a great quantity of voice processing. If, however, a process (or part of it) is forced out of disk due to insufficient memory resource, and then needed later, the time it takes to retrieve the process from the disk may be too great. If this process is in a real-time computational path, speech processing delays can occur. Therefore, it is imperative that all processes and data required to meet an application's needs fit in the core memory simultaneously. It is more important to consider memory usage than CPU or disk usage when combining features or developing data interface processes (DIPs).

Paging and Buffer Cache

The effect of paging on a system can be worse than the effect of not finding a phrase in memory. If pages of speech buffer cache have been paged and VROP finds it needs a phrase from the buffer cache that has been paged, VROP generates a page fault and waits for the required speech to be brought in from the swap device. Meanwhile, many serviceable requests may go unserviced since VROP is blocked, thus, impeding speech processing. If, however, the phrase is not in the speech buffer cache, VROP requests the phrase from DIO and it still able to service other requests.

Software Components

The following sections detail the features identified as major impacts on system performance. Each section includes a description of the feature (that is, how it works) and the feature's effect on performance, memory resources, CPU resources, and disk resources.

Voice Play

Voice play (or speech playback) is the most widely used feature of the system. It poses some difficult performance issues due to the architecture of the system, the real-time nature of speech, and the great variability that can be found in how applications use speech. Variables which affect play performance include phrase length, active speech pool size, and speech coding rate.

Phrase Length

Phrase length affects play performance in two ways. The concatenation of several short phrases requires the VIS to process several talk requests. This involves retrieving several different phrases from the speech file system. The initial talk request is retrieved from disk and stored in core memory for quicker access at a later time if the phrase is played again. With a single longer phrase, a single talk instruction is processed by the VIS and only one initial retrieval from disk is necessary.

Phrase length also affects the utility of speech buffers. Longer phrases typically make more efficient use of speech buffers. Inefficient use of speech buffers requires more data to be moved than what is actually used, causing wasted speech buffer cache memory and SP window buffer contention. The best way to enhance speech buffer utilization is to eliminate unnecessary short phrases from applications. Do not use short phrases for silence if the silence can be concatenated with longer phrases. Avoid trimming phrases to the absolute minimum and then speaking silence phrases between other phrases. Record phrases that are always used together as a single phrase. Also, note that speech buffer efficiency cannot be calculated by taking the average of the phrases in the application talk file, but must be calculated by considering the frequency that each phrase is used during a typical execution of the application.

Active Speech Pool

The active speech pool is a list of all phrases used during system operation. The size of this pool is the quantity (in bytes or seconds) of the speech. If a large quantity of unique speech is required by the applications running on the system, it is unlikely that the system speech buffer cache can be used effectively. As new phrases are required for speech, old phrases are flushed out of the cache and must be reread from disk when needed later. It is best to share speech across applications and reuse speech in applications wherever possible.

Speech Coding

The speech coding rate affects voice play in two ways: bytes per second of speech required, and Digital Signal Processor (DSP) resource requirements. Coding rates requiring fewer bytes per second (for example, SBC16) lessen the load on the CPU and the disk and reduces the memory requirements if phrases would have required more than a single block with the standard coding algorithm (ADPCM32). They also reduce storage space. The drawback of SBC-type algorithm occurs in DSP requirements. To avoid DSP overload, do not exceed any of the voice coding capacities as provided in Chapter 6, "Capacity and Performance Considerations," of *CONVERSANT Voice Information System System Description, 585-350-201,* DSP resources are adequate with IVP cards to handle any coding type but when using SP cards for voice, capacities are reduced.

Voice Play Usage Summary

The following information summarizes the voice play feature usage on the system.

CPU Usage varies widely among applications. Copying for play is typically the most CPU intensive activity in the entire system. Using 16Kb/s code speech, ensuring efficient use of speech buffers and maintaining speech in the speech buffer cache can help alleviate CPU load due to play.

Disk Same as CPU.

Memory   Same as CPU. Also, be sure that too big a buffer cache is not forcing paging on the system. See "System Architecture" earlier in this chapter. If a wide variety of speech is played (greater that 20% of *max_phrases* with the default setting of 32,000), a lot of memory may be used by phrase list blocks (PLBs). Consider making *max_phrases* as small as possible, particularly if speech requirements are not expected to grow. Phrase list blocks are used to find the address of a phrase on disk. Phrases Ids are hashed (uniformly distributed) into a table and the appropriate address for the phrase is found. This technique provides for very fast identification of where phrases are on the disk. The drawback it that addresses of every phrase on the disk(s) must be stored in shared memory (in core or on the swap device). The hash table is sized at system startup, its size is proportional to *max_phrases.* Since hash algorithms attempt to uniformly distribute indexes across the table, it is possible that system with only a small speech pool will require the entire hash table to reside in core, this can be wasteful. When *max_phrases* is set to 32,000, 234 pages of shared memory are reserved for this table.

Voice Code

Voice coding requires more resources than voice play. Additional resources are required for setting up the code, and since coding does not benefit from the system buffer cache, it tends to increase disk activity and reduce the effectiveness of the system buffer cache. The ADPCM coding types also require more SP resources for coding than playing speech. However, voice coding does not generally share the same complexities found in play due to the combination of buffer efficiency and phrase concatenation. CPU usage is increased during voice coding since an available phrase-id from the requested talkfile must be found, and speech buffers must be allocated in core memory prior to code start. The voice coding algorithm also effects load for the same reasons discussed under play. Code length also effects the likelihood of problems. Code is a continuous process, the longer the code, the more likely that the system will get bogged down performing some other activity.

E-6

Voice Coding Usage Summary

The following information summarizes the voice coding feature usage on the system.

CPU   Copying data from the voice cards to memory to disk is the main CPU resource consumer. Denser coding algorithms can be used to lessen this load.

Disk   Disk usage may increase not only to copy coded speech to disk but also to reclaim speech for play which was over written in the buffer cache to make room for the newly coded speech. Also be aware of capacity limitations. A system coding on 48 channels continuously and simultaneously using the ADPCM32 coding algorithm will easily fill a 600 MB disk to capacity in less than one hour.

Memory   Memory requirement increase by about 20 pages for coding over play alone. More of the Phrase List Block structure will be required in memory.

Events

In general, a small number of script events (8 events on calls with a hold time of 2 minutes over 48 channels) can be handled without any serious performance degradation. As scripts process more events, however, event processing costs can become significant. This is due to heavy use of disk resources. The processing of events impedes the voice system from retrieving speech from the disk fast enough to avoid speech breaks. Since event processing is spawned from the script when the call completes, it is also possible to overload the system with calls having relatively few events but very short call hold times. That is, the load introduced by Events is a function of both the call rate and the number of Events per script.

For applications under very tight performance specifications, call data logging can be turned off by starting **cdh** with the *-ns* option. This change should be made to the files **/etc/inittab** and **/vs/data/CONVERSANT.**

Events Usage Summary

The following information summarizes the events feature usage on the system.

CPU   CPU usage will increase at the rate of about 1% CPU utilization per event per second.

Disk   Disk throughput, assuming **base48** type activity, will be saturated at about 8 events per second on an ESDI system. SCSI systems can handle twice that rate or more.

Memory   No effect measured.

Touch Tones

Although the system is efficient and accurate in processing touch tones, this processing overhead can be significant under load conditions. Each touch tone results in a message sent from the board interface process to TSM. Processing of these messages can get expensive if touch tones are received at very high rate (greater that 2 touch-tones per second per channel over 48 channels) Applications are not likely to see performance related problems resulting from touch tone overloads, but keep in mind that they do have a cost.

Touch Tone Usage Summary

The following information summarizes the touch tone feature usage on the system.

CPU   The system requires approximately 0.4% of the CPU per touchtone per second.

Disk   No effect measured.

Memory   No effect measured.

Local Database

The local database is difficult to characterize since applications can vary widely. In general, all tables should be indexed on the primary key. Other things to watch out for are tables which change in size as the database never reclaims the space for a table after it has grown and shrunk. This is true for VIS tables such as **events** and **cdh.** Rollback segments also grow in this manner and can cause space problems.

Since the Script Builder database querying capabilities do not support many of the features found in high level database query languages, views could be used to encapsulate common queries across tables, thereby eliminating processing required at the script level. Through the use of views, there exists a potential of increasing the amount of work ORACLE has to do.

Complicated ORACLE interaction takes more time than sets of simple interactions. The time to update a particular field was roughly proportional with the overall complexity of the database request. That is, it takes much less time to performs 30 simple updates that it takes to perform 1 update with 30 components.

E-8

Local Database Usage Summary

The following information summarizes the local database feature usage on the system.

CPU | Depends too heavily on application to attempt a figure.

Disk | Same as CPU, note that the SCSI systems performed at least twice as well as the ESDI system indicating the the disk is the bottleneck for local database applications.

Memory | Additional 200 pages of memory required for applications using the local database. This is the expected increment for most small database applications.

Feature Packages

The following section details the performance impact of some features packages available with the CONVERSANT VIS. Due to the enormity of features available with the VIS, all feature packages were not formally characterized. Performance assessment of these features can be made under the following assumptions:

1. Features are used in such a way that the load they place on the system is proportional to the number of active channels on the system.

2. The use of the feature is no more disk or CPU intensive than if the channel using the feature was performing voice code or play.

Most features meet these assumptions as the sections below explain. Memory cannot be put under these assumptions. In real time, all processes cannot run on the CPU or access the disk, but all processes required to meet the needs of an application must be resident in memory at all times. For this reason, in conjunction with the assumption given above, only a memory requirement for each feature is given. This memory requirement should be subtracted from the free memory of an application. If the free memory value drops below 100 pages, serious consideration should be given to reducing the memory requirements of the application.

E-9

Features Using SP Cards

Speech Recognition, Text-to-Speech (TTS), Call Classification Analysis (CCA), and Primary Rate Interface (PRI) use the processors on the Signal Processor (SP) and Companion (CMP) cards to perform the computations required to provide the feature functionality. The SP cards contain a microprocessor similar in power to the processor of the main voice system plus some DSP chips which are used to perform the signal processing portion of their operations. The voice system software understands the limits of the SP cards for operations they perform, and SP cards are guaranteed to perform with no performance related problems up to those limits. Thus, the SP cards themselves will never show any load related problems. It is up to the application designer to ensure that there are enough SP resources available to handle the application at hand. In the case of Speech Recognition, TTS and CCA, an SP can be thought of as a multiple server resource, it can be modeled with standard queuing theory techniques. Knowing the rate at which service for the SP resource will arrive, the mean service time and the number of channels of service an SP can deliver, the probability of insufficient SP resources can be calculated for any number of SP's. Note that queuing models assume that blocked jobs will be queued, this is provided automatically by TTS but must be programmed with Speech Recognition and CCA, presumably through some retry strategy. The concurrent channel capacity of the SP cards for TTS and CCA is 6 channels per card. For Speech Recognition, an SP with a single CMP card can recognize on 6 channels and with dual CMP cards can recognize on 12 channels concurrently. For additional information about performance issues on features using SP cards refer to "Optional Features Effects on Performance" below.

Optional Features Effects on Performance

Most of these features will have a no effect on the performance or will actually improve performance when compared with applications using standard voice system functionality unless the DIPs introduced with these features cause paging problems.

- Speech Recognition improves system performance since this feature, as a data gathering technique, is much slower than touch-tone input. As a result, the CPU will spend more time waiting for an Speech Recognition response than waiting for a touch-tone response.

- TTS also improves performance. Rather than the system moving around 4,000 bytes per channel per second with voice play, it only has to move a few bytes with TTS, those being the English text of the phrase. While the TTS SP card is playing, the main system remains idle for that channel.

- CCA is used to improve the accuracy of outbound call classification. The performance effect of CCA depends on two concepts: Firstly, in comparison to intelligent calls, full CCA calls which fail will return more quickly. Secondly, during Call Classification, no other system resources are being used. The combined effect is that idle time will be reduced. How much depends on call rates and the probability of call failure.

E-10

- The PRI SP is used only to perform protocol analysis from the PRI D channel. Load on the SP from PRI protocol analysis will be proportional to the rate of calls to the VIS. The call rate will be throttled by the main CPU before the PRI SP resources are exhausted. The throttling of the call rate by the CPU exists independently of PRI.

- Form Filler is simply an application over the existing voice system with a small database. The bulk of the work in form filler is with voice code. Form filler will not use resources at a level significantly greater than those being used by standard voice code applications.

- Host is not expected to be any worse than local database in terms of resource consumption. Response times will depend heavily on the number of concurrent host activities being generated by the system, the number of LUs and the response time of the host. Low bandwidth communications channels (4800 baud), will have difficulty supporting 30 channels of host access.

- AUDIX Voice Power is not expected to be any worse than standard voice code and play applications with the possible exception of a larger speech pool and longer code times.

- Remote database, in comparison to a local database application, will have the following performance impact: slower response times unless database server is much faster than the VIS, less disk utilization since database access will be performed on a remote system. Use of a VIS for voice processing and a centralized database server is not recommended for systems with high voice traffic. Remote database is an attractive feature for systems which are currently heavily loaded with simultaneous voice and local database activity.

- The effect of the network will depend largely on the application. Note the effect of background process performing activities on the system in parallel for call processing. For example, copying phrases coded from an earlier call to a centralized machine, yet allowing new calls to continue to code speech. The ability of the VIS will be reduced by as much as half since, in aggregate, the VIS will be performing twice the work per code.

E-11

Other System Processing

With a properly written application, the voice system usually operates without any performance problems. The introduction of non-voice system activities to the system, however, can degrade voice processing performance. Although the additional processing may seem light in terms of disk and CPU use, memory usage is impacted significantly. The VIS has been tuned to make as efficient use as possible of its memory resources. All critical VIS processes must be in memory when voice processing is occurring and it is also desirable to have as much speech as possible in main memory.

When new processes are started on the system, they force other processes or data, or at least parts of them, to be placed on disk. This is referred to as swapping or paging. If a critical part of a voice system process is placed on disk, it will not be able to run when the system needs it and delays in speech processing will occur. The UNIX system does what it can to keep the most important or active process or data in memory but it can only guess what will be needed next. Therefore, logging onto the system during call processing may result in user perceptible delays and speech breaks. Operational, Administration and Maintenance activities should be done during off hours. Script development (with Script Builder, etc) should also be done in off hours or on a development machine.

DIPs should be written to consume as little memory as possible. They should also avoid forks and execs.

If utilities are written for administration and other activities, they should be run during off hours. Shell scripts are very dangerous since they typically will fork and exec many processes. As processes are formed in UNIX, they consume memory. This memory consumption forces other processes out of memory, potentially critical voice system processes. After the processes are running for some time they will find their working set, and assuming sufficient memory, will perform adequately. With shell scripts however, processes are typically spawned off very frequently and continuously. This behavior is likely to force critical processes out of core memory. Shell scripts are also wasteful of CPU resources. If shell scripts are written, they should be used sparingly and only to control operations at a very high level. Scripts which contain looping constructs with process executions within the body of loops are typically poor performers. **ksh** features to perform mathematical and lexical operations should be used over standard UNIX commands.

Known Poor Performers

The following types of applications have been identified as poor performers either through testing or in the field. The VIS can support these applications but only at reduced channel counts or with carefully-tuned applications. Where appropriate, a recommended channel capacity is given for the application type. Customer application designers should be aware of these as potential pitfalls. Reference prior sections of this document for more details about some of these application types in their respective sections.

- Applications making inefficient use of speech buffers

  This includes applications playing many small phrases in such a variety that they cannot be contained in memory simultaneously.

- Applications using PCM64 coding algorithm

  If PCM64 is used for most speech processing and the application spends the majority of call connect time doing voice code or play, systems should be limited to 30 channels.

- Applications with memory intensive dips or non-voice system processes

  If these processes force paging (check memory usage data), channel count should be decreased to free up memory used for speech processing and script data space. Typically, reducing channel count will not free memory in a linear manner if at all. If memory usage cannot be reduced, the only recourse may be to reduce load enough so the system can live with the paging.

- Applications with large numbers of call data events

  See the section on "Events" earlier in this chapter.

- Systems used simultaneously for both application development and call processing

  Customers should be strongly encouraged to purchase low end development systems to support script development (or to hang onto their old systems). If customers insist on doing script development on production systems then they should be warned up front about the performance impact. Since script development is a memory consumer and activity will be sporadic, a suggested reduction in capacity cannot be given.

- Applications taking calls during hours when call data records are summarized

  If customers expect high traffic volumes overnight, the call data summary cron jobs should be moved to the lowest call volume time of the day.

- Systems experiencing OA&M and voice processing simultaneously

  Such activities are similar to script development and carry the same risks. Running reports via **cvis_menu** is extremely memory intensive.

General Conclusions About Performance

There are two general conclusions which are important to the understanding of performance on the CONVERSANT VIS.

- Performance limitations are probabilistic numbers.
- The CONVERSANT VIS is a general purpose computing device.

The limitations advertised for the VIS are numbers that we are quite sure we can meet. The vast majority of field applications will never see any performance related problems. For those that do see problems it is likely that tweaking the application, with the understanding of the underlying architecture and how it affects performance, can remove those problems. The idea of the VIS as a general purpose computing device lends the VIS to all the same performance issues of any other general purpose computing device. Since the VIS is programmable, there is nothing that prevents customers from writing perfectly insane applications from a performance perspective. These applications, in most cases, can also lend themselves to more intelligent solutions aided through the understanding of the principles discussed here.

Abbreviations

AB

A

ACD	Automatic Call Distributor
ADPCM	Adaptive Differential Pulse Code Modulation
ANI	Automatic Number Identification
ARU	Alarm Relay Unit
ASAI	Adjunct/Switch Application Interface
ASCII	American Standard Code for Information Interchange

B

BB	Bulletin Board
bps	Bits per second
BSC	Binary Synchronous Communication

C

CCA	Call Classification Analysis
CDH	Call Data Handler
CIC	AT&T Customer Information Center
CICS	Customer Information Control System
CMP	Companion card
CMS	Call Management System
CO	Central Office
CPE	Customer Provided Equipment or Customer Premise Equipment
CPU	Central Processing Unit
CSU	Channel Service Unit

D

dB	Decibels
DBMS	Database Management System
DC	Direct Current
DCE	Data Communications Equipment
DCP	Digital Communications Protocol
DIO	Disk Input and Output Process
DIP	Data Interface Process
DNIS	Dialed Number Identification Service
DSP	Digital Signal Processor
DTE	Data Terminal Equipment
DTMF	Dual Tone Multi-Frequency

E

EBCDIC	Extended Binary Coded Decimal Interexchange Code
EIA	Electronic Industries Association
EISA	Extended Industry Standard Architecture
ESDI	Extended Serial Data Interface
ESS	Electronic Switching System

F

FACE	Framed Access Command Environment interface
FDD	Floppy disk drive
FEP	Front end processor
foos	Facility out-of-service state

H

HDD	Hard disk drive
hwoos	hardware out-of-service
Hz	Hertz

I

IBM	International Business Machines
ID	Identification
IE	Information Element
inserv	in service
IPC	Inter-Process Communication
IPCI	Integrated personal computer interface
ISDN	Integrated Services Digital Network
IVP4	Integrated Voice Processing card with 4 analog channels
IVP6	Integrated Voice Processing card with 6 analog channels

K

Kbps	Kilobite per second
Kbyte	Kilobyte

L

LAN	Local Area Network
LED	Light-emitting Diode
LU	Logical Unit

M

manoos	Manually out-of-service
MAP/100	Multi-Application Platform 100
MAP/100C	Multi-Application Platform 100C
MAP/40	Multi-Application Platform 40
Mbyte	Megabyte
ms	Millisecond
MHz	Megahertz
MTC	Maintenance Process

N

NCP	Network Control Program
netoos	Network out-of-service
nonex	Non-existent
NRZ	Non Return to Zero
NRZI	Non Return to Zero Inverted

P

PBX	Private Branch Exchange
PC	Personal Computer
PCB	Printed circuit board
PCM	Pulse Code Modulation
PEC	Price element code
PRI	Primary Rate Interface

R

RAM	Random Access Memory
RDBMS	ORACLE relational database management system

S

SBC	Sub-band coding
SCCS	Switching Control Center System
SCSI	Small Computer System Interface
SDLC	Synchronous Data Link Control
SIMM	Single Inline Memory Module
SNA	Systems Network Architecture
SP	Signal Processor
SPIP	Signal Processor Interface Process
SPPLIB	Speech Processing Library
SQL	Structured Query Language
sysgen	System generation

T

TCC	Technology Control Center
TCP/IP	Transmission Control Protocol/Internet Protocol
TDM	Time Division Multiplexing
T E	Terminal Emulator
TLP	Transmission Level Plan
T/R	Tip/Ring
TRIP	Tip/Ring Interface Process
TSC	AT&T Technical Services Center
TSO	Time Share Operation
TSM	Transaction State Machine
TTS	Text-to-Speech
TWIP	T1 Interface Process

V

VIS	CONVERSANT Voice Information System
VPC	Voice processing co-marketer
VRU	Voice Response Unit
VROP	Voice Response Output Process

AB-**5**

Glossary

GL

Terms that appear in quotes ("") within definitions are defined elsewhere in this glossary.

3270 interface   A link between one or more VIS machines and a host mainframe. In CONVERSANT Voice Information System (VIS) documentation, the 3270 interface means the link between one or more VIS machines and an IBM host mainframe.

ACD   See "Automatic Call Distributor."

ADPCM   See "Adaptive Differential Pulse Code Modulation."

Adaptive Differential Pulse Code Modulation   A means of encoding analog voice signals into digital signals by adaptively predicting future encoded voice signals. This adaptive modulation method reduces the number of bits required to encode voice. See also "Pulse Code Modulation."

adjunct products   Products (for example, Adjunct/Switch Application Interface) that the CONVERSANT® Voice Information System (VIS) administers via cut-through access to the inherent management capabilities of the product itself; this is in opposition to CONVERSANT VIS's ability to administer the switch directly.

Adjunct/Switch Application Interface   An optional feature package that provides an Integrated Services Digital Network-based interface between AT&T PBX's and adjunct processors.

alerter System process which responds to patterns of events logged by the "logdaemon" process.

analog An analog signal, such as voice or music, that varies in a continuous manner. An analog signal may be contrasted with a digital signal, which represents only discrete states.

application Made of several components which provides an automated version of the communication between a caller and an attendant.

application administration The component of the VIS that provides access to the applications currently available on your system and helps you to manage and administer them.

application installation A two-step process in which the VIS invokes the TSM script assembler for the specific application name and files are moved to the appropriate directories.

application verification A process in which the VIS verifies that all the components needed by an application are complete.

ASCII ASCII is an acronym for American Standard Code for Information Interchange, a standard for data representation. ASCII code represents alphanumeric characters as binary numbers. The code includes 128 upper- and lower-case letters, numerals, and special characters. Each alphanumeric and special character has an ASCII code (binary) equivalent that is one byte long.

asynchronous communication A method of data transmission in which bits or characters are sent at irregular intervals and bits or characters are spaced by start and stop bits and not by time. See also "synchronous communication."

AUDIX Voice Power AUDIX Voice Power. A complete voice-mail messaging system accessed and operated by touch-tone telephones and integrated with a switch or "Private Branch Exchange."

Automatic Call Distributor A phone system that recognizes and answers incoming calls and completes these calls based on a set of instructions contained a database. The Automatic Call Distributor can send the call to an operator or group of operators as soon as the operator has completed a previous call or after the system has played a message to the caller.

back up To preserve a copy of the information in a file in a different location, so that the data will not be lost in the event of hardware or system failure.

backing up an application   A utility that makes an archive copy of a completed application or makes an interim copy of an application in progress. The backup copy can be *restored* to the VIS if the online version is damaged, or if you make revisions and wish to go back to the previous version.

batch file   A file containing one or more lines, each of which is a command executable by the UNIX shell.

Binary Synchronous Communications   A character-oriented synchronous link protocol.

blind transfer protocol   A protocol in which a call is completed as soon as the extension is dialed, without having to wait to see if the phone is busy, or if the caller answered.

BSC   See "Binary Synchronous Communications."

bundle   In the context of the Enhanced File Transfer package, this term is used to denote a single file, a group of files (package), or a combination of both.

byte   A byte is a unit of storage in the computer. On many systems, a byte is eight bits (binary digits), the equivalent of one character of text.

Call Classification Analysis   An optional feature package that allows application developers to classify the disposition of originated and transferred calls.

call data event   A parameter that specifies a list of variables that are appended to a call data record at the end of each call.

Call Data Handler Process   A software process that accumulates generic call statistics and application events.

caution   The caution admonishment is used when there is a possibility of a service interruption.

CCA   See "Call Classification Analysis."

CDH   See "Call Data Handler process."

Central Processing Unit   A component of the VIS that is based on either the Multi-Application Platform 100 (MAP/100) or the Multi-Application Platform 100C (MAP/100C).

CICS	See "Customer Information Control System."
Customer Information Control System	Considered part of the operating system that manages resources for running applications (for example, IND$FILE). Note that TSO and CMS provide analogous functionality in other host environments.
cluster controller	A bisynchronous interface that provides a means of handling remote communications processing.
command	An instruction or request given by the user to the VIS software to perform a particular function. An entire command consists of the command name and options.
CompuLert/ SCCS Interface	The CompuLert®/SCCS Interface is an optional feature that enables remote or console monitoring of error messages generated from the CONVERSANT VIS. Compulert is a centralized maintenance system for monitoring minicomputers, computer mainframes, etc. The Switching Control Center System (SCCS) is similar to the Compulert system but is used to support 4ESS local switching systems.
configuration	The arrangement of the software and hardware of a computer system or network. The CONVERSANT Voice Information System configuration includes either a standard or custom processor, requisite peripheral equipment (for example, printers, modems), and software applications. Configuration also refers to the way the switch network is set up; that is, the types of products that are in the network and how those products communicate.
configuration management	The component of the VIS that allows you to manage the current configuration of voice channels, host sessions, and database connections, assign scripts to run on specific voice channels or host sessions assign functionality to SP and T1 cards, and perform various maintenance functions.
copying an application	A utility in which information from a source application is directed into the destination application.
CPU	See "Central Processing Unit."
crash	The crash command is an interactive utility for examining the operating system core and is useful for determining if system parameters are being exceeded.
danger	The danger admonishment is used when there is a possibility of personal injury.

GL-4

Data Interface Process	A software process that communicates with Script Builder applications.
database	A structured set of files, records, or tables.
database fields	Used to extract values from a local database and form the structure upon which a database is built.
database table	A structure, made up of columns and rows, that holds information in a database. Database tables provide a means of storing information that change too often to "hard-code," or permanently store, in the transaction outline.
debug	The process of locating and correcting errors in computer programs. This process is also referred to as troubleshooting.
default	The way a computer will perform a task in the absence of other instructions.
diagnose	The procedure used to perform diagnostics on Tip/Ring, T1, or SP cards or a bus.
directory	A type of file used to group and organize other files or directories.
DNIS	See "Dialed Number Identification Service."
DIP	See "Data Interface Process."
display errdata	A command that displays system errors sent to the logger.
DSO	Digital Service Level 0 (64,000 bps).
DTMF	See "Dual Tone Multi-Frequency."
Dual 3270 Links	The dual 3270 link feature provides an additional physical unit (PU) to allow a cost-effective means of connecting to two host computers. The customer can connect a VIS to two separate FEPs or to a single FEP shared by one or more host computers. Each link supports a maximum of 32 LUs.
Dual Tone Multi-Frequency	A touch tone.
dump space	An area of the disk that is fixed in size and should equal the amount of RAM on the system. The operating system "dumps" an image of core memory upon system crashes. The dump can be fetched after rebooting for analysis of what may have caused the crash.

error message	A message on the screen indicating that something is wrong and possibly suggesting how to correct it.
Error Tracker Process	See "etStub."
etStub	System process which processes pre-Version 3.1 error message logging requests. These requests are transformed and passed on to the "logdaemon" process.
FACE	See "Framed Access Command Environment."
feature	A function or capability of a product or an application within the CONVERSANT VIS.
field	A "slot" in a VIS window that holds one column of information in a row.
file	A collection of data treated as a basic unit of storage.
file transfer	An option that allows you to transfer files interactively or directly to and from UNIX. File transfer is performed either interactively or directly using the File Transfer System.
filename	Alphabetic characters used to identify a particular file.
Form Filler Plus	An optional feature package that provides the capability for application scripts to record caller's responses to prompts for later transcription and review.
Framed Access Command Environment	The FACE (Framed Access Command Environment) interface that enables you to execute a variety of administrative procedures including, disk operations, user login setup, and peripherals setup.
Function key	A key, labeled F1 through F8, on your keyboard to which the CONVERSANT VIS software gives special properties for manipulating the user interface.
hardware	The physical components of a computer system. The Central Processing Unit, disks, tape and floppy drives, etc, are all hardware.
host computer	A computer linked to a network providing a range of services, such as database access and computation. The host computer operates in a time-sharing manner with other computers linked to it via the network.

IBM	See "International Business Machines."
iCk	System integrity checking process.
IND$FILE	The standard SNA file transfer utility that runs as an application under CICS, TSO, and CMS. IND$FILE is independent of link-level protocols such as BISYNC and SDLC.
indexed table	A table that, unlike a non-indexed table, may be searched via a field name that has been indexed.
initialize	To start up the system for the first time.
Integrated Services Digital Network	A network that provides end-to-end digital connectivity to support a wide range of voice and data services.
Integrated Voice Processing card	The IVP4 or IVP6 card.
intelligent transfer protocol	A transfer protocol that monitors the line after dialing is complete to determine whether a busy, reorder (fast busy) or other failure has been encountered. It also recognizes when the extension is answered or if the extension is not answered after a specified number of rings.
interface	The access point of a system. With respect to the VIS, the interface is designed to provide you with easy access to the software's capabilities.
IPC	See "Interprocess Communication."
Ipcs	A command that reports interprocess communication facilities status.
ISDN	See "Integrated Services Digital Network."
keyboard mapping	In emulation mode, this feature enables the keyboard to send 3270 keyboard codes to the host according to a configuration table set up during installation.
LAN	See "Local Area Network."
Local Area Network	A data communications network in a limited geographical area. The Local Area Network provides communications between computers and peripherals.

local database   A database residing on the VIS.

logical unit   A type of SNA Network Addressable Unit.

Logdaemon   System information and error logging process.

Logger   See "logdaemon."

Logging on/off   Entering or exiting the CONVERSANT Voice Information System software.

LU   See "logical unit."

main screen   The CONVERSANT VIS VERSION 3.1 screen, from which you are able to enter FACE or Voice System Administration.

maintenance process   A software process that runs temporary diagnostics.

master   A board that provides clock information to the TDM bus.

megabyte   A unit of memory equal to 1,048,576 bytes (1024 x 1024). It is often rounded to one million.

Microsoft   A company that manufactures software products, primarily for IBM-compatible computers.

MS-DOS   A personal computer DOS operating system developed by the Microsoft Corporation.

MTC   See "maintenance process."

NetView   An optional feature package that transmits high priority (major or critical) messages to the host as Operator-Generated Alerts (OGAs) over the 3270 host link. The NetView Alarm feature package does not require a dedicated LU.

non-indexed table   A table that may be searched only in a sequential manner and that may not be searched via a field name.

note   The note admonishment is used to supply supplementary information for the topic being discussed.

null value   An entry containing no value. A field containing a null value is normally displayed as blank and is different from a field containing a value of zero.

on-line help   Messages or information that appear on the user's screen when a "Function Key" (F1 through F8) is pressed.

option	An argument used in a command line to modify program output by modifying the execution of a command. When you do not specify any options, the command will execute according to its default options.
PBX	See "Private Branch Exchange."
PCM	See "Pulse Code Modulation."
peripheral (device)	Equipment such as printers or terminals that is in addition to the basic processor.
poll	A message sent from a central controller to an individual station on a multipoint network inviting that station to send if it has any traffic to send.
polling	A network arrangement whereby a central computer asks each remote location whether they wish to send information. This arrangement enables each user or remote data terminal an opportunity to transmit and receive information on shared facilities.
Primary Rate Interface	An optional feature package that provides a digital interface capable both of receiving and originating telephone calls directly from/to an AT&T 4ESS switch.
Private Branch Exchange	A private switching system, either manual or automatic, usually serving an organization, such as a business or government agency, and usually located on the customer's premises.
processor	In CONVERSANT Voice Information System documentation, the computer on which the UNIX Operating System and CONVERSANT Voice Information System software runs. In general, the part of the computer system that processes the data. Also known as the "Central Processing Unit."
ps	A command that shows active processes. This command displays the process table and can be used to determine which processes are consuming large amounts of system resources, such as CPU time.
Pulse Code Modulation	A digital modulation method of encoding voice signals into digital signals. See also "Adaptive Differential Pulse Code Modulation."
raw mode	Conveys data from a terminal to a user without processing the data.

recovery	The process of using copies of the VIS to reconstruct files that have been lost or damaged. See also "restore."
remote database	The component of the VIS that provides access to the applications currently
reports administration	The component of the VIS that provides access to system reports, including VIS call classification reports, call data detail reports, call data summary reports, message log reports, and traffic reports. In addition, if AUDIX Voice Power R2.1.1 is installed on your system, the reports administration component gives you access to AUDIX Voice Power reports.
restore	The process of recovering lost or damaged files by retrieving them from available backup tapes or from another disk device. See also "Recovery."
restore application	A utility that replaces a damaged application or to restore an older version of an application.
roll back	To cancel changes to a database since the point at which changes were last committed.
rollback segment	A portion of the database which records actions which should be undone under certain circumstances. rollback segments are used to provide transaction rollback, read consistency, and recovery.
root space	An area of the disk that houses the UNIX® Operating System, all VIS executable and data files, Script Builder application files, and the database.
sar	A command that is associated with the system activity report package.
Script Builder	An optional software package that provides a menu-oriented interface that is designed to assist in the development of custom voice response applications on the VIS.
SCSI	See "Small Computer System Interface."
Shared database table	Using the same database table in more than one application.
shared speech	Speech that is a part of more than one application.
shared speech pools	A parameter that allows the user of a voice application to share speech components with other applications.

slave	A board that depends on the TDM bus for clock information.
Small Computer System Interface	The Small Computer System Interface (SCSI) is a disk drive control technology in which a single SCSI adapter card plugged into a PC slot is capable of controlling as many as seven different hard disks, optical disks, tape drives, etc.
software	The set or sets of programs that instruct the computer hardware to perform a task or series of tasks -- for example, the UNIX operating system software and the VIS Version 3.1 software.
Speech Recognition	An optional feature that provides speaker independence, connected digit recognition, key word spotting, prompt interrupt, and DTMF support functionality.
speech space	An area that contains all digitized speech used for playback in the applications loaded on the system.
StarLAN Networking	Version 3.1 supports connecting a VIS to the AT&T StarLAN network using the AT&T StarLAN 10 Network PC Network Access Unit (NAU) and AT&T Enhanced TCP/IP WIN/386 R3.0 software.
string	A contiguous sequence of characters treated as a unit. Strings are normally bounded by white spaces, tabs, or a character designated as a separator. A string value is a specified group of characters symbolized by a variable.
swap space	An area of the disk that is fixed in size depending on the amount of Random Access Memory (RAM) that is on the system. This area is used to temporarily store programs (swap in and out) that are competing for CPU time and cannot remain in core memory due to size constraints.
switch	A software and hardware device that controls and directs voice and data traffic. A customer-based switch is known as a "Private Branch Exchange."
switch hook	The device at the top of most telephones which is depressed when the handset is resting in the cradle (on hook). The device is raised when the handset is picked up (the phone is off hook).
switch hook flash	A signaling technique in which the signal is originated by momentarily depressing the "switch hook."
switch interface administration	The component of the VIS that enables you to define the interaction between the VIS and switches by allowing you to establish and modify switch interface parameters and protocol options for both analog and digital interfaces.

GL-11

switch network	Two or more interconnected switching systems.
synchronous communication	A method of data transmission in which bits or characters are sent at regular time intervals, rather than being spaced by start and stop bits. See also "asynchronous communication."
System 75	An advanced digital switch supporting up to 800 lines that provides voice and data communications for its users.
System 85	An advanced digital switch supporting up to 3,000 lines that provides voice and data communications for its users.
system administrator	The person assigned the responsibility of monitoring all VIS software processing, performing daily system operations and preventive maintenance, and troubleshooting errors as required.
system architecture	The manner in which the CONVERSANT Voice Information System software is structured.
system message	An event or alarm generated by either a VIS or end user process.
system monitor	A component of the VIS in which tests are performed to verify that each incoming telephone line and its associated tip/ring or T1 card is functional. Through the "System Monitor" component, you are able to see displays of the Voice Channel and Host Session Monitors.
T1	A digital transmission link with a capacity of 1.544 Mbps.
table	A collection of records that are logically grouped together.
talkfile	A talkfile is an ASCII file that contains the speech phrase tags and phrase tag numbers for all the phrases of a specific application.
TDM	See "Time-Division Multiplex."
Terminal Emulator	Software which allows the VIS to temporarily transform itself into a "look alike" of an IBM 3270 terminal. In addition to providing full 3270 functionality, the Terminal Emulator enables you to transfer files to and from UNIX.
Text to Speech	An optional feature that allows an application to play speech directly from ASCII text by converting that text to synthesized speech. The text may be used for prompts or for text retrieved from a database or host, and can be spoken in an application with prerecorded speech. Text to Speech application development is supported through Script Builder.

Time-Division Multiplex	A method of serving a number of simultaneous channels over a common transmission path by assigning the transmission path sequentially to the channels, each assignment being for a discrete time interval.
trace	A command that can be used to monitor the execution of a script.
traffic	The flow of information or messages through a communications network for voice, data, or audio services.
transaction	Comprised of the exchanges between the caller and the voice system.
TRIP	See "Tip/Ring Interface Process."
Transaction State Machine Process	A software process that controls transactions via script execution and commands. The Transaction State Machine Process manages interaction with the network, manages interaction with other parts of the Voice System, allocates and frees devices and channels, and executes script language programs.
troubleshoot	The process of locating and correcting errors in computer programs. This process is also referred to as debugging.
TSM	See "Transaction State Machine Process."
TTS	See "Text to Speech."
UNIX Operating System	A multi-user, multitasking computer operating system developed by Bell Telephone Laboratories division of AT&T.
UNIX shell	The command language that provides a user interface to the UNIX operating system.
Usr space	An area of the disk that houses user home directories and files, and is used at installation time to temporarily load some feature packages. This is also a file system which is fixed in size once the system is partitioned at installation.
vi editor	A screen editor used by the VIS to create and change electronic files.

GL-13

virtual channel   A channel that is not associated with an interface to the telephone network (Tip/Ring, T1, or PRI). Virtual channels are intended to run "data only" applications which do not interact with callers but may interact with DIPs. Voice or network functions (for example, coding or playing speech, call answer, origination or transfer) will not work on a virtual channel. Virtual channel applications may be initiated only by a "virtual seizure" request to TSM from a DIP.

VIS   See "Voice Information System."

voice channel   A channel that is associated with an interface to the telephone network (Tip/Ring, T1, or PRI). Any VIS application may run on a voice channel. Voice channel applications may be initiated by being assigned to particular voice channels or dialed numbers to handle incoming calls or they may be initiated by a "soft seizure" request to TSM from a Data Interface Process (DIP) or the **soft_szr** command.

Voice Information System   A computer connected to a telephone network that handles touch-tone input, voice response, and line transfer. The Voice Information System uses a screen-based, menu-driven user interface to interact with the system operator or administrator.

Voice Response Output Process   A software process that transfers digitized speech between system hardware (for example, Tip/Ring and SP cards) and data storage devices (that is, hard disk, etc.)

Voice System Administration   The means by which you are able to administer both voice and non-voice related aspects of the system.

VROP   See "Voice Response Output Process."

warning   The warning admonishment is used when there is a possibility of equipment damage.

wink signal   An interruption of current to a busy lamp indicating that there is a line on hold.

Index

R

S

T

U

V

W