



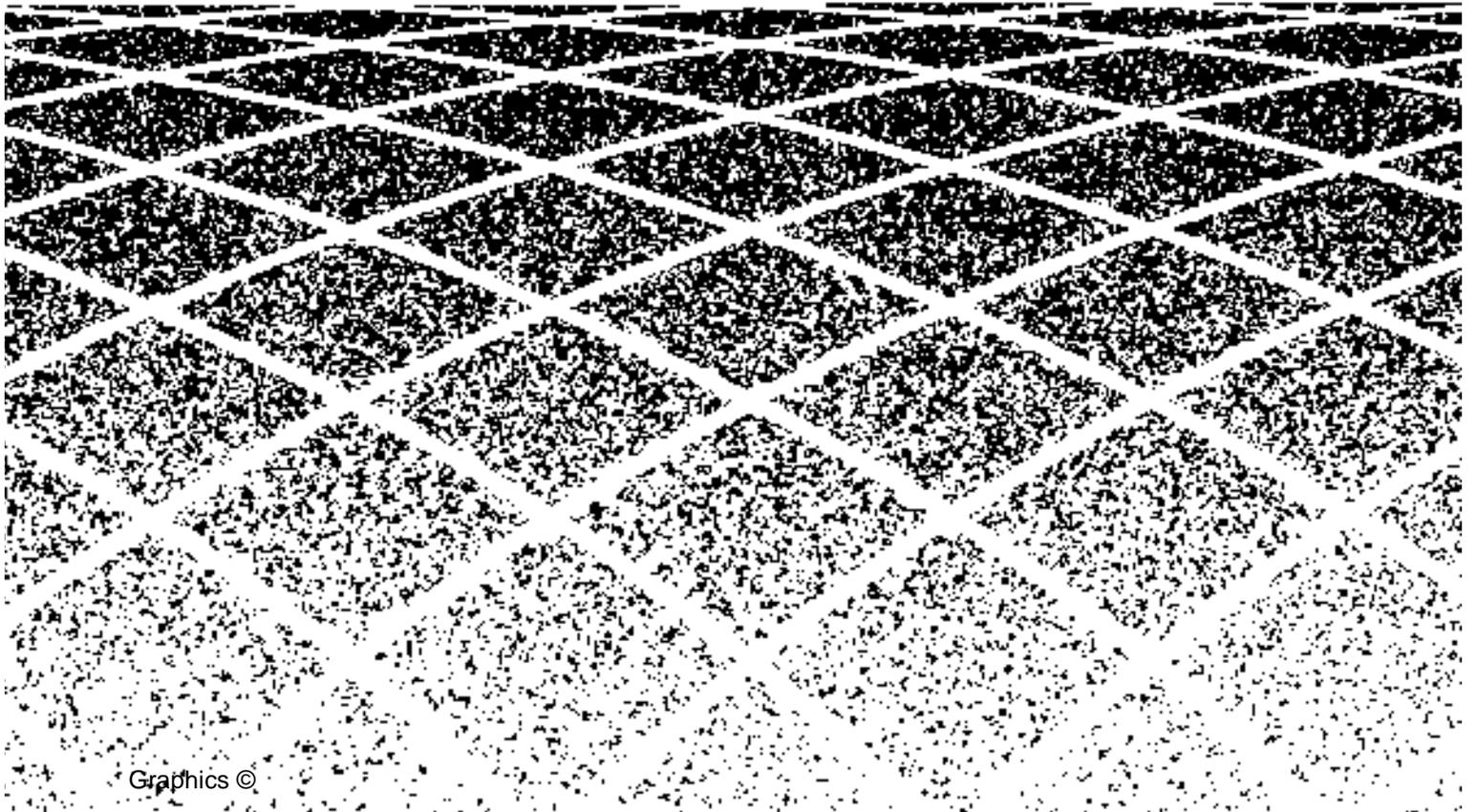
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July, 1995

# **CONVERSANT VIS V4.0**

## **Primary Rate Interface (PRI)**





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## About This Book

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### **Purpose**

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This book, *CONVERSANT VIS V4.0 Primary Rate Interface (PRI)*, provides descriptions and procedures for installing PRI software, information on assigning PRI, using PRI Script Builder actions, writing PRI applications in script language, and a summary of PRI commands.

This book provides the information needed to use the PRI feature. Some of the information supplements information in the generic CONVERSANT® Voice Information System (VIS) documentation. For example, the *tic* ('O') instruction is discussed in *CONVERSANT Voice Information System Version 4.0 Application Development*, 585-350-208, as well as in this book, because its use may differ from PRI.

## **Intended Audience**

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This book, *CONVERSANT VIS V4.0 Primary Rate Interface*, is intended for United States (U.S.) and non-U.S. customers. Your system may or may not have all of the functionality described throughout this book. Furthermore, some features may only apply to customers in the U.S. If you are not sure whether or not a particular feature is available to you, please contact your local AT&T representative. If you are a non-U.S. customer, please contact the International Technical Assistance Center (ITAC) on 1-303-538-4666.

The intended audiences for this book are:

- End customer application developers — This group is responsible for creating and maintaining applications on the CONVERSANT VIS environment.
- Custom application developers — This group is responsible for creating applications to be used in the VIS environment for end-user customers. This audience includes any of the custom application development organizations within AT&T.
- Application distributors — This group distributes and implements applications for end-users.

## **How This Book Is Organized**

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This book is organized into the following chapters:

- Chapter 1, "Overview of Primary Rate Interface"  
This chapter provides an overview of the Primary Rate Interface.
- Chapter 2, "Installing PRI Software"  
This chapter contains information on installation and setup procedures for the PRI feature package.
- Chapter 3, "Assigning PRI"  
This chapter contains information on assigning PRI functionality to cards, assigning the `isdn_test` call service, bringing up PRI service, and troubleshooting the PRI.
- Chapter 4, "Using PRI with Script Builder"  
This chapter provides information on the actions used to access the PRI capabilities from the Script Builder environment.
- Chapter 5, "Writing PRI Applications"  
This chapter provides information on using the instruction with PRI, as well as, information on retrieving the calling party number (CPN), redirecting the number and service type. This chapter also provides information on sending the CPN on outbound calls, and using the `setattr` instruction with PRI.

- Chapter 6, "PRI Summary of Commands"

This chapter contains summaries of the commands and script instructions specific to the PRI feature.

This book also includes a list of Abbreviations, a Glossary, and a cross-referenced Index.

## Conventions Used in This Book

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The following typographic conventions are used in this book:

- Terminal keys

- Terminal keys are shown in rounded boxes. For example, an instruction to press the enter key is shown as

Press `ENTER`.

- Function keys (also known as *soft* keys) are shown in rounded boxes followed by the function of that key in parentheses. For example, an instruction to press function key 3 is shown as

Press `F3` (CHOICES).

- Two or three keys that you press at the same time (that is, you hold down the first key while pressing the second and/or third key) are shown as a series of rounded boxes. For example, an instruction to press and hold `ALT` while typing the letter `d` is shown as

Press `ALT` `D`.

- User input

- The word *enter* means to type a value and press `ENTER`. For example, an instruction to type `y` and press `ENTER` is shown as

Enter `y` to continue.

- The word *type* means to press the key or sequence of keys specified. For example, an instruction to type `y` is shown as

Type `y` to continue.

Do *not* press `ENTER` after you type the value specified.

- The word *select* is used to mean the following: move to the desired menu item using the arrow keys and press `ENTER`. For example, an instruction to select an item from a menu and press `ENTER` is shown as

Select Configuration Management from the Voice System Administration menu.

- Information that you enter or type from your terminal keyboard is shown in **bold** type; for example

Enter **root** at the `Console Login` prompt.

- Command and file names and their parameters are shown in **bold** type. Variable parameters are shown in ***bold italic*** type when they are part of a user input and in *regular italic* type when they are not. All are illustrated in the following example:

Use the **print** command to print your report. The command syntax is **print *reportname***, where *reportname* is the name of the report to be printed.

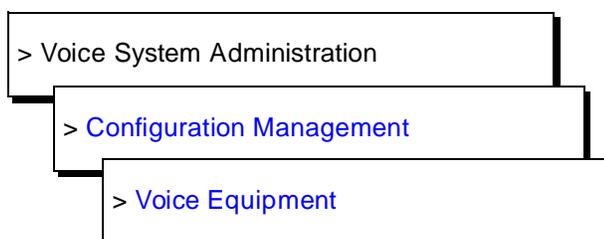
- Screen displays

- Information that is displayed on your terminal screen — including screen displays, prompts, script code, and system messages — is shown in `typewriter-style` type; for example

```
Installation is in progress -- do not remove  
the floppy disk.
```

- The sequence of menu options that you must select to display a specific screen is shown as follows:

Begin at the CONVERSANT Administration menu, and select the following sequence:



In this example, you would first access the CONVERSANT Administration menu. Then you would select the Voice System Administration option to display the Voice System Administration menu. From that menu, you would select the Configuration Management option to display the Configuration Management menu. From that menu, you would select the Voice Equipment option to display the Voice Equipment screen.

- The screens shown in this book are only examples. Your screens may not appear exactly as illustrated.

## **Related Resources**

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The following books should be used in conjunction with this book:

- *CONVERSANT VIS V4.0 Command Reference*, 585-350-209
- *CONVERSANT VIS V4.0 Application Development*, 585-350-208

Refer to *CONVERSANT VIS V4.0 Documentation Guide*, 585-350-002, for a complete list of associated documentation.

## **Customer Training**

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Customer training is available through the GBCS Training Center for CONVERSANT VIS. Contact your AT&T CONVERSANT VIS account executive/sales representative or call 1-800-255-8988 for details about the courses available.

## **Technical Updates**

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Every effort was made to ensure that the information contained in these books is technically accurate, and will guide readers in the normal operation of the system. There are instances however, when the CONVERSANT VIS Version 4.0 product behaves differently than is documented in the core library.

To help with this, an online bulletin board is available to all CONVERSANT VIS Version 4.0 customers that provides supplemental information about this product in an electronic, E-mail format. These updates include hints, tips, and exception conditions about all aspects of the CONVERSANT VIS V4.0 product that were discovered after the core library was published.

This service is called Access, and is available 24 hours-a-day, seven days-a-week to anyone who subscribes to it. To begin receiving electronic CONVERSANT VIS Version 4.0 Access articles, call 1-800-242-6005, and ask for department 186.

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## Overview of Primary Rate Interface

# 1

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### What's in This Chapter

The ISDN (Integrated Services Digital Network) Primary Rate Interface (PRI) is a digital interface capable both of receiving and originating telephone calls directly from/to an AT&T 4ESS, 5ESS, System 75, or System 85 switch, as well as from/to a Phase 1 or Phase 2 Service Node Controller and ISDN Network Controller. In addition to these basic features, the PRI has the following capabilities:

- Answer and Disconnect Supervision
- Calling Party Number Identification
- Call-by-Call Outbound Service Selection
- Call-by-Call Inbound Service Query
- Redirecting Number Query

## **Answer and Disconnect Supervision**

Like the VIS T1 Robbed-bit E&M digital interface, the PRI provides both answer and disconnect supervision. This allows the application to know precisely when a called party has answered an outbound call and when they have disconnected.

## **Calling Party Number Identification**

Applications that receive calls over the PRI are able to retrieve the calling party's telephone number. On a call-by-call basis, applications may request Automatic Number Identification (ANI) or Station Identification (SID) as the type of Calling Party Number (CPN) Identification to be delivered. This feature is compatible with PRI facilities that provide the billing number with all calls (subscribed ANI) and with those that require the VIS to request the billing number on a call-by-call basis (call-by-call ANI). For systems that are connected to call-by-call facilities, the specific application receiving the call can choose whether it wishes to request the number, as well as the type (ANI or SID) desired.

## **Call-by-Call Outbound Service Selection**

When placing outbound calls, the application can specify the outbound service it wishes to use. For example, a PRI facility may have more than one outbound network service available such as Software Defined Network (SDN) or nodal long distance service. One VIS application may require SDN service while another application requires nodal long distance service. Each application can specify which service it wishes to use to originate the call.

## **Call-by-Call Inbound Service Query**

When accepting incoming calls, applications can request the service used to deliver the call. For example, a PRI facility may be able to accept calls from more than one inbound network service. This feature can be useful in selecting a service type for returning calls.

## **Redirecting Number Query**

When accepting incoming calls, applications can request the redirecting number. The redirecting number is the number that a caller dialed before it was intercepted by the network and redirected to the VIS.

## **Hardware Requirements**

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To support a PRI on a T1 interface, you must install one dedicated SP card (either the AYC2 on the AT&T 6386 WGS CPU 371/374 platform or AYC2B or AYC9 card on any platform) in addition to the SP card required for voice and one or two T1 cards (AYC3B version only). One T1 card supports 23 PRI voice channels. Two T1 cards support 47 PRI voice channels. Refer to Chapter 5, "Installing Circuit Cards" in the hardware installation and upgrade book for your platform.

To support PRI on an E1 interface, you must install one ACY21 Network Interface and one SP card (AYC2C) for each PRI link that will be supported in the system. In addition, you will need one protocol conversion card for each link. The protocol conversion card must have the conversion module that is appropriate for the installation you are using. Each E1 link supports 30 voice channels and one D channel (30B + D).



### What's in This Chapter

This chapter contains information on installing the Primary Rate Interface (PRI) software. It is a supplement to the following documentation:

- *CONVERSANT Voice Information System Version 4.0 Software Installation*, 585-350-111
- *CONVERSANT Voice Information System Version 4.0 Upgrades*, 585-350-110

## Installing PRI Software

If you are installing the PRI feature package as part of the initial software load, refer to Chapter 1, "Installing Version 4.0 Software" of *CONVERSANT Voice Information System Version 4.0 Software Installation*, 585-350-111.

If you are installing the PRI feature package on a running system, follow the procedures to stop the VIS, then load the software.

### NOTE:

The PRI package takes approximately 3.6 Mbyte in the **root** directory. Make sure there is enough space before beginning the installation.

## Loading the PRI Software

1. Insert the first disk of the PRI feature package set into the floppy disk drive.
2. At the prompt, type **installpkg**, then press **(ENTER)**.
3. Follow the instructions displayed on the screen as to when to insert the subsequent disks.
4. When the installation is complete, you may either restart the VIS, or continue with other tasks.

## Removing the PRI Software

Before you remove the PRI software, make sure that any cards with PRI functionality assigned have been changed to the E&M protocol. Refer to Chapter 5, "Switch Interface Administration" in *CONVERSANT Voice Information System Operations*, 585-350-703, as well as Chapter 3, "Assigning PRI" in this book for additional information.

1. At the prompt, type **removepkg**, then press **(ENTER)**.  
The numbered list of installed packages is displayed.
2. Type the number associated with the PRI software package, then press **(ENTER)**

The following message appears:

```
Voice System is currently running. Is it ok to
STOP the Voice System? [y/n]
```

3. Type **y** to stop the voice system.

When the prompt is returned, the PRI software package has been removed.

The following message appears:

```
Package removed. Would you like to restart the  
Voice System? [y/n]
```

4. Type **y** to restart the voice system.



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# Assigning PRI

# 3

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## What's in This Chapter

This chapter is a supplement to the *CONVERSANT Voice Information System Version 4.0 Operations*, 585-350-703, and contains the following information:

- Assigning PRI Functionality to Cards
- Assigning the isdn\_test Service
- Bringing Up Service on the PRI
- Troubleshooting the PRI

## **Assigning PRI Functionality to Cards**

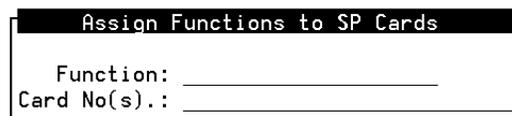
There are at least two cards to which you must assign PRI functionality for this feature to operate properly. One SP card must be assigned to process the PRI protocol. One or two T1 (AYC3B or AYC11) or E1 (AYC21) cards must be provisioned to provide the physical layer for the PRI.

### **Assigning PRI Functionality to an SP Card**

Make sure the SP card is in the Manoos state before beginning this procedure. Refer to Chapter 3, "Configuration Management" in *CONVERSANT VIS Version 4.0 Operations*, 585-350-703, for more information on changing the state of a card.

1. From the Voice System Administration menu, select Configuration Management.
2. From the Configuration Management menu, select Voice Equipment to open the Voice Equipment screen.
3. Press **F8** (CHG-KEYS) to display the alternate set of function keys.
4. From the Voice Equipment screen, press **F3** (ASSIGN) to display the Assign screen.
5. At the Assign screen, select Functions to SP Cards, then press **ENTER** to display the Assign Functions To SP Cards screen (Figure 3-1).

---



Assign Functions to SP Cards

Function: \_\_\_\_\_

Card No(s): \_\_\_\_\_

---

**Figure 3-1. Assign Functions to SP Cards Screen**



**NOTE:**

Assignments made in the Assign Functions to SP Cards screen overwrite any other assignments currently in effect on the specified cards. You should, therefore, be careful when making assignments and reassignments.

6. In the Function field, enter PRI to assign PRI functionality to an SP.

**⇒ NOTE:**

If you change a signaling protocol of PRI from one SP to another, the functionality of the first SP automatically reverts to voice. For example, if you want to change a PRI assignment from SP-3 to SP-4, simply assign PRI functionality to SP-4 and the protocol for SP-3 is converted automatically to voice.

To use PRI, you must assign PRI to an SP before you select the PRI protocol for a T1/E1 card. When the PRI protocol is selected for a T1/E1 card, the system checks to see if an SP card has been assigned the PRI function. If it has not, the PRI protocol is not loaded onto the T1/E1 card.

7. In the Card No(s) field, specify the card to which you wish to assign PRI functionality. Note that the card number refers to the card number found from display card (that is, it is not the OS Index).
8. Press **F3** (SAVE) to save the values you entered.
9. Press **F6** (CANCEL) twice to return the Voice Equipment screen.
10. Restore the SP card to service.

### Assigning PRI Functionality to a T1 or E1 Card

Make sure the T1/ E1 card is in the Manoos state before performing this procedure. Refer to Chapter 3, "Configuration Management" in *CONVERSANT VIS V 4.0 Operations*, 585-350-703, for more information on changing the state of a card.

Use the following procedure to assign PRI functionality to a T1 or E1 card.

1. From the CONVERSANT VIS Version 4 menu, select Voice System Administration.
2. From the Voice System Administration menu, select Switch Interfaces to open the Switch Interfaces screen (Figure 3-2). The VIS must be running before you can use Switch Interface Administration. Refer to Chapter 3, "Configuration Management" in the *CONVERSANT VIS V 4.0 Operations*, 585-350-703, for information on starting the VIS.

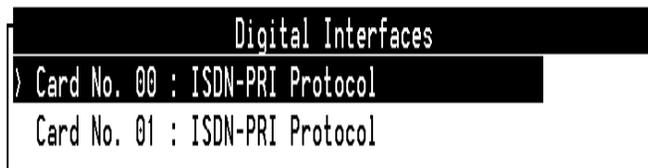
The Switch Interfaces screen (Figure 3-2) offers two choices: Analog Interfaces and Digital Interfaces.



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**Figure 3-2. Switch Interfaces Screen**

3. Select Digital Interfaces to open the Digital Interfaces screen (Figure 3-3). The Digital Interfaces screen automatically lists the system card numbers of the T1 or E1 cards installed in the VIS and the digital protocol assigned to each. For T1 cards, the protocol is either T1 A/B Robbed-bit E&M or T1 ISDN-PRI Layer 1. For E1 cards, the protocol choices are either Unassigned Protocol or ISDN-PRI Protocol.



---

**Figure 3-3. Digital Interfaces Screen**

- ⇒ **NOTE:**  
The T1 must be an AYC3B version only. The E1 interface must be an AYC21 version only.
- ⇒ **NOTE:**  
To use the PRI protocol, the PRI function must be assigned to one SP card before you select PRI for a T1 card in the Digital Interfaces screen. When you select the PRI protocol for a T1 card, the system checks to see if the PRI function is assigned to an SP card. If there is no SP card with the PRI function assigned, the PRI protocol is not loaded onto the T1 card.

---

Likewise, when you try to assign another function to an SP card that currently has PRI assigned to it, the system checks to see if any T1/E1 card has the PRI protocol assigned. If the PRI protocol is assigned to any T1/E1 cards, the PRI function must remain assigned to one SP card. The system will display a warning that an T1/E1 card has PRI functionality assigned to it. Therefore, the system will not unassign the PRI function from an SP card unless there are no T1/E1 cards with the PRI protocol or there is one other SP card with the PRI protocol assigned.

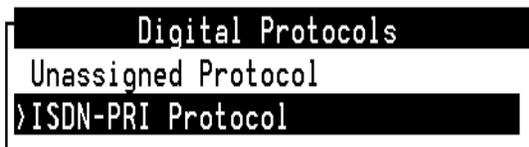
4. To change the protocol, select the line you want to change to display the T1 or E1 Digital Protocols screen (Figure 3-4 or Figure 3-5). The Digital Protocols screens display the protocols installed on that system.
- 



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**Figure 3-4. T1 Digital Protocols Screen**

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**Figure 3-5. E1 Digital Protocols Screen**

---

5. To display the Digital Protocol: PRI screen, select T1 ISDN-PRI Layer 1 Protocol or, for E1, ISDN-PRI Protocol. The Digital Protocol: PRI screen opens (Figure 3-6 and Figure 3-7).

```

Digital Protocol: PRI
System Card No.: 00

Framing/Line Coding: ESFB8ZS
DTMF Muting: YES
CSU Distance: 0-133 ft.
D-Channel on This Card?: YES
Incoming Speech Volume: 1414
Outgoing Speech Volume: 707
Outgoing Text Volume: 1000

```

---

**Figure 3-6. T1 Digital Protocol: PRI Screen**

---

```

Digital Protocol: PRI
System Card No.: 00

Framing/Line Coding: CEPTHDB3
Idle Code: 01010101
DTMF Muting: YES
CSU Distance: 0-133 ft.
D-Channel on This Card?: YES
PRI Group: PRI1
A-LAW or MU-LAW?: A-LAW
Incoming Speech Volume: 1414
Outgoing Speech Volume: 707
Outgoing Text Volume: 1000

```

---

**Figure 3-7. E1 Digital Protocol: PRI Screen**

---

**⇒ NOTE:**

The E1 Digital Protocol: PRI screen (Figure 3-7) Outgoing Text Volume field appears only if the TTS package is loaded. The CSU Distance field is not implemented on the E1 card.

**System Card No.**

The System Card No. field contains the same number as the System Card No. field in the Digital Interfaces screen. When you have specified the values you want to use, press **F3** (SAVE) to save these parameters.

## Framing/Line Coding

For PRI, the T1 card may be used with either D4 framing or Extended Superframing (ESF). If you select D4 framing, Zero Code Suppression (ZCS) must be used. If you select ESF framing, B8ZS must be used. Check with your PRI service provider to determine whether to use D4 or ESF. The valid options for this field are D4ZCS and ESFB8ZS. The default is D4ZCS.

For the E1 rate, the framing is CEPT and the line coding is HDB3. No other selection is valid.

## Idle Code

The idle code is the bit pattern that is transmitted on E1 bearer channels when there is no call present. The three choices are 11111111, 01010101 and 01010100. Ask your Network Service Provider which idle code is used on the link.

## DTMF Muting

DTMF Muting is intended to reduce false Dual Tone Multi-Frequency (DTMF), or touch-tone, recognitions that sometimes result from voice response simulations of DTMF tones. If DTMF Muting is turned on, the outgoing speech path will be interrupted, so that verification of the DTMF tone can be made. DTMF Muting, therefore, should be set to yes for most applications. Some applications cannot tolerate interruptions in the outgoing speech path. Consequently, if DTMF muting is turned off, the outgoing speech will not be interrupted, but a false DTMF report will be generated if a simulated tone is encountered. If you have an application that:

- Requires DTMF detection to adhere to the Local Switching System GeneralRequirements (LSSGR) for DTMF receivers; or
- Transmits tones in phrases

you may want to set DTMF Muting to no. The default is yes.

## CSU Distance

The CSU Distance field specifies the cable distance (in feet) between the Channel Service Unit (CSU) and the VIS. The valid options are: 0-133, 134-266, 267-399, 400-533, 534-666. Press **F2** (CHOICES) to see the valid options for this field. The default value is 0-133.

If there is no CSU, the value entered in this field should be the cable distance between the VIS and the equipment to which it is connected.

### **D-Channel on This Card?**

This field specifies whether or not this card carries the D-Channel. The options for this field are yes or no. The VIS supports both 23B+D and 47B+D configurations. The 23B+D configuration supports 23 Bearer (B) channels and one Data (D) channel. Because the 23B+D configuration requires only one T1 card configured for PRI, the entry in this field should be yes.

For the 47B+D configuration, one of the two T1 cards has 23 Bearer channels and 1 Data Channel. This card should be optioned with this field set to yes. The other T1 card in the 47B+D configuration has all Bearer channels. It should be optioned with this field set to no.

Only one PRI T1 card can have a D-channel. The D-channel is always the twenty-fourth channel on that card.

For PRI services running at the E1 rate, each E1 card has a D channel on it, and is configured as a 30B+D interface. The D-channel is always 16 and the bearer channels are 1-15 and 17-31 on each card.

### **PRI Group**

Whenever more than one D channel is present in a system, each E1 card must be assigned to a different PRI group, either PRI1 or PRI2. In addition, each PRI group has an SP card with PRI assigned.

### **A-Law or Mu-Law**

This is the speech companding rule used for voice transmission on digital bearer channels. Most countries outside North America use A-Law. Ask your Network Service Provider which rule is used on the digital link.

### **Incoming Speech Volume**

This field specifies a volume adjustment for all incoming speech. This parameter affects all T1/E1 cards in the system. Any adjustment occurs before the incoming speech is processed by the system, for example, being coded for later playback. The value represents a gain applied to the speech input using a logarithmic scale on which a value of 1000 equals no gain (i.e., the input is recorded at the level received). Multiplying by 1.414 (the square root of 2) approximately doubles the volume (in fact, increases it by 3 decibels). Therefore, a value of 1414 in this field doubles the volume of any incoming speech before it is used; 2000 doubles it again, 2828 doubles it a third time, etc. On the other hand, multiplying by 0.707 approximately halves the volume (decreases it by 3 decibels). Therefore, a value of 707 in this field reduces the volume by one half, 500 by half again, etc. Table 3-1 shows the relationship between the volume number and the actual change in volume expressed in decibels (dB).

Values can range from 0 to 32000. However, values less than 100 or more than 8000 may distort the incoming speech and make it difficult to understand. The default value for digital (T1/E1) cards is 1414 (3dB). The default is based on network standards and performance. Refer to Appendix D, "Information for Advanced Users" in the *CONVERSANT VIS V4.0 Operations*, 585-350-703, for more information on the Transmission Level Plan before changing the default incoming or outgoing speech volumes. You should use this value unless experience with your system dictates a change. If you have trouble hearing speech you recorded using this value, you can increase the value and record the speech again. This field has no effect on prerecorded speech from other sources. Refer to the following discussion of outgoing speech volume for additional information.

### Outgoing Speech Volume

This field specifies a volume adjustment for all outgoing speech. Any adjustment is applied to recorded speech as it is processed for playback. The value and its effect are the same as for Incoming Speech Volume (refer to the information given previously and to Table 3-1).

The default value for digital (T1/E1) cards is 707 (-3dB). As with the incoming speech volume, the default is based on network standards and performance and should be used unless experience with your system dictates a change. Refer to Appendix D, "Information for Advanced Users" in *CONVERSANT VIS V4.0 Operations*, 585-35-703, for more information on the Transmission Level Plan before changing the default incoming or outgoing speech volumes. If you have trouble hearing speech phrases when played back at this level, you can increase the output volume by increasing the value in this field. With speech you supply, you also can rerecord the speech using a higher input gain to increase the recorded speech volume level. Refer to the previous discussion of Incoming Speech Volume for additional information.

#### NOTE:

This parameter affects all T1/E1 cards in the system.

**Table 3-1. Volume Number in Terms of Gain in Decibels (dB)**

Volume Number	Gain in Decibels (dB)
500	-6
707	-3
1000	0
1414	+3
2000	+6

Make sure to put the SP card in an inserv state after you have assigned the PRI Layer 1 protocol to a T1 card. Refer to Chapter 3, "Configuration Management" in *CONVERSANT VIS V4.0 Operations*, 585-350-703, for more information on changing the state of a card.

### Outgoing Text Volume

This field is the outgoing volume of speech for Text-to-Speech applications. Valid values range from 0-32000 (-6 to +6 dB). The default is 1000.

**⇒ NOTE:**

The Outgoing Text Volume field is displayed only if the Text-to-Speech optional feature package software is installed on your system.

The T1/E1 interface uses wink start robbed-bit E&M signaling on a link using D4 framing with Zero Code Suppression (ZCS). The T1/E1 interface outputs Dial Tone Multi-Frequency (DTMF) tones at 7 pulses per second when originating outbound calls and requires DTMF when taking inbound calls. Make sure that the switch to which the system is connected is programmed with these options.

### PRI Layer 2 and Layer 3 Parameters

Your PRI service provider may need to know some Layer 2 and Layer 3 parameters used by the VIS. Table 3-2 and Table 3-3 provide a list of the most commonly requested parameters.

Incoming calls to the VIS should be provisioned so that the channel number is exclusive and not preferred.

**⇒ NOTE:**

If the switch is configured to deliver ANI on a subscription basis, it is not possible for the VIS to request a different type of ANI on a call-by-call basis.

**Table 3-2. PRI Layer 2 Parameters**

---

Layer 2 Parameter	Value
Retry Count N200	3
Timer T200	1 second
Timer T203	30 seconds
HDLC (D4ZCS)	inverted
HDLC (ESFB8ZS)	non-inverted

---

**Table 3-3. PRI Layer 3 Parameters**

Layer 3 Parameter	Value
Timer T302	10 seconds
Timer T303	4 seconds
Timer T305	4 seconds
Timer T308	4 seconds
Timer T310	10 seconds
Timer T313	4 seconds
Timer T316	120 seconds
Timer TL3	120 seconds
Timer T309	10 seconds
Interface ID (with D-chan)	1
Interface ID (without D-chan)	2
Bearer Capability	64 Kbit voice

## **Assigning the isdn\_test Service**

As part of a built-in test capability of the PRI, the switch can place test calls to the VIS using a special test call number. Your PRI service provider should supply you with that number. In order for the VIS to respond correctly to the test call, you must assign the service called `isdn_test` to that special test number. Use the following procedure to assign the `isdn_test` service.

1. From the Voice System Administration menu, select Configuration Management.
2. From the Configuration Management menu, select Voice Equipment.
3. Press **F8** (CHG\_KEYS) to display another set of function keys.
4. Press **F3** (ASSIGN) to open the Assign menu.
5. Select Services to Called Numbers to display a table of assigned services.
6. Press **F8** (CHG\_KEYS) to display another set of function keys.
7. Press **F1** (ADD) to display the Add Service to Called Number screen.
8. With the cursor on the first line (Service Name to be Added), press **F2** (CHOICES) to see a list of currently available services.
9. Using the cursor keys, select the service called `isdn_test`. The list of services should disappear and `isdn_test` should appear on the first line of the current screen.
10. Press **ENTER** to move the cursor to the second line of the form, Corresponding called number.

11. Type the test number provided to you by your PRI service provider, then press **ENTER**.
12. If both items appear to be correct, press **F3** (SAVE). A Command Output screen appears, confirming the assignment.
13. Continue to press **F6** (CANCEL) until you have returned to the Voice System Administration menu.

You have completed the assignment of the `isdn_test` service.

---

## **Bringing Up Service on the PRI**

---

Before you can bring up applications on the PRI, you first must install and configure T1, E1, and SP cards for PRI service, connect the PRI T1/E1 cards to the switch, have an application assigned to a DNIS number, and start the voice system. Refer to Chapter 5, "Installing Circuit Cards" in the hardware installation and upgrade book for your platform for information on installing the cards and connecting the PRI T1/E1 cards to the switch. Refer to "Assigning PRI Functionality to Cards", earlier in this chapter for information on administering the T1, E1, and SP cards for PRI. Refer to Chapter 3, "Configuration Management" in *CONVERSANT VIS V4.0 Operations*, 585-350-703, for information on assigning services to called numbers and starting the VIS.

**⇒ NOTE:**

When you assign service to the PRI channels, do not assign service to the D-channel.

### **B-Channels and D-Channels**

---

It is important that you understand the types of channels on the PRI and their uses. The 24th channel of the T1/E1 card that was configured to have the D-channel is the D (Data) channel. (Refer to the information on "Assigning PRI Functionality to a T1 or E1 Card" in this chapter for more details). The D-channel cannot be used to run applications. It carries messages between the switch and the VIS that are used to control the state of calls on all the other PRI channels.

**⇒ NOTE:**

When PRI is running at the E1 rate, the D channel is 16. In addition, channel 0 on each card is used for frame alignment and cannot be a bearer channel or D channel.

All the other PRI channels are referred to as B (Bearer) channels. The B-channels are used to run applications. Therefore, on a PRI that has been configured to have only one T1 card, the first 23 channels (B-channels) on that card can be used to run applications. The 24th channel (D-channel) is reserved for call control. If your PRI has been configured with two T1 cards, the additional T1 card (the one configured without a D-channel) will have 24 B-channels. Your VIS can run applications on a total of 47 B-channels.

**⇒ NOTE:**

When PRI is running at the E1 rate, bearer channels are 1-15 and 17-31 on each card.

## Determining the D-Channel

If you do not know which channel is the D-channel, you can find out easily by displaying all channels. To do this, follow these steps:

1. From the Voice System Administration menu, select Configuration Management.
2. From the Configuration Management menu, select Voice Equipment. Refer to Chapter 3, "Configuration Management" in *CONVERSANT VIS V4.0 Operation*, 585-350-703, for more information.
3. The Voice Equipment screen displays a list of all channels in the system. Use the  and  cursor keys to scroll through the list of channels. The D-channel is the only channel that is labeled PRID in the TYPE column. B-channels are labeled PRIB.



### NOTE:

For the E1 rate, the TYPE field of channel 0 is marked FRM, representing 'framing.'

Once you know which channel is the D-channel, you are ready to bring the PRI into service. Change the state of all PRI channels to inserv using the same steps for Analog (tip/ring) and T1 channels described in Chapter 3, "Configuration Management" in *CONVERSANT VIS V4.0 Operations*, 585-350-703.

## Monitoring PRI Channels

The easiest method to monitor the state of PRI channels is to use the System Monitor screen. This screen displays the status of all channels in the system. Refer to Chapter 6, "System Monitor" in *CONVERSANT VIS V4.0 Operations*, 585-350-703, for more information. Once you have displayed the System Monitor, use the  and  cursor keys to display the D-channel (it will have the same channel number that it had in the Voice Equipment screen).

If the D-channel shows D-Manoos in the Service Status column, you have not successfully changed the state to D-Inserv. Repeat the steps to change the state to D-inserv.

If the D-channel has a Service Status of D-Netoos, the switch and the VIS are trying to establish communication. This may take several seconds or possibly several minutes, depending on the switch to which the VIS is connected. While the D-channel is in the D-Netoos state, all B-channels that should be in service will be in the Hwoos state, meaning that the B-channel is waiting for the D-channel to come into service.

When the D-channel comes into service, it will have a Service Status of D-Inserv. Messages will be exchanged on the D-channel between the switch and the VIS to bring each of the B-channels into service. While this is taking place, the B-channels will have a Service Status of D-Netoos. Once the message exchange

has been completed to bring a B-channel into service, the B-channel will have a Service Status of On Hook. The B-channel is now ready to accept calls.

## **Troubleshooting the PRI**

If, after following the steps described in the previous section, "Bringing Up Service on the PRI", the D-channels or B-channels do not come into service, use Table 3-4 as a troubleshooting guide.

**Table 3-4. Troubleshooting the PRI**

<b>D-Chan Status</b>	<b>B-Chan Status</b>	<b>Trouble Indication</b>	<b>Corrective Action</b>
D-MANOOS	Manoos	Channels have not been put into service.	Change state of channels to inserv.
Foos	Foos	T1/E1 facility has not established physical connectivity or is experiencing a problem.	<p>Could be due to one of several reasons. This is normal for about 10-20 seconds after restoring T1/E1 channels. If the condition persists, the System Message Display screen should contain an error message numbered TWIP013 through TWIP018 that indicates the nature of the problem.</p> <p>Refer to the explanation of error messages numbered TWIP013 through TWIP018 in Chapter 3, "System Message Listings" of <i>CONVERSANT VIS V4.0 Maintenance</i>, 585-350-112.</p>
D-MANOOS	Hwoos	D-channel has not been put into service	Change state of D-channel to inserv.
D-HWOOS	Hwoos	SP card assigned to PRI is not in service	Restore SP card to service. If SP card is broken, diagnose it. If the card is bad, replace it.

*continued on next page*

**Table 3-4. Troubleshooting the PRI — Continued**

<b>D-Chan Status</b>	<b>B-Chan Status</b>	<b>Trouble Indication</b>	<b>Corrective Action</b>
D-NETOOS	Hwoos	D-channel has not yet established connection.	This condition can last several minutes. If the D-channel does not change after 5 minutes, check the configuration. Check that the card with the D-channel is connected to the correct port on the switch. Also make sure that the switch is provisioned to invert the HDLC data and D channel data if framing/coding used is D4ZCS. Data is not inverted if framing/coding is ESFB8ZS.
D-INSERV	Manoos	B-channel has not been put into service.	Change state of B-channel to inserv.
D-INSERV	Netoos	B-channel has not been put into service by the switch.	This condition can last several seconds after the D-channel comes into service. If the condition persists, check the configuration of the switch.
Foos	Hwoos	T1/E1 card that contains the D-channel is having problems.	See previous case where D-channel is Foos.
D-NETOOS	Pending	D-channel has lost connection. Active call on B-channel is being kept up.	Check switch or System Message Display screen for indication of why D-channel connection was lost.
D-HWOOS	Pending	SP card assigned to PRI is not in service. Active call on B-channel is being kept up.	Restore SP card to service. If broken, diagnose it. If the card is bad, replace it.

*continued on next page*

**Table 3-4. Troubleshooting the PRI — Continued**

<b>D-Chan Status</b>	<b>B-Chan Status</b>	<b>Trouble Indication</b>	<b>Corrective Action</b>
Foos	Pending	T1/E1 card that contains the D-channel is having link problems. Active call is being kept up on B-channel.	See previous case where D-channel is Foos.
D-INSERV	On-Hook	Incoming calls to VIS are not answered. Switch reports error that indicates the VIS is attempting to negotiate to a non-existent channel.	Interface ID Provisioning on switch may not be correct. Make sure the card that has the D-channel is set for Interface ID of 1 and that the card without the D-channel is set for Interface ID of 2.
D-INSERV	On-Hook	Outgoing calls are rejected by the switch. Switch reports error indicating invalid information element or invalid service.	Make sure that you have correctly specified the service type (using the "ISDN_Service" function in Script Builder or the "setparam" script instruction).



---

### What's in This Chapter

This chapter contains descriptions of the new Script Builder screens and menus for the Primary Rate Interface (PRI). These descriptions include:

- New actions (ISDN\_billing and ISDN\_service)
- New external function (Attr\_ANI)

For more information on external actions, refer to Chapter 10, "Using Advanced Features" of *CONVERSANT Voice Information System Version 4.0 Script Builder*, 585-350-704.

 **NOTE:**

This chapter is a supplement to *CONVERSANT Voice Information System Version 4.0 Script Builder*, 585-350-704.

In addition, the following call control actions are supported for use with PRI and can be used as they are for T1/E1.

- Answer
- Disconnect
- Make Call
- Call Bridge

 **NOTE:**

The Call Transfer action is not supported for use with PRI because the protocol does not support the transfer function.

Refer to Chapter 8, “Defining the Transaction” of *CONVERSANT Voice Information System Version 4.0 Script Builder*, 585-350-704, for more information.

For additional information on the PRI and its features, refer to Chapter 3, “Assigning PRI,” Chapter 5, “Writing PRI Applications in Script Language,” and Chapter 6, “PRI Summary of Commands,” in this book.

## **PRI Actions**

---

There are two new external actions available with the PRI package: ISDN\_billing, and ISDN\_service. These external actions are available only if the PRI software has been installed.

### **Retrieving CPN**

---

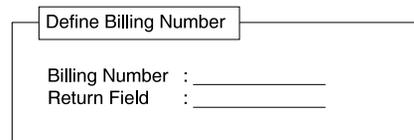
The billing feature retrieves the billing number on an incoming call. The billing number is called the Calling Party Number or is sometimes referred to as Automatic Number Identification (ANI). The ISDN\_billing external action provides the billing number to incoming call applications.

In cases where the PRI facility subscribes to the billing number (ANI is defined for all calls), the billing number always is available to the application. However, for facilities that do not subscribe to the billing number, the number must be requested by applications on a call-by-call basis. In this case, you also must use the Attr\_ANI external function described later in this chapter.

To add the ISDN\_billing external action, use the following procedure.

1. In the Define Transaction screen, with the cursor on the line below which you want to add the ISDN\_billing external action, press **F1** (ADD).  
The Action Choices screen opens.
2. In the Action Choices screen, select “ISDN\_billing.”
3. Press **F6** (CANCEL) to exit from this screen and return to the Define Transaction screen.
4. In this Define Transaction screen, select External Action: ISDN\_billing. The Define Billing Number screen opens (Figure 4-1).
5. Press **F7** (DEFINE).

---



Define Billing Number

Billing Number : \_\_\_\_\_

Return Field : \_\_\_\_\_

---

**Figure 4-1. Define Billing Number Screen**

6. The Billing Number field specifies the Script Builder numeric variable to which the billing number is to be copied. Press **F2** (CHOICES) to select an existing Script Builder variable or type a new variable.
7. The Return Field is optional. You can specify the return code in this field. The Return Field should never contain a value less than zero.

### **Setting Service Type for Outbound Calls**

---

The ISDN\_service external action allows an application to choose Service Type for outgoing PRI calls. If this external action is not used, no service is specified for the call and the type is based on the way that the PRI is provisioned or administered at the switch. Make sure that the switch is provisioned to support the service type you specify. You must place this external action in the application before the part that originates the call.

This service type applies to any subsequent originations on this channel until the script terminates and also to any call bridge initiated from this channel. Refer to Chapter 8, "Defining the Transaction" in *CONVERSANT VIS V4.0 Script Builder*, 585-350-704, for information on the Make Call and Call Bridge actions.

To specify the service type, use the following procedure.

1. In the Define Transaction screen, with the cursor on the line below which you want to add the ISDN\_service external action, press **F1** (ADD).  
The Action Choices screen opens.
2. In the Action Choices screen, select ISDN\_service.
3. Press **F6** (CANCEL) to exit from this screen and return to the Define Transaction screen.
4. In the Define Transaction screen, select External Action: ISDN\_service.
5. Press **F1** DEFINE. The Define Service Type screen opens (Figure 4-2).

Define Service Type

Service Type : \_\_\_\_\_

Return Field : \_\_\_\_\_

---

**Figure 4-2. Define Service Type Screen**

6. The Service Type field is an optional field that specifies the service type to be used for outgoing calls. Press **F3** (CHOICES) to select from a menu of service types. The following choices are displayed:

- ACCUNET
- DIALITNOVA
- ETN
- I800
- INWATS
- MEGACOM
- MEGACOM800
- NODAL\_LDS
- PRIVATE\_LINE
- RESERVED\_CNO
- SDN
- WATS

Select the service type that you want.

**⇒ NOTE:**

The previous Service Types are not valid for all switches supported by the PRI package.

The Service Type field has no effect, at this time, on PRI services running at the E1 rate.

7. The Return Field is optional. You can specify the return code in this field. If the external action fails to set any of the attributes, this field contains a value less than zero.

## **Requesting ANI for Inbound Calls (Call-by-Call Basis)**

---

The external function, Attr\_ANI, is included with the PRI package. This function allows you to request the billing number for incoming calls on a call-by-call basis. For facilities that subscribe to ANI, ANI always is available to the application. In this case, there is no need to use this external function. For facilities that do not subscribe to ANI, ANI can be requested by including this external function in the application script.

**⇒ NOTE:**

The call-by-call ANI feature is not supported, at this time, on PRI services running at the E1 rate.

To set Attr\_ANI for an application, use the following procedure.

1. In the Define Transaction screen, with the cursor on the line below which you want to add one of the PRI external functions, press **(F1)** (ADD).  
The Action Choices screen opens.
2. In the Action Choices screen, select External Function.
3. Press **(F6)** (CANCEL) to exit from the Action Choices screen.
4. Select External Function.
5. Press **(F1)** (DEFINE). The Define External Function screen opens.
6. In the Define External Function screen, type Attr\_ANI, then press **(F6)** (CLOSE).



## What's in This Chapter

Scripts that use the PRI can be written using the script instructions described in Chapter 4, “Script Instructions” and Appendix A, “Summary of Script Instructions” of the *CONVERSANT Voice Information System Version 4.0 Application Development*, 585-350-208. If you have written T1 scripts, you will find that PRI scripts are similar. The following pages describe new instructions and changes to existing instructions that control the behavior of the PRI.

Topics that are discussed include:

- Using the *tic* instruction with PRI
- Retrieving the Calling Party Number (CPN) — either Station ID (SID) or Automatic Number Identification (ANI)
- Retrieving the Redirecting Number
- Retrieving the Service Type (inbound call)
- Sending the CPN on outbound calls
- Using the *setattr* instruction with PRI

 **NOTE:**

This chapter is a supplement to the *CONVERSANT VIS Version 4.0 Application Development*, 585-350-208.

## The tic Instruction

---

The tic instruction described in the *CONVERSANT Voice Information System Version 4.0 Application Development*, 585-350-208, is used for basic control of incoming and outgoing calls on the PRI. The supported tic instruction options are listed in Table 5-1. These options are used in the same manner for PRI as for T1.

**Table 5-1. tic Options Supported for the PRI**

Option	Function
a	Answer an incoming call
h	Disconnect (hangup) a call
o	Originate a call
O	Originate a call & wait for Answer Supervision
d	Dial touch-tone digits

to summary page for tic in Chapter B, "Summary of Script Instructions" in *CONVERSANT VIS V4.0 Application Development*, 585-350-208, for details on how to use these options.

Some options to the tic instruction are not applicable to the PRI. These options are listed in Table 5-2.

**Table 5-2. tic Options Not Applicable to the PRI**

Option	Function
f or F	Switch Hook Flash
w or W	Wait for Speech Detection
D	Dial digits and wait for tones

### **The tic('O') and Disconnect Event Return Codes**

The PRI implementation of the tic('O') (Originate) instruction provides additional return code information over the T1 and Analog interface implementations. Register r.1 returns the ISDN cause value (if available) in the event of an incomplete call. These cause values are returned by the network and are passed through to the script. The cause value is also passed in register r.1 upon a disconnect event. Table 5-3 contains a list of ISDN cause values returned in register r.1.

All of the ISDN return codes returned in register r.1 are classified into several groups. These groups are shown in Table 5-3. A call disposition value gives a more general indication of the type of problem encountered. The disposition value is returned in register *r.0*

**Table 5-3. tic ('O') Return Values for PRI**

<b>Call Disposition Value (r,0)</b>	<b>Return Value (r, 1)</b>	<b>Meaning</b>
Vacant Code ("v")	CV_UNASSNUM (1) CV_NUMCHANGE (22)	Unassigned Number Number Changed
Provisioning or Protocol Error	CV_UNACCEPTCHAN (6) CV_NOUSER (18) CV_STATRESP (30) CV_NORMALUNSP (31) CV_FACNOTSUB (50) CV_OUTBARRED (52) CV_INBARRED (54) CV_BEARERNA (58) CV_SERVICENA (63) CV_BEARERNI (65) CV_CHANNELNI (66) CV_FACILITYNI (69) CV_INVALIDCALL (81) CV_NOCHANNEL (82) CV_BADDEST (88) CV_MISSINGIE (96) CV_BADMESS (97) CV_BADSTATE (98) CV_INVALIDIE (100) CV_TIMEOUTREC (102) CV_INTERWORKING (127)	Channel Unacceptable No User Response Status Enquiry Normal, Unspecified Facility not Subscribed Outgoing Calls Barred Incoming Calls Barred Bearer not available Service not available Bearer not implemented Channel not implemented Facility not implemented Invalid Call Reference Nonexistent Channel Incompatible Destination Info Element Missing Nonexistent Message type Incompatible Message Invalid Info Element Recovery on timer Interworking, unspecified
Dialtone Detected ("D")	CV_NORMALCLR (16)	Normal Clearing
Busy ("B")	CV_USERBUSY (17)	User Busy
Fast Busy ('F')	CV_NOROUTE (2) CV_CALLREJECT (21) CV_FACREJECT (29) CV_NOCIRCUIT (34) CV_NETWORKDOWN (38) CV_TEMPFAILURE (41) CV_SWITCHBUSY (42) CV_USERIETOSS (43) CV_CIRCUITNA (44) CV_CALLPREEMPTED (45)	No Route Call Rejected Facility Rejected No circuit Network Out of Order Temporary Failure Switching Congestion Access Info Discarded Circuit not available Pre-empted
Answer Supervision ('P')		

*Continued on next page*

**Table 5-3. tic ('O') Return Values for PRI — *Continued***

<b>Call Disposition Value (r,0)</b>	<b>Return Value (r, 1)</b>	<b>Meaning</b>
Hardware Failure, Undetermined Reason (-1)		
Timeout - No Answer, Reason Not Provided		
Illegal Dial String	CV_INVALIDNUM (28)	Invalid Number

**⇒ NOTE:**

If the called party is not an ISDN subscriber, there is no ISDN cause value and -2 is returned to the script. Until ISDN is more prevalent, -2 will be a common return.

The include (header) file ( /att/include/tas\_defs.h ) provides macro definitions of these values. This file can be used by your application by including the following line in your script source file:

```
#include "tas_defs.h"
```

Figure 5-1 provides an example of how you might use this feature in an outbound call script. This script outdials customer numbers retrieved from an account database. If the number dialed was unassigned, invalid, or incomplete, the script sends a message back to the database indicating this. The customer record can then be checked.

---

```
#include "tas_defs.h"                /* VIS provide header file */
#include "dip_defs.h"                /* Application dip header file */

#define DIALED_NUMBER 0              /* location of dialed number string */

/* Specify the speech file you wish to use */
tfile(application)

Begin:
/* Get the number to be dialed from a database */
dbase (DIP14, RETRIEVE_NUMBER, ch.DIALED_NUMBER, ... )
/* Telephone number to be dialed is now in ch.DIAL_NUMBER */
tic('O', ch.DIALED_NUMBER)
/* Check to see if the call was answered */
jmp (r.0 == imm.'P', Continue)/* Call answered, speak */
/* Call was not answered */
/* Did PRI indicate that the number does not exist? */
jmp (r.1 == imm.CV_UNASSNUM, NumberUnassigned)
/* Did PRI indicate that the number was incomplete? */
jmp (r.1 == imm.CV_INVALIDNUM, NumberIncomplete)
/* Did PRI indicate that the number has been changed? */
jmp (r.1 == imm.CV_NUMCHANGE, NumberChanged)
/* Otherwise hangup */
tic('h')
quit()

NumberChanged:
/* Send request to database to mark this telephone number as */
/* changed. (Client's number can be updated later) */
dbase (DIP14, CHANGED_NUMBER, ch.RESULT, ch.DIALED_NUMBER, ... )
quit()

NumberUnassigned:
/* Send request to database to mark this telephone number as */
/* unassigned. (Client's number can be check for accuracy) */
dbase (DIP1, UNASSIGNED_NUMBER, ch.RESULT, ch.DIALED_NUMBER, ... )
quit()

NumberIncomplete:
/* Send request to database to mark this telephone number as */
/* bad. (Client's number can be check for completeness) */
dbase (DIP1, INCOMPLETE_NUMBER, ch.RESULT, ch.DIALED_NUMBER, ... )
quit()

Continue:
/* continue with normal call processing */
talk ( "Hello" )
...
...
quit()
```

---

**Figure 5-1. PRI Application Using the tic Instruction — Sample 1**

The example shown in Figure 5-1 checks only three values. It could be rewritten to check a wider range of error conditions using the call disposition value. In the example shown in Figure 5-2, r.0 is used to check call disposition values instead of r.1. The ISDN actual cause value (in r.1) is passed in the *dbase* call so that the exact nature of the call can be checked later. Calls that are not

completed because of busy circuits, ring-no-answer, user busy, etc., can be reported to the database so that they can be dialed again at a later time.

```

#include "tas_defs.h"                /* VIS provide header file */
#include "dip_defs.h"                /* Application dip header file */
#define DIALED_NUMBER                0      /* location of dialed number
(12 chars) */
#define ISDN_CAUSE_VALUE            12     /* cause value is passed to
dbase here */
#define MESSAGE_SIZE                16     /* size of message sent to
database */

/* Specify the speech file you wish to use */
tfile(application)

Begin:
    /* Get the number to be dialed from a database */
    dbase (DIP1, RETRIEVE_NUMBER, ch.DIALED_NUMBER, ch.0, 12, 0)
    /* Telephone number to be dialed is now in ch.DIAL_NUMBER */
    tic('O', ch.DIALED_NUMBER)
    /* Check to see if the call was answered */
    /* Return value of 'P' indicates Answer Supervision */
    jmp (r.0 == imm.'P', Continue)/* Call answered, speak */
    /* The call did not go through */
    /* Save the ISDN cause value */
    /* This will be sent as the 11th byte of the message */
    /* to the database */
    load (int.ISDN_CAUSE_VALUE, r.1)
    /* Was there any kind of protocol problem */
    jmp (r.0 == imm.'p', BadNumber)
    /* Was the number a vacant number (non-existent) */
    jmp (r.0 == imm.'v', BadNumber)
    /* Was the number incomplete ? */
    jmp (r.0 == imm.-3, BadNumber)
    /* Cases that are left are busy ('B') and Fast Busy ('F') */
    /* These numbers are valid but cannot be reached now */
    /* Put these in the database to be tried again later */
    dbase (DIP1, RETRY_NUMBER, ch.0, ch.DIALED_NUMBER, 0, MESSAGE_SIZE)
    quit()
BadNumber:
    /* Theses numbers were invalid for some reason */
    /* No use trying to dial these again, put these in the database */
    /* to be checked for accuracy later */
    dbase (DIP1, CHECK_NUMBER, ch.0, ch.DIALED_NUMBER, 0, MESSAGE_SIZE)
    quit()
Continue:
    /* continue with normal call processing */
    talk ( "Hello" )
    ...
    ...
    quit()

```

**Figure 5-2. PRI Application Using the tic Instruction — Sample 2**

## Retrieving the Calling Party Number (CPN)

---

A script can retrieve the Calling Party Number (CPN) of an incoming call. The number is available as an ASCII character string in the register IE\_ANI.

If the PRI network provides the CPN with every incoming call (subscribed ANI), the CPN is stored in IE\_ANI. Figure 5-3 illustrates using the retrieved CPN in an application. If the CPN is unknown or unavailable, the IE\_ANI register contains a null character string.

---

```
#define    "tas_defs.h"
#define    CALLING_PARTY_NUMBER
/* location where you want to store ANI */

/* reference application speech */
tfile(application)

/* Copy ANI to location CALLING_PARTY_NUMBER */
strcpy(ch.CALLING_PARTY_NUMBER,IE.IE_ANI)

/* Answer the call */
tic('a')

/* Speak introduction */
talk("Hello")
talk("Your number is")

/* Speak character string (the ANI) */
tchars(ch.CALLING_PARTY_NUMBER)

quit()
```

---

**Figure 5-3. Retrieving the Calling Party Number on Subscription Basis — Example**

If the PRI network provides the CPN on a call-by-call basis, then the script must request the CPN before it can be retrieved in the IE\_ANI register.

The `setattr` instruction can be used to request the CPN from the network before starting the script. If the switch is provisioned to allow you to select the type of CPN on incoming calls, the following types of CPN can be requested:

- SID preferred - request SID; if not available, request ANI
- SID only - request SID only
- ANI preferred - request ANI; if not available, request SID
- ANI only - request ANI only

**⇒ NOTE:**

The `setattr` instruction describes the environment in which scripts run. The `setattr` directives take effect before the script starts. Therefore, it is not possible to alter dynamically a script's attributes. For this reason, the `setattr` instruction should be used only once in each script. For example, the following script fragment always requests ANI, regardless of the DNIS.

```
Begin:
    strcmp (dnis.0,imm."6145555121")
        jmp (r.0 == imm.0, gotdnis)
    setattr (ATTR_ANI)
gotdnis:
```

The values in Table 5-4 (defined in `tas_defs.h`) can be used with the `setattr` instruction to specify the type of CPN being requested.

**Table 5-4. Tables `tas_defs.h` define values**

ATTR_ANI	ANI only
ATTR_ANI_O	ANI only
ATTR_ANI_P	ANI preferred
ATTR_SID_O	SID only
ATTR_SID_P	SID preferred

For example, to request only the SID be returned in the CPN, use the following instruction:

```
setattr (ATTR_SID_O)
```

Figure 5-4 shows an example of a script that uses `setattr` to request ANI.

```

#include "tas_defs.h"      /* VIS provided header file */

#define NUMBER_TO_BE_CHECKED    0    /* User space
allocation */

    /* Specify attribute that causes the PRI to request ANI
*/
    setattr(ATTR_ANI)

    /* Specify the speech file you wish to use */
    tfile(application)

Begin:
    /* Retrieve the ANI number */
    /* ANI is a character string stored in special register
`IE_ANI' */
    strcpy (ch.NUMBER_TO_BE_CHECKED, IE.IE_ANI)

    /* Is the call from AREA code 614 ? */
    jmp (ch.NUMBER_TO_BE_CHECKED != imm.'6', WrongAreaCode
)
    jmp (ch.NUMBER_TO_BE_CHECKED+1 != imm.'1',
WrongAreaCode )
    jmp (ch.NUMBER_TO_BE_CHECKED+2 != imm.'4',
WrongAreaCode )

    /* Area Code OK */

    /* Answer call */
    tic('a')

    /* Begin transactions */
    talk("Welcome ... ")
    ...

    ...
    quit()

WrongAreaCode:
    /* Wait for caller to Hangup */
    goto WrongAreaCode

```

---

**Figure 5-4. Using setattr to Request ANI — Example**

## Retrieving the Redirecting Number

If an incoming call has been redirected from the originally-dialed number to a PRI trunk on the VIS, a redirecting number is available as an ASCII character string in the script register IE.IE.REDIRECTING. The redirecting number is the originally-dialed number.

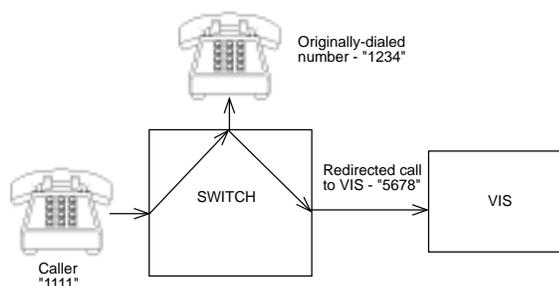
### NOTE:

The redirecting number feature is not supported, at this time, for PRI services running at the E1 rate.

Figure 5-5 depicts a call placed to "1234" that has been redirected to "5678." In this example, the VIS provides the telephone numbers shown in Table 5-5 to the script.

**Table 5-5. Telephone Numbers Provided to the Script for Redirected Numbers**

Script Register	Number
IE.IE_DNIS	"5678"
IE.IE_REDIRECTING	"1234"
IE.IE_ANI	"1111"



**Figure 5-5. Retrieving the Redirecting Number — Example**

If the PRI trunks are provided with multiple incoming services (for example, MEGACOM800 or MULTIQUEST), the script provides a register that contains the type of service which delivered the incoming call. The service type is stored in the IE\_SERVICE register as an integer. Table 5-6 lists the values of common services provided by AT&T:

**Table 5-6. Common Service Values**

Service	Value (defined in tas_defs.h)
SDN (including GSDN)	SVC_SDN
MEGACOM 800	SVC_MEGACOM800
MEGACOM	SVC_MEGACOM
INWATS	SVC_INWATS
WATS maximal subscribed band	SVC_WATS
ACCUNET switch digital	SVC_ACCUNET
Nodal Long Distance Service	SVC_NODAL_LDS
International 800	SVC_I800
ETN	SVC_ETN
Private Line	SVC_PRIVATE_LINE
DIAL IT NOVA, MULTIQUEST	SVC_DIALITNOVA
Reserved (CNO)	SVC_RESERVED_CNO

---

## Sending the Calling Party Number (CPN) on Outbound Calls

---

Applications can send a Calling Party Number on an outbound call. The instruction to set the CPN is:

```
setstring (IE.OUTBOUND_ANI, ctype.src)
```

where *ctype.dst* is a character string which represents the CPN. After *setstring* is invoked, subsequent outbound calls will use the *ctype.dst* argument as the outbound CPN.

For example, the following instructions will place an outbound call to ch.CALLED as the dialed number and with (614) 555-1212 as the calling party number.

```
setstring (IE.OUTBOUND_ANI imm."6145551212")  
tic ('o',ch.CALLED)
```

### NOTE:

If the *setstring* command fails, R.0 will be set to a negative number. Note that the *setstring* command will fail if the destination operand (IE.OUTBOUND\_ANI) is incorrect or if the format of the number to use for outbound ANI is incorrect.

## **Specifying Outbound Service Type**

Your PRI facility may require that you specify the type of service that you wish to use when placing outbound calls. The header file `/att/include/tas_defs.h` contains a list of macro definitions of typical service types used in the AT&T network. Valid service types are provided in Table 5-7.

**⇒ NOTE:**

Outbound Service types do not apply, at this time, to PRI services running at the E1 rate.

**Table 5-7. Valid Service Types**

<b>Service</b>	<b>Valid Service Types</b>
SDN (including GSDN)	SVC_SDN
MEGACOM 800	SVC_MEGACOM800
MEGACOM	SVC_MEGACOM
INWATS	SVC_INWATS
WATS maximal subscribed band	SVC_WATS
ACCUNET switch digital	SVC_ACCUNET
Nodal Long Distance Service	SVC_NODAL_LDS
International 800	SVC_I800
ETN	SVC_ETN
Private Line	SVC_PRIVATE_LINE
DIAL IT NOVA, MULTIQUEST	SVC_DIALITNOVA
Reserved (CNO)	SVC_RESERVED_CNO

Figure 5-6 shows how to use the `setparam` instruction in an application to specify Nodal Long Distance Service when placing an outbound call.

---

```

#include "tas_defs.h"      /* Contains SERVICE_TYPE macro
definitions */
#define DIALED_NUMBER    0 /* Location of character string
to be dialed */
    /* Specify the speech file you wish to use */
    tfile(application)
Begin:
    /* Set service type for outgoing call to Nodal Long
Distance */
    setparam(imm.SERVICE_TYPE, imm.SVC_NODAL_LDS)
    /* initialize character string to be dialed */
    strcpy(ch.DIALED_NUMBER, imm."6145551212")
    /* Originate call */
    tic ('0', ch.DIALED_NUMBER)

...

```

---

**Figure 5-6. Using `setparam` to Specify an Outbound Service Type — Example**

**⇒ NOTE:**

If you specify a service type that is not available, typically the `tic` instruction returns the value 'p' in register `r.0`. Register `r.1` typically contains the value `CV_MISSINGIE` (96) or `CV_SERVICENA` (63) depending on the switch software.

If the service you need to specify is not included in `tas_defs.h`, you can specify it with the following lines

```

#define SPECIAL_SERVICE  X /* service type you
want to use */

setparam(imm.SERVICE_TYPE, imm.SPECIAL_SERVICE)

```

where `X` is a number between 0 and 31 that is to be placed in the Facility Coding Value field of the *Network-Specific Facilities* information element of the ISDN *SETUP* message.



---

## PRI Summary of Commands

# 6

---

### What's in This Chapter



**NOTE:**

This chapter is a supplement to the *CONVERSANT Voice Information System Version 4.0 Command Reference*, 585-350-209.

This chapter contains summaries of the commands and script instructions specific to the PRI feature:

- settatr
- setparam
- setstring

## setattr

---

### Synopsis

---

setattr — statically sets attribute associated with a script

### Command Format

---

```
#include "tas_defs.h"  
setattr (attribute)
```

### Description

---

 **NOTE:**

The setattr instruction does not apply, at this time, for PRI services running at the E1 rate.

The setattr instruction statically sets an attribute associated with a script. Several attributes may be combined by several invocations of setattr.

The attributes that setattr modifies are static and control functions that take place before a script is started on a channel. It is not possible to vary dynamically a script's behavior that is controlled with *setattr*. Therefore, the setattr instruction should not be used to set conflicting attributes (for example, by using both setattr(ATTR\_ANI) and setattr(ATTR\_SID\_0) instructions).

Valid attributes are:

ATTR_ANI	ANI only
ATTR_ANI_O	ANI only
ATTR_ANI_P	ANI preferred
ATTR_SID_O	SID only
ATTR_SID_P	SID preferred

#### Example

For example, to set an attribute that requests an SID for the Calling Party Number, use:

```
setattr (ATTR_SID_O)
```

## **setparam**

---

### **Synopsis**

---

setparam — sets a parameter associated with a script

### **Command Format**

---

```
include "tas_defs.h"
setparam (type.src, type.dest)
```

### **Description**

---

#### **⇒ NOTE:**

The setparam instruction does not apply, at this time, for PRI services running at the E1 rate.

The setparam instruction dynamically sets a parameter associated with a script. Note that Register 0 (r.0) is set to a negative number if the instruction fails.

For example, setparam can be used to change the service type for outbound PRI calls by setting the SERVICE\_TYPE parameter. Valid service types are:

<b>Service</b>	<b>Service Type</b>
SDN (including GSDN)	SVC_SDN
MEGACOM 800	SVC_MEGACOM800
MEGACOM	SVC_MEGACOM
INWATS	SVC_INWATS
WATS maximal subscribed band	SVC_WATS
ACCUNET switch digital	SVC_ACCUNET
Nodal Long Distance Service	SVC_NODAL_LDS
International 800	SVC_I800
ETN	SVC_ETN
Private Line	SVC_PRIVATE_LINE
DIAL IT NOVA, MULTIQUEST	SVC_DIALITNOVA
Reserved (CNO)	SVC_RESERVED_CNO

**Example**

---

**setparam (imm.SERVICE\_TYPE imm.SVC\_MEGACOM)**

In this example, the service type is set to MEGACOM.

## **setstring**

---

### **Synopsis**

---

setstring — set string parameter associated with a script

### **Command Format**

---

```
#include "tas_defs.h"  
setstring (type.src ctype.dst)
```

### **Description**

---

The setstring instruction sets a string parameter associated with a script. For example, setstring can be used to set the calling party number on outbound calls by setting the OUTBOUND\_ANI parameter. After setstring is invoked, subsequent outbound calls will use the *ctype.dst* argument as the outbound calling party number.

Register 0 is set to -1 if the *ctype.dst* argument is too long or if the *type.src* argument is invalid. Register 0 is set to -2 if the *ctype.dst* argument is not a valid number.

### **Examples**

---

The following examples set the calling party number of an outbound call to (614) 555-1212:

Example 1:

```
setstring (IE.OUTBOUND_ANI,imm."6145551212")
```

Example 2:

```
load (int.STRINGTYPE imm.OUTBOUND_ANI)  
strcpy (ch.CPN imm."6145551212")  
setstring (int.STRINGTYPE ch.CPN)
```



---

# Abbreviations

---

## A

### AC

Alternating current

### 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

### ASI

Analog switch integration

---

## B

### BB

Bulletin board

### bps

Bits per second

### BSC

Binary synchronous communication

---

## C

### CCA

Call classification analysis

### CDH

Call data handler

## Abbreviations

---

### **CICS**

Customer Information Control System

### **CMP**

Companion circuit 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

### **DB**

Database

### **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

### **DMA**

Direct memory access

### **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

### **EMI**

Electromagnetic interference

### **ESD**

Electrostatic discharge

### **ESDI**

Extended Serial Data Interface

### **ESS**

Electronic Switching System

---

## **F**

### **FACE**

Framed Access Command Environment Interface

### **FCC**

Federal Communications Commission

### **FDD**

Floppy disk drive

### **FIFO**

First-in-first-out processing order

### **foos**

Facility out-of-service state

---

## **G**

### **GSE**

Graphical Speech Editor

**GUI**

Graphical user interface

---

**H****HDD**

Hard disk drive

**hwoos**

Hardware out-of-service state

**Hz**

Hertz

---

**I****IBM**

International Business Machines

**ICK**

Integrity checking process message class

**ID**

Identification

**IE**

Information element

**inserv**

In-service state

**IPC**

Interprocess communication

**IPC**

Intelligent Ports Card (IPC-900)

**IPCI**

Integrated personal computer interface

**IRQ**

Interrupt request

**ISA**

Industry Standard Architecture

**ISDN**

Integrated Services Digital Network

**ISV**

Independent Software Vendor

**ITAC**

International Technical Assistance Center

**IVP4**

Integrated Voice Processing card with 4 analog channels

**IVP6**

Integrated Voice Processing card with 6 analog channels

**IVPSS**

Integrated Voice Processing System Software

---

**K****Kbps**

Kilobites per second

**Kbyte**

Kilobyte

---

**L****LAN**

Local area network

**LDB**

Local database

**LED**

Light-emitting diode

**LN**

Load number

**LU**

Logical unit

---

**M****manoos**

Manually out-of-service state

**MAP/100**

Multi-Application Platform 100

**MAP/100C**

Multi-Application Platform 100C

## Abbreviations

---

### **MAP/40**

Multi-Application Platform 40

### **Mbps**

Megabits per second

### **Mbyte**

Megabyte

### **ms**

Millisecond

### **msec**

Millisecond

### **MHz**

Megahertz

### **MTC**

Maintenance process

---

## **N**

### **NCP**

Network Control Program

### **NEBS**

Network Equipment Building Standards

### **NEMA**

National Electrical Manufacturers Association

### **netoos**

Network out-of-service state

### **nonex**

Nonexistent state

### **NRZ**

Non Return to Zero

### **NRZI**

Non Return to Zero Inverted

---

## **O**

### **OEM**

Original equipment manufacturer

---

## **P**

### **PBX**

Private branch exchange

### **PC**

Personal computer

### **PCB**

Printed circuit board

### **PCM**

Pulse code modulation

### **PEC**

Price element code

### **PRI**

Primary rate interface

### **PSTN**

Public switch telephone network

### **PS&BM**

Power supply and battery module

---

## **R**

### **RAM**

Random access memory

### **RECOG**

Speech recognition feature message class

### **RDBMS**

ORACLE relational database management system

### **REN**

Ringer equivalence number

### **RFS**

Remote file sharing

### **RM**

Resource manager

### **RMB**

Remote maintenance board

### **RTS**

Request to send

---

**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 circuit card

**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

**TE**

Terminal emulator

**TLP**

Transmission level plan

**T/R**

Tip/Ring circuit card

**TRIP**

Tip/Ring interface process

**TSC**

AT&amp;T Technical Services Center

**TSO**

Technical Service Organization

**TSO**

Time Share Operation

**TSM**

Transaction state machine process

**TTS**

Text-to-Speech

**TWIP**

T1 interface process

---

**U****UK**

United Kingdom

**USOC**

Universal service ordering code

**UVL**

Unified Voice Library

---

**V****VDC**

Video display controller

**VIS**

Intuity CONVERSANT Voice Information System

**VPC**

Voice processing comarketer

**VRU**

Voice response unit

**VROP**

Voice response output process



---

# Glossary

---

## Numerics

---

### **3270 interface**

A link between one or more CONVERSANT Voice Information System (VIS) machines and a host mainframe. In CONVERSANT VIS documentation, the 3270 interface means the link between one or more VIS machines and an IBM host mainframe.

### **4ESS**

A large AT&T central office switch used to route calls through AT&T's telephone network.

---

## A

### **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 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.

### **affiliate**

A business organization that AT&T controls or which with AT&T is in partnership.

### **alarm relay unit**

A unit used in central office telecommunication arrangements that transmits warning indicators from telephone communications equipment (like the CONVERSANT VIS) to audio.

### **alerter**

A system process that 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 that provide an automated version of the communication between a caller and an attendant. The CONVERSANT VIS provides several methods for creating applications, including Script Builder and transaction state machine (TSM) script language.

**application administration**

The component of the CONVERSANT 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 CONVERSANT 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 CONVERSANT VIS verifies that all the components needed by an application are complete.

**ASCII**

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 lowercase letters, numerals, and special characters. Each alphanumeric and special character has an ASCII code (binary) equivalent that is 1 byte long.

**asynchronous communication**

A method of data transmission in which bits or characters are sent at irregular intervals and are spaced by start and stop bits and not by time. See also "synchronous communication."

**asynchronous data unit**

An electronic communications device that allows computer systems to communicate over asynchronous lines more than 50 feet in length.

**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 telephone system that recognizes and answers incoming calls and completes these calls based on a set of instructions contained in 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.

**automatic number identification**

A method of identifying the calling party by automatically receiving a string of digits that identifies the calling station of a particular customer.

---

**B**

**back up**

The preservation of the information in a file in a different location, so that the data is not 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.

**barge-in**

A capability provided by WholeWord speech recognition that allow callers to speak their responses to the VIS prompt and have those responses recognized before the prompt has finished playing.

**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 telephone is busy or if the caller answered.

**bridging**

The process of connecting one telephone network connection to another telephone network connection over the CONVERSANT VIS TDM bus. Bridging decreases the processing load on the system since an active bridge does not require speech processing, database access, host activity, etc., for the transaction.

**BSC**

See "binary synchronous communication."

**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 unit of storage in the computer. On many systems, a byte is 8 bits (binary digits), the equivalent of one character of text.

---

**C****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.

**called party number**

The number dialed by someone making a telephone call. It can be used by telephone switching equipment to selectively route an incoming call to a particular department or agent.

**caller**

The party that calls for a service, gets connected to the CONVERSANT VIS, and interacts with the system. As the CONVERSANT VIS is also capable of making outbound calls for service, the caller can also be the person who responds to those outbound calls.

**call progress tones**

Standard telephony sounds that indicate the status of the call. These sounds include busy, fast busy, ringback, reorder, etc.

**card cage**

An area within a CONVERSANT VIS platform that contains and secures all of the standard and optional circuit cards used in the system.

**cartridge tape drive**

A high-capacity data storage/retrieval device that can be used to transfer large amounts of information onto high-density magnetic cartridge tape based on a predetermined format. This tape can be removed from the system and stored as a backup, or used on another system.

**caution**

An admonishment used when there is a possibility of a service interruption or a loss of data.

**CCA**

See "call classification analysis."

**CDH**

See "call data handler process."

**central office**

An office or location in which large telecommunication machines such as telephone switches and network access facilities are maintained. These locations follow strict installation and operation requirements.

**central processing unit**

A component of the CONVERSANT VIS that is based on either the Multi-Application Platform 100 (MAP/100), MAP/40, or MAP/100C.

**channel**

See "port."

**CICS**

See "Customer Information Control System."

**circuit card upgrade**

A new circuit card that replaces an existing one in the platform. Usually the replacement is an updated version of the other card, and the replacement is designed to deal with technology made obsolete by industry trends or a new VIS release.

**cluster controller**

A bisynchronous interface that provides a means of handling remote communication 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**

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 VIS configuration includes either a standard or custom processor, 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.

**Converse Data Return (conv\_data)**

A Script Builder action that supports the DEFINITY call vectoring (routing) feature by enabling the switch to retain control of vector processing in the VIS environment. It supports the DEFINITY "converse" vector command to establish a two-way routing mechanism between the switch and the VIS to facilitate data passing and return.

**controller circuit card**

A circuit card used on a computer system that controls its basic functionality and makes the system operational. These cards are used to control magnetic peripherals, video monitors, and basic system communications.

**copying an application**

A utility in which information from a source application is directed into the destination application.

**coresidency**

The ability of two products or services to operate and interact with each other on a single hardware platform. An example of this is the use of AUDIX Voice Power along with CONVERSANT on the same VIS platform.

**CPU**

See "central processing unit."

**crash**

An interactive utility for examining the operating system core and for determining if system parameters are being exceeded.

**custom speech**

Unique words or phrases to be used in CONVERSANT VIS voice prompts that AT&T records for a customer on a custom basis.

**custom vocabulary**

A specialized package of unique words or phrases created on a per-customer basis and used by WholeWord or FlexWord speech recognition.

**Customer Information Control System**

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.

---

## D

### **danger**

An admonishment used when there is a possibility of personal injury.

### **data interface process**

A software process that communicates with Script Builder applications.

### **database**

A structured set of files, records, or tables.

### **database field**

A field 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 changes 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 performs a task in the absence of other instructions.

### **diagnose**

The process of performing diagnostics on Tip/Ring, T1, or SP circuit cards or a bus.

### **dialed number identification service**

A service that allows incoming calls to contain information about the telephone number for which it is destined.

### **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 (64,000 bps).

### **DTMF**

See "dual tone multi-frequency."

### **dual 3270 links**

A feature that 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.

---

**E****Earth recall**

A method of call transfer used by some PBXs outside of the U.S. Special considerations must be taken when identifying and tuning some communication protocol parameters before attempting to interface another machine to a system that uses this method of call transfer.

**editor system**

A system that allows speech phrases to be displayed and edited by a user. See “Graphical Speech Editor.”

**Enhanced File Transfer**

A feature that allows the transferring of files automatically between the CONVERSANT VIS and a synchronous host processor on a designated logical unit.

**Enhanced Serial Data Interface**

A software- and hardware-controlled method used to store data on magnetic peripherals.

**error message**

A message on the screen indicating that something is wrong and possibly suggesting how to correct it.

**Error Tracker process**

See “etStub.”

**Ethernet**

A name for a local area network that uses 10BASE5 or 10BASE2 coaxial cable and InterLAN signaling techniques.

**etStub**

A system process that processes pre-Version 3.1 error message logging requests. These requests are transformed and passed on to the “logdaemon” process.

**event**

The notification given to an application when some condition occurs.

**external actions**

Specific tasks and interfaces controlled by CONVERSANT VIS software that allow a Script Builder application script to invoke processes and interact with other products or services. For example, a CONVERSANT VIS application script can invoke AUDIX Voice Power functionality through the used of an external action within an application script.

---

**F**

**FACE**

See “Framed Access Command Environment.”

**feature**

A function or capability of a product or an application within the CONVERSANT VIS.

**feature package**

An optionally purchased package that may contain both hardware and software resources, which provides additional functionality to a standard system.

**feature\_tst script package**

A standard CONVERSANT VIS software program that allows a VIS user to perform self-tests of critical hardware and software functionality.

**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 using the File Transfer System.

**filename**

Alphabetic characters used to identify a particular file.

**FlexWord speech recognition**

A type of speech recognition based on subword technology that recognizes phonemes or parts of words of American English vocabularies. See “subword technology.”

**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**

An 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.

---

## G

### **Graphical Speech Editor**

A window-driven, X Windows/Motif based, graphical user interface (GUI) that can be accessed to perform different functions associated with the creation and editing of speech files to be used by VIS applications.

---

## H

### **hard disk drive**

A high-capacity data storage/retrieval device that is located inside a computer platform. A hard disk drive stores data on nonremovable high-density magnetic media based on a predetermined format for retrieval by the system at a later date.

### **hardware**

The physical components of a computer system. The central processing unit, disks, tape and floppy drives, etc., are all hardware.

### **hardware upgrade**

Replacement of one or more fundamental platform hardware components (for example, the CPU or hard disk drive), but the existing platform and other existing optional circuit cards remain.

### **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.

---

## I

### **iCk**

The system integrity checking process.

### **idle channel**

A channel that either has no owner or is owned by its default owner and is onhook.

### **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 nonindexed table, can 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 circuit card**

The IVP4 or IVP6 circuit 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 CONVERSANT VIS, the interface is designed to provide you with easy access to the software's capabilities.

**ipcs**

A command that reports interprocess communication facilities status.

**ISDN**

See "Integrated Services Digital Network."

---

**K**

**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.

**keyword spotting**

A capability provided by WholeWord Speech Recognition that allows the VIS to recognize a single word in the middle of an entire phrase spoken by a caller in response to a prompt.

---

**L**

**LAN**

See "local area network."

**line side T1**

A digital method of interfacing a CONVERSANT VIS to a PBX or switch using T1-related hardware and software.

**listfile**

An ASCII catalog that lists the contents of one or more talkfiles. Each application script is typically associated with a separate listfile. The listfile maps speech phrase strings used by application scripts into speech phrase numbers.

**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 CONVERSANT 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 VIS software.

**LU**

See "logical unit."

---

**M****magnetic peripherals**

Data storage devices that use magnetic media to store information. Such devices include hard disk drives, floppy disk drives, and cartridge tape drives.

**main screen**

The CONVERSANT VIS VERSION 4.0 screen from which you are able to enter System Administration or Voice System Administration.

**maintenance process**

A software process that runs temporary diagnostics.

**Manual Configurator Program**

A software program that resolves or blocks the allocation of CPU and memory resources for controlling and optional circuit cards.

**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.

**mirroring**

A method of data backup that allows all of the data transactions to the primary hard disk drive to be copied and maintained on a second identical drive in near real time. If the primary disk drive crashes or becomes disabled, all of the data stored on it (up to 1.2 billion bytes of information) is accessible on the second mirrored disk drive.

**MS-DOS**

A personal computer disk operating system developed by the Microsoft Corporation.

**MTC**

See "maintenance process."

---

## N

### **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.

### **nonindexed table**

A table that may be searched only in a sequential manner and that cannot be searched via a field name.

### **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.

---

## O

### **on-line help**

Messages or information that appear on the user's screen when a "function key" (F1 through F8) is pressed.

### **Operator Generated Alerts**

System monitoring messages transmitted from the CONVERSANT VIS or other computer system to an IBM host computer that are classified as critical or major.

### **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.

### **ORACLE**

A company that produces Relational Database Management software. It is also used as a generic term that identifies a database residing on a local or remote system that is created and maintained using an ORACLE RDBMS product.

---

## P

### **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.

### **phoneme**

A single basic sound of particular spoken language. The English language contains 40 phonemes that represent all basic sounds used with the language. As an example, the word

“one” can be represented with three phonemes, “w” - “uh” - “n.” Phonemes vary between languages because of guttural and nasal inflections and syllable constructs.

**phrase tag**

A string of up to 50 characters that identifies the contents of a speech phrase used by an application script.

**platform migration**

See “platform upgrade.”

**platform upgrade**

The process of replacing the existing platform with a new platform.

**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 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 VIS documentation, the computer on which UNIX and CONVERSANT VIS 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.

**pseudo driver**

A driver that does not control any hardware.

**pulse code modulation**

A digital modulation method of encoding voice signals into digital signals. See also “adaptive differential pulse code modulation.”

---

**R****raw mode**

Conveys data from a terminal to a user without processing the data.

**recovery**

The process of using copies of the VIS software to reconstruct files that have been lost or damaged. See also "restore."

**remote database**

The component of the VIS that provides access to information not currently on the VIS.

**remote maintenance board**

A CONVERSANT VIS board that is equipped standard on all new MAP/100 and MAP/40 platform purchases. This card, available with a built-in modem, allows remote personnel (for example, field support) to access all CONVERSANT VIS machines with a standard simplified process.

**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 restores an older version of an application.

**reuse**

The concept of reusing an existing system component after a software upgrade or platform migration.

**roll back**

To cancel changes to a database since the point at which changes were last committed.

**rollback segment**

A portion of the database that records actions that should be undone under certain circumstances. Rollback segments are used to provide transaction rollback, read consistency, and recovery.

---

## S

**sar**

A command that is associated with the system activity report package.

**screen pop**

A method of delivering a screen of information to a telephone operator at the same time a telephone call is delivered. This is accomplished by a complex chain of tasks that include identifying the calling party number, using that information to access a local or remote ORACLE database, and pulling a "form" full of information from the database using an ORACLE database utility package.

**script**

The set of instructions for the CONVERSANT VIS to follow during a transaction.

**Script Builder**

An optional software package that provides a menu-oriented interface designed to assist in the development of custom voice response applications on the VIS.

**SCSI**

See "Small Computer System Interface."

**shared database table**

A database table that is used 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.

**Single Inline Memory Modules**

A method of containing random access memory (RAM) chips on narrow circuit card strips that attach directly to sockets on the CPU circuit card. Multiple SIMMs are sometimes installed on a single CPU circuit card.

**slave**

A circuit card that depends on the TDM bus for clock information.

**Small Computer System Interface**

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, UNIX software and the CONVERSANT VIS Version 4.0 software.

**software upgrade**

The installation of a new version of software. The existing platform and circuit cards are kept.

**source system**

The system from which you are upgrading (that is, your system as it exists *before* you upgrade).

**speech energy**

The amount of energy in an audio signal. Literally translated, it is the output level of the sound in every phonetic utterance.

**speech envelope**

The linear representation of voltage on a line. It reflects the sound wave amplitude at different intervals of time. This envelope can be plotted on a graph to represent the oscillation of an audio signal between the positive and negative extremes.

**speech file**

A file containing an encoded speech phrase.

**speech filesystem**

A collection of several talkfiles. The filesystem is organized into 16-Kbyte blocks for efficient management and retrieval of talkfiles. The CONVERSANT VIS speech filesystem is not consistent with standard UNIX filesystems, and can not be referenced with standard UNIX commands such as **ls**, **cat**, etc.

**speech modeling**

Creating WholeWord speech recognition algorithms by collecting thousands of different speech samples of a single word and comparing them all to obtain a statistical average of the word. This average is then used by a WholeWord speech recognition program to recognize a single spoken word.

**speech phrase**

A continuous speech segment encoded into a digital string.

**speech space**

An area that contains all digitized speech used for playback in the applications loaded on the system.

**standard speech**

The speech package containing simple words and phrases produced by AT&T for use with an CONVERSANT VIS. This package includes digits, numbers, days of the week, and months, each spoken with initial, medial, and falling inflection. The speech is in digitized files stored on the hard disk to be used in the voice prompts played by the VIS.

**standard vocabulary**

A standard package of simple word speech models provided by AT&T and used for WholeWord speech recognition purposes. These phrases include the digits "zero" through "nine," "yes," "no," and "oh."

**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.

**Structured Query Language**

A standard data programming language used with data storage and data query applications.

**subword technology**

A method of speech recognition that recognizes phonemes or parts of words of American English vocabularies. See "whole-word technology."

**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 that is depressed when the handset is resting in the cradle (on hook). The device is raised when the handset is picked up (the telephone 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.

**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 3000 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 VIS 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.

---

**T****T1**

A digital transmission link with a capacity of 1.544 Mbps.

**table**

A collection of records that are logically grouped together.

**talkfile**

An ASCII file that contains the speech phrase tags and phrase tag numbers for all the phrases of a specific application. The speech phrases are organized and stored in groups. Each talkfile can contain up to 65,535 phrases and the speech filesystem can contain multiple talkfiles.

**target system**

The system to which you are upgrading (that is, your system as you expect it to exist *after* you upgrade).

**TDM**

See "time-division multiplex."

**telephone network connection**

The point at which a telephone network connection terminates on a CONVERSANT VIS. Supported telephone connections are Tip/Ring, T1, and E1.

**Terminal Emulator**

Software that 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 can 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.

**ThickNet**

A 10-millimeter (10BASE5) coaxial cable used to provide InterLAN communications.

**ThinNet**

A 5-millimeter (10BASE2) coaxial cable used to provide InterLAN communications.

**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, with each assignment being for a discrete time interval.

**Tip/Ring**

A term used to denote analog telecommunications using four-wire media.

**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. A transaction can involve one or more telephone network connections and voice responses from the CONVERSANT VIS. It can also involve one or more of the VIS optional features, such as speech recognition, 3270 host interface, FAX response, etc.

**transient process**

A process that is created dynamically only when needed.

**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.”

---

## U

**UNIX Operating System**

A multiuser, multitasking computer operating system developed by the Bell Telephone Laboratories division of AT&T.

**UNIX shell**

The command language that provides a user interface to the UNIX operating system.

**upgrade scenario**

The particular combination of current hardware, software, application and target hardware, software, applications, etc.

---

## V

**vi editor**

A screen editor used by the CONVERSANT VIS to create and change electronic files.

**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."

**vocabulary**

A collection of words that a VIS is able to recognize using either WholeWord or FlexWord speech recognition.

**voice channel**

A channel that is associated with an interface to the telephone network (Tip/Ring, T1, or PRI). Any CONVERSANT VIS application can 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 by a "soft seizure" request to TSM from a data interface process (DIP) or the **soft\_srz** 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 processing co-marketer**

A company licensed to purchase voice processing equipment, such as the CONVERSANT VIS, to market and sell based on their own marketing strategies.

**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 nonvoice-related aspects of the system.

**VROP**

See "voice response output process."

---

**W**

**warning**

An admonishment used when there is a possibility of equipment damage.

**WholeWord speech recognition**

An optional feature based on whole-word technology that provides speaker independence, connected digit recognition, key word spotting, prompt interrupt, and DTMF support functionality. See "whole-word technology."

**whole-word technology**

The ability to recognize an entire word, not the phoneme or a part of a word. See "subword technology."

**wink signal**

An interruption of current to a busy lamp indicating that there is a line on hold.

**word**

A unique utterance understood by the recognizer.

**word spotting**

The ability to search past extraneous speech during a recognition.

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