Natural Language Speech Recognition with the Intuity™ CONVERSANT® System

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About This Book

Purpose

This document, *Natural Language Speech Recognition with the Intuity™ CONVERSANT® System*, 585-310-774, provides details about the functions of the Natural Language Speech Recognition (NLSR) offer. This document includes:

- An overview of the NLSR offer and software package
- Instructions to install the NLSR software
- Descriptions and procedures for the administrative functions
- Guidelines for troubleshooting

Intended Audience

The primary audience for this book is as follows:

- End customer developers — This group creates and maintains applications in the Intuity™ CONVERSANT® system environment.
- Custom application developers — This group creates applications used in the system environment for end-user customers and includes Lucent Technologies custom application developers.
- Application distributors — This group distributes and implements applications for end-users, and includes independent software vendors (ISVs) and voice processing co-marketers (VPCs).
- Installers — This group installs Intuity CONVERSANT systems, and includes Lucent Technologies installers.

How to Use This Book

Table 1 provides guidelines for using this book.

Table 1. Guidelines for Using This Book

For information about:	Refer to the following chapter/section:
1 The NLSR offer (general information and overview)	Chapter 1, Overview of the Natural Language Speech Recognition Offer
2 System requirements	Chapter 1, Overview of the Natural Language Speech Recognition Offer
3 Installing software	Chapter 2, Software Installation and Removal
4 Administering NLSR	Chapter 3, Administration
5 Removing software	Chapter 2, Software Installation and Removal
6 Using the NLSR offer	Chapter 4, Use of NLSR in Voice Applications
7 Using external functions	Chapter 4, Use of NLSR in Voice Applications
8 Developing NLSR applications	Chapter 4, Use of NLSR in Voice Applications
9 Alarms and error messages	Chapter 5, Troubleshooting
10 Troubleshooting problems	Chapter 5, Troubleshooting
11 Conventions (typography, terminology, etc.) used in this book	About This Book

All the procedures to install, administer, troubleshoot, and specific to this offer on Intuity CONVERSANT systems are provided in this book. However, where information is common to Intuity CONVERSANT systems in general, other books in the Intuity CONVERSANT document library are referenced (see Related Resources). Also, where information is specific to external vendor software, that vendor's documentation is referenced.

Conventions Used in This Book

Understanding the typographical and other conventions used in this book is helpful in using the information.

Terminology

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

  Type **y** to continue.

- The word “enter” means to type a value and then press **ENTER**. For example, an instruction to type the letter “y” and press **ENTER** is shown as:

  Enter **y** to continue.

- The word “select” means to move the cursor to the desired menu item and then press **ENTER**. For example, an instruction to move the cursor to the Start Test option on the Network Loop-Around Test screen and then press **ENTER** is shown as:

  Select **Start Test**.

- The INTUITY CONVERSANT system displays *menus*, *screens*, and *windows*. Menus (Figure 1) present options from which you can choose to view another menu, a screen, window. Screens and windows can show or request system information (Figure 2 and Figure 3).

Figure 1. Example of INTUITY CONVERSANT Menu

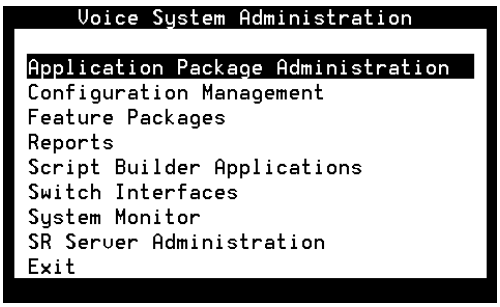


Figure 2. Example of INTUITY CONVERSANT Window Showing Information

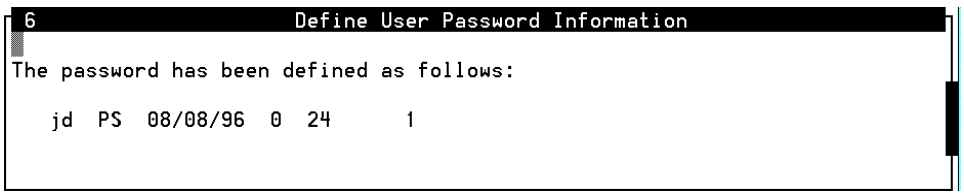
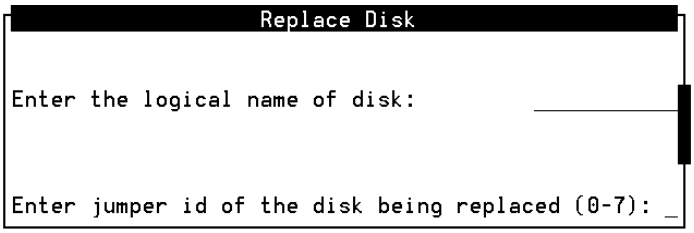


Figure 3. Example of INTUITY CONVERSANT Window Requesting Information



Keyboard and Telephone Keypad Representations

- Keys that you press on your *terminal* or *PC* are represented with bold all-capital text. For example, an instruction to press the enter key is shown as

  Press **ENTER**.

- Two or three keys that you press at the same time on your *terminal* or *PC* (that is, you hold down the first key while pressing the second and/or third key) are represented with bold all-capital text joined with a plus symbol. For example, an instruction to press and hold **ALT** while typing the letter "d" is shown as

  Press **ALT+D**.

- Function keys on your terminal, PC, or system screens, also known as *soft keys*, are represented with bold all-capital text, followed by the function or value of that key enclosed in parentheses. For example, an instruction to press function key 3 is shown as

  Press **F3** (Choices).

- Keys that you press on your *telephone keypad* are represented with bold numerals. For example, an instruction to press the first key on your telephone keypad is shown as

  Press **1** to record a message.

Screen Displays

- Values and field names that appear on the screen are shown in bold type, as shown in the following example:

  ~ Enter the number of ports to be dedicated to outbound traffic in the **Maximum Simultaneous Ports** field.

- System messages and prompts that appear on the screen are shown in constant-width font, as shown in the following example:

  ~ The system displays the following message:

  ```
  Alarm Form Update was successful.
  Press <Enter> to continue.
  ```

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

  Start at the Voice System Administration menu and select:

  > Configuration Management

  > Feature Licensing

  In this example, you access the INTUITY CONVERSANT Voice Administration menu, then select the **Configuration Management** option, then the **Feature Licensing** option from the Configuration Management menu.

- Screens shown in this book are examples only. The screens you see on your machine will be similar, but not exactly the same.

Other Typography

- Commands and text you type or enter appear in **bold type**, for example:
  - ~ Enter **change-switch-time-zone** at the **Enter command:** prompt.
  - ~ Type **high** or **low** in the **Speed:** field.
- Command variables are shown in ***bold italic*** type when they are part of what you must type in and *regular italic* type when they are not, for example:

  Enter **ch ma *machine_name***, where *machine_name* is the name of the call delivery machine you just created.

Safety Labels

This book uses the following symbols to call your attention to potential problems that could cause personal injury, damage to equipment, loss of data, service interruptions, or breaches of toll fraud security:

⚠ CAUTION:
Indicates the presence of a hazard that if not avoided *can* or *will* cause minor personal injury or property damage, including loss of data.

⚠ WARNING:
Indicates the presence of a hazard that if not avoided *can* cause death or severe personal injury.

⚠ DANGER:
*Indicates the presence of a hazard that if not avoided **will** cause death or severe personal injury.*

Related Resources

Additional training material and documentation and training material is available for you to learn more about the INTUITY CONVERSANT product.

Training

For information on INTUITY CONVERSANT training in the United States, visit the Global Learning Solutions (GLS) training web site at:

http://training.gbcset.lucent.com/

Or you can call the Enterprise Networks (EN) GLS Education and Training Center at one of the following numbers:

- Organizations within Lucent Technologies (904) 636-3261
- Lucent Technologies customers and all others (800) 255-8988

To arrange international training, contact your sales representative.

Documentation

For complete information about your Intuity CONVERSANT system, see the *Intuity™ CONVERSANT® System Documents* CD-ROM that came with your system.

In addition, the *INTUITY™ CONVERSANT® System Version 7.0 System Description*, 585-313-204, describes all the books in the INTUITY CONVERSANT documentation library. See the inside front cover of that book for information on how to order INTUITY CONVERSANT documentation. This book also contains a glossary of terminology, including abbreviations, associated with the Intuity CONVERSANT system.

Note: Always refer to the appropriate book for specific information on planning, installing, administering, or maintaining an INTUITY CONVERSANT system.

Technical Support

- For technical support specific to the Intuity CONVERSANT system, follow your normal escalation path.
- For technical support specific to the NLSR server or engine, contact your NLSR product technical support or authorized product distributor.

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- UnixWare is a registered trademark of the Santa Cruz Operation, Inc.

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Lucent Technologies
GLS Information Development Organization
Room 22-2H15
11900 North Pecos Street
Denver, CO 80234-2703 US

Fax: (303) 538-1741

1 Overview of the Natural Language Speech Recognition Offer

Overview

This chapter provides an overview of the Natural Language Speech Recognition (NLSR) offer for Intuity CONVERSANT System Version 7.0 and beyond.

Purpose

The purpose of this chapter is to familiarize you with the NLSR offer and software package. Topics include the following:

- What Is Natural Language Speech Recognition?
- The NLSR Offer
- NLSR Offer Architecture
- System Requirements
- Tasks Required to Use the NLSR Offer

What Is Natural Language Speech Recognition?

Within the context of interactive voice response (IVR) systems and applications, the term “speech recognition”, sometimes also called “automatic speech recognition” or “advanced speech recognition” (ASR), is the ability of an IVR system to recognize spoken responses from a caller and either convert it to text or use the results to initiate some system action. On Intuity CONVERSANT systems today, several different forms of speech recognition exist, including the following:

- WholeWord speech recognition which uses standard WholeWord “grammars” to recognize numerical and yes/no responses
- Custom WholeWord speech recognition, which is similar to standard WholeWord speech recognition except that you can define your own special vocabulary for the grammar
- FlexWord speech recognition, which uses phonemes to recognize longer words and phrases

For more information about these speech recognition technologies, see the *Intuity™ CONVERSANT® System Speech Development, Processing, and Recognition* book for your system.

All these forms of ASR are very good at what they do, and in many applications they are quite sufficient. They do, however, share some limitations, both in the number of words or phrases that can be recognized, and also in their inability to take into account grammatical sentence structure. While these ASR technologies can recognize specific words or phrases, even when extraneous words or phrases are thrown in by the caller, they have no ability to recognize what part the recognized speech plays in the overall statement. In other words, these ASR technologies are all designed to *recognize* specific words or phrases, but not to *interpret* what they recognize.

Natural language speech recognition (NLSR) takes the speech recognition process several steps further by providing a more natural conversational interface with IVR systems. Not only can NLSR be used to recognize particular words and phrases, it can also interpret and assign meaning to the speech it recognizes.

For example, under the more basic forms of ASR, a caller can respond only to specific prompts, such as "Say 'one' if you want information about..." or "Say 'yes' if this is correct." NLSR enables you to write applications that ask the caller more open-ended questions, such as a banking application that presents the caller with a list of options and then asks "What would you like to do?" Then, when the caller responds "I'd like to know the balance of my checking account, please," the system can recognize what kind of information the caller is asking for (the *balance* in a *checking account*) and can automatically direct the call to a new prompt that would ask for the caller's checking account number. This new technology provides a more natural way of interacting with callers.

It is worth noting that NLSR is also able to take into account grammatical structures. This allows it, for instance, to recognize and deal appropriately with differences in statements like the following caller responses:

"I would like to fly from Chicago to LAX."

"I need to get from LAX to Chicago."

NLSR is also capable of understanding natural numbers ("seventy-six" instead of "seven six"), natural dates ("July 26th" instead of "zero seven two six") and natural currency ("25 dollars" instead of "two five zero zero").

Because of the relatively complex nature of NLSR, it requires the use of larger vocabularies and grammars. For this reason, it often works best when a "proxy server" is used to do the speech recognition. Speech recognizers running on external speech recognition servers have at their disposal more CPU power and more memory than specialized voice processing circuit cards such as the Speech and Signal Processing (SSP) circuit card on the Intuity CONVERSANT system. They also offer more flexibility by allowing you to use multiple speech recognition servers, thus increasing the available CPU power and memory even more. That is the thinking behind this Lucent NLSR offer.

The NLSR Offer

The NLSR offer provides you with the ability to use the Intuity CONVERSANT voice response system with NLSR components from external vendors in a client/server configuration. (For a more complete description of this process, see Tasks Required to Use the NLSR Offer.)

The NLSR offer consists of the following components:

- **Natural Language Speech Recognition - Proxy/Client** software package on floppy diskette
- **Natural Language Speech Recognition with the Intuity™ CONVERSANT® System** software installation instructions on paper
- **Natural Language Speech Recognition with the Intuity™ CONVERSANT® System** "electronic book" in the form of a .pdf file available from an Internet site

The **Natural Language Speech Recognition - Proxy/Client** floppy diskette contains software that provides an interface to connect the Intuity CONVERSANT with an external NLSR server using a dedicated LAN connection. This proxy software, after verifying the availability of a recognizer resource on the NLSR server, passes the caller's utterance, in the form of digitized speech, to the recognizer. It then passes the results—that is, what the recognizer heard—back to the Intuity CONVERSANT. Thus, this software package provides a way for non-resident NLSR resources to appear as resident resources to Intuity CONVERSANT applications.

The **Natural Language Speech Recognition with the Intuity™ CONVERSANT® System** software installation documentation is a short instruction sheet that tells you how to install the NLSR software on the Intuity CONVERSANT system. It also has the instructions for downloading the full documentation for this offer (in the form of a .pdf file) from the Web.

NLSR Offer Architecture

The NLSR offer assumes you are using one or more Intuity CONVERSANT systems in conjunction with one or more NLSR computers in a client/server configuration. This setup assumes that the Intuity CONVERSANT is the client and the NLSR computer is the server. Beyond that, the exact NLSR system architecture is dependent on what other components you are using in conjunction with this offer.

All computers in the system communicate using an Ethernet PCI local area network (LAN) connection.

The following scenarios depict various configurations that might be used to deploy NLSR applications. They include:

- A minimum configuration model, showing the most basic type of setup you might use
- A multiple-client/multiple-server configuration model

Minimum Configuration Model

Figure 4 shows a prototypical model for the NLSR offer using a minimum-component configuration. It is followed by a description of how the system works (Table 2). Note that this is only a sample of *one* way an NLSR system might be set up and used.

Figure 4. Minimum Configuration Model for NLSR Offer

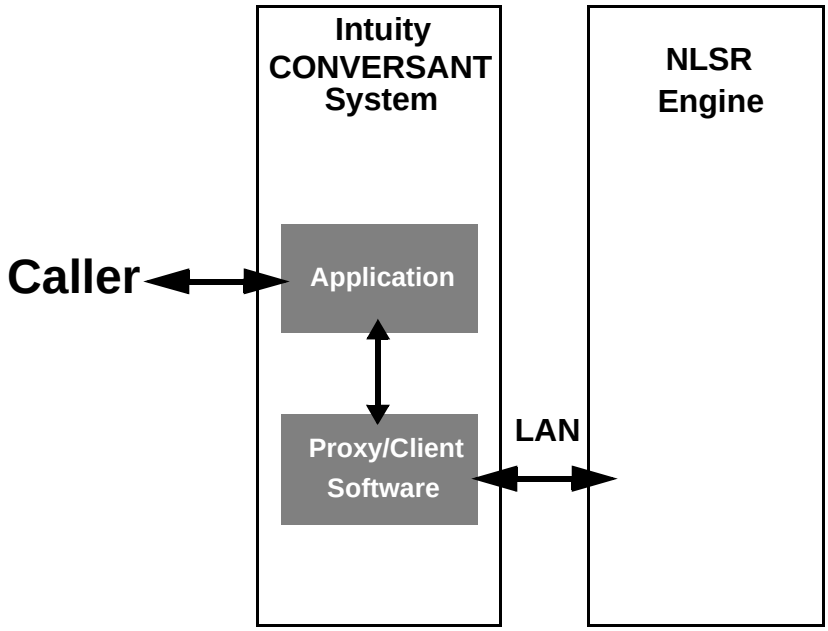

Table 2. NLSR Minimum Configuration Model Description

Action	Relevant Object(s) in Figure 1
1 The call is received on the Intuity CONVERSANT, and the NLSR call flow application begins running.	Caller, Application
2 The application answers the call and allocates a remote NLSR resource.	Application, Proxy/Client Software
3 (Optional) The application sends recognizer-specific commands to the remote NLSR resource to set it up for the caller's response.	Application, Proxy/Client Software, NLSR Engine
4 The application performs a Prompt and Collect action to obtain a response from the caller.	Application, Caller

1 of 2

Table 2. NLSR Minimum Configuration Model Description

Action	Relevant Object(s) in Figure 1
5 The caller's spoken response is converted into digitized speech data and sent to the remote NLSR recognizer.	Proxy/Client Software, NLSR Engine
6 The remote NLSR recognizer processes the incoming digitized speech data.	NLSR Engine
7 The remote NLSR recognizer returns a recognition string to the application.	NLSR Engine, Application, Proxy/Client Software
8 (Optional) The application may query the remote NLSR resource one or more times to obtain or send vendor-specific data and information.	Application, Proxy/Client Software, NLSR Engine
9 The application takes whatever steps are necessary to complete the caller's request. This may involve multiple Prompt and Collects and several data exchanges between the Intuity CONVERSANT and the NLSR server.	Caller, Application, Proxy/Client Software, NLSR Engine
10 The application releases the remote NLSR resource.	Application, Proxy/Client Software
11 The call is terminated.	Application

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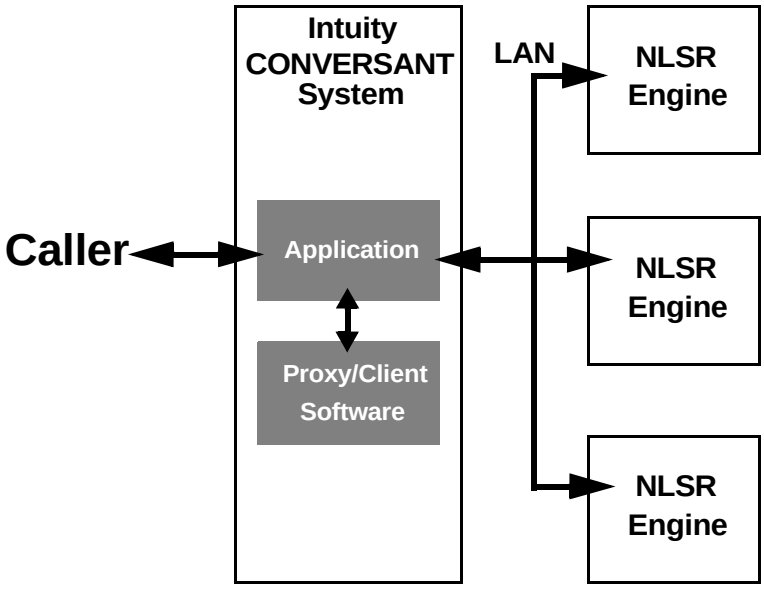
Single-Client/Multiple-Server Model

Figure 5 shows a model for the NLSR offer using a single Intuity CONVERSANT with multiple NLSR servers. It is followed by a description of how the system works (Table 3). Note that this is only a sample of *one* way an NLSR system might be set up and used.

Figure 5. Single-Client/Multiple-Server Model



Note: Each NLSR engine in this setup *must* be administered identically to the other NLSR engines in the system. This means, among other things, that you can have only one type of external vendor NLSR speech engine per system.

Table 3. NLSR Single-Client/Multiple-Server Model Description

Action	Relevant Object(s) in Figure 1
1 The call is received on the Intuity CONVERSANT, and the NLSR call flow application begins running.	Caller, Application
2 The application answers the call and allocates a remote NLSR resource.	Application, Proxy/Client Software
3 The application performs a Prompt and Collect action to obtain a response from the caller.	Application, Caller
4 The caller's spoken response is converted into digitized speech data and sent to the remote NLSR recognizer.	Proxy/Client Software, NLSR Engine
5 The remote NLSR recognizer processes the incoming speech data.	NLSR Engine
6 The remote NLSR recognizer returns a recognition string to the application.	NLSR Engine, Application, Proxy/Client Software

1 of 2

Table 3. NLSR Single-Client/Multiple-Server Model Description

Action	Relevant Object(s) in Figure 1
7 The application uses the Natural Language Interpreter to get "tokens" and values of "variables" from the recognition string.	Application
8 The application takes the steps necessary to complete the caller's request.	Application
9 (Optional) Steps 3 through 8 are repeated any number of times, as required by the call flow.	
10 The application releases the remote NLSR resource.	Application, Proxy/Client Software
11 The call is terminated.	Application

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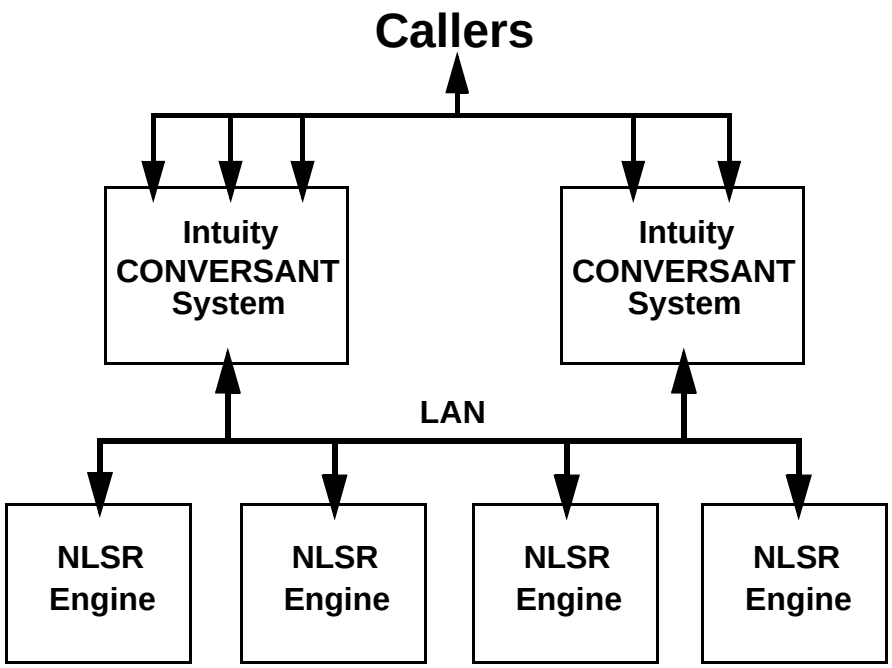
Multiple-Client/Multiple-Server Model

Figure 6 shows a model for the NLSR offer using a multiple-client (Intuity CONVERSANT)/multiple-server configuration. Note that this is only a sample of *one* way such an NLSR system might be set up and used.

Note: When setting up a multiple-client/multiple-server configuration, keep in mind that each Intuity CONVERSANT system acts independently and cannot dynamically share resources with other Intuity CONVERSANT systems. In other words, you must make sure you assign your NLSR servers carefully. While it is possible to do otherwise, Lucent strongly recommends that you assign each NLSR server to a single Intuity CONVERSANT client, even though all machines in the system may share a single LAN. In the example below, for instance, you could assign the first two NLSR servers to the first Intuity CONVERSANT system and the third and fourth NLSR servers to the second Intuity CONVERSANT system. You must also carefully plan your incoming telephone lines for each Intuity CONVERSANT system.

Figure 6. Multiple-Client/Multiple-Server Model



Note: Each NLSR engine assigned to a single Intuity CONVERSANT client in this setup *must* be administered identically to the other NLSR engines in the system assigned to that same Intuity CONVERSANT client. This means, among other things, that you can have only one type of external vendor NLSR speech engine per Intuity CONVERSANT client.

System Requirements

This section provides information about the software and hardware requirements for the NLSR offer.

Software Requirements

The NLSR offer requires a number of software packages. Table 4 lists the required software packages and whether each package is available as part of the NLSR offer package.

Table 4. NLSR Required Software

Package Name	Available as part of the NLSR offer package?
Intuity CONVERSANT base system software (V7.0 or beyond)	**N**
rfu+b patches (V7.0 systems only): asp+bp1 and us+bp1	**N**
Appropriate circuit card drivers (for example, SSP, T1, and LAN)	**N**
INTUITY ASP driver package	**N**
Natural Language Speech Recognition - Proxy/Client software package	**Y**
Voice@Work or Script Builder with INTUITY Service Creation Integration Package	**N**
NLSR engine software (provided by the NLSR engine vendor and installed on remote NLSR server)	**N**

Hardware and LAN Requirements

Table 5 summarizes the hardware and LAN requirements for the NLSR offer. In addition to these requirements, you must also have one or more remote NLSR servers, depending on the NLSR engine requirements. Hardware requirements for these NLSR servers are provided by the NLSR engine vendor.

Table 5. Hardware and LAN Requirements

Intuity CONVERSANT System	LAN
MAP/40P or MAP/100P with: **Note:** This offer is not valid for MAP/5P systems, because they do not support the SSP circuit card. • At least one of the following telephony cards: ~ Tip/Ring (analog) ~ E1/T1 (digital) • Lucent-certified Ethernet PCI (Peripheral Component Interconnect) LAN circuit card • SSP circuit card **Note:** You cannot use SP circuit cards for the NLSR offer or for speech coding applications in general. • 128 Mb of RAM	**Note:** LAN installation is the customer's responsibility. Transmission Control Protocol/ Internet Protocol (TCP/IP) PCI Ethernet network operating at a speed of at least one of the following: • 10 Mbps (supports up to 28 channels) • 100 Mbps (supports up to 96 channels) **Note:** The speed required is influenced by the number of LAN-intensive features, such as ASAI or Proxy Text-to-Speech, running on the Intuity CONVERSANT. LAN segment dedicated for all Intuity CONVERSANT traffic

Tasks Required to Use the NLSR Offer

There are three basic sets of tasks you must accomplish in order to use the NLSR offer:

- First, install and configure the appropriate software and hardware.
- Next, design, develop, and test the NLSR application.
- Finally, deploy the NLSR application.

This section provides the basic steps for accomplishing these tasks.

Configuring the Hardware and Software

Table 6 lists the basic steps to install and administer the NLSR offer. Detailed procedures for each step are found in the section cross references listed in the second column.

Note: The following steps are for the configuration of Intuity CONVERSANT systems only; for the procedures to configure the NLSR server(s), see the documentation for your NLSR system.

Table 6. Steps for NLSR Initial Installation and Administration

Action/Step	Procedure Reference
1 Verify that you have all the required software and hardware for the installation set up properly.	System Requirements in this chapter
2 Verify that the Ethernet PCI LAN circuit card is installed and administered on the Intuity CONVERSANT system.	The *Intuity™ CONVERSANT® System Maintenance* book for your system, Chapter 2, Installing or Replacing Circuit Cards, PCI Ethernet LAN Circuit Cards
3 Install the **Natural Language Speech Recognition - Proxy/Client** software package on the Intuity CONVERSANT system.	Chapter 2, Software Installation and Removal, Installing the NLSR Proxy/Client Software
4 Perform all the initial administration tasks prescribed for your system, taking special note of procedures that only apply to one configuration or another (that is, procedures specific to applications involving one or more external vendors).	Chapter 3, Administration, Initial Administration for the NLSR Offer Software
5 Verify that connections between the Intuity CONVERSANT and any NLSR servers are established.	Chapter 3, Administration, Initial Administration for the NLSR Offer Software

While there are other options you can use to enhance the NLSR offer (described in Chapter 3, Administration and Chapter 4, Use of NLSR in Voice Applications), once you have completed these basic steps, you are ready to use the NLSR offer.

Creating and Testing the Application

Table 7 lists the basic steps required to create an NLSR application. Depending on your system configuration and what you want your NLSR application to do, you may need to add steps to or skip over steps in this basic model. This example only provides guidelines.

Table 7. Steps for Creating an NLSR Application

Action/Step	Procedure Reference(s)
1 Design the call flow architecture. You must analyze what you want your application to do and then create a call flow to move the caller through the transaction, paying special attention to the prompts used to elicit caller responses.	Select from among the following: • *Using Voice@Work*, 585-313-207 • *Intuity™ CONVERSANT® System Application Design with Script Builder* for your system • (Optional, if using an external vendor application design tool) Documentation for the external vendor tool In addition, you may find the following book helpful: *Intuity™ CONVERSANT® System Version 6.0 Application Design Guidelines*, 585-310-670
2 Analyze your call flow design to determine what kinds of responses you are likely to get from prompts, perhaps using customer interaction testing.	
3 Use the results of your analysis to develop your natural language vocabulary grammars.	• The documentation that came with your NLSR grammar development tool
4 Create a stub grammar.	Chapter 4, Use of NLSR in Voice Applications, Creating Stub Grammars
5 Develop the actual Intuity CONVERSANT call flow application using Voice@Work or Script Builder.	Select from among the following: • *Using Voice@Work*, 585-313-207 • *Intuity™ CONVERSANT® System Application Design with Script Builder* for your system
6 Verify that the application runs; debug as necessary.	*Intuity™ CONVERSANT® System Version 6.0 Application Design Guidelines*, 585-310-670

Note: Many of these steps are iterative and may need to be repeated several times before you are ready to deploy the application.

Deploying the Application

Table 8 lists the basic steps required to deploy an NLSR application. Depending on your system configuration and what you want your NLSR application to do, you may need to add steps to or skip over steps in this basic model. This example only provides guidelines.

Table 8. Steps for Deploying an NLSR Application

Action/Step	Procedure Reference(s)
1 Create, test, and debug your application.	Creating and Testing the Application, above
2 Transfer the call flow application(s) to the Intuity CONVERSANT system.	Select from among the following: • *Using Voice@Work*, 585-313-207 • *Intuity™ CONVERSANT® System Application Design with Script Builder* for your system
3 Install the call flow application(s) on the Intuity CONVERSANT system.	Select from among the following: • *Using Voice@Work*, 585-313-207 • *Intuity™ CONVERSANT® System Application Design with Script Builder* for your system
4 Install the appropriate software on the NLSR server.	Select from among the following: • Documentation for the NLSR engine
5 Place a test call to the system and verify that it responds as expected.	

Note: Many of these steps are iterative and may need to be repeated several times before you are ready to place the application in active service.

2 Software Installation and Removal

Overview

The Intuity™ CONVERSANT® software components of the basic NLSR offer are contained in the **Natural Language Speech Recognition - Proxy/Client** software package. This software provides the Intuity CONVERSANT system the ability to interface with remote natural language speech recognizers in a client/server configuration.

Purpose

This chapter contains the procedures required to install and remove the **Natural Language Speech Recognition - Proxy/Client** software package. Topics include the following:

- Installing the NLSR Proxy/Client Software
- Removing the NLSR Proxy/Client Software

Installing the NLSR Proxy/Client Software

To install the Natural Language Speech Recognition Proxy/Client software package, do the following:

1. Log in to the Intuity CONVERSANT system as root.
2. At the command prompt, enter:

   stop_vs; stop_wait

   The system displays a series of voice system status messages, ending with the following:

   ```
   The Voice System has stopped.
   ```

3. At the command prompt, enter:

   pkgadd -d diskette1

   The system displays the following message:

   ```
   Insert diskette into Floppy Drive 1.
   Type [go] when ready.
     or [q] to quit: (default: go)
   ```

4. Insert the floppy diskette labeled **Natural Language Speech Recognition - Proxy/Client** into the floppy diskette drive.
5. Press **Enter**.

6 At the command prompt, press **Enter** again.

The system displays a series of messages indicating the progress of the package installation, ending with the following:

```
The system should now be rebooted.

Installation of INTUITY Natural Language Speech
Recognition - Proxy/Client (nlsrproxy) was
successful.

Insert diskette into Floppy Drive 1.
Type [go] when ready.
  or [q] to quit: (default: go)
```

7 Enter **q**

8 Remove the floppy diskette from the floppy diskette drive.

You must reboot the system before it will recognize the software just installed.

9 To reboot the system, at the command prompt, enter:

shutdown -i6 -y -g0

10 To start the voice system, at the command prompt, enter **start_vs**

The system displays a series of messages indicating the voice system status progress, ending with the following:

```
Startup of the Voice System is complete
```

Note: If the voice system is already running, the system displays a message to that effect.

Removing the NLSR Proxy/Client Software

To remove the NLSR Proxy/Client software from your system, do the following:

1. Log in to the Intuity CONVERSANT system as root.
2. At the command prompt, enter:

   stop_vs; stop_wait

   The system displays a series of voice system status messages, ending with the following:

   ```
   The Voice System has stopped.
   ```

3. At the command prompt, enter:

   pkgrm nlsrproxy

   The system displays the following message:

   ```
   The following package is currently installed:
       nlsrproxy     INTUITY Natural Language Speech
                     Recognition - Proxy/Client
                     (i486) i.2.1

   Do you want to remove this package [y,n,?,q]
   ```

4. Enter **y**

   The system displays a series of progress messages, ending with the following:

   ```
   Removal of <nlsrproxy> was successful.
   ```

5. To reboot the system, at the command prompt, enter:

   shutdown -i6 -y -g0

6. To restart the voice system, at the command prompt, enter **start_vs**

   The system displays a series of messages indicating the voice system status progress, ending with the following:

   ```
   Startup of the Voice System is complete
   ```

Note: If the voice system is already running, the system displays a message to that effect.

3 Administration

Overview

After the NLSR software is installed, you must administer the local area network (LAN) connection, as well as the NLSR software and the remote NLSR resource server on the Intuity™ CONVERSANT® system.

Purpose

This chapter provides the procedures required to perform the initial NLSR administration on the Intuity CONVERSANT system once the NLSR software has been installed.

This chapter also describes the procedures needed to perform common administrative tasks used to maintain or report on the NLSR service.

Topics include the following:

- Initial Administration for the NLSR Offer Software
- Maintenance Administration for the NLSR Offer

Initial Administration for the NLSR Offer Software

Once you have the NLSR offer software installed, use the following procedures to set up your system for each NLSR offer server. These procedures include the following:

Note: Lucent recommends that you do these tasks in the order in which they are presented. In some cases, one procedure depends upon a previous procedure already being done.

- Verifying the Right-to-Use Licensing
- Obtaining IP Addresses
- Adding the NLSR Engine Server to the /etc/hosts File
- Administering the NLSR Server on the Intuity CONVERSANT System
- Administering SSP Functions for NLSR
- Administering Voice Equipment Options

Verifying the Right-to-Use Licensing

A sufficient number of Right-to-Use (RTU) licenses must be purchased as needed for use with all ASR and NLSR channels. This includes Lucent ASR channels, such as WholeWord speech recognition, as well as those needed for any external vendor NLSR engine channels.

NLSR Licensing Types

External NLSR recognizers are divided into two types for licensing control:

- Recognizers that have their own separate licensing control on the NLSR server side, and thus which do not depend on an Intuity CONVERSANT RTU licensing mechanism to limit the number of NLSR server recognizers. In this case, the Intuity CONVERSANT RTU mechanism is used to control the CONVERSANT resources, such as proxy licenses, but not the NLSR engine resources. The Nuance NLSR engine falls into this category.
- Recognizers that do not have licensing control on the NLSR server side, and thus which depend on the Intuity CONVERSANT RTU licensing mechanism to limit the number of NLSR recognizers made available on an Intuity CONVERSANT system.

The intent is for all future NLSR engines to be of the first type whenever possible.

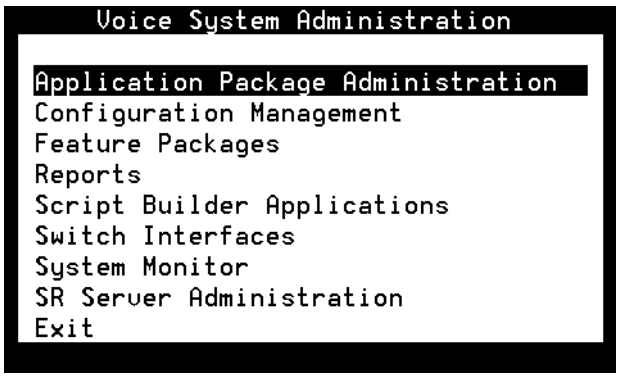
RTU License Verification Procedure

To verify RTU licensing, do the following:

1. Log in to the Intuity CONVERSANT system as root.
2. Enter **cvis_menu**

   The system displays the Voice System Administration menu (Figure 7).

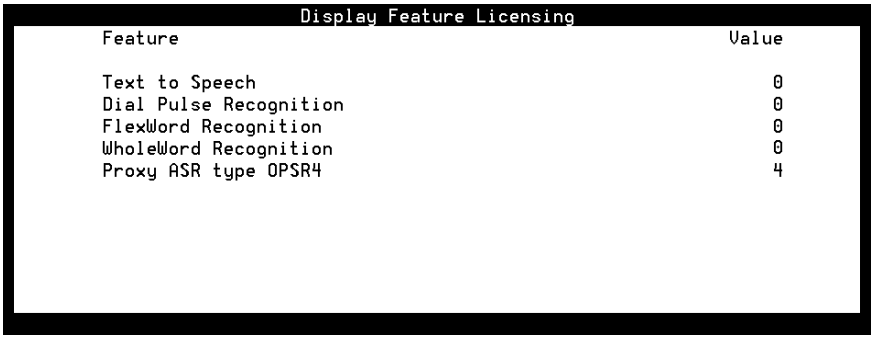
Figure 7. Voice System Administration Menu



3. Select the following:

The system displays the Display Feature Licensing window (Figure 8).

Figure 8. Feature Licensing Window



4 Verify that the appropriate feature license entry is valid:

~ **Proxy ASR type OPSR4** for external vendors

Note: A zero (0) in a Value field indicates there are no valid licenses for that feature. Any other number indicates the number of valid licenses for the feature.

If the RTU licensing is not correct, contact your remote service center for information about RTU license administration.

5 Press **F6** (Cancel) three times to return to the command prompt.

Obtaining IP Addresses

Obtain from your LAN administrator a unique Internet Protocol (IP) address for *each* NLSR server on the dedicated LAN and for the Intuity CONVERSANT system. Use this information to administer the NLSR server and the Intuity CONVERSANT system.

Note: For the LAN requirements, see System Requirements in Chapter 1, Overview of the Natural Language Speech Recognition Offer and the documentation for your NLSR server.

Adding the NLSR Engine Server to the /etc/hosts File

To enable network connectivity between the Intuity CONVERSANT system and the NLSR engine server, normally it is sufficient to set the IP address or DNS name in the SR Server Administration window (see Administering the NLSR Server on the Intuity CONVERSANT System below). The **/etc/hosts** file contains information, however, which may be required to help establish a valid connection between the Intuity CONVERSANT system and the NLSR engine server.

To enter the NLSR engine server in the **/etc/hosts** file on the Intuity CONVERSANT system, do the following:

1. Log in to the Intuity CONVERSANT system as root.
2. Open the **/etc/hosts** file with an ASCII text editor, such as the **vi** editor.
3. For each NLSR engine server, add an entry to the **/etc/hosts** file consisting of one line that includes the server's IP address and DNS name.

   If desired, you can also add one or more aliases for the DNS name using the following format:

   IP_address DNS_name alias alias

Note: By convention, the DNS name should match the PC name administered in the operating system on the server.

4. Save the file and exit.

Administering the NLSR Server on the Intuity CONVERSANT System

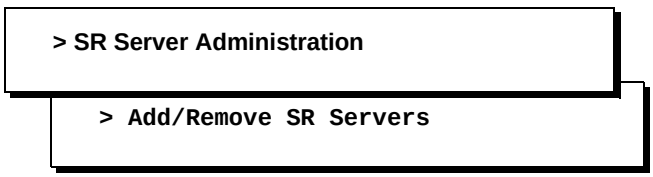
To set the NLSR server connection parameters on the Intuity CONVERSANT system, do the following:

Note: To minimize system disruptions and speech recognition failures, you should perform the following procedures only during off or non-peak hours.

1. Log in to the Intuity CONVERSANT system as root.
2. At the command prompt, enter **cvis_menu**

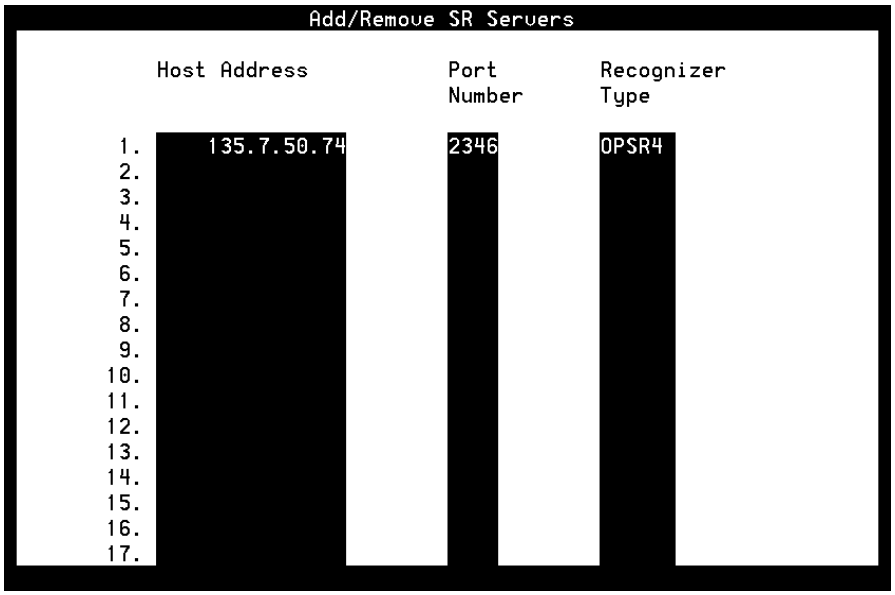
   The system displays the Voice System Administration menu (Figure 7).

3. Select the following:



   The system displays the Add/Remove ASR Servers window (Figure 9).

Figure 9. Add/Remove SR Servers Window



4 In the **Host Address** field, enter the IP address of the server to be added.

Note: Press **TAB** or **ENTER** to move through the fields.

5 In the **Port Number** field, enter the port/socket number to be used by the server for speech recognition processing.

You must work with the vendor of the remote NLSR recognizer to determine what socket number you should use. The number you use here must match what the remote server expects.

6 In the **Recognizer Type** field, press **F2** (Choices) and select the type of recognizer you want to use for your application from the menu.

OPSR4 is used for speech recognition engines from external vendors. This is the only valid choice at this time.

Note: This field is case-sensitive. That is, if you enter characters manually, you must enter them in all uppercase letters. If you use lowercase letters, the server is not administered.

7 To save the information in this window, press **F3** (Save).

The system displays the following prompt:

```
Check with your application developer or ASR vendor
to determine if speech center clipping should be
turned on.

Do you want speech center clipping for barge-in
turned on?
```

8 Depending on whether your speech recognizer requires that speech center clipping be turned on or off, type either **y** or **n**

Note: Speech center clipping is a process in which the level of a signal is set to near zero when it falls below a designated threshold. You must check with your NLSR speech recognition engine's documentation or technical support person to determine whether you should turn this on or off.

The system displays the following prompt:

```
This command will terminate ongoing calls for a few
seconds. Do you want to continue?
```

9 Type **y**

10 Press **F1** (Acknowlg Message).

11 Press **F6** (Cancel) twice to return to the Voice System Administration menu.

Administering SSP Functions for NLSR

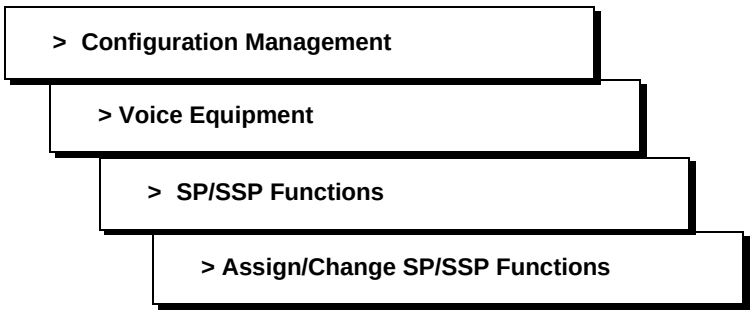
Before using the NLSR service, you must assign the SSP functions to the SSP circuit card. The required functions include the following:

- play
- code
- echocan (echo cancellation) Default

To administer the SSP functions, do the following:

Note: The following procedure assumes you are already logged in to the Intuity CONVERSANT system as root, and that you are already using the **cvis_menu** command.

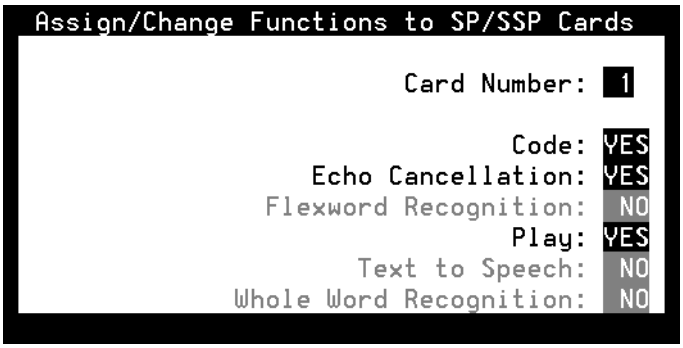
1 Starting from the **Voice System Administration** menu (Figure 7), select the following:



The system displays the Assign/Change Functions to SP/SSP Cards window (Figure 10).

Note: Other options in this window may appear or be selected, depending upon what other features you have and are using on your system.

Figure 10. Assign/Change Functions to SP/SSP Cards Window



2 In the **Card Number:** field, enter the SSP circuit card number.

If you do not know the number of the SSP circuit card, you can examine a list of the possible choices by clicking the **F2** (Choices) key.

⚠ CAUTION:
Do not attempt to use SP circuit cards for any functions of the NLSR offer. In other words, Code, Play, and Echo Cancellation should be assigned *only* to SSP circuit cards, and *not* to any SP circuit cards that may be co-resident in the system. Serious failures can result if SP circuit cards are used for these functions in NLSR systems.

Note: If you are using multiple SSP circuit cards, they must *each* be configured to the following settings.

3 Verify that the following SSP functions are set to **YES**:

- Code
- Echo Cancellation
- Play

Note: The other fields may or may not be set to **YES**, depending on what other features and options you have set for your system.

To change the value of a given function, select that function, press the **F2** (Choices) key, and use the directional arrows to highlight your choice. Press **ENTER** to confirm your choice.

4 Press **F3** (Save).

If the SSP circuit card is in service, the system displays the following warning:

```
The SP card needs to be put in a manual out of
service state. Press 'y' to take the card out of
service, assign the specified functions, and return
the card to service. Press 'n' to abort.

WARNING: Taking a card out of service will cause any
calls in progress to be dropped.
```

Note: If the SSP circuit card is *not* in service, it must be put in service before using an application. For the procedure to place an SSP circuit card in

service, see Placing the SSP Circuit Card in Service in the Maintenance Administration for the NLSR Offer section of this chapter.

5 Enter **y**

If you have WholeWord or FlexWord speech recognition installed but do not have them assigned here, the system displays a message similar to the following:

WARNING: The list of functions should include all of the available recognizers for this card, as well as the echo canceler.

Original assignment list requested is:

code, echocan, play

Suggested assignment list is:

code, echocan, play, wholeword, flexword

Is it OK to use the suggested assignment list (y or n) [y]?

6 Do one of the following:

- If your application uses WholeWord and/or FlexWord speech recognition, press **Enter.**
- If your application does not use WholeWord or FlexWord speech recognition, enter **n**

7 Verify that the system displays the following message:

Assignment made.

Press Enter to continue.

8 Press **ENTER**.

9 Press **F6** (Cancel) twice to return to the Voice Equipment menu.

Administering Voice Equipment Options

The Voice Equipment options you must administer depend on the type of circuit card you are using. If you are using a tip/ring circuit card, see Administering Tip/Ring Circuit Cards for the NLSR Offer below. If you are using an E1 or T1 circuit card, see Administering E1/T1 Circuit Cards for the NLSR Offer below.

Administering Tip/Ring Circuit Cards for the NLSR Offer

If you are using a tip/ring circuit card for the NLSR service, you must assign the Time Division Multiplex (TDM) option to the appropriate channels.

To assign TDM to circuit cards supporting NLSR applications, do the following:

Note: The following procedure assumes you are proceeding directly from the previous procedure.

1 From the Voice Equipment menu, select:

```
> Equipment Options
```

The system displays the Change Options of Voice Equipment window (Figure 11).

Figure 11. Change Options of Voice Equipment Window

```
Change Options of Voice Equipment

            Talk-tdm: tdm
           Equipment: card
   Equipment Number: 0-3
```

2 In the **Talk-tdm:** field, enter **tdm**

3 In the **Equipment:** field, enter **card**

4 In the **Equipment Number:** field, enter a number or a range of numbers corresponding with the tip/ring circuit card numbers to which you want to assign the TDM function.

5 Press **F3** (Save).

6 Press **F6** (Cancel) twice to return to the Configuration Management menu.

Administering E1/T1 Circuit Cards for the NLSR Offer

If you are using an E1 or T1 circuit card for the NLSR offer feature, you must first administer the card on the Intuity CONVERSANT system using the procedures given in the *Intuity™ CONVERSANT® System Administration* book for your system.

Maintenance Administration for the NLSR Offer

Use the procedures in this section to check the NLSR server connection status, use the proxy data collection utility, generate an NLSR activity report, or administer the SSP circuit card for maintenance purposes. Subtopics in this section include the following:

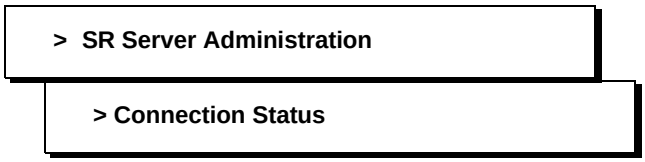
- Verifying the NLSR Server Connection Status on the Intuity CONVERSANT System
- Using the Proxy Data Collection Utility
- Turning Center Clipping On or Off
- Generating NLSR Activity Reports
- Using the Server Maintenance Commands
- Placing the SSP Circuit Card in Service
- Removing the SSP Circuit Card from Service

Verifying the NLSR Server Connection Status on the Intuity CONVERSANT System

To check the NLSR server connection status on the Intuity CONVERSANT system, do the following:

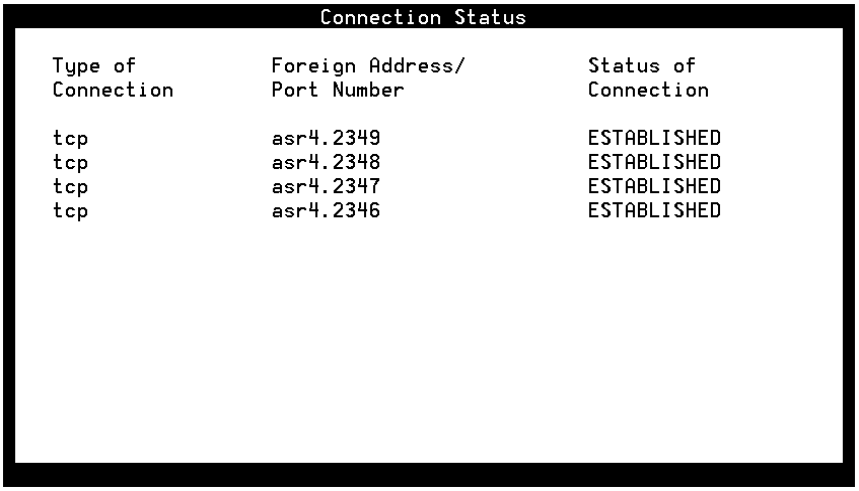
1. Log in to the Intuity CONVERSANT system as root.
2. Enter **cvis_menu**

   The system displays the Voice System Administration window (Figure 7).
3. Select the following:



The system displays the Connection Status window (Figure 12).

Figure 12. Connection Status Window



This window lists only the TCP/IP connections and their status.

4 Press **F6** (Cancel) twice to return to the Voice System Administration menu.

Using the Proxy Data Collection Utility

There may be times when you need to review the speech data for the proxy NLSR applications on your system. To assist you in collecting and reviewing this data, the proxy data collection (PDC) utility has been provided as part of the **Natural Language Speech Recognition - Proxy/Client** software package.

Because these proxy data collection files can take up a large amount of disk space, you should use this utility only when you really need it and turn it off as soon as you no longer need it. The system monitors disk space, and if you leave it running, and if the disk reaches a condition where only 20% or 10 Mb of space remains, the PDC utility is automatically turned off.

In any case, to keep the files from taking too much space, the Intuity CONVERSANT system automatically removes data collection files that are more than seven days old.

The PDC utility resides in the **/vs/bin** directory on the Intuity CONVERSANT. This utility allows you to:

- Turn proxy speech data collection on and off
- Display current status of the proxy speech data collection
- Change the save path for proxy speech data collection files
- Remove all proxy speech data collection files for a particular recognition type

To use the PDC utility, first log in to the Intuity CONVERSANT system as root, and then at the command prompt enter **nlsr admin pdc**, followed by one of the arguments in Table 9.

Table 9. NLSR - Proxy/Client Software Package Components

Argument	Description/Comments
on [*RecogType*]	This argument turns on the proxy data collection utility for a particular recognizer type, specified as the optional *RecogType*. **Note:** This argument requires that you stop and restart the voice system. Also, the only valid recognizer type at this time is **OPSR4**.
off [*RecogType*]	This argument turns off the proxy data collection utility for a particular recognizer type, specified as the optional *RecogType*. This is the default for proxy data collection. **Note:** This argument requires that you stop and restart the voice system. Also, the only valid recognizer type at this time is **OPSR4**.
status	This argument displays: • The current status of the **pdc** utility (on or off) • The current path of the directory to which PDC files are saved • The number of proxy data collection files for each NLSR type
remove [*RecogType*] or **rm [*RecogType*]**	This argument removes all proxy data collection files for a particular NLSR type, specified as the optional *RecogType*. **Note:** The only valid recognizer type at this time is **OPSR4**.
directory <*dirName*> or **dir <*dirName*>**	This argument changes the path of the directory to which PDC files are saved. The default path is **/home2/dc**. **Note:** This argument requires that you stop and restart the voice system.

Turning Center Clipping On or Off

While it is possible to turn speech center clipping on or off using the cvis_menu command (as described in Administering the NLSR Server on the Intuity CONVERSANT System), many times it is faster and more convenient to turn it on or off using a line command.

To use the center clipping line commands, at the system prompt, enter **nlsr admin cclip <*option*>**, where <*option*> is one of the arguments in Table 10:

Table 10. NLSR Center Clipping Command Options

Argument	Description/Comments
status [*RecogType*]	This argument displays the current status of the speech center clipping function. **Note:** The only valid recognizer type at this time is **OPSR4**.
on [*RecogType*]	This argument turns the speech center clipping function on. **Note:** The only valid recognizer type at this time is **OPSR4**.
off [*RecogType*]	This argument turns the speech center clipping function off. **Note:** The only valid recognizer type at this time is **OPSR4**.

Generating NLSR Activity Reports

The Lucent NLSR offer includes a utility that allows you to generate reports of NLSR activity. These are “real-time” reports which are updated at intervals you can specify in the command. These reports can include information about:

- The number of NLSR server resources that are administered in the system
- The number of NLSR server resources currently in service and/or busy in the system
- Peak activities for the reporting period

To generate an NLSR report, first log in to the Intuity CONVERSANT system as root, and then at the command prompt enter some form of the following:

/vs/bin/srvrpt [-t <*type*>] [-i <*interval*>] [-n <*iterations*>] [-f <*filename*>]

where:

- -t <*type*> is the recognizer type for the NLSR engine being used. Currently, the only valid option is **OPSR4**. This is an optional argument.

- -i <*interval*> is the reporting interval in seconds. The valid range is 0–60 seconds. The default is 5 seconds. Using a value of zero (0) for this argument results in a single “snapshot” report being generated. This is an optional argument.
- -n <iterations> is the number of times you want the report to be generated. If you do not specify this option, reports are generated continually (at the time interval specified by -i <*interval*>) until you terminate the report. This is an optional argument.
- -f <*filename*> is the name of an output file to write the report to. When used, instead of a screen display, the report is written to the file named. This is an optional argument.

To terminate the report, press the **Delete** key.

Figure 13 shows an example of a report generated using this command (without any arguments being specified). Table 11 lists and describes the columns/fields in this report.

Figure 13. Sample NLSR Activity Report

```
                    Server Activity Report                Feb 22 2000
                                                          13:39:25
         #       #       #     #     Peak   Peak
Server  Conn   Inserv  Alloc  Busy  Alloc  Busy
     1:  02      00     00     00     00     00
     2:  02      02     00     00     00     00
     3:  02      02     00     00     00     00
        ----    ----   ----   ----   ----   ----
        006     004    000    000    000    000



Press DELETE to terminate.
```

Table 11. NLSR Activity Report Fields

Column / Field	Description / Comments
# Conn	This displays the number of NLSR servers for the requested type that have been administered in the system.
# Inserv	This is the number of NLSR servers for the requested type that are currently in the INSERV (in-service) state.
# Alloc	This is the number of NLSR servers that are currently allocated for use by application scripts.
# Busy	This is the number of NLSR servers that are currently performing a recognition task.

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Table 11. NLSR Activity Report Fields

Column / Field	Description / Comments
`Peak Alloc`	This is the greatest number of NLSR servers allocated during the reporting period.
`Peak Busy`	This is the greatest number of NLSR servers actually busy during the reporting period.

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Using the Server Maintenance Commands

The Lucent NLSR offer includes a number of commands that can be used on the Intuity CONVERSANT system to display the status or change the state of any external NLSR servers used in conjunction with the Intuity CONVERSANT system for natural language speech recognition. With these commands you can:

- Take an NLSR server manually out of service (nlsr remove server command)
- Place an NLSR server into service (nlsr restore server command)
- Display status information about one or more NLSR servers (nlsr display server command)
- Diagnose NLSR server network status (nlsr diagnose server command)
- Detach or attach an NLSR server from the system (nlsr detach server and nlsr attach server commands)

The Remove Server Command

The **nlsr remove server** command places an NLSR server in the "manual out-of-service" (MANOOS) state. This command is used, for instance, when you want or need to take an NLSR server out of the active state so you can perform maintenance on it or administer updates to it without having to bring the whole NLSR system down.

Placing a server in the MANOOS state causes the system to automatically allocate calls to other (still active) servers in the system. This implies that, to use this command most effectively, you must have multiple NLSR servers in the system.

After an NLSR server has been placed in the MANOOS state, you must wait until any calls that have been allocated to that server are released by the server before you attempt any maintenance or updates to the server.

To use this command, enter one of the following at the command prompt:

/vs/bin/nlsr remove server <*server #*> | <*DNS name*> | <*IP address*>

/vs/bin/nlsr rem server <*server #*> | <*DNS name*> | <*IP address*>

where:

- <*server #*> represents the number(s) assigned to the server(s) you want to remove from service. (For information about finding server numbers for particular servers, see The Display Server Command.) Server numbers can be specified as follows:
  - ~ A single server, designated by a single numeral (example: **3**)
  - ~ A group of individual servers, designated by a list of numbers separated by commas (example: **2,4,5**)
  - ~ A group of servers, designated as a range of numbers (example: **3-8**)
  - ~ All NLSR servers (example: **all**)
- <*DNS name*> is the domain name assigned to the server (example: **nlsr4**).
- <*IP address*> is the Internet Protocol (IP) address of the server (example: **135.7.64.211**).

Note: The "|" in the examples above are "OR" symbols, not lower case letter Ls.

The Restore Server Command

The **nlsr restore server** command places an NLSR server in the "in-service" (INSERV) state. This command is used when a server that has previously been placed in the "manual out-of-service" (MANOOS) needs to be put back into active service (see The Remove Server Command).

To use this command, enter one of the following at the command prompt:

/vs/bin/nlsr restore server <*server #*> | <*DNS name*> | <*IP address*>

/vs/bin/nlsr res server <*server #*> | <*DNS name*> | <*IP address*>

where:

- <*server #*> represents the number(s) assigned to the server(s) you want to restore to service. (For information about finding server numbers for particular servers, see The Display Server Command.) Server numbers can be specified as follows:
  - ~ A single server, designated by a single numeral (example: **3**)
  - ~ A group of individual servers, designated by a list of numbers separated by commas (example: **2,4,5**)
  - ~ A group of servers, designated as a range of numbers (example: **3-8**)
  - ~ All NLSR servers (example: **all**)
- <*DNS name*> is the domain name assigned to the server (example: **nlsr4**).
- <*IP address*> is the Internet Protocol (IP) address of the server (example: **135.7.64.211**).

Note: The "|" in the examples above are "OR" symbols, not lower case letter Ls.

The Display Server Command

The **nlsr display server** command is used to display status information about all or only selected servers in the NLSR system. When used, this command displays information about the server's identity within the system, its activity status, the type of NLSR being used, and other status information (see figure and table).

To use this command, enter one of the following at the command prompt:

/vs/bin/nlsr display server [<*server #*> | <*DNS name*> | <*IP address*>]

/vs/bin/nlsr disp server [<*server #*> | <*DNS name*> | <*IP address*>]

where:

- <*server #*> represents the number(s) assigned to the server(s) you want to display information about. Server numbers can be specified as follows:
  - A single server, designated by a single numeral (example: **3**)
  - A group of individual servers, designated by a list of numbers separated by commas (example: **2,4,5**)
  - A group of servers, designated as a range of numbers (example: **3-8**)
  - All NLSR servers (example: **all**)
- <*DNS name*> is the domain name assigned to the server (example: **nlsr4**).
- <*IP address*> is the Internet Protocol (IP) address of the server (example: **135.7.64.211**).

Note: The "|" in the examples above are "OR" symbols, not lower case letter Ls.

Figure 14 shows an example of the display that appears when this command is used to display servers 4 and 5. Table 12 lists and describes the fields in this display that pertain to each NLSR server as a whole. Table 13 lists and describes the fields that pertain to each NLSR recognizer running on a particular NLSR server.

Figure 14. Sample Display Server Command Information Display.

```
SERVER: 1 STATE: Inserv IP ADDRESS: 139.8.64.210 NAME: nlsr1
          RECOG TYPE: NLSR  PROTOCOL: 2  CENTER CLIP: On

    SOCKET   RECOG   STATE   LINK
1   7000     OPSR4   Inserv  Alive
2   7001     OPSR4   Inserv  Alive

SERVER: 2 STATE: Inserv IP ADDRESS: 139.8.64.211 NAME: homer
          RECOG TYPE: NLSR  PROTOCOl: 2  CENTER CLIP: Off

    SOCKET   RECOG   STATE   LINK
1   7000     OPSR4   Inserv  Alive
2   7001     OPSR4   Foos    Dead

SERVER: 3 STATE: Manoos IP ADDRESS: 139.8.64.212 NAME: nlsr2
          RECOG TYPE: NLSR  PROTOCOl: 2  CENTER CLIP: On

    SOCKET   RECOG   STATE   LINK
1   7000     OPSR4   Manoos  Dead
2   7001     OPSR4   Manoos  Dead
```

Table 12. Display Server Command Server Fields

Field	Description/Comments
SERVER:	The number of the server being displayed. Range: 1-96
STATE:	The current permanent state of the server. Possible states include: • **Nonex** – The server is non-existent, as far as the Intuity CONVERSANT system is concerned. • **Foos** – The server is in the "facility out-of-service" state. • **Manoos** – The server is in the "manual out-of-service" state. • **Inserv** – The server is in active service, the "in-service" state. **Note:** For more information about these states, see the Intuity CONVERSANT *Administration* book for your system.
IP ADDRESS:	This is the IP address assigned to the NLSR server.
NAME:	This is the DNS name assigned to the NLSR server.
RECOG TYPE:	This is the type of speech recognition assigned to the server. Currently the only recognition type is **NLSR** – Natural Language Speech Recognition
PROTOCOL:	This is the version number of the protocol that describes the communication link used between the remote recognition resource and the NLSR Proxy/Client software running on the Intuity CONVERSANT system.
CENTER CLIP:	This field displays the current status of the speech center clipping function (on or off).

Table 13. Display Server Command Recognizer Fields

Field	Description/Comments
SOCKET	This is the socket number assigned to each recognizer engine running on the designated server.
RECOG	This is the type of NLSR engine being used by the server. Currently, the only type included supported by this offer is **OPSR4**, which refers to any NLSR engine produced by an external vendor.

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Table 13. Display Server Command Recognizer Fields

Field	Description/Comments
STATE	The current temporary state of the recognizer engine. Possible states include: • **Inserv** – The recognizer is currently in service. • **Busy** – The recognizer is currently being used. • **Foos** – The recognizer is currently not in service (see FOOS above). • **Manoos** – The recognizer is currently not in service (see MANOOS above).
LINK	The state of the TCP/IP link connection. Possible states include: • **Alive** – A valid, working TCP/IP connection exists between the NLSR server recognizer engine and the Intuity CONVERSANT. • **Dead** – A valid, working TCP/IP connection does not exist between the NLSR server recognizer engine and the Intuity CONVERSANT.

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The Diagnose Server Command

The **nlsr diagnose server** command diagnoses the network between the Intuity CONVERSANT and any selected servers, regardless of whether the selected servers are in the "manual out-of-service" (MANOOS) or the "in-service" (INSERV) state. This command does not have any impact on active calls.

To use this command, enter one of the following at the command prompt:

/vs/bin/nlsr diagnose server <*server #*> | <*DNS name*> | <*IP address*>

/vs/bin/nlsr diag server <*server #*> | <*DNS name*> | <*IP address*>

where:

- <*server #*> represents the number(s) assigned to the server(s) you want to diagnose. (For information about finding server numbers for particular servers, see The Display Server Command.) Server numbers can be specified as follows:
  - A single server, designated by a single numeral (example: **3**)
  - A group of individual servers, designated by a list of numbers separated by commas (example: **2,4,5**)
  - A group of servers, designated as a range of numbers (example: **3-8**)
  - All NLSR servers (example: **all**)
- <*DNS name*> is the domain name assigned to the server (example: **nlsr4**).
- <*IP address*> is the Internet Protocol (IP) address of the server (example: **139.8.64.211**).

Note: The "|" in the examples above are "OR" symbols, not lower case letter Ls.

The Detach Server Command

The **nlsr detach server** command places NLSR servers in the "non-existent" (Nonex) state.

Before this command can be used, if the server is in the "in-service" (Inserv) state, it must be placed in the "manual out-of-service" (Manoos) state, using the nlsr remove server command.

To use this command, enter the following at the command prompt:

/vs/bin/nlsr detach server <*server #*> | <*DNS name*> | <*IP address*>

where:

- <*server #*> represents the number(s) assigned to the server(s) you want to detach. (For information about finding server numbers for particular servers, see The Display Server Command.) Server numbers can be specified as follows:
  - A single server, designated by a single numeral (example: **3**)
  - A group of individual servers, designated by a list of numbers separated by commas (example: **2,4,5**)
  - A group of servers, designated as a range of numbers (example: **3-8**)
  - All NLSR servers (example: **all**)
- <*DNS name*> is the domain name assigned to the server (example: **nlsr4**).
- <*IP address*> is the Internet Protocol (IP) address of the server (example: **139.8.64.211**).

Note: The "|" in the examples above are "OR" symbols, not lower case letter Ls.

The Attach Server Command

The **nlsr attach server** command is used to "attach" an NLSR server that has been "detached" (see The Detach Server Command). When this command is used, the server is logically attached by changing its permanent state from "non-existent" (NONEX) to "manual out-of-service" (MANOOS).

After using this command, you must use the nlsr restore server command to place the server back into active service.

To use this command, enter the following at the command prompt:

/vs/bin/nlsr attach server <*server #*> | <*DNS name*> | <*IP address*>

where:

- <*server #*> represents the number(s) assigned to the server(s) you want to attach. (For information about finding server numbers for particular servers, see The Display Server Command.) Server numbers can be specified as follows:
  - A single server, designated by a single numeral (example: **3**)
  - A group of individual servers, designated by a list of numbers separated by commas (example: **2,4,5**)
  - A group of servers, designated as a range of numbers (example: **3-8**)
  - All NLSR servers (example: **all**)

- <*DNS name*> is the domain name assigned to the server (example: **nlsr4**).
- <*IP address*> is the Internet Protocol (IP) address of the server (example: **139.8.64.211**).

Note: The "|" in the examples above are "OR" symbols, not lower case letter Ls.

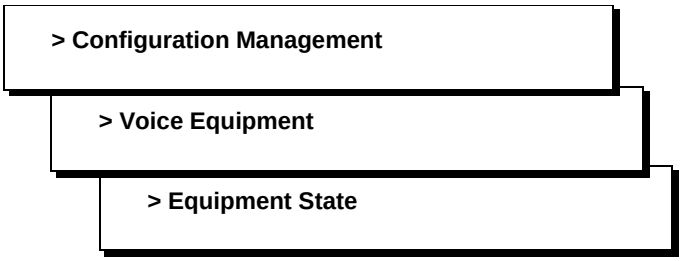
Placing the SSP Circuit Card in Service

There are times when an SSP circuit card must be removed from service to allow you to administer other features or functions on the Intuity CONVERSANT system. Before you can use the NLSR service, you must place the SSP circuit card back in service.

To place an SSP circuit card in service, do the following:

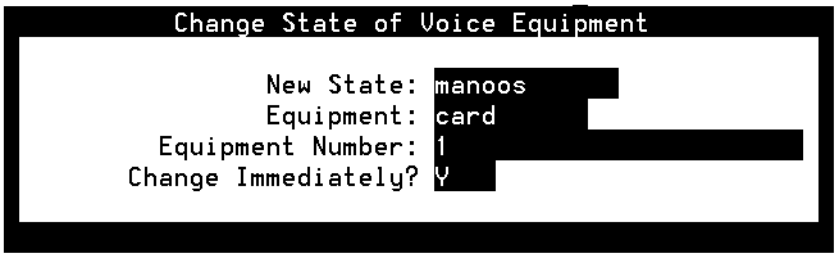
1. Log in to the Intuity CONVERSANT system as root.
2. At the system prompt, enter **cvis_menu**

   The system displays the Voice System Administration menu (Figure 7).
3. Select the following:



The system displays the Change State of Voice Equipment window (Figure 15).

Figure 15. Change State of Voice Equipment Window



Note: To move between the fields, use the **TAB** or the **ENTER** key. To see and select possible choices for any of the following fields, you can use the **F2** (Choices) key, directional arrow keys, and the **ENTER** key.

4 Set the fields of the Change State of Voice Equipment window to the following values:

- **New State: inserv** (in service)
- **Equipment: card**
- **Equipment Number: #** (SSP card number)

Note: If you do not know the number of the SSP circuit card, you can examine a list of the possible choices by pressing the **F2** (Choices) key.

- **Change Immediately? Y**

5 Press **F3** (Save).

The system displays the following message:

```
Card 1 changed to state INSERV.

Press ENTER to continue.
```

6 Press **ENTER**

7 To return to the Voice Administration Menu, press **F6** (Cancel) three times.

Removing the SSP Circuit Card from Service

There are times when an SSP circuit card must be removed from service to allow you to administer other features or functions on the Intuity CONVERSANT system.

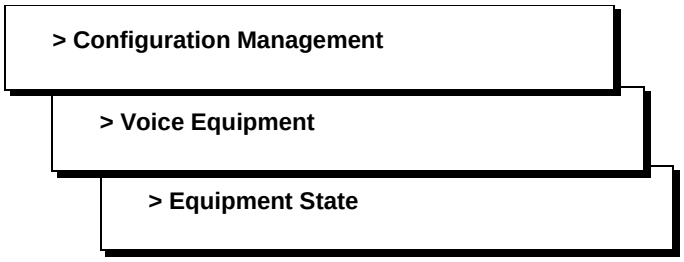
To remove an SSP circuit card from service, do the following:

1 Log in to the Intuity CONVERSANT system as root.

2 At the system prompt, enter **cvis_menu**

The system displays the Voice System Administration menu (Figure 7).

3 Select the following:



The system displays the Change State of Voice Equipment window (Figure 15).

Note: To move between the fields, use the **TAB** key. To see and select possible choices for any of the following fields, you can use the **F2** (Choices) key, directional arrow keys, and the **ENTER** key.

4 Set the fields of the Change State of Voice Equipment window to the following values:

- **New State: manoos** (manual out-of-service)
- **Equipment: card**
- **Equipment Number: #** (SSP card number)

Note: If you do not know the number of the SSP circuit card, you can examine a list of the possible choices by pressing the **F2** (Choices) key.

- **Change Immediately? Y**

5 Press **F3** (Save).

The system displays the following message:

```
Immediate mode will disconnect any calls in progress on
this card.

Press <y> to confirm.
Press <n> to cancel.
```

6 Type **y**

The system displays the following message:

```
Remove card 1. Asking for equipment...
Card 1 changed to state MANOOS.

Press ENTER to continue.
```

7 Press **ENTER**.

8 To return to the Voice Administration Menu, press **F6** (Cancel) three times.

4 Use of NLSR in Voice Applications

Overview

This chapter describes how to use Natural Language Speech Recognition (NLSR) in interactive voice response (IVR) applications.

Purpose

This chapter provides information on using the NLSR offer, including the procedures for using the NLSR external functions in both Voice@Work and Script Builder applications. Topics include the following:

- Using the NLSR Offer
- Creating Stub Grammars
- NLSR External Functions
- Sample NLSR Applications

Using the NLSR Offer

The Natural Language Speech Recognition (NLSR) offer is designed to allow you to create IVR applications which offer the caller a more natural way of interacting with the software. This offer uses a client/server configuration in which the Intuity CONVERSANT IVR system uses one or more external NLSR servers to process speech data collected from callers during Prompt and Collect actions. The Lucent NLSR offer is a flexible new way to take advantage of external vendor NLSR engines within IVR applications.

The basic general steps for creating and deploying NLSR applications can be found in Tasks Required to Use the NLSR Offer in Chapter 1, Overview of the Natural Language Speech Recognition Offer. The following sections expand on some steps in that process.

NLSR Grammars

A prerequisite to creating and deploying NLSR applications is creating the required NLSR grammars. Check with your NLSR vendor for the specifics on how to create and install the required grammars.

In addition to creating the actual NLSR grammars, you must also create corresponding “stub grammars” for each NLSR grammar you intend to use in your application. For details about these stub grammars and the procedure to create them, see Creating Stub Grammars below.

Barge-in and NLSR

Barge-in is a capability provided by some speech recognition technologies, including NLSR, that allows callers to speak or enter their responses during a prompt and have those responses recognized and acted upon immediately without having to play the entire prompt (similar to the Speak with Interrupt capability for Announce nodes or action steps). For more general information about barge-in, see *Intuity™ CONVERSANT® System Version 6.0 Application Design Guidelines*, 585-310-670.

There are a number of facts you should keep in mind if you plan to use barge-in with your NLSR applications.

Note: In the following discussion of Intuity CONVERSANT applications, the use of the term "node" refers to elements used in Voice@Work applications, and "action step" refers to elements found in Script Builder applications.

Barge-in is not exactly the same as the Speak with Interrupt feature used for Announce nodes or action steps. The Speak with Interrupt feature works only with touchtone input. Barge-in, which works with WholeWord, Dial-Pulse Recognition, and NLSR input, can accept either touchtone or spoken response inputs.

Thus, the Announce node or action step cannot use spoken responses to interrupt the Announce prompt, only touchtone input.

By contrast, the Prompt and Collect node or action step, the Menu node, and the Automenu node prompts can all be interrupted using either touchtone or spoken input from the caller.

Note: You can restrict barge-in to touchtone-only input in these nodes and action steps by selecting **Touchtones** as the only Input ASR Mode. However, if you select a WholeWord or NLSR grammar as the Input ASR Mode, the system also accepts touchtone input, so you effectively get both types of barge-in.

To use barge-in, you must use an SR_Prompt external function in Voice@Work or an SR_Prompt external action in Script Builder.

Note: When creating NLSR applications in Voice@Work that use barge-in, you should use Touchtone for all Input ASR Mode settings and make sure that you do not set "Reserve ASR Resource Before Playing Prompt" to True on the Response tab (Prompt and Collect and Automenu nodes).

You can, if you want, treat different types of inputs from the caller differently in your application. When a response to a prompt is received from a caller, the system sets the $CI_RECOG system variable to identify the type of recognizer that performed the recognition. For example, if the caller responds using touchtone input, the system sets the $CI_RECOG variable to 0 (zero). If the caller responds with a spoken reply, the system sets the $CI_RECOG variable to 4. So, you can have the application look at the value stored in the $CI_RECOG variable after a caller responds to a prompt and take different actions according to whether the caller responded with touchtone or spoken input. (For more information about possible $CI_RECOG variable values, see the *Intuity™ CONVERSANT® Application Development with Script Builder* book for your system.)

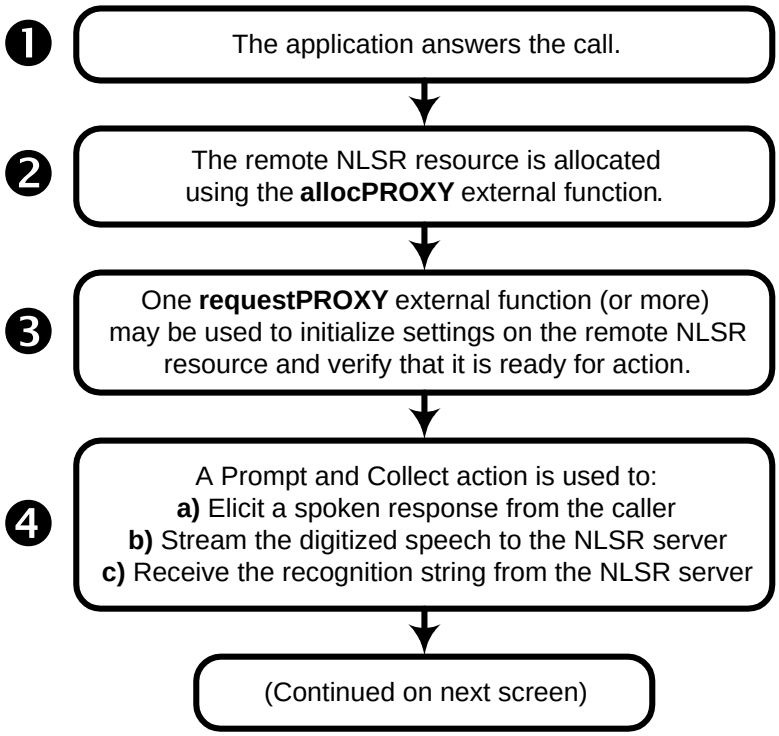
Actions Requiring External Functions

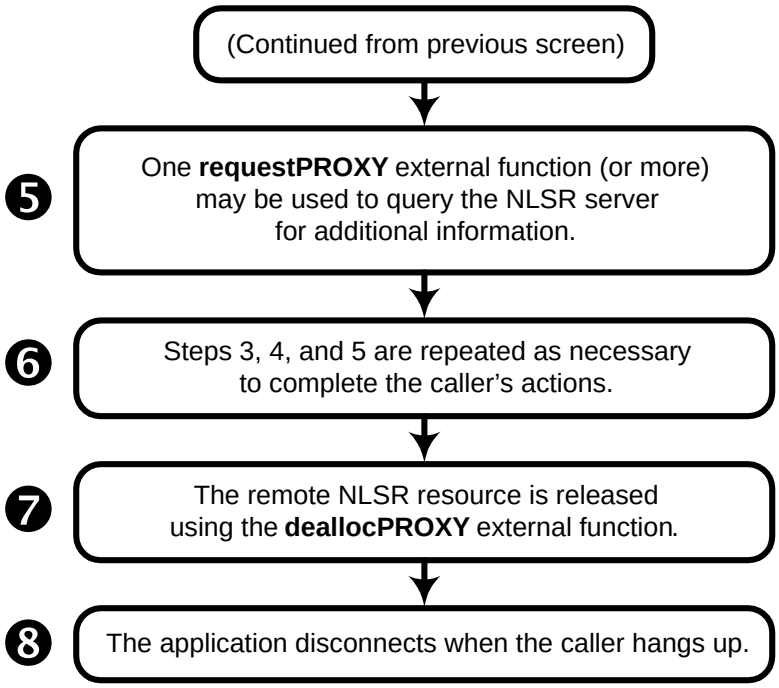
In a typical NLSR application, external functions are used to:

- Allocate NLSR resources on the remote NLSR server (allocPROXY) and release them when the application is finished with them (deallocPROXY)
- Exchange command and response strings with the NLSR server (requestPROXY)

Figure 16 shows how these external functions might be used in a typical NLSR application. Note that this is only one example of a typical call flow.

Figure 16. Use of Basic NLSR External Functions in a Typical Application





Other proxy external functions are used to:

- Get data collection files for analysis (getdcPROXY)
- Remove data collection files when they are no longer needed (rmdcPROXY)

These external functions allow you to incorporate natural language speech recognition functionality into your Voice@Work and Script Builder applications. For more information about using these external functions, see NLSR External Functions below.

Creating Stub Grammars

In order to call an NLSR grammar from within a Voice@Work or Script Builder application, you must first create a "stub grammar". This stub grammar allows the application to make sure that caller input is sent to the correct NLSR engine and that the correct NLSR grammar is used by the Prompt and Collect action calling it.

Depending on whether you are using Voice@Work or Script Builder, the means of creating this stub grammar is different.

For a Voice@Work Application

To create a stub grammar for a Voice@Work application, do the following from within the Voice@Work application:

1. Open the FlexWords Manager.
2. Right click inside the FlexWords Manager.
3. From the popup menu, select **New**, then **NLSR grammar...**
4. When prompted, enter the name of the NLSR grammar and click **OK**.

   Voice@Work displays the Natural Language Grammars window.
5. Select **Open Speech Recognition (External Vendor - OPSR4)**
6. Click **OK**.

   Voice@Work displays the Natural Language Grammar Editor window. This window displays the name of the grammar and the grammar type in non-editable fields.
7. Click **OK**.

   The Natural Language Grammar is added to the FlexWords Manager list of FlexWord grammars. During Code Generation (assuming you have used the grammar in your application), the appropriate grammar file is generated.

   Later, when you transfer and install the application to the target Intuity CONVERSANT system, Voice@Work directs the system to create the appropriate stub grammar automatically, as part of the application transfer and installation processes.
8. If the stub grammar is for any existing application, re-verify and re-install all existing applications on the Intuity CONVERSANT system.

For a Script Builder Application

To create a stub grammar for a Script Builder application, do the following:

1. Log in to the Intuity CONVERSANT system as root.
2. At the command prompt, enter **cd /att/asr/wordlists/active**
3. At the command prompt, enter **vi <*GRAMMARNAME*>**
   where *GRAMMARNAME* is the name of the stub grammar.

   The grammar name *must*:

   - Use all capitals
   - Be a valid Unix filename
   - Have no more than 14 characters

   The **pwl_gen** tool, which creates the stub grammar and other required file entries for the stub grammar, does not recognize grammars with lower case letters in the file name. So, if you use lower case letters in the file name, no grammar is generated, and the necessary file entries are not made.
4. Using the vi editor, create a single line entry in the grammar file. This entry, which is a keyword entry, must be **RECOG=OPSR4** (for all external vendor product grammars).

Note: This line must be entered using all capital letters, exactly as shown above.

5. Save the grammar file and quit the vi editor.
6. At the system command prompt, enter **pwl_gen**

   The system displays a series of progress messages, ending with the following:

   ```
   Generation of data files has completed.
   ```
7. Stop and restart the voice system.
8. If the stub grammar is for any existing application, re-verify and re-install all existing applications on the system.

NLSR External Functions

A set of common proxy external functions is required and provided for the use of the NLSR offer. In general, these may be broken down into two groups.

The first group, which includes **allocPROXY**, **deallocPROXY**, **requestPROXY**, and **LreqPROXY**, are the basic external functions used to allocate and release remote NLSR server resources, and to exchange command and response strings with the NLSR server.

The remaining two external functions, **getdcPROXY** and **rmdcPROXY**, are used for working with proxy data collection files on the Intuity CONVERSANT.

Table 14 lists and describes these external functions.

Table 14. NLSR External Functions

External Function	Arguments	Return Value	Description/Comments
allocPROXY	***Argument 1:*** • INPUT (Recognition type: Null-terminated char string)	**0** = Resource successfully reserved **-1** = System error **-2** = No resources in service **-3** = No resources currently available **-4** = Resource timed out **-5** = Proxyload DIP not running **-6** = Invalid recognition resource type, Argument 1	This external function reserves a remote NLSR resource of a requested type. In other words, it sets up a connection to an NLSR server. The requested type, Argument 1, must be **OPSR4** – Open speech recognition (external vendor). This external function must be invoked before any call to a Prompt and Collect using an NLSR grammar. The remote NLSR resource may be allocated and released multiple times during the application. Any external vendor NLSR resource that conforms to the required protocol is supported by **OPSR4**, though only one may connect to the Intuity CONVERSANT system at a time.
allocPROXY (cont.)			See also: A CAUTION about the allocPROXY external function.

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Table 14. NLSR External Functions

External Function	Arguments	Return Value	Description/Comments
deallocPROXY	***Argument 1:*** • INPUT (Recognition type: Null-terminated char string)	**0** = Resource successfully released **-1** = System error **-2** = No resources in service **-3** = No resources currently available **-4** = Invalid recognition resource type, Argument 1	This external function releases a remote NLSR resource of a specified type. The requested type is the same as for the **allocPROXY** external function. The remote NLSR resource should be released when it is no longer needed by the application, thus allowing other channels access to the resource.
requestPROXY	***Argument 1:*** • INPUT (Recognition type: Null-terminated char string) ***Argument 2:*** • INPUT/OUTPUT (Request/Return string: Null-terminated char array with maximum length of 256, not including the terminating null)	**0** (or greater) = Request successful **-1** = DIP not running **-2** = No DIP response within reasonable time (default: 45 seconds) **-3** = Invalid recognition resource type, Argument 1 **-4** = No resource available	This external function sends a speech recognizer-specific command string to the speech recognizer. This external function must be called after an **allocPROXY** external function. It may be used to accomplish a variety of tasks and may be called multiple times. The requested type (Argument 1) is the same as for the **allocPROXY** external function. Argument 2 is a text buffer that contains the command string to be sent to the remote NLSR resource. The contents of this command string are determined by the external vendor. Argument 2 also contains the response string returned by the remote NLSR recognizer. See also: LreqPROXY

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Table 14. NLSR External Functions

External Function	Arguments	Return Value	Description/Comments
LreqPROXY	***Argument 1:*** • INPUT (Recognition type: Null-terminated char string) ***Argument 2:*** • INPUT/ OUTPUT (Request/ Return string: Null-terminated char array with maximum length of 2020, not including the terminating null)	**0** (or greater) = Request successful **-1** = DIP not running **-2** = No DIP response within reasonable time (default: 45 seconds) **-3** = Invalid recognition resource type, Argument 1 **-4** = No resource available	Except for the maximum possible length of the return string (Argument 2), this external function is identical to the **requestPROXY** external function. The return string size was increased to maximize its use in Voice@Work applications. This external function should be used in Voice@Work applications *only*. Do *not* use this external function in Script Builder applications. See also: requestPROXY
getdcPROXY	***Argument 1:*** • INPUT (Recognition type: Null-terminated char string) ***Argument 2:*** • OUTPUT (File name: Null-terminated char array with maximum length of 256, not including the terminating null)	**0** (or greater) = Request successful **-1** = DIP not running **-2** = No DIP response within reasonable time (default: 45 seconds) **-3** = Invalid recognition resource type, Argument 1 **-4** = File does not exist ***Full path name*** of the data collection file, stored in buffer provided by Argument 2	This external function requests the speech data collection file name for the most recent recognition attempt. The requested type (Argument 1) is the same as for the **allocPROXY** external function. Argument 2 is a text buffer that contains the full path name for the data collection file. This text buffer must be large enough to contain the full path name. This external function can only be used after an **allocPROXY** external function.

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Table 14. NLSR External Functions

External Function	Arguments	Return Value	Description/Comments
rmdcPROXY	***Argument 1:*** • INPUT (File name: Null-terminated char array with maximum length of 256, not including the terminating null)	**0** (or greater) = Request successful **-1** = DIP not running **-2** = No DIP response within reasonable time (default: 45 seconds) **-3** = File does not exist or remove request failed	This external function requests that a specified speech data collection file be removed. It is typically used after a Prompt and Collect using NLSR and a **getdcPROXY** external function. Argument 1 is a text buffer that contains the full path name of the data collection file to be removed.

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A CAUTION about the allocPROXY external function

Exercise caution when using the **allocPROXY** external function in conjunction with an Announce node or action step. If the **allocPROXY** external function is placed immediately before the Announce action in the call flow, and the Allow Interrupt (Speak with Interrupt) option is set to allow the caller to interrupt the Announce prompt, **allocPROXY** will fail and you will get a return value of **-2**.

To avoid this problem, you have three options:

- If possible, set the Allow Interrupt (Speak with Interrupt) option to *not* allow the caller to interrupt the Announce prompt.
- Add a second, "null", Announce node or action step immediately after the first (before the **allocPROXY** external function). Leave the prompt blank and set the Allow Interrupt (Speak with Interrupt) option to *not* allow the caller to interrupt.
- Place the **allocPROXY** external function so that it comes *before* the Announce action in the call flow.

Using NLSR External Functions with Voice@Work

As of Release 3.2 of Voice@Work, all NLSR external functions are incorporated as part of the standard external function set. To use them, simply import them into your application as you would any other standard external function.

Note: For each external function, you must specify a value for every argument in the order shown in Table 14, using the function names and file names shown in the table.

For earlier versions of Voice@Work, you must create custom external functions. For this procedure, see the Voice@Work online help or the *Using Voice@Work* manual, 585-313-207.

Using NLSR External Functions with Script Builder

In a Script Builder application, you access NLSR external functions from the **Define Transaction** screen. This screen allows you to specify the name of the external function, the function arguments, and the return code field that receives a value back from the function. For details on using external functions in a Script Builder application, see the following sections of *Intuity™ CONVERSANT® System Version 7.0 Application Development with Script Builder*, 585-313-206:

- Defining External Functions in Chapter 7, Defining the Transaction
- Using External Functions in Chapter 11, Using Advanced Features

Note: For each external function, you must specify a value for every argument in the order shown in Table 14, using the function names and file names shown in the table.

Sample NLSR Applications

The Lucent GLS Documentation website contains a number of sample applications for both Voice@Work and Script Builder. These sample applications illustrate the basic principles of how to use the NLSR external functions and other NLSR features, using a variety of NLSR engines.

To see these sample applications, visit the following URL:

http://glsdocs.lucent.com/

When prompted for the access code, enter: **wy2oy**

Note: This access code is case-sensitive. Be careful to enter it *exactly* as given above.

5 Troubleshooting

Overview

Intuity™ CONVERSANT® system messages alert you to problems, potential problems, or a change in the state of the system. This chapter contains the messages specific to the NLSR offer. This chapter also tells you how to view information about the status of the NLSR servers and how to troubleshoot problems that are not associated with system messages.

Note: All other Intuity CONVERSANT system messages are described in Alarms and Log Messages in the *Intuity™ CONVERSANT® System Reference* book for your system.

Purpose

Refer to this chapter to determine the action to take regarding troubles for NLSR. Topics include the following:

- NLSR Offer Components
- Checking Server Connectivity
- NLSR Alarms and Log Messages
- NLSR Troubleshooting Guidelines

NLSR Offer Components

Table 15 lists and describes the main components of the **Natural Language Speech Recognition - Proxy/Client** software package. Details for using these components, where applicable, are in Chapter 4, Use of NLSR in Voice Applications.

Table 15. NLSR - Proxy/Client Software Package Components

Component	Description/Comments
Proxy Message Handler (**proxy_msg**)	The Proxy Message Handler communicates with Intuity CONVERSANT applications through the IRAPI Extension Library and the Proxy DIP, using a predefined set of UNIX IPC messages. When appropriate, the Proxy Message Handler spawns the Proxy Socket Handler and uses a pipe to write commands to it. It receives replies from the Proxy Socket Handler through the UNIX IPC interface and transmits them back to the application. The Proxy Message Handler is started from an entry in the /etc/inittab file.
Proxy Socket Handler (**proxy_vcp**)	The Proxy Socket Handler is used to "translate" or convert messages from the Proxy Message Handler being sent to the NLSR server from UNIX IPC to TCP format. It also translates messages received from the NLSR server from TCP to UNIX IPC. In other words, its primary function is to translate messages from one protocol to another.
Proxy DIP (**proxyload**)	This data interface process (DIP) is used for applications using a remote NLSR resource. This DIP's function is to transmit NLSR messages not contained within the IRAPI Extension Library to the Proxy Message Handler. The Proxy DIP is started from an entry in the /etc/inittab file.
IRAPI Extension Library	This component provides proxy-specific library implementation of the generic ASR IRAPI function calls.
External functions	External functions are provided for Voice@Work and Script Builder applications to allocate/release remote recognition resources and to manage speech data collection files. For more information about these external functions and their use, see Chapter 4, Use of NLSR in Voice Applications.

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Table 15. NLSR - Proxy/Client Software Package Components

Component	Description/Comments
Taskfiles	These files provide information about the nature of socket connections and the valid list of static grammars available to the application. There is a separate file for each NLSR type. All taskfiles are located in the /vs/data/proxy directory.
Server files	These files provide connection information needed for the Proxy Socket Handler to make connections to the remote NLSR servers. There is a separate file for each NLSR type. All server files are located in the /vs/data/proxy directory.
Proxy Data Collection (PDC) utility	This utility allows you to collect speech data from the system for review. It is useful mostly when you are experiencing intermittent or hard-to-trace problems with an NLSR application. For more information about the proxy data collection utility, see Using the Proxy Data Collection Utility in Chapter 3, Administration.
Speech center clipping utility	This utility allows you to turn the speech center clipping on or off and to view the current status. For details about this utility, see Turning Center Clipping On or Off in Chapter 3, Administration.
NLSR report utilities	These utilities allow you to generate a variety of "real-time" reports regarding the NLSR server resources. For details about these reports, see Generating NLSR Activity Reports in Chapter 3, Administration.

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Checking Server Connectivity

Use the following procedure to check connectivity to a NLSR server from the Intuity CONVERSANT system:

Enter **ping *serverName*** or **ping *IPaddress***

where *serverName* is the DNS name and *IPaddress* is the IP address of the NLSR server .

If the Intuity CONVERSANT system and NLSR server are both running and connected via the LAN, the system displays the following message:

serverName or *IPaddress* is alive.

For a more in-depth procedure to verify server connectivity, you can use the procedure given in Verifying the NLSR Server Connection Status on the Intuity CONVERSANT System in Chapter 3, Administration.

Note: For help with Intuity CONVERSANT system connectivity problems, see the following NLSR Alarms and Log Messages and NLSR Troubleshooting Guidelines. For help with NLSR server connectivity problems, see your NLSR server documentation.

NLSR Alarms and Log Messages

In case of errors in NLSR applications, alarms and error messages may be generated. The NLSR Proxy/Client software generates the alarms and error log messages described in the following subsections.

Viewing the Message Log Report

To view the message log to find error messages related to the NLSR proxy/client software, do the following:

1. Log in to the Intuity CONVERSANT system as root.
2. Enter **cvis_menu**

   The system displays the Voice System Administration window (Figure 7).
3. Select the following:

The system displays the Message Log Report window.

Understanding PROXY Error Log Messages

The following subsections list and describe the NLSR proxy-related error messages.

Where suggested repair procedures are sequential, they are numbered. Bulleted lists indicate that procedures may be tried in any order. Where a suggested procedure is documented in this book, the reference is given; otherwise, see the appropriate Intuity CONVERSANT or external vendor product documentation.

If a repair procedure for a message does not effectively correct the problem experienced, escalate the problem to the next level of support.

PROXY01 (PX_BROKEN_SOCKET)

Alarm Level None

Description An established connection to a server has a problem.

Repair procedure Try the following procedures:

1. Use the **ping** command to verify that the server responds (see NLSR Offer Components above). If not:
   - **a** Verify that the LAN cables are physically connected between the Intuity CONVERSANT, the NLSR server, and the LAN hub.
   - **b** Verify that the TCP/IP is administered correctly on the NLSR server (see the NLSR server system documentation).
   - **c** Verify that the TCP/IP is administered correctly on the Intuity CONVERSANT system (see the *Intuity™ CONVERSANT® System Administration* book for your system).
2. Verify that the speech recognizers are running on the NLSR server(s) (see the speech recognizer documentation).
3. Verify that the Intuity CONVERSANT is administered correctly (see Verifying the NLSR Server Connection Status on the Intuity CONVERSANT System in Chapter 3, Administration).

PROXY02 (PX_IO_INTERFACE_ERROR)

Alarm Level None

Description The proxy has failed to initialize correctly. The error message contains additional information.

Repair procedure Try the following procedures:

1. Stop and restart the voice system.
2. If the problem continues, reboot the Intuity CONVERSANT and NLSR server(s).
3. If the problem continues, contact your field support representative.

PROXY03 (PX_SERVER_FILE_ERROR)

Alarm Level Critical

Description The servers file (***/vs/data/proxy/servers[4,7,9]***) has an invalid number of arguments. The message contains the line number of the line that has the error. The proxy will not function until the problem is resolved.

Repair procedure Contact your field support representative.

PROXY06 (PX_UNEXPECTED_INPUT)

Alarm Level None

Description An unexpected message was received from a server that does not have an established connection.

Repair procedure This message should never occur. If it does and it persists, contact your field support representative.

PROXY08 (PX_PROXY_MSG_DEAD)

Alarm Level Critical

Description The **proxy_vcp** process has stopped receiving messages from the **proxy_msg** process. The **proxy_vcp** process assumes that **proxy_msg** is dead; as a result, it self-destructs and then restarts. The proxy will not function until the problem is resolved.

Repair procedure Try the following procedures:

1. Stop and restart the voice system.
2. If the problem continues, reboot the Intuity CONVERSANT and NLSR server(s).
3. If the problem continues, contact your field support representative.

PROXY09 (PX_BAD_MSG)

Alarm Level Critical

Description The **proxy_vcp** process received a message or data block from the **proxy_msg** process that was not the correct length. The **proxy_vcp** process self-destructs and then restarts. All calls in progress when this error occurs may experience recognition failures.

Repair procedure Try the following procedures:

1. Stop and restart the voice system.
2. If the problem continues, reboot the Intuity CONVERSANT and NLSR server(s).
3. If the problem continues, contact your field support representative.

PROXY10 (PX_BAD_DEVICE)

Alarm Level None

Description The proxy socket handler received a request for a server connection that is outside the range of the number of valid server connections, that is, a server connection with a number greater than 96, which is the maximum number of possible server connections.

Repair procedure Use the **cvis_menu SR Server Administration** screen to verify that the system is administered for only 96 server connections (see Administering the NLSR Server on the Intuity CONVERSANT System in Chapter 3, Administration).

PROXY11 (PX_RESULTS)

Alarm Level None

Description This is an informational message and only occurs when the proxy is in the debug mode.

Repair procedure Contact your field support representative to turn proxy debugging off.

PROXY12 (PX_SRV_OOS)

Alarm Level Major

Description A server is being taken out of service by the proxy because of a server communication failure.

Repair procedure Try the following procedures:

1. Use the **ping** command to verify that the server responds (see NLSR Offer Components above). If not:
   - **a** Verify that the LAN cables are physically connected between the Intuity CONVERSANT, the NLSR server, and the LAN hub.
   - **b** Verify that the TCP/IP is administered correctly on the NLSR server (see the NLSR server system documentation).
   - **c** Verify that the TCP/IP is administered correctly on the Intuity CONVERSANT system (see the *Intuity™ CONVERSANT® System Administration* book for your system).
2. Verify that the speech recognizers are running on the NLSR server(s) (see the speech recognizer documentation).
3. Verify that socket numbers and IP addresses have been correctly administered on the Intuity CONVERSANT (see Verifying the NLSR Server Connection Status on the Intuity CONVERSANT System in Chapter 3, Administration).

PROXY13 (PX_CAUGHT)

Alarm Level Critical

Description The proxy received a signal, such as a kill command, from the Unix system; as a result, it self-destructs and then restarts. All calls in progress when this error occurs may experience recognition failures.

Repair procedure Try the following procedures:

1. Stop and restart the voice system.
2. If the problem continues, reboot the Intuity CONVERSANT and NLSR server(s).
3. If the problem continues, contact your field support representative.

PROXY14 (PX_INFO)

Alarm Level None

Description This is a message that provides additional information about the current proxy activity.

Repair procedure None required

PROXY15 (PX_MISSING_ARGUMENT)

Alarm Level Critical

Description A proxy startup argument is missing a required parameter. The message contains the argument with the missing parameter. The proxy self-destructs and then restarts. The proxy will not function until the problem is resolved.

Repair procedure Try the following procedures:

1. Verify that the application has the required missing parameter.
2. Contact your field support representative.

PROXY16 (PX_BAD_ARGUMENT)

Alarm Level Critical

Description A proxy startup argument is invalid. The message contains the invalid argument. The proxy self-destructs and then restarts. The proxy will not function until the problem is resolved.

Repair procedure Try the following procedures:

1. Verify that the application has the correct argument.
2. Contact your field support representative.

PROXY17 (PX_SOCKET_SERVER_TROUBLE)

Alarm Level Critical

Description The **proxy_msg** process cannot find or start the **proxy_vcp** process. The proxy self-destructs and then restarts. The proxy will not function until the problem is resolved.

Repair procedure Try the following procedures:

- Determine if **/vs/bin/vrs/proxy_vcp** exists. If not, it may be necessary to re-install the **Natural Language Speech Recognition - Proxy/Client** software package.
- If the problem continues, contact your field support representative.

PROXY18 (PX_FUNC_FAILURE)

Alarm Level None

Description An internal proxy failure occurred.

Repair procedure Try the following procedures:

1. Stop and restart the voice system.
2. If the problem continues, reboot the Intuity CONVERSANT and NLSR server(s).
3. If the problem continues, contact your field support representative.

PROXY19 (PX_BAD_CHAN)

Alarm Level None

Description The proxy message handler received a request for a server that is outside the range of the number of valid server connections, that is, a server connection with a number greater than 96, which is the maximum number of possible server connections.

Repair procedure Use the **cvis_menu SR Server Administration** screen to verify that the system is administered for only 96 server connections (see Administering the NLSR Server on the Intuity CONVERSANT System in Chapter 3, Administration).

PROXY20 (PX_SPEECHBREAK)

Alarm Level Major

Description A speech buffer overflow occurred and speech has been discarded. This happens when the recognizer is not processing speech fast enough. This may cause recognition failures.

Repair procedure Try the following procedures:

- Stop and restart the NLSR server.
- If the problem continues, contact the field support representative for your NLSR server system.

PROXY21 (PX_VCODE_FAILURE)

Alarm Level Major

Description The speech and signal processor (SSP) circuit card has reported an error during speech coding. This can cause speech recognition failures.

Repair procedure Diagnose the SSP circuit card. Replace if necessary.

PROXY22 (PX_SP_VCBUF_BAD)

Alarm Level Major

Description The proxy received an invalid speech buffer from the speech and signal processor (SSP) circuit card.

Repair procedure Diagnose the SSP circuit card. Replace if necessary.

PROXY23 (PX_UNRECOGNIZED_MSG)

Alarm Level None

Description The proxy received an invalid message. The message is ignored.

Repair procedure If the problem continues, contact your field support representative.

PROXY24 (PX_BAD_TASKFILE)

Alarm Level Minor

Description The named task file has an invalid parameter. The invalid parameter is ignored. The message contains the line number and a description of the error.

Repair procedure Contact your field support representative.

PROXY25 (PX_BAD_DATABASE)

Alarm Level Minor

Description The proxy has detected an error in the task file. If this happens, there is a coding error in the option's name list in **proxy.h** that needs to be corrected.

Repair procedure Contact your field support representative.

PROXY26 (PX_ALLOC_FAILURE)

Alarm Level Critical

Description The proxy failed to allocate memory. The proxy will not function until the problem is resolved.

Repair procedure Try the following procedures:

1. Stop and restart the voice system.
2. If the problem continues, reboot the Intuity CONVERSANT and NLSR server(s).
3. If the problem continues, contact your field support representative.

PROXY27 (PX_BAD_LOADTASK)

Alarm Level None

Description The proxy has detected an error in the ***/vs/data/proxy/taskfile[4,7,9]*** file. The message contains additional details.

Repair procedure Contact your field support representative.

PROXY28 (PX_UNEXPECTED_HADDR)

Alarm Level Minor

Description There is an invalid format for the server address in the servers file (***/vs/data/proxy/servers[4,7,9]***). The host address must consist of four integers, each integer separated by a dot (.).

Repair procedure Contact your field support representative.

PROXY29 (PX_UNEXPECTED_ADRLEN)

Alarm Level Minor

Description There is an invalid format for the server address in the servers file (***/vs/data/proxy/servers[4,7,9]***). The host address must consist of four integers, each integer separated by a dot (.).

Repair procedure Contact your field support representative.

PROXY31 (PX_SRV_NOT_AVAILABLE)

Alarm Level Critical

Description The driver (ASP) for the speech and signal processor (SSP) circuit card is not available. The proxy will not function until the problem is resolved.

Repair procedure Try the following procedures:

1. Verify that the SSP circuit card is in service and has the correct functions assigned.
2. Verify that the ASP driver is installed.
3. If the problem continues, contact your field support representative.

PROXY32 (PX_REMOTE_SERVER_TROUBLE)

Alarm Level Minor

Description The proxy has timed out waiting for a response from the NLSR server. The time-out interval is three times the **-T** argument.

Repair procedure If the problem continues, contact the field support representative for your NLSR server system.

PROXY33 (PX_GRAMMAR_ERROR)

Alarm Level Minor

Description The proxy has detected that a grammar file has not been loaded. The message contains additional details.

Repair procedure Try the following procedures:

- Verify that the correct grammar has been created in **/att/asr/wordlists/active**.
- Use the **pwl_gen** command to create the stub grammar.

PROXY34 (PX_INTERRUPTED)

Alarm Level Critical

Description The proxy received a signal while a call was in progress. The proxy self-destructs and then restarts. All calls in progress when this error occurs may experience recognition failures.

Repair procedure Try the following procedures:

1. Stop and restart the voice system.
2. If the problem continues, reboot the Intuity CONVERSANT and NLSR server(s).
3. If the problem continues, contact your field support representative.

PROXY36 (PX_BAD_HOSTNAME)

Alarm Level Minor

Description There is an invalid server name or IP address in the servers file (***/vs/data/proxy/servers[4,7,9]***). The message contains the server name that cannot be resolved.

Repair procedure Try the following procedures:

1. Use **cvis_menu SR Server Administration** screen to verify that the NLSR server has the correct server name or IP address administered on the Intuity CONVERSANT (see Administering the NLSR Server on the Intuity CONVERSANT System in Chapter 3, Administration).
2. Examine the **/etc/hosts** file and verify that the server has the correct name and IP address listed.
3. Use the **ping** command to verify that the connection is live.
4. If the problem continues, contact your field support representative.

PROXY38 (PX_NO_SERVICE)

Alarm Level Critical

Description A required User Datagram Protocol (UDP) echo service was not found. The proxy will not function until the problem is resolved.

Repair procedure The LAN and/or TCP/IP packages may not be installed. Contact your field support representative for assistance.

PROXY39 (PX_HOST_OFFLINE)

Alarm Level None

Description The specified NLSR server is not responding to **ping** messages. The NLSR server is not allocated to a channel while this condition exists.

Repair procedure Try the following procedures:

1. Use the **ping** command to verify that the server responds (see NLSR Offer Components above). If not:
   - **a** Verify that the LAN cables are physically connected between the Intuity CONVERSANT, the NLSR server, and the LAN hub.
   - **b** Verify that the TCP/IP is administered correctly on the NLSR server (see the NLSR server system documentation).
   - **c** Verify that the TCP/IP is administered correctly on the Intuity CONVERSANT system (see the *Intuity™ CONVERSANT® System Administration* book for your system).

2 Verify that the speech recognizers are running on the NLSR server(s) (see the speech recognizer documentation).

3 Verify that the Intuity CONVERSANT is administered correctly (see Verifying the NLSR Server Connection Status on the Intuity CONVERSANT System in Chapter 3, Administration).

PROXY40 (PX_HOST_BACK_ONLINE)

Alarm Level None

Description The specified NLSR server is once again responding to *ping* messages. This is an informational message only.

Repair procedure None required

PROXY41 (PX_FILE_SYSTEM_FULL)

Alarm Level Major

Description The proxy speech data collection file system is 80% full. Additional speech data collection files cannot be created.

Repair procedure Use the **pdc -r <*recogType*>** utility, where *recogType* is the remote NLSR type, to remove the proxy speech data collection files.

NLSR Troubleshooting Guidelines

To troubleshoot problems with NLSR, use the guidelines in Table 16.

Table 16. NLSR Troubleshooting

Problem:	Possible Solutions:
The Intuity CONVERSANT fails to establish a connection to a remote NLSR server.	1 Using the ping command, verify that the server responds (see NLSR Offer Components above). If it does not: a Verify that the LAN cables are correctly connected between the Intuity CONVERSANT, the NLSR server, and the LAN hub (where applicable). b Verify that the TCP/IP is administered correctly on both the Intuity CONVERSANT and the NLSR server. 2 Verify that the speech recognizer is running on the NLSR server. 3 Verify that the Intuity CONVERSANT is administered correctly (see Administering the NLSR Server on the Intuity CONVERSANT System in Chapter 3, Administration). In particular, verify that the **Host Address** and **Port Number** fields are populated with the correct information.

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Table 16. NLSR Troubleshooting

Problem:	Possible Solutions:
The Intuity CONVERSANT fails to establish a connection to a remote NLSR server. (*continued*)	**4** Verify that the **Port Number**(s) administered on the Intuity CONVERSANT agree with the port numbers used on the NLSR server. **5** Verify that the **/etc/hosts** file has the correct IP address(es) and server name(s) for the NLSR server. **6** Put all computers used in the NLSR application on a dedicated LAN hub, completely isolated from the rest of the LAN; and configure them appropriately. Repeat step 1. **7** If none of these solutions work, contact your field support representative.
The application fails to allocate the remote NLSR server.	**1** If the application has limited recognition resources, it is possible that all remote NLSR resources are busy and not available for allocation to other calls. You must wait for resources to become available or increase the number of resources the system can use. **2** Use the **cvis_menu SR Server Administration** screen to verify the connection status to the remote NLSR server (see Administering the NLSR Server on the Intuity CONVERSANT System in Chapter 3, Administration). If there is no connection established, see the troubleshooting procedures for the previous item. **3** Use the **RTUquery** command to verify that the Right-to-Use license is administered for the remote NLSR server and that there is a sufficient number of licenses for the application (see Verifying the Right-to-Use Licensing in Chapter 3, Administration). **4** Verify that the application is allocating the correct remote NLSR type (see *Using Voice@Work*, 585-313-207 or *Intuity™ CONVERSANT® System Application Design with Script Builder* for your system). **5** If none of these solutions work, contact your field support representative.
The application fails to send a command string to the remote NLSR server.	**1** Use the **ps -ef | grep proxy** command to verify that the proxyload process is running. If it is not: **a** Stop and restart the voice system. **b** If the problem still persists, contact your field support representative. **2** Verify that the application is using the correct remote NLSR type (see *Using Voice@Work*, 585-313-207 or *Intuity™ CONVERSANT® System Application Design with Script Builder* for your system). **3** If none of these solutions work, contact your field support representative.
The application fails to release the remote NLSR server resource.	**1** Verify that the application is using the correct remote NLSR type (see *Using Voice@Work*, 585-313-207 or *Intuity™ CONVERSANT® System Application Design with Script Builder* for your system). **2** Stop and restart the voice system. **3** If none of these solutions work, contact your field support representative.

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Table 16. NLSR Troubleshooting

Problem:	Possible Solutions:
The application fails to receive a data collection file name.	**1** Use the **pdc -s** command to verify that data collection is turned on for the remote NLSR type. If not: **a** Use the **pdc -o <*recogType*>** command, where *recogType* is the remote NLSR type, to turn on data collection. **b** Stop and restart the voice system. **2** Use the **dfspace** command to verify that the data collection file system has enough free space, at least 20% free. If not: **a** If the data is critical, copy the data collection files to tape. **b** Use the **pdc -r <*recogType*>** command, where *recogType* is the remote NLSR type, to remove the data collection file. **3** Verify that the application is using the correct remote NLSR type (see *Using Voice@Work*, 585-313-207 or *Intuity™ CONVERSANT® System Application Design with Script Builder* for your system). **4** If none of these solutions work, contact your field support representative.
The application returns a value of -1 or -2 for the allocPROXY external function.	**1** Use the **ps -ef | grep proxy** command to verify that the proxyload process is running. If it is not: **a** Stop and restart the voice system. **b** If the problem still persists, contact your field support representative. **2** Verify that the application is using the correct remote NLSR type (see *Using Voice@Work*, 585-313-207 or *Intuity™ CONVERSANT® System Application Design with Script Builder* for your system). **3** If none of these solutions work, contact your field support representative.
The application returns a value of -2 after a timeout for the allocPROXY external function, even though the NLSR servers have been confirmed as being in service.	Check your application to make sure you have not used the allocPROXY external function immediately after an Announce node or action step with the Allow Interrupt (Speak with Interrupt) option set to allow the caller to interrupt. See A CAUTION about the allocPROXY external function in Chapter 4, Use of NLSR in Voice Applications.
The application fails to remove a data collection file name.	**1** Use the **ps -ef | grep proxy** command to verify that the proxyload process is running. If it is not: **a** Stop and restart the voice system. **b** If the problem still persists, contact your field support representative. **2** Verify that the application is using the correct remote NLSR type (see *Using Voice@Work*, 585-313-207 or *Intuity™ CONVERSANT® System Application Design with Script Builder* for your system). **3** If none of these solutions work, contact your field support representative.

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Table 16. NLSR Troubleshooting

Problem:	Possible Solutions:
The message log reports that speech breaks, SPIP001, are occurring on channels.	If the speech breaks are occurring when multiple channels are disconnecting at the same time, the speech break message is normal and no action is required. If the speech breaks are occurring during the call, the SSP circuit card may be overloaded, and it may be necessary to add another SSP circuit card.
Prompt barge-in does not work, even when SR_Prompt external function (external action) is used.	For V7.0 systems: **1** Install RFU+a (patches vs+ap4, TSM+ap1, maint+ep1, prmlg+ap1, and—if fax is installed—fax+ap3) **2** Re-install the **Natural Language Speech Recognition - Proxy/Client** software package. **3** Reboot the system.

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A Using the NLSR Offer with Nuance

The Lucent Intuity™ CONVERSANT® IVR environment can be integrated with Nuance Communications speech recognition software using the **Natural Language Speech Recognition - Proxy/Client** software package and Nuance Communication's proxy client system software.

For more information about using the Lucent NLSR offer with Nuance software, see your Nuance system software documentation; or contact Nuance technical support at:

www.support@nuance.com

A Using the NLSR Offer with Nuance

Glossary

A

AC

alternating current

advanced speech recognition

(ASR) Same as automatic speech recognition

American Standard Code for Information Interchange

(ASCII) A standard code for data representation that 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.

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.

announcement

A message the system plays to the caller to provide information. The caller is not asked to give a response. Compare to "prompt."

API

Application programming interface

application

The software that directs an automated transaction among the caller, the voice response system, and any databases or host computers required for a business.

ASCII

American Standard Code for Information Interchange

ASR

automatic speech recognition or advanced speech recognition

automatic speech recognition

(ASR) A speech recognition ability that allows the system to understand spoken inputs from callers.

AYC5B

The IVP6 Tip/Ring (analog) circuit card.

AYC10

The IVC6 Tip/Ring (analog) circuit card.

AYC21

The E1/T1 (digital) circuit card.

AYC30

The NGTR (analog) circuit card.

AYC43

The speech and signal processor (SSP) circuit card.

B

barge-in

A capability provided by some speech recognition technologies, including NLSR, that allows callers to speak or enter their responses during the prompt and have those responses recognized and acted upon immediately, without having to play the entire prompt (similar to the Speak with Interrupt capability). See also "echo cancellation."

bps

bits per second

byte

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

C

caller

The party who calls for a service, gets connected to the Intuity CONVERSANT system, and interacts with it. As the Intuity CONVERSANT system can also make outbound calls for service, the caller can also be the person who responds to those outbound calls.

call flow

See"transaction."

caution

An admonishment or advisory statement used in Intuity CONVERSANT system documentation to alert the user to the possibility of a service interruption or a loss of data.

central processing unit

(CPU) See "processor."

CGEN

Voice system general message class

channel

See "port."

command

An instruction or request the user issues to the system software to make the system perform a particular function. An entire command consists of the command name and options.

configuration

The arrangement of the software and hardware of a computer system or network. The Intuity CONVERSANT system configuration includes either a standard or custom processor, peripheral equipment (for example, printers and modems), and software applications. Natural language speech recognition proxy configurations include Intuity CONVERSANT configurations, similar proxy NLSR server configurations, and their associated LANs.

configuration management

The component of the system 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 SSP and E1/T1 circuit cards, and perform various maintenance functions.

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 an Intuity CONVERSANT system along with a package from a different vendor on the same system platform.

CPU

central processing unit

custom speech

Unique words or phrases to be used in Intuity CONVERSANT system voice prompts that Lucent Technologies custom records on a per-customer basis.

custom vocabulary

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

D

danger

An admonishment or advisory statement used in Intuity CONVERSANT system documentation to alert the user to the possibility of personal injury or death.

data interface process

(DIP) 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 record

The information in a database for a person, product, event, etc. The database record is made up of individual fields for each information item.

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 store permanently, in the transaction outline.

DB

database

DC

direct current

debug

The process of locating and correcting errors in computer programs; also referred to as "troubleshooting."

default

The way a computer performs a task in the absence of other instructions.

dial pulse recognition

A method of recognizing caller pulse inputs from a rotary telephone.

dialed number identification service

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

dictionary

A reference book containing an alphabetical list of words, with information given for each word including meaning, pronunciation, and etymology.

DIP

data interface process

directory

A type of file used to group and organize other files or directories.

DNIS

dialed number identification service

DPR

dial pulse recognition

DSP

digital signal processor

E

E1 / T1

Digital telephony interfaces, commonly called *trunks*. E1 is an international standard at 2.048 Mbps. T1 is a North American standard at 1.544 Mbps.

echo cancellation

The process of making the channel quiet enough so that the system can hear and recognize voice or dial pulse inputs during the prompt. See also "barge-in."

Enhanced Basic Speech

Pre-recorded speech available from Lucent Technologies in several languages. Sometimes called "standard speech."

error message

A message on the screen indicating that something is wrong with a possible suggestion of how to correct it.

Ethernet

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

external actions

Specific predefined system tasks that Script Builder can call or *invoke* to interact with other products or services. When an external action is invoked, the systems displays a form that provides choices in each field for the application developer to select. Examples are Call_Bridge, Make_Call, SP_Allocate, SR_Prompt, etc. In Voice@Work, external actions are treated as "external functions."

external functions

Specific predefined (or customer-created) system tasks that Voice@Work or Script Builder can call or *invoke* to interact with other products or services. The function allows the application developer to enter the argument(s) for the function to act on. Examples are concat, getarg, length, substring, etc. See also "external actions."

external vendor

A company not formally associated with Lucent Technologies that produces hardware and/or software which can be used in conjunction with Lucent products. See also "independent software vendor."

F

FAX Actions

An optional feature package that allows the system to send fax messages.

FCC

Federal Communications Commission

feature

A function or capability of a product or an application within the Intuity CONVERSANT system. See also “offer“.

feature package

An optional package that may contain both hardware and software resources to provide additional functionality to a standard system.

field

See “database field.”

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 (FTS).

filename

Alphanumeric 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 in a specific language. See also "WholeWord speech recognition" and “subword technology.”

foos

facility out-of-service state

function key

A key, labeled F1 through F8, on your keyboard to which the Intuity CONVERSANT system software gives special properties for manipulating the user interface.

G

grammar

A list of possible inputs that a speech recognizer uses to identify (or match with) voice input from a caller.

GUI

graphical user interface

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.

host computer

A computer linked to a network to provide 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.

Hz

Hertz

I

IBM

International Business Machines

ID

identification

independent software vendor

(ISV) A company that has an agreement with Lucent Technologies to develop software to work with the Intuity CONVERSANT system to provide additional features required by customers. See also "external vendor."

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.

inserv

in-service state

Integrated Services Digital Network

(ISDN) A network that provides end-to-end digital connectivity to support a wide range of voice and data services.

Integrated Voice Processing (IVP) circuit card

The IVP6 circuit card that provides tip/ring connections. The NGTR (AYC30) card also provides the same functions.

interactive voice response

(IVR) The technology that allows a voice response system, such as the Intuity CONVERSANT, to accept and recognize spoken responses from callers. See also "voice response system."

interface

The access point of a system. With respect to the Intuity CONVERSANT system, the interface is designed to provide you with easy access to the software capabilities.

interrupt

The termination of voice and/or telephony functions when some condition occurs.

Intuity Response Application Programming Interface

(IRAPI) A library of commands that provide a standard development interface for voice-telephony applications. The Natural Language Speech Recognition offer extends this library to accomplish its work.

IPC

interprocess communication

IRAPI

Intuity Response Application Programming Interface

ISDN

Integrated Services Digital Network

ISV

independent software vendor

ITAC

International Technical Assistance Center

IVC6 circuit card (AYC10)

A tip/ring (analog) circuit card with six channels.

IVP6 circuit card (AYC5B)

A tip/ring (analog) card with six channels.

IVR

interactive voice response

IVR application

An application that makes use of IVR technology to guide a caller through a transaction.

K

Kb

kilobyte

Kbps

kilobytes per second

keyword

In ASR technology, a specific word or phrase being looked for by a speech recognizer.

keyword spotting

A capability provided by WholeWord speech recognition that allows the system to recognize a specific word or phrase in the middle of a longer phrase spoken by a caller in response to a prompt.

L

LAN

local area network

LDB

local database

LED

light-emitting diode

library states

The state information about channel activities maintained by the IRAPI.

line side E1

A digital method of interfacing an Intuity CONVERSANT system to a PBX or “switch” using E1-related hardware and software.

line side T1

A digital method of interfacing an Intuity CONVERSANT system to a PBX or “switch” using T1-related hardware and software.

local area network

(LAN) A data communications network in a limited geographical area. The LAN provides communications between computers and peripherals.

local database

(LDB) A database residing on the Intuity CONVERSANT system.

logical unit

A type of SNA Network Addressable Unit.

LSE1

line side E1

LST1

line side T1

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 Intuity CONVERSANT system screen from which you are able to enter either the System Administration or Voice System Administration menu.

maintenance process

A software process that runs temporary diagnostics and maintains the state of circuit cards and channels.

manoos

manually out-of-service state

MAP/100P

multi application platform 100P

MAP/100C

multi application platform 100C

MAP/40P

multi application platform 40P

MAP/5P

multi application platform 5P

Mbps

megabits per second

Mb

megabyte

megabyte

(Mb) A unit of memory equal to 1,048,576 bytes (1024 x 1024). It is often rounded to one million.

menu

Options presented to a user on a computer screen or with voice prompts.

MHz

megahertz

ms or msec

millisecond

MS-DOS

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

multithreaded application

A single process/application that controls several channels. Each thread of the application is managed explicitly. Typically this means state information for each thread is maintained and the state of the application on each channel is tracked.

N

natural language speech recognition

(NLSR) An advanced form of automatic speech recognition (ASR) in which the application is able to accept more natural voice responses from a caller. This type of speech recognition differs from WholeWord and FlexWord™ speech recognition in that it uses a much greater vocabulary and allows a much broader range of responses on the part of the caller. Another feature is that the recognizer is able to distinguish not only the important words or phrases being spoken, but also their grammatical function within the caller's statement. Compare with "WholeWord speech recognition" and "FlexWord™ speech recognition."

netoos

network out-of-service state

next generation tip/ring (AYC30) circuit card

(NGTR) An analog circuit card with six channels.

NGTR

next generation tip/ring (AYC30) circuit card

NLSR

natural language speech recognition

NLSR application

An application that makes use of natural language speech recognition (NLSR) technology.

NLSR engine

A software package used to convert digitized speech collected from callers into text strings using natural language speech recognition technology. This engine usually resides on an external (proxy) server. See also "NLSR server" and "speech recognition engine."

NLSR grammar

A list of possible inputs that a natural language speech recognizer uses to identify (or match with) voice input from a caller. See also "grammar."

NLSR server

An external (proxy) server used to convert digitized speech collected from callers into text strings using natural language speech recognition (NLSR) technology. See also "NLSR engine" and "speech recognition server."

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

obsolete hardware

Hardware that is no longer supported on the Intuity CONVERSANT system.

OEM

original equipment manufacturer

offer

A set of functions or capabilities of a product or an application within the Intuity CONVERSANT system.See also “feature”.

online help

Messages or information that appear on the Intuity CONVERSANT user's screen when a "function key" (F1 through F8) is pressed. Also used to refer to electronic documentation delivered as part of a software product such as Voice@Work.

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 executes 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

P&C

Prompt and Collect action

PBX

private branch exchange

PC

personal computer

PCB

printed circuit board

PCI

peripheral component interconnect

PCM

pulse code modulation

PDC

Proxy Data Collection

PEC

price element code

peripheral (device)

Equipment such as printers or terminals that is in addition to the basic processor.

peripheral component interconnect

(PCI) A newer, higher speed PC bus that is gradually displacing ISA for many components.

phoneme

A single basic sound of a particular spoken language. For example, the English language contains 40 phonemes that represent all basic sounds used with the language. The English 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 filtering (screening)

The rejection of unrecognized speech. The WholeWord, FlexWord, and natural language speech recognition packages can be programmed to reprompt the caller if the Intuity CONVERSANT system does not recognize a spoken response.

phrase tag

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

port

A connection or link between two devices that allows information to travel to a desired location.

private branch exchange

(PBX) 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 Intuity CONVERSANT system documentation, the computer on which UnixWare and Intuity CONVERSANT system software runs. In general, the part of the computer system that processes the data. Also known as the “central processing unit.”

prompt

A message played to a caller that gives the caller a choice of selections in a menu and asks for a response. Compare to “announcement.”

prompt and collect (P and C)

A message played to a caller that gives the caller a choice of selections in a menu and asks for a response. The response is collected and the application progresses based on the caller’s response.

proxy

A computer external to the Intuity CONVERSANT system used to perform one or more functions for an Intuity CONVERSANT application. Examples include proxy text-to-speech (PTTS) and the use of proxy ASR recognizers in natural language speech recognition applications.

Proxy Data Collection

(PDC) A utility on the Intuity CONVERSANT used to collect caller inputs received in response to NLSR prompts and store them in a proxy speech data collection file.

proxy speech data collection file

A file containing caller input data collected using NLSR prompts.

pseudo driver

A driver that does not control any hardware.

pulse code modulation

(PCM) A digital modulation method of encoding voice signals into digital signals.

R

RAID

redundant array of independent disks

RAID Array

An assembly of disk drives configured to provide some level of RAID functionality

RAM

random access memory

RDB

remote database

RDMBS

ORACLE relational database management system

RECOG

speech recognition feature message class

recognition type

The type of input the recognizer can understand. Available types include touch-tone, dial pulse, and Automatic Speech Recognition (ASR), which includes WholeWord, FlexWord, and natural language speech recognition.

recognizer

The software on the Intuity CONVERSANT or external (proxy) system that compares caller input to a grammar in order to correctly identify the caller input. See also “proxy.“

record

See “database record.”

remote database

(RDB) Information stored on a system other than the Intuity CONVERSANT system that can be accessed by the Intuity CONVERSANT system.

remote maintenance circuit card

(RMB) An Intuity CONVERSANT system circuit card, available with a built-in modem, that allows remote personnel (for example, field support) to access all Intuity CONVERSANT system machines. This card is standard equipment on all new MAP/100, MAP/40, and MAP/5P purchases.

reports administration

The component of Intuity CONVERSANT system that provides access to system reports, including call classification, call data detail, call data summary, message log, and traffic reports.

RMB

remote maintenance circuit card

RTS

request to send

S

script

The set of instructions for the Intuity CONVERSANT system to follow during a transaction. See also “application.“

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 Intuity CONVERSANT system. See also “Voice@Work.”

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.

signal processor circuit card (AYC2, AYC2B, AYC2C, or AYC9d)

(SP circuit card) A speech processing circuit card that is an older, lower-capacity version of the speech and signal processor (SSP) circuit card (AYC43).

SLIP

serial line interface protocol

software

The set or sets of programs that instruct the computer hardware to perform a task or series of tasks — for example, UnixWare software and the Intuity CONVERSANT system software.

SP circuit card

signal processor circuit card (AYC2, AYC2B, AYC2C, or AYC9d)

speech and signal processor circuit card (AYC43)

(SSP circuit card) The high-performance signal processing circuit card, capable of simultaneous support for various speech technologies.

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.

speech modeling

The process of creating WholeWord or natural language 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 or natural language speech recognition program to recognize a single spoken word.

speech phrase

A continuous speech segment encoded into a digital string.

speech recognition

The ability of a system to understand voice input from callers.

speech recognition engine

A software package used to convert digitized speech collected from callers into text strings. See also "NLSR engine."

speech recognition server

An external (proxy) server used to convert digitized speech collected from callers into text strings. See also "NLSR server."

SQL

structured query language

SR

speech recognition

SSP circuit card

speech and signal processor circuit card (AYC43)

standard speech

The speech package available in several languages containing simple words and phrases produced by Lucent Technologies for use with the Intuity CONVERSANT system. 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 voice prompts and messages to the caller. This feature is also called “Enhanced Basic Speech”.

standard vocabulary

A standard package of simple word speech models provided by Lucent Technologies and used for WholeWord speech recognition. These phrases include the digits “zero” through “nine,” “yes,” “no,” and “oh,” or the equivalent words in a specific local language.

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

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

subword technology

A method of speech recognition used in FlexWord recognition that recognizes phonemes or parts of words. Compare to “WholeWord speech recognition” or “natural language speech recognition.”

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.”

system administrator

The person assigned the responsibility of monitoring all Intuity CONVERSANT system software processing, performing daily system operations and preventive maintenance, and troubleshooting errors as required.

system architecture

The manner in which the Intuity CONVERSANT system and other associated (external or proxy) software is structured.

system message

An event or alarm generated by either the Intuity CONVERSANT system or end-user process.

system monitor

A component of the Intuity CONVERSANT system that tests to verify that each incoming telephone line and its associated tip/ring or E1/T1 circuit 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

See "database table."

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.

talkoff

The process of a caller interrupting a prompt, so the prompt message stops playing. See also "barge-in."

TAS

transaction assembler script

TCP/IP

transmission control protocol/internet protocol

TDM

time division multiplexing

test application

An application used only for testing the prompts, caller responses, grammars, etc., during the design phase of an IVR application.

text-to-speech

(TTS) An optional feature that allows an application to play US English 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 Voice@Work and Script Builder.

time-division multiplex

(TDM) 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

Analog telecommunications using four-wire media.

token

In NLSR applications, a "keyword" returned to indicate the essence of a caller's response to an NLSR prompt.

token ring

A ring type of local area network that allows any station in the network to communicate with any other station.

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

The interactions (exchanges) between the caller and the voice response system. A transaction can involve one or more telephone network connections and voice responses from the Intuity CONVERSANT system. It can also involve one or more of the system optional features, such as speech recognition, 3270 host interface, FAX Actions, etc.

transaction assembler script

(TAS) The computer program code that controls the application operating on the voice response system. The code can be produced using Voice@Work, Script Builder, or by writing directly in TAS code.

transaction state machine process

A multi-channel IRAPI application that runs applications controlled by TAS script code.

troubleshooting

The process of locating and correcting errors in computer programs. This process is also referred to as debugging.

TSO

Technical Services Organization

TSM

transaction state machine process

TTS

text-to-speech

U

UK

United Kingdom

US

United States of America

UNIX Operating System

A multiuser, multitasking computer operating system.

UNIX shell

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

usability

A measurement of how easy an application is for callers to use. The measurement is made by making observations and by asking questions. An application should have high usability to be successful.

V

variable

In most applications, a placeholder for information that changes. In NLSR applications, this term has a somewhat more restricted meaning. In these applications, a variable refers to a specific type of information being sought by the application.

vi editor

A screen editor used to create and modify electronic files.

virtual channel

A channel that is not associated with an interface to the telephone network (tip/ring, E1/T1, LSE1/LST1, 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 can be initiated only by a “virtual seizure” request to TSM from a DIP.

vocabulary

A collection of words that the Intuity CONVERSANT system is able to recognize using either WholeWord, FlexWord, or natural language speech recognition.

vocabulary loading

The process of copying the vocabulary from the system where it was developed and adding it to the target system.

Voice@Work

An optional software package that provides a graphical user interface to assist in development of voice response applications for the Intuity CONVERSANT system (see also “Script Builder”).

voice channel

A channel that is associated with an interface to the telephone network (tip/ring, E1/T1, LSE1/LST1, or PRI). Any Intuity CONVERSANT system application can run on a voice channel. Voice channel applications can 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 DIP or the **soft_szr** command.

voice processing co-marketer

(VPC) A company licensed to purchase voice processing equipment, such as the Intuity CONVERSANT system, to market and sell based on their own marketing strategies.

voice response system

A computer connected to a telephone network that can play messages to callers, recognize caller inputs, access and update a databases, and transfer and monitor calls. See also "interactive voice response."

voice system administration

The means by which you are able to administer both voice- and nonvoice-related aspects of the system.

VPC

voice processing co-marketer

W

warning

An admonishment or advisory statement used in Intuity CONVERSANT system documentation to alert the user to the possibility of equipment damage.

WholeWord speech recognition

An optional feature, available in several languages, based on whole-word technology that can recognize the numbers one through zero, “yes”, and “no” (the key words). This feature is reliable, regardless of the individual speaker. This feature can identify the key words when spoken in phrases with other words. A string of key words, called *connected digits*, can be recognized. During the prompt announcement, the caller can speak or use touch tones (or dial pulses, if available). See also “whole-word technology” and “FlexWord™ speech recognition.”

whole-word technology

The ability to recognize an entire word, rather than just the phoneme or a part of a word. Compare with “subword technology.”

word

A unique utterance understood by the recognizer.

wordlist

A set of words available for FlexWord™ speech recognition by an application during a Prompt and Collect action.

word spotting

The ability to search through extraneous speech during a recognition.

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