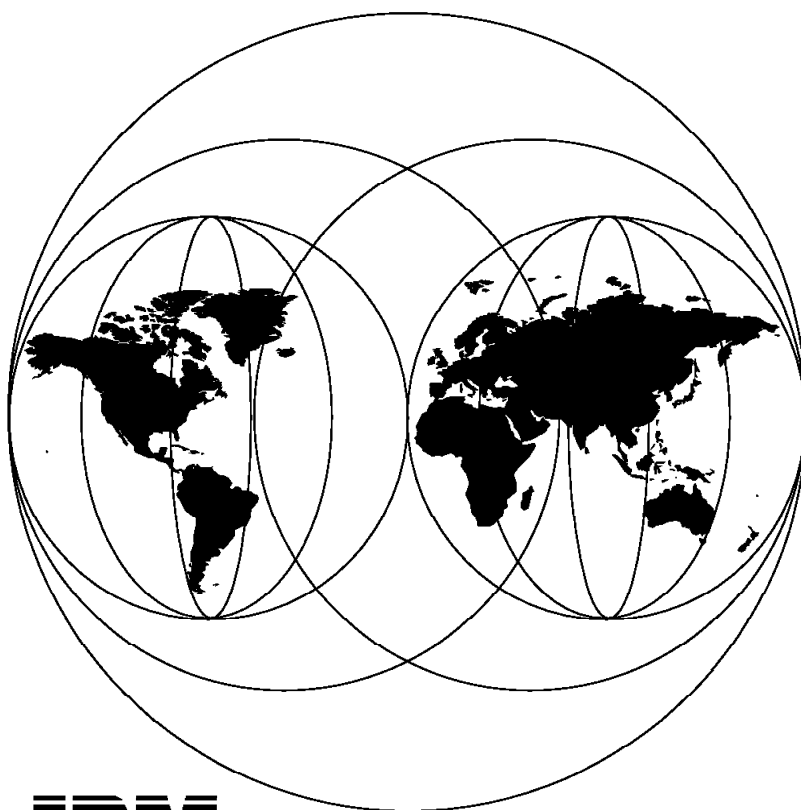


CallPath Call Center Planning and Reference Guide

October 1996



**International Technical Support Organization
Raleigh Center**



International Technical Support Organization

SG24-4140-01

**CallPath Call Center
Planning and Reference Guide**

October 1996

Take Note!

Before using this information and the product it supports, be sure to read the general information in Appendix D, "Special Notices" on page 375.

Second Edition (October 1996)

This edition applies to:

- CallPath Server/2
- CallPath Server/6000
- CallPath/400
- CallPath CICS
- CallPath CallCoordinator/2
- CallPath CallCoordinator for Windows
- CallPath CallCoordinator CICS
- CallPath SwitchServer/2
- CallPath DirectTalk/2
- CallPath DirectTalk/6000
- IBM PC DOS V 5.0 and above
- Microsoft Windows 3.1 and above
- OS/2 Version 2.11 and above
- Communications Manager/2

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Preface

This redbook is a reference guide for use when planning a Call Center. It contains all currently available information relating to CallPath products. We explain what CallPath is and how it works. Information on current IBM CallPath-compliant products is also included. This redbook would also be useful when answering tender responses. A section on PABXs is also included. This redbook is not intended to be a complete installation guide and refers to the necessary documentation where required.

Some of the content of this book can be found in the referenced manuals. The intent of this book is to provide as much information as possible in one place.

This redbook is intended for account systems engineers, voice specialist system engineers, consultants, customers and sales representatives who need to know how to plan a CallPath Call Center.

A lot of information is available on the Internet. A good place to start is the CallPath home page located at <http://www.raleigh.ibm.com/cti/ctiover.html>.

How This Redbook Is Organized

This redbook contains 403 pages. It is organized as follows:

- Chapter 1, "CallPath Call Center Architecture"

This chapter provides a definition of a Call Center.

- Chapter 2, "Introducing the CallPath Products"

This chapter gives an overview of the CallPath family.

- Chapter 3, "Benefits, Features and Functions"

This chapter describes some benefits, features and functions of the CallPath family of products.

- Chapter 4, "Planning for the Products"

This chapter describes the necessary hardware and software components required to build a Call Center.

- Chapter 5, "Telephony Concepts"

This chapter discusses telephony in general terms and includes some considerations when building a Call Center.

The Team That Wrote This Redbook

This redbook was produced by a team of specialists working at the Systems Management and Networking ITSO Center, Raleigh.

Ian Redman is a Call Center Systems Architect in Australia. He has 17 years of experience in IBM and 8 years of experience in Call Centers. He writes extensively and teaches IBM classes worldwide on all areas of CallPath. His areas of expertise include CallPath Server/2 and Server/6000, CallCoordinator/2 and Windows, DirectTalk/2 and DirectTalk/6000.

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This book is an update and expansion of *CallPath Call Center Planning and Installation Guide*, GG24-4140-00, published in 1994. The author of the previous edition was:

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Comments Welcome

We want our redbooks to be as helpful as possible. Should you have any comments about this or other redbooks, please send us a note at the following address:

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Your comments are important to us!

Chapter 1. CallPath Call Center Architecture

This chapter introduces you to the basic concepts of a CTI-enabled CallPath Call Center. We describe some benefits for you and for your customers, and provide some information on the architecture and standards that are evolving in this area. We also provide some examples of what a CTI-enabled Call Center can do.

For an overview of basic telephony concepts that relate to Call Centers, see Chapter 5, "Telephony Concepts" on page 159.

1.1 Definition of a Call Center

A Call Center can be defined as a place in a company or business that handles incoming and/or outgoing telephone calls from/to its customers in support of the day-to-day operation. This can be a telemarketing area, where the employees make outgoing calls to try and sell the company's product(s). It can be a service area that receives incoming calls from its customers for repair or maintenance of the company's goods or services.

Today there are many ways to access a Call Center:

- By telephone. Companies publish specific telephone numbers that direct customers' calls to an appropriate group of Call Center agents.
- The Internet. Companies set up interactive services on the Internet where a user, through the use of a Web browser, can request a call back from a Call Center agent.
- Fax. Customers fax their requests for information or services to a Call Center where an agent can process those requests.
- Kiosk. Companies establish interactive kiosks placed in public places where their customers can make business transactions or information requests by using a touch screen or video interface. If needed, Call Center agents can respond to these requests either immediately or by calling back at a later time.
- In person. Customers can walk up to a Call Center's reception desk and speak directly to one of the agents.

1.2 Architecture Overview

The following diagram shows an overview of the basic components of a CTI-enabled Call Center. All of the components in this diagram can be equated to a product or solution that is found in this book. Together these components make up a complete Call Center solution.

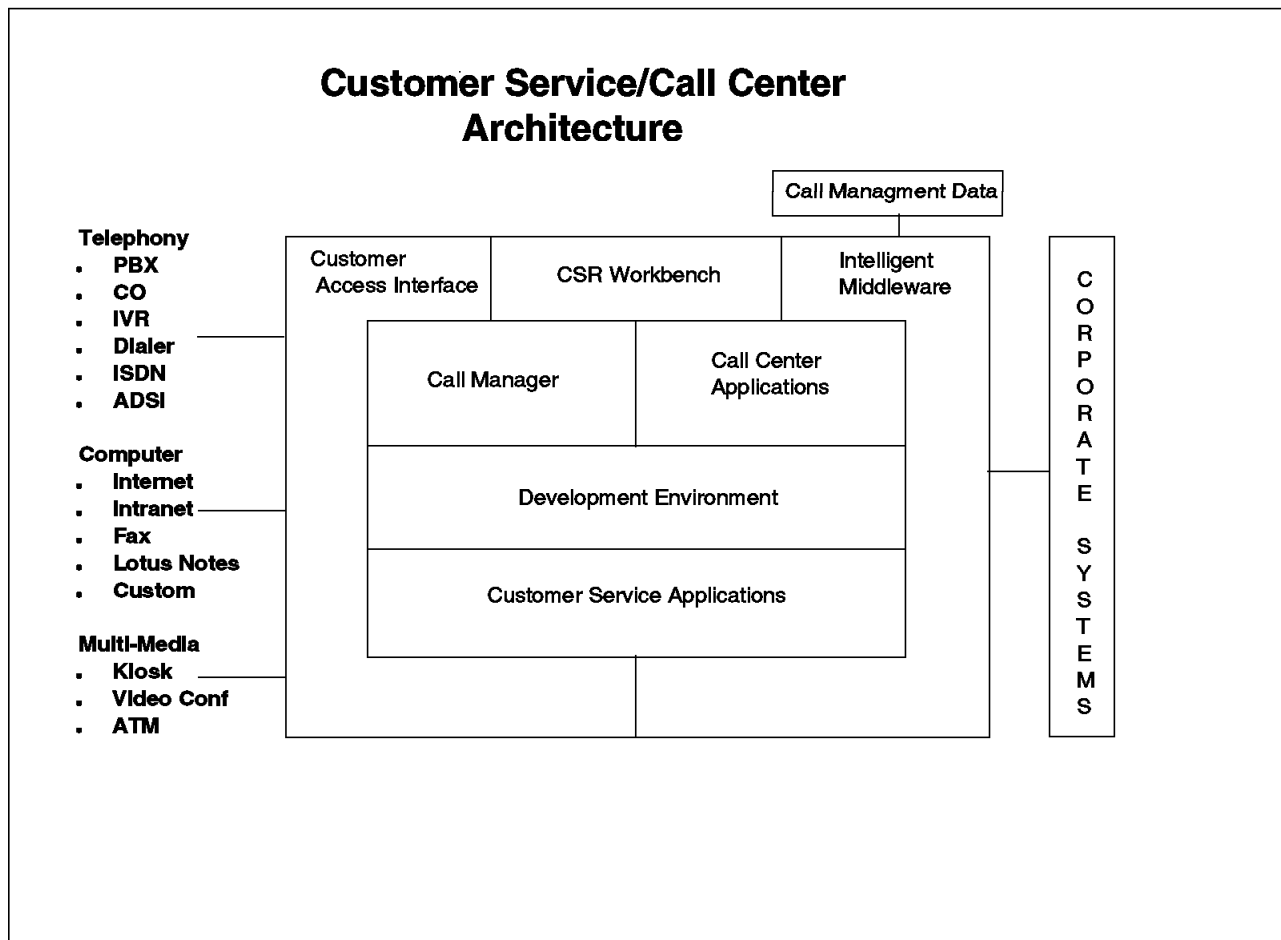


Figure 1. Customer Service/Call Center Architecture

- **Customer Access Interface:** The linkage between customers and the customer service environment. How customers access a Call Center. We can divide the methods of access into three categories:
 - Telephony
 - Computer
 - Multi-media
- **Call Manager:** Tools that monitor, manage, and report on calls and Call Center resources.
- **CSR (Customer Service Representative, or agent) Workbench:** What the Call Center agent sees or hears. The set of tools the Call Center agent uses to access required information.
- **Customer Service Applications:** Industry-specific applications and functions served by the Call Center, for example, Early, Cloud & Company (ECC) CallFlow Banker in the banking industry.
- **Call Center Applications:** Applications that provide Call Center functions such as dialing, load balancing and skills-based routing.
- **Intelligent Middleware:** Software that provides linkage to enterprise data and legacy systems.
- **Development Environment:** The tools that allow creation and customization of the Call Center environment.

1.3 What Do We Require?

All customers, regardless of size, have needs that can be summarized as follows:

1. Investment protection: Every single company already has made a sizeable investment in both the installed voice system and the applications and data existing on the data system. The desired approach is to reduce cost and increase revenue by building on the existing investment.
2. Improved employee productivity: Employees need better tools which will allow them to close more business. This can be done by creating more contacts per hour or day if the employee is placing calls to solicit business or to handle incoming calls faster.
3. Reduced costs: Business is tough today and profit margins are slim. A company needs to maintain the same level of business transactions with fewer people or grow the transaction volumes while maintaining a steady headcount.
4. Improved customer service: While maintaining emphasis on producing quality products, companies also want to be easy to do business with. They want to get telephone calls to the right person and reduce the number of times a customer needs to repeat information. Our goal with this book is to show you how to link the telephone and data systems to improve the business transaction that is taking place via a telephone call.
5. Enhanced management information: Management wants to be able to relate information that exists in the data system and the telephone system to understand what is happening in the business.
6. Increased revenue: A company can capitalize on emerging technologies to offer new services that will result in added revenue or recover what today is a lost revenue opportunity.

These are the requirements/needs that you can address with CallPath solutions.

1.3.1 Call Centers

As the cost of making a face-to-face sales call increases, the selling strategy has turned to account and business solicitation by telephone, with follow-on orders placed by the customer phoning an order entry department. This approach results in departments of people that will spend most of their workday conducting transactions on the telephone. Where we have a group of people whose primary task is to handle incoming calls or to place calls for business purposes, we will refer to these departments as *formal* Call Centers. Some examples are reservations centers, catalog order centers, policy service centers and such.

If we are dealing with a group of people who answer or place calls in addition to their normal duties, but who do not place/receive calls on a full-time basis, then we refer to this group as an *informal* Call Center. An example might be stockholder relations for a company.

IBM hired an independent consulting firm to study Call Centers and their expected growth. The firm found the number of Call Centers will increase dramatically over the next few years. From another perspective, consider that in

1989, 8 billion calls were placed to 635,000 toll-free lines to place an order or to get information about products.¹

1.3.2 Call Center Components

The public telephone network is becoming more intelligent. In almost all cities we can receive from the various long distance carriers the telephone number someone called (Dialed Number Identification Service - DNIS) and the number they called from (Automatic Number Identification - ANI). Some telephone systems are now able to pass that information over a switch-to-host link for an application to use with information contained in the database.

Automatic Call Distribution (ACD) allows a limited staff to manage a larger volume of calls. It does this by having callers wait, typically listening to music, until someone is available to service the caller. This capability maximizes your customer service representative resources during peak calling periods.

Voice Messaging is becoming standard equipment. It gives the caller an option to leave a callback message when all customer service representatives are busy.

More recently, many businesses have recognized the value of providing 24-hour, 7-day-a-week access to information. Using a Voice Response Unit (VRU), also known as an Interactive Voice Response unit (IVR), calls can be taken any time of the day or night. The CallPath DirectTalk family of products fulfills the need for 24-hour, 7-day-a-week service. (For more information see the *Direct Talk Voice Processing Product Presentation Guide*, G326-0095.)

The challenge for Call Centers today is that the telephone systems that do offer a switch-to-host link to pass call information are all different. Each telephone system sends different information in different protocols and in a different format. There is no standard fully defined today for switch-to-host communications. IBM has seen the need for consistency and standards and is participating with standards groups to address this need. For a further discussion on switch-to-computer standards, see 1.5, "Standards Activities" on page 7.

1.4 What Does a Call Center Look Like?

A Call Center will always have a telephone system. This system can be as simple as a small single-line phone, increasing in complexity up to a large multi-node PABX. A Call Center may have a computerized system for tracking, logging and recording call details, or may simply use paper forms. It may have one operator or agent, or it may have many, depending on the size of the company or business.

Multiple site Call Centers are becoming more common and need to be linked together to form a single "virtual" Call Center. Operators working from home need to be included in the Call Center and must appear to be transparent in their connection to the Call Center. Many different types of access need to be made available to the Call Center customers. These can include a simple phone connection or complex connections to the Internet. Many functions of a Call Center can be performed by an IVR prior to the caller being transferred to an

¹ Source: Direct Marketing Association.

operator. Some functions may be handled completely by the IVR and not need any operator intervention at all.

Call Centers come in many sizes, from a small service-oriented Call Center to a large, complex Call Center that is the hub of a company's business, enabling them to perform all of their business from a central site. This is becoming quite common in the banking industry, where banks are closing down branches and moving all their customer services to a central site.

Today's Call Center can have many components. This book attempts to provide some insight into how some of these components fit together. A Call Center can use a large mainframe for its database storage, or a small PC with a stand-alone database. The Center can be networked via a LAN or WAN or it can be a stand-alone system unit. It can be connected to mail managers such as Lotus Notes and work flow systems such as FlowMark.

The important thing to remember is that the Call Center is the hub of a company's business and is the most important customer contact area in the company. It should be sized right and built correctly to allow for growth in the company and expansion in the business area and other areas to which it is attached.

1.4.1 Business Goals

Communications have helped create a "smaller" world. At the same time, most economies are becoming more and more service oriented. The need to compete in the "global marketplace" has created the requirement to provide access to services outside of normal business hours. The cost of an average business sales call continues to escalate, as do costs for personnel who process orders, perform dispatch functions and service accounts. All these factors need to be considered in the quest to retain and gain market share.

The implementation of leading-edge solutions can increase the effectiveness of communications with your customers only if the technology is transparent to them. If the technology is easy to use, you can provide an environment that enables your organization to be easy to do business with.

More than ever, executives are recognizing the need to differentiate their products and services from competitors and are looking for innovative ways to develop a competitive advantage.

Many companies have invested significant resources in the quest to provide timely and accurate information for the inquiries called into their organizations. Yet few, if any, have unlimited resources with which to service those inquiries. Think of your own experiences when calling other businesses. It is not uncommon to hear a cordial greeting assuring us our call is important and then hear music for a brief period of time (sometimes longer) before your call is answered. Then the challenge begins to find the right person to assist you with your inquiry.

If a company has one number for all types of services offered, callers invariably get transferred to a specialist who can assist with the particular type of request. If a company offers different numbers for different services offered, callers invariably call the first number they find for that company and again end up being transferred. In either case, callers are telling each customer service representative along the way who they are and what they want. This increases

the caller's frustration level and also extends the length of the telephone call. The companies that will succeed in the 90s are those who create an environment that makes it easy for customers to do business. As an example, let's take a look at a few commonly accepted business observations.

1.4.2 Business Environment - Some Observations

A significant and growing proportion of interaction with customers now takes place over a telephone. It is therefore of primary importance to ensure that such interaction is carried out as efficiently as possible. This message is confirmed by the following observations:

Winning over new customers is a goal worth a great deal of effort and investment. Once a new customer has been brought into the fold, it is necessary to provide a good level of service to keep him or her happy. It has been estimated that it costs five times as much to win a new customer as it does to provide the service necessary to retain an existing one.

Even with the best people and processes, you can't keep all of the customers happy all of the time. Problems will occur and when they do there is the potential of losing a customer. If, however, a customer's problem can be resolved quickly, then there is a good chance he or she will remain loyal and continue to do business with you. Indeed, a supplier may gain loyalty based on how efficiently they are able to handle problems when they arise.

Customers with good service take it for granted and are normally very quiet about it. Customers experiencing poor service are usually very vocal about it to anyone who will take the time to listen.

1.4.3 Benefits

A Call Center can be costly to build and a company needs to show a benefit to the business to justify its existence. There are many benefits that can be realized from a properly constructed, CTI-enabled Call Center.

1.4.3.1 How Callers Benefit

- Less time on hold
- Improved response time for callers once they get through to the company
- Instant access to database information, often on a 24-hour basis
- Better informed customer service representatives who are able to understand the caller's past relationship with the company
- Access to customer service representatives who, when freed from routine functions, have more time to research the answer to more complicated questions
- No need to repeat identification information and reason for calling when transferred to another agent or department

1.4.3.2 How the Business Benefits

- Prompter and more accurate response to inquiries, orders, and service requests
- Personalized attention and efficient problem resolution
- Improved customer and prospects access to information about new products and services

- Increased number of services available and extended hours of operation
- Increased telesales revenue
- Higher levels of referral and repeat business
- Fewer data entry keystroke errors
- Shorter transaction time, increased employee productivity
- Improved employee morale
- Cost savings from operational efficiencies
- Lower toll-free telephone line charges and trunk requirements

1.5 Standards Activities

Switch-host protocol standards are currently under development. IBM recognizes the need for standards and is actively participating in the efforts of national and international organizations to define switch-host standards. Until a standard is defined and approved by vote by the standards body, there is no official standard. Vendors have started implementing switch-host communications and IBM has taken the lead in implementing standards, in that, CallPath Services Architecture has implemented all of the components of the standards that have been defined so far. It is IBM's intent to implement the complete standards when they are fully defined and approved.

The European Computer Manufacturers Association (ECMA) started meeting every 5 to 7 weeks in 1988 to define a standard in Europe. IBM attends their regular meetings and has had more submissions accepted by ECMA than any other vendor. The ECMA switch-host standard is named Computer Supported Telecommunications Applications (CSTA) and the committee defining the standard has completed their technical work. The main ECMA body voted in June '92 to accept that work. (Note: The committee defining the standard has named an IBM employee as their chairman.)

IBM is also actively participating in meetings held by the American National Standards Institute (ANSI) to help define a switch-host standard dubbed Switch-Computer Applications Interface (SCAI). In May of 1989 ANSI started meeting twice monthly and the committee finished technical work in January '92 and finished editing of the standards document in March '92. The voting process in ANSI can be somewhat lengthy and can take up to a year or more. An estimate for a standard in the US was the end of '92 or early '93. As of July '96 the standards had not been fully finalized.

International standards will be defined and approved in the future and the committee will include people involved in ANSI and ECMA. All standards will evolve such that eventually all will be compatible.

In September 1993, IBM announced the following statement of direction. IBM intends to expand its telephone connectivity alternatives for customer call-processing solutions to include computer-telephone systems protocols reflecting the ongoing ECMA CSTA standards activities.

IBM understands that customers cannot wait for standards for switch-host communications. In May of 1990 IBM announced a switch-host application control architecture known as CallPath Services to establish a foundation for defining how these systems can best operate together.

When standards-defined formats and protocols are defined and approved, CallPath Services Architecture will provide the migration to the standards. The *CallPath Services Programmer's Reference Guide*, GC31-6824, provides detailed information on the functions that CallPath Services provides for applications that need to communicate with a telephone system.

1.5.1 Versit

Created in November 1994, Versit is an initiative founded by Apple Computer, AT&T, IBM and Siemens to promote interoperability while preserving diversity and freedom of equipment choice. Interoperability benefits all of us; it means users can count on systems working together and it means that developers have the widest possible markets for their products.

Versit develops open specifications that enable cross-platform interoperability. It does so through a process that builds on existing standards, making them even more comprehensive and widely applicable. It publicly issues trial specifications, free of charge, and invites comments from developers and users throughout the industry. And finally, Versit issues and promotes specifications that, when followed, ensure the open, cross-platform solutions we all seek.

1.5.1.1 Versit Update

- Delivered specifications as of August 1996 include:
 - Versit CTI Encyclopedia 0.9
 - VCard Electronic Business Card
 - Versit H.320 Two Bearer Channel (Implementors' Agreement)
- Shared specification drafts for review and comment with various industry groups, including ECTF, ECMA, IMTC and IrDA.
- Developed a comprehensive White Paper which furthers the understanding of CTI solutions within the marketplace.
- Versit founding companies committed to the rapid advance of interoperability by joining the ECTF.

For further information, see Versit on the Web at <http://www.versit.com>.

1.6 History of CallPath

In May of 1989, IBM announced CallPath Host, which established a path over which information about a call could be passed from a ROLM 9751 and made available to a CICS/MVS application on an S/370 or S/390. This initial offering opened a whole new approach for businesses to increase the level of service they gave to their customers while doing business over the telephone.

In May of 1990, IBM announced a new architecture, CallPath Services Architecture, and established that this would be the building block for IBM's integrated voice and data solutions. This intention was demonstrated by the announcement of the initial implementation on the AS/400, CallPath/400. In addition, IBM made statements of direction that the architecture would be supported by platforms on the S/370 and PC, statements subsequently fulfilled by the September 1991 announcements. January of 1992 saw IBM's announcement of CallPath CallCoordinator CICS/MVS and the fulfillment of previous statements of direction on CallPath Host's migration to CallPath Services Architecture. Additionally, IBM issued a statement of direction indicating its commitment to

migrate DirectRoute/2 (an OS/2-based call management application) to IBM's CallPath Services Architecture. Within two months it announced CallPath CallCoordinator/2. Concurrently, IBM announced yet another statement of direction, this time to implement CallPath Services Architecture on the RISC System/6000. IBM quickly fulfilled that commitment in September when it announced CallPath/6000, continually expanding the reach and range of our industry leading product line.

In May of 1994, IBM announced new CallPath products called CallPath Server/2 and CallPath Server/6000. These products offer an enhanced client/server CTI solution that enables CallPath applications in AIX, OS/2, DOS Windows, Sun Solaris, HP-UX, and SCO UNIX operating system environments.

When they saw the announcement of CallPath Services Architecture and IBM's plans as contained in the original statements of direction, industry consultants and trade press commentators were quick to acclaim IBM as the leader in integrated voice/data, truly the customer service champion.

Today, hundreds of customers have CallPath products installed, thus reinforcing IBM's leadership position in the voice/data market.

1.7 CallPath Services Architecture - The Strategy

In developing the CallPath Services Architecture, the objective was to define an architected programming interface for interaction between an IBM computer and a telephone system so that an application on the computer can monitor and influence the actions of the switch. This application programming interface (API) is designed to allow applications to receive messages from a telephone system and to send call control requests to the telephone system. Through this API, a large set of telephony functions can be provided, such as make, monitor and transfer a call.

The CallPath Services Architecture was designed to provide customer investment protection in many ways:

1. By facilitating telephony enhancements to existing data applications as well as fostering the development of new applications
2. By supporting multiple IBM and non-IBM host platforms
3. By providing links to multiple telephone systems that are sold worldwide

The CallPath Services Architecture is an IBM strategic architecture. The API is now implemented across IBM's major platforms:

- PC (OS/2)
- AS/400 (OS/400)
- S/390 (CICS/MVS and CICS/VSE)
- RISC System/6000 (AIX)

In addition, CallPath Server now extends the API to these non-IBM environments: Sun Solaris, HP-UX, and SCO UNIX.

Implementation of the API is consistent in function so that customers may leverage skills and application design across operating systems. New or existing applications running on any of these computer systems will be able to

integrate many telephone services, such as Inbound, Outbound and Personal Phone Services, without regard to the communications transport method or protocols utilized between the computer and the supported switch.

- Inbound Teleservices refer to the areas in the business which typically receive calls (orders/inquires).
- Outbound Teleservices refer to the areas in the business which primarily generate calls (collections/market research/telemarketing).
- Personal Phone Services is the ability to use the terminal keyboard to access telephone system features.

1.7.1 CallPath Services Architecture Implementation

The implementation of CallPath Services Architecture on an IBM host consists of three basic elements:

1. An architected application programming interface (API)
2. A telephony subsystem, known as the CallPath Services Subsystem
3. Switch protocol mapping

1.7.1.1 Application Programming Interface (API)

The application programming interface consists of a set of requests that an application can send to the telephony subsystem or to a telephone system, and a set of messages that an application can receive from the telephone system or the telephony subsystem. A functionally consistent API allows programmer skills and application design to be leveraged so that the programmer is shielded from the complexity of the format and protocols of each telephone system. The architecture allows portability of application design between various host environments, thus protecting the customer's investment.

1.7.1.2 CallPath Services Subsystem

The CallPath Services Subsystem is software that provides the underlying services necessary to support the requests initiated by the application and the messages received from the switch. It gives the application access to telephony functions provided by the switch, via the API, yet shields the application from both the communications transport and protocols used between the computer and the switch. This is an important service since standards for switch-host communications have not been fully established, as we have discussed. Several switch manufacturers have already implemented proprietary formats and protocols and there are also many types of communications transport possible, such as async, X.25, and LU 6.2. The subsystem allows an application programmer to concentrate on use of the API and the architected telephony functions, while deriving the benefits of access to multiple switches, all of which support different protocols.

The telephony component issues CallPath Services requests and collects CallPath Services messages to provide specific solutions to your business. The telephony component integrates an implementation of the architecture into the application. IBM, IBM Business Partners or the customer must provide the telephony component. Once this is done, the application is enabled to take advantage of the interface to the telephone system.

1.7.1.3 Switch Protocol Mapping

The third component is switch protocol mapping support. This is the translation of the API requests, initiated by the application, into a format that a particular target switch understands. In particular, it is the switch protocol mapping that, as mentioned earlier, shields the application from the details of the specific formats and protocols required by a switch. Switch protocol mapping is also designed to facilitate the implementation of international switch-host communication standards as they evolve. When standards-defined formats and protocols are defined and approved, IBM will provide a mapping from the CallPath API to the standard protocol. IBM expects that the migration to standards will have little, if any, impact on the API or on the applications written to the API. An application that is designed to run with a specific switch should not have to change and should support all of its old functions, plus new ones, when the switch migrates to use the new standard protocol. The API is protected, which is key and is the main benefit of the architecture.

1.7.2 IBM CallPath Enabled Solutions

IBM's CallPath Services Architecture enablers, when integrated into business applications, provide customers with functions that will put them on the leading edge of their market place. We describe these features as *enabled solutions* because CallPath enables these capabilities *to be built into* existing or new applications. Let's look at the enabled solutions and see how they have been used to address customer business requirements.

Businesses can develop these solutions in-house or they may wish to work with IBM or an IBM Business Partner. Of the IBM customers who have implemented CallPath solutions, approximately half have opted to do their own application development and half have utilized the services of IBM or IBM Business Partners.

Enabled solutions are dependent on individual telephone system capabilities. Each CallPath supporting telephone system implements a subset of the CallPath Services Architecture messages and requests. Similarly, the IBM host selected for a CallPath solution may be impacted by characteristics of the desired solution.

1.7.2.1 Enabled Solution - Intelligent Answering

Intelligent answering is the initial presentation of caller-related information on a terminal screen as a call arrives at an employee's workstation. The agent answering the call is better prepared to immediately begin servicing the caller's request because the caller's profile or history, from the business application, automatically pops up on the screen.

CallPath provides the host application with information about callers. The application can be designed to match the information in the database and present the appropriate screen to the correct workstation. The information that appears can be any data you choose that would assist the agent in handling the call quickly and more professionally. For example, the application may present information based on:

- The telephone number of a caller (ANI)
- The "800" number the caller dialed to reach your organization (DNIS)

- The extension the caller dialed (DID)²
- The trunk on which the call came in

As you can imagine, this saves time and enhances productivity. Improved efficiency can cascade through your entire operation. Agent-caller transaction times can be reduced, resulting in significantly shorter queue holding times. These combined factors can lower 800 service charges and potentially reduce telephone system trunk requirements. Operating costs can be substantially reduced, while responsiveness to customers, vendors and prospects is dramatically enhanced.

1.7.2.2 Intelligent Answering - Distribution Industry

One of IBM's distribution industry customers is using intelligent answering with great business results. The company, a provider of health care products, wanted to improve customer service, streamline order processing and reduce operating costs. Their customer base is comprised primarily of small businesses. They implemented CallPath in conjunction with Automatic Number Identification (ANI).

With over 95% of their calls arriving with the telephone number of the caller, they are able to match the number in their customer database and present the order entry screen, already filled in with the customer's name, address etc., to the agent answering the call. This has shortened the average call length by 12%.

Company representatives now answer calls more personally. Their customers like being greeted by name, and no longer need to search for their account number before placing an order.

This customer has implemented powerful software in their telephone system to help route calls more effectively. Based on the ANI information received, the telephone system can route special customers on a priority basis to a special accounts group. It can also determine, by searching tables in the telephone system, whether a customer is on credit hold, and rather than route the call to order entry, sends the call directly to the accounts receivable department for appropriate action.

The customer is also using CallPath for several other purposes:

- Abandoned call tracking: When a caller hangs up before reaching an agent, the application is notified and automatically puts that caller in a list for agents to call back as soon as they are available. The goal, which they are achieving, is to capture potential lost sales before the caller orders from a competing vendor.
- Automatic database update: When a call arrives without an ANI match in the customer database, the agent merely presses a PF key which automatically records the telephone number the person is calling from.
- Enhanced system access security: CallPath is being used as an additional measure of security for off-site system access. When an employee dials up the host system and enters a user ID and password, the system uses ANI to verify that the caller is using the phone number of an approved system user.

² Direct inward dialing (DID) refers to the ability to call an individual extension directly, without first going through a company operator. Many customers use this service today.

Overall, this customer credits CallPath with significantly improving customer service and order processing, enabling the same number of agents to handle many more calls and increasing sales while yielding other completely unexpected benefits.

This is a “business-to-business” calling environment where the likelihood that the call is originating from a business office is high. This contributes to the successful implementation of Intelligent Answering with Automatic Number Identification. In many areas of the United States, privacy issues have been raised regarding the passing of calling party information (ANI). Some states have enacted laws prohibiting this on an intrastate basis. The FCC still has not acted on this issue relative to regulating interstate commerce. Generally, businesses will be able to obtain ANI services from long-distance carriers in order to conduct interstate business.

1.7.2.3 Enabled Solution - Coordinated Voice/Data Transfer

Coordinated voice/data transfer is the ability to transfer a phone call to another party and have an appropriate data screen transfer to that party simultaneously.

As functions are specialized, businesses are increasingly required to transfer data when transferring telephone calls. When customers call into a business, they should only have to identify themselves and provide information once, regardless of how many different departments or individuals service their requests.

Coordinated voice/data transfers are especially valuable when used in conjunction with a voice processing system such as CallPath DirectTalk. When a caller needs to transfer to a “live” agent, the application can transfer the last screen used by the voice processing system to the agent receiving the call. The agent is immediately aware of the preceding interactions between the caller and the voice processing system and can continue, rather than asking the caller to repeat his or her name and purpose for calling.

In this example, we see a bank customer, Ms. Lowe, calling in for information about her account. She has been answered by a voice processing system, which after prompting Ms. Lowe for identification, has given her access to current banking information. Ms. Lowe has a problem with her account, so she requests the voice processing system transfer her to a customer service representative. In doing so, the application receives notification of where the call is being transferred, and sends the last transaction screen used by the voice processing system to the associated workstation. The bank representative answering the call has Ms. Lowe’s name and bank account information automatically displayed on his or her screen allowing him or her to respond personally and effectively.

Actually, depending on business needs, the information on the screen of the person receiving the transfer does not have to be identical to that of the previous screen; it depends on the nature of the business. As an example, think about calling your insurance company. Perhaps you speak to someone in the automobile insurance department, then need to speak to a home insurance agent. As your call is transferred, the application, knowing the extension where the call is being routed and the application associated with that user, can display your home insurance profile rather than your automobile policy information. The individual receiving the call is ready for productive, efficient, responsive work the moment the phone is answered.

This capability increases productivity for both caller and service provider. It lets customers receive improved service while reducing telephone expenses. Finally, with personalized handling of callers, company image is enhanced in the eyes of its customers.

Service quality will continue to be more and more significant in the competition for customer loyalty. Coordinated voice/data transfer will make doing business with a company more convenient than ever before.

1.7.2.4 Coordinated Voice/Data Transfer - Finance Industry

One IBM customer has increased collections significantly using CallPath coordinated voice/data transfer together with an interactive voice response unit. The company is a large financier of property loans.

When customers fail to make a loan payment, this firm mails a letter instructing the delinquent customers to call an 800 number about their loan. The customer, concerned that his or her property may be repossessed or foreclosed, calls the 800 number and is greeted by a voice processing system, which prompts him or her for his or her social security number. The application checks the customer's account. If the customer is 45 days late or less, the voice processing system asks the caller whether he or she promises to pay within 5 days. If the caller responds "yes", the transaction is logged and the call completed. If the application determines that the customer is over 45 days delinquent, the voice processing system transfers the caller, along with his or her account record, to a collections agent, who follows the appropriate procedures.

The company has observed that their customers would rather interact with a machine than have to speak with a collections agent. In addition to a dramatic increase in collections, they have reduced average call lengths by 45 seconds resulting in a 40% reduction in collections agents needed to handle these calls. The abandoned call rate has dropped to practically none. And, the excess resource from this application has been applied to other areas of the business, contributing to the dramatic increase in collections.

ANI is also being captured as an indicator of where property is located in the eventuality that repossession is required.

1.7.2.5 Enabled Solution - Voice/Data Consultation

Another capability supported by CallPath is voice/data consultation, the ability to establish a voice and data conference call. As an example, an agent might need to consult with a supervisor or specialist on a particular call. The agent initiates a conference call, and at the same time, the information on his or her terminal can appear on the supervisor's or specialist's display.

The information displayed on both terminals does not have to be identical. For example, additional information about the customer could also be displayed on the supervisor's terminal. The objective is to get the pertinent, caller-related information to the conferenced party.

Timely and relevant caller information is available to both parties so that accurate, on-the-spot decisions may be made, and callers are handled satisfactorily the first time they call. In addition, use of voice/data consultation can greatly enhance two-tier staffing in Call Centers. It can also significantly reduce training requirements.

Voice/data consultation can also be used in conjunction with agent monitoring activities.

1.7.2.6 Voice/Data Consultation - Insurance Industry

One insurance company, like many other companies with large Call Centers, had a need to handle incoming calls more efficiently, and reduce the necessity of calling customers back to complete the requested transaction. The insurance company decided to organize their Call Center staff into "Level 1" and "Level 2" support. Their newer, less experienced customer service representatives handle all initial calls arriving at the Call Center, the majority of which are routine requests. The Level 2 representatives, of whom there are considerably fewer, are reserved for resolving more difficult caller requests or issues.

With CallPath, when a Level 1 representative needs assistance with a call, a coordinated voice/data consultation is initiated with a Level 2 representative. The Level 2 representative can see exactly where the Level 1 representative is in the application while talking through the problem. The customer may be conferenced in as well, or may be on hold. The Level 2 representative explains the necessary course of action to handle the transaction and in the process, not only eliminates the need to research the request and get back to the caller at a later time, but also imparts on-the-job skills transfer to the Level 1 representative who will know how to handle a similar situation in the future.

Through the use of voice/data consultation, this company virtually eliminated customer call-backs and is able to provide a higher quality of service to their customers. Because calls are handled and completed more efficiently, actual conversation lengths are shorter, and call holding times are reduced, resulting in lower 800 line costs. In addition, Call Center training requirements have been reduced.

Because of the efficiency attributed to the voice/data consultation capability, this company is able to handle an increased volume of calls with 10 fewer agents than originally anticipated.

1.7.2.7 Enabled Solution - Computer-Assisted Dialing

Computer-assisted dialing is a capability that automates the placing of calls, either within or outside an organization. With computer-assisted dialing, the application can direct the telephone system to make a call based on the phone number displayed on a workstation screen or stored in the system database.

The productivity of people whose jobs entail placing calls is increased not only because the dialing is automated, but also because the dialing may be integrated with calling decisions, such as who to call and when to call, that can be driven by the application. Agents are able to spend more time speaking with customers/clients and less time preparing for and placing the call.

In addition to more efficient use of personnel, cost savings can be derived from the elimination of misdialed calls (which can happen often when high volumes of calls are being made manually).

There are several levels of automation possible within computer-assisted dialing.

Preview dialing: An agent has the opportunity to review call-related information on the screen before pressing a terminal key to initiate the call. An application can also be designed to automatically initiate calls based on numbers stored in a database.

Intelligent dialing: Combines the functions of preview dialing with the processing of call status information received from the network. For example, if the application is notified by the telephone system that the line is busy at the other end, the application can store that number back in a calling queue and automatically initiate the next call.

Predictive dialing: Predictive dialing takes intelligent dialing and links it to complex algorithms that pace the automatic placing of calls with the expected availability of an agent. When the call is answered it is quickly routed to an available agent, along with an appropriate screen of information.

As you may guess, predictive dialing is geared toward high volume outbound Call Center applications where little advance information about the called party is required.

Predictive dialing is a specific type of outbound calling which requires application programming not only to integrate voice functions into a business application, but also requires coding which helps the application “predict” when calls should be placed in anticipation of both a connected call and an available agent.

Please note that not all enabled solutions may be supported by every CallPath supporting telephone system. In addition, not all host environments may be appropriate platforms for every enabled function.

1.7.2.8 Computer-Assisted Dialing - Teleservices Industry

Computer-assisted dialing is becoming a necessity in many departments of businesses where a high volume of outbound calls is made. In fact, there are firms that specialize in making calls on behalf of other businesses, for applications such as collections, market research, and marketing campaigns. One such company is using CallPath to reach the maximum number of customers for its clients.

For this firm, the more times their agents reach a live person, the greater the potential is to successfully collect on aged accounts or sell client’s services. Using a predictive dialing solution in conjunction with an ISDN Primary Rate Interface to network services, they are able to double the number of call attempts without additional staff. As a result, revenues have increased by 75%!

Since the agents receive the called party’s information on their screen when the call is routed to them, they can address the person they are speaking to by name.

By routing calls over an ISDN Primary Rate Interface, this Teleservices company benefits in other ways. Significantly more calls can be placed over the same number of T1 channels, thereby reducing the trunking requirements of the telephone system. In addition, call set up times are reduced by more than 70% when using ISDN services.

Legislation has passed in several areas of the USA regarding “nuisance calls”. Often characterized by machine-generated telephone calls, a nuisance call

results when a machine has placed a call out into the network, but, when the called party answers, a live agent is not available so the machine hangs up on the individual called. The chances of this happening are greatly reduced when a good predictive dialing algorithm is implemented.

Also, with the accuracy of ISDN signaling, agents usually are connected before the called party has finished saying "hello". Some dialing technologies are not able to discern a call-answered status for several seconds, giving the called party the opportunity to say "Hello" two or three times, then hang up before an agent is ever connected. Not only is this annoying to the public, but it is an unnecessary waste of company resources.

1.7.2.9 Enabled Solution - Computer Assisted Routing

Now that telephone systems and applications are able to share data about calls handled by a telephone system, an IBM host can determine where calls should be routed based on application information.

For example, let's say a call comes into a customer service department with network-delivered information which indicates the call is from a major account - SuperCompany. The database records for customers include the name of the representative who normally supports the account. In the case of SuperCompany, Joe is the assigned customer representative. The application then directs the telephone system to route the call to Joe. The customer will then be handled by the person they are most comfortable dealing with.

Computer-assisted routing enables the use of network information to identify the calling party and the routing of calls based on host application criteria.

Bear in mind that in a scenario like the one above, a business will have to plan for alternate routing of calls when an assigned agent is unavailable.

1.7.2.10 Computer-Assisted Routing - Utilities Industry

Computer-assisted routing is a way to route calls based on caller information. You can also use CallPath to balance the call loads of a multi-site operation.

One utility company was looking for a way to consolidate nine customer service centers to improve service, reduce costs and better utilize their customer representatives. After a physical consolidation was ruled out, IBM showed the company how CallPath could help all the locations function "logically" as one large Call Center. Their objective was to provide a high service level across all sites even though call loads varied greatly, with no predictable pattern, throughout the day.

Each site's telephone system is linked to the CallPath host and each site has a voice processing system. All calls are first answered by the voice processing system and callers are prompted for their desired service. The voice processing system passes the requests to the host and the CallPath application determines which Call Center has the shortest number of calls in queue for that service. The voice processing system then transfers the caller to the appropriate Call Center group.

The company has significantly improved the response time for answering calls and both their customers and employees are very pleased with the CallPath solution.

Typically, the only way to improve service levels in a Call Center is to add more agents. With CallPath these results were achieved with no increase in staff. The voice processing system helps reduce agent call volumes by answering commonly asked questions. In addition, the caller can choose any one of a number of languages when the voice processing system answers.

1.7.2.11 Enabled Solution - Personal Services

With CallPath, you have the flexibility to develop personal services by customizing workstation programmed function (PF) keys. From an organizational perspective, this capability can improve employee productivity. In most Call Centers, agents are communicating with the computer system through their keyboard while wearing a telephone headset to speak with the caller. The keyboard then becomes a natural place from which to perform telephone functions such as transferring a call or initiating a call. Telephone functions can be supported by PF keys on the same terminal used for application access.

For example, you can use the PF key that is pressed to conclude a data transaction to simultaneously end the related phone conversation. In addition, you can generate calls or set up a conference call from the on-screen command line even if you're working in another application environment.

1.7.2.12 Enabled Solution - Management Information/Reports

With CallPath, your computer and your telephone system can work together to manage Call Center operations. You can measure your operations from the caller's perspective and correlate specific business transactions to call activity. You have the ability to create and customize reports based on your particular Call Center objectives.

You can collect information to help:

- Track call flows - what happens to calls, from beginning to end?
- Spot problem areas - are your "800" telephone lines being misused by callers or employees? Are callers transferred too often?
- Record abandon calls - those callers who hung up while waiting to be handled: who were they?
- Accurately determine caller/agent interaction - what transpired with this call after an agent began handling the caller? Did the customer have to be placed on hold several times?
- Correlate call length to revenue - do longer calls generate more successful collections?

For example, you may have some agents who, on average, take longer than others to process calls. While normally this may be seen as negative, the business activity transacted on these calls may be superior to that of other agents. CallPath allows efficient correlation of call activity with business results.

Since your host system now has access to both application and call-related activity, CallPath-enabled reports can help fine tune your Call Center for optimal customer service.

The information available for use in reports will vary by telephone system.

1.7.3 Traditional Reports versus CallPath-Enabled Reports

With customer service being so key to successful business operations, getting better information is of utmost importance to measure a Call Center's effectiveness. Traditionally, this meant quantitative measurements of agent productivity (Automatic Call Distribution (ACD) statistics) with limited information about the quality of service a Call Center is providing. CallPath provides the qualitative information needed to complete the picture.

Rather than only knowing the length of calls, you can determine what happened to that call along the way - was it put on hold or transferred and if so how many times? This highlights elements within your Call Center that may require greater management focus.

And those anonymous callers who hung up after waiting on hold for an agent can now be identified by the Automatic Number Identification information that arrived with their calls. This provides you with the opportunity to create a list of those callers for agents to call back when inbound activity slows down.

ACD statistics and reports can provide valuable quantitative information about agent activity. This need will not go away. CallPath-enabled reports help you measure the success of your business. They can identify problems and indicate potential answers.

1.8 Building Your Customer's Vision

When customers use a Call Center, they have a vision of the services they would like to see provided. As a business person, you have identified, and IBM is ready to assist you in identifying, additional business applications that can be enhanced by tying together the power of data processing systems and telephone systems. Current applications include:

- Customer service
- Help desk
- Telemarketing
- Sales order entry
- Account management
- Collections processing

To enable you to exploit the functional integration of voice and data, IBM offers the CallPath Services Architecture family of products that run on a variety of computer platforms and telephone systems. This family of products includes application programs that provide numerous features to improve the services you provide to your customers; for example:

- CallPath Server/2
- CallPath/400
- CallPath CICS/MVS and CICS/VSE
- CallPath SwitchServer/2
- CallPath CallCoordinator/2
- CallPath CallCoordinator/Windows
- CallPath CallCoordinator CICS/MVS
- CallPath Server/6000

CallPath Services Architecture is an open architecture that provides the framework to greatly improve customer service, using existing or new data applications. Combined with IBM's DirectTalk Voice Processing Systems and Voice Network Management products, the CallPath offerings can be a base for your vision for the 90s and beyond.

You're probably thinking, "That's great, I understand, but I don't have the resources to pull this off!" Resources include time, people, and skills. These are all very often in short supply, and IBM understands this. IBM has the services and the resources that can address your business needs and help you reach your vision.

1.8.1 Total Solutions Delivery

IBM can now be your single source provider for voice and data application solutions. The integration of these products into your current or new applications can be enhanced and expedited by customized IBM services offerings, resulting in a cohesive total solution.

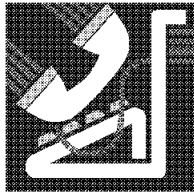
IBM can offer any combination of services you require to implement voice and data solutions.

- Consulting services
- Project management and systems integration - of IBM and non-IBM hardware and software
- Requirements analysis and solution recommendation
 - Site/facility planning
 - Performance and sizing
 - Configuration - IBM requirements and telephone system requirements
 - Software prerequisites and requirements
- Application design, integration and modification - with or without a business partner
- Installation conversion/migration services
- Customer education and training
 - Product education
 - Implementation education
 - User operation education
 - System administration training
- System administration and management
 - Management information reporting
 - Problem identification and resolution

IBM wants to provide you with the best solution for your business and will work with you in any stage of the process to ensure that you are completely satisfied.

The total voice and data solutions offered by IBM, then, are a combination of IBM CallPath products, applications and services as well as those of IBM Business Partners. This combination of products and services most fully addresses business requirements for today's business environment.

Chapter 2. Introducing the CallPath Products



This chapter introduces the products in the CallPath family and discusses the benefits associated with each. There are many products in this family and the product list is growing all the time. It is up to you to determine what is best for your customers and work with them to produce a solution that best fits their needs. Further information can be found in *the IBM CallPath Family Presentation Guide* (which is found on the VAS conference disk). This presentation includes a set of foils.

2.1 CallPath SwitchServer/2

CallPath SwitchServer/2 is a program product that runs on an IBM PC under the IBM Operating System/2 (OS/2) 2.1. CallPath SwitchServer/2 connects one or more host computers to a switch and controls communications between them.

In this book, the term host computer refers to a host computer system that supports the CallPath Services application program interface (API). CallPath Services is the IBM architecture for coordinating voice technology with new and existing applications. It includes an API for programs requiring computer-switch communication. The API allows a program to access services such as the establishment, monitoring, and termination of telephone calls. The term *switch* is used to refer to any telephone switching system, for example, a private branch exchange (PBX).

CallPath SwitchServer/2 works as a protocol converter between one or more host computers and a switch. It also provides a user interface for administration and problem determination in CallPath SwitchServer/2 and support for a remote console.

The CallPath SwitchServer/2 PC can be connected to a host computer via a Synchronous Data Link Control (SDLC) link, an IBM Token-Ring Network, an Ethernet network, an X.25 network, or any other network supported by OS/2 Communications Manager/2 and the appropriate host computer. CallPath SwitchServer/2 communicates with host computers using the Systems Network Architecture (SNA) logical unit 6.2 (LU 6.2) protocol.

2.1.1 What CallPath SwitchServer/2 Does

CallPath SwitchServer/2 enables you to form a coordinated computer/telephony system with minimal modifications to the host computer software for a particular switch. You can connect multiple host computers to your switch by using CallPath SwitchServer/2 as the protocol converter.

After you have installed and configured CallPath SwitchServer/2 as directed, it is ready to start processing messages, and you can leave it to operate unattended.

The main tasks of CallPath SwitchServer/2 are protocol conversion and message mapping, which involve:

- Receiving requests for switch functions from a host computer, converting them to messages that the switch understands, and sending the messages to the switch

- Receiving messages from the switch, converting them to messages that the host computer understands, and sending the messages to the host computer

Conversion is necessary because host computers do not use the same protocols and message formats as your switch.

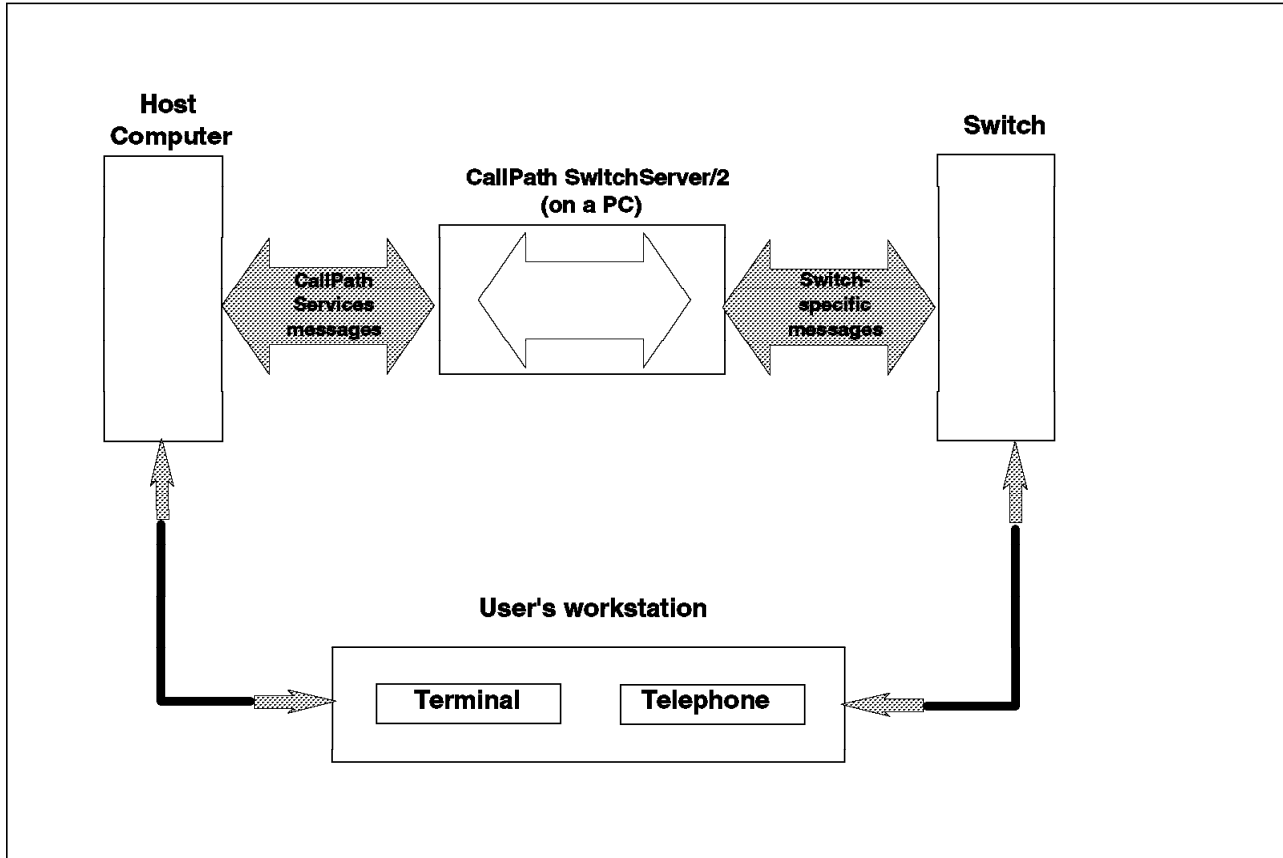


Figure 2. Message flow through CallPath SwitchServer/2

Figure 2 shows how CallPath SwitchServer/2 enables a telephony system to be integrated with a host computer. At the user's workstation, a terminal is linked to a host computer, and a telephone is linked to the switch. The switch and host computer communicate not only with the telephone and the terminal, respectively, but also with one another through CallPath SwitchServer/2. CallPath SwitchServer/2 is shown converting messages in the switch-specific protocol from the switch to CallPath Services messages for the host computer. Conversely, CallPath Services messages from the host computer are converted to the switch-specific protocol that the switch understands.

CallPath SwitchServer/2 filters messages from the switch and forwards only those messages that the host computer has requested. Therefore, the volume of traffic on the host computer connection may be less than the volume of traffic on the switch connection. You can use the CallPath SwitchServer/2 administrative support facilities to measure the traffic on the host computer connections, or on the switch connection, or both.

2.1.1.1 CallPath SwitchServer/2 - Supported IBM Environments

Using Communications Manager/2, a single CallPath SwitchServer/2 can be connected to multiple IBM hosts simultaneously. This connection can be via a Synchronous Data Link Control (SDLC) link, an IBM Token-Ring Network, an X.25 network, or Ethernet. These connections are supported by SwitchServer/2 in the OS/2 Communications Manager/2 environment. The limit on the number of connections is dependent on the connection vehicle and your performance requirements. CallPath SwitchServer/2 communicates with hosts using the APPC (LU 6.2) protocol. This product is a prerequisite product for the following host CallPath enabling products:

- CallPath Server/2
- CallPath/DOS for Windows
- CallPath/400 (not all telephone systems)
- CallPath CICS/MVS
- CallPath CICS/VSE
- CallPath Server/6000

CallPath DOS for Windows and CallPath/2 implementations with the ROLMphone 244PC do not require SwitchServer/2.

2.1.1.2 CallPath SwitchServer/2 - Supported Telephone Systems (US and Canada)

A critical component of your voice and data solution is your telephone system. CallPath Services Architecture and your IBM CallPath telephony subsystem define the capabilities possible for your solution. However, if your telephone system does not have a CallPath Services Architecture switch-host capability or if your supported telephone system does not provide the necessary information, then your desired solution may not be possible.

For example, if your telephone system does not provide a "hold" or "abandon" event, then you cannot determine "hold times" or "abandons while in queue" as part of your solution. If your telephone system does not provide events relative to transferred calls, then coordinated voice and data transfers are not possible. It is important for you to design your desired CallPath Services solution and then work with IBM and your telephone system vendor to verify the design.

Supported PABXs are:

- ROLM 9751 Release 9005
- ROLM 9751 Release 9006
- Northern Telecom Meridian
- Northern Telecom DMS-100
- American Telephone and Telegraph (AT&T) DEFINITY Generic 2
- American Telephone and Telegraph (AT&T) DEFINITY Generic 3i, Generic 3r, Generic 3s
- American Telephone and Telegraph (AT&T) 5ESS Central Office (CO) System
- Ericsson MD110
- Aspect CSA

IBM continues to work with many telephone system vendors worldwide in the switch, Automatic Call Distribution (ACD), central office and other related areas to allow the CallPath Services API to be used with their specific telephone system. Announcements will be made as support for other telephone systems becomes available.

2.1.1.3 CallPath SwitchServer/2 - Supported Telephone Systems (Outside US)

CallPath Services Architecture is IBM's worldwide strategic platform for voice and data solutions. This strategy includes CallPath SwitchServer/2 as the product to deliver worldwide telephone system capability.

In Europe, the Middle East and Africa (EMEA) the following telephone systems are supported:

- Siemens Hicom 300
- Northern Telecom Meridian 1

In Asia Pacific (AP) countries the supported telephone systems are:

- Northern Telecom Meridian 1
- Nippon Electric (NEC) APEX/NEAX 2400/7400 Information Management System (IMS)

IBM CallPath SwitchServer/2 supports installed IBM Com300 (Release 2.3 and 3.1) telephone systems in EMEA.

2.2 CallPath Server

CallPath Server/2, Advanced Interactive Executive (AIX) CallPath Server/6000, and the CallPath Developer's Toolkit (referred to collectively in this book as CallPath Server) are IBM-licensed programs that implement the IBM CallPath Services Architecture (CSA)³ in a client/server computer environment consisting of the following:

- Servers based on the following operating systems:
 - Operating System/2 2.1 (OS/2)
 - AIX RISC System/6000 3.2.5
- Client workstations running the following operating systems and user interfaces:
 - OS/2 2.0 and later
 - AIX 3.2 and later
 - Microsoft Windows 3.1
 - SUN Microsystems Solaris 2.2
 - HP UX 9.01
 - SCO UNIX 3.2

³ CallPath Services is the IBM architecture for integrating voice technology into new or existing application programs. CallPath Server is functionally consistent with other IBM CallPath Services products that implement the CallPath Services Architecture.

CallPath Server provides an application programming interface (API) that enables the integration of telephony processing capabilities for telephone systems with application programs on client workstations. Application programs on either the CallPath Server or on the clients access the telephony functions of a switch through remote procedure calls (RPCs) over networks.

CallPath Server enables application programs to operate with a variety of supported switches.⁴ You may be able to use your existing equipment to merge call information with computer transactions. The integration of computer data and programs and telephone services can help you do the following:

- Reduce costs
- Increase productivity
- Improve customer service
- Increase revenues

CallPath Server is easy to install and makes fast, flexible business solutions possible. The API provided by CallPath Server reduces the time and effort needed by application program developers when developing application programs that require access to telephony functions provided by a switch.

2.2.1.1 Remote Procedure Call API

CallPath Server uses RPCs in a Transmission Control Protocol/Internet Protocol (TCP/IP) network to enable a client application program on one networked computer to use a server application running on the same or other networked computers to call procedures or access data. With application programs developed for CallPath Server, the CallPath Server subsystem acts as the server application to client applications running on the various workstations supported by CallPath Server, or on CallPath Server itself. The RPC facility makes the program call of the initiating client program look as if it were executed by the client program instead of the CallPath Server subsystem.

See *CallPath Developer's Toolkit Programming Guide and Reference*, SC31-6243 for more information about developing application programs for CallPath Server.

2.2.1.2 User-Based Pricing

A usage charge applies to the CallPath Server product. Per-user features must be acquired in a quantity equal to the number of concurrent users. A concurrent user is defined as a person or port of a voice processing unit that accesses CallPath Server resources.

CallPath Server implements a usage control mechanism that monitors concurrent users of CallPath Server resources. A warning message is logged to alert the system administrator when the total concurrent users exceeds the authorized number of registered users. An informational message is logged when the number of concurrent users reaches eighty percent (80%) of the maximum value. Also, the application program will receive a resources-unavailable return code upon requesting resources from the server

⁴ There are many terms for "switch" including: telephone system, private branch exchange (PBX), computerized branch exchange (CBX), business communication system, centrex, telephony system, telephone switching system, telephony device, and so on.

when the maximum value is exceeded. Messages will be issued to the administrator so that appropriate action can be taken when this occurs.

2.2.1.3 Migration from CallPath/2 or CallPath/6000

CallPath Server/2 and AIX CallPath Server/6000 replace the earlier, workstation-based CallPath/2 and CallPath/6000 program products with the following:

- Client/server environment for telephony applications
- New features and program calls
- Direct connection between the server and selected switches
- User-based pricing
- Enhancements to existing program calls, such as program data and other party list

2.2.1.4 Integrating Voice and Data

Telephone services are often provided from a Call Center. Call centers can be grouped as formal or informal. A formal Call Center is a group of people (called service representatives or agents) the actual department names and job titles depend on your organization's business) whose primary task is to answer calls or to place calls for business purposes. Examples include reservation centers, catalog order centers, policy service centers, and so on. In an informal Call Center, agents answer or place calls as an adjunct to their normal duties, but do not answer or place calls on a full-time basis. Examples may include a personnel department or stock relations for a company.

Call handling in Call Centers involves answering an inbound call or making an outbound call, prompting the client for information, and providing some type of service. Agents usually have terminals or workstations on their desks so that they can access relevant data while handling calls.

Traditionally, call handling (voice) and data processing (data) have been separate activities. After answering an inbound call, the agent would ask the customer for some information, then pause during the conversation to retrieve the information from an application program. If the call was transferred to another agent, the second agent would have to ask the customer for the same identifying information again, and retrieve it while the caller waited.

With integrated voice and data application programs, agents can see information about a caller displayed on their terminal or workstation screen when the telephone rings. This is made possible by the ability of the telephone network, and the equipment on customer premises, to pass the identifying information to an application program. The information identifies the caller (automatic number identification, which is referred to as ANI, or calling line identification, which is referred to as CLID) and the reason for the call (dialed number identification service, which is referred to as DNIS). CallPath Server provides an API that allows application program access to information provided by switches.

2.2.2 What CallPath Server Does

CallPath Server can automate telephony activities by enabling application programs to perform the greatest number of tasks for Call Center personnel.

The specific CallPath Server configuration you need depends on the needs of your company and the type of data processing and telephone equipment available. Application programs enabled by CallPath Server can provide you with the following automated telephony functions:

- Intelligent answering (immediate display of computer data associated with inbound calls)
- Coordinating voice and data transfer
- Receiving inbound calls
- Placing outbound calls
- Handling simple and repetitive requests
- Consulting and conferencing during active calls among two or more persons viewing the same information
- Collecting and analyzing data automatically
- Generating and reporting statistics

The following sections describe some of these Call Center tasks.

2.2.2.1 Intelligent Answering

Application programs use the functions provided by CallPath Server to coordinate data and call information if the necessary information is provided by the public switched network and the switch. The public switched network and the switch typically offer the following functions.

- Dialed number identification service (DNIS)

For inbound calls, some switches can identify the number that the caller dialed. This is useful if calls to several telephone numbers are routed to the same destination. An application program can use the dialed number to determine which service the caller wants. For example, one agent can answer the telephone for three different departments, and will greet the caller with the department name corresponding to the telephone number the caller dialed.

- Automatic number identification (ANI)

For inbound calls, some switches can provide either the caller's billing or directory number as supplied by ANI- and CLID-type services available through network carriers. For example, an application program can use the number provided by ANI to look up and display data about a customer without having to ask the caller for an account number.

- User-to-user information (UUI)

For an Integrated Services Digital Network (ISDN), the CallPath Server data feature can pass the call-related information from the application program along with the call as it moves from one program to another, one computer to another, or one switch to another. For example, an agent in one location can transfer both the call and associated caller data to an agent in another location.

The availability of functions depends on the particular make and model of the switch and varies from country to country. Refer to the switch-specific documentation for more information about the functions supported by your switch. Switch capabilities are also affected by the services provided by the network carrier.

2.2.2.2 Call Routing

Application programs can use the functions provided by CallPath Server to process various types of call routing features provided by the public switched network and the switch. For example, by routing high volumes of inbound calls to specialized answering stations, automatic call distribution (ACD) offers fast, efficient call handling, reducing busy tones and waiting times for external callers. Switches are normally configured so that a group of agents, who provide the same service to callers, belong to the same ACD group. When a caller dials the number for the service, the switch routes the call to an agent in the ACD group.

In addition to ACD, the switch can also provide a variety of call-processing features for telephone extensions, such as the following.

- Call forwarding
- Conference calling
- Call logging
- Call holding
- Computer-directed routing
- Direct inward dialing
- Voice messaging
- On-hook dialing (hands-free operation)

2.2.2.3 Coordinating Voice and Data Transfer

Application programs that use CallPath Server can retain and manipulate data associated with a call. If an agent needs to transfer the call to another agent, the application program can transfer the client's data record to the other agent's terminal simultaneously. This data retention eliminates the need for subsequent agents to spend time identifying and gathering information about a caller. Therefore, client satisfaction is increased and costs are reduced by reducing the length of each call.

2.2.2.4 Receiving Inbound Calls

The handling of inbound calls can be automated by a voice processing system (VPS) and can be used with CallPath Server application programs. The VPS provides a series of prompts that callers answer by pressing keys on the telephone keypad. A VPS can, for example:

- Answer inbound calls
- Make decisions based on the time and date, ANI, and DNIS
- Greet callers and request information in a digitally recorded human voice
- Retrieve information from a computer database through an application program
- Match computer responses with pre-recorded spoken messages and play the messages

- Transfer or terminate calls

A VPS can either handle a call itself or transfer the call to an agent. For example, a VPS can handle a simple inquiry, but pass a more complex transaction to an agent. CallPath Server and CallPath SwitchServer/2 enable an application program to take control of calls transferred from a VPS. The application program then has access to the data collected from the caller by the VPS and to the call information provided by the switch. A VPS is also useful for handling calls outside normal business hours and for overflow calls during peak periods.

2.2.2.5 Placing Outbound Calls

With CallPath Server, Call Centers can support automated outbound calls. Once you initiate a telephone call, CallPath Server-enabled application programs can use enhanced dialing functions and decide how to dial the telephone number. Outbound application programs can include the following.

- Preview dialing

A type of computer-assisted dialing in which an application program presents to an agent a list of suggested telephone call targets based upon information stored in a database. The agent chooses a target from the list and directs the program to place a telephone call to the indicated target. Since the dialing is automated, the productivity of the agents placing calls is improved. In addition, the preview dialing may be integrated with other application program logic. For example, a collections application program can be designed to automatically display on an agent's screen a list of customers who are 60 days past due. The agent can press a function key to initiate each call while the application program retrieves the account history of the customer being called. When the party answers, the agent has all the background information needed to work with the customer.

- Progressive dialing

A type of computer-assisted dialing similar to preview dialing, except that the agent does not provide an input to the application program when the agent is ready to make the call. The call is started when the screen appears to the agent.

- Predictive dialing

A type of computer-assisted dialing in which an application program places calls to prospective customers on behalf of agents. The program, rather than an agent, determines which customers to call. Further, the program may request that one or more telephone calls be made at a time when all agents are already involved in calls. The program, in this situation, predicts that some number of the outbound telephone call attempts will be unsuccessful and that by the time one of the calls is answered successfully by a customer, one of the busy agents will have become idle and can handle the call. In addition, calls that are unanswered or receive a busy signal can be identified by the application program and retried at a later time. These capabilities are dependent on the functions offered by the switch and the application program. Refer to the switch-specific documentation for more information about your switch functions.

2.2.2.6 Handling Simple and Repetitive Requests

Application programs using CallPath Server handle simple and repetitive requests, which often involve inbound telephone calls. Application programs can access data such as ANI to quickly and automatically retrieve answers to simple repetitive requests such as account balance information based on a customer's profile stored in a database.

2.2.2.7 Consulting and Conferencing

Application programs using CallPath Server help agents establish conference calls and consultation simultaneously among multiple agents and the customer. For example, an application program can allow an agent and an agent's supervisor to view the same data while they consult about the call. Since the application program knows that the agent and supervisor are involved in the same client call, it provides the same data to both. However, depending on the application program, the information on the second workstation does not have to be identical to that on the first. A supervisor's screen may show the agent's name and more detailed information about the customer.

2.2.2.8 Collecting and Analyzing Data Automatically

Application programs using CallPath Server provide automatic data collection and can capture and store Call Center data for future analysis. Call Center data includes information about agent performance. Agent performance data indicates the volume of new business generated by an employee, or the frequency with which an agent transfers or closes calls. An application program can capture data for occasional specific needs, such as testing the response to an advertising campaign. Automatic data collection assists managers and Call Center supervisors in directing Call Centers and the activities of agents.

2.2.2.9 Generating and Reporting Statistics

Application programs can collect data to generate statistics for reporting purposes and query system information for a specific moment in time to evaluate performance. For example, a Call Center supervisor can query agent data to get a "snapshot" of that agent's activity at that given moment. From this information, the Call Center supervisor can determine who the agent is talking to and how long that agent is spending on that call. Generating and reporting statistics can assist Call Center supervisors in managing the daily activities of agents.

2.3 CallPath/400

In May of 1990, IBM announced CallPath/400, an implementation of CallPath Services Architecture on the IBM AS/400 computer. CallPath/400 links the data processing power of the AS/400 with the telephony processing capabilities of select telephone switches. The product became generally available in March, 1991 as program product numbers 5730-TL1, to run on the AS/400 Operating System OS/400 Version 1, 5738-CP1, for OS/400 Version 2 and 5738-CP2 for OS/400 Version 2 Rel. 2. In September, 1993, IBM announced CallPath/400 Version 2 Release 3 (5738-CP2), providing compatibility with OS/400 Version 2 Release 3. In May, 1994, IBM announced CallPath/400 Version 3 Release 1 (5763-CP2), providing compatibility with OS/400 Version 3 Release 1.

CallPath/400 demonstrates IBM's commitment to combining the power of the computer and information databases with that of telephone systems to offer enhanced solutions to meet business requirements.

2.3.1.1 CallPath/400 - System Structure

CallPath/400 is an application enabler that provides the CallPath/400 application programming interface (API) for integrating call control function and telephony information into AS/400 application solutions. CallPath/400 is the implementation on the AS/400 of the CallPath Services Architecture. CallPath/400 implements a very large subset of the functions defined in CallPath Services Architecture.

CallPath/400 presents to applications a single programming interface, the CallPath/400 Application Programming Interface, regardless of the specific telephone system, or systems, attached. The CallPath/400 Telephony Subsystem supports the API and handles the mapping to switch-specific formats and protocols. IBM will provide mapping between the CallPath Services API and the standards-defined formats and protocols once standards are defined. Support for this mapping will be provided in the CallPath/400 subsystem.

The following telephone systems support CallPath/400 in the U.S.:

- The ROLM 9751 CBX Release 9005
- The ROLM 9751 CBX Release 9006
- The Northern Telecom Meridian 1 Communication Systems (Options 11, 21, 51, 61, and 71, and all models of the Meridian SL-1 upgraded to Meridian 1-ready)
- The Northern Telecom DMS-100 (ACD, BCS34 and CompuCall are required) Via SwitchServer/2. (OS/400 V.2 R.2)
- The Teleos Communications, Inc. IRX9000 Integrated Services Digital Network (ISDN) Resource Exchange
- The AT&T DEFINITY G3i, G3r, G3s PBX
- The AT&T 5ESS Central Office (CO) System
- The Ericsson MD110

IBM is also working with other telephone system vendors to allow additional systems to support CallPath/400 in the future.

The Siemens Hicom 300 and IBM Com300 telephone systems also support CallPath/400 and are sold in specific European countries.

2.3.2 What CallPath/400 Does

CallPath/400 can automate telephony activities by enabling application programs to perform the greatest number of tasks for Call Center personnel.

The specific CallPath/400 configuration you need depends on the needs of your company and the type of data processing and telephone equipment available. Application programs enabled by CallPath/400 can provide you with the following automated telephony functions.

- Intelligent answering (immediate display of computer data associated with inbound calls)
- Coordinating voice and data transfer
- Receiving inbound calls
- Placing outbound calls
- Handling simple and repetitive requests

- Consulting and conferencing during active calls among two or more persons viewing the same information h
- Collecting and analyzing data automatically
- Generating and reporting statistics

The following sections describe some of these Call Center tasks.

2.3.2.1 Intelligent Answering

Application programs use the functions provided by CallPath/400 to coordinate data and call information if the necessary information is provided by the public switched network and the switch. The public switched network and the switch typically offer the following functions.

- Dialed number identification service (DNIS)

For inbound calls, some switches can identify the number that the caller dialed. This is useful if calls to several telephone numbers are routed to the same destination. An application program can use the dialed number to determine which service the caller wants. For example, one agent can answer the telephone for three different departments, and will greet the caller with the department name corresponding to the telephone number the caller dialed.

- Automatic number identification (ANI)

For inbound calls, some switches can provide either the caller's billing or directory number as supplied by ANI- and CLID-type services available through network carriers. For example, an application program can use the number provided by ANI to look up and display data about a customer without having to ask the caller for an account number.

- User-to-user information (UUI)

For an Integrated Services Digital Network (ISDN), the CallPath/400 data feature can pass the call-related information from the application program along with the call as it moves from one program to another, one computer to another, or one switch to another. For example, an agent in one location can transfer both the call and associated caller data to an agent in another location.

The availability of functions depends on the particular make and model of the switch and varies from country to country. Refer to the switch-specific documentation for more information about the functions supported by your switch. Switch capabilities are also affected by the services provided by the network carrier.

2.3.2.2 Call Routing

Application programs can use the functions provided by CallPath/400 to process various types of call routing features provided by the public switched network and the switch. For example, by routing high volumes of inbound calls to specialized answering stations, automatic call distribution (ACD) offers fast, efficient call handling, reducing busy tones and waiting times for external callers. Switches are normally configured so that a group of agents, who provide the same service to callers, belong to the same ACD group. When a caller dials the number for the service, the switch routes the call to an agent in the ACD group.

In addition to ACD, the switch can also provide a variety of call-processing features for telephone extensions, such as the following:

- Call forwarding
- Conference calling
- Call logging
- Call holding
- Computer-directed routing
- Direct inward dialing
- Voice messaging
- On-hook dialing (hands-free operation)

2.3.2.3 Coordinating Voice and Data Transfer

Application programs that use CallPath/400 can retain and manipulate data associated with a call. If an agent needs to transfer the call to another agent, the application program can transfer the client's data record to the other agent's terminal simultaneously. This data retention eliminates the need for subsequent agents to spend time identifying and gathering information about a caller. Therefore, client satisfaction is increased and costs are reduced by reducing the length of each call.

2.3.2.4 Receiving Inbound Calls

The handling of inbound calls can be automated by a voice processing system (VPS) and can be used with CallPath/400 application programs. The VPS provides a series of prompts that callers answer by pressing keys on the telephone keypad. A VPS can, for example:

- Answer inbound calls
- Make decisions based on the time and date, ANI, and DNIS
- Greet callers and request information in a digitally recorded human voice
- Retrieve information from a computer database through an application program
- Match computer responses with prerecorded spoken messages and play the messages
- Transfer or terminate calls

A VPS can either handle a call itself or transfer the call to an agent. For example, a VPS can handle a simple inquiry, but pass a more complex transaction to an agent. CallPath/400 and CallPath SwitchServer/2 enable an application program to take control of calls transferred from a VPS. The application program then has access to the data collected from the caller by the VPS and to the call information provided by the switch. A VPS is also useful for handling calls outside normal business hours and for overflow calls during peak periods.

2.3.2.5 Placing Outbound Calls

With CallPath/400, Call Centers can support automated outbound calls. Once you initiate a telephone call, CallPath/400-enabled application programs can use enhanced dialing functions and decide how to dial the telephone number. Outbound application programs can include the following:

Preview dialing: A type of computer-assisted dialing in which an application program presents to an agent a list of suggested telephone call targets based upon information stored in a database. The agent chooses a target from the list and directs the program to place a telephone call to the indicated target. Since the dialing is automated, the productivity of the agents placing calls is improved. In addition, the preview dialing may be integrated with other application program logic. For example, a collections application program can be designed to automatically display on an agent's screen a list of customers who are 60 days past due. The agent can press a function key to initiate each call while the application program retrieves the account history of the customer being called. When the party answers, the agent has all the background information needed to work with the customer.

Progressive dialing: A type of computer-assisted dialing similar to preview dialing, except that the agent does not provide an input to the application program when the agent is ready to make the call. The call is started when the screen appears to the agent.

Predictive dialing: A type of computer-assisted dialing in which an application program places calls to prospective customers on behalf of agents. The program, rather than an agent, determines which customers to call. Further, the program may request that one or more telephone calls be made at a time when all agents are already involved in calls. The program, in this situation, predicts that some number of the outbound telephone call attempts will be unsuccessful and that by the time one of the calls is answered successfully by a customer, one of the busy agents will have become idle and can handle the call. In addition, calls that are unanswered or receive a busy signal can be identified by the application program and retried at a later time. These capabilities are dependent on the functions offered by the switch and the application program. Refer to the switch-specific documentation for more information about your switch functions.

2.3.2.6 Handling Simple and Repetitive Requests

Application programs using CallPath/400 handle simple and repetitive requests, which often involve inbound telephone calls. Application programs can access data such as ANI to quickly and automatically retrieve answers to simple repetitive requests such as account balance information based on a customer's profile stored in a database.

2.3.2.7 Consulting and Conferencing

Application programs using CallPath/400 help agents establish conference calls and consultation simultaneously among multiple agents and the customer. For example, an application program can allow an agent and an agent's supervisor to view the same data while they consult about the call. Since the application program knows that the agent and supervisor are involved in the same client call, it provides the same data to both. However, depending on the application program, the information on the second workstation does not have to be identical to that on the first. A supervisor's screen may show the agent's name and more detailed information about the customer.

2.3.2.8 Collecting and Analyzing Data Automatically

Application programs using CallPath/400 provide automatic data collection and can capture and store Call Center data for future analysis. Call center data includes information about agent performance. Agent performance data indicates the volume of new business generated by an employee, or the frequency with which an agent transfers or closes calls. An application program can capture data for occasional specific needs, such as testing the response to an advertising campaign. Automatic data collection assists managers and Call Center supervisors in directing Call Centers and the activities of agents.

2.3.2.9 Generating and Reporting Statistics

Application programs can collect data to generate statistics for reporting purposes and query system information for a specific moment in time to evaluate performance. For example, a Call Center supervisor can query agent data to get a "snapshot" of that agent's activity at that given moment. From this information, the Call Center supervisor can determine who the agent is talking to and how long that agent is spending on that call. Generating and reporting statistics can assist Call Center supervisors in managing the daily activities of agents.

2.4 CallPath CICS/MVS/VSE

CallPath CICS/MVS and CallPath CICS/VSE are software platforms that enable business applications to combine the data processing power of the System/370 and System/390 with the telephony processing capabilities of an expanding list of telephone systems. With CallPath CICS offerings, existing applications can be customized and new applications can be created that allow your organization to differentiate the products and services you offer from those of your competitors. By improving customer service, personalizing caller interactions, improving employee productivity and leveraging your existing assets (host processor, business application and telephone system) your organization can be better positioned to compete in the 90s.

CallPath CICS/MVS and CallPath CICS/VSE in conjunction with CallPath SwitchServer/2 implement CallPath Services Architecture on the System/370 and System/390 host processors. CallPath CICS/MVS became available in March 1992 and CallPath CICS/VSE became available in April 1992. CallPath CICS/MVS and CallPath CICS/VSE are application enablers. They implement (in conjunction with SwitchServer/2) the CallPath Services Architecture on the S/370 and S/390 host platforms and provide the CallPath Services Architecture application programming interface (API). The CallPath Services Telephony Subsystem receives messages from supported telephone systems and allows application programs running on the host the opportunity to monitor and influence various switch activities.

For example, by monitoring telephone systems, applications can be informed that a telephone call is ringing on extension 321 and that the call was dialed from telephone number 919-555-1234. Your application, now informed with this information, can retrieve any data associated with that number (such as a customer profile) and deliver it to the terminal associated with extension 321. The result of this action can be a customer service representative who is immediately prepared to assist the caller rather than going through a lengthy qualification process (who you are and what you want) before being able to assist them. The converse of this example would be an outgoing application where you need to return a call to a customer. Your application can tell the

telephony subsystem to make a call to 919-555-1234 and place calling information on the terminal associated with extension 321. This process reduces the time it takes to place outgoing calls, resulting in each employee placing more calls per day.

The telephony subsystem allows a programmer to learn only the CallPath Services Architecture API, yet have access to multiple telephone systems. CallPath CICS uses CallPath SwitchServer/2 to communicate with the ROLM 9751 Release 9005, ROLM 9751 Release 9006, Northern Telecom Meridian 1 (options 21-71) and DMS-100 with BCS34 and CompuCall, and Ericsson MD110. Also supported are the AT&T DEFINITY Generic 2 with the ASAI Gateway interface, the AT&T DEFINITY Generic 3i, G3s, and G3r, and the AT&T 5ESS Central Office (CO) System. When SwitchServer/2 supports additional telephone systems, they too will be able to implement the enabled functions of CallPath CICS/MVS and CICS/VSE.

2.4.1 What CallPath CICS/MVS/VSE Does

CallPath CICS can automate telephony activities by enabling application programs to perform the greatest number of tasks for Call Center personnel.

The specific CallPath CICS configuration you need depends on the needs of your company and the type of data processing and telephone equipment available. Application programs enabled by CallPath CICS can provide you with the following automated telephony functions:

- Intelligent answering (immediate display of computer data associated with inbound calls)
- Coordinating voice and data transfer
- Receiving inbound calls
- Placing outbound calls
- Handling simple and repetitive requests
- Consulting and conferencing during active calls among two or more persons viewing the same information
- Collecting and analyzing data automatically
- Generating and reporting statistics

The following sections describe some of these Call Center tasks.

2.4.1.1 Intelligent Answering

Application programs use the functions provided by CallPath CICS to coordinate data and call information if the necessary information is provided by the public switched network and the switch. The public switched network and the switch typically offer the following functions.

- Dialed number identification service (DNIS)

For inbound calls, some switches can identify the number that the caller dialed. This is useful if calls to several telephone numbers are routed to the same destination. An application program can use the dialed number to determine which service the caller wants. For example, one agent can answer the telephone for three different departments, and will greet the caller with the department name corresponding to the telephone number the caller dialed.

- Automatic number identification (ANI)

For inbound calls, some switches can provide either the caller's billing or directory number as supplied by ANI- and CLID-type services available through network carriers. For example, an application program can use the number provided by ANI to look up and display data about a customer without having to ask the caller for an account number.

- User-to-user information (UUI)

For an Integrated Services Digital Network (ISDN), the CallPath CICS data feature can pass the call-related information from the application program along with the call as it moves from one program to another, one computer to another, or one switch to another. For example, an agent in one location can transfer both the call and associated caller data to an agent in another location.

The availability of functions depends on the particular make and model of the switch and varies from country to country. Refer to the switch-specific documentation for more information about the functions supported by your switch. Switch capabilities are also affected by the services provided by the network carrier.

2.4.1.2 Call Routing

Application programs can use the functions provided by CallPath CICS to process various types of call routing features provided by the public switched network and the switch. For example, by routing high volumes of inbound calls to specialized answering stations, automatic call distribution (ACD) offers fast, efficient call handling, reducing busy tones and waiting times for external callers. Switches are normally configured so that a group of agents, who provide the same service to callers, belong to the same ACD group. When a caller dials the number for the service, the switch routes the call to an agent in the ACD group.

In addition to ACD, the switch can also provide a variety of call-processing features for telephone extensions, such as the following:

- Call forwarding
- Conference calling
- Call logging
- Call holding
- Computer-directed routing
- Direct inward dialing
- Voice messaging
- On-hook dialing (hands-free operation)

2.4.1.3 Coordinating Voice and Data Transfer

Application programs that use CallPath CICS can retain and manipulate data associated with a call. If an agent needs to transfer the call to another agent, the application program can transfer the client's data record to the other agent's terminal simultaneously. This data retention eliminates the need for subsequent agents to spend time identifying and gathering information about a caller. Therefore, client satisfaction is increased and costs are reduced by reducing the length of each call.

2.4.1.4 Receiving Inbound Calls

The handling of inbound calls can be automated by a voice processing system (VPS) and can be used with CallPath CICS application programs. The VPS provides a series of prompts that callers answer by pressing keys on the telephone keypad. A VPS can, for example:

- Make decisions based on the time and date, ANI, and DNIS
- Greet callers and request information in a digitally-recorded human voice
- Retrieve information from a computer database through an application program
- Match computer responses with pre-recorded spoken messages and play the messages
- Transfer or terminate calls

A VPS can either handle a call itself or transfer the call to an agent. For example, a VPS can handle a simple inquiry, but pass a more complex transaction to an agent. CallPath CICS and CallPath SwitchServer/2 enable an application program to take control of calls transferred from a VPS. The application program then has access to the data collected from the caller by the VPS and to the call information provided by the switch. A VPS is also useful for handling calls outside normal business hours and for overflow calls during peak periods.

2.4.1.5 Placing Outbound Calls

With CallPath CICS, Call Centers can support automated outbound calls. Once you initiate a telephone call, CallPath CICS-enabled application programs can use enhanced dialing functions and decide how to dial the telephone number. Outbound application programs can include the following.

- Preview dialing

A type of computer-assisted dialing in which an application program presents to an agent a list of suggested telephone call targets based upon information stored in a database. The agent chooses a target from the list and directs the program to place a telephone call to the indicated target. Since the dialing is automated, the productivity of the agents placing calls is improved. In addition, the preview dialing may be integrated with other application program logic. For example, a collections application program can be designed to automatically display on an agent's screen a list of customers who are 60 days past due. The agent can press a function key to initiate each call while the application program retrieves the account history of the customer being called. When the party answers, the agent has all the background information needed to work with the customer.

- Progressive dialing

A type of computer-assisted dialing similar to preview dialing, except that the agent does not provide an input to the application program when the agent is ready to make the call. The call is started when the screen appears to the agent.

- Predictive dialing

A type of computer-assisted dialing in which an application program places calls to prospective customers on behalf of agents. The program, rather than an agent, determines which customers to call. Further, the program may request that one or more telephone calls be made at a time when all

agents are already involved in calls. The program, in this situation, predicts that some number of the outbound telephone call attempts will be unsuccessful and that by the time one of the calls is answered successfully by a customer, one of the busy agents will have become idle and can handle the call. In addition, calls that are unanswered or receive a busy signal can be identified by the application program and retried at a later time. These capabilities are dependent on the functions offered by the switch and the application program. Refer to the switch-specific documentation for more information about your switch functions.

2.4.1.6 Handling Simple and Repetitive Requests

Application programs using CallPath CICS handle simple and repetitive requests, which often involve inbound telephone calls. Application programs can access data such as ANI to quickly and automatically retrieve answers to simple repetitive requests such as account balance information based on a customer's profile stored in a database.

2.4.1.7 Consulting and Conferencing

Application programs using CallPath CICS help agents establish conference calls and consultation simultaneously among multiple agents and the customer. For example, an application program can allow an agent and an agent's supervisor to view the same data while they consult about the call. Since the application program knows that the agent and supervisor are involved in the same client call, it provides the same data to both. However, depending on the application program, the information on the second workstation does not have to be identical to that on the first. A supervisor's screen may show the agent's name and more detailed information about the customer.

2.4.1.8 Collecting and Analyzing Data Automatically

Application programs using CallPath CICS provide automatic data collection and can capture and store Call Center data for future analysis. Call Center data includes information about agent performance. Agent performance data indicates the volume of new business generated by an employee, or the frequency with which an agent transfers or closes calls. An application program can capture data for occasional specific needs, such as testing the response to an advertising campaign. Automatic data collection assists managers and Call Center supervisors in directing Call Centers and the activities of agents.

2.4.1.9 Generating and Reporting Statistics

Application programs can collect data to generate statistics for reporting purposes and query system information for a specific moment in time to evaluate performance. For example, a Call Center supervisor can query agent data to get a "snapshot" of that agent's activity at that given moment. From this information, the Call Center supervisor can determine who the agent is talking to and how long that agent is spending on that call. Generating and reporting statistics can assist Call Center supervisors in managing the daily activities of agents.

2.5 IBM CallPath Call Management

IBM has three Call Management program product offerings for our customers: CallPath CallCoordinator CICS/MVS, CallPath CallCoordinator/2, and CallPath CallCoordinator for Windows.

2.5.1 CallCoordinator/2 and CallCoordinator for Windows

In today's competitive business environment, it is increasingly important to provide quality, cost-effective customer service. In many industries, including finance, retail, manufacturing, and public utilities, a company's success is a reflection of the quality of service it provides.

More and more, businesses rely on telephone systems to deliver responsive, high-quality service that customers expect. Telephones are commonly used for ordering merchandise, checking account balances, reporting problems, or requesting services. Call Centers, such as help desks and order desks, are increasing to meet the growing demand.

In a Call Center, incoming calls are answered by service representatives who normally request the caller's name or account number. The caller must wait while this information is keyed into a computer to access current customer records. In order to reduce this delay in response, IBM has developed the following call management solutions for the OS/2 environment and the Windows environment:

- CallCoordinator/2 runs on workstations in the OS/2 environment. This solution is known as the CallCoordinator/2 workstation.
- CallCoordinator for Windows runs on workstations in the Windows environment. This solution is known as the CallCoordinator for Windows workstation.

Note: The term CallCoordinator is used in this book to refer to both call management solutions. Where the information applies to only one of the solutions, the solution will be appropriately identified.

CallCoordinator uses computer telephony integration (CTI) to enhance Call Center operations and increase the quality of service provided by the call center.

By using recent advances in telephone technology, CallCoordinator automates the gathering of customer information. CallCoordinator uses data provided by the telephone network to automatically access a caller's records, so that when the service representative receives a call, the customer information is already available. These benefits, and others explained in this book, provide a competitive edge to the Call Center using CallCoordinator.

2.5.2 Who Should Use CallCoordinator?

CallCoordinator can be used in most Call Center environments where there is a need to improve customer service. If incoming calls are unanswered or if service representatives are spending too much time on each call, CallCoordinator offers a solution.

For Call Centers with a large investment in host computer applications, CallCoordinator can be installed without modifying existing applications. Since CallCoordinator operates on workstations, it has little effect on the performance of critical business applications on host computers. Furthermore, CallCoordinator can interact with business applications in virtually any System/390, System/370, Application System/400 (AS/400), System/36, or 80386 or higher computer environment.

For smaller Call Centers, CallCoordinator offers a modest point of entry to CTI and enables incremental expansion as the volume of calls increases or additional services are offered.

For Call Centers where ANI is not available, CallCoordinator/2 supports the easy integration of complementary voice processing devices, such as VRUs. These systems interact with the caller to gather data such as telephone number, account number, or type of service required. This data can be used in the same manner as ANI and DNIS to retrieve data from a host computer application.

Note: For CallCoordinator for Windows, at least one CallCoordinator/2 workstation license is required to support a VRU application. See *CallPath CallCoordinator/2 System Administrator's Guide, SC22-0076*, for more information.

For Call Centers requiring continuous operation, CallCoordinator enables service representatives to continue working, even if part of the system fails. This is possible because CallCoordinator is a passive system, simulating the actions of human service representatives. If CallCoordinator is temporarily unavailable, the Call Center simply reverts to manual mode. Calls continue to be answered and service is provided by manual data entry. In effect, the Call Center operates as if CallCoordinator were not implemented.

2.5.2.1 What Is CallCoordinator?

CallCoordinator is a flexible call management solution that enhances Call Center service and increases productivity.

Information about an incoming call is provided by the telephone company's central office to the Call Center's telephone switch. This information is known as automatic number identification (ANI) service and dialed number identification service (DNIS). ANI is the phone number of the calling party and DNIS is the phone number dialed. CallCoordinator uses ANI and DNIS to automatically access customer records in a database.

Figure 3 on page 42 illustrates a typical CallCoordinator/2 stand-alone workstation configuration.

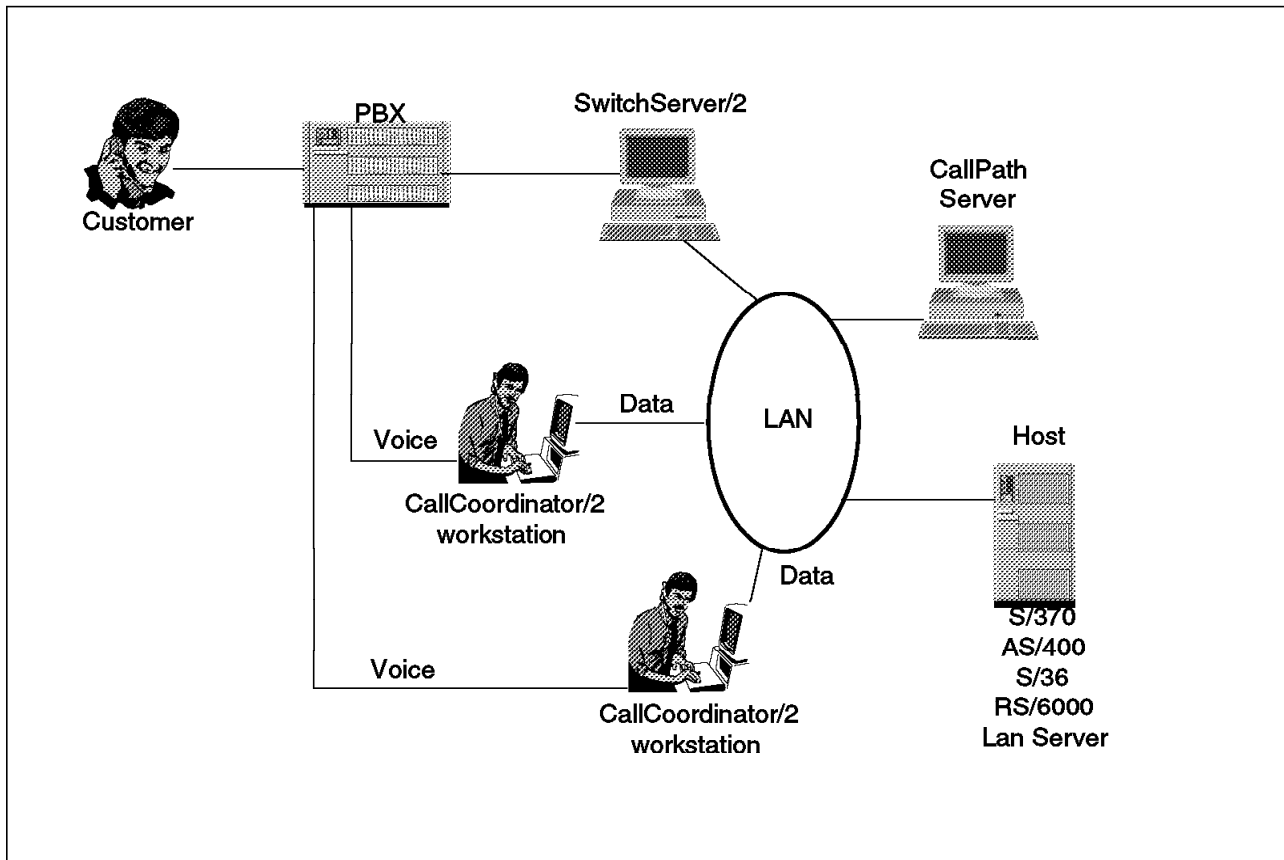


Figure 3. CallCoordinator/2 Stand-Alone Workstation Configuration

Figure 4 on page 43 illustrates a typical CallCoordinator/2 workstation or CallCoordinator for Windows workstation configuration with CallCoordinator/2 Server.

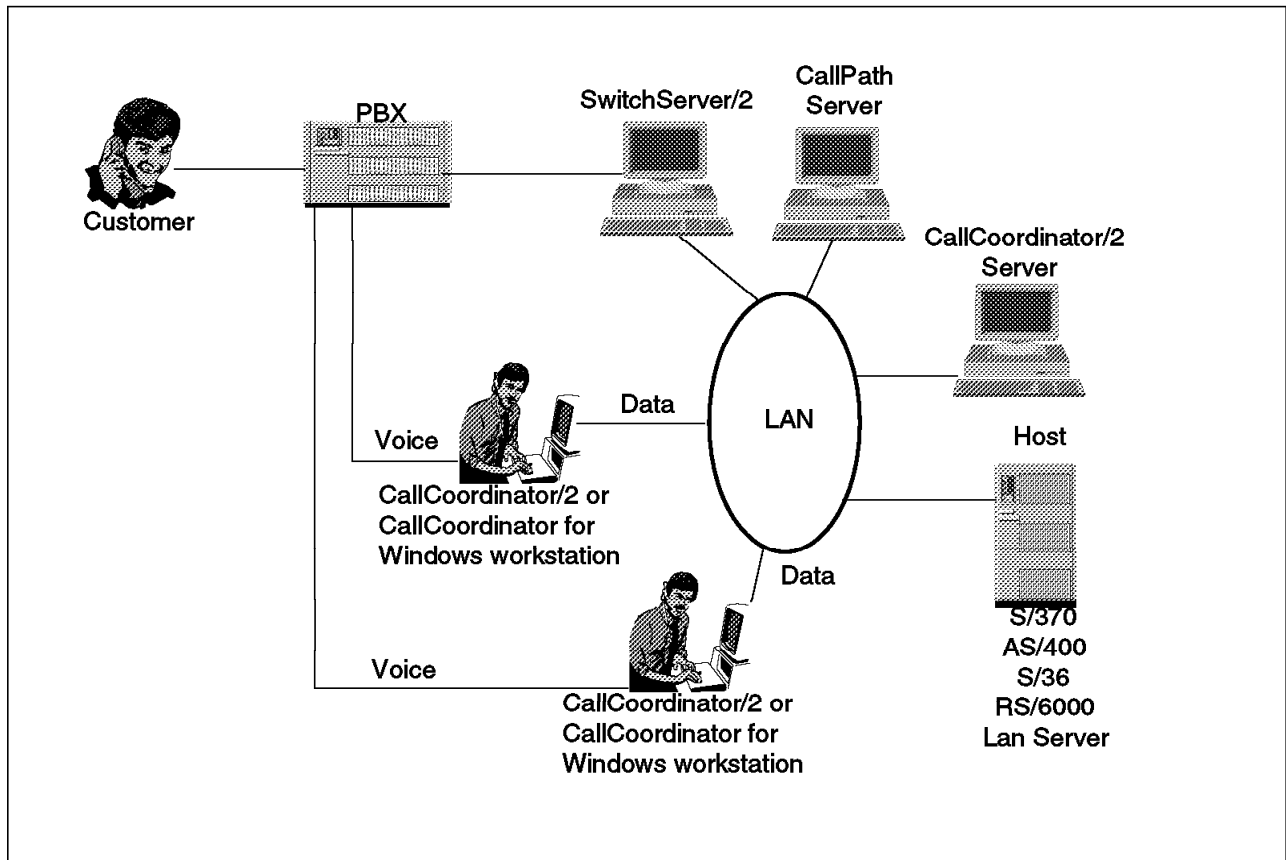


Figure 4. CallCoordinator/2 Workstation or CallCoordinator for Windows Workstation

CallCoordinator uses DNIS to automatically select the correct host computer application. Then CallCoordinator uses the caller's phone number (ANI) to access the caller's profile in the application. This means CallCoordinator identifies the caller and the purpose of the call without operator assistance.

The use of telephony data to obtain caller information prior to answering a call is known as intelligent answering. Intelligent answering helps CallCoordinator reduce response time to a customer, which can result in significant cost savings for the Call Center. If a typical Call Center receives 2,000 calls per day, reducing each call by 30 seconds saves over 16 call-hours per day. If the Call Center operates 5 days per week, the savings amounts to over 4,000 call-hours per year.

Intelligent answering also improves service to the customer. Callers are not required to repeat identifying data with each call. This reduces hold times, making service representatives more available. In addition, since customer data is automatically accessed, data entry errors are dramatically reduced.

Service is further enhanced by CallCoordinator because customer data is transferred along with the call. This capability, known as coordinated voice/data transfer, relieves the customer of repeating the collected information to each new service representative.

CallCoordinator also helps service representatives dial outbound calls from their OS/2 or Windows workstations. Numbers to be called are entered from the workstation or accessed from online telephone directories.

To assist the service representative, CallCoordinator provides programmable QuickKeys, which are defined by the system administrator. QuickKeys enable the agent to execute complex commands by pressing key combinations, such as Alt+J. For example, a service representative can request the system administrator to define Alt+J as *login*. Using QuickKeys saves time and reduces keying errors.

2.5.2.2 How Does CallCoordinator Work?

Configurations for the two call management solutions are similar:

- A typical CallCoordinator/2 configuration consists of CallCoordinator workstations on a token-ring or Ethernet local area network (LAN), which is connected to a telephone switch by CallPath SwitchServer/2 and attached to one or more databases.
- A CallCoordinator for Windows configuration is similar, except that CallCoordinator/2 Server is required to link CallCoordinator for Windows with the telephone switch.

Communication between the telephone switch and CallCoordinator is provided by the CallPath SwitchServer/2 and the CallPath server subsystem, that is, CallPath/2, CallPath Server/2, or AIX CallPath Server/6000. CallPath SwitchServer/2 provides the connection to the telephone switch and the CallPath server subsystem provides an interface to the telephony function of the switch. When a call arrives, the switch sends telephony data from the incoming call (ANI, DNIS and other data provided by the switch) to CallPath SwitchServer/2. CallPath SwitchServer/2 sends the data over the LAN through the CallPath server subsystem to CallCoordinator. CallCoordinator uses the telephony data to interact with Call Center applications on the host computer or business database and retrieve information such as the caller's profile and transaction history. This information appears on the CallCoordinator screen as the call arrives at the service representative's telephone.

CallCoordinator operations are automated using Host Application Transaction (HAT) files.

A HAT file can contain the following tables:

Call table: This includes programmed instructions that tell CallCoordinator how to interact with the host application when a call arrives.

Navigate table: These are keyboard emulations that provide a quick way to move from the current host computer screen to another screen.

QuickKey table: These are macro definitions used to execute complex commands.

HAT files can contain Call tables, Navigate tables, and QuickKey tables that fulfill the specific needs of the Call Center.

For example, in a help desk environment, one Call table could be designed to initiate trouble reports and another Call table could be designed to help take orders for merchandise. Both Call tables could use ANI to automatically access

customer records on a host computer. The trouble report could be specified as the default application, with order entry available secondarily. When a customer calls, the service representative's CallCoordinator screen would automatically display the trouble report screen. If the caller wanted to order merchandise, the service representative would then select the order entry Call table.

Call tables can also use the number dialed (DNIS) to automatically select between Call Center applications.

For example, if the two Call tables from the previous example were merged into one, the merged Call table could use DNIS to automatically select between the trouble report or the order entry application. Using DNIS, as the call arrives, the service representative would automatically have the correct application, as well as the caller information, displayed on the screen.

During installation, the system administrator designs Call tables to support the various Call Center applications. The HAT Development Facility (HDF) helps the system administrator build Call tables using the IBM OS/2 Presentation Manager user interface. The system administrator can also build Navigate tables and QuickKey tables to streamline Call Center operations.

Note: For CallCoordinator/2, the HDF is included and can be installed on any OS/2 workstation. For CallCoordinator for Windows, HDF is a separately ordered feature that must be installed on an OS/2 workstation.

2.5.2.3 CallCoordinator Environment

To select the best configuration, it is important to understand the components that make up the CallCoordinator/2 environment and how they work together.

The components are as follows.

CallCoordinator/2 or CallCoordinator for Windows: Used by the service representative to access Call Center applications or business databases on host computers and perform other telephony operations.

The CallCoordinator software resides on the OS/2 or Windows workstation.

CallCoordinator/2 Server: Coordinates data routing during coordinated voice and data transfers to automatic call distribution (ACD) queues. The CallCoordinator/2 Server is required for CallCoordinator for Windows to connect to SwitchServer/2 through the CallPath server subsystem. It is optional for CallCoordinator/2.

CallCoordinator/2 Standalone Workstation: CallCoordinator/2 software with CallPath/2 installed and configured on the same OS/2 workstation. Or, the CallCoordinator/2 software installed on an OS/2 workstation with CallPath Server/2, or AIX CallPath Server/6000 configured on the same workstation.

CallCoordinator/2 Archive: Gathers data on CallCoordinator operations. This data can be used by OS/2 Query Manager to generate various types of reports. This component is optional for both CallCoordinator for Windows and CallCoordinator/2.

Note: The Server and Archive are separately ordered products. CallCoordinator for Windows uses the CallCoordinator/2 Server to connect to the private branch exchange (PBX). The Server uses SwitchServer/2.

CallPath SwitchServer/2: Provides a physical connection between the IBM CallPath server subsystem and the PBX. CallCoordinator for Windows communicates through the CallCoordinator/2 Server to CallPath SwitchServer/2.

Telephone System: Your company's internal telephone system which may or may not provide telephony and data capability.

2.5.2.4 Software Environment

The software requirements for the CallCoordinator solutions are as follows.

CallCoordinator/2: CallCoordinator/2 requires that OS/2 be installed on each workstation. The CallCoordinator/2 workstation graphical user interface (GUI) operates under IBM OS/2 Presentation Manager and conforms to the IBM Common User Access (CUA) guidelines. This means that the user interface is similar in appearance to other OS/2 software applications.

The CallCoordinator/2 workstation can use OS/2 Communications Manager to communicate with host computers. Communications Manager enables concurrent access to multiple sessions, with a single host or multiple hosts.

When CallCoordinator/2 uses the CallPath Server/2 or AIX CallPath Server/6000 to communicate with the switch subsystem, IBM TCP/IP 2.0 must be installed and running on the OS/2 workstation where the CallCoordinator/2 Server and the CallCoordinator/2 stand-alone workstation are installed.

CallCoordinator for Windows: CallCoordinator for Windows requires Windows 3.1 on each workstation running DOS 5.0 or higher or MS-DOS 6.0. The IBM PC/3270 or RUMBA emulation program is required to communicate with your 3270 or 5250 host.

2.5.2.5 Extending CallCoordinator

CallCoordinator architecture enables communication with other voice and data products on the LAN through software interfaces called device drivers. Device drivers are invoked from a HAT file. CallCoordinator/2 currently provides device drivers for a number of voice and data systems. For a complete list of these systems, see *CallPath CallCoordinator/2 System Administrator's Guide*.

CallCoordinator for Windows also provides telephony functions using DDE device drivers.

You may want to create your own customized driver, modeled after the sample drivers provided, to access your custom application.

2.5.3 Telephony Development Application System (TADS)

Like CallCoordinator, the Telephony Development Application System (TADS) environment (hereafter referred to as the TADS system) is an easy-to-use and powerful telephony development tool environment. Using the TADS system, you can quickly develop sophisticated applications that take full advantage of the features and functions provided by Computer-Telephony Integration (CTI).

2.5.3.1 What is TADS?

TADS is a collection of programs that allows an application to control or access a rich set of telephony services, including:

- Intelligent call answering
- Intelligent call routing (ICR)
- Intelligent call transferring (ICT)
- Skills-based routing
- Coordinated voice and data transferring
- Load balancing
- Inbound call receiving
- Outbound call placing
- Consulting and conferencing
- Automatic collecting and analyzing of data
- Call and agent statistics logging
- Statistics generation and reporting
- ACD queue administration

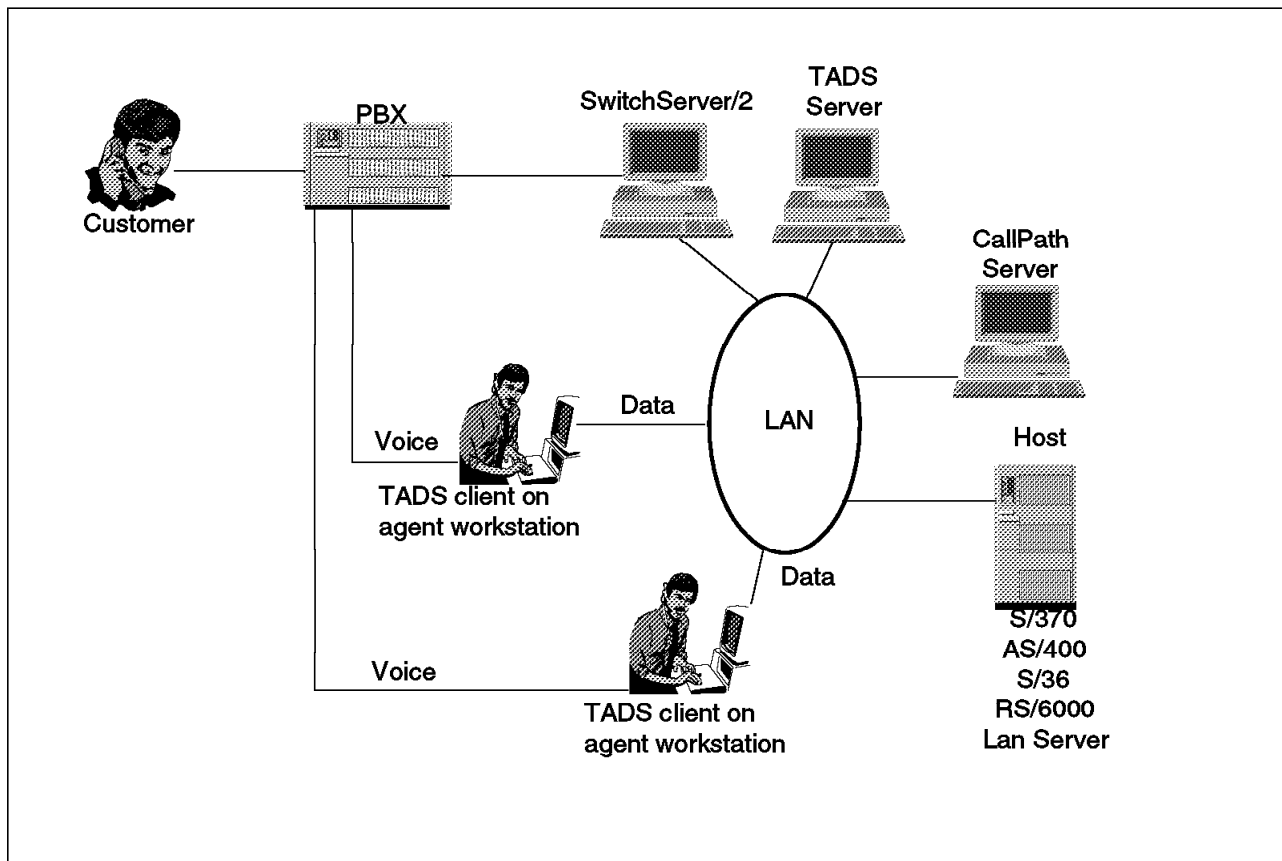


Figure 5. Telephony Development Application System (TADS)

Intelligent Call Answering and Transferring: Application programs can use the functions provided by the TADS system to coordinate data and call information if the necessary information is provided by the public switched network and the telephony switch. The public switched network and the switch typically offer the following functions:

- **Dialed Number Identification Service (DNIS)**

For inbound calls, some switches can identify the number that the caller dialed. This is useful if calls to several telephone numbers are routed to the

same destination. An application can use the dialed number to determine which service the caller wants. For example, one CSR can answer the telephone for three different departments, and will greet the caller with the department name corresponding to the telephone number the caller dialed.

- **Automatic Number Identification (ANI)**

For inbound calls, some switches can provide either the caller's billing or directory number as supplied by ANI- and CLID-type services available through network carriers. For example, an application program can use the number provided by ANI to look up and display information about a customer without having to ask the caller for an account number.

- **User-to-user information**

For integrated services digital network (ISDN), the TADS system can link programs and data to a call, and pass the call-related information along with the call as it moves from one program to another, one computer to another, or one switch to another. For example, a CSR in one Call Center can transfer both the call and associated caller data to a CSR in another Call Center. Unlike most other telephony subsystems, the TADS system also allows application programs to pass data internally within a switch and externally across switches and non-ISDN networks.

Note: The availability of the preceding services depends upon the make and model of your switch and may vary from country to country. Refer to your switch-specific documentation for further information about the functions supported by your switch. Switch capabilities are also affected by the services provided by your telephone network services carrier.

Intelligent Call Routing: Application programs can use the functions provided by the TADS system to process various types of call routing features provided by the public switched network and the switch. For example, by routing high volumes of inbound calls to specialized answering stations, ACD offers fast efficient call handling, reducing:

- The number of busy tones that customers receive
- The amount of time that customers have to wait for a CSR

Switches are usually configured so that a group of CSRs, who provide the same service to callers, belong to the same ACD group. When a caller dials the number for the service, the switch routes the call to a CSR in the ACD group. The TADS system allows applications to control the routing decisions, based on:

- Customer information
- Which CSRs are available (the call is routed to the best available CSR)
- Other customer-controlled criteria

In addition to ACD, the switch can also provide a variety of call processing features for telephone extensions, including:

- Call forwarding
- Call conferencing
- Call logging
- Call holding
- Computer-directed routing
- Direct inward dialing
- Voice messaging
- On-hook dialing (hands free operation)

Skills-Based Routing: The TADS system provides the ability to do intelligent, skills-based routing, matching callers to only those agents who have the skills required to handle the calls. Callers are matched to the best available agents the first time, thereby increasing customer satisfaction and improving the utilization of Call Center resources.

In the TADS implementation of skills-based routing, each agent has a unique skills resume, and each call is enqueued based on its unique call requirements. The TADS subsystem finds the best match between available agents and calls enqueued. If more than one agent is available, the agent with the closest skills match to the call requirements is selected (the best match). That allows agents with more extensive skills to be reserved for more difficult calls.

The following is a typical call scenario:

1. A call arrives at an IVR, which answers the call and gathers skill requirements through interaction with the caller.
2. The IVR builds a skill expression and submits the expression to the TADS system.
3. The call is enqueued for the next available agent having the skills required to handle the call. (If there is no agent with the required skills immediately available, the call remains in queue.)
4. When an agent with the required skills becomes available, the TADS subsystem sends a command to the IVR instructing it to transfer the call directly to the selected agent.

In the preceding scenario, the call is actually held on the IVR until the TADS subsystem signals the IVR to transfer the call directly to an agent's physical extension. By holding the call, the IVR can continue to interact with the caller until an agent becomes available, providing such information as:

- Intelligent queue time announcements
- Company information
- Interactive voice advertising
- Faxback services

The TADS subsystem depends on an external program to collect the caller's skill requirements, create a skill expression, and enqueue the call. Typically, an IVR is used. An external program can easily be written, however, to simply collect the ANI or DNIS from the TADS subsystem, retrieve the caller's predefined skill requirements from a customer lookup table, and enqueue the call on the switch, without tying up valuable IVR ports.

Coordinated Voice and Data Transferring: Application programs that use the TADS system can retain and manipulate data associated with a call. If a CSR needs to transfer the call to another CSR (or even an IVR), the application program can cause the TADS system to transfer a copy of the client's data record to the other CSR's terminal simultaneously. (The other CSR does not even need to be in the same physical Call Center.)

This data retention eliminates the need for subsequent CSRs to spend time identifying and gathering the same information about a caller. Therefore, client satisfaction is increased and costs are reduced by reducing the length of each call (reducing the network costs on 1-800 calls, and freeing the CSR to handle additional calls).

Load Balancing: The TADS system provides application programs with APIs that allow them to determine the best Call Center for a given call and cause these calls to be automatically routed to that Call Center. Traditionally, public network providers provide this service before the call enters the Call Center.

The TADS system enables you to also reroute the call after you have collected information on the customer. For example:

1. A call arrives at Call Center A.
2. An application program (at Call Center A) that is monitoring the incoming telephone call makes a request, from the TADS system, for the number of the least busy Call Center.
3. The call can then be transferred to that Call Center, or handled locally.
4. Assuming that the local Call Center can handle the call, the call is placed into the call handling mechanism (usually an IVR or ACD queue).
5. Before the call is transferred to a CSR within that Call Center, the application program can again prompt the TADS system for the best available destination.
6. Once data has been collected, the TADS system can route both the call and the data to the answering party, regardless of the party's location.

Receiving Inbound Calls: Inbound calls can be automated using IVRs and can be used with TADS application programs. IVRs provide a series of prompts that callers answer by pressing keys on the telephone keypad (some IVRs now accept voice commands). An IVR can, for example:

- Answer inbound calls
- Make decisions based on the time and date, ANI, DNIS, or other information
- Greet callers and request information in a digitally recorded human voice
- Retrieve information from a computer database
- Match computer responses with prerecorded spoken messages and play the messages to the caller
- Associate caller data through the TADS system to the existing call
- Transfer or terminate calls

An IVR can either handle a call itself or transfer the call to a CSR (either directly or through an ACD group). For example, an IVR can handle a simple inquiry, but pass a more complicated transaction to a CSR. The TADS system enables an application program to take control of calls transferred from an IVR. The application program then has access to the data collected from the caller by the IVR and to the call information provided by the switch. An IVR is also useful for handling calls outside normal business hours and for overflow calls during peak periods.

The TADS system provides API calls to IVR applications to allow them to:

- Query the best destination for the call to be routed.
- Collect ANI/DNIS information from the switch.
- Associate a user-defined block of data with the call.
- Query the amount of time that the caller would wait for a CSR to become available on a given ACD queue.

- Transfer the call to another extension.
- Sense when the customer has disconnected and immediately cause the IVR to answer the next call.

(IVRs typically have trouble sensing when a call has disconnected and this can drastically reduce the number of IVR channels actively involved in calls. The TADS system, by sensing the disconnection, can inform the IVR that the caller has disconnected and thus free-up that channel.)

- Reenter a script at a specific point if the caller is transferred back to the IVR

CSR applications can also be written to take advantage of inbound telephony-using functions, such as ANI and DNIS. TADS also provides status information on the Call Center itself. For example, the TADS system provides API calls to query the status of an ACD Queue and all of its members. The TADS system will return, to the application program, the following information if it is available:

- The number of calls within that ACD queue
- The age of the oldest call in the queue
- The status of each of the CSRs logged on to that particular ACD queue
- Switch-specific information such as the service level

Placing Outbound Calls: With the TADS system, Call Centers can support automated outbound calls. Once you initiate a telephone call, TADS-enabled applications can use enhanced dialing functions and decide how to dial the telephone number. Outbound application programs can include the following:

- **Preview Dialing:** A type of computer-assisted dialing in which an application program presents, to a CSR, a list of suggested telephone call targets, based upon information stored in a database. The CSR chooses a target from the list and directs the program to place a telephone call to the indicated target. Since the dialing is automated, records can be automatically generated and the productivity of the CSR placing the call can be improved.

In addition, preview dialing can be integrated with other application program logic. For example, a collections application program can be designed (or modified) to automatically display, on a CSR's screen, a list of customers who are 60 days past due. The CSR can then select one of those customers causing the application program to initiate the call and simultaneously retrieve the account history of the customer. When the customer answers, the CSR has all the background information needed to work with the customer. Also, the system can automatically log the call results (such as busy and not available).

- **Progressive Dialing:** A type of computer-assisted dialing similar to Preview Dialing, except that the CSR does not provide an input to the application program when the CSR is ready to make the call. The call is started when the screen appears to the CSR. For example, when CSRs make themselves available, the application program automatically dials a customer and displays the customer record of the called party.
- **Predictive Dialing:** A type of computer-assisted dialing in which an application program places calls to prospective customers on behalf of CSRs. The program, rather than a CSR, determines which customers to call. Furthermore, the program can request that one or more telephone calls be made at a time when all CSRs are already involved in calls. The program predicts that:
 - A number of the outbound telephone call attempts will be unsuccessful

- By the time one of the calls is answered successfully by a customer, one of the busy CSRs will be available to handle the call

In addition, calls that are unanswered or receive a busy signal can be identified by the application program and retried at a later time.

Note: The capabilities described in this section are dependent upon the functions offered by your switch and the application program. Refer to your switch-specific documentation for more information about your switch functions.

Consulting and Conferencing: Application programs using the TADS system help CSRs establish conference calls and consultation simultaneously among multiple CSRs and the customer. For example, an application program can allow a CSR and that CSR's supervisor to view the same data while they consult about the call.

Since the application program knows that the CSR and the supervisor are involved in the same call (through the TADS system), it provides the same data to both. However, depending upon the application program, the information on the second workstation does not have to be identical to that on the first. A supervisor's screen might show the CSR's name and more detailed information about the customer.

The TADS system also allows applications to be written that would allow the CSR and the supervisor (or any other internal party involved in the telephone call) to send data messages to one another while maintaining the voice connection to the customer. For example, the CSR could type questions to the supervisor which the TADS system would pass through the data connection, unknown to the customer.

The TADS system can also provide more detailed information about the conferenced parties than is possible on traditional telephone handsets. For example, the TADS system can provide information about all of the internal parties connected in a conference call and can even inform the application program when one of the parties drops out.

Collecting and Analyzing Data Automatically: Application programs using the TADS system can provide automatic data collection and can capture and store Call Center data for future analysis and action. Call Center data includes information about CSR performance. CSR performance data can indicate the volume of business generated by an employee, or the frequency with which a CSR transfers or closes calls. Application programs can capture data for occasional specific needs, such as testing the response to an advertising campaign. Automatic data collection helps Call Center managers and supervisors:

- Run their Call Center smoothly
- Monitor the activities of their CSRs

The TADS system can also provide information to applications about specific call activities. For example, an application can monitor abandoned calls. An abandoned call is a call in which a customer hangs up before being connected to a CSR. For example, the caller might decide that the wait time for an available CSR is too long.

Using the TAD system, application programs can keep track of abandoned calls, and cause customers to be called back when:

- A CSR becomes available
- Call volume decreases

Note: Data previously collected with the call can also be retrieved and displayed on the CSR's screen while the call is being placed.

Call and agent statistics logging: The TADS system provides a facility to log call progress and agent activity statistics events, which ensures that the statistics events are not lost when an application is not receiving events from the TADS system.

For example, applications can be written to gather statistical information on call center activity, but if the application needs to be stopped for a period of time, it can catch up on all of the previous events.

The statistics logging facility is provided with the optional *TADS Server Statistics Package*.

Generating and Reporting Statistics: Application programs can collect real time and historical data from the TADS system to:

- Generate statistics for reporting purposes
- Query system information for a specific moment in time to evaluate performance

For example, a Call Center supervisor might query ACD Queue data to get a snapshot of that ACD Queue's activity at that given moment. From the information, the supervisor can determine whether or not to add additional CSRs or reassign existing resources.

ACD Queue Administration: The TADS system enables application programs to be written to rearrange resources within an ACD queue on certain switches. For example, Call Center supervisors can add ACD queue members to, and delete ACD queue members from, ACD groups. Supervisors can also add and delete Agent IDs from the system.

The optional TADS ACD Monitor Object application enables supervisors to easily:

- Drag existing ACD members from one ACD group to another
- Create new ACD members
- Delete existing members

Note: To do the ACD queue administration described in this section, you require the *TADS Server ACD Package for ROLM 9005*.

2.5.3.2 How Does TADS Work?

The TADS system uses Remote Procedure Calls (RPCs) in a Network Basic Input Output System (NetBIOS), or Transmission Control Protocol/Internet Protocol (TCP/IP) network to enable a client application on one networked computer, to use a server application running on the same or another networked computer, to call procedures or access data.

Application programs invoke functions of the TADS system by issuing program calls defined by the TADS API. The TADS component attached to the application program processes the program call and, if no errors are found, formats the information from the application and sends it to the TADS Client process.

The TADS Client process either processes the call locally (for example, with a local Smartphone) or sends it over the local area network (LAN) via a supported communications protocol to the TADS Server component residing on a remote computer. TADS Server then acts upon that program request and returns control to the calling program, along with a return code and the appropriate returned parameters of the program call. All TADS API calls are treated as RPCs to local objects.

The TADS Client process determines if the call can be handled locally and if not, reroutes the call to a remote object to satisfy the request. TADS Server will only communicate to remote applications through its surrogate, the TADS Client process on the remote workstation.

Depending upon the function requested by the application program, the switch can send one or more messages through the TADS system (such as, call-progress event messages) to the application program in reply. These messages are received asynchronously to the processing of the program call. That is, execution of a program call completes before any expected messages are received from the TADS Subsystem.

2.5.3.3 The TADS Environment

The TADS platform is distributed as a set of application program interfaces (APIs) and libraries that allow you to build CTI solutions for a wide variety of platforms, including:

- IBM Operating System/2(OS/2) Version 2.1, WARP, or later:
 - C/C++
 - Workplace Shell/System Object Model (SOM)
 - Restructured Extended Executor Language (REXX)
 - WATCOM VX-REXX
- IBM Advanced Interactive Executive (AIX)
 - C/C++
- Hewlett-Packard UNIX (HP-UX)
 - C/C++
- AT&T System V
 - C/C++
- Microsoft Windows 3.1
 - C/C++
 - Microsoft Visual Basic
 - Microsoft Visual C++
 - Borland Interactive C++

The TADS components and application programs communicate with the switch in different ways, depending on the installation's configuration.

- *TADS Server to Switch Communications:* Depending on the switch involved, TADS Server communicates with the switch through either a direct connection, the CallPath Services architecture, or both.
- *TADS Application to Switch Communications:* The TADS system communicates with a switch via switch protocol mappings in one of two ways:

- For most supported switches, TADS Server communicates to the switch through the CallPath Services architecture (which includes the CallPath Server/2, CallPath Server/6000, and CallPath SwitchServer/2 program products).
- For some supported switches, TADS Server communicates to the switch through a direct connection.
- *Application Program to Switch Communications:* Application programs communicate indirectly with the switch through the TADS subsystem. Although there are many types of calls (for example, incoming, outgoing, transfer, conference, and hold), they all involve a common set of base processes that are handled through the TADS system.

2.5.4 CallPath Server Subsystem

CallPath/2 provides an interface to the telephony functions of the PBX through CallPath SwitchServer/2. CallPath/2 has two variations which share a common CallPath Services Architecture API, the CallPath/2 CallPath Services Architecture API.

- **MultiAgent**

Provides telephony data and functions to a CallCoordinator/2 Server or a CallCoordinator/2 workstation.

- **SingleAgent**

Provides telephony data and function to a CallCoordinator/2 workstation.

Note: SingleAgent applies only to CallCoordinator/2 workstations.

For OS/2 environments, larger Call Centers may benefit by using the CallCoordinator/2 Server with CallPath/2 MultiAgent. For smaller Call Centers running CallCoordinator/2, it is often more economical to install CallPath/2 SingleAgent, unless the server is required to perform coordinated transfers of the data associated with calls in an ACD queue.

2.5.4.1 CallPath Server

Provides an interface to the telephony function of the PBX through CallPath SwitchServer/2. CallPath Server has two variations which share a common API. The OS/2 CallPath Services Architecture (CSA) Client API is included with the CallCoordinator/2 product.

- **CallPath Server/2**

Runs in the OS/2 environment and communicates through TCP/IP Remote Procedure Calls (RPCs) to the OS/2 CSA Client API.

- **AIX CallPath Server/6000**

Runs in the RISC System/6000 AIX environment and communicates through TCP/IP Remote Procedure Calls (RPCs) to the OS/2 CSA Client API.

When using the CallPath/2 subsystem, the CallPath/2 product may be installed on the OS/2 workstation where the CallCoordinator/2 Workstation is installed or on the OS/2 workstation where the CallCoordinator/2 Server is installed.

When using the CallPath Server/2 subsystem, the CallPath Server/2 product may be installed on the OS/2 workstation where the CallCoordinator/2 Workstation is installed, where the CallCoordinator/2 Server is installed, or on a separate OS/2 workstation attached to the LAN. When using the AIX CallPath Server/6000

subsystem, the AIX CallPath Server/6000 product is installed on an AIX workstation attached to the LAN.

2.5.5 CallPath CallCoordinator CICS/MVS

To this point we have discussed examples of the productivity and customer service enhancements that can be accomplished by exploiting IBM's CallPath enabling products.

We also recognize that not every customer has the time or resources to write the telephony component required to integrate existing applications into CallPath Services Architecture. To address this need for the System/390 CICS/MVS user, IBM announced CallPath CallCoordinator CICS.

CallPath CallCoordinator CICS is an enhanced version of IBM's original product CallPath Host which has been available since 1989 and is considered by many to be the most comprehensive inbound product available. Many customers have expressed interest in having outbound capability with CallPath Host. In addition, we have had numerous requests for CallPath Host to work with other vendors' telephone systems. IBM CallPath CallCoordinator CICS addresses both those requirements as well as providing many enhancements to further leverage your Call Center assets. With the announcement of CallPath CallCoordinator CICS, IBM fulfills the statements of direction made in May, 1990 and September, 1991.

Using the elements of IBM's strategic CallPath Services Architecture, (CallPath CICS and CallPath SwitchServer/2), CallPath CallCoordinator CICS provides a complete solution that combines the call processing power of the most commonly used telephone systems with the data processing power of your existing System/370 and System/390 CICS business applications.

SwitchServer/2 provides the mapping and communications support for CallPath CICS/MVS which implements the CallPath Services Architecture on the S/390. CallPath CallCoordinator CICS is the telephony component or call management application that integrates business applications with CallPath Services Architecture.

CallPath CallCoordinator CICS can enhance the way a company communicates with customers, suppliers, distributors, prospects and other important business contacts. CallCoordinator CICS allows a company to personalize caller interactions, improve customer service, enhance employee productivity and customize business services. Integrating caller information to host transactions allows a customer to develop management reports to look at his business in a new way - seeing the quality of the service he is providing and measuring the real value of each phone call to his business. You can use CallCoordinator CICS/MVS to interface to multiple business applications in a single region or multi-region CICS environment.

2.6 DirectTalk/2 and DirectTalk/6000

IBM has two Interactive Voice Response (IVR) systems that are members of the CallPath family: DirectTalk/2 and DirectTalk/6000. They run on different platforms and have a different way of developing and processing their applications, but essentially they perform the same functions from the perspective of a user on the end of a telephone.

In the following paragraphs we discuss the generic operation of DirectTalk systems and how they can be used. We then discuss each product individually to determine the differences of each.

2.6.1 Voice Processing with DirectTalk

The telephone is a nearly universal means of communication. Most businesses and homes have one. Voice processing technology can make this readily available device into a computer terminal, which is the universal input and access device. Voice processing technology gives the telephone user access to a world of computer-based information. It provides powerful solutions for conducting business applications by phone, anytime and anywhere.

In recent years, business requirements have driven the evolution of voice processing technology. Businesses are looking for solutions that can provide power and flexibility to address key management concerns in the customer service environment today:

- Automation
- Personnel cost reduction
- Processing and networking cost reduction
- Demand for convenience

Voice response technology addresses these concerns and DirectTalk voice processing extends the capabilities of voice response by adding more function and flexibility.

2.6.1.1 Voice Response

Voice response technology addresses several business issues such as improving customer service, extending business hours of operation, and allowing staff to focus on calls that need special customer attention. Voice response technology gives callers controlled access to the information system through a telephone keypad.

Typically, voice response provides:

- An automated attendant to direct calls to different customer service representatives or departments.
- The capability to "speak" information such as brief announcements, calendar notes, and so on.
- The facility for callers to conduct their own transactions and retrieve electronically stored information via terminal emulation.

2.6.1.2 Voice Processing

What does DirectTalk voice processing add to voice response?

- Automated outbound calling
- Telephone access to multiple systems and applications
- Storage capacity for large amounts of audio data
- Use of text-to-speech conversion
- Transaction-related voice messaging
- Speech recognition

- Integration with fax

2.6.1.3 Automated Outbound Calling

You can easily automate your outbound applications to improve customer service and generate revenue (collections, marketing campaigns, and so on). DirectTalk can place calls to provide automated caller notification, announcements, and customer surveys. For example, a business can automatically call a customer to notify them that their order has been shipped and give an approximate arrival date.

2.6.1.4 Telephone Access to Multiple Systems and Applications

DirectTalk allows the caller to access a complete range of information and transactions with a single call. The caller has access to remote, host-based data, as well as local databases, via an open interface that provides multiple connectivity options, as well as via 3270 terminal emulation.

2.6.1.5 Storage Capacity

DirectTalk can “speak” audio information using quality, digitally stored speech and script responses. With DirectTalk disk storage capacity to store the digital, pre-recorded words and phrases, the ability to read the text information and respond to the caller has been greatly enhanced over previously offered 927X Voice Response products.

In addition, the IBM-developed telephony hardware compresses voice traffic at the above-average ratio of 5-to-1, while retaining very high voice quality. This further increases the capacity of the system to store audio data.

2.6.1.6 Text-to-Speech

As an alternative to storing all your voice responses as audio data, you can store them as text and convert them to speech as needed, using a separate text-to-speech product. Text-to-speech enables the caller to access and hear information that is impractical to prerecord as a voice message. For example: callers may wish to access their electronic mail by using the phone, listen to an item of news, or hear a spoken description of an ordered part number.

2.6.1.7 Transaction-Related Voice Messaging

Transaction messaging allows customers to leave voice messages related to transactions that they have conducted using DirectTalk voice applications. The message is stored with a header that includes identifiers unique to that transaction, for example, a time and date stamp along with a customer number, order number, or other identifier.

2.6.1.8 Coordinated Voice and Data Transfer

DirectTalk can handle all routine business, but sometimes callers need to talk directly to a service agent. Using DirectTalk together with one of the CallPath call processing products, you can provide an application that both transfers the call and puts any data that DirectTalk has already gathered onto the agent’s computer display. So the agent is fully prepared to handle the inquiry. This is known as coordinated voice and data transfer.

2.6.1.9 Speech Recognition

With speech recognition, the number of callers that can utilize DirectTalk applications has been substantially increased. Callers can choose to interact with a DirectTalk application either by pressing keys on their dual-tone multi-frequency (DTMF) phone or simply speaking an appropriate response into any telephone handset.

Where telephones are able to send DTMF tones, you can mix tone input (for long numbers, for example) with speech input (for selecting between a small number of options—names of towns, product categories, days of the week, and so on). For callers without DTMF phones, speech recognition provides an alternative means of interacting with a voice application.

DirectTalk speech recognition can be integrated with other industry-standard speech recognition products.

2.6.1.10 Integration with Fax

DirectTalk can support fax by means of a separate fax server product using dedicated fax modems and analog lines. This allows customers to request specific information to be sent from DirectTalk by fax. For example, a customer can request a fully detailed bank statement by calling in to DirectTalk. Custom software can then access the requested information and send it to the customer's fax machine.

2.6.1.11 Analog Display Services Interface (ADSI)

DirectTalk supports the transmission of text data across a voice phone line using the ADSI standard. An ADSI phone has a screen display that is used to display the caller's information. This information can be in the form of a bank statement or a shopping list and is scrollable on the phone. The caller then uses function keys on the phone to select the option they want to display. Then the request is sent back to DirectTalk over the voice phone line. These phones are sometimes called smartphones.

2.6.1.12 Telephony Device for the Deaf (TDD)

DirectTalk supports TDD over a voice phone line. These devices are used by hearing impaired callers to talk to each other or to DirectTalk over a voice phone line. These devices are similar to a teletext machine and normally operate at a slow transmission speed of around 300baud.

2.6.2 How Can DirectTalk Change Your Business?

DirectTalk is an *application enabler* with which you can design and implement your own voice processing applications. Applications can answer or initiate telephone calls, access local or remote databases to retrieve and store information, and play voice responses that provide information and services to clients. Voice applications can also store and retrieve voice messages.

Calls are answered day or night, providing more business opportunities.

Many calls are answered at once, reducing problems with busy-hour traffic and long switch queues.

Routine calls are handled without an agent, freeing your staff to deal with more complex inquiries.

Calls are initiated automatically, providing clients and customers with information you want them to have.

Calls are transferred or forwarded automatically—an entire exchange of information taking place without the involvement of your staff.

Calls can be transferred to a member of your staff, at the caller's request.

Callers can retrieve the information they need from the appropriate database—which may be local or remote.

Callers can update their own database information without the intervention of a third party.

Your business, your customers, your suppliers, and your employees can benefit from DirectTalk in so many ways.

2.6.3 DirectTalk: Your Solution to Business Communication

DirectTalk voice processing can help you to enhance your business operations in these key areas:

- Customer service
- Network processing costs
- Productivity

2.6.3.1 Improve Customer Service

Extend your operations to 24 hours per day without the cost of overtime or additional staffing.

Reduce the possibility of agent error. Caller confidence increases, when they know they can access the database themselves.

Callers spend less time on hold for available agents.

Callers can easily conduct multiple transactions in a single call, accessing data on different host computers.

2.6.3.2 Reduce Network Processing Costs

Routine calls can be completely automated, keeping caller hold time to a minimum, which is especially beneficial on toll-free (800) number calls, when your business is paying for the cost of the call. This also makes agents or customer service representatives more available to deal with other calls.

Where applicable, local database access can allow you to minimize host dependency to lower communication cost to a remote host.

2.6.3.3 Increase Productivity

With DirectTalk:

- Routine calls can be off-loaded, to free up agents to handle more complex transactions.
- Agents have more time to focus on more important customer situations.
- Customer account data can be collected before passing the call to an agent.

2.6.4 DirectTalk: Beyond the Call Center

Voice processing technology has been thought of as a solution for large customer service Call Centers who receive high call volumes daily. But voice processing can also be a solution for all businesses, addressing both internal and external requirements.

Here are some examples:

- A company vendor or supplier can access your purchasing application to verify if you received their shipment of goods.
- You can automate credit card applications for special program offerings or promotional campaigns. You can automate credit card or account status verification.
- A doctor's office or clinic can automate patient scheduling. Patients and doctors can make appointments, and you can automatically have the system place a call to confirm appointments, or other notification requirements such as test results (if you are delivering good news).
- You can have a personnel application that uses the voice processing technology to notify employees of change in scheduling of important meetings or work projects.
- Airline attendants often bid for certain preferred work or shift schedules. This process can be automated while the system keeps a current updated database of the schedule.
- Special work groups can leave voice messages of specific results, instructions or special comments.

Voice processing can be used in a variety of applications. It offers solutions that can take you beyond the call center.

2.7 Early, Cloud & Company

Founded in 1981 as a consulting company with a focus on customer service automation, Early, Cloud & Company (ECC) is a software development and consulting services organization. Acquired by IBM in 1995, ECC's products are representative of the "intelligent middleware" component of the Customer Service/Call Center Architecture discussed in Chapter 1, "CallPath Call Center Architecture" on page 1.

2.7.1 CallFlow

CallFlow is a distributed software solution for large-scale Call Center automation that improves customer satisfaction, minimizes Call Center costs and maximizes revenue opportunities. It allows companies to automate customer contact applications such as customer service, telesales, account management and collections. CallFlow is one of the few products that allows organizations to build scalable applications in high transaction volume client/server environments.

CallFlow provides application generation, business workflow, computer telephony integration, contact management, fulfillment and call result reporting. It enables access to corporate data systems throughout the enterprise through a unique object-driven technology. Customer information from multiple systems and databases can be seamlessly integrated with graphical workstation-based

applications using a distributed object approach, allowing representatives to respond quickly and efficiently to customers and prospects.

2.7.1.1 CallFlow Core Module

The core module supports the application generation, Call Center management, reporting tools and electronic business workflow capabilities of CallFlow. The application generator allows the user to define the business functions managed by CallFlow. Call routing mechanisms and statistical collection points are defined by the generator. The core product uses a data dictionary to define the size and structure of variable data fields, which contain unique customer-specific information. Business workflow is developed using the core module by building workflow queues and defining the workflow process. Also provided are facilities for reporting and manipulating queues as well as a "locator" function for tracking work-in-progress. CallFlow manages the enterprise Call Center by ensuring that the right call gets to the right CSR, with the right information, at the right time. CallFlow provides the tools to create a truly integrated solution.

2.7.1.2 Data Voice Bridge (DVB)

The DVB component of CallFlow provides CTI required for handling both inbound and outbound calls. Inbound features include intelligent answering services that significantly improve agent response times and simultaneous voice/data transfer. Automatic Number Identification (ANI) allows the system to retrieve specific customer information based upon the number from which the customer is dialing. Dialed Number Identification Service (DNIS) allows the system to trigger the appropriate CallFlow application associated with the number that was dialed.

SpeedDial and Predictive Dial modules provide the outbound functionality of DVB. SpeedDial enables agents to place a call with the click of a mouse. Predictive Dial provides mass dialing capabilities presenting only connected calls to agents. Both features result in significant productivity enhancements for agents, thereby allowing them to spend more time engaged in actual customer contact services.

2.7.1.3 Enterprise Information Access

Information from diverse applications and databases can be transparently integrated into the CSR's application with CallFlow. The Enterprise Access Component provides access to processes and data throughout the enterprise, including legacy systems. This product connects multiple systems transparently, eliminating the need for duplicate data or for the customer service representative to serially log on to various systems to retrieve the information.

2.7.2 Message Driven processor (MDp)

Message Driven processor (MDp) is a message-based middleware solution that offers a sophisticated approach for migrating to a distributed client/server architecture. MDp provides a framework for integrating desktop applications with systems and data located throughout the enterprise. Designed for transaction intensive environments, MDp easily ties together disparate workstations, servers and mainframe systems using a distributed object approach to create a truly integrated environment.

MDp provides both development and runtime environments. By significantly reducing the development time required to create client/server applications, MDp enables large organizations to smoothly migrate to client/server computing while leveraging their investment in their existing systems. As an object-based

technology, MDp improves the productivity of programmers by reducing development complexity and allowing objects to be reused. Through messaging, MDp can reduce network traffic, simplify network protocol management and minimize changes to legacy systems.

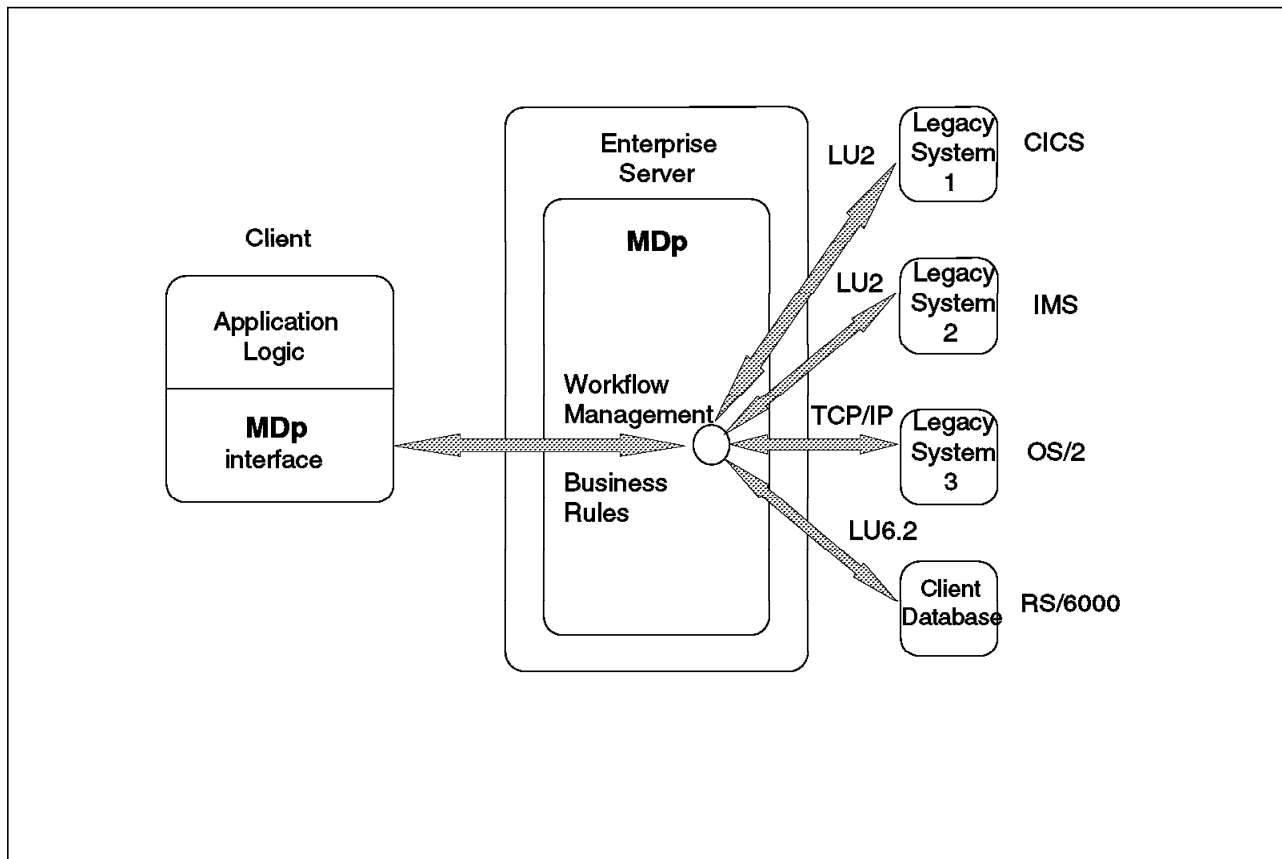


Figure 6. ECC's Message Driven processor (MDp)

2.7.2.1 How MDp Works

MDp operates as a business request broker. A client application builds a business request in the form of a message and passes that to MDp. MDp "brokers" the execution of the business request in a client/server environment and invokes the appropriate server applications and databases. MDp understands which applications or databases need to be invoked to satisfy the request and where these systems reside in the enterprise.

MDp explodes the single request into multiple units of work for the back end server applications and databases. These tasks are dispatched out to the servers using the appropriate communication protocols and connectivity styles.

The back-end processes execute their tasks either synchronously or asynchronously and return the results to MDp. MDp manages the receipt of a message, the brokering of tasks to back-end systems and controls business logic execution based on the information from the back-end systems. MDp then reconstructs one or more replies which are then forwarded to the requesting client or to any target destination. Through a store-and-forward mechanism, MDp supports error recovery and time-based processing of a business request.

2.7.2.2 Platform Support

MDp is a CICS based business request broker. As such, MDp is supported in a distributed CICS environment and runs under the CICS subsystem. MDp today runs under CICS/MVS 3.2.1. Due to MDp's platform flexibility, an organization can select the platform within the enterprise and build a distributed solution for business request brokering based upon MDp.

2.7.2.3 Communication Support

MDp supports multiple communication protocols on the client and server sides. On the client side, MDp offers support for messaging styles including IBM's MQSeries and several others. On the server side, MDp supports the use of FEPI, NetView Access Services (NVAS), LU6.2, LU0, TCP/IP, EDI, CICS Peer-to-Peer and various messaging styles including IBM's MQSeries.

Chapter 3. Benefits, Features and Functions

In this chapter we discuss the benefits, features and functions of each of the CallPath products. Most of this information is available in various forms, such as General Information Manuals (GIM). We have chosen to repeat it here in order to make your task easier when building an entire Call Center.

3.1 CallPath SwitchServer/2

In this chapter we describe the main functions of IBM CallPath SwitchServer/2 and the facilities it provides.

CallPath SwitchServer/2 is a program product that runs on an IBM PC under the IBM Operating System/2 (OS/2). CallPath SwitchServer/2 connects one or more host computers to a switch and controls communications between them. Since each PABX has a unique set of commands, there is a different version of SwitchServer/2 code for each vendor. Some of these versions are owned and marketed by the PABX vendor and not IBM. One example of this is the Ericsson MD110. Ericsson's product is called ApplicationLink.

In this book, the term *host computer* refers to a host computer system that supports the CallPath Services application programming interface (API). CallPath Services is the IBM architecture for coordinating voice technology with new and existing applications. It includes an API for programs requiring computer-switch communication. The API allows a program to access services such as the establishment, monitoring, and termination of telephone calls. The term *switch* is used to refer to any telephone switching system, for example, a private branch exchange (PBX).

CallPath SwitchServer/2 works as a protocol converter between one or more host computers and a switch. It also provides a user interface for administration and problem determination in CallPath SwitchServer/2 and support for a remote console.

The CallPath SwitchServer/2 PC can be connected to a host computer via a Synchronous Data Link Control (SDLC) link, an IBM Token-Ring Network, an Ethernet network, an X.25 network, or any other network supported by OS/2 Communications Manager/2 and the appropriate host computer. CallPath SwitchServer/2 communicates with host computers using the Systems Network Architecture (SNA) logical unit 6.2 (LU 6.2) protocol.

SwitchServer/2 is normally kept in a locked room, usually with the PABX. With this in mind, it is important to be able to maintain operation of SwitchServer/2 but keep it secure at the same time.

SwitchServer/2 can be operated from a remote console, either in the same building or at a remote location. In order for SwitchServer/2 to be operated from a remote console, you will need IBM's Distributed Console Access Facility (DCAF), which enables one PC to control and monitor the display and input devices of another PC.

The two PCs communicate with each other via an LU 6.2 connection or an asynchronous link. This means that you can perform from the remote PC most of the functions possible at the SwitchServer/2 machine.

3.1.1 Traffic Data

One of SwitchServer/2's many features is its ability to produce a vast amount of meaningful statistics. SwitchServer/2 also maintains a "heartbeat" pulse with its attached PABX, thus enabling it to determine the "health" of the connection even in periods of no traffic.

Traffic is measured over a fixed interval of 15 minutes. At the end of each 15-minute period, SwitchServer/2 passes the traffic counts to all CallPath Services host computers with a current session, regardless of whether the host computers have tracing set to "on". However, traffic data is recorded for a host computer connection only if the trace option is on.

SwitchServer/2 also records traffic between itself and the PABX, provided the trace option for that PABX connection is set to "on". For more information on configuring and using the trace option refer to *Using CallPath SwitchServer/2*, SC34-2406.

The traffic data consists of the following counts for each 15-minute period:

- The number of messages received from the traced host computers
- The number of messages sent to the traced host computers
- The number of messages received from the PABX
- The number of messages sent to the PABX

At the end of the 15-minute counting period, SwitchServer/2 saves the data to a traffic data buffer. Then the traffic measurements begin again. You can transfer the collected data from the buffer to a file and browse the file on the screen, print it, or delete it.

3.1.2 Performance Data

CallPath SwitchServer/2 can generate performance data based on the traffic data collected. CallPath SwitchServer/2 performs a statistical analysis of the traffic over the period you specify, between 1 and 999 minutes. The analysis gives an indication of the quality of service the traffic is receiving. For example, you can use the analysis to assess:

- Calling patterns, based on the percentage of inbound calls in comparison with outbound calls
- Host computer connection requirements, based on the percentage of switch-to-host computer messages

You need to be able to interpret standard deviation to analyze the performance data.

The following performance data is available for host computer-to-switch and switch-to-host computer messages for the specified period:

- The mean transit time of all messages sent or received
- The standard deviation of the transit times of all messages sent or received
- The 95th percentile transit time of all messages sent or received
- The 99th percentile transit time of all messages sent or received
- The number of messages received by CallPath SwitchServer/2 from the host computer and switch

Note: The transit time referred to is the time taken by CallPath SwitchServer/2 to process the messages, given in milliseconds (ms).

At the end of each performance counting period, CallPath SwitchServer/2 saves the collected performance data to the performance data buffer. You can transfer the collected data from the buffer to a file and browse the file on the screen, print it, or delete it.

3.2 CallPath Server

Many aspects of business operations can be enhanced by integrated voice and data applications capable of handling inbound calls, outbound calls, or a combination of inbound and outbound calls. Existing business applications can be enhanced and new applications can be created for virtually all industries. The following list describes how various industries can use integrated voice and data applications:

- Finance and banking
 - Checking stock prices
 - Transferring funds between accounts
 - Ordering checkbooks and statements
 - Inquiring about accounts (for example, the account balance and the last six transactions)
- Insurance
 - Checking the status of claims
 - Verifying insurance coverage
- Retail
 - Inquiring about charge card accounts
 - Placing catalog orders
 - Checking the status of orders
- Education
 - Describing courses
 - Checking class availability
 - Registering students
- Travel
 - Checking flight schedules
 - Checking flight status and availability
 - Ordering tickets
 - Inquiring about account balances for frequent travelers
- Repair and maintenance services
 - Routing calls for information and repairs
 - Verifying customers' accounts
 - Tracking outside technicians

The following sections describe benefits that provide a clear competitive advantage to businesses that implement CallPath Server.

3.2.1.1 Improving Customer Service

Often, Call Centers are overloaded with phone calls, with customers having to wait for an available agent, answer a long list of trivial questions before the real purpose of the call is addressed. Sometimes callers are transferred to many different departments before reaching someone who can assist them. This type of service results not only in errors and inconsistencies in data entry and information relayed to a caller, but also to unhappy customers and lost time and profits.

CallPath Server can improve customer service in the following ways:

- Offering a faster, more personalized service based on ANI, DNIS, UUI, and VPS input
- Minimizing time spent gathering information from a caller through the use of ANI, DNIS, UUI, VPS, and, where supported, program data
- Providing a higher degree of accuracy (computer-assisted dialing and data entry)
- Retaining customer information (avoiding the need to request or repeat information when transferred to another agent)

3.2.1.2 Reducing Costs

In a Call Center with a high volume of phone calls each day, it takes many agents to handle these calls efficiently. Callers have to wait for an available agent, which increases costs to the customer, and can be a potential loss of business for you due to abandoned calls and unhappy customers.

CallPath Server can reduce costs by the following:

- Shortening the length, duration, and cost of the average call
- Having agents available to handle inbound or outbound calls based on immediate call loads
- Using ACD to transfer calls between locations, balance the call load, and reduce personnel costs
- Retaining current business and potential business opportunities by reducing the number of calls that are abandoned
- Reducing bad debts (for example, by immediately routing an inbound order-entry call placed by a known delinquent customer to collections and then back to order entry)
- Reducing telephone trunking costs

3.2.1.3 Increasing Revenue

CallPath Server can increase revenues in the following ways:

- Calling more customers and selling more items in a given time period
- Selling to inbound callers using ANI and DNIS input and computer database information
- By using ANI, automating the callback of inbound abandoned calls and outbound calls that were unanswered or received a busy signal
- Improving company image

3.2.1.4 Increasing Agent Productivity

With CallPath Server, agent productivity is increased because of the following:

- Agents are able to handle more calls in a given time period
 - Caller and application identification and security verification are performed using ANI and DNIS.
 - Agents avoid the need to request or repeat caller information that has been transferred from another agent.
 - Initial customer information that is available in the database is displayed when the agent takes the call.
 - Outbound calls can be handled “hands-free” using on-hook dialing.
 - Unanswered calls and calls that received a busy signal are automatically rescheduled for callback.
- Calls handled yield greater results
 - Specialized and personalized customer greetings are offered based on ANI, DNIS, UUI, VPS, and, where supported, program data.
 - Inbound abandoned calls and outbound calls that were unanswered or received a busy signal are automatically scheduled for callback.
 - Scripts are computer-generated based on ANI, DNIS, UUI, VPS, and, where supported, program data input.

3.2.1.5 Enhancing Information for Call Center Managers

Switches can record basic call statistics, but applications can provide more useful information for management by relating the call data to information about the business generated from the calls, as well as the productivity of the Call Center agents. Information can be collected to produce the following statistics:

- Call flows: what happens to calls from beginning to end
- Problem areas: for example, whether callers are transferred too often
- Caller/agent interaction: information about what transpired over the course of a call, the duration of the call, and whether the caller had to be placed on hold
- Abandoned call information: information about the callers who hung up before being connected to an agent
- Call length to revenue correlation: whether longer calls generate more revenue/collections
- Security control: information about attempts to log on to the system with an unauthorized password

3.2.1.6 Protecting Your Investment

CallPath Server and the CallPath family of products implement a long-term strategy for integrated voice and data application programs. CallPath Server supports the CallPath Services Architecture and is functionally consistent with the other CallPath API implementations. This consistency allows customers and application program developers to capitalize on their skills and application program designs across operating systems. It also provides transparency to the underlying communications and switch protocols.

A company has already made a sizeable investment in its voice system, as well as the application programs and data existing on its computer system. With

CallPath Server, a company can build on and get a faster return on that investment, and offer faster, more efficient service to its clients.

3.2.2 CallPath Server Environment

CallPath Server is an application program enabler that operates either in the OS/2 operating system environment or the AIX operating system environment on the RISC System/6000. CallPath Server implements the IBM CallPath Services Architecture (CSA), a framework for integrating call-processing functions with existing and new data processing applications.

3.2.2.1 CallPath Server to Switch Communications

CallPath Server communicates with a switch through switch protocol mappings in one of the following ways:

- For some IBM supported switches, the CallPath Server computer can communicate with the switch through a local connection. A local connection is a direct, physical attachment between CallPath Server and a supported switch.
- For all IBM supported switches, the CallPath Server computer can communicate with the switch through a remote connection. A remote connection requires CallPath SwitchServer/2 for CallPath Server-to-switch communications.

Communications between CallPath Server and CallPath SwitchServer/2 is through Systems Network Architecture (SNA) logical unit 6.2 (LU 6.2) protocols, which are called advanced program-to-program communications (APPC), on either a Token-Ring or Ethernet local area network (LAN).

- For original equipment manufacturer (OEM) supported switches, the CallPath Server computer communicates with the switch through an OEM gateway. See your OEM representative for more information.

Appendix A, "CallPath Server Supported PBXs" on page 185 identifies the switches and switch connections supported by CallPath Server/2 and AIX CallPath Server/6000.

3.2.2.2 Application Program to Switch Communications

Application programs communicate indirectly with the switch through the CallPath Server subsystem. Although there are many call types (outgoing, incoming, transfer, conference, hold, and so on), they all involve the following base processes:

For outgoing calls

- Call initialization between the application program and the CallPath Server subsystem to identify the program making the call request and the resources involved
- Program call requests sent by the application program to the CallPath Server subsystem
- Verification of program call requests by the CallPath Server subsystem and return codes sent back to the application program
- Call establishment requests sent from the CallPath Server subsystem to the switch for valid application program call requests
- Call status messages sent from the switch to the CallPath Server subsystem

- Call status messages passed to the application program from the CallPath Server subsystem

For incoming calls

- Call initialization between the application program and the CallPath Server subsystem to identify the program awaiting incoming calls and the resources involved
- Alert messages from the switch to the CallPath Server subsystem when an incoming call associated with the application program is detected
- Alert messages passed from the CallPath Server subsystem to the application program
- Receive program calls sent from the application program to the CallPath Server subsystem in response to alert messages
- Answer call requests sent from the CallPath Server subsystem to the switch

See *CallPath Developer's Toolkit Programmer's Guide and Reference*, SC31-6243 for a more detailed description of the communications between an application program and a switch for the various call types.

3.2.3 Example Environments

CallPath Server can operate in a variety of environments. The figures on the following pages illustrate just three of the possible environments.

3.2.3.1 CallPath Server/2 in a CallCoordinator Environment

To avoid initial application program development, CallPath Server/2 can be implemented with CallCoordinator workstation products. CallCoordinator products provide predefined business voice/data applications for OS/2- and Windows-based clients, as shown in Figure 7 on page 72.

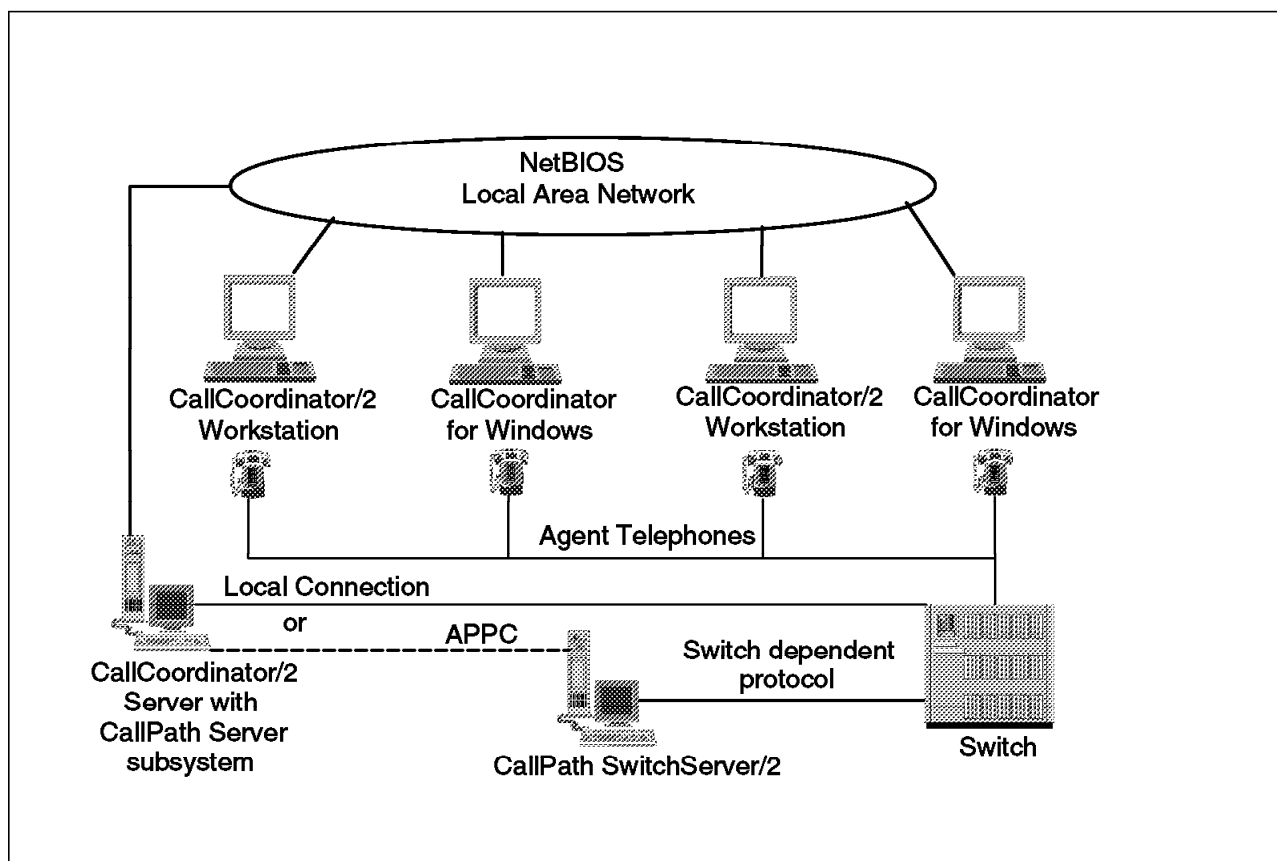


Figure 7. CallPath Server/2 in a Network with CallCoordinator Workstations

3.2.3.2 Single AIX CallPath Server/6000

AIX CallPath Server/6000 can operate with a single RISC System/6000, as shown in Figure 8 on page 73.

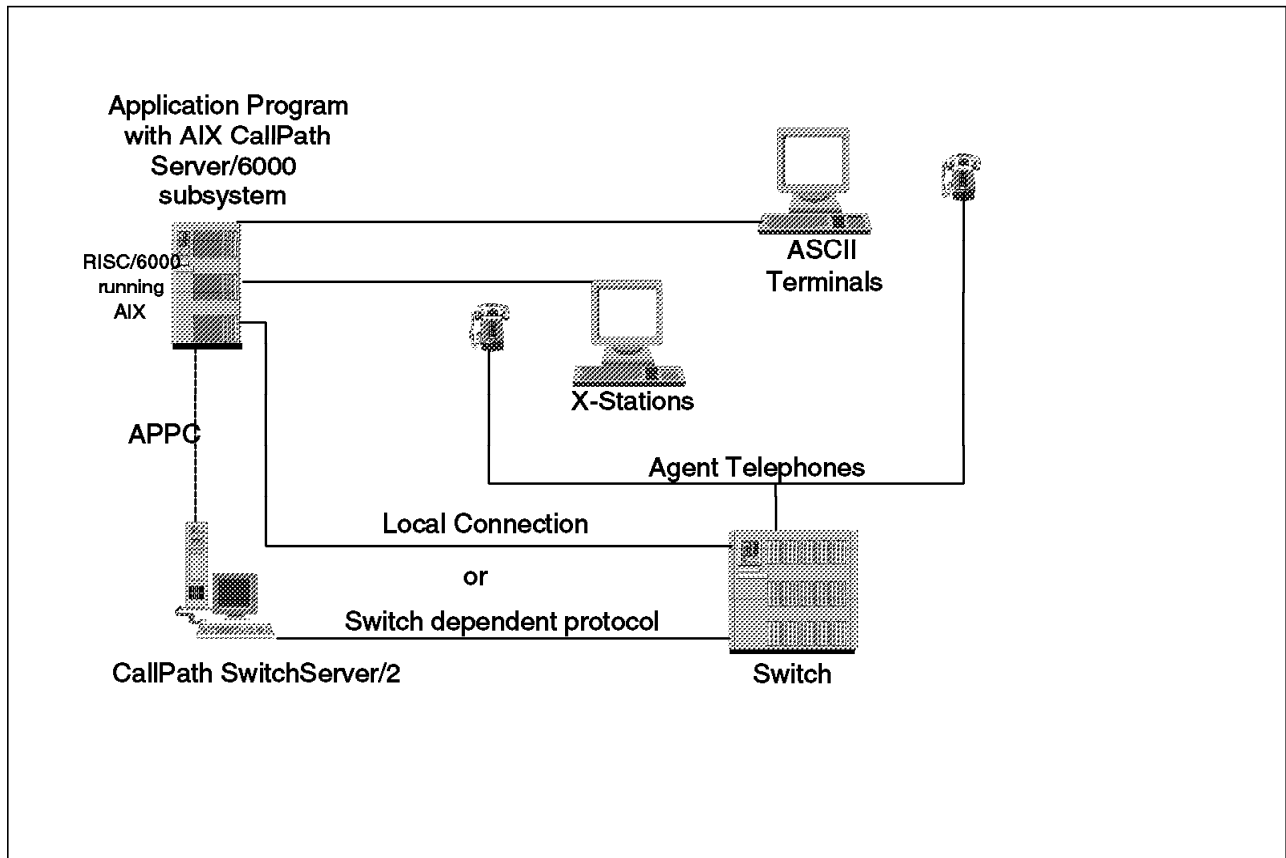


Figure 8. Single AIX CallPath Server/6000 Environment

3.2.3.3 Multiple Clients Environment

Using a TCP/IP LAN with CallPath Server, agents can work with a variety of computer environments, as shown in Figure 9 on page 74.

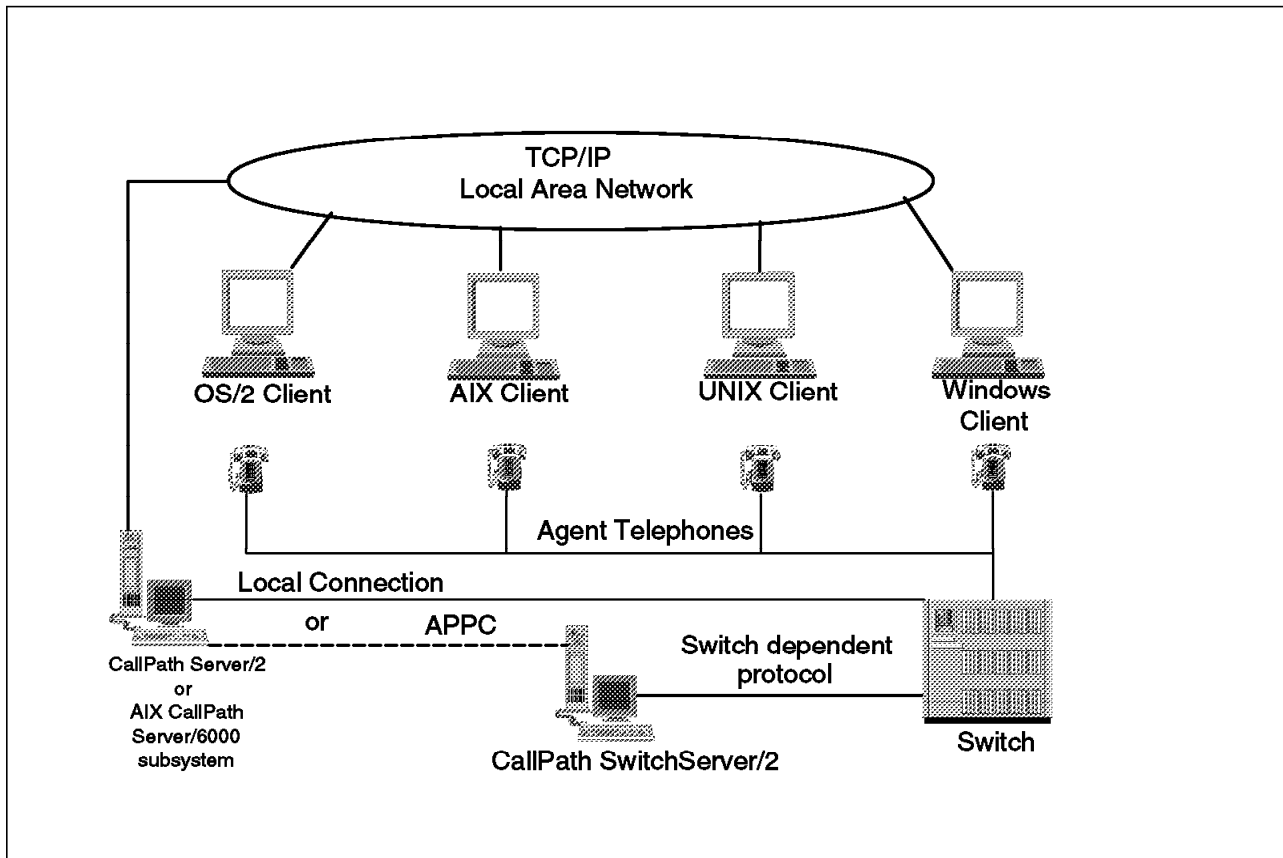


Figure 9. CallPath Server with Multiple Clients in a TCP/IP Local Area Network

3.2.3.4 Logical Components of CallPath Server

The logical components of CallPath Server include the following:

- API for business applications to facilitate computer-to-switch communications.

The API provides access to a wide range of program calls (requests from an application program for telephony functions) and telephony messages (sent, for example, by the switch to the application). 'C' program functions providing RPC support enable clients in TCP/IP networks to access application programs running on the CallPath Server or client application programs.

- Software telephony subsystem that provides the underlying services in support of the API and the following:
 - Local connections to selected switches
 - Interface with CallPath SwitchServer/2, an OEM gateway, or both, if a direct connection to a switch is not supported
- System Management functions.
- Installation utility.

3.2.3.5 Application Program Interface (API)

The CallPath Server API enables application programs in the client environments to communicate with, and access services provided by, an attached switch. The API enables a broad set of telephony functions, including the following:

- Computer-assisted dialing of outbound telephone calls
- Intelligent answering of inbound telephone calls
- Redirecting inbound telephone calls at the request of the application program
- Application program management of existing telephone calls, such as transferring an existing call or data to another party
- Application program monitoring of the progress of telephone calls and associated events
- Specifying data to be associated with a telephone call until a party answers the call
- Listing all parties involved in telephone calls in party structures for application program use
- Enabling Remote Procedure Call (RPC) and distributed function

The CallPath Server API is functionally consistent with other CallPath Services API implementations. By using the CallPath Server API, application programs are shielded from telephone system-specific formats and protocols.

3.2.3.6 CallPath Server Subsystem

The CallPath Server Subsystem is a set of programs that provides support for both the requests initiated by the application program and the management of messages received from the switch. It provides the application program access, by way of the API, to telephony functions provided by the switch while shielding the application program from the details of the formats and protocols required by that switch.

This shielding is made possible by the CallPath Server implementation of the CSA. Since several switch manufacturers have already defined different formats and protocols for their switch computer links, shielding is an important service provided by the subsystem. The subsystem allows an application program developer to learn only the API while deriving the benefits of access to multiple switch implementations.

Just as the CallPath Server Subsystem shields the application program from the details of the network- and switch-specific protocols, it shields the application program from the underlying communications transport protocols utilized for the exchange of messages between the CallPath Server Subsystem and the switch.

This allows the application programmer to concentrate on the use of the architected telephony functions without regard to how those functions are communicated to the switch.

3.2.3.7 System Management Functions

The CallPath Server Management Facility provides administration functions to do the following:

- Configure and manage CallPath Server
- Configure and manage switch connections
- Set up and manage traces and the resulting log files for the following:
 - Error messages
 - Application program messages
 - Switch messages
- Access the CallPath Developer's Toolkit and CallPath API Test Utility
- Start and stop links to network management facilities

3.2.4 CallPath Server Features

This section describes CallPath Server installation features, system features, return codes, configuration requirements, and security considerations.

3.2.4.1 Installing CallPath Server

The Installation Utility installs CallPath Server on a PC or compatible computer, or on a RISC System/6000. It makes the necessary subdirectories and copies the program files from the distribution package diskettes.

The Installation Utility also provides an "uninstall" option to remove installed CallPath Server programs and files.

3.2.4.2 Operating Systems

Installation of the server operating system is a prerequisite for the successful installation of CallPath Server. (For more details, see your operating system manuals.)

3.2.4.3 Distribution Package Contents

When you install CallPath Server, the Installation Utility lets you install separately licensed products from the following distribution packages:

- CallPath Server
- CallPath Developer's Toolkit

3.2.4.4 CallPath Server Distribution Package

The CallPath Server distribution package contains the following:

- Program libraries, which provide the CallPath Server capabilities to application programs
- Installation Utility
- CallPath Server Management Facility:
 - Subsystem Administration, which starts, stops, and monitors CallPath Server and switch connections
 - Configuration, which sets up CallPath Server and switch parameters
 - Log and Trace Facility, which manages the Error Log Facility and tracing for locally connected switches and for user application programs

- *CallPath Server Planning, Installation, and Problem Determination Guide*, SC31-6242
- For locally connected switches (if specified at order time):
 - Switch-dependent feature code executables (switch protocol mappings) for your switch
 - Switch reference guide for your switch

3.2.4.5 CallPath Developer's Toolkit Distribution Package

The CallPath Developer's Toolkit distribution package contains the following:

- Example code, which contains source code examples showing how to invoke the functions of the program libraries
- CallPath API Test Utility, which assists developers in testing their application programs and demonstrating the functions of the program libraries
- API support libraries and Include files, which are required to compile and link application programs
- *CallPath Developer's Toolkit Programming Guide and Reference*

Note: The CallPath Developer's Toolkit distribution package requires the CallPath Server distribution package as a prerequisite.

3.2.5 System Features

CallPath Server includes the following to install, test, and maintain CallPath Server operations:

- Program libraries
- CallPath Server Management Facility

3.2.5.1 Program Libraries

The CallPath Server program libraries consist of executable files that provide a general-use program interface intended for customers. The program libraries can serve multiple application programs simultaneously and enable application programs to access the CSA program calls and messages. If a telephony system does not support a documented feature of the CSA, messages are sent to the application program indicating that a requested function is unavailable.

3.2.5.2 CallPath Server Management Facility

Once CallPath Server is installed, the CallPath Server Management Facility provides Subsystem Administration that supports CallPath Server functions and switch connection functions. It also provides a Configuration Utility for CallPath Server switch parameters, and a Log and Trace Facility. The following are the facilities included with the CallPath Server Management Facility:

- CallPath Server Error Log and Trace Facilities
- CallPath Server Subsystem Administration
- CallPath Server Configuration
- CallPath Server Utilities
- CallPath Server Help Facility

CallPath Server Log and Trace Facility: The CallPath Server Log and Trace Facility manages the error log and turns on tracing of switches and application programs. The following options are available for the CallPath Server Log and Trace Facility:

- Error Log Facility, which monitors concurrent CallPath Server errors and enables management (view, copy, or delete) of the archived error log files
- CallPath Server Application Tracing, which traces user application programs and enables management (view, copy, or delete) of the trace files
- Local Switch Tracing, which traces CallPath Server and switch messages and enables management (view, copy, or delete) of the trace files

CallPath Server Subsystem Administration: Through CallPath Server Subsystem Administration, the following administrative options are available for CallPath Server functions and switch connection functions:

- Start CallPath Server Subsystem
- Shut down CallPath Server Subsystem
- Start switch communications
- Stop switch communications
- Show status of CallPath Server
- Maintain user passwords
- Start Simple Network Management Protocol (SNMP) communications
- Stop SNMP communications

CallPath Server Configuration: CallPath Server Configuration provides a means of configuring CallPath Server and switch parameters. CallPath Server Configuration provides the following options:

- CallPath Server Configuration modifies CallPath Server parameters for application programs accessing CallPath Server
- CallPath Server Switch Parameter Configuration:
 - For local switch connections, sets parameters for CallPath Server-to-switch communications
 - For remote switch connections, sets parameters for CallPath Server communication with CallPath SwitchServer/2
- CallPath Server backup: backs up configuration information
- CallPath Server restore: restores configuration information from a previous backup

CallPath Server Utilities: CallPath Server Utilities provide the following option to help detect and resolve problems with applications or switches:

- Monitor system trace function displays system messages, application messages, and messages to and from a locally connected switch as they occur. This function also allows you to filter these messages, which can be particularly useful for program diagnosis.

CallPath Server Help Facility: The CallPath Server Help Facility provides access to a menu of help topics to assist you in using the CallPath Server Management Facility interface.

3.2.5.3 CallPath Developer's Toolkit Features

The CallPath Developer's Toolkit includes the following to help you develop your own telephony applications for use with CallPath Server:

- API libraries
- CallPath API Test Utility
- Example code

API Libraries: The API support libraries and Include files are required to compile and link application programs written in C language for use on CallPath Server or supported clients.

CallPath API Test Utility: The CallPath API Test Utility is an application that enables developers to test program calls, one at a time, before using a call in new application programs. It helps developers understand exactly how each program call operates by enabling them to sample a CallPath Server function by invoking program calls using requests sent through the graphical user interface (GUI).

Example Code: The example code is intended to be instructive in the methods of creating or writing application programs using CallPath Server. The example code demonstrates how to invoke and process various CallPath Server requests and messages.

3.2.6 Generating Return Codes

The program libraries generate return codes that can be used by the application program enabled by CallPath Server. See *CallPath Developer's Toolkit Programming Guide and Reference*, SC31-6243 for information on return codes.

3.2.6.1 Detecting Errors

CallPath Server can detect and log the following errors:

- Program errors detected during normal operations
- Link errors between CallPath Server and locally connected switches
- Link errors between CallPath Server and CallPath SwitchServer/2
- Link errors between CallPath Server and other programs
- Application program errors caused by entering invalid data or selecting inappropriate actions

CallPath Server assists in network management through the CallPath Server system error log. CallPath Server will place potential system or application problems into the CallPath Server error log and to the Simple Network Management Protocol (SNMP) network management focal point for processing by applications supporting the SNMP. Key operational data can be viewed from a centralized network management control point, such as Netview for AIX.

3.2.6.2 Diagnosing Errors

For diagnostic operations, CallPath Server relies on the CallPath Server Subsystem Administration, as well as on the operating system, to examine the communication link between CallPath Server and the attached switch. The CallPath API Test Utility helps developers detect errors between CallPath Server and application programs.

3.2.6.3 Finding Diagnostic Information

You can find diagnostic information in the *CallPath Server Planning, Installation, and Problem Determination Guide*, SC31-6242. This guide explains error messages generated by CallPath Server and shows how to use the CallPath Server Log and Trace Facility for problem determination. It also explains error messages from the program libraries. Switch-specific messages are addressed in the switch reference guides.

3.3 CallPath/400 Features

- **All AS/400 Programming Languages Supported**

CallPath/400 can be integrated into AS/400 business applications using any of the AS/400 programming languages (Control Language (CL), C/400, RPG/400, Pascal, COBOL/400, PL/1)

- **Call Detail Record (CDR) Collection**

Call Detail Record (CDR) collection is a CallPath/400 function that will collect, validate, and format call detail information and System Management Detail Records (SMDRs) as received from a telephone switch. A business operation's efficiency can be tracked and specific business transactions and call activity can be compared. You can create and customize reports based on CDR information such as the date, time, and duration of a call.

- **Alarm Collection**

Alarms are events that describe telephone switch problem conditions and network failures. They are reported to the AS/400 system from the telephone switch. The alarm management capability enables centralized alarm management from a single operator message queue by consolidating telephone switch problem data with AS/400 system hardware and software alerts. With the CallPath/400 program, an alert message is issued to the AS/400 system operator message queue when a telephone system alarm is received by the AS/400 system.

Alarm alerts are optionally converted to System Network Architecture (SNA) network management alerts and sent to an SNA focal point network management node such as AS/400 systems management utilities or NetView. The CallPath/400 alarm management capability enables central site management of multiple telephone switch and computer system locations (when supported by the telephone switches).

- **Administration Facilities**

CallPath/400 provides facilities for installing and servicing the CallPath/400 program. Subsystem support is also provided.

- **Multiple Sample Application Programs**

The *CallPath/400 Programmer's Reference*, SC33-1366 contains example programs that use the various functions of the CallPath/400 program. Examples are given for program calls with the Control Language (CL), C/400, RPG/400 and Pascal languages supported on the AS/400 system.

- **CallPath/400 Program Toolkit**

CallPath/400 provides a toolkit of helpful programs to facilitate the development of CallPath/400 applications. Included is a program to verify that the CallPath/400 program has been installed correctly and that the

communications path to the switch is working so that requests and messages flow between the AS/400 and the switch.

- **CallPath/400 Diagnostic Aids**

The *CallPath/400 Programmer's Reference*, SC33-1366 explains how to use trace data to diagnose problems at the CallPath/400 API layer. Also provided is an example of trace job output and detailed explanations of trace information.

3.4 CallPath CICS Features

CallPath CICS/MVS and VSE provide more than just the implementation of the CallPath Services API and telephony subsystem. The products also include administration facilities which are necessary to maintain and manage the systems as well as tools to assist the developer during the design, implementation and testing of applications that utilize CallPath Services Architecture.

The administration facilities provide menus to turn CallPath CICS on and off, allow you to define each participating telephone system, monitor system status, start and stop various traces and collect traffic measurements.

The installation verification program is used to ensure that all host components related to CallPath CICS are properly installed and working.

A sample program is also included. While not a practical application, the program demonstrates by example how to code the most commonly used functions a customer might integrate into their application.

In order to expedite the development of integrated voice and data solutions, a switch simulator is also provided. The simulator allows you to modify your current applications and create new applications under CallPath CICS without the need for CallPath SwitchServer/2 or a telephone system to be connected. Additionally the simulator can be used to test application development activities before moving to your production system.

These tools are provided to make it quick and easy for you to implement integrated voice and data solutions.

3.5 CallCoordinator Benefits

In this section we discuss the benefits and features of CallPath CallCoordinator/2 and CallPath CallCoordinator for Windows. We refer to both products simply as CallCoordinator.

CallCoordinator can be used in most Call Center environments to improve customer service, increase the productivity of service representatives, and provide for growth of your business.

3.5.1.1 Improving Service to Call Center Customers

- Service representatives respond to each call more quickly.
- Service representatives are more readily available.
- Communication errors between service representatives and callers are reduced.
- When accessing host computer applications, data entry errors are reduced.

3.5.1.2 Increasing the Productivity of Service Representatives

- Time spent gathering information from a caller is minimized.
- Simultaneous access to multiple host computer applications is provided.
- Programmable QuickKeys for complex operations are available.
- Outbound calling assistance is provided.
- There is smooth integration of telephony data and other applications running on the service representative's workstation.

3.5.1.3 Providing for Growth of Your Business

- Existing host computer applications are accessed, normally without modification.
- The Call Center can easily expand as business grows.
- Workstations can be tailored to the needs of the individual service representative.
- Complementary products, such as VRUs, can be utilized.

Note: CallCoordinator for Windows requires at least one CallCoordinator/2 license to implement a VRU application.

- CallCoordinator/2 conforms to standards such as CallPath Services Architecture and CUA.

These benefits provide a clear, competitive advantage as well as cost savings to the Call Center using CallCoordinator.

3.5.2 CallCoordinator Features

IBM offers Server and Archive features to use with CallCoordinator. These OS/2-based programs enhance CallCoordinator's base functions and enable maximum flexibility in purchasing and configuring CallCoordinator.

Note: The Server feature is required when using CallCoordinator for Windows. It is required for CallCoordinator/2 if ACD queues are implemented.

3.5.2.1 CallCoordinator/2 Server

The CallCoordinator/2 Server coordinates voice and data transfers between service representatives when calls are transferred to ACD queues. During these transfers, the Server ensures that the data associated with the call is routed to the OS/2 workstation.

The Server also streamlines the handling of calls in large Call Centers by centralizing communication to the switch onto a single OS/2 workstation using CallPath/2 MultiAgent. Since one CallCoordinator/2 Server controls all telephony functions, it helps large Call Centers reduce costs by eliminating the need for additional servers.

3.5.2.2 CallCoordinator/2 Archive

The CallCoordinator/2 Archive collects data about each service representative's telephone line and stores the information using OS/2 Database Manager. The archive records data for the following types of transactions:

- Incoming calls
- Connected calls
- Disconnected calls
- Transferred calls
- Conferenced calls
- Holding calls
- Failed calls

Archive recording of these transactions can be selective at the discretion of the system administrator. The archive can be tailored to add transaction information to the database and associate the information with a particular call.

Using OS/2 Query Manager, the Call Center supervisor can access database information to generate reports about specific aspects of Call Center activity, such as:

- Productivity
- Maintenance
- Sales

A sample archive report is shown in Table 1 on page 84.

Table 1. Typical Archive Report

DAILY EVENT REPORT FOR: STEVE MILLER PERIOD: 11.17.96						
<u>EXTENSN</u>	<u>TIME</u>	<u>DATE</u>	<u>ANI</u>	<u>ACTION</u>	<u>CUSTOMER</u>	<u>ORDER AMT</u>
9876	14:15:03	11/17/96	3015551212	RINGING	-	-
9876	14:15:03	11/17/96	3015551212	CONNECTED	-	-
9876	14:15:03	11/17/96	3015551212	USER_DATA	ABC, INC	-
9876	14:15:03	11/17/96	3015551212	USER_DATA	-	10,900.00
9876	14:18:22	11/17/96	3015551212	HELD	-	-
9876	14:20:19	11/17/96	3015551212	TRANSFERRED	-	-
9876	14:20:19	11/17/96	3015551212	DISCONNECTED	-	-
9876	14:22:32	11/17/96	2025554444	RINGING	-	-
9876	14:22:32	11/17/96	2025554444	CONNECTED	-	-
9876	14:22:32	11/17/96	2025554444	USER_DATA	XYZ CORP	-
9876	14:22:32	11/17/96	2025554444	USER_DATA	-	1,425.75
9876	14:27:44	11/17/96	2025554444	DISCONNECTED	-	-
9876	14:29:32	11/17/96	7035554321	RINGING	-	-
9876	14:29:35	11/17/96	7035554321	CONNECTED	-	-
9876	14:32:35	11/17/96	7035554321	DISCONNECTED	-	-
11-21-1996 10:36:08						
PAGE(1)						

3.5.3 CallCoordinator Telephony Functions

CallCoordinator/2 can operate in a window on the workstation screen. If desired, the top portion of the screen can contain a window running a host computer application, while the CallCoordinator/2 window is displayed in the lower portion of the screen. The size of the windows can be adjusted according to individual needs. The CallCoordinator/2 window can also be reduced to an icon.

In addition to providing intelligent answering using ANI and DNIS, CallCoordinator offers the following telephony functions:

- Answering a call
- Holding/reconnecting a call
- Consulting/transferring a call
- Setting up a conference call
- Dialing a call
- Disconnecting a call
- Logging on and off the ACD queue
- Forwarding data associated with a call that is transferred from an ACD queue when the available agent does not answer

These functions enable the service representative to maintain focus on the CallCoordinator workstation without switching between the workstation and the telephone.

CallCoordinator for Windows provides a Call Log feature, which enables service representatives to track their incoming, outgoing, and missed calls. For more information about the Call Log feature, and for illustrations of the CallCoordinator for Windows windows, see *CallPath CallCoordinator for Windows User's Guide*, SC31-6255.

Make sure that your telephone switch and phones support the functions you want to use. Not all functions are supported on all switches. See your switch reference manual for detailed information on the functions that are supported.

3.5.3.1 Intelligent Answering

CallCoordinator uses telephony data from an incoming call or data gathered from a VRU to access customer information stored on a host computer. (CallCoordinator for Windows requires at least one CallCoordinator/2 workstation license for VRU applications.) This intelligent answering function enables customer information to be displayed automatically on the CallCoordinator screen as the telephone rings.

For example, when a telephone call is received by a CallCoordinator workstation, CallCoordinator can use the calling phone number (ANI) to access the customer information in a host application. The customer's data is displayed on the screen as the call arrives.

The business database access is controlled through HAT files. Based on data received from the switch or a VRU, CallCoordinator selects and executes one of the Call tables in the HAT file. The Call table may contain instructions to select one of the host computer sessions, move through application program screens, enter data into specific fields, and access data to be displayed on the customer's

main application in the CallCoordinator window. All of this occurs so rapidly that the customer information can be displayed as the call arrives at the service representative's telephone.

3.5.3.2 Answering Calls

CallCoordinator enables a service representative to answer incoming calls without using the telephone. By using the Answer window shown in Figure 10, the service representative can respond to calls on several lines. Selecting the Answer push button connects the service representative's headset to the selected line.

Note: CallCoordinator/2 and CallCoordinator for Windows provide similar telephony functions. For example, each one enables you to answer and transfer calls. However, the actual screens in each solution differ in appearance. Throughout the rest of this section, CallCoordinator/2 and CallCoordinator for Windows screens are shown to illustrate the telephony capability in CallCoordinator.

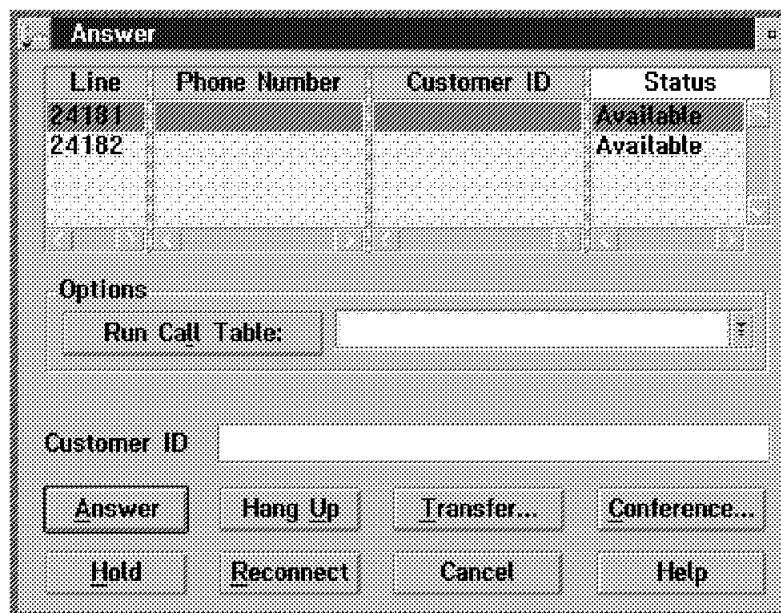


Figure 10. CallCoordinator/2 Answer Window

The Hold and Reconnect push buttons enable the service representative to place a line on hold or release the line from the hold state. Selecting the Hang Up push button is similar to hanging up a conventional telephone. The service representative can also request transfers and conferences from this window.

3.5.3.3 Dialing Calls

The Dial windows shown in Figure 11 on page 87, Figure 12 on page 87, and Figure 13 on page 88 are used for dialing calls.

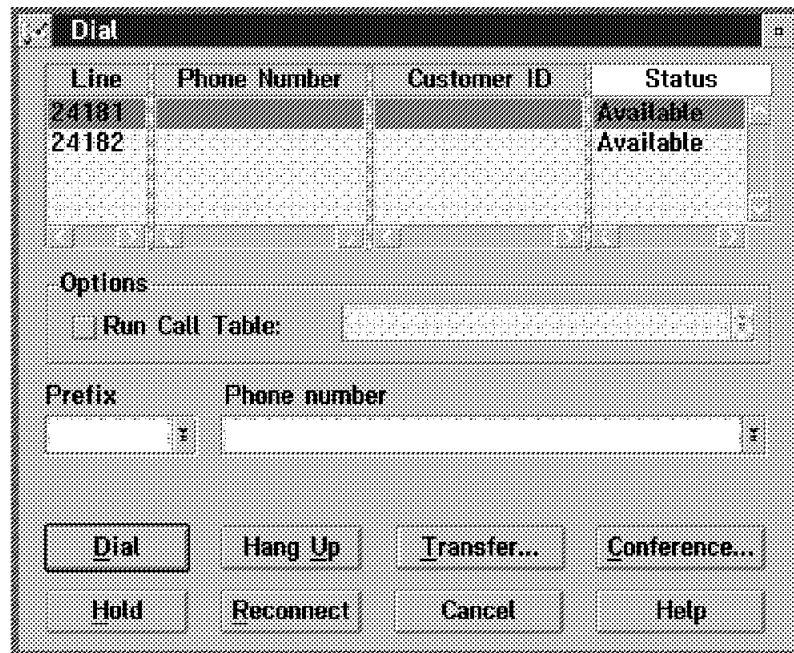


Figure 11. CallCoordinator/2 Dial Window

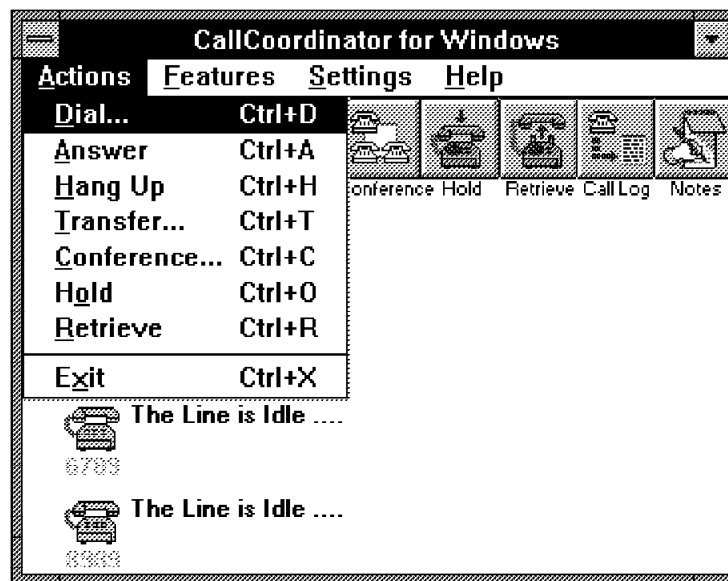


Figure 12. CallCoordinator for Windows First Dial Window

CCWin Dial Pad			
Actions		Directory	HAT Help
Dial Prefix		Personal Directory	
Search for :			
1	2	3	
4	5	6	
7	8	9	
*	0	#	
Dial	Cancel		

Carter David	405-555-1234	Pres, Emerald T
Greene Ellen	201-555-1234	Owner, Greene
Jarman Ben	405-555-2234	Purchasing Mgr.
Lyman Jerry	908-555-1234	Buyer, City Tran
Pillmann William	202-555-1234	Pillman and Son
Randall Steve	404-555-1234	Owner, Camera
Smith Dorothy	919-555-1234	Partner, Eckert
Solarev Ivan	617-555-1234	Owner, Solarev
Trent Paula	718-555-1234	Buyer, NLC Corp
Washburn Cynthia	206-555-1234	Owner, NewDes

Figure 13. CallCoordinator for Windows Second Dial Window

A call can be initiated from this window without using the telephone. First, the phone number is selected from the "Phone number" field drop-down in CallCoordinator/2 or the "Personal Directory" field in CallCoordinator for Windows. These lists contain a CallCoordinator directory⁵. You may scroll through the list to locate, then highlight a number. If "AlphaSearch"⁶ is activated at your location, you can search the directory alphabetically for a number. See *CallPath Coordinator/2 User's Guide*, SC22-0075 for details. The phone number can also be entered manually.

Next, a Call table may be selected to run as the number is dialed, using the selected phone number instead of ANI. This can be used to display a customer profile or transaction history for reference during the call. Finally, selecting the Dial push button makes the call.

3.5.3.4 Transferring Calls

The Consult/Transfer window shown in Figure 14 on page 89 and Figure 15 on page 89 is used to transfer calls internally.

⁵ A CallCoordinator directory is a file containing a list of telephone numbers and names. Directories are easily modified by service representatives.

⁶ "AlphaSearch" is the ability to do a search by using the "alpha" characters on your keyboard. The more characters you enter the more the search is narrowed down.

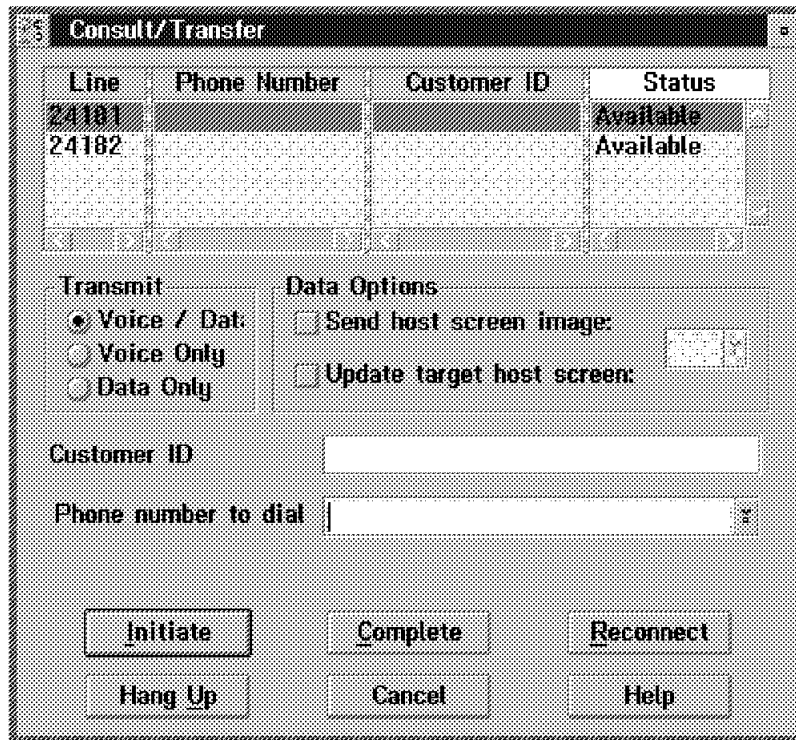


Figure 14. CallCoordinator/2 Consult/Transfer Window

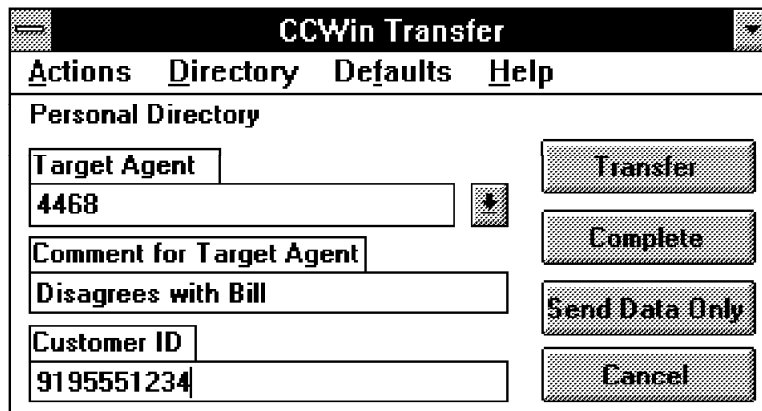


Figure 15. CallCoordinator for Windows Consult/Transfer Window

A call can be initiated from this window without using the telephone. First, the phone number is selected from the "Phone number to dial" drop-down list which contains a CallCoordinator CallCoordinator/2 directory. You can scroll through the list to locate, then highlight a number. If AlphaSearch is activated at your location, you may search the directory alphabetically. See *CallPath CallCoordinator/2 User's Guide*, SC22-0075 for details. The phone number can also be entered manually.

When a call is transferred, the telephony data such as ANI is transferred along with the call, so that the receiving workstation can access the business database. Optionally, a copy (snapshot) of the current application screen can also be sent to the receiving workstation. This coordinated voice and data

transfer provides the receiving service representative with an immediate transaction status.

By selecting the Initiate push button, a service representative can speak with an associate before actually transferring the call. This operation, known as consulting, places the customer on hold until the Complete push button is selected. Calls can also be transferred without consulting by selecting the Complete push button before the other person answers. This is called a blind transfer.

Calls may also be transferred immediately, without prior consultation, using the Immediate Transfer window, which is not shown. When the transfer is made, the originating representative is automatically disconnected from the call.

3.5.3.5 Conferencing Calls

The Conference windows, shown in Figure 16 and Figure 17 on page 91, are used to make conference calls that include the customer.

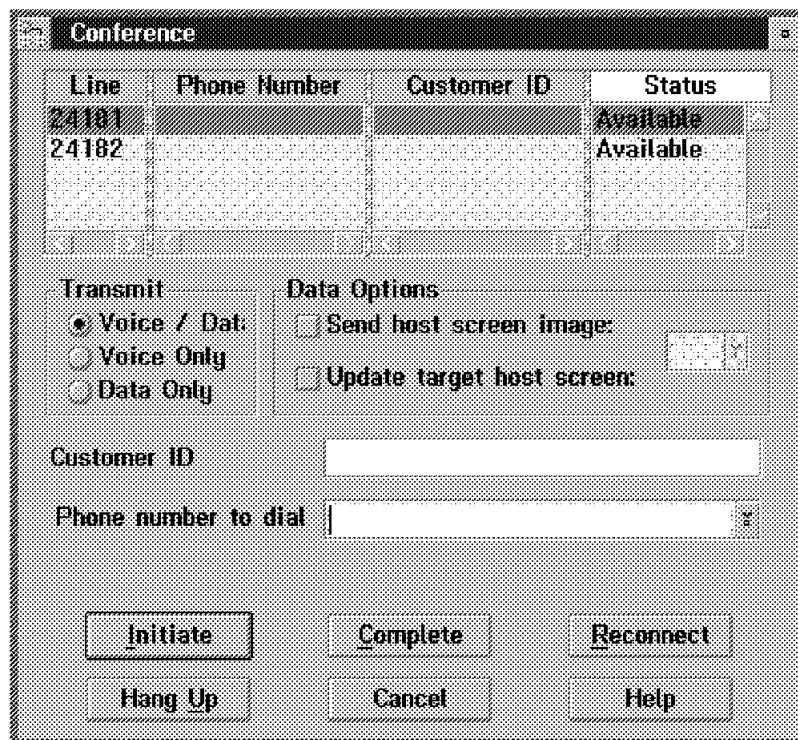


Figure 16. CallCoordinator/2 Conference Window

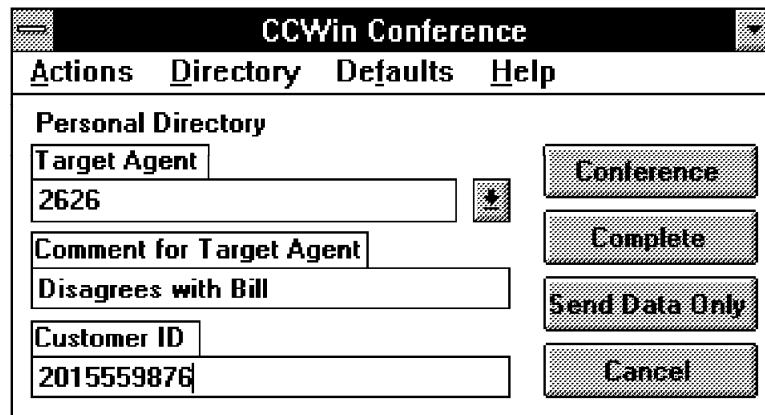


Figure 17. CallCoordinator for Windows Conference Window

Conferencing is similar to transferring a call, except that several service representatives, in addition to the customer, can all be included in the conference.⁷ By selecting the Initiate push button, a service representative can consult with other associates before including the customer in the call. The customer is placed on hold until the Complete push button is selected.

As in transferring a call, conferencing enables coordinated voice and data transfer so that all service representatives in the conference view the same host computer screens.

3.5.4 Automating CallCoordinator Operations

CallCoordinator/2 provides QuickKeys to automate workstation operations. A QuickKey is a combination of the Alt key and another key, such as Alt+Q. A QuickKey executes a complex set of commands that would normally require many keystrokes. Using QuickKeys saves time and helps to eliminate costly keying errors.

For example, if a customer calls to place an order, the service representative can use a QuickKey to automatically enter data onto one host or business database screen, and then move to another screen to place an order.

For CallCoordinator/2 environments, the system administrator can enable QuickKey features without requiring the input focus to remain on the CallCoordinator/2 window. This enables the service representative to implement QuickKeys in any window in which the service representative is working, including the host application window. Figure 18 on page 92, Figure 19 on page 92 and Figure 20 on page 93 show QuickKeys windows with some sample QuickKey definitions. QuickKeys are defined by the system administrator as part of the CallCoordinator configuration process. Because QuickKeys are defined in HAT files, each service representative can have a customized set of QuickKeys.

⁷ The ability to include more than two service representatives in a conference is dependent on the telephone switch. If the telephone switch supports multiparty conferencing, then CallCoordinator/2 enables it also.

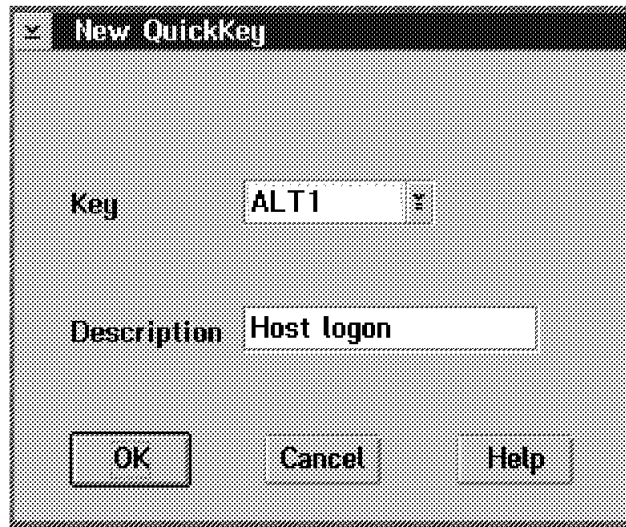


Figure 18. CallCoordinator/2 New QuickKeys Window

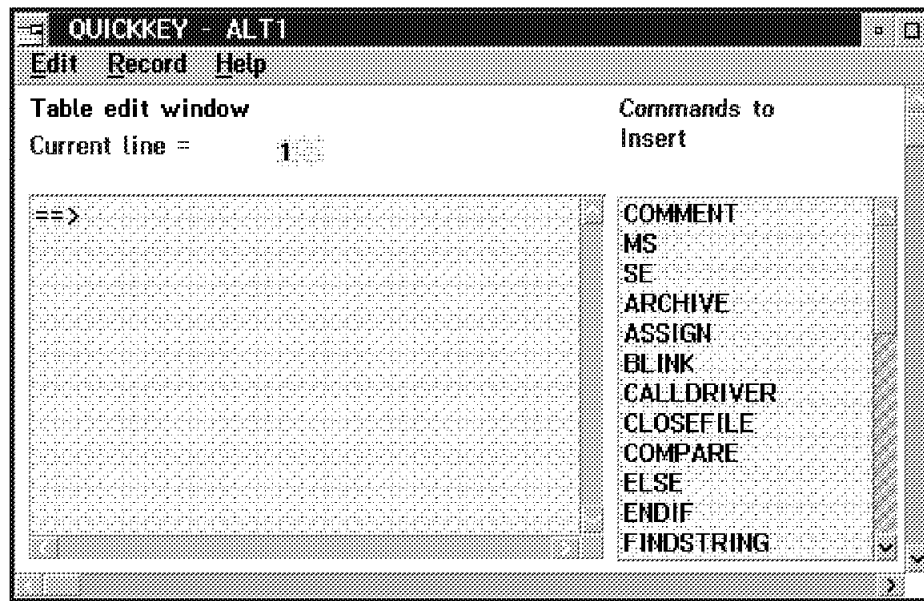


Figure 19. CallCoordinator/2 QuickKeys Table Window

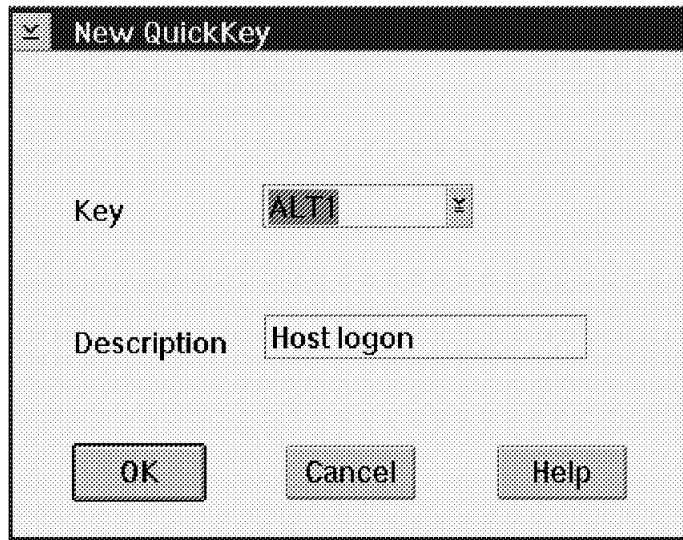


Figure 20. CallCoordinator for Windows New QuickKeys Window

3.5.5 Using CallCoordinator with a Voice Response Unit

As shown in Figure 21 on page 94 and Figure 22 on page 95, CallCoordinator/2 can be configured to operate with VRUs, such as a non-IBM VRU or the IBM DirectTalk/2 Voice Processing System. A VRU can automatically collect customer information and enhance a CallCoordinator/2 installation by:

- Obtaining information from the customer when ANI is not available
- Filtering unwanted or incorrect calls
- Ensuring quick response to customer calls
- Handling routine inquiries without operator assistance
- Directing calls to service representatives, using coordinated voice and data transfer

Note: CallCoordinator for Windows requires at least one CallCoordinator/2 license to implement the application that interfaces with the VRU. See *CallPath CallCoordinator/2 System Administrator's Guide*, SC22-0076 for more information.

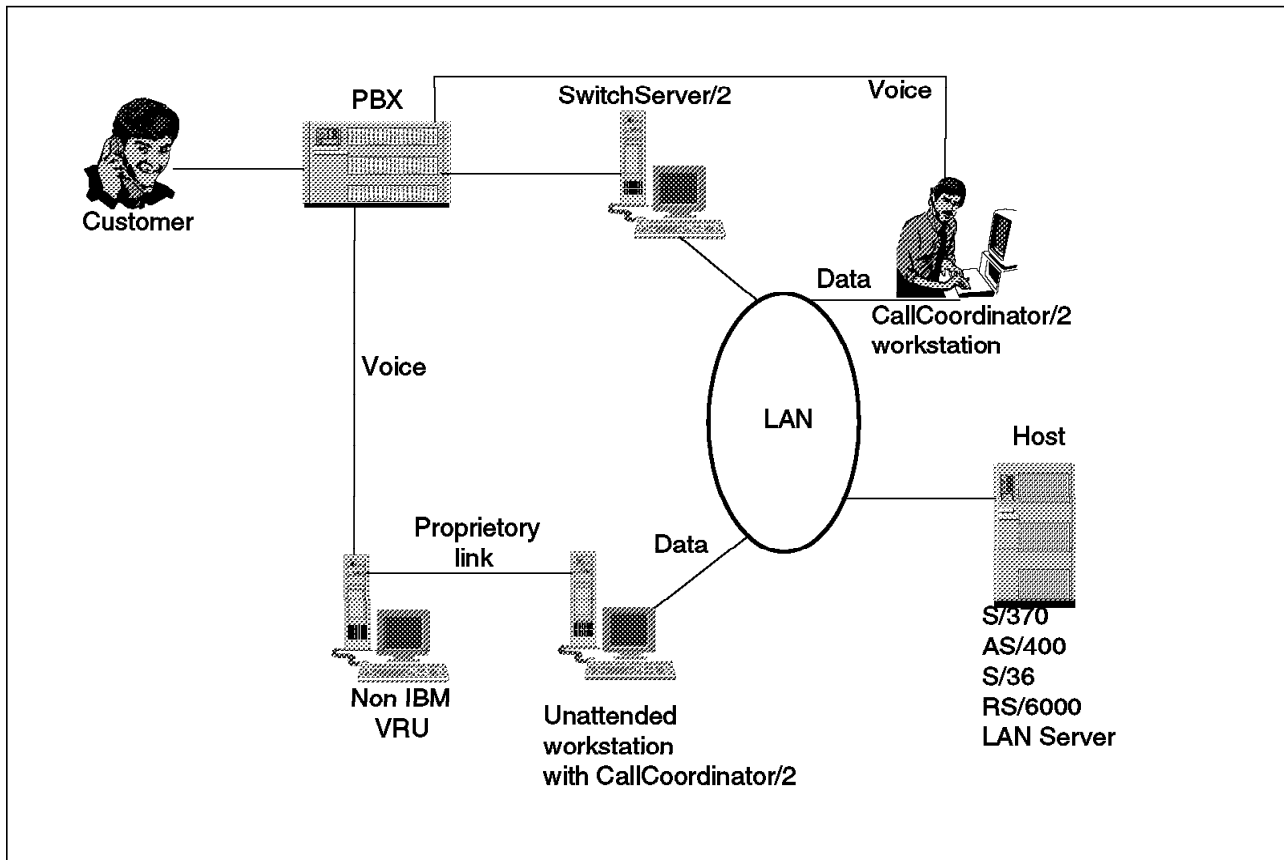


Figure 21. CallCoordinator/2 Used with a Non-IBM Voice Response Unit

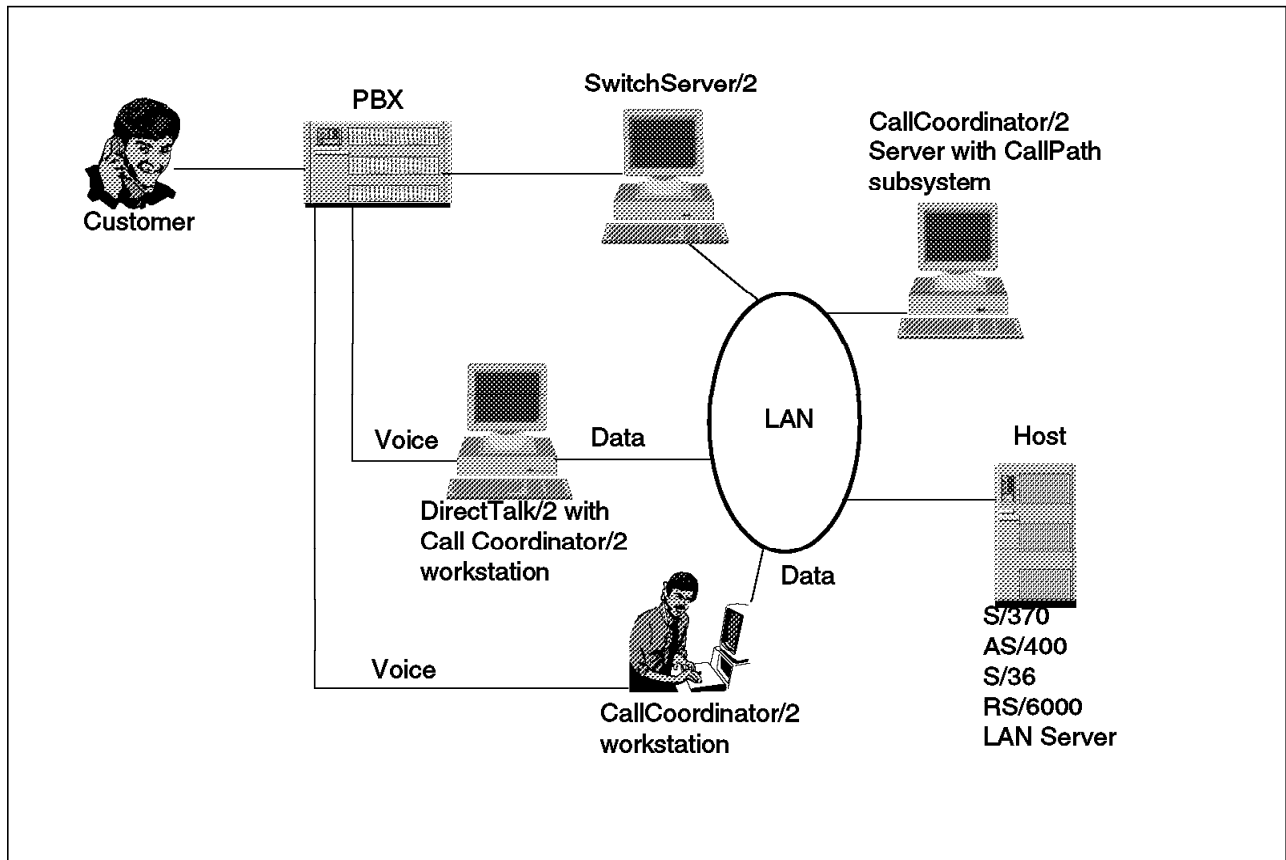


Figure 22. CallCoordinator/2 Used with DirectTalk/2

A VRU can often handle routine calls without the intervention of a service representative. Since most VRUs support multiple telephone lines, several callers can be serviced at the same time. If the VRU supports bidirectional communication, CallCoordinator/2 can receive requests from the VRU and send responses. The VRU emulates the voice of the service representative to gather data from the caller. When the VRU needs information, CallCoordinator/2 emulates the service representative's keystrokes to retrieve data from a host computer. The VRU can then provide this information verbally to the caller. The VRU can also instruct CallCoordinator/2 to update customer data on the host computer, as required.

If a call requires assistance by a service representative, CallCoordinator/2 enables data that the VRU has gathered to be transferred with the call using coordinated voice and data transfer. As the call arrives, the correct business application and customer data are automatically displayed to the service representative. This type of call processing can replace ANI and DNIS, and is recommended for areas where these services are not available.

Where ANI and DNIS are available, CallCoordinator/2 can pass them to a VRU. This can shorten the call, thereby providing an even greater improvement in service.

Where CallCoordinator/2 provides the interface between the VRU and the host computer, the VRU does not need to be programmed for host access. Since CallCoordinator/2 uses HAT files to access host applications, these actions are easily performed by a service representative.

Communication between CallCoordinator/2 and a VRU is handled by device drivers. CallCoordinator/2 includes device drivers for the following VRUs:

- IBM 9270 Voice Response Unit
- IBM 9274 Voice Response Unit
- IBM CallPath DirectTalk/2 Voice Processing System, Versions 1 and 2
- IBM CallPath DirectTalk/6000* Voice Processing System

CallCoordinator/2 provides documentation and samples of device drivers to help system administrators create drivers for VRUs not listed.

For a VRU to operate with CallCoordinator/2, it must, at a minimum, be able to pass data to the device driver. However, the VRU must also be able to receive data from a device driver to achieve a full level of integration.

3.6 Telephony Application Development System (TADS)

Many aspects of business operations can be enhanced by integrated voice and data applications capable of handling inbound calls, outbound calls, or both. Existing business applications can be enhanced or new applications can be created for virtually all industries. The following list describes how various industries can use integrated voice and data applications:

- Finance and Banking
 - Checking stock prices and interest rates
 - Transferring funds between accounts
 - Ordering checkbooks and statements
 - Inquiring about accounts
- Insurance
 - Checking the status of claims
 - Verifying insurance coverage
- Utilities
 - Billing inquiries
 - Service calls
 - Emergency calls
- Retail
 - Inquiring about charge card accounts
 - Placing catalog orders
 - Checking the status of orders
- Education
 - Describing courses
 - Checking class availability
 - Registering students
- Travel
 - Checking flight schedules
 - Checking flight status and availability
 - Ordering tickets
 - Inquiring about account balances for frequent travelers
- Repair and Maintenance Services

- Routing calls for information and repairs
- Verifying customer accounts
- Tracking outside technicians

3.6.1 TADS Benefits

The following sections describe benefits that provide a clear competitive advantage to businesses that implement the TADS system.

3.6.1.1 Improving Customer Service

Often, Call Centers are overloaded with phone calls, due to customers having to wait for an available CSR, and then answer a long list of trivial questions before the real purpose of the call is addressed. Sometimes callers are transferred to many different departments before reaching someone who can assist them. This type of service can cause data entry and communication errors and inconsistencies, and can result in unhappy customers and lost time and profits. With the TADS system, you can improve customer service, as follows:

- Offer a faster, more personalized service based on ANI, DNIS, user-to-user interface (UUI), and IVR input
- Save time spent gathering information from a caller through the use of ANI, DNIS, UUI, IVRs, and coordinated voice/data transfers
- Provide a higher degree of accuracy through computer-assisted dialing and data entry
- Retain customer information, avoiding the need to request or repeat information when transferred to another CSR or IVR
- Enhance customer treatment in the IVR, for example:
 - Waiting time can be announced
 - Callbacks can be arranged
 - Live tutorials can be arranged

3.6.1.2 Reducing Costs

In a Call Center with a high volume of phone calls each day, it takes many CSRs to handle the calls efficiently. Callers have to wait for an available CSR, which increases costs to the customer (and also to your business if you are using 1-800 services). There is a potential loss of business for you due to abandoned calls and unhappy customers.

With the TADS system, you can reduce costs by:

- Shortening the length, duration and cost of the average call
- Having CSRs available to handle inbound or outbound calls based on immediate call loads
- Using ACD to transfer calls between locations, balance the call load, and reduce personnel costs
- Reducing bad debts (for example, by immediately routing an inbound order-entry call placed by a known delinquent customer to collections and then back to order entry)
- Reducing telephone trunking costs

3.6.1.3 Increasing Revenue

With the TADS system, you can increase revenue by:

- Calling more customers and selling more items in a given time period
- Selling to inbound customers using ANI and DNIS input and computer database information
- Reducing the number of abandoned calls (missed sales opportunities) and automating the callback of:
 - Inbound abandoned calls
 - Outbound calls that were unanswered, or received a busy signal
- Improving your company image

3.6.1.4 Increased CSR Productivity

With the TADS system, CSR productivity is increased:

- CSRs are able to handle more calls in a given time period
 - Caller and application identification and security validation are performed using ANI and DNIS
 - CSRs avoid the need to request or repeat caller information that has been transferred from another CSR (or IVR)
 - Initial customer information that is available in the database is displayed when the CSR takes the call (eliminating the need for the CSR to enter that information)
 - Outbound calls can be handled hands-free using on-hook dialing
 - Unanswered calls and calls that received a busy signal are automatically scheduled for callback
- Calls that are handled yield greater results
 - Specialized and personalized customer greetings are offered based upon ANI, DNIS, UII, IVRs and coordinated voice/data transfers
 - Inbound abandoned calls and outbound calls that were unanswered or received a busy signal are automatically scheduled for callback
 - Scripts are computer-generated based upon ANI, DNIS, UII, IVRs, and coordinated voice/data transfers

3.6.1.5 Enhancing Information for Call Center Managers

Switches can record basic call statistics but TADS applications can provide more useful information for management by relating the call data to information about the business generated from the calls, as well as the productivity of the Call Center CSRs. Information can be collected to produce the following:

Call Flows: What happens to calls from the beginning of the call until it ends.

Problem Areas: Areas of Call Center operation that are impacting your customers (for example, whether callers are transferred too often).

Caller and CSR Interaction: Information about what transpired over the course of a call, the duration of the call, and whether the caller had to be placed on hold.

Abandoned Call Information: Information about the callers who hung up before being connected to a CSR.

Correlation Between Call Length and Revenue: Whether longer calls generate more revenue or collections.

Security Control Information about attempts to log on to the system with an unauthorized password.

Statistics: Information about calls and agents useful for later analysis of Call Center performance.

3.6.1.6 Protecting Your Investment

The TADS system implements a long-term strategy for integrated voice and data application programs. It supports the CallPath Services architecture and also provides natural extensions to that architecture. The TADS system provides transparency to the underlying communications and switch protocols. The TADS APIs are available on a wide variety of platforms and operating systems.

With the purchase of a voice system, and a computer system containing application programs and data, a company has already made a substantial investment. With the TADS system, a company can build on, and get a faster return on that investment, while offering faster and more efficient service to its customers.

3.6.2 Telephony Application Development System (TADS) Features

This section describes installation features, system features, configuration requirements, program libraries, and security features.

3.6.2.1 Installing TADS Server

The installation utility installs the TADS system on an OS/2-based computer. It makes the required subdirectories and copies the program files from the distribution package diskettes to the target hard disk.

The installation utility also provides an uninstall option, which not only removes installed TADS programs and files, but also removes system configuration changes made during the install (for example, lines that were added to the CONFIG.SYS file).

3.6.2.2 Operating Systems

Installation of the operating system is a prerequisite for the successful installation of the TADS system. (For more details, see your operating system manuals.)

TADS Server is supported on the following platforms:

- OS/2 Version 2.1, WARP, or later
- AIX Version 4.1 for RS/6000 (*future*)

The TADS Client process is supported on the following platforms:

- OS/2 Version 2.1, WARP, or later
 - C/C++ (16 and 32 bit)
 - System Object Model/Workplace Shell (SOM/WPS). (This means that any SOM-supported language may be used.)
 - REXX/VX-REXX
- Microsoft Windows 3.1

- C / C ++
 - Visual Basic
- AIX Version 3.2
 - C / C ++
- HP-UX
 - C / C ++
- AT&T Conversant IVR (System V UNIX)
 - C / C ++
 - Conversant Script Language
- CCS FirstLine IVR
 - FirstLine Script Language

3.6.2.3 Distribution Package Contents

When you install the TADS system, the Installation Utility lets you install separately licensable components from the following distribution packages:

- TADS Server consisting of:
 - TADS Call Center Productivity Package (Mandatory)

Contains the client/server and administration portions of the product. It also contains all of the program libraries, the installation program, the Configuration and Management Utility, and the subsystem that allows for:

 - Load balancing
 - Inbound and outbound call control
 - Coordinated voice/data transfers
 - Abandoned call handling

The TADS Call Center Productivity Package also contains the TADS Client for OS/2 component.
 - TADS Server ACD Package for ROLM 9005 (Direct Connect)

Contains the code for the ROLM 9751 Release 9005 direct connect to retrieve real-time ACD information and reports, and add and delete ACD members and IDs.
 - TADS Server Statistics Package

Contains the code for the call and agent statistics logging facility.
 - TADS Software Development Toolkit (SDK), containing the following:
 - Example code, which contains source code examples showing how to invoke the functions of the program libraries
 - API support libraries and include files, which compile and link application programs
 - A test application that can be used to exercise the entire TADS API
- TADS Client for Windows
- TADS Client for AIX
- TADS Client for HP-UX
- TADS Client for Conversant

- TADS Client for FirstLine

3.6.2.4 System Features

The TADS system includes the following to enable you to install, test, and maintain the TADS system:

- Program Libraries
- Installation Utility
- TADS Configuration and Maintenance Facility

3.6.2.5 Program Libraries

The TADS Program Libraries consist of executable files. They provide a general-use program interface intended for customers. The program libraries can serve multiple application programs simultaneously. Through the program libraries, application programs have access to the TADS program calls and messages.

Some telephony systems may not yet support all the documented features of TADS. In such cases, messages are sent to the application program indicating that a requested function is unavailable.

3.6.2.6 Security Features

Password access to the GUI administrative functions is provided to users with valid passwords. The TADS system allows remote configuration and management.

3.7 DirectTalk

Here are some more detailed examples of how DirectTalk can help in specific business situations. These are common for both DirectTalk/2 and DirectTalk/6000.

3.7.1 Businesses

If your business depends on providing customers across the country with up-to-date inventory information, you can create a DirectTalk voice application to take orders from customers and retrieve the information they need (such as prices and quantities available).

When a customer inquires about a stock item, the application can determine the item's availability, reserve the stock, and schedule delivery. The application can verify the customer's charge account balance or credit limit, or check on the status of an order. The application then updates your inventory database or files to reflect any activity that resulted from a call.

A DirectTalk voice application can also support communication between the main office and your marketing or sales force. Company representatives can obtain product information (such as release schedules) or order product literature anytime, anywhere—using the telephone.

3.7.2 Financial Institutions

The financial industry depends on timely, accurate information. Using a DirectTalk voice application, brokerage firms can make current stock prices, quotations, and portfolio balances available over the telephone. Clients can perform complex transactions without the intervention of a broker. When a broker's advice is required, the DirectTalk voice application can transfer the call. Banks can let customers access their account balances, obtain information on interest rates and mortgages, calculate loan payments, or transfer funds, all using DirectTalk voice applications. A DirectTalk voice application can call customers to inquire about transactions such as renewing a certificate of deposit.

3.7.3 Transportation Industry

DirectTalk voice applications greatly simplify the process of making travel arrangements. Travelers can use DirectTalk to check on schedules and status, make reservations, and select seat assignments. Voice applications can call passengers to inform them of scheduling or status changes.

If your company is a transport company, let a DirectTalk voice application track the location of your company's vehicles. Your employees on the road can receive up-to-date weather reports, new schedules and assignments, and messages from home—with one telephone call.

3.7.4 Service Industries

Organizations such as hospitals and health care facilities must supply fast, accurate information to patients and health care providers. A DirectTalk voice application can make the latest patient information accessible over the telephone. Patients can obtain test results or schedule appointments automatically, and health care providers can reschedule appointments by having a DirectTalk voice application make the call.

3.7.5 Government Agencies

National and local governments are constantly required to provide information of all types to a variety of people. Use a DirectTalk voice application to ensure that such information is always available and in more than one language. DirectTalk can also provide services such as allowing callers to check on the status of a tax refund or social security benefit, informing prospective jurors whether to report for duty, and providing callers with information about current employment opportunities.

3.7.6 Educational Institutions

A DirectTalk voice application can provide information about class schedules, availability, and student courses. Students can register using the telephone, and the DirectTalk voice application that handles the registration process can also update the database containing enrollment information. A DirectTalk voice application can call students to inform them of schedule changes or openings in a class for which enrollment had been closed.

Chapter 4. Planning for the Products

This chapter describes the hardware and software required for each of the CallPath products mentioned in this book. It is not intended to be an installation manual and in each case the appropriate installation manual will be referenced.

This information is intended to help you "size" your needs when planning your Call Center. Some pertinent tips are also included here from the installation manuals.

4.1 CallPath SwitchServer/2

This section lists the required hardware and software for CallPath SwitchServer/2.

Note: The installation diskette contains a README.TXT file that should be reviewed before starting the installation procedure. After inserting the diskette in drive A, you can print the README.TXT file by entering the following from an OS/2 command prompt:

```
PRINT A:README.TXT
```

or you can display the README.TXT file by entering the following:

```
E A:README.TXT
```

Before you install CallPath SwitchServer/2, read the installation chapter in the CallPath Services switch reference manual for your switch. Then follow the instructions in the "Checklist of Installation Tasks" in the appropriate switch reference manual.

4.1.1 Required Hardware

CallPath SwitchServer/2 requires:

- An IBM PC with a 486 processor (or higher) running at 66 megahertz (MHz) (or faster) with the following minimum configuration:
 - 8 megabytes (MB) of random access memory (RAM), 16MB recommended
 - 220MB fixed disk, 340MB recommended
 - An adequate number of expansion slots to support the following:
 - An appropriate communication card to the switch
 - Ethernet
 - X.25
 - ISDN BRI
 - Others as required
 - A communication card to the CallPath host (if needed)
 - Memory expansion boards (if needed)
- A PC monochrome or color display
- A pointing device supported by the operating system
- CallPath SwitchServer-to-host connectivity hardware

- A special cable may also be required (further information on the cable may be found in the appropriate switch manual.)

4.1.2 Required Software

CallPath SwitchServer/2 requires:

- IBM Operating System/2 (OS/2) 2.1 (or later) and the latest Corrective Service Diskettes (CSDs)
- Communications Manager/2 Version 1.1 (or later)
- TCP/IP Version 2 (or later) for OS/2 Base Kit (this includes LAN Adapter and Protocol Support (LAPS) for OS/2 2.1) or MPTS if you are using OS/2 WARP Connect

Note: OS/2 WARP (Version 3.0) Connect includes TCP/IP Version 3.0 and MPTS (which includes LAPS). MPTS requires TCP/IP 3.0 or higher.

- CallPath SwitchServer/2 installation diskettes for the appropriate switch connection
- CallPath SwitchServer-to-host connectivity software
- For remote console support, IBM Distributed Console Access Facility (optional)

4.1.3 Installation Considerations

CallPath SwitchServer/2 is distributed on one or more 2MB, 3.5-inch, read-only diskettes. (For documentation purposes, we refer to one installation diskette throughout this book.) The diskette contains all the CallPath SwitchServer/2 programs, as well as the transfer utility program, which installs the CallPath SwitchServer/2 programs on the fixed disk of your PC.

You install CallPath SwitchServer/2 on drive C of your PC. CallPath SwitchServer/2 uses disk space on drive C only. If the disk of your PC is partitioned into more than one logical disk (that is, if it has more than one drive), ensure that you have at least the minimum recommended amount of disk space on drive C. See the *CallPath Services Reference* for your switch for the amount of disk space your switch requires.

It is recommended that your CallPath SwitchServer/2 PC be dedicated to running CallPath SwitchServer/2 and the programs listed in "Required Software" of *Using CallPath SwitchServer/2*, SC34-2406. If you have installed other program products on the PC, ensure that their processing requirements do not impact on the memory and disk space requirements of CallPath SwitchServer/2. Consider the potential impact of the other program products on the CallPath SwitchServer/2 application, as well as the possible effect of the CallPath SwitchServer/2 installation on them.

During the installation procedure, the INSTALL.EXE transfer utility program offers to modify the CONFIG.SYS and the STARTUP.CMD files and to save the current copies of these files to the CONFIG.BAK and STARTUP.BAK files, respectively. If you have installed other program products, your PC may have files of the same name already. If you want to keep the current copy of your CONFIG.BAK and STARTUP.BAK files, you need to rename them before installation. Otherwise, the transfer utility program overwrites these files with a copy of your current CONFIG.SYS and STARTUP.CMD files.

If you have made changes to the CONFIG.SYS file or STARTUP.CMD file for other program products, ensure that the changes do not conflict with the modifications that the CallPath SwitchServer/2 installation makes. The modifications are described in the *CallPath Services Reference* for your switch. If the changes conflict, you should not run the other program products on the CallPath SwitchServer/2 PC.

4.2 CallPath Server/2

This section lists the required hardware and software for CallPath Server/2.

4.2.1 Required Hardware for CallPath Server/2

- System processor -- IBM Personal Computer (PC) or compatible, with an 80486 or higher processor, running at 66 Megahertz (MHz) or faster, that is supported by OS/2 Version 2.1 or higher (including OS/2 Warp 3.0 or higher) operating system
- Display -- IBM PC display or compatible
- Pointing device -- Supported by OS/2 version being run
- System memory -- 12 megabytes (12MB) for base server system, 1MB for CallPath Developer's Toolkit, 8MB for direct attach per telephone system connection, and an additional configuration-dependent amount above prerequisite software calculated as the number of applications times the number of outstanding messages times 7000.
- Fixed disk -- 20MB for base server system, 10MB for CallPath Developer's Toolkit, 5MB for direct attach per telephone system connection above prerequisite software. Use 340MB when connecting to CSTA compatible telephone systems.
- Diskette Drive -- 3.5-inch 1.44MB
- Adapter -- Token-Ring 16/4 MB Network Adapter or Ethernet LAN Adapter (supported by OS/2 version being run) for communications to a client on the LAN or remote-attached connectivity to a telephone system

Note: For a direct connection to an IBM-supported switch, a PC based on the Micro Channel architecture (MCA) or Industry Standard Architecture (ISA) bus is required. For all other supported telephone systems, see the specific reference book for any IBM-supplied systems (AT&T, Nortel, ROLM, and so on). Contact telephone system supplier for similar documentation available for CallPath compliant telephone systems, not provided by IBM. Also, note that ROLM 9751 CBX (Release 9005) telephone system does not support ISA architecture.

4.2.2 Required Hardware for CallPath Server/2 Clients

- For AIX client:
 - System processor -- RISC System/6000 POWERserver 220 or higher, except 9076 SP processor
 - System memory -- Sufficient to accommodate application-dependent and other prerequisite software
 - Fixed disk -- Sufficient to accommodate application-dependent and other prerequisite software
 - Adapter -- Token-Ring High Performance Network Adapter or Ethernet High Performance LAN Adapter

- For OS/2 Warp, DOS Windows, and SCO-UNIX clients

Note: Windows 95 and Windows NT clients can run 16-bit application on the DOS Windows client.

 - System processor -- IBM PS/2, PS/ValuePoint, or PC compatible with 80486 or higher processor
 - System memory -- Sufficient to accommodate application-dependent and other prerequisite software
 - Fixed disk -- Sufficient to accommodate application-dependent and other prerequisite software
 - Adapter -- Token-Ring 16/4 MB Network Adapter or Ethernet LAN Adapter supported by operating system
- For Sun clients
 - System processor -- Sun SPARCstation
 - System memory -- Application-dependent and other prerequisite software
 - Fixed disk -- Application-dependent and other prerequisite software
 - Adapter -- Token-Ring or Ethernet LAN Adapter supported by above workstation
- For HP clients
 - System processor -- HP 9000 Series 700 or 800 workstations
 - System memory -- Sufficient to accommodate application-dependent and other prerequisite software
 - Fixed disk -- Sufficient to accommodate application-dependent and other prerequisite software
 - Adapter -- Token-Ring or Ethernet LAN Adapter supported by above workstation

4.2.3 Required Software for CallPath Server/2

- IBM Operating System/2(R) (OS/2) Version 2.1 or higher (including OS/2 Warp Version 3.0) operating system
- IBM TCP/IP for the OS/2 version being run

Note: If IBM OS/2 Warp Connect Version 3.0 is used, TCP/IP for OS/2 Version 3.0 and OS/2 LAN Server Version 4.0 Requester, including LAN Adapter and Protocol Support (LAPS) programs are included in the package.
- For local attachment to Nortel telephone systems, using X.25 link, or for remote attachment to telephone systems via IBM CallPath SwitchServer/2 requires:
 - Communications Manager/2 Version 1.1 or higher and the latest CSDs (includes LAN Adapter and Protocol Support (LAPS)) for communications to direct-attached telephone system connection(s) using X.25 link or SNA communications to remote-attached telephone system connection(s)

4.2.4 Required Software For CallPath Server/2 Clients

- AIX clients
 - AIX Version 3 Release 2 for RISC System/6000 (5756-030) or AIX Version 4 Release 1 for Client (5765-393) or a later release of Version 4
 - AIX TCP/IP, part of base operating system
- OS/2 clients
 - OS/2 Version 2.1 or higher (including OS/2 Warp Version 3.0)

- IBM TCP/IP for the version of OS/2 being run and the latest CSDs
- DOS/Windows clients
 - Microsoft Windows Version 3.1
 - IBM DOS Version 3.3 or higher as required by Windows 3.1
 - IBM TCP/IP Version 2.1.1 for DOS Base Kit or TCP/IP Windows sockets-compliant product
- Note:** Windows NT and Windows 95 clients can run in 16-bit mode on the DOS/Windows client
- Sun clients
 - Sun Solaris 2.2
 - Sun TCP/IP
- HP clients
 - HP-UX 9.01
 - HP TCP/IP
- SCO UNIX clients
 - SCO UNIX System V/386 R3.2
 - SCO TCP/IP

4.3 AIX CallPath Server/6000

This section provides the minimum hardware, software, and telephony requirements for installing and using the AIX CallPath Server/6000 licensed programs.

4.3.1 Required Hardware for CallPath Server/6000

- System processor -- RISC SYSTEM/6000 POWERserver 220 processor or higher (except the 9076 System Parallel (SP) processor)
- Display -- Mono or color display/ASCII terminal supported by RISC System/6000 processor
- For AIX CallPath Server/6000 Motif-based management (recommended) and CallPath Developer's Toolkit (required):
 - Display -- display supported by AIXwindows Environment/6000
 - Pointing device -- IBM 3-button mouse or compatible device
- System memory -- 12 megabytes (12MB) for base server system, 1MB for CallPath Developer's Toolkit, 8MB for direct attach per telephone system connection, and an additional configuration-dependent amount above prerequisite software calculated as the number of applications times the number of outstanding messages times 7000.
- Fixed disk -- 20MB for base server system, 10MB for CallPath Developer's Toolkit, 5MB for direct attach per telephone system connection above prerequisite software
- Diskette Drive -- 3.5-inch 1.44MB
- Adapter -- Token-Ring High Performance Network Adapter or Ethernet High Performance LAN Adapter for communications to a client on the LAN or remote-attached connectivity to a telephone system

4.3.2 Required Hardware for CallPath Server/6000 Clients

- For AIX client:
 - System processor -- RISC System/6000 POWERserver 220 or higher, except 9076 SP processor
 - System memory -- Sufficient to accommodate application-dependent and other prerequisite software
 - Fixed disk -- Sufficient to accommodate application-dependent and other prerequisite software
 - Adapter -- Token-Ring High Performance Network Adapter or Ethernet High Performance LAN Adapter
- For OS/2 Warp, DOS Windows, and SCO-UNIX clients

Note: Windows 95 and Windows NT clients can run 16-bit application on the DOS Windows client.

 - System processor -- IBM PS/2, PS/ValuePoint, or PC compatible with 80486 or higher processor
 - System memory -- Sufficient to accommodate application-dependent and other prerequisite software
 - Fixed disk -- Sufficient to accommodate application-dependent and other prerequisite software
 - Adapter -- Token-Ring 16/4 MB Network Adapter or Ethernet LAN Adapter supported by operating system
- For Sun clients
 - System processor -- Sun SPARCstation
 - System memory -- Application-dependent and other prerequisite software
 - Fixed disk -- Application-dependent and other prerequisite software
 - Adapter -- Token-Ring or Ethernet LAN Adapter supported by above workstation
- For HP clients
 - System processor -- HP 9000 Series 700 or 800 workstations
 - System memory -- Sufficient to accommodate application-dependent and other prerequisite software
 - Fixed disk -- Sufficient to accommodate application-dependent and other prerequisite software
 - Adapter -- Token-Ring or Ethernet LAN Adapter supported by above workstation

4.3.3 Required Software for CallPath Server/6000

- Either one of the following:
 - AIX Version 3 Release 2.5 for RISC System/6000 (5756-030)
 - AIX Version 4 Release 1 for Servers (5765-393)
- AIX TCP/IP, part of base operating system
- AIX System Network Architecture Server/6000 Version 3 Release 1 (5765-582) for connectivity to telephone systems remotely via IBM CallPath SwitchServer/2 or OEM vendor CallPath-compliant gateways
 - If AIX Version 4.1 or higher is used, order the following:
 - AIX X.25 and AIXLINK/X.25 Version 1.1 (5696-686 or 5696-926) for support of X.25 adapter card

- For Motif-based management, AIXwindows Environment/6000 Version 1.2.5 (5601-257) (optional)
- For network management, AIX NetView/6000 Version 2 (5696-362) or AIX NetView/6000 Entry Version 1 (5696-464) or SystemView for AIX (5765-527) (optional)

4.3.4 Required Software for CallPath Server/6000 Clients

- AIX client
 - AIX Version 3 Release 2 for RISC System/6000 (5756-030) or AIX Version 4 Release 1 for Client (5765-393) (or a later release of Version 4)
 - AIX TCP/IP, part of base operating system
- OS/2 clients
 - OS/2 Version 2.1 or higher (including OS/2 Warp Version 3.0)
 - IBM TCP/IP for the version of OS/2 being run
- DOS Windows clients
 - IBM DOS Version 3.3 or higher
 - Microsoft Windows Version 3.1
 - IBM TCP/IP Version 2.1.1 for DOS Base Kit or Windows Sockets-compliant product

Note: Microsoft Windows NT and Windows 95 clients can run in 16-bit mode on the DOS/Windows clients.

- Sun clients
 - Sun Solaris 2.2
 - Sun TCP/IP
- HP clients
 - HP-UX 9.01
 - HP TCP/IP
- SCO UNIX Clients
 - SCO UNIX System V/386 R3.2
 - SCO TCP/IP

4.3.5 Requirements For CallPath Developer's Toolkit for AIX

Operating system and TCP/IP requirements for application development on supported clients are the same as those given in 4.3.4, "Required Software for CallPath Server/6000 Clients" The only programming language supported for application development is C language.

- AIX CallPath Server/6000 Version 1
- For AIX client
 - AIX XL C Compiler/6000 Version 1.3, part of base AIX Version 3.2 operating system
 - If AIX Version 4.1, C for AIX Version 3.1 (5765-423)
 - AIXwindows Environment/6000 Version 1.2.5 (5601-257)
- For OS/2 client
 - IBM C Set ++(TM) for OS/2 version being run
- For DOS Windows Version 3.1 clients

- Microsoft C Compiler Version 7.0
- Microsoft Windows Version 3.1 Software Development Kit

Note: The Windows 3.1 client library is not supported under the OS/2 implementation of Windows 3.1.

- For Sun clients
 - Sun SPARCompiler C Version 2.2
- For HP clients
 - HP C Compiler Version 7.03
- For SCO UNIX clients
 - SCO C Compiler Version 3.0

4.4 Telephone System Communications Requirements (Direct-Attached)

Note: For CallPath Server/2 direct-attached IBM telephone system connection(s), either an IBM PC with ISA or Micro Channel Architecture (MCA) bus is supported by the AT&T G3, Nortel Meridian 1, and Nortel DMS-100, except ROLM 9751 Release 9005. This telephone system only works on MCA bus processors. For AIX CallPath Server/6000, IBM RISC System/6000 with Micro Channel Architecture (MCA) bus architecture is supported for direct-attachment to Nortel Meridian 1, Nortel DMS-100, and AT&T G3 telephone systems.

4.4.1 AT&T DEFINITY G3i, 3r, and 3s

- One of the following to connect the PC to the DEFINITY G3 PBX:
 - Data Terminal Adapter (XLT-DTA) card with an appropriate cable for PCs with ISA architecture.
 - Data Terminal Adapter/Micro Channel card (XLT-DTA/MC) with an appropriate connection cable for PCs with Micro Channel architecture.

Note: The above card was formerly called NCR ISDN BRI DTA/MC card. This card is available ONLY from EXCELLTECH, Inc. at 113 West Third Avenue, Yankton, South Dakota 57078. Contact telephone numbers: 605-367-3540, 605-665-5811, or 605-665-8324.

- For Ethernet connection, any 10Base-T Ethernet card supported by the operating system, with an RJ45 connector and an appropriate cable. Plus, 10Base-T hub with RJ45 connectors is required for connectivity to the telephone system.

Note: Use a separate Ethernet card and isolated LAN segment for connectivity to the PBX to prevent performance problems and toll fraud. A single Ethernet card cannot be used for both host and PBX connectivity.

Note: For the RISC System/6000, the Ethernet card must be an IBM Micro Channel card.

4.4.2 Nortel Meridian 1

- One of the following sets of hardware for each active connection:
 - IBM X.25 Interface Co-processor/2 card with Micro Channel architecture (PN 16F1858) or for RISC processor with Micro Channel architecture (PN 51G9060) or

- IBM X.25 Interface Co-processor/2 card with ISA architecture (PN 71G6460) or
- IBM 7855-10 modem or equivalent for V.24
- A connection from the PC to the Nortel Meridian 1 system, using an IBM X.25 Interface Co-Processor cable option V.24 (PN 16F1869); from RISC processor to Nortel system, cable option V.24 (PN 07F3161)

4.4.3 Nortel DMS-100

- One of the following sets of hardware for each active connection:
 - Option 1
 - IBM X.25 Interface Co-processor/2 card with Micro Channel architecture (PN 16F1858) or for RISC processor with Micro Channel architecture (PN 51G9060) or
 - IBM X.25 Interface Co-processor/2 card with ISA architecture (PN 71G6460) or
 - IBM 5822-10 Data Service Unit (DSU) or equivalent for V.35
 - Option 2
 - A connection from the PC to the Nortel DMS-100 system, using an IBM X.25 Interface Co-Processor cable option V.35 (PN 16F1871) or cable option V.24 (PN 16F1869) or for RISC processor with Micro Channel architecture, cable option V.24 (PN 07F3161)
 - IBM 7855-10 modem or equivalent for V.24

Note: The 7855 or 5822 should match modem or DSU or Channel Service Unit (CSU) attached to the DMS-100.

4.4.4 ROLM 9751 Release 9006i

- For MCA Connection:
 - IBM Realtime Interface Co-processor (RIC) Multiport/2 with 1MB of RAM (part number 16F1820)
 - IBM RIC Multiport/2 eight-port EIA-232-D interface board (part number 09F1952)
 - One IBM Multiport/2 Interface Cable Adapter (part number 00F5531)
- For ISA PC Connection:
 - IBM X.25 ISA Interface CoProcessor (part number 71G6460 or machine type 8550, model ZZZ, feature number 6753)
 - ISA cable option V.24 (part number 16F1869, feature number 6322 or machine type 8550, model ZZZ, feature number 6322)

4.4.5 ROLM 9751 Release 9005

- One to five IBM Realtime Interface Co-Processor (RIC) Multiport/2 cards with 1MB RAM (one for inbound and up to four for outbound), part number 16F1820
- IBM RIC Multiport/2 eight-port RS-232-C interface board
- Zero to four IBM RIC Multiport/2 eight-port RS-422-A interface boards (15F8852) (per installed outbound RIC card), part number 15F8852

- IBM RIC Multiport/2 eight-port EIA-232-D interface board for inbound connection, part number 09F1952
- One to five IBM Multiport/2 Interface Cable Adapter (one for each RIC card), part number 00F5531

4.5 Telephone System Configurations (Direct-Attached):

1. For remote-attached telephone system configurations through CallPath SwitchServer/2 Version 1.2 or higher, refer to IBM Software Announcement 296-113, dated April 16, 1996.
2. For telephone system configurations through an OEM gateway, contact your OEM telephone system representative.
3. It is recommended that customers verify the configuration with the telephone system manufacturer before ordering equipment. IBM is not responsible for changes to telephone system configurations.

4.5.1 AT&T DEFINITY G3i, G3r, and G3s

- AT&T G3V4 CallVisor ASAI switch software features:
 - Ethernet link support (Supplied by AT&T DEFINITY LAN Gateway)
 - Send DTMF tones
 - Agent Login Event/Agent Logout Event
 - Redirect of an Alerting Call
 - ASAI Provided reason for redirection
 - Originated Event
 - Provide Indicator
- AT&T G3V1, G3V2, and G3V3 CallVisor ASAI switch software
 - Features supported in G3V2:
 - International Address Type for ISDN Calls
 - Redirection on No Answer (RONA)
 - Converse Vector Command
 - Expert Agent Selection (EASe)
 - Vector Directory Numbers (VDNs) in Coverage Path (non-CallPath related capability)
 - Called Party Number in Route Requests (non-CallPath related capability)
 - Features supported in G3V3:
 - User to User Information (UUI)
 - Answering Machine Detection
 - Version Control
 - Multiple Monitors
 - Multiple Outstanding Route Requests
 - Connected Event after Trunk Seized
 - Optional Switch Classified Calls (non-CallPath related capability)

4.5.2 Nortel (Northern Telecom) Meridian 1 Communications System

- Meridian Link Software Module Version 4.0
 - Meridian 1 Generic X11 software Release 21
 - Fast Transfer
- Meridian 1 Generic X11 software Release 19, 20
- Features include Host Enhanced Routing and Call Tracking capability
- Meridian Link Module
- Enhanced Serial Data Interface (ESDI) card
- VT-100 compatible terminal (customer supplied)
- Meridian Link software features may include (optional):
 - Inbound call management
 - Outbound call management
 - Link operation, administration, and maintenance
 - Automatic Number Identification (ANI)
 - Dialed Number Identification Service (DNIS)

Note: Meridian Link Versions 2.0 or 3.0 are supported remote-attached only through CallPath SwitchServer/2 Version 1.2 or higher (See Withdrawal Announcement 995-126, dated November 28, 1995 for withdrawal from marketing announcement, effective February 29, 1996).

- Nortel (Northern Telecom) DMS-100
 - CompuCALL Software
 - ACD Software
 - Centrex Software
 - BCS 33 or 34 generic software level
 - BCS 35 generic software level, except no link set concept
 - BCS 36 in BCS 35 compatibility mode

4.5.3 ROLM 9751 Release 9006i

- Release 9006.3 with CallBridge for Workgroups-CSA switch software:
 - Hold Call -- For digital phones only
 - Retrieve Call -- For digital phones, call on hold can be retrieved
 - Invoke Feature Request -- Do not disturb, Logon, Logoff, Busy, and so on
 - Feature Invoke Event -- Do not disturb, forwarding, and so on
- Model 30 or 80
- Release 9006.1 and 9006.2 (includes host-based routing) system software
- RS-232 cable
- For 9600 BPS link, no special hardware is required
- For 19200 BPS link support (Release 9006.2)
 - DCI 731 Terminal Adapter
 - Two Subscriber Line Modules SO (SLMS) cards
 - Line Control SO (LCSO) card

4.5.4 ROLM 9751 Release 9005 with CallBridge for CallPath Switch Software

- Models 10, 40, 50, or 70
- Release 9005.1.75, 9005.2.77, 9005.2.78, or 9005.2.79 or 9005.2.81 system software
- Outboard Dialer Interface (ODI) card(s), part numbers 98D3918
- System Monitor Input/Output (SMIO) card, part number 98D0083
- ODI cable(s) (RS-422-A)
 - Part Number 98D3941 for Model 10
 - Part Number 98D3942 for Model 40, 50, or 70
- SMIO card cable (RS-232-C, special cable), Part Number 97D0035

Note: For most IBM telephone systems connections, CallPath Services Architecture (CSA) Version 1 enhancements for call tracking have been incorporated, such as Program Data and Other Party List. (For call tracking functions supported, refer to the CallPath Services Reference for your specific switch.) In addition, CSA Version 2 enhancements include support for Call Detail Records (CDR), Call Alerting, Connected and Routed for Related Party List, Immediate Transfer and Redirect Call for New Party Data, and a new indicator for Display lamp and Advanced Display text.

CallPath Server/2 does not support the interface to ROLMphone 244PC or ROLMphone 600D series telephones that were available on the CallPath/2 and CallPath/DOS for Windows products.

Compatibility CallPath Server/2 and AIX CallPath Server/6000 Versions 1.1.2 are compatible with IBM SwitchServer/2 Version 1.2.3.: CallPath Server/2 and AIX CallPath Server/6000 Version 1.1.2 when configured with a local connection to a telephone system *must* operate with Version 1.1.2 of the switch connection code. The previous version of switch connection code, Version 1.1.1, is not supported.

Users of CallPath/2 Version 1.1 will receive migration instructions to assist in migrating applications and data to CallPath Server/2.

CallPath/6000 Version 1 is upwardly compatible to AIX CallPath Server/6000.

Limitations: Customers must be aware that application functions that can be enabled by CallPath Server are dependent on the features supported by the specific telephone system being used, and may also be limited by the network services provider. See CallPath publications for the specific telephone system being used.

Performance Considerations: Performance depends on the call load for a given time period and other applications running concurrently in the system processor. Assistance with performance evaluation is available upon request. Refer to the *CallPath Server General Information*, GC31-6241.

4.6 Planning Information for CallPath Server

The customer is responsible for the planning and installation of CallPath Server. In order to take advantage of the CallPath Server functions, the customer must evaluate an appropriate application solution based on the specific environment and business needs.

To assist customers, the Customer Relationship Solutions Sales Team (CRSST) and IBM CallPath Business Partners can offer application development, integration, and consulting services based on the CallPath family product line. To complement IBM's CallPath family of products, IBM Business Partners will provide integrated voice processing applications.

Customer Responsibilities: The customer is responsible for acquiring a telephone system that is supported by CallPath Server/2 or AIX CallPath Server/6000.

Packaging: CallPath Server/2, AIX CallPath Server/6000, and IBM CallPath Developer's Toolkit are shipped with the following materials in the base program package or upgrade package:

- IBM International Program License Agreement with Programming Support Summary
- Registration Card
- License Information including the Statement of Service
- Proof of Entitlement
- Server diskettes: 3.5-inch (1.44MB) diskettes containing program libraries and system administration, configuration, trace, and installation utilities.
- Publication: *CallPath Server Planning, Installation, and Problem Determination Guide*, SC31-6242.

If a telephone system is selected, the above package will also include:

- Selected switch dependent code: 3.5-inch (1.44MB) diskettes containing the software for direct-attachment of the telephone system to CallPath Server
- Publication: reference for selected telephone system

CallPath Developer's Toolkit for OS/2 and AIX is shipped with the following material:

- IBM International Program License Agreement with Programming Support Summary
- Registration Card
- License Information including the Statement of Service
- Proof of Entitlement
- Toolkit diskettes: 3.5-inch (1.44MB) diskettes formatted for AIX and OS/2 containing client API libraries, example code, and test utility
- Publication: *CallPath Developer's Toolkit Programming Guide and Reference*, SC31-6243.

4.7 CallPath Server Security, Auditability, and Control

The announced OS/2 programs use the security and auditability features of OS/2 Warp Version 3.0 operating system. Also, CallPath Server/2 provides password protection to access the system management functions.

The announced AIX program uses the security and auditability features of the IBM RISC System/6000 and the AIX Version 3 Release 2 or the AIX Version 4 Release 1 operating system.

After AIX CallPath Server/6000 is installed, all files are owned by root; root is the only user with authority for any AIX CallPath Server/6000 Management Facility functions. You can designate this authority to another user, group of users, or everyone on the system by changing permissions. Also, password protection can be enabled to access the Management Facility functions.

User management is responsible for evaluation, selection, and implementation of security features, administrative procedures, and appropriate controls in application systems and communication facilities.

4.8 CallPath Server Migration Paths

Both product and application migration issues should be considered when upgrading from CallPath/2, CallPath DOS for Windows, or AIX CallPath/6000.

4.8.1 CallPath/2 to CallPath Server/2 Product Migration

To migrate from the CallPath/2 product to CallPath Server/2, do the following:

- Use a text editor to open the default file *C:\WTSOS2\WTS.INI* (or whatever file was supplied as the second parameter when invoking WTS.EXE) and transfer applicable configuration information from it to the CallPath Server Management Facility in accordance with the instructions in *CallPath Server Planning, Installation, and Problem Determination Guide*.
- Remove all CallPath/2 directories from CONFIG.SYS paths. If you used the default directory, these might include the following:

```
LIBPATH=C:\ WTSOS2;C:\ WTSOS2\ TTRACE;C:\ WTSOS2\ SAMPLES;  
PATH=C:\WTSOS2;C:\WTSOS2\TTRACE;C:\WTSOS2\SAMPLES;  
DPATH=C:\WTSOS2;C:\WTSOS2\SAMPLES;  
HELP=C:\WTSOS2\TTRACE;  
LIB=C:\WTSOS2\LIB;  
INCLUDE=C:\WTSOS2\INCLUDE;C:\WTSOS2\SAMPLES;
```
- If CallPath Server/2 will communicate with a remote CallPath SwitchServer/2, no changes are needed to the Communications Manager/2 configuration files. Otherwise, see the communication installation steps in *CallPath Server Planning, Installation, and Problem Determination Guide*.

4.8.2 CallPath/2 and CallPath DOS for Windows to CallPath Server/2 Application Migration

CallPath Server/2 can coexist with CallPath/2, but the two products cannot interact. CallPath Server/2 cannot coexist with CallPath DOS for Windows.

To convert your existing CallPath/2 or CallPath DOS for Windows message-based or function-based application to CallPath Server/2, you must make the following changes:

- If the application used the message-based or function-based CallPath/2 API, it must be changed to interface with the CSA RPC-based API. The effort required to make the change depends on how well your original application encapsulated the CSA functions.

Note: The Include files for the CallPath Server/2 API have special compiler flags incorporated in them so that application developers can reduce the amount of migration effort from CallPath/2 to CallPath Server/2. This is done by mapping the old constants and structures to the new ones, as well as by supporting either a Version 1 or 0 request or message. See *CallPath Developer's Toolkit Programming Guide and Reference*, SC31-6243 for more information.

- WTSSTART program call must be changed to the following STL program calls:
 - *Create_Program_Name* (STLCRT)
 - *Identify_Program_Name* (STLIDEN)
- WTSQUERY program call is not supported by CallPath Server/2.
- WTS program calls related to the phone-specific features (for example, ROLMphone 244PC) are not supported by CallPath Server/2.
- WTSSTOP program call must be changed to the following STL program call:
 - *Release_Program_Name* (STLREL)
- The C structure for the CSA messages have changed. The application must change all the old C structure references to the new ones.
- If the application will be residing on an OS/2 client and not on CallPath Server/2, the following program calls must be added:
 - *Identify_Server_Name* (STLISN)
 - *Identify_Program_Description* (STLIPD)
- To take advantage of the new Version 1 functions, the following program calls can be used by specifying `#define CSA_1` before the `#include csa.h`. `CSA_1` causes all the new CSA Version 1 fields to be included in structures.
 - *Identify_Program_Version* (STLIPGV)

See *CallPath Developer's Toolkit Programming Guide and Reference*, SC31-6243 for more information on Version 1 functions.

No matter what is done with the current CallPath/2 CSA applications, they must be recompiled, relinked, and retested to work with the new CallPath Server.

4.8.3 AIX CallPath/6000 to AIX CallPath Server/6000 Product Migration

When migrating from AIX Callpath/6000 to AIX CallPath Server/6000, you do not have to migrate the AIX CallPath/6000 "host" configuration information to AIX CallPath Server/6000. You can either accept the defaults supplied by `installp` or modify the AIX CallPath Server/6000 configuration as detailed in the *CallPath Server Planning, Installation, and Problem Determination Guide*.

You must, however, consider the following when migrating from the AIX CallPath/6000 product to the AIX CallPath Server/6000 product:

- AIX SNA configuration changes
- Switch connection configuration changes

4.8.3.1 AIX SNA Configuration Considerations

The information that was in the CallPath/6000 Minimum SNA Switch Configuration was used to update AIX/SNA configuration screen profiles. These profiles are completely different in AIX SNA Server 2.1.

Note: AIX CallPath Server/6000 requires AIX SNA Server 2.1, and AIX CallPath/6000 will not run on AIX SNA Server 2.1.

There are two ways to make the required SNA configuration changes for AIX CallPath/6000 migration to AIX CallPath Server/6000:

1. Follow the migration suggestions provided by AIX SNA Server 2.1 with the SNA profiles on your system.
2. Follow the configuration steps in the *CallPath Server Planning, Installation, and Problem Determination Guide* to set up SNA parameters for communication with CallPath SwitchServer/2.

The latter method is simpler and therefore recommended.

4.8.3.2 Switch Connection Configuration Considerations

The values of the configurable parameters in CallPath/6000 can be entered into AIX CallPath Server/6000. These include the following:

- **Auto-start switch**

Specifies whether the switch connection should be activated automatically when AIX CallPath Server/6000 is started.

- **Restart on failure**

Specifies whether the switch connection should be automatically restarted if the connection has been terminated because of a failure.

- **Retry count**

Specifies the number of times AIX CallPath Server/6000 will attempt to establish an SNA session, with which it will communicate with CallPath SwitchServer/2, before deciding it is unable to establish the session and declare an error.

- **Retry interval**

Specifies the number of seconds between retries of SNA session establishment.

- **CallPath SwitchServer/2 transaction program names**

The default program names for CallPath SwitchServer/2 were GREC and GTRA.

- **TRANSMIT name**

In AIX CallPath/6000, there was a TRANSMIT connection name that was the name of an SNA connection. Consistent with the changes made to AIX/SNA, the corresponding field in AIX CallPath Server/6000 is the "TRANSMIT fully qualified LU name" field (which is the < netid>.< luname> of the "receive" LU on the CallPath SwitchServer/2 side).

Note: The AIX CallPath Server/6000 transmit talks to the CallPath SwitchServer/2 receive.

- **RECEIVE name**

In AIX CallPath/6000, there was a RECEIVE connection name that was the name of an SNA connection. Consistent with the changes made to AIX/SNA, the corresponding field in AIX CallPath Server/6000 is the "RECEIVE fully qualified LU name" field (which is the < netid>.< luname> of the "transmit" LU on the CallPath SwitchServer/2 side).

Note: The AIX CallPath Server/6000 receive talks to the CallPath SwitchServer/2 transmit.

4.8.4 AIX CallPath/6000 to AIX CallPath Server/6000 Application Migration

Applications that were written for the CallPath/6000 API need only be relinked with the CSA RPC function-based API, as long as the applications reside on the original CallPath/6000 workstation or computer. When adding any of the following new features or when recompiling with the new Include files, you must make the following changes:

- Change all the program calls associated with Version 1 features to accommodate the new parameters added to several of the existing requests (Make Call or Extend Call, for example).

Note: The Include files for the AIX CallPath Server/6000 API have special compiler flags incorporated in them so that application developers can reduce the amount of migration effort from AIX CallPath/6000 to AIX CallPath Server/6000. This is done by having the appropriate mappings of the old constants and structures to the new ones, as well as the capability to support either a Version 1 or 0 request or message. For more information, see *CallPath Developer's Toolkit Programming Guide and Reference*, SC31-6243.

- If the application will be residing on an AIX client and not on AIX CallPath Server/6000, the following program calls must be added:
 - *Identify_Server_Name* (STLISN)
 - *Identify_Program_Description* (STLIPD)
- To take advantage of the new Version 1 functions, the following program calls can be used by specifying **#define CSA_1** before the **#include csa.h**. CSA_1 causes all the new CSA Version 1 fields to be included in structures.
 - *Identify_Program_Version* (STLIPGV)

See *CallPath Developer's Toolkit Programming Guide and Reference*, SC31-6243 for more information on Version 1 functions.

4.8.5 Coexistence

CallPath Server adheres to conventions regarding the use of operating system resources and will coexist with other application programs.

4.8.6 Limitations

Application program functions that can be enabled by CallPath Server are dependent on the features supported by the specific switch being used, and may also be limited by the network services provider.

4.8.7 Performance Considerations

Performance depends on the call load for a given time period and on other application programs running concurrently on the computer system.

4.8.8 Initiating Security

In both the OS/2 and AIX environments, access to the CallPath Server Management Facility administrative functions is provided to users with valid passwords. However, because of the complex security issues involved when working in an AIX environment, additional security is provided for AIX CallPath Server/6000 through the AIX Version 3.2 operating system file permissions.

The security of CallPath Server also depends on the security of the other products connected to it, that is, CallPath SwitchServer/2 and the application programs. User management is responsible for evaluation, selection, and implementation of security features, administrative procedures, and appropriate controls in application systems and communication facilities.

4.9 CallPath/400

This section explains the components that are required in a complete CallPath/400 solution.

4.9.1 CallPath/400 Version 3 Release 1

Version 3 Release 1 of CallPath/400 offers:

- Telephone system inbound and outbound call-processing in the AS/400 system environment.
- Compatibility with new OS/400 Version 3 Release 1.
- Support for the Rolm 9751 Computerized Branch Exchange (CBX), via IBM SwitchServer/2.
- Continued support for existing telephone system connectivity.
- New four-tier PBOTC pricing structure.

CallPath/400 provides an application programming interface enabling customers to gain the benefits of call-processing in the AS/400 system environment. An existing AS/400 installation may be used for CallPath/400. Existing CallPath/400 installations may be upgraded to Version 3 Release 1. CallPath/400 enables a Call Center to handle calls more efficiently, managing incoming calls or outbound calls for telemarketing or teleservicing applications.

The end-user customer business is completed more efficiently by the synchronization of the customer phone call with the customer file held on the AS/400 database. CallPath/400 enables a Call Center to handle calls more efficiently. CallPath/400 may be used to manage incoming calls, and simultaneously display a customer's data file at an agent's screen.

The new four-tier PBOTC pricing structure provides the customer a more convenient price choice dependent on processor size.

4.9.2 CallPath/400 Telephone System Support (USA/Canada)

Telephone System	Announcement Reference	Date	Availability Date
Teleos IRX 9000	290-436	8/90	3/91
NTI Meridian 1 opt 21-71	291-229	5/90	3/91
Rolm 9751 Bind 73	291-229	5/90	3/91(3)
AT&T DEFINITY G3i	292-092	2/92	9/92
NTI DMS-100 BCS 33	292-142	3/92	9/92(1)
AT&T DEFINITY G3r	292-457	9/92	9/92
Rolm 9751 Bind 75, 77	393-055	3/93	3/93(3)
NTI DMS-100 BCS 34	393-055	3/93	3/93(1)
Ericsson MD110 bc 6.3/7.0	393-055	3/93	6/93(2)
NTI Meridian 1 rel 17/18	293-512	9/93	9/93
AT&T DEFINITY G3s	293-512	9/93	9/93
Rolm 9751 bind 78	293-512	9/93	9/93(3)
AT&T 5ESS CO	293-505	9/93	9/93(1)
Rolm 9751 Release 9006i	293-505	9/93	1/94(3)
Rolm 9751 bind 79	294-247	5/94	At GA

Note: (1): Attachment is through IBM SwitchServer/2 host/PBX gateway. All other CallPath/400 attachments are direct to the telephone system.

Note: (2): For information on the availability of the MD110 ApplicationLink, contact the PreSales Support Group for MD110 ApplicationLink Ericsson Business Networks AB, in Tyreso, Sweden.

Note: (3): CallPath/400 support of Rolm 9751 is now through SwitchServer/2.

Note: (4): Aspect Telecommunications have announced the operation of their CSA Gateway for the Aspect CallCenter with IBM's CallPath/400. For further information, refer to the Aspect announcement *Open Enterprise: IBM CallPath Services Architecture (CSA)*.

4.9.3 Technical Information

Specified Operating Environment: CallPath/400 Version 3 Release 1 operates in the AS/400 system environment.

This product uses only existing attachment interfaces, already available in earlier releases.

Hardware Requirements: CallPath/400 Version 3 Release 1 (5763-CP2) runs on all models of the AS/400 system and requires the following:

- 20MB of DASD for Program Storage
- AS/400 Communication Adapter Port(s) for connection to telephone systems
- IBM PC is required when using SwitchServer/2 (see SwitchServer/2 documentation for PS/2 models and related requirements)
- Requirements for the telephone switching systems must be obtained from the representatives of the appropriate switch manufacturers.

For specific telephone system machine requirements, refer to the *CallPath/400 Planning and Installation Guide*, SC41-9601.

Software Requirements: Operating System/400 (OS/400) Version 3 Release 1 is required.

Compatibility: CallPath/400 supports the ROLM 9751 RP600 phone with the DCO option installed. CallPath/400 Version 3 Release 1 support of the Rolm 9751 CBX is via SwitchServer/2. Direct (native) attachment was withdrawn from marketing in September, 1994. For the direct attachment, Call Control and Event Monitoring is no longer supported. CDR support is still available.

4.9.4 Migration

CallPath/400 Version 3 Release 1 includes all the functions announced in prior versions (5730-TL1, 5738-CP1, and 5738-CP2). Customers operating prior versions of CallPath/400 should upgrade to 5763-CP2 when they install Version 3 Release 1 of the OS/400 licensed program (5763-SS1).

Limitations: The range of CallPath/400 capabilities is dependent on the features supported by the specific switch being used, and may also be limited by the network services provider.

4.9.5 Additional Telephone System Support

Aspect has announced operational attachment of the CSA Gateway and Callcenter automatic call distributor with IBM's CallPath/400.

For further information, refer to the telephone system manufacturer's announcement.

Manufacturers' product names are trademarks of the manufacturers.

4.9.6 Planning Information

Customer Responsibilities:: Customers should define specific functions supported by their telephone system, and what upgrades, if any, may be necessary. It is also the customer's responsibility to work with the network provider to determine what services are provided in their location.

Installability: The installation of CallPath/400 Version 3 Release 1 will require OS/400 Version 3 Release 1.

Installation information for CallPath/400 with telephone systems may be found in the *CallPath/400 Installation and Planning*, SC41-9601.

4.9.7 Security, Auditability and Control

The announced program uses the security and auditability features of the OS/400 System.

User management is responsible for evaluation, selection, and implementation of security features, administrative procedures, and appropriate controls in application systems and communication facilities.

4.9.8 Installation Tasks

This section provides a guide for planning and coordinating the installation of your CallPath/400 solution.

- **Define the application requirements**

The first step in planning for a CallPath/400 solution is to define the application requirements. Work with your application provider (this may be your application developers, an IBM Business Partner, or others) to translate the application requirements into the specific CallPath/400 application capabilities and to decide which network services are required. The application provider must also define the performance impact of the application on the AS/400 system. The application capabilities, network services, and performance information are necessary in later planning steps.

- **Select the telephone switch environment**

Using your business needs and requirements as a guideline, select the telephone switch environment. For further details on CallPath/400 application support capabilities, see the specific telephone switch chapters in the *CallPath/400 Planning and Installation Guide*, SC41-9601-01 and consult your telephone switch representative.

Work with your telephone switch representative and your network service representative to determine the specific telephone switch and network components required to support the application you have defined. If your existing telephone switch is one that supports the CallPath/400 program, you may decide to use it in combination with the CallPath/400 program.

- **Contact the network service provider**

If your application requires public network services, contact your network service provider to establish availability of services (availability varies within individual countries and throughout the world).

- **Define the AS/400 system components**

Contact your IBM representative to define the AS/400 system components required for your CallPath/400 solution. The AS/400 system requirements are unique in each telephone switch environment. See the specific telephone switch appendixes of this publication for a detailed list of AS/400 system operating requirements.

When you define the AS/400 system components, you must also analyze your application's performance effect on the AS/400 system. This analysis could indicate that upgrades to your AS/400 system are required for acceptable application performance.

- **Order components**

After completing the preceding steps, order all the necessary components.

- **Install the telephone switch environment**

Work with your telephone switch representative to install and verify the telephone switch environment necessary to support your CallPath/400 application.

Note: US customers: The telephone switch representative must identify your telephone switch serial number and customer number. This information may be required later for CallPath/400 software support. If, for example, a CallPath/400 program and telephone switch communication problem occurs, IBM and your telephone switch service provider may need to coordinate the

diagnosis and resolution of the problem. Your IBM software support representative needs your telephone switch serial number and customer number when contacting the telephone switch support organization.

- **Install the network services**

Work with your network services provider to install and verify the required network services, if necessary.

- **Install the AS/400 system components**

Work with your IBM representative to install and verify the AS/400 system components. In addition:

- The representative must clearly label the communication cables that are required for the AS/400 system communications attachment to the telephone switch. You need cable information to configure the CallPath/400 program.
- The representative should ensure that all IBM cables and equipment (for example, modems or modem eliminators) you ordered for customer installation have been delivered, unless you have ordered from other sources.
- The AS/400 system model and serial number, along with your IBM customer number, are required for CallPath/400 software support. Your IBM representative can help you identify this information.

- **Install the customer-install components**

See the appropriate telephone switch chapter in the *CallPath/400 Planning and Installation Guide*, SC41-9601-01 for a list of the customer-install components for your CallPath/400 program solution.

- **Install the CallPath/400 licensed program**

See the appropriate AS/400 system documentation for a guide to installing licensed programs on an AS/400 system.

- **Install your application**

Work with your application provider to install and verify the application.

IBM offerings are available to meet your requirements for planning, coordinating, installing, verifying your new system, and providing ongoing support for a total CallPath/400 solution.

4.9.8.1 Performance Considerations

The effect of the CallPath/400 program on performance of the AS/400 system depends on several complex variables:

- The number of telephone calls involved in your application during the busiest hours of your operations
- The number of switch and AS/400 system commands and messages being processed
- The type of solution used (inbound, outbound, workstation control of telephone features, or a combination of all)

Information is available from your IBM representative to assist you in evaluating CallPath/400 program performance on the AS/400 system. In addition, the system resources used by the application program must be considered when analyzing the AS/400 system performance.

A CallPath/400 application solution can also affect the performance of your telephone switch. Consult your telephone switch representative to understand switch performance considerations.

4.10 CallPath CICS

This section describes the software and hardware requirements for CallPath CICS and CallPath SwitchServer/2 and explains what you have to do to prepare for successful installation and operation. For further information see *CallPath CICS and CallPath SwitchServer/2 General Information*, SC34-2401.

4.10.1 Software Environment

CallPath CICS/MVS runs under one of the following operating systems:

- MVS/XA
- MVS/ESA

You need ACF/VTAM Version 3 Release 2 or later for your operating system (ACF/VTAM Program Number 5665-289 for MVS/XA or ACF/VTAM Program Number 5685-085 for MVS/ESA).

One of the following programs is also required:

- CICS/OS/VS (Program Number 5740-XX1) Release 1.7
- CICS/MVS (Program Number 5665-403) Version 2
- CICS/ESA (Program Number 5685-083) Version 3

Note: The program numbers listed are for a particular version/release of the product. Different program version/release numbers may be used if they satisfy the particular CICS environment running CallPath CICS/MVS.

One of the following programs is required if you want CallPath SwitchServer/2 alerts to be processed on the host:

- NetView for MVS/XA (Program Number 5665-362)
- NetView for MVS/ESA (Program Number 5685-152)

To install CallPath CICS/MVS program libraries, you need System Modification Program/Extended (SMP/E) (Program Number 5668-949) Version 5.

CallPath CICS/VSE operates under one of the following operating systems:

- VSE/SP
- VSE/ESA

Note: The program numbers listed are for a particular version/release of the product. Different program version/release numbers may be used if they satisfy the particular CICS environment running CallPath CICS/VSE.

You need ACF/VTAM for your operating system (Program Number 5666-313 Version 3 Release 2 for VSE/SP or Program Number 5666-363 Version 3 Release 3 for VSE/ESA).

One of the following programs is also required:

- CICS/VS (Program Number 5746-XX3) Release 1.7

- CICS/VSE (Program Number 5686-026) Version 2.1

The following program is required if you want CallPath SwitchServer/2 alerts to be processed on the host:

- NetView for VSE (Program Number 5666-343)

CallPath SwitchServer/2 operates under:

- OS/2 Version 2.1 or later

If your switch is the IBM Com300/Siemens Hicom 300 Release 2.3, you can use OS/2 Extended Edition, Version 1.2.

- Optionally, for connectivity to CallPath/DOS for Windows workstations, VM PWSCS (Program Number 5684-138, feature code 5767), Version 1.0 or later

The following program is required if you want to operate CallPath SwitchServer/2 from a remote console:

- Distributed Console Access Facility (Program Number 5621-031), Version 1.0 or later

4.10.2 Hardware Environment

CallPath CICS does not require any equipment configurations in addition to those for MVS/XA, MVS/ESA, VSE/SP, or VSE/ESA.

4.10.3 CallPath CICS Storage Requirements

The main storage and disk space used by the system depend on the number of switches defined, the number of active telephone numbers, and the type and volume of application requests. Table 2 shows the storage requirements for a configuration with:

- 50 concurrently active applications, each with four call profiles and four outstanding switch requests
- Five switches
- 100 concurrently active telephone numbers, each with four connection IDs and one ownership registration
- No buildup of application message queues (the applications receive messages as soon as they arrive.)

Table 2. CallPath CICS Storage Requirements		
Type of Storage	Purpose	Approximate Size
CICS storage (above 16MB line for CallPath CICS/MVS)	Tables, for example, one call profile table and five request tag tables (one per switch), plus event and request handler load modules	1MB
CICS storage (below 16MB line for CallPath CICS/MVS)	API load modules and system configuration table	1.2MB
CICS transient data queues	Message handler queues and the administration subsystem queue	7KB
VSAM data sets	Trace, error, traffic, switch configuration, and control files	9MB
Optional archive data sets	Archived error, trace, and traffic files	23MB

Note: KB equals 1024 bytes. MB equals 1024KB.

4.10.4 Installation

CallPath CICS/MVS is installed using standard installation procedures for MVS products. The program is distributed in SMP/E Release 5 format. An installation verification program enables the installer to check the installation.

CallPath CICS/VSE is installed using standard installation procedures for VSE products. The program is distributed in Maintain History Program (MSHP) format. There is an installation verification program to enable the installer to check the installation.

4.10.4.1 Human Factors

Traditionally, voice and data processing have been separate, and the people who manage them have not worked together. CallPath CICS changes that. The design and implementation of coordinated voice and data applications requires cooperation between telephony people and data processing people.

For example, applications need online directories of agents' extensions, pilot numbers for incoming calls, client telephone numbers for outgoing calls, and switch identifications. Someone must ensure that the directories used by the application programs are compatible with the switch configuration.

It is recommended that you assign someone the role of "voice/data coordinator." This person will coordinate efforts of all the people involved in the development and implementation of combined voice and data applications.

4.10.5 Planning Checklist

Here is a checklist of things to do before and after installing CallPath CICS and CallPath SwitchServer/2:

- Check that the switch you have, or will have, is supported by CallPath SwitchServer/2.
- Order the communications connections that you need.
- Check that you have enough virtual storage on your CICS system.
- Order and install any hardware that you need.
- Order and install any software that you need. Order CallPath CICS/MVS or CallPath CICS/VSE.
- Order CallPath SwitchServer/2.
- Check whether the switch or any VRUs need to be reconfigured; talk to the vendor's customer engineers.
- Decide who will be responsible for CallPath CICS administration and CallPath SwitchServer/2 administration.
- Install CallPath CICS/MVS or CallPath CICS/VSE.
- Analyze agents' use of switch functions and application functions, and either design the application coordination of these functions or buy a suitable application from a vendor.
- Either code the new application functions using the API or install a CallPath CICS application supplied by a vendor.

- Define the CallPath SwitchServer/2 PC to the ACF/VTAM and, optionally, to the Network Control Program (NCP).

If NetView is used, check whether any NetView configuration or definition is required.

- Define the hosts to Communications Manager. If applicable, define the CallPath/DOS for Windows hosts to VM PWSCS.
- Test the applications using the CallPath CICS switch simulator.
- Install CallPath SwitchServer/2.
- Configure CallPath SwitchServer/2.
- Connect the CallPath SwitchServer/2 PC to the switch. If you are going to operate CallPath SwitchServer/2 remotely, connect the CallPath SwitchServer/2 PC to the remote PC and install Distributed Console Access Facility on both computers.
- Test the applications using CallPath SwitchServer/2 and the switch. Train the Call Center staff, the CallPath CICS administrator, the CallPath SwitchServer/2 administrator, and the help desk staff.

4.11 CallCoordinator

The best CallCoordinator results are obtained through careful planning. Tasks to consider in planning for CallCoordinator include:

- Determining what you want the system to do
- Determining whether your current system meets the hardware and software requirements
- Establishing plans for the installation and administration of the system

4.11.1 Hardware Requirements

The following section shows the hardware requirements for CallCoordinator/2 and CallCoordinator for Windows.

- **Server**
 - Base workstation, such as an IBM PC, PS/ValuePoint, PS/1 or selected non-IBM system units with an 80386 (or higher) microprocessor supported by the required OS/2 software.
 - IBM PC Display or compatible.
 - A typical system needs 12MB of memory for the OS/2 base operating system, Communications Manager, LAN Requester and CallCoordinator/2 Server. CallCoordinator/2 Server takes 2.0MB beyond normal memory requirements.
 - A typical system needs at least an 80MB fixed disk drive. CallCoordinator/2 Server requires 2.0MB on the fixed disk drive, including 0.5MB for the optional CallCoordinator/2 Server log file.
 - 3.5-inch 1.44MB diskette drive.
 - IBM 16/4Mbps Token-Ring Network Adapter, or Ethernet adapter.
- **Archive**

- Base workstation, such as an IBM PC, PS/ValuePoint, PS/1 or selected non-IBM system units with an 80386 (or higher) microprocessor supported by the required OS/2 software.
- IBM PC display or compatible.
- A typical system needs 10MB of memory for the OS/2 base operating system, Network Transport Services/2 or LAN Services, and CallCoordinator/2 Archive. CallCoordinator/2 Archive requires 2.0MB beyond normal memory requirements.
- A typical system needs at least a 160MB fixed disk drive. CallCoordinator/2 Archive requires 2.0MB on the fixed disk drive, including 0.5MB for the optional CallCoordinator/2 Archive log file.
- 3.5-inch 1.44MB diskette drive.
- IBM 16/4Mbps Token-Ring Network Adapter, or Ethernet adapter.
- **Workstation (CallCoordinator/2)**
 - Base workstation, such as an IBM PC, PS/ValuePoint, PS/1 or selected non-IBM system units with an 80386 (or higher) microprocessor running the required OS/2 software.
 - IBM PC display or compatible.
 - A typical system needs 10MB of memory for the OS/2 base operating system, Communications Manager and two host emulation sessions, LAN Requester and CallCoordinator/2 with device drivers. CallCoordinator/2 requires 2.0MB beyond normal memory requirements for the system when using one telephone line. This does not include memory required for user-developed device drivers. Each additional telephone line requires 150KB of memory.
 - A typical system needs at least an 80MB fixed disk drive. CallCoordinator/2 requires 2.0MB on the fixed disk drive, including 0.5MB for the optional CallCoordinator/2 log file.
 - 3.5-inch 1.44MB diskette drive.
 - IBM 16/4Mbps Token-Ring Network Adapter, or Ethernet adapter.
 - Host communications adapter, such as 3270 Connection or token-ring.
- **Workstation (CallCoordinator for Windows)**
 - IBM PC or compatible with an 80386 (or higher) microprocessor
 - IBM PC display or compatible display supported by Windows 3.1
 - IBM PC mouse or compatible pointing device
 - Minimum of 4MB random access memory (RAM)
 - 3MB fixed-disk space
 - IBM Token-Ring Adapter or Ethernet adapter

4.11.2 Software Requirements

The following section shows the software requirements for CallCoordinator/2 and CallCoordinator for Windows.

- **Server software**
 - OS/2 2.1 (or higher) with Communications Manager/2 1.0 (with Network Transport Services/2 if you are using CallPath SwitchServer/2)

- CallPath/2 MultiAgent
- CallPath SwitchServer/2
- CallCoordinator/2 Server
- TCP/IP 2.0, 2.1
- NetWare Requester for OS/2 2.1, Version 2.01 (for NetWare support only)
- **Archive software**
 - OS/2 2.1 (or higher) with Communications Manager/2 1.0 (with Network Transport Services/2 if you are using CallPath SwitchServer/2)
 - CallPath SwitchServer/2
 - CallCoordinator/2 Archive
 - NetWare Requester for OS/2 Version 2.01 (for NetWare support only)
- **Workstation software (CallCoordinator/2)**
 - OS/2 2.1 (or higher) with Communications Manager/2 1.0 (with Network Transport Services/2 if you are using CallPath SwitchServer/2)
 - CallPath/2 SingleAgent
 - CallPath SwitchServer/2
 - CallCoordinator/2
 - TCP/IP 2.0 (for stand-alone workstation)
 - NetWare Requester for OS/2 2.1, Version 2.01 (for NetWare support only)
- **Software (CallCoordinator for Windows)**
- IBM DOS 5.0 or 6.x Microsoft Windows 3.1 (Enhanced Mode)
- IBM LAN Support Program
- or
- Novell NetWare IPX/SPX
- DOS Lan Requester
- RUMBA by Wall Data Inc. (optional for terminal emulation)
- IBM PC/3270 (optional for terminal emulation)

4.12 CallCoordinator CICS/MVS

This section lists the specific data equipment requirements for CallPath CallCoordinator CICS/MVS.

4.12.1 Hardware

CallPath CallCoordinator and CallPath CICS/MVS, which is a prerequisite, reside on a mainframe computer, such as the IBM System/370 (S/370) or IBM System/390 (S/390). Information is sent between CallPath CallCoordinator and a switch through CallPath SwitchServer/2, which resides on an IBM Personal System/2 (PC) computer.

4.12.1.1 IBM 3270 Terminals

CallPath CallCoordinator works with your existing network of the IBM 3270 family of terminals. You need not buy programmable workstations (PWS) or use Integrated Services Data Network (ISDN) protocol for links, as might be required to run other coordinated voice and data systems.

The family of nonprogrammable terminals (NPTs) associated with the IBM 3270 Information Display System (IDS) provide several screen sizes (1920, 2560, 3440, and 3564) and features to accommodate the differing requirements of your applications. You can also use IBM 3270 display controller-attached PWS operating in 3270 emulation mode, thus providing you with workstation use as well as host computer access.

For a detailed list of specific IBM 3270 terminals supported by CallPath CallCoordinator, see the *CICS/MVS Facilities and Planning Guide*, SC33-0504.

4.12.1.2 IBM PC Computer

CallPath SwitchServer/2, the protocol converter between the host computer and the switch, resides on a PC computer. CallPath SwitchServer/2 is a CallPath Services product and is required by CallPath CICS/MVS. Refer to *CallPath CICS/MVS and CallPath SwitchServer/2 General Information*, GC34-2401, and *Using CallPath SwitchServer/2*, SC34-2406, for information about requirements.

4.12.2 Software

The following prerequisite and co-requisite software products must be installed on the IBM S/370 or S/390:

- CICS/OS/VS Release 1.7 (5740-XX1) or later and corresponding MVS system
- IBM Assembler H Version 2 Release 1 (5668-962) or later or Assembler XF (MVS/370)
- Advanced Communication Function/Virtual Telecommunications Access Method (ACF/VTAM) as appropriate for your version of CICS
- System Modification Program Extended (SMP/E) (5668-949) Release 5 or later
- Virtual Storage Access Method (VSAM) support: DFP/XA Release 2.3 (5665-SA2)

4.12.3 CallPath CallCoordinator CICS/MVS

The CallPath CallCoordinator software is delivered in three modules:

- CallPath CallCoordinator Base Module, identified by the component code EZZ
- CallPath CallCoordinator Inbound Feature Module, identified by the component code CAM
- CallPath CallCoordinator Outbound Feature Module, identified by the component code EVQ

You can buy the Inbound feature, the Outbound feature, or both. Table 3 on page 132 lists what you receive.

<i>Table 3. CallPath CallCoordinator CICS Features and Modules</i>	
If you buy	You receive
Inbound feature	CallPath CallCoordinator Base Module CallPath CallCoordinator Inbound Feature Module
Outbound feature	CallPath CallCoordinator Base Module CallPath CallCoordinator Outbound Feature Module
Both features	CallPath CallCoordinator Base Module CallPath CallCoordinator Inbound Feature Module CallPath CallCoordinator Outbound Feature Module

4.12.4 CallPath CICS/MVS

CallPath CallCoordinator requires CallPath CICS/MVS. CallPath CICS/MVS is an IBM licensed program that implements the CallPath Services architecture and controls the link between the host computer and the switch or switch network. CallPath CICS/MVS establishes, monitors, and ends calls between a switch and a computer. CallPath CICS/MVS resides on an IBM S/370 or S/390 computer.

Refer to *CallPath CICS/MVS and CallPath SwitchServer/2 General Information*, GC34-2401, and *Using CallPath CICS/MVS*, SC34-2404, for information about requirements.

4.13 DirectTalk/2

When planning to install DirectTalk/2, you need to consider both hardware and software requirements.

This section provides guidance on the hardware and software for implementing a working DirectTalk/2 system. You will also need to refer to the appropriate country and language books.

However, due to the rate of technological change and the differences in the availability of different components in different countries, you should discuss the requirements for your installation with your local IBM representative.

4.13.1 DirectTalk/2 Components

DirectTalk/2 consists of a base system component, a runtime system component, and a number of optional features. You require a DirectTalk/2 runtime system and the following minimum additional hardware and software to create a basic voice processing system:

- A personal computer with either Industry Standard Architecture (ISA) bus or Micro Channel architecture, running IBM OS/2 Warp Version 3.0
- One or more Dialogic or Aculab network interface cards for connecting the required type and number of telephone lines to DirectTalk/2
- One or more Dialogic voice processing cards

Note: Some Dialogic cards provide both network interface and voice processing capabilities.

4.13.1.1 DirectTalk/2 Base System Functions

The DirectTalk/2 base system cannot be used on its own, but, when connected to other voice systems that are capable of running voice applications, it allows you to:

- Use the application development environment including:
 - A menu-driven program for creating voice applications
 - A set of predefined actions and variables that you can use in your applications
 - A number of prerecorded voice segments for commonly used words and phrases in multiple languages
 - Support for recording your own voice segments
 - Test and debug tools
 - The ability to develop applications in either DirectTalk/2's own application language or in OS/2 REXX
- Use the system management tools which:
 - Support local and remote system management
 - Collect statistics on application use
 - Display real-time status of telephone lines and applications
 - Provide password protection and audit-trail facilities

The base system license also enables you to install and use the Toolkit, which allows you to write your own user actions, user servers, and user requesters to expand your system features.

4.13.1.2 DirectTalk/2 Runtime System Functions

A runtime DirectTalk/2 system allows you to perform all the base system tasks and also allows you to run applications that can:

- Answer the telephone and interact with callers
- Accept pushbutton or voice input from callers
- Play prerecorded messages or computer-generated speech
- Provide correct spoken syntax for numbers, dates, times, and currency
- Originate calls
- Allow the caller to exit the application and talk to a person
- Refer or transfer the caller to another person
- Recognize dial tone, ring back, line busy, and circuit busy tones
- Allow analog or digital connection

The runtime system also provides:

- Support for multiple voice-processing applications on a single personal computer
- Support for between 2 and 48 analog or digital telephone lines on a single system
- Data manipulation that enables your applications to:
 - Process numeric, alphabetic, and alphanumeric data
 - Perform arithmetic calculations and string operations
 - Combine prerecorded voice segments with variable data
 - Make decisions based on caller input or stored data

4.13.1.3 Functions Provided by DirectTalk/2 Features

The DirectTalk/2 optional features extend the facilities offered by the runtime system. Some of the optional features also require additional hardware and software to make use of their function.

Voice Recognition Feature

This feature, when used with additional voice recognition hardware, adds the following capabilities to your system:

- Recognition of discrete numeric voice input
- Recognition of discrete alphanumeric input
- Recognition of continuous voice speech input
- Support for multiple voice recognition languages
- Allowing callers to interrupt prompts
- Resolution of ambiguous responses to improve accuracy
- Recovery from speaker error and provision of context-sensitive help
- Allowing callers with rotary phones to use DirectTalk/2 applications

Note: Not all capabilities are available on all hardware.

Text-to-Speech Feature

This feature, when used with additional text-to-speech hardware and software, enables ASCII text to be converted into computer-generated speech. The text source can be the DirectTalk/2 database or voice segments text, application data, or a host screen. This feature is available for use with English, German, French, Italian, and Spanish.

Note: To use the full range of languages you must use Antares cards with L&H firmware.

Communications Feature

This feature, when used with additional communications hardware and software, adds the following capabilities to your system:

- Interaction with host computers, including retrieving data and communicating it to the caller
- Support for a wide range of host communications options for S/370, S/390, AS/400, and ASCII terminal hosts
- Support for multiple host terminal emulation sessions per telephone line
- Support for a variable number of shared paths for APPC servers in host APPC sessions
- NetView alerts for remote network management

Voice Messaging Feature

This feature adds the following capabilities to your system:

- Recording voice messages and storing them in a mailbox
- Retrieving and playing messages from a mailbox
- Maintaining a directory of mailbox users and databases of user names and messages

Telecommunications Devices for the Deaf (TDD) Feature

This feature allows hearing-impaired callers to communicate with DirectTalk/2 through TDD terminals.

ADSI Feature

This feature adds the following capabilities to your system:

- Support for interaction with ADSI devices
- A development environment to create and manage ADSI scripts
- Support for the transmission of ADSI functions to ADSI devices with real-time variable substitution
- Support for the receipt of alphanumeric data from ADSI devices

4.13.2 DirectTalk/2 Applications

A DirectTalk/2 application consists of programmed interaction between a voice system and a caller. You can create applications to use any of the DirectTalk/2 functions described earlier in this chapter, but the functions that you actually use will depend on the tasks you want your voice system to perform, and the hardware and software that you have installed.

Voice applications consist of one or more voice programs which control the interactions between callers and the various functions of DirectTalk/2. Voice programs also contain voice logic modules, which control the playing of recorded or synthesized voice segments.

The **Voice Application Developer (VAD)** and the DirectTalk/2 actions that are included in the DirectTalk/2 base package enable you to create voice applications quickly and easily.

The **Application Manager** runs your DirectTalk/2 applications, interpreting the DirectTalk/2 actions that are included in your voice programs.

The **Node Manager** allows you to start and stop applications and to monitor the status of applications and telephone lines.

4.13.3 Telephone Connections

DirectTalk/2 supports up to 48 analog or digital telephone lines on a single personal computer. DirectTalk/2 is connected to telephone lines through standard voice communications cards. The telephone lines can come directly from the public telephone network or through a private branch exchange (PBX).

If you expect that your call volumes require (or will grow to require) more than 48 lines, you can create additional DirectTalk/2 systems and connect them together through a LAN. All systems connected together through a LAN can be managed from a single node.

4.13.3.1 Connecting Resources to Telephone Lines

Within a voice system you may want to make the function of several different cards, voice recognition and text-to-speech for example, available on each of a number of telephone lines. To make this possible you must connect the cards together with ribbon cables to form either a Pulse Code Modulation Expansion Bus (PEB) or a System Computing Bus (SCbus).

4.13.4 Planning Your DirectTalk/2 Site

When preparing for the installation of DirectTalk/2, you need to consider a number of requirements relating not only to DirectTalk/2, but also to the other resources you will need. This section considers the following:

- Telephone line requirements
- Personal computer configuration

- Network configuration
- Personnel skills

4.13.4.1 Planning Your Telephone Requirements

When planning a system, you need to determine the number of telephone lines your DirectTalk/2 system requires. For example, on a 24-line system, you can run one application on 24 different telephone lines or you can run 24 different applications on 24 separate telephone lines.

4.13.4.2 Estimating Your Telephone Line Requirements

Three factors determine how many telephone lines your DirectTalk/2 system will need for a given application:

- The number of calls the application expects during its peak hours.
- The average length of time spent on each call.
- The acceptable percentage of blockage, namely, the percentage of callers that receive busy tones during your peak hours. To the caller, this equates to the average time that they must wait before their call is answered.

In many cases, DirectTalk/2 will be installed into an existing telephony application. If so, you can determine the approximate number of peak-hour call attempts by examining existing records such as automatic call distribution (ACD) reports, trunk traffic statistics, or telephone bills. If no other records exist, you will probably require a traffic study to determine the number of peak-hour call attempts.

Similarly, with an existing application, the average length of a call, or the call-hold time, can be obtained from ACD reports or by timing enough actual calls to get a good average value.

4.13.4.3 Calculating Telephone Traffic

The number of peak-hour calls and the average call hold time can be used to calculate the telephone traffic in units known as *erlangs*. The amount of traffic (in erlangs) equals the number of calls you receive in a peak hour, multiplied by the average hold time in seconds, divided by the number of seconds in an hour (3600). Hold time is the amount of time DirectTalk/2 takes to process a call. When you know your erlang figure, and have calculated how many calls your business can afford not to deal with (the Acceptable Blockage Level), you can use Table 4 to calculate how many lines you need to install on your DirectTalk/2 system.

Table 4 (Page 1 of 3). Number of Lines Required According to Traffic and Blockage Rate

Traffic in Erlangs	Acceptable Blockage Rate and Number of Lines Required						
	0.1%	0.5%	1.0%	2.0%	5.0%	10.0%	20.0%
1	6	5	5	4	4	3	2
2	8	7	7	6	5	4	4
3	10	9	8	8	7	6	5
4	12	11	10	9	8	7	5
5	14	12	11	10	9	8	6
6	15	14	13	12	10	9	7
7	17	15	14	13	11	10	8

Table 4 (Page 2 of 3). Number of Lines Required According to Traffic and Blockage Rate							
	Acceptable Blockage Rate and Number of Lines Required						
Traffic in Erlangs	0.1%	0.5%	1.0%	2.0%	5.0%	10.0%	20.0%
8	18	16	15	14	13	11	9
9	20	18	17	15	14	12	10
10	21	19	18	17	15	13	11
11	23	20	19	18	16	14	12
12	24	22	20	19	17	15	12
13	26	23	22	20	18	16	13
14	27	24	23	21	19	17	14
15	28	26	24	23	20	18	15
16	30	27	25	24	21	19	16
17	31	28	27	25	22	20	17
18	32	29	28	26	23	21	17
19	34	30	29	27	24	22	18
20	35	32	30	28	26	23	19
21	36	33	31	29	27	24	20
22	37	34	32	31	28	25	21
23	39	35	34	32	29	26	22
24	40	36	35	33	30	27	22
25	41	38	36	34	31	28	23
26	42	39	37	35	32	29	24
27	44	40	38	36	33	29	25
28	45	41	39	37	34	30	26
29	46	42	40	38	35	31	27
30	47	44	42	39	36	32	27
31	49	45	43	41	37	33	28
32	50	46	44	42	38	34	29
33	51	47	45	43	39	35	30
34	52	48	46	44	40	36	31
35	54	49	47	45	41	37	31
36	55	51	48	46	42	38	32
37	56	52	49	47	43	39	33
38	57	53	51	48	44	40	34
39	58	54	52	49	45	41	35
40	60	55	53	50	46	42	36
41	61	56	54	51	47	43	36
42	62	57	55	52	48	43	37
43	63	59	56	53	49	44	38
44	64	60	57	55	50	45	39
45	66	61	58	56	51	46	40
46	67	62	59	57	52	47	40

Table 4 (Page 3 of 3). Number of Lines Required According to Traffic and Blockage Rate							
	Acceptable Blockage Rate and Number of Lines Required						
Traffic in Erlangs	0.1%	0.5%	1.0%	2.0%	5.0%	10.0%	20.0%
47	68	63	61	58	53	48	41
48	69	64	62	59	54	49	42
49	70	65	63	60	55	50	43
50	71	66	64	61	56	51	44
51	73	68	65	62	57	52	44
52	74	69	66	63	58	53	45
53	75	70	67	64	59	54	46
54	76	71	68	65	60	55	47
55	77	72	69	66	61	56	48
56	78	73	70	67	62	56	48

The following examples show how this table can be used.

Example 1: Calculate the number of telephone lines required to support 342 busy-hour calls with an average hold-time of 60 seconds, if the acceptable blockage level is 1%.

Calculate the traffic using the formula as follows:

$$\text{Traffic} = 342 \times 60 / 3600 = 5.7 \text{ erlangs}$$

The acceptable blockage level is 1%. To determine the number of telephone lines required, look down the **Traffic in Erlangs** column until you find a number greater than 5.7. The nearest is 6. Now look across until you reach the 1% column. This indicates that the application requires a minimum of 13 telephone lines.

Example 2: For the same acceptable blockage level, what would be the capacity of a 17-line system, given the same average hold-time per call?

From Table 4 on page 136, a 17-line system, at a 1% acceptable blockage level, could handle a traffic of up to 9 erlangs. This corresponds to $9 \times 3600 / 60 = 540$ calls per hour. If the call volume grows beyond this level, you can add additional lines or even a new system. You can use the fact that DirectTalk/2 monitors the number and length of calls processed by each line to plan for future growth.

4.13.4.4 Other Factors

You might have to consider additional factors to estimate the number of telephone lines needed for your DirectTalk/2 application. These include:

- Whether DirectTalk/2 is in an ACD group
- Normal planned growth in traffic to the application
- Additional growth stimulated by the installation of DirectTalk/2

4.13.5 Requirements for Your Personal Computers

For each node in a DirectTalk/2 system you must have a personal computer for which you need to provide space, power, and LAN access if you are planning a distributed network.

The figures given in this chapter give a guide to the system requirements, but the complexity of voice applications varies considerably and it is not possible to give a set of figures to cover all applications.

DirectTalk/2 runs on two different bus architectures. The architecture that you choose determines, to some extent, the capabilities of the DirectTalk/2 system that you implement:

- **Industry Standard Architecture (ISA)**, which is often referred to as the "AT-bus". If you are installing a new system this is the architecture you should use. Many of the DirectTalk/2 functions can only be used with this architecture.
- **IBM Micro Channel**, which is used in nearly all PS/2 systems. You should only use this architecture if you are trying to upgrade an existing system. The Dialogic cards that support this architecture are no longer available to new customers. Also, many of the DirectTalk/2 functions are not supported for this architecture, or have only limited capabilities, and this support is not being extended.

Regardless of the bus architecture being used, DirectTalk/2 requires IBM OS/2 Warp Version 3.0 to be installed.

The processor and memory requirements for each personal computer will depend on the hardware you want to install, and the DirectTalk/2 functions you want it to perform.

4.13.6 Space Requirements

When planning the site for each personal computer, allow for adequate ventilation space to ensure that power dissipation is not a problem.

4.13.7 Power Requirements

Your system needs sufficient power outlets nearby (either 115 Volt AC or 240 Volt AC). Typical power requirements for an IBM Personal System/2 (PS/2) are:

- Power supply input:
 - Low range (115 volts nominal): 100 through 125 VAC
 - High range (240 volts nominal): 180 through 265 VAC
- Frequency: 50/60 Hz.
- Power consumption: the power consumption of a PC depends on the model, and the type and number of additional cards, disk size and type, and so on. For a 24-line DirectTalk/2 configuration including telephony and voice processing hardware, the minimum power consumption would be unlikely to be less than 300 watts.

Refer to the manufacturer's documentation for the precise power requirements for your personal computer.

4.13.8 Hardware Requirements

The personal computer hardware required to support DirectTalk/2 depends on the number of telephone lines and DirectTalk/2 features that you want to support. You must consider the following items:

- Voice and optional hardware
- Number of backplane (adapter) slots
- Processor type
- Random Access Memory (RAM)
- Fixed disk space

4.13.8.1 Voice Hardware

If you intend to run or develop DirectTalk/2 voice applications on a particular system, it must contain one of the following:

- One or more Dialogic or Aculab Network Interface (NIF) cards and one or more Dialogic Voice Processor cards
- One or more Dialogic combined Network Interface cards and a Voice board

4.13.8.2 Optional Hardware

The following hardware is optional in a DirectTalk/2 configuration:

- LAN cards, if you want to create a networked system
- Host Communications cards, if you want to use the optional DirectTalk/2 Host Communications Feature
- A data backup device
- A printer for printing data or reports from your applications

4.13.8.3 Adapter Slot Requirements

When planning your DirectTalk/2 system, keep in mind how many slots are available on your personal computer. The number of slots you need depends on several factors, including:

- The number of lines you intend to install
- Adapters required to support any optional features you plan to install
- Adapters required by other applications running on your personal computer

Choose your personal computer carefully, as some have fewer Industry Standard Architecture (ISA) slots than others. Also check that you have sufficient full-length ISA slots and that the maximum length of the ISA cards is not restricted, as all Dialogic and Aculab cards are full-length ISA.

A large DirectTalk/2 system may require more adapter slots than you have available in your personal computer. In this case, you will need to use a bus expansion chassis.

Note: External modems attach to the serial port and so do not require any slots. Table 5 on page 141 summarizes the telephony card slot requirements for the different numbers of telephone lines.

4.13.8.4 Processor Requirements Guidance

You should be careful to estimate the processor resource required by your application. Most telephony operations are performed by the adapters and require little processor resource, but your applications may have to perform a large number of transactions that require processor resource. Estimate the resource required for the operations if they were performed by a program interacting directly with a user at the personal computer. You should look at elapsed time, disk I/O requests, and processor usage. You then need to multiply these figures by the number of applications you want to run on the machine to determine how much processor power you need.

Table 5. Processor, Backplane, and Memory Requirements

Number of Lines	Recommended Processor Type•	Number of slots•
2	66MHz 486 DX2	1
4	66MHz 486 DX2	1 or 2
8	66MHz 486 DX2	2
12	Pentium 75	2 to 4
16	Pentium 75	1 to 4
24	Pentium 100	1 to 6
30	Pentium 120	2 to 8
32	Pentium 133	3 to 8
36	Pentium 133	3 to 8
48	Pentium 166	2 to 14

Notes:

1. These are the recommended processor requirements. Consider installing a more powerful processor if you are running user actions and other software.
2. Depends on the bus type and cards supported for your country and whether the telephone lines are analog or digital.

4.13.9 Memory Requirements Guidance

Precise memory requirements are always difficult to state owing to the diverse configurations and applications implemented at different user sites. As a result, the following notes are for guidance only.

The amount of memory required for DirectTalk/2 itself (as opposed to that required for the operating system, Communications Manager and other applications running on the system), depends on several factors including:

- Which features are installed
- The number of phone lines in use
- The resources required for the voice applications
- The number of host sessions active
- The communications program and protocol being used
- The number of user actions and servers being used

It is very important to take into account any resources needed by other programs on your system, and by any user actions, servers, or voice segment cache. Table 6 on page 142 provides an estimate of the DirectTalk/2 memory requirements for a DirectTalk/2 system with:

- IBM OS/2 Warp Version 3.0

- Communications Manager/2, Communications Server/2, or Personal Communications
- DirectTalk/2 Communications Feature installed
- A voice application of about 300 lines of code

In addition:

- Communications Manager/2, Communications Server/2, and Personal Communications require up to 4MB each
- IBM OS/2 Warp Version 3.0 requires:
 - 16MB for a 0-16 line system
 - 20MB for a 24-32 line system
 - 24MB for a 36 line system
 - 30MB for a 48 line system
- The voice cache on a busy system should be chosen to minimize the disk I/O. This could be 5-10MB on systems with a large number of segments running at 64 kbps recording rate.

<i>Table 6. Memory Requirements for DirectTalk/2 Systems</i>	
Function	Memory
DirectTalk/2 basic requirement	6.0MB
Recommended voice cache	2-10MB
For each telephone line	0.6MB (voice program) 0.7MB (telephony)
For each host connection	0.6MB (ARTIC) 0.7MB (CM/2 EHLLAPI) 0.8MB (PCOM EHLLAPI) 1.0MB (CM/2 or CS/2 LUA)
For each user action	Up to 200KB for each telephone line
For each user server	Up to 500KB
Note: <ol style="list-style-type: none"> 1. These memory estimates are in addition to that required by the operating system and other applications. 2. The memory usage of user actions and servers depends heavily on the function they are performing. 3. ARTIC does not require CM/2, CS/2 or PCOM. 	

For example, a 12-line DirectTalk/2 system with four EHLLAPI host sessions (via Communications Manager/2) would require:

$$6.0 + 2.0 + (12 \times 0.6) + (4 \times 0.7) = 18\text{MB}$$

Note: When DirectTalk/2 starts up, it requires more than this amount. However, this is a temporary condition, and does not impose additional requirements on your system.

If this Direct Talk/2 system has 16MB of RAM, the size of the swapper file can be estimated. This is given by the total (swappable) memory required less the physical RAM in the system, that is:

$$20.0 \text{ (for OS/2 and CM/2)} + 18 \text{ (DirectTalk/2)} - 16 = 22\text{MB}$$

However, the OS/2 swapper file processing often retains a larger file size that includes approximately 30% free space.

IBM OS/2 Warp Version 3.0 takes much more memory for itself in larger systems. For a 24-line system 20-25MB is required for IBM OS/2 Warp Version 3.0; for 48 line systems, the requirement can be in excess of 30MB.

It is recommended that you choose the amount of system RAM required to reduce the swap file to a minimum. This particularly applies to systems with 16 lines or more.

4.13.10 Disk Space Calculation for DirectTalk/2 Systems

At least 100MB of available fixed disk space is required; the precise amount depends on:

- The compression rate to be used for recording and playing your voice segments
- The number of voice segments to be recorded

DirectTalk/2 supports four different compression rates for recording voice segments. A higher rate produces a better quality voice recording, but requires more disk space. Table 7 illustrates the four rates and the corresponding amount of disk space required to store 10 seconds, 3 minutes, and 1 hour of recorded voice segments.

<i>Table 7. Disk Space Requirements and Compression Rates</i>			
Compression Rate	10 seconds	3 minutes	1 hour
24 Kbps	30KB	540KB	10.8MB
32 Kbps	40KB	720KB	14.4MB
48 Kbps	60KB	108KB	21.6MB
64 Kbps	80KB	144KB	28.8MB

Table 8 illustrates the amount of recorded voice in hours that can be stored on some representative disk sizes. (The calculation allows approximately 50MB for OS/2, DirectTalk/2, and application data files.)

<i>Table 8. Recorded Voice Duration and Disk Size</i>			
Compression Rate	100MB	200MB	400MB
24 Kbps	4.6 hrs.	9.3 hrs.	18.6 hrs.
32 Kbps	3.4 hrs.	6.8 hrs.	13.7 hrs.
48 Kbps	2.3 hrs.	4.6 hrs.	9.2 hrs.
64 Kbps	1.6 hrs.	3.2 hrs.	6.4 hrs.

4.13.10.1 Voice Messaging Disk Space Requirements:

If you are using the Voice Messaging Feature of DirectTalk/2, based on the increased voice storage requirements inherent in voice-messaging applications, a large fixed disk is recommended. The exact size of the disk required depends on your requirements, so consider the following:

- Number of mailboxes required
- Maximum length of a message
- Number of messages per mailbox

Then calculate how much space would be required if all the mailboxes had the maximum number of messages, and all messages were of the maximum length. You also need to take account of the compression rate used for voice messages.

4.13.10.2 Swap Space

In your calculations on disk space requirements, you should also take into account the swap file used by OS/2, especially during startup. In OS/2, the swap file grows as required, so the swap file space is not permanently consumed. However, it must be available if normal processing is to continue. As a rule-of-thumb you should allow a minimum of 20MB of swap space for a production system.

4.13.11 Software Requirements

The software listed here is required for all DirectTalk/2 configurations.

- IBM OS/2 Warp Version 3.0
- IBM DirectTalk/2 Licensed Program Product Base System
- IBM DirectTalk/2 Licensed Program Product for each feature used

If your application includes coding to the DirectTalk/2 open architecture (that is, writing C programs that use one of the DirectTalk/2 APIs), the following additional software is required:

- Any compiler that supports OS/2 DLLs
- IBM OS/2 Programming Tools and Information (toolkit)

Note: If you are writing 32-bit versions for the current version of DirectTalk/2, use the OS/2 2.1 toolkit or the IBM OS/2 Warp Version 3.0 toolkit.

If you are writing 16-bit actions or servers, to maintain compatibility with earlier versions of DirectTalk/2, you need the OS/2 1.3 toolkit.

Dialogic and Aculab Software

The support software required for the DirectTalk/2 base system, if you intend to run any voice applications or develop voice applications locally, is supplied as part of DirectTalk/2. You should not install any other versions of this software on your DirectTalk/2 systems.

4.14 DirectTalk/6000

This section lists the minimum hardware and software requirements for DirectTalk/6000, then goes into more detail about both requirements and the optional extras that you will need for using DirectTalk/6000 in specific ways. We also discuss location planning for the hardware, and the factors you should take into consideration when planning the memory and storage you need to order. Although every effort was made at the time of publication to ensure that this book is accurate, DirectTalk/6000 is an evolving product. To ensure that you have the latest information, please check the *IBM CallPath DirectTalk/6000 General Information and Planning*, GC33-1720.

4.14.1 Minimum Requirements

The minimum configuration for DirectTalk/6000 is:

Platform	RISC System/6000 POWERstation and POWERserver 250
RAM	48MB
Storage	1GB fixed disk
Tape Drive	1/4-inch or 8-mm tape drive
Diskette Drive	3.5-inch diskette drive
Display	IBM 8508 monochrome display with graphics display adapter (color recommended)
Keyboard	101-key keyboard
Mouse	RISC System/6000 mouse (3-button mouse)
Voice Processing	9291 Single Digital Trunk Processor or 9295 Multiple Digital Trunk Processor Digital Trunk Adapter (feature number 6300) or Digital Trunk Dual Adapter (feature number 6305)
Software	IBM AIX Version 4.1 for RISC System/6000 IBM AIX DirectTalk/6000 Version 1 Release 6

However, DirectTalk/6000 offers many different options, allowing you to select a configuration that meets your business needs. Use the information in the following sections to determine a configuration that is best for your operation.

4.14.2 Software

The IBM AIX DirectTalk/6000 licensed program product basic system includes most features that support the capabilities described in the previous sections:

- Handling calls and interacting with callers
- Accessing, storing, and manipulating information
- Storing and retrieving messages.

You can either order DirectTalk/6000 preloaded along with other software on the RISC System/6000 or on tape. Ordering the software preloaded simplifies installation.

4.14.3 Optional Features

DirectTalk/6000 can include the following optional features:

- System prompts and voice segments in various languages
- Basic speech recognition vocabularies in various languages
- DirectTalkMail application
- Text-to-speech support
- Telecommunications device for the deaf support
- Signalling System Number 7 support

4.14.4 Channel Increments

The basic system includes processing for 12 channels. Additional channels are available in increments of 6 up to a maximum of 96 (T1) or 120 (E1). The number of channels you want to process will affect your choice of RISC System/6000 model.

4.14.5 Hardware

The hardware you need includes:

- RISC System/6000
- Digital trunk processors and adapters
- Telecommunications cables
- The ACPA card for high-quality audio recording (optional)
- Displays
- Xstations
- Keyboard and mouse
- Machine-readable media
- Printer
- Speech recognition and text-to-speech

4.14.5.1 RISC System/6000

DirectTalk/6000 runs on RISC System/6000 POWERstation and POWER server 2xx, 3xx, and 9xx models.

The 9xx series RISC System/6000 processors are typically used as servers for many different applications and users. DirectTalk/6000 can be one of these applications; however, you must be very careful when balancing the application load. When running many voice channels, DirectTalk/6000 places heavy demand on the CPU. This could affect the other applications.

The RISC System/6000 model you need depends on:

- How many channels you want to be able to support

To use more than 48 (T1) or 60 (E1) channels, you need a 300 series or 500 series RISC System/6000. This is because the number of channels that can connect to a single RISC System/6000 depends on the number of Micro Channel slots available for digital trunk adapters.

- The type of voice processing your applications will offer

You need to take into consideration the complexity of the voice applications and whether they access remote information. You must also consider whether you require either speech recognition or text-to-speech, or both. DirectTalk/6000 capacity to handle calls and give a voice response depends on these factors, and you will need a faster model of RISC System/6000 to handle more complex applications and provide an acceptable response time. Your IBM representative can help you decide what physical configuration is best.

4.14.5.2 Digital Trunk Processors and Adapters

To process voice signals, the RISC System/6000 is connected to one or more *digital trunk processors*, through one or more *digital trunk adapters*.

The digital trunk processor is a separate unit that contains one or more VPACKs. A VPACK is a logical component consisting of a *base card*, which connects to the digital trunk adapter in the RISC System/6000, and a *trunk interface card* (TIC), which manages the trunk connection to the switch. One model of TIC provides a T1 interface, carrying up to 24 channels, and the other provides an E1 interface, carrying up to 30 channels.

Types of pack:

- **VPACK**, which provides digital trunk processing for channel associated signalling protocols
- **SPACK**, which provides digital trunk processing for Signalling System Number 7
- **RPACK**, which provides resources for speech recognition

There are two digital trunk processors available:

- The 9291 Single Digital Trunk Processor, which is a single VPACK
- The 9295 Multiple Digital Trunk Processor, which contains slots for up to five VPACKs

Both digital trunk processors include a built-in power supply. A redundant power supply is available for the 9295 Multiple Digital Trunk Processor.

Each VPACK and SPACK is cabled to a digital trunk adapter in the RISC System/6000. Two adapters are available:

- The Digital Trunk Adapter (feature number 6300) attaches to one VPACK.
- The Digital Trunk Dual Adapter (feature number 6305) attaches to two VPACKs.

DirectTalk/6000 includes processing for 12 channels, and additional channel processing is available. The number of digital trunk processors and adapters you require depends on the number of channels you are going to use. This is shown in Table 9 on page 148.

<i>Table 9. Digital Trunk Processor and Adapter Requirements</i>				
Trunk	Maximum Channels to Be Processed	Digital Trunk Processor(s) Required	Digital Trunk Adapter(s) Required	RISC System/6000 Model Required
	T1 E1			
1	24 30	One IBM 9291	One Digital Trunk Adapter	2xx, 3xx, 5xx, or 9xx
2	48 60	Two IBM 9291s or One IBM 9295 and 2 VPACKs	Two Digital Trunk Adapters or One Digital Trunk Dual Adapter	2xx, 3xx 5xx, or 9xx
3	72 90	Three IBM 9291s or One IBM 9295 and 3 VPACKs	Three Digital Trunk Adapters or One Digital Trunk Adapter and one Digital Trunk Dual Adapter	3xx, 5xx, or 9xx
4	96 120	Four IBM 9291s or One IBM 9295 and 4 VPACKs	Two Digital Trunk Adapters and one Digital Trunk Dual Adapter or Two Digital Trunk Dual Adapters	3xx, 5xx, or 9xx
Note: Note that heavy use of voice messaging by applications may reduce the number of channels that it is feasible to process with the minimum RISC System/6000 configuration.				

4.14.5.3 Signalling System Number 7 Attachment

Support for E1 trunk connection using the Signalling System Number 7 protocol is provided by a special pack, the SPACK, which performs the same function as the digital trunk processor component, the VPACK. The SPACK is housed like the VPACK in the 9295 Multiple Digital Trunk Processor enclosure. It is not available as a stand-alone (9291-type) unit.

The number of digital trunk processors and adapters you require depends on the number of trunks you are going to use, as the following table shows.

Table 10. Digital Trunk Processor and Adapter Requirements				
Trunk	Maximum E1 Channels	Digital Trunk Processors(s) Required	Digital Trunk Adapter(s) Required	RISC System/6000 Model Required
1	30	One SPACK	One 6300	2xx, 3xx, 5xx, or 9xx
2	60	Two SPACKs or One SPACK and one VPACK	Two 6300s or One 6305	2xx, 3xx, 5xx or 9xx
3	90	Two SPACKs and one VPACK or One SPACK and two VPACKs	Three 6300s or One 6300 and one 6305	3xx, 5xx or 9xx
4	120	Two SPACKs and two VPACKs or One SPACK and three VPACKs	Two 6300s and one 6305 or Two 6305s	3xx, 5xx or 9xx
Note: Feature number 6300 is the Digital Trunk Adapter. Feature number 6305 is the Digital Trunk Dual Adapter.				

4.14.5.4 Optional Hardware

An Electronics Industry Association (EIA) 0.483-meter (19-inch) *relay rack* can hold the multiple digital trunk processor, a channel bank (if you are using one), or both.

If you are not using a relay rack, you could instead order a *set of feet* for the 9295 Multiple Digital Trunk Processor.

An *enclosure* for the 9295 Multiple Digital Trunk Processor is also recommended.

4.14.5.5 Telecommunications Cables

DirectTalk/6000 includes a telecommunications cable to connect each VPACK or SPA telephone network. The T1 telecommunications cable is a straight-through cable, 49.5 ft long and terminates at both ends with a 15-pin D-shell connector.

There are two types of E1 telecommunications cable. One of the two types is used everywhere except in France and the other is used only in France. The cable assembly for use outside France is 8.5 ft long and consists of two coaxial

cables, each with a male coaxial connector, with the other ends of both cables terminating in a single 15-pin D-shell connector.

The cable for France is 24.6 ft long and consists of two shielded type stripped leads on one end and a 15-pin D-shell connector at the other end.

4.14.5.6 High-Quality Audio Recording

For recording and playing back higher-quality audio than can be recorded over the telephone, the RISC System/6000 can be equipped with an Audio Capture and Playback Adapter (ACPA). The adapter, which is installed in a Micro Channel slot, includes four 3.5 mm (0.136 in.) jacks: two for input and two for output. One of the input jacks accepts the signals from a microphone. The other accepts signals from a standard line input device. The output jacks let you play back what you have recorded through headphones, speakers, an amplifier, or a tape recorder.

4.14.5.7 Displays

DirectTalk/6000 has a graphical window interface for both system management and application development. To support the interface, the RISC System/6000 must be equipped with a graphics monitor and a graphics display adapter. Table 11 lists the suitable displays and graphics cards. We recommend that you use a color display.

Table 11. Characteristics of Candidate Displays		
Display	Resolution	Requires
IBM 8508 monochrome	1280 x 1024	Gray scale graphics display adapter cabled to monitor
IBM 6091 16-inch color	1280 x 1024	Color graphics display adapter cabled to monitor
IBM 6091 19-inch color	1280 x 1024	Color graphics display adapter cabled to monitor
IBM 6091 23-inch color	1280 x 1024	Color graphics display adapter cabled to monitor

An ASCII interface provides access to the system management functions using a character-based terminal. The ASCII interface can be used via a modem or dial-up remote location.

Xstations: When DirectTalk/6000 is part of a LAN that includes Xstations, the DirectTalk/6000 windows can be displayed on an Xstation for remote voice application development.

The Xstation must have the minimum configuration shown in Table 12.

Table 12. Characteristics of Candidate Displays	
Model	Xstation 120, 130 or 150
Video memory	At least 2MB, with full 256 color capability.
Processor memory	A total of 6MB to 8MB, depending on the amount of AIXwindows activity on the Xstation.

The Xstation comes with a built-in Ethernet adapter. All of the RISC System/6000 Model 200 series have built-in adapters, and most of the Model 300 and 500 series have built-in adapters. To connect an Xstation to any other models of the RISC System/6000, via Ethernet, requires an Ethernet High-Performance LAN adapter for the RISC System/6000.

To connect the Xstation to the RISC System/6000 on a token-ring network requires a Token-Ring Network 16/4 Adapter/A for the Xstation and a Token-Ring High-Performance Network Adapter for the RISC System/6000.

4.14.5.8 Keyboard and Mouse

To use DirectTalk/6000, you need a mouse. We recommend that you use an IBM 3-button mouse. The RISC System/6000 includes a mouse adapter.

You also need a RISC System/6000 keyboard. The system operates with a 101-key keyboard, a 102-key keyboard, or a 106-key keyboard. The 102-key keyboard is available with keysets for a number of different languages.

4.14.5.9 Machine-Readable Media

Unless you ordered your system preloaded, the DirectTalk/6000 software is delivered on tape. You need an 8mm or 0.25-inch tape drive to install the software.

You need a 3.5inch diskette drive for maintenance and service.

You may need extra machine-readable media for backing up files.

4.14.5.10 Printer

An IBM Proprinter, or any other printer supported by the RISC System/6000 and AIX, can be used to print DirectTalk/6000 information, such as custom server build reports, the components of a voice application, and statistical reports.

4.14.6 Built-in Speech Recognition

Speech recognition processing in Release 4.1 is provided by a special resource pack called the RPACK, which is conceptually similar to the basic digital trunk processor component called the VPACK. The RPACK is housed like the VPACK in the Multiple Digital Trunk Processor enclosure and uses the same connection to the digital trunk adapter in the RISC/6000. Unlike the VPACK, however, the RPACK has no telephony interface. It is not available as a stand-alone (9291-type) unit.

The possible combinations of VPACK (or SPACK) and RPACK are shown in Table 13 on page 152, assuming that all five slots in the enclosure are used.

<i>Table 13. Combinations of VPACKs, SPACKs, or RPACKs</i>				
	Telephony channels supported	VPACKs (or SPACKs) required for telephony channels	RPACKs that can be installed in remaining slots	Recognition requests that can be handled simultaneously
T1	24	1	4	80
	48	2	3	60
	72	3	2	40
	96	4	1	20
T1	30	1	4	80
	60	2	3	60
	90	3	2	40
	120	4	1	20

A basic configuration, with one VPACK and one RPACK, supports 30 E1 or 24 T1 simultaneous telephony channels. Of these, 20 can be serviced at any one time by recognition. The processing resource on the RPACK is statically loaded but dynamically allocated. This maximizes the potential coverage with speech recognition resource intensive applications, while minimizing the additional burden of device driver-to-RPACK processing.

Each RPACK must be attached to a digital trunk adapter controlled by the same DirectTalk/6000 system as the VPACK whose telephony channels it is to support. An RPACK cannot be accessed by a DirectTalk/6000 on a remote RISC System/6000. A VPACK and an RPACK can either be attached to two separate Digital Trunk Adapters (single) or to the same Digital Trunk Dual Adapter.

The RPACK is delivered with no executable or application data installed. The executable (recognition algorithm) is automatically downloaded when the pack is enabled, but then you must identify and download the application data (the vocabulary) to the RPACK before it can be used. This process is similar to the initial configuration of the existing VPACK interface cards, though simpler because the RPACK is functionally less complex than the VPACK.

Once installed, a fully operational RPACK can support 20 simultaneous requests for recognition resource. A specific recognition request is bound to a specific VPACK channel solely for the duration of the current recognition action. Once complete and the resource is released, the same resource on the RPACK is free to service another recognition request from the same or different voice channel on the same or different VPACK.

You need to take care to distribute the vocabulary files across the processor resource-intensive RPACK to ensure the most effective utilization of that resource.

4.14.6.1 Multiple RPACKs

In servicing a maximum of 20 requests in the basic configuration, clear channel voice is retrieved from the VPACK channel and transferred to the RPACK. In more complex configurations with multiple VPACKs and additional RPACKs, it is recommended that not more than 60 channels of clear-channel (uncompressed) voice data be transferred.

If you have more than one digital trunk processor enclosure, and more than one RPACK, it is recommended that you spread the RPACKs among the enclosures, rather than having the RPACKs in one enclosure and all the VPACKs or SPACKs in another.

4.14.6.2 Vocabularies for Speech Recognition

Some vocabularies are supplied as optional features of DirectTalk/6000 to support particular applications. Other vocabularies need to be generated specially for an application.

The following sections go into more detail about the following:

- Collecting samples for generation of vocabularies
- Generating the vocabulary

4.14.6.3 Collecting Samples for Generation of Vocabularies

To create additional vocabularies in different languages, or vocabularies that are specific to applications that suit your local dialect, you need to collect sample data before a vocabulary can be constructed. You should contact your IBM marketing representative, who can help you organize data collection. Once the data has been collected, it is processed by IBM and a vocabulary is generated. The vocabulary is given a preliminary test by IBM, but we recommend that it be tested more fully before putting it into production.

Specific hardware is required to run an application that engages a caller in collecting appropriate samples. It is recommended that for a given vocabulary, at least 80 speakers, and preferably more, should be recorded. The speakers must be representative of the population that will be using the eventual application. That means that both male and female speakers of suitably representative age groups should be recorded; they should also be from representative geographical regions to ensure suitable accent coverage.

A suitably large list of items must be recorded. This is essential for two reasons:

- The algorithm itself generates the appropriate template for each of the 15 categories of a vocabulary, but also establishes a reject category with any remaining words. This can help sustain recognition accuracy, but should not include items which sound like items in the vocabulary (that is, one of the 15 items).
- The voice data collection is probably the most onerous task. As many items as may ultimately be used for a number of different vocabularies can be collected at one time and stored for later processing.

Note, however, that callers quickly become bored if the test application includes more than sixty or so items.

Make sure that you collect the data under conditions that match those under which the application is to be run. If the live application is to be run on the public telephone network it is of little use collecting data samples over a private digital network. Line noise can be processed by the vocabulary generation algorithm procedure to effect some line noise cancellation. This is effective only if the line noise is truly representative of both the final application and the data collection application.

The data collection will take typically some six to eight weeks at the very least. This should be planned for and does not include the generation of the vocabulary itself.

4.14.6.4 Generating the Vocabulary

The data samples must be validated before delivery to IBM. It is also important exactly how the vocabulary should be structured (that is, what words to include, place in the reject category) and how the words were represented in the data collection algorithm (were numbers input as digits or character strings; if the latter, are strings uppercase, lowercase, or mixed?). Without this information, IBM may not be able provide the desired vocabulary within the agreed time limit.

4.14.6.5 External Speech Recognition

To integrate DirectTalk/6000 with an external speech recognition server, you need a local area network (LAN), preferably a 16MB token-ring, connecting DirectTalk/6000 with a machine with speech server software, unless the software is installed on the same RISC System/6000.

4.14.7 Text-to-Speech

To get the best performance out of the DirectTalk/6000 optional Text-to-Speech feature, install the speech synthesis server on a second RISC System/6000, or on more than one RISC System/6000, depending on what your requirements are. You need a dedicated network (LAN), preferably a 16MB token-ring, connecting DirectTalk/6000 to the speech synthesis servers.

4.14.8 Location Planning

The T1 digital trunk processor must be within 15.24 meters (50 ft) of the switch or CSU to which it is connected.

In France, the E1 digital trunk processor must be within 7.5 meters (24.6 ft) of the RISC/6000 to which it is connected.

Outside France, the cable supplied with the E1 digital trunk processor allows the RISC/6000 to be placed no more than 2.5 meters (8.2 ft) from the switch or channel bank to which it is connected. This distance can be increased using extension coaxial cables.

4.14.9 Physical Dimensions

You also need to leave space around the digital trunk processor(s) to allow the heat buildup that is generated to dissipate. It is recommended that both models (but especially the 9295 Digital Trunk Processor) be positioned with at least 1.25 cm (0.5 in.) clearance around it.

Table 14 has more details.

<i>Table 14 (Page 1 of 2). Dimensions of the Digital Trunk Processors</i>		
Characteristic	9291 Single Digital Trunk Processor	9295 Multiple Digital Trunk Processor
Height	110 millimeters (4.33 in.)	266 millimeters (10.5 in.)
Width	220 millimeters (8.66 in.)	449 millimeters (17.6 in.)
Depth	430 millimeters (16.9 in.)	400 millimeters (15.7 in.)

<i>Table 14 (Page 2 of 2). Dimensions of the Digital Trunk Processors</i>		
Characteristic	9291 Single Digital Trunk Processor	9295 Multiple Digital Trunk Processor
Weight	7.5 kilograms (16.5 lb)	From 13.2 kilograms (29.2 lb) to over 28 kilograms (over 60 lb)

Wherever you plan to locate DirectTalk/6000, you will need enough space for the RISC System/6000. For details, see the *IBM RISC System/6000 General Information and Planning Information Kit*.

4.14.10 Environment

Wherever you locate the RISC System/6000 and digital trunk processors, be careful to keep them out of dusty or polluted places. In addition, try to place them where they cannot be jarred or jolted. Make sure the location does not get too hot, too cold, or too humid.

The acceptable temperature and humidity ranges in which the digital trunk processors can operate are as follows:

- Temperature: 10 to 40 degrees Centigrade (50 to 90 degrees F)
- Wet bulb temperature: 27 degrees Centigrade (73 degrees F)
- Relative humidity: 8 to 80 %, non-condensing

4.14.11 Electrical Power

Make sure there are sufficient power outlets for the system. Both the RISC System/6000 and the digital trunk processors have a power supply. The system should be grounded, as should all connecting cables. The electrical requirements for the digital trunk processor are:

- Voltage range: 100-124 or 200-240 (autoranging)
- Frequency (Hertz): 50 or 60 (at any supported voltage)

4.14.12 Memory and Storage Planning

The DirectTalk/6000 system that you choose should not only accommodate the number of telephone channels you need, but should also answer calls and provide information quickly. To satisfy these requirements, you need adequate amounts of random access memory (RAM) and disk storage space.

4.14.12.1 How Much Memory?

How much RAM the RISC System/6000 needs depends in part on the number of channels DirectTalk/600 handles. If you are connecting DirectTalk/6000 to a remote computer, you also need RAM to support the connection. For instance, if you need to support 30 channels and 30 sessions of 3270 terminal emulation, we recommend 64MB of RAM. For 120 channels with voice messaging, the minimum you would need is 128MB. The number of voice applications you expect the system to handle also affects the amount of memory you need.

The minimum RISC System/6000 configuration with which DirectTalk/6000 operates includes 32MB of RAM. (4.14.1, "Minimum Requirements" on page 145 lists the components of the minimum configuration.) This amount of RAM allows DirectTalk/6000 to support up to 48 T1 channels (60 E1 channels), with no 3270 terminal emulation.

Other performance factors affect how much RAM you should order. For example, applications in memory execute more quickly. The number of applications that can be held in memory at one time depends upon the number of buffers that are available to hold them. Each buffer represents 4KB (1KB = 1,024 bytes) of RAM. When you install DirectTalk/6000, you define the number of buffers (up to a maximum of 2,000). If you define the maximum, you will use 8MB of available RAM for buffers. The number of custom servers that voice applications use also affects how much RAM the system needs.

4.14.12.2 Basic DirectTalk/6000 RAM Requirement

DirectTalk/6000 requires a minimum of 32MB. Factors affecting RAM requirements for DirectTalk/6000 are:

- The number of channels configured
- The number of simultaneous active host sessions (remote host, custom server, or local database) configured
- The number of prompt cache buffers for fast playback of greetings and prompts to callers

Memory is required for DirectTalk/6000 to process data, buffer pools and 3270 screens. DirectTalk/6000 requires space to store maintenance and administration files, error files, and statistics. Each time the system is restarted the old files are saved and new files are created. One set of files can take up to 1.5MB of disk space.

4.14.12.3 Voice Cache

If you want to record many of the application prompts uncompressed, or want a large number of prompts available for performance reasons, then additional voice cache should be allocated. It is likely that certain prompts will be played to all callers: numbers, dates, dollars and other basics are in constant use. These prompts should be cached to improve performance. Voice cache is used for all voice segments and messages. Voice cache is a subset of the buffer pool.

The customer can expand voice cache (using the DirectTalk/6000 configuration interface) if enough RAM is available. The more physical RAM that is available, the less paging, and the better the performance.

Refer to Table 15 for system defaults and maximum values allowed to be configured. If you intend to increase voice cache from the default, take note of the maximum voice cache expansion allowed. To compute voice cache space in KB (4096 bytes/K, or 0.004MB), multiply the number of voice seconds by 1.6 Kbps compressed (8 Kbps uncompressed).

<i>Table 15. Buffer Pool and Voice Cache Default/Maximum</i>		
	Default/MB	Maximum/MB
Total # buffers in buffer pool	500/2	2000/8
# voice cache buffers	300/1.2	500/2
Compressed voice	750 secs	1250 secs
Uncompressed voice	150 secs	250 secs

Note: A large number of fixed state tables and prompt directories can increase the number of buffers required in the buffer pool.

4.14.13 How Much Disk Space?

The amount of disk space you need depends on a number of factors, including:

- The average size of a voice application
- The number of applications DirectTalk/6000 handles
- The number of languages in which DirectTalk/6000 runs applications
- How often you archive the DirectTalk/6000 logs
- How much RAM you have on the system
- How much other information you plan to store on the RISC System/6000

The minimum RISC System/6000 configuration with which DirectTalk/6000 operates includes a 560MB hard disk. The DirectTalk/6000 software, including AIX and AIXwindows, takes up about 425MB of internal disk storage.

You also need disk space to store voice application information (state tables, voice segments, and messages). Allow extra disk space so that you can import and export application files. Importing and exporting allow you to back up individual applications and move them from one RISC System/6000 to another.

Additional languages require additional disk space, as do the DirectTalk/6000 error information and system statistics logs.

In addition to application information, the RISC System/6000 can also store the business information available to callers through voice applications. If you plan to store business information on the RISC System/6000, be sure to order enough disk space.

4.14.13.1 Voice Storage

Stored voice includes voice segments used in prompts and voice messages. The capacity requirements are determined by whether voice compression is used. Voice segments can be recorded compressed or uncompressed. The most frequently spoken voice segments should be recorded uncompressed. Refer to Table 16, Table 17 on page 158, and Table 18 on page 158 to determine the DASD needed.

Table 16. Compressed Voice Segment Storage								
MB of Storage								
Number of compressed segments	2000	16.0	32.0	48.0	64.0	80.0	96.0	
	1500	12.0	24.0	36.0	48.0	60.0	72.0	
	1000	8.0	16.0	24.0	32.0	40.0	48.0	
	900	7.2	14.4	21.6	28.8	36.0	43.2	
	800	6.4	12.8	19.2	25.6	32.0	38.4	
	700	5.6	11.2	16.8	22.4	28.0	33.6	
	600	4.8	9.6	14.4	19.2	24.0	28.8	
	500	4.0	8.0	12.0	16.0	20.0	24.0	
	400	3.2	6.4	9.6	12.8	16.0	19.2	
	300	2.4	4.8	7.2	9.6	12.0	14.4	
	200	1.6	3.2	4.8	6.4	8.0	9.6	
	100	0.8	1.6	2.4	3.2	4.0	4.8	
		5	10	15	20	25	30	
Average segment length in seconds								

Table 17. Uncompressed Voice Segment Storage							
MB of Storage							
Number of uncompressed segments	2000	80.0	160.0	240.0	320.0	400.0	480.0
	1500	60.0	120.0	180.0	240.0	300.0	360.0
	1000	40.0	80.0	120.0	160.0	200.0	240.0
	900	36.0	72.0	108.0	144.0	180.0	216.0
	800	32.0	64.0	96.0	128.0	160.0	192.0
	700	28.0	56.0	84.0	112.0	140.0	168.0
	600	24.0	48.0	72.0	96.0	120.0	144.0
	500	20.0	40.0	60.0	80.0	100.0	120.0
	400	16.0	32.0	48.0	64.0	80.0	96.0
	300	12.0	24.0	36.0	48.0	60.0	72.0
	200	8.0	16.0	24.0	32.0	40.0	48.0
	100	4.0	8.0	12.0	16.0	20.0	24.0
		5	10	15	20	25	30
Average segment length in seconds							

Table 18. Voice Message Storage							
MB of Storage							
No. of messages	20000	492	984	1968	3936	5904	7872
	15000	369	738	1476	2952	4428	5904
	10000	246	492	984	1968	2952	3936
	5000	123	246	492	984	1476	1968
	1000	25	49	98	197	295	394
	500	12	25	49	98	148	197
		15	30	60	120	180	240
Average segment length in seconds							

4.14.13.2 File Recovery, Compression and Free Space Requirements

DirectTalk/6000 will recover data from files that have been corrupted in some manner. This is performed automatically when the system is restarted following a failure or power-off. The administrator also has the opportunity to request a full recovery when manually starting the system.

When voice segments or messages are deleted from the DirectTalk/6000 database, free space is created which, if not reclaimed, will cause files to occupy more space than necessary. An automatic process, which runs automatically at midnight, will compress database files with a certain percentage or an absolute amount of free space. During this time, the voice data may be unavailable.

Chapter 5. Telephony Concepts

Telephone calls enter and leave a Call Center through the company's telephone network. This telephone network can consist of one or more PABXs, each supporting many telephone extensions. A PABX is also known as a telephone "switch", since it switches calls to the appropriate internal extension or outside line.

Most switches support a large number of configurable options that allow the customer great flexibility in how they manage their Call Center. For example, the Call Center's telephones can be configured as part of one or more Automatic Call Distribution (ACD) queues. This allows an inbound call to appear on any of the defined ACD extensions.

Inbound calls go through the following steps to reach a Call Center agent:

1. A caller dials a published telephone number.
2. The call is passed through the Public Switched Telephone Network (PSTN) until it reaches the target PABX's ACD pilot number. A pilot number is the entry point into an ACD queue.
3. The PABX identifies that the call is destined for a Call Center ACD queue, and routes the call to the next available agent's extension, based on how that queue was configured.
4. A Call Center agent answers the phone and speaks with the caller.

Outbound calls go through the following steps to reach a company's customer:

1. A Call Center agent dials the telephone number of an existing or potential customer.
2. The company's PABX directs the call to the Central Office (CO) switch via the PSTN.
3. The PSTN switches the call from CO switch to CO switch until it can ring the target telephone.
4. The call is either answered or not.

This chapter provides a technical description of basic telephony and how it is used in Call Centers.

5.1 Switch Interfaces

Switches provide various types of information ports, each with different characteristics. The physical interface may be analog or digital. Included among these are the following types of ports:

1. A central office (CO) trunk connects a PABX to the public switched telephone network (PSTN). Applications include wide area telephone service (WATS), foreign exchange lines (FX) and direct inward dialing (DID) trunks. Central office trunk characteristics include:
 - Appearance as a station line to the central office switch.
 - Many ports/lines logically treated as one group and accessed by users via trunk group access codes, for example, dial 9 for an outside line.
 - PABX provided statistics on group usage, traffic, etc.

- The called number can be sent by the central office switch to the PABX on a DID trunk.⁸
 - Answer detection and far-end disconnect (hangup detection) may be available, depending on the specific protocol used.
 - Call transfer capability is not provided.
2. A tie line connects (ties) one PABX to another PABX in a non-switched private network. A tie line can also be used to connect a PABX to an interexchange carrier (IXC) for long distance service; a tie line used for this application is sometimes known as a "dedicated access line" (DAL). A tie line is similar to a central office trunk in some respects:
 - Many ports/lines logically treated as one group and accessed by users via trunk group access codes, for example, dial 8 for a tie line to another location.
 - PABX provided statistics on group usage, traffic, etc.
 - Number identification (calling and/or called) can be sent between PABXs.
 - Answer detect and far-end disconnect are provided.
 - Call transfer capability is not generally supported. However, some PABXs support call transfer using an E&M tie line configured as a release link trunk (RLT).⁹
 3. A station (also known as an extension) sits "behind" a PABX and can perform call handling functions such as transfer, forward, do not disturb, etc. that are not available to a central office trunk or tie line. Number identification, answer detection and far-end disconnect are generally not available.
 4. A Centrex line is a PABX station interface provided by a service provider (that is, telephone company) switch generally located in a central office. The PABX-like capability is achieved by programming part of a central office switch to emulate a PABX or by a separate switch dedicated to the customer.

Trunks and tie lines are known as trunk-side protocols while stations and Centrex lines are known as line-side protocols. A line-side protocol generally provides a voice processing system application with a greater level of "function" than a trunk-side protocol.

5.1.1 Automatic Call Distributor (ACD)

An ACD or Automatic Call Distributor is essentially a facility for handling large volumes of inbound telephone traffic. The ACD function can be provided as a stand-alone system or incorporated into the PABX itself. The ACD receives, queues and distributes incoming calls to a group of people called agents. The phones assigned to these agents are defined as members of an ACD queue.

Incoming calls are assigned to an ACD group or pilot number which can contain a number of extensions/agents. The ACD groups are usually defined on the

⁸ An analog DID trunk does not have the same electrical interface as an analog CO trunk.

⁹ A PABX provides a release link trunk by recognizing hook flash on an E&M tie line as a call transfer request. Hook flash is not recognized on a "normal" E&M tie line and may cause the call to be disconnected. The release link trunk was developed to support a PABX feature called centralized attendant service (CAS). With some PABXs, call transfer on a release link trunk is allowed only from an attendant console.

basis of departmental function within a company (for example, sales, services, help desk etc.).

The queuing function within ACD allows calls to be answered, usually with a recorded voice announcement, and then held with music on hold until an agent within the group is free to take the call. The calls are distributed from the queue to the agents on the basis of how many agents there are to handle the calls, and a predefined distribution method. The distribution methods can include:

- Distributing the call to the agent who has been free the longest
- Distributing the call to agents in a predefined order of priority
- Distributing the call on a rotational basis around the group

Management Information software is used extensively to monitor and track the performance of the agents and record and analyze the call traffic handled by the various queues within the Call Center.

5.2 Telephony Functions Required by Voice Processing Applications

The following sections describe telephony functions typically required when developing a voice processing application, for example, voice mail or interactive voice response (IVR).

5.2.1 Call Transfer

Most voice processing applications offer the calling or called party the opportunity to transfer a call. Call transfer can be provided in several ways, although the only standard method uses PABX station or Centrex line features. Other methods for transfer include a release link trunk, unique T1 or E1 protocols or host access control links

There are two types of call transfer, screened transfer and blind transfer. Screened transfer is usually desired. However, a blind transfer does reduce the duration of a successful transfer process and may be acceptable.

With a screened (or supervised) transfer, the voice processing application places the existing party in a suspended state (hold), and completes the transfer only if the call to the third party is answered. If an application detects a busy signal while transferring a call or if the third party does not answer, the application can take one of the following actions:

- Reconnect to the existing party and offer the caller another option.
- Dial an alternate number.
- Play a "please hold" message and continuously re-try the extension until it becomes free.

With a blind transfer, the application places the existing party on hold and disconnects from the call after sending the address of the third party. If the transfer is unsuccessful, the switch usually places a new call to the party that originally initiated the transfer request.

5.2.1.1 Call Transfer with DirectTalk/6000

With channel associated signaling, DirectTalk/6000 can generate call transfer request signals using "feature codes" (character strings consisting of 0 through 9, * and #) with or without hook or ground flash. A call is transferred by invoking the TransferCall action. With Transfer Call Request Signal (Signaling Type parameter group with Field access) set to Feature Code, Transfer Call Feature Code (Signaling Type parameter group with Field access) identifies the character string recognized by the switch as a call transfer request.

Prior to Release 1.3, Transfer Call Feature Code was known as Call Transfer Feature Code. Because hook and ground flash are not supported by Call Transfer Feature Code, they are implemented using the Dial action.

If the Channel Associated Signaling protocol being used does not provide call transfer, but the switch has a host access control link that supports call transfer, a DirectTalk/6000 signaling process can be written as a custom server.

5.2.1.2 Call Transfer with DirectTalk/2

DirectTalk/2 can generate call transfer request signals using "feature codes" with or without hook or ground flash. Using channel associated signaling DirectTalk/2 transfers a call using either the Place_a_Call action (when call progress tone monitoring is desired) or Put_Tone_String (when call progress tone monitoring is not required).

DirectTalk/2 also supports call transfer using E1 common channel signaling protocols.

5.2.2 Far-End Disconnect (Hangup Detection)

Recognizing far-end disconnect is a normal requirement for voice processing systems. Far-end disconnect or call abandonment can occur at any time during a call. The faster this condition can be detected, the sooner the channel can be freed and made available for another call.

In high traffic situations with calls of short duration, recognizing far-end disconnect becomes particularly important. If hangup detection takes a significant amount of time, then the average duration of each call is increased and more channels are required to support given traffic levels. Furthermore, in situations where the voice processing system customer is paying for the call, this time can be a significant point because the telephone network carrier does not stop billing for the call until the voice processing system disconnects.

Voice processing systems use various methods to detect far-end disconnect, depending on what is provided by the switch. The following methods are listed in order of preference, from most desirable to least desirable.

- Disconnect signal: When the far-end disconnects, most Channel Associated Signaling or common channel signaling protocols provide a change of state in the signaling channel to indicate a return to the idle (on-hook) state. For an analog interface, the indication is removal of loop current by opening the loop or removing tip ground.
- Disconnect clear signal: When the far-end disconnects, some switches provide a disconnect clear signal by momentarily removing talk battery

feed¹⁰ for about 300-1000 ms. This is sometimes called "wink-off" and is generally used with OPS/OPX (off-premise station/off-premise extension) lines (and sometimes recorded dictation trunks). With channel associated signaling, this signal appears as a momentary change of state in the signaling channel.

- Continuous tone: A continuous tone (usually dial tone) may be returned when the switch party disconnects.
- Interrupted tone: An interrupted ("cadenced") tone (usually busy signal) may be returned when the switch party disconnects.
- Continuous silence: Silence may be returned after the switch party disconnects or after the switch sends a continuous or interrupted tone.
- Host access control link: Some switches provide call event information, including answer detection and far-end disconnect, on a host access control link.
- Application timeout: A call can be terminated by the voice processing system application if a timeout occurs while waiting for a response from the caller.

5.2.2.1 Recognizing Far-End Disconnect with DirectTalk/6000

DirectTalk/6000 can use the following methods for recognizing far-end disconnect.

- Disconnect signal: DirectTalk/6000 will recognize a disconnect signal from a Channel Associated Signaling protocol (for example, FXS ground start, E&M, R2, UK Tie/DDI) that lasts for at least the period specified by CO on-hook (Signaling parameter group with field access).
- Disconnect clear signal: DirectTalk/6000 recognizes a disconnect clear (wink-off) signal with FXS/LS and SAS/LS Channel Associated Signaling protocols.¹¹ The disconnect clear signal (which appears to DirectTalk/6000 as a momentary removal of tip ground) must be present for a period specified by CO On-hook (Signaling Type parameter group with Field access), but less than 5 seconds. If the disconnect clear signal lasts more than 5 seconds,¹² an "a-bit" fault is reported by DirectTalk/6000.
- Continuous tone: With Release 1 Version 4.1, continuous tones are recognized by setting Loop Start Hangup Detection (Channel Group parameter group with admin access) to Yes. Only loop start protocols (that is, FXS loop start, SAS loop start and Remote Extension) are supported. When DirectTalk/6000 detects continuous audio energy for 2 seconds or more, the call is terminated. Note, if DirectTalk/6000 is recording when this occurs, 2 seconds of continuous tone will be heard at the end of the stored message when it is played back.

In the next release, the parameter will be replaced by Hang Up Detection and all protocols will be supported. Continuous tones will be recognized by setting Hang Up Detection to Constant Energy. Two system parameters will

¹⁰ The AT&T Definity G2 does not remove talk battery feed, but instead appears to provide a low impedance "shunt" across the tip and ring leads. Most channel banks will not recognize this as a disconnect clear signal. An exception is the IBM ADNX (Access Digital Network Exchange) channel bank that will recognize the AT&T "shunt" when using a 2-wire FXO card configured for universal voice grade (UVG).

¹¹ Disconnect clear is not available with the Remote Extension (E1) protocol.

¹² This value is configurable using Network Response Short Timeout (Signaling parameter group with lab access).

be added in the next release to support this change: Constant Energy Maximum and Constant Energy Minimum. Both are in the Signaling Type parameter group and have admin access.

- Interrupted tone: Release 1, Version 4.1 has been enhanced to recognize interrupted tones¹³ by setting Loop Start Hangup Detection (Channel Group parameter group with admin access) to Yes and specifying the interrupted tone as Tone 25 in the Tone Group (Channel Group parameter group with Field access) in the corresponding channel group. Only loop start protocols, that is, FXS loop start, SAS loop start and Remote Extension are supported. Note: if DirectTalk/6000 is recording when this occurs, a few seconds of the interrupted tone will be heard at the end of the stored message when it is played back. In the next release, the parameter will be replaced by Hang Up Detection (Signaling Type parameter group with admin access) and all protocols will be supported. Interrupted tones will be recognized by Hang Up Detection to Cadenced Energy. All protocols will be supported. The following parameters, all in the Signaling Type parameter group with admin access, are added to support this change:

- Cadence Energy Maximum
- Cadence Energy Minimum
- Cadence Off Time Maximum
- Cadence Off Time Minimum
- Cadence On Time Maximum
- Cadence On Time Minimum
- Cadence Silence Maximum

- Continuous silence: While recording, DirectTalk/6000 monitors the voice channel for speech and silence and stops recording after silence is present for a specified amount of time, provided speech was recorded before the silence is detected. This capability is also known as "silence detection."

With the E1 SL (Subscriber Loop) protocol, recording stops and a call is terminated when the silence detection timeout occurs. With other protocols, detection of silence stops recording, but cannot be used to terminate the call. However, with the next release of DirectTalk/6000, it will be possible to terminate a call when silence is detected while recording. The system variable System:Action information (SV180)¹⁴ is set to 1 after a record action (that is, RecordVoiceMessage, RecordVoiceSegment, RecordAudioName or RecordGreeting) returns a "Succeeded" result, provided recording was stopped because silence was detected. The TerminateCall action can then be invoked to end the call.

The following system parameters (all Trunk Interface parameter group with field access) affect DirectTalk/6000 silence detection:

- Maximum Silence Duration¹⁵
- Maximum Silence Level
- Minimum Speech Level

¹³ Contact Level 2 Support regarding availability.

¹⁴ In previous releases this was known as System:Action failed reason.

¹⁵ This parameter is admin access in the next release of DirectTalk/6000.

- Host access control link: DirectTalk/6000 may be able to connect to a host access control link on the switch using the DirectTalk/6000 exchange data link.
- Application timeout: A call can be terminated by the application if a timeout occurs while executing one of the following DirectTalk/6000 state table actions:
 - GetData or GetKey. The timeout value is specified when defining the action.
 - RecordVoiceMessage. The timeout value is specified using the Record Voice Maximum system parameter (DirectTalk/6000 parameter group with Admin access).

Note: The GetData action is used when the caller must provide more than one piece of data to the application, while the GetKey action is used when the caller is required to provide only a single piece of information.

5.2.2.2 Recognizing Far-End Disconnect with DirectTalk/2

DirectTalk/2 can use the following methods for recognizing far-end disconnect.

- Disconnect signal: This method is available with DirectTalk/2 when connected to the switch using a digital interface (T1 or E1) and a Channel Associated Signaling protocol such as FXS/GS, E&M, R2 etc.
- Disconnect clear signal: When connected to a switch using an analog interface, DirectTalk/2 can be configured to look for a disconnect clear (wink-off) signal of duration specified by the Loop Current Drop for HUP parameter. Using a T1 digital interface, a disconnect clear signal can only be detected using FXS/LS and SAS/LS Channel Associated Signaling protocols.
- Continuous or interrupted tone (frequencies specified):¹⁶

DirectTalk/2 monitors the line for defined continuous or interrupted tones by checking both the defined frequency or frequencies and cadence (if any). If a match is detected, the caller hung up (HUP) code is returned at the next action. This method of detection is enabled by manually editing the Telephony Server configuration file (VSTS.CFG).
- Continuous or interrupted tone (no frequencies specified)¹⁷

DirectTalk/2 monitors the line for defined continuous or interrupted periods of silence and nonsilence. If a match is detected, the caller hung up (HUP) code is returned at the next action. DirectTalk/2 does not check the frequencies of the tone or tones, only the timing. This method of detection is enabled by specifying the following parameters during DirectTalk/2 configuration:

 - Hangup Minimum Nonsilence
 - Hangup Maximum Nonsilence
 - Hangup Minimum Silence
 - Hangup Maximum Silence
 - Hangup Repeat Count
 - Silence Debounce

¹⁶ This parameter is admin access in the next release of DirectTalk/6000.

¹⁷ This method is identified as "Hangup Pattern" in Appendix H of the *IBM CallPath DirectTalk/2 Installation Guide*.

- Continuous non-silence: DirectTalk/2 monitors the line for all periods of continuous non-silence for a period specified by the parameter Nonsilence Before Hangup. When the period of non-silence exceeds the specified value, DirectTalk/2 returns the caller hung up (HUP) return code at the next action. Refer to "Continuous Non-Silence" in Appendix H of the *IBM CallPath DirectTalk/2 Installation Guide* for cautions when relying on this method to recognize far-end disconnect.
- Continuous silence: DirectTalk/2 monitors the line for all periods of continuous silence for a time specified by Silence Before Hangup. When the period of silence exceeds the specified value, DirectTalk/2 returns the caller hung up (HUP) return code at the next action. Refer to "Continuous silence" in Appendix H of the *IBM CallPath DirectTalk/2 Installation Guide* for cautions when relying on this method to recognize far-end disconnect.

5.2.3 Dialed Number Identification Service (DNIS)

Dialed Number Identification Service (DNIS) is an 800 toll-free subscription service available in the US and Canada providing the called party with a personalized identification of the service or product associated with the call. The number provided is not necessarily the number dialed by the caller, but will always be a number that has meaning to the customer. DNIS is not the same as direct inward dialing (DID), which can be used for a similar purpose.

A voice processing system should be able to receive DNIS using one of the following methods:

- Directly from the carrier's network using an analog or digital interface (Channel Associated Signaling or ISDN)
- From a switch over a tie line
- From a switch via a host access control link

This method is identified as "Hangup Tone Detection" in Appendix H of the *IBM CallPath DirectTalk/2 Installation Guide*.

DNIS is offered by MCI and Sprint on incoming analog or digital wide area telephone service (INWATS) trunks using DTMF (or MFR1). DTMF digits are sent in the following sequence: **DNIS*. The DNIS information is sent in-band before the call is answered.

DNIS is offered by AT&T on ISDN primary rate facilities and on analog and digital tie lines as Megacom 800 service. AT&T also offers DNIS as COMM DNIS on DID trunks.

DirectTalk/6000 can receive DNIS from MCI, Sprint and AT&T Megacom 800 or COMM DNIS services. The configuration is the same as for DID. A channel bank is required if an analog interface to the network carrier is used. DirectTalk/6000 cannot directly receive DNIS from AT&T using ISDN facilities. However, if DirectTalk/6000 is connected to a PABX that connects to the network via ISDN, the DNIS information received from the network by the PABX can be sent to DirectTalk/6000 on a tie line or via the DirectTalk/6000 exchange data link.

5.2.4 Direct Inward Dialing (DID)

Direct Inward Dialing (DID) (known in the UK as Direct Dialing Inward or DDI), is a central office feature that identifies to a PABX the specific extension to which the calling party wishes to be connected (that is, the called number). The central office switch sends to the PABX the minimum number of address digits (usually four) needed to uniquely identify the PABX extension dialed by the calling party. The address digits are sent using dial pulses (decadic dialing) or DTMF over a DID analog trunk or a digital tie line configured for DID operation. The feature is normally used to reduce the need to have an attendant answer every incoming call and then extend the call to the desired PABX party.

DirectTalk/6000 supports DID operation using a Channel Associated Signaling tie line protocol configured to receive incoming address information (that is, the called number) in-band as DTMF or MFR1 in the information channel or dial pulses out-of-band in the channel associated signaling channel. For DID operation, DirectTalk/6000 system parameters (all with admin access) are set as follows:

- Call Information Type (Channel Group) = Register.
- Address Register Type (Signaling Type) = Fixed Length.
- Register Length (Signaling Type) = 1 to 15 as required.
- Incoming Address Signaling Type (Signaling Type) = DTMF, MFR1 or Dial Pulse as required.¹⁸
- Direction (Channel Group) = Incoming.¹⁹
- T1 Protocol or E1 Protocol (Channel Group) = DID, E&M, R2, UK Tie/DDI or UK Callstream as required
- DID Start Type, E&M Start Type or UK DDI Start Type (Channel Group) = Wink Start, Delay Start or Immediate Start as required.²⁰
- Signaling Type (Channel Group) = DID, E&M, R2 or UK Tie/DDI.

DirectTalk/2 normally receives the called number on a digital interface using a tie line protocol. DirectTalk/2 does not support DID on analog interfaces.

5.2.5 Automatic Number Identification (ANI)

Automatic Number Identification (ANI) (US only) provides the telephone number of the calling party. It is generated by the caller's originating central office switch, passed onto a telephone network carrier if required, and then either directly to a switch or voice processing system. ANI is not available from all end offices. Therefore, even when the service is provided, a significant percentage of the calls will not have the calling number presented to a voice processing system. As with DNIS, when a voice processing system is connected to a PABX, ANI information can be sent in-band to a voice processing system using a tie line or out-of-band via a host access control link.

MCI and Sprint provide ANI with or without DNIS on the voice channel using DTMF or MFR1 on a T1 digital line using Channel Associated Signaling. The

¹⁸ Set to Dial Pulse for UK Callstream.

¹⁹ Set to Bothway for UK Callstream

²⁰ UK Tie/DDI does not support Wink Start

format is *ANI** or *ANI*DNIS*. The ANI service from AT&T (INFO-2) uses ISDN primary rate facilities. MCI and Sprint also provide ANI on ISDN primary rate facilities.

DirectTalk/6000 can receive ANI from MCI and Sprint in the same manner as it receives DNIS, that is, configured for DID. The DirectTalk/6000 application examines the incoming address digits and separates ANI digits from any DNIS digits. DirectTalk/6000 cannot receive ANI directly from AT&T (or MCI or Sprint) using ISDN. However, ANI received on ISDN facilities can be sent to DirectTalk/6000 from a PABX using a tie line or via the DirectTalk/6000 exchange data link.

DirectTalk/2 normally receives ANI information on a digital interface but can also support ANI on analog interfaces.

5.2.6 Calling Line Identity (CLID)

Calling Line Identity (CLID) is functionally the same as ANI. However, the term CLID is usually used in Europe where the service is provided by ISDN facilities.

DirectTalk/6000 can receive CLID from a switch on a tie line or via the DirectTalk/6000 exchange data link if the switch is connected to the network via ISDN.

DirectTalk/2 supports various forms of ISDN in Europe and therefore, may provide CLID, depending on the network.

5.2.7 Feature Group D

Feature Group D (FG D) (US only), like ANI/DNIS, is a way to receive the calling number and the called number directly from the network. Feature Group D provides an Equal-Access-End Office (EAEO)-to-interexchange carrier (IXC) connection arrangement. The calling party dials an access code of 10XXX to identify the desired interexchange carrier. This is followed by 0 or 1 to indicate whether the call requires operator assistance (0) or does not require operator assistance (1). Then, the 7- or 10-digit telephone number of the called party is dialed. The calling number and called number are provided to the IXC via MFR1 in a specific sequence.

As with ANI and DNIS, when DirectTalk/6000 is attached to a PABX, the in-band information is not likely to be passed by the PABX to DirectTalk via the voice channel. However, the calling and called numbers may be provided to DirectTalk/6000 as previously described. DirectTalk/6000 is configured for Feature Group D by setting DirectTalk/6000 system parameters (all with admin access) as listed below:

- Call Information Type (Channel Group) = Register.
- Address Register Type (Signaling Type) = Feature Group D.
- Incoming Address Signaling Type (Channel Group) = MFR1.
- T1 Protocol (Channel Group) = E&M.
- E&M Start Type (Channel Group) = Wink Start.
- Direction (Channel Group)= Bothway.

Feature Group D is not supported by DirectTalk/2.

5.2.8 Using Called and Calling Number Identification

For a voice response application, called number information (DNIS/DID) can be used to select which voice application answers an incoming call based on the number dialed by the caller. In the absence of DNIS or DID information, the application can be chosen based on the channel on which the call arrives. In a voice mail application, the called number information is used to play personalized greetings and take messages for a specified extension.

Calling number information (ANI/CLID)²¹ can be used to identify the caller or at least the number of the telephone from which the caller is dialing. By using the calling number as a key to a customer database, the caller can be greeted by name, or in a specific language, or offered some special or priority service.

DirectTalk customers should carefully consider the use of ANI, as it is only useful when the users will always place calls from the same number, such as for business-to-business calls. When the location of callers is unpredictable, it may be more effective to simply ask callers to identify themselves by voice and use speech recognition or by entering DTMF digits.

5.2.9 Message Waiting Indicator (MWI) Control

Switches use several mechanisms to alert users that there are messages waiting for them, for example, providing interrupted (stutter) dial tone in place of normal dial tone, illuminating a light on the phone or calling the user at specified intervals with a distinctive ringing pattern.

DirectTalk/6000 can control such indicators using the exchange data link. Also, some PABXs provide for activation and deactivation of message waiting indicators by dialing a specific telephone number followed by a sequence of DTMF digits. DirectTalk/2 and DirectTalk/6000 can both use this method when it is available.

5.2.10 Answer Detection

A voice processing system must be able to determine when a call originated by it is answered. Some Channel Associated Signaling protocols provide a positive indication that a call has been answered (that is, answer supervision). Loop start Channel Associated Signaling protocols (that is, FXS loop start, SAS loop start and Remote Extension) do not provide answer supervision.

5.2.10.1 Answer Detection with DirectTalk/6000

When answer supervision is not available via signaling, DirectTalk/6000 uses the presence of voice energy to determine when a call is answered. The threshold level for this is set by Answer Detect Threshold (Trunk Interface parameter group with Field access). To be qualified as a valid answer, the audio signal must consist of more than two frequencies which must be present for the time specified by Answer Detect Time (Trunk Interface parameter group with Field access).

²¹ Also known as calling party number or CPN.

5.2.10.2 Answer Detection with DirectTalk/2

Like DirectTalk/6000, DirectTalk/2 can determine when a call has been answered by detecting voice energy.

This is done by setting Call Progress Characterization (CPC) parameters which define call analysis and call progress. This capability is available with both analog and digital interfaces to DirectTalk/2.

DirectTalk/2 classifies the result of a call it makes using the Place_a_Call action as shown in Table 19.

<i>Table 19. Results of Using Place-a-Call Action</i>	
Result	Description
Answered	The party the action called answered the telephone and is on the line.
Busy	The action received a busy signal after dialing the telephone number.
No answer	The call is not answered after the number of rings specified by the Rings Before No Answer system parameter.
No ring	No ringback tone is received.
Operator intercept	The action received a Special Information Tone (SIT) indicating the number called is no longer in service or has been changed.
Answering Machine	The action detected an answering machine or it encountered a period of continuous nonsilence for a specified period after the call was answered.
No dial tone	The action did not detect a dial tone and did not attempt to place a call.
FAX/Modem	A facsimile machine or modem answer tone is detected.
Caller hungup	If the action returns this return code as part of transferring a call, then this return code indicates the caller hung up.

5.2.11 Blocking

For testing purposes, some customers wish to block²² specific channels on a digital interface. Since there are no EIA/TIA-464A T1 Channel Associated Signaling protocols with a unique blocking code, some customers make a channel busy to block it from receiving incoming calls. On DirectTalk/6000, this method works with E&M, FXS/Loop Start and SAS/Loop Start protocols. The next release of DirectTalk/6000 will also allow this action to be performed with FXS/Ground Start.

Some switches (for example, the Aspect CallCenter) using E&M wink start or delay consider a channel blocked if the voice processing system does not return a wink or delay start signal following an incoming seizure.

In the next release of DirectTalk/6000 a new system parameter, Blocking Action (Signaling Type parameter group with Field access) is used to specify how DirectTalk/6000 indicates a channel is blocked. Blocking by appearing off-hook is selected by setting the parameter to Offhook while blocking by not responding with a wink start or delay start signal is selected by setting the parameter to No Wink.

²² Also known as busy-out or make-busy.

Except for RE (Remote Extension) and E&M, all the E1 Channel Associated Signaling protocols supported by DirectTalk have unique blocking codes.

In conjunction with Blocking Action, the system parameter Send RAI (Trunk Interface parameter group with Field access) is added in the next DirectTalk/6000 release to control sending a T1 remote alarm indication (RAI). When Send RAI is set to Yes, DirectTalk/6000 sends RAI (also known as "yellow alarm") to the switch while the DirectTalk/6000 trunk Operating Status (Trunk Interface parameter group with admin access) is Enabled. The RAI is discontinued when DirectTalk/6000 completes a channels-in-service action for all channels on the trunk.

5.3 Computer-Telephony Integration (CTI)

Many switches provide a host access control link to computers which allows the switch to pass telephony event information and traffic statistics to the computer and can also allow a computer some control over the switch, for example, the ability to initiate or transfer calls. This feature is commonly known as computer-telephony integration (CTI).

The specific data and functions which are available on these host access control links vary, but the following are typical examples:

- Called number (DNIS or DID)
- Calling number (ANI or CLID)
- Reason for forwarding:
 - Called number is busy
 - Called party does not answer
 - All calls to the original destination are being forwarded
 - Call is directly dialed to a new destination (for example, DirectTalk)
- Switch party has answered
- Switch party has disconnected
- Message waiting indicator control
- Call transfer

5.3.1 DirectTalk/6000 Exchange Data Link (EDL)

The DirectTalk/6000 exchange data link supports computer-telephony integration. DirectTalk/6000 is supplied with servers supporting the following host access link protocols:

- Simplified Message Service Interface (SMSI) for AT&T 1A ESS and 5ESS
- Simplified Message Desk Interface (SMDI) for Northern Telecom DMS100/250/MTX
- Voice Message System (VMS) for Ericsson MD110
- Application Connectivity Link (ACL) for Siemens Hicom 300

Table 20 on page 172 is a summary of the data and functions available with the host access protocols supported by DirectTalk/6000.

Table 20. Capabilities of Host Access Protocols Supported by DirectTalk/6000

Protocol	Calling Number		Called Number	Reason	Message Waiting Indicator		Answer	Disconnect	Transfer
	Intra Switch	External			Activate	Deactivate			
ACL (Siemens Hicom 300)	Yes	Yes	Yes	No	Yes	Yes	No	No	Yes
SMDI (Northern Telecom DMS 100)	Yes	No	Yes	Yes	Yes	Yes	No	No	No
SMSI (AT&T 5ESS)	Yes	No	Yes	Yes	Yes	Yes	No	No	No
VMS (Ericsson MD110)	Yes	No	Yes	Yes	Yes	Yes	No	Yes	No

DirectTalk/6000 can support computer-telephony integration with other switches using a custom signaling process (see *IBM CallPath DirectTalk/6000 Programming for the Signaling Interface*, SC33-1155) to implement the host access link protocols used by the switches.

5.3.2 Selecting a DirectTalk/6000 Exchange Data Link Signaling Process

In DirectTalk/6000, signaling processes are used to implement:

- Exchange data link protocols
- Common channel signaling protocols

Signaling processes are *not* used to implement Channel Associated Signaling processes.

DirectTalk/6000 is configured to use a signaling process, either supplied with DirectTalk/6000 (ACL, SMSI, SMDI or VMS) or user provided (User 1 through User 19), by setting the following system parameters (all with admin access) as appropriate:

- Call Information Type (Channel Group parameter group)
- Signaling Process Type (Channel Group parameter group)
- EDL Switch Type (Message Information parameter group)

With some switches, DirectTalk/6000 is required to answer an incoming call before receiving call information on the exchange data link. This capability is controlled by Off Hook Before Call Setup (Application Server Interface parameter group with Admin access).

5.3.3 Address Signaling

Voice processing applications may require incoming address signaling²³ (called number identification -- DDI/DID/DNIS and calling number identification -- ANI/CLID), outgoing address signaling, or both.

A "proceed-to-dial" signal is normally used to tell the originating end when to send address signaling. This is to guarantee an address register is attached at the receiving end before transmitting the address digits. If this procedure is not followed, the first digit transmitted may be received incorrectly or not at all.

There are three types of proceed-to-dial signals:

1. Dial tone

²³ Address signaling is also known as register signaling.

2. Start signal, that is, a wink or delay dial²⁴
3. Seizure acknowledgment signal (not wink or delay dial) in the signaling channel

Wink start and delay dial signals are similar, distinguished only by when the signals begin and the duration of the signals.

- **wink start:** Must begin no earlier than 100 ms after recognizing incoming seizure; must last for 140 to 290 ms (200 ms nominal).
- **delay start:** Must begin no earlier than 100 ms and no later than 150 ms after recognizing incoming seizure; must last for at least 140 ms.

Some switches do not send dial tone and there is no positive indication that an address register is attached. In this situation, the address digits are sent within about 65 ms following outgoing seizure. This method is called immediate start and it is generally not recommended.

Note: The term *start* as used with FXS loop start, SAS loop start and FXS ground start has to do with initiating a request for service and does not refer to address signaling control.

5.3.3.1 Outgoing Address Signaling Using Dial Tone Control

A switch normally uses dial tone to control address signaling from a station. Additionally, some switches have the option of returning dial tone on a tie line. Dial tone control is recommended for the following reasons when FXS/loop start or SAS/loop start is used:

- The presence of dial tone means an address register is attached.²⁵
- The call will proceed faster since it is generally necessary to wait at least 2 seconds before dialing when dial tone is not being detected.

DirectTalk/6000 uses call progress tone detection to determine if dial tone is present but will recognize dial tone only if the Call Progress Tones table is correctly configured. See Appendix B in the *IBM CallPath DirectTalk/6000 Configuration and Administration Guide* for the procedure used to set call progress tone parameters. DirectTalk/6000 dial tone detection is affected by the following system parameters (all in the Signaling Type parameter group with admin access):

- Dial Tone Detection
- Dial Tone
- Dial Tone Timeout

DirectTalk/2 uses the *Place_a_Call* action to specify if dial tone detection is used to control outgoing address signaling. The following parameters affect DirectTalk/2 dial tone detection:

- Dial Tone Off Debounce
- Dial Tone Presence Valid
- Dial Tone Presence Wait
- Maximum Dial Tone Wait Time

²⁴ Delay dial is the signal used with delay start.

²⁵ With FXS/GS, the presence of tip ground generally indicates an address register is attached.

- Valid Dial Tone

5.3.3.2 Outgoing Address Signaling Using Start Signal Control

With the following Channel Associated Signaling protocols, the switch sends a wink or delay dial signal when ready to receive address signaling from DirectTalk:

- E&M T1
- E&M E1 (DirectTalk/6000 only)
- UK Tie/DDI (delay start only)

DirectTalk/6000 parameters Wink Start Duration and Delay Start Duration (Signaling Type parameter group with Field access) and DirectTalk/2 parameters Maximum Wink and Minimum Wink, control recognition of the wink or delay dial signal sent by the switch.

5.3.3.3 Outgoing Address Signaling Using Seizure Acknowledgment Control

With the following Channel Associated Signaling protocols, the switch sends a unique seizure acknowledgment signal when ready to receive address signaling from DirectTalk:

- Italy (DirectTalk/6000 only)
- R2

5.3.3.4 Outgoing Address Signaling Type

DirectTalk/6000 outgoing address signaling type (DTMF, MFR1 or dial pulse) is controlled by Outgoing Address Signaling Type (Channel Group parameter with Admin access). DirectTalk/6000 cannot transmit outgoing address signaling using R2 register signaling (also known as R2MFC). However, many switches offer DTMF in place of R2MFC when using R2 digital line signaling.

DirectTalk/2 outgoing signaling address type (DTMF or dial pulse) for T1 digital and analog interfaces is controlled by the *Place_a_Call action*. The DirectTalk/2 T1 digital interface supports DTMF only. The DirectTalk/2 analog interface supports DTMF or dial pulse. The DirectTalk/2 E1 digital interface supports DTMF, dial pulse, MFR1 or R2MFC.

5.3.3.5 Incoming Address Signaling Using Start Signal Control

With the following Channel Associated Signaling protocols, DirectTalk sends a wink or delay dial signal when ready to receive address signaling from the switch:

- E&M T1
- E&M E1 (DirectTalk/6000 only)
- DID (DirectTalk/6000 only)
- UK Tie/DDI (delay start only)

The following DirectTalk/6000 system parameters (Signaling Type parameter group with field access) control the wink or delay dial signal sent by DirectTalk/6000:

- Wink Start Delay
- Wink Start Duration

- Delay Start Delay
- Delay Start Duration

The following DirectTalk/2 system parameters control the wink or delay start signal sent by DirectTalk/2:

- Wink Length
- Wink Delay

Note: For DirectTalk/2 immediate start operation, both Wink Length and Wink Delay are set to zero.

5.3.3.6 Incoming Address Signaling Using Seizure Acknowledgment Control

With the following Channel Associated Signaling protocols, DirectTalk sends a unique seizure acknowledgement signal when ready to receive address signaling from the switch:

- EL7 CAS (DirectTalk/6000 only)
- Italy (DirectTalk/6000 only)
- R2
- UK Callstream

5.3.3.7 Incoming Address Signaling Using Dial Tone Control

DirectTalk does not provide dial tone for control of address signaling from the switch.

5.3.3.8 Incoming Address Signaling Type

DirectTalk/6000 can receive incoming address signaling using DTMF or MFR1 in the information channel or dial pulses in the signaling channel. DirectTalk/6000 can also receive address signaling via the exchange data link. DirectTalk/6000 cannot receive incoming address signaling using R2 register signaling (R2MFC).

To receive incoming address signaling using a Channel Associated Signaling protocol, DirectTalk/6000 system parameters (all with admin access) are set as follows:

- Call Information Type (Channel Group parameter group) = Register.
- Address Register Type (Signaling Type parameter group) = Fixed or Feature Group D.
- Register Length (Signaling Type parameter group) = The number of expected address digits when Address Register Type is set to Fixed.
- Incoming Address Signaling Type (Channel Group parameter group) = DTMF, Dial Pulse or MFR1.²⁶

To receive incoming address signaling using the DirectTalk/6000 exchange data link or with common channel signaling, Call Information Type is set to Signaling Process.

²⁶ Set to MFR1 for Feature Group D.

DirectTalk/2 can receive incoming address signaling on T1 digital and analog interfaces using DTMF. The DirectTalk/2 E1 digital interface can receive incoming address signaling using DTMF, dial pulse, MFR1 or R2MFC.

5.3.3.9 Incoming Address Signaling with Station Protocols

Some PABXs and ACD systems (for example, Philips SOPHO-S, Alcatel Digimat 2000, Rockwell Galaxy Spectrum and AT&T Definity G3) send number identification (called and/or calling) using a station protocol (for example, FXS or SAS). This is done by sending DTMF digits before or after the call is answered by the voice processing system. This is known as "on-hook VF transmission," and is used, for example, for automated utility meter reading.

A DirectTalk/6000 application can be written to support this capability only if the address information is sent after the call is answered by DirectTalk/6000.²⁷

DirectTalk/2 will accept DTMF address information on an analog interface anytime after ringing current is applied (even before DirectTalk/2 answers the call). The ANI/DNIS Wait Time parameter is used to specify how long DirectTalk/2 waits to receive incoming address digits after ringing is detected. If the value is set to 0, no digits are expected. If a digit is received, DirectTalk/2 will continue to collect digits until no more digits are received. Any received string of digits is passed to the application as ANI_DNIS_data.

5.3.3.10 Caller Provided Information and Application Control

Voice processing system applications handle information requests and processing. The applications often require callers to respond with certain information and/or to control the application. Applications typically ask questions that the caller can answer by a series of Yes/No responses or by transmitting a series of digits (0 through 9). It is also possible for the caller to send alphabetic characters based on how many times a digit is sent, for example, "D" can be indicated by sending digit 3 twice.

DirectTalk can interact with callers and retrieve information from them using the following methods:

- DTMF detection
- Voice recognition²⁸

5.3.3.11 DTMF Detection

DTMF was developed as a replacement for pulse dialing telephones used to send address signaling directly to a central office or PABX. Customers should be informed that using DTMF for "data" transmission for example, with a voice processing system, is considered by telephone companies to be a "permissive" service, that is, it is not guaranteed to work under all conditions.

DirectTalk/6000 has two algorithms for DTMF detection:

- Record DTMF
- DID DTMF

²⁷ The capability to receive this incoming DTMF address information before the call is answered is being considered for a future release of DirectTalk/6000.

²⁸ There is a limited form of voice recognition known as "grunt" detection. DirectTalk sometimes uses this technique for answer detection

DirectTalk/6000 uses the Record DTMF algorithm to recognize DTMF digits while recording. The system parameter, Record DTMF Level (Trunk Interface group parameter with Field access), is used to set the detection threshold for received DTMF tones. This algorithm cannot detect DTMF digits at a rate greater than 7 digits per second and with tone-on and tone-off times less than 70 ms each.

DirectTalk/6000 uses the DID DTMF algorithm for incoming address signaling and for access to applications except during recording. The system parameters, DTMF Maximum Receive Level and DTMF Minimum Receive Level (Trunk Interface group parameters with field access) specify the upper and lower detection thresholds, respectively, for received DTMF tones. This algorithm will recognize DTMF digits at speeds up to 10 digits per second with tone-on and tone-off times of 50 ms each.

DirectTalk/2 uses one algorithm for DTMF detection and there are three parameters that affect incoming DTMF detection:

- DTMF Anti-Talkoff
- DTMF Debounce Time
- DTMF Edge Detection

5.3.3.12 DirectTalk Voice Recognition

Voice recognition with DirectTalk is provided by the following methods:

- Built-in voice recognition using the RPACK (DirectTalk/6000)²⁹
- Built-in voice recognition using Dialogic hardware (DirectTalk/2)
- External voice recognition using a custom server (DirectTalk/2 and DirectTalk/6000)

5.3.3.13 Pulse-to-Tone Converters (PTTCs)

Introduction: In many countries, rotary dial telephones are more common than DTMF telephones. Unless voice recognition or hand-held tone dialers are used, voice applications are limited to “passive” types, that is, a caller listens to a recorded announcement or is routed directly to a voice mailbox to leave a message and hang up.

If voice recognition is not available, an alternative is a “pulse-to-tone” converter. This device “listens” to the “noise” produced when dialing from a rotary dial telephone. The converter counts the number of clicks sent each time a digit is dialed and converts the dialed digit to a DTMF tone.

Operation: Pulse-to-tone converters are generally digital signal processing systems that recognize the audible “noise” produced when dialing from a rotary dial telephone. PTTCs then generate a DTMF digit equivalent to the number dialed. There are no equivalents to the DTMF tones for * and #.

PTTCs respond to the “pulse signature” of the various noise pulses on the line, including:

- Voice prompts from the voice processing system
- Caller’s voice

²⁹ The RPACK is not supported by the 9291-010/020.

- Background noise
- Noise created by dialing
- Noise created by ringing
- Line noise

A PTTC must use an algorithm that can successfully distinguish the various types of pulse signatures to accurately convert dial pulses to DTMF tones.

Connecting to Voice Processing Systems: Although most PTTCs use digital signal processing techniques to perform the conversion, the majority are connected to voice processing systems on an analog basis, that is, analog input from the switch or PABX and analog output to the voice processing system. The PTTC is usually connected in series between the switch or PABX and the voice processing system. There are two other methods for connecting PTTCs to voice processing systems:

- A passive analog connection in parallel with the two-wire central office subscriber loop or the PABX extension.
- A digital connection (T1 or E1) in series with the switch or PABX and the voice processing system.

Accuracy: The switch itself has a major effect on the accuracy of a pulse-to-tone converter and it affects accuracy in two ways:

1. Disconnect: Some switches disconnect a caller with a rotary dial telephone who dials any number higher than three after a call is established.³⁰ This may only be a problem with older CO equipment.
2. Noise suppression: The clicks generated by a rotary dial are treated as noise spikes and some switches provide muting or some form of noise limiting to prevent acoustic shock to the caller.

Usually, pulse-to-tone converters are not considered very accurate. Problems include incorrectly recognizing rotary dialed digits and recognizing hook flashes as a dialed 1 digit. Contact IBM Spain, IBM Brazil, IBM Colombia or IBM Finland for recent experience with some the products listed below.

List of Manufacturers: The following is a list of manufacturers of pulse-to-tone converters:

- Aerotel, 5 Hazoref St. Holon, Israel; Tel. +972 3 559 3222; Fax. +972 3 559 6111. Contact: Rafi katz.
- Digitro, Brazil. IBM Colombia reports this device is E1 input and E1 output. No further information is available.
- Electropiezo IND. e Com. Ltda., Sao Paulo, SP- Brazil; Tel. +55 11 572 6434. Contact IBM Brazil for further information. This converter appears to use a passive parallel connection.
- Parwan Electronics Corporation, 47 Gordons Corner Road, Marlboro, NJ 07746; Tel. +1 202 536 7500. Contact: John R. O'Donnell.
- Pika Technologies Inc., 155 Terrence Matthews Crescent, Kanata, Ont. Canada K2M 1W8; Tel. +1 613 591 1555; Fax. +1 613 591 1388. Contact:

³⁰ This is known as over-dialing, that is, dialing with a rotary telephone after a connection is made.

Peter Karneef. This product can be connected in series or in parallel with the telephone; the series connection is recommended by Pika.

- Rummel Engineering & Consulting, 3 Beede Avenue, Lynn, MA 01902; Tel. +1 617 581 7880. Contact: Rosanna Garcia. This converter appears to use a passive parallel connection.
- Telecorp Systems, Inc., 1000 Holcomb Woods Parkway, Suite 410A, Roswell, GA 30076; Tel. +1 404 587 0700; Fax. +1 404 587 0589. Contact: Katherine Ebersole.
- Teleliaison Inc., 3501 rue Ashby, Ville St. Laurent, Quebec, Canada, H4R 2K3; Tel. +1 514 333 5333. Contact Georges Bettan.

5.3.4 Developing Voice Processing Applications with DirectTalk

DirectTalk applications can provide voicemail and/or interactive voice response services. Developing these applications requires one or more of the following functions:

1. Number identification (calling and/or called)
2. Answer detection
3. Call transfer
4. Call progress tone detection
5. Outcalling capability
6. Hangup (far-end disconnect) detection
7. Message waiting indicator control

Two of these functions, call transfer and number identification, are generally mutually exclusive when using Channel Associated Signaling protocols. The reason for this is that call transfer is a line-side protocol feature, while number identification is a trunk-side (DID or tie line) protocol feature. In fact, the only DirectTalk Channel Associated Signaling protocol that supports both call transfer and number identification is E&M, if the switch provides a release link trunk.

5.3.4.1 Call Transfer and Number Identification Using a Station Protocol

When a customer's voice processing system application requires both call transfer and number identification, it may be possible to use DirectTalk/6000 with a line-side protocol such as FXS or RE, together with the exchange data link if the switch has a host access control link. If one of the available DirectTalk/6000 EDL protocols cannot be used, then using the DirectTalk/6000 signaling interface, a signaling process can be written to support the host access control link that is provided by the switch.

5.3.4.2 Call Transfer and Number Identification Using VoiceBridge

If the customer is using one of the following PABXs, another way to provide call transfer and number identification is by using the VoiceBridge from Voice Technologies Group (VTG), Inc. in Buffalo, New York:

- AT&T System 75/85 or Definity (G1, G2 or G3)
- Mitel SX series
- NEC Neax 2400/7400
- Northern Telecom SL-1 or Meridian

- Rolm 9751

The VTG product available now is called the VoiceBridge Series II (VB II). VB II emulates a PABX digital telephone set and extracts number identification information sent to the set. VB II passes the number information to a voice processing system using the Bellcore Simplified Message Desk Interface (SMDI) protocol developed for Centrex applications. VB II also allows the voice processing system to control the message waiting indicator per the SMDI specification.

VB II requires the PABX be connected to the voice processing system using PABX station (line-side appearance) ports to support call transfer. Also, except for the NEC Neax 2400, a channel bank is required to connect the PABX to the voice processing system.³¹

A station port does not usually provide an indication of far-end disconnect and this information is not provided on the SMDI interface.

Each VB II connects to one digital station port on the PABX and supports from 22 to 24 voice processing system ports, depending on the PABX. If more than 24 ports are needed, additional VB IIs can be used, but a PC is required to multiplex the separate VB II SMDI ports to a single SMDI port connected to the voice processing system.

VTG will soon be marketing the VoiceBridge III (VB III) for connecting to voice processing systems with T1 digital interfaces. The VB III will provide inputs for 8 to 48 PABX digital stations and connect to the voice processing system using 1 or 2 T1 digital interfaces configured as an E&M tie line. Call transfer will be supported by using a release link trunk protocol (hook flash). VB III provides a single SMDI connection to the voice processing system. An E1 version of VB III is planned. For more information, contact VTG directly at +1 (716) 689-6700.

5.4 Planning Your Telephone Requirements

When planning a system, you need to determine the number of telephone lines your DirectTalk/2 system requires. For example, on a 24-line system, you can run one application on 24 different telephone lines or you can run 24 different applications on 24 separate telephone lines.

5.4.1 Estimating Your Telephone Traffic

Three factors determine how many telephone lines your DirectTalk/2 system will need for a given application:

The number of calls expected to the application during its peak hours.

The average length of time spent on each call.

The acceptable percentage of blockage—namely, the percentage of callers that receive busy tones during your peak hours. To the caller, this equates to the average time that they must wait before their call is answered.

³¹ There are two reasons for using a channel bank: (1) not all PABXs support FXS on a T1 digital interface and (2) not all PABXs that do provide FXS on T1 also provide a busy appearance to a digital station set for FXS ports on T1.

In many cases, DirectTalk/2 will be installed into an existing telephony application. If so, you can determine the approximate number of peak-hour call attempts by examining existing records such as automatic call distribution (ACD) reports, trunk traffic statistics, or telephone bills. If no other records exist, you will probably require a traffic study to determine the number of peak-hour call attempts.

Similarly, with an existing application, the average length of a call, or the call-hold time, can be obtained from ACD reports or by timing enough actual calls to get a good average value.

5.4.1.1 Calculating Telephone Traffic

The number of peak-hour calls and the average call hold time can be used to calculate the telephone traffic in units as *erlangs*. The formula is:

$$\text{Traffic (in erlangs)} = N_{nb} \times T_h \div (3600 \text{ sec/hr.})$$

Where:

N_{nb} Number of busy-hour calls.

T_h Average hold time (in seconds) per call, where "time" refers to the amount of time DirectTalk/2 uses to process the call.

The traffic in erlangs and the acceptable blockage level can be used to determine the number of lines required, as shown in Table 21.

5.4.2 Erlang B Carried Traffic Capacity Table

The following table shows the number of telephone lines required for a given traffic level at various acceptable blockage levels.

Table 21 (Page 1 of 3). Erlang B Carried Traffic Capacity Table						
Number of lines	Acceptable Blockage Level					
	10.0%	5.0%	2.0%	1.0%	0.5%	0.1%
1	0.10	0.05	0.02	0.01	0.01	0.00
2	0.54	0.36	0.22	0.15	0.10	0.05
3	1.14	0.85	0.59	0.45	0.35	0.19
4	1.84	1.45	1.07	0.86	0.70	0.44
5	2.59	2.11	1.62	1.35	1.13	0.76
6	3.38	2.81	2.23	1.89	1.61	1.14
7	4.20	3.55	2.88	2.48	2.15	1.58
8	5.04	4.32	3.55	3.10	2.72	2.05
9	5.89	5.10	4.26	3.74	3.32	2.55
10	6.76	5.91	4.98	4.42	3.94	3.09
11	7.64	6.72	5.72	5.11	4.59	3.65
12	8.53	7.55	6.48	5.82	5.25	4.23
13	9.42	8.39	7.25	6.54	5.93	4.83
14	10.33	9.24	8.04	7.28	6.63	5.44

Table 21 (Page 2 of 3). Erlang B Carried Traffic Capacity Table

Number of lines	Acceptable Blockage Level					
	10.0%	5.0%	2.0%	1.0%	0.5%	0.1%
15	11.24	10.10	8.83	8.03	7.34	6.07
16	12.15	10.97	9.63	8.79	8.06	6.71
17	13.07	11.84	10.44	9.56	8.79	7.37
18	13.99	12.72	11.26	10.33	9.53	8.04
19	14.92	13.60	12.09	11.12	10.28	8.72
20	15.86	14.49	12.92	11.91	11.04	9.40
21	16.79	15.38	13.76	12.71	11.80	10.10
22	17.72	16.28	14.60	13.51	12.57	10.80
23	18.66	17.18	15.45	14.32	13.35	11.51
24	19.61	18.08	16.30	15.14	14.13	12.23
25	20.55	18.99	17.15	15.96	14.92	12.96
26	21.50	19.90	18.02	16.79	15.72	13.69
27	22.45	20.81	18.88	17.62	16.52	14.42
28	23.40	21.72	19.75	18.45	17.32	15.17
29	24.35	22.64	20.62	19.29	18.13	15.91
30	25.30	23.56	21.49	20.13	18.94	16.67
31	26.26	24.48	22.37	20.98	19.75	17.42
32	27.21	25.41	23.25	21.83	20.57	18.19
33	28.17	26.33	24.13	22.68	21.40	18.95
34	29.13	27.26	25.02	23.54	22.22	19.72
35	30.09	28.19	25.91	24.39	23.05	20.50
36	31.05	29.12	26.80	25.25	23.89	21.27
37	32.02	30.06	27.69	26.12	24.72	22.06
38	32.98	30.99	28.58	26.98	25.56	22.84
39	33.94	31.93	29.48	27.85	26.40	23.63
40	34.91	32.86	30.38	28.72	27.24	24.42
41	35.88	33.80	31.28	29.59	28.09	25.21
42	36.84	34.74	32.18	30.46	28.94	26.01
43	37.81	35.68	33.08	31.34	29.79	26.81
44	38.78	36.63	33.99	32.22	30.64	27.61
45	39.75	37.57	34.89	33.10	31.50	28.42
46	40.72	38.52	35.80	33.98	32.35	29.23
47	41.69	39.46	36.71	34.86	33.21	30.04
48	42.66	40.41	37.62	35.75	34.08	30.85
49	43.63	41.36	38.54	36.63	34.94	31.66
50	44.61	42.31	39.45	37.52	35.80	32.48
51	45.58	43.26	40.36	38.41	36.67	33.30
52	46.55	44.21	41.28	39.30	37.54	34.12

Table 21 (Page 3 of 3). Erlang B Carried Traffic Capacity Table

Number of lines	Acceptable Blockage Level					
	10.0%	5.0%	2.0%	1.0%	0.5%	0.1%
53	47.53	45.16	42.20	40.20	38.41	34.94
54	48.50	46.11	43.12	41.09	39.28	35.77
55	49.48	47.06	44.04	41.99	40.15	36.59
56	50.45	48.02	44.96	42.88	41.02	37.42
57	51.43	48.97	45.88	43.78	41.90	38.25
58	52.41	49.93	46.81	44.68	42.78	39.08
59	53.38	50.88	47.73	45.58	43.65	39.92
60	54.36	51.84	48.65	46.48	44.53	40.75
61	55.34	52.80	49.58	47.38	45.41	41.59
62	56.32	53.75	50.51	48.29	46.30	42.43
63	57.30	54.71	51.43	49.19	47.18	43.27
64	58.28	55.67	52.36	50.09	48.06	44.11
65	59.26	59.63	53.29	51.00	48.95	44.95
66	60.24	57.59	54.22	51.91	49.84	45.80
67	61.22	58.55	55.15	52.82	50.72	46.64
68	62.20	59.51	56.08	53.73	51.61	47.49
69	63.18	60.48	57.01	54.64	52.50	48.34
70	64.16	61.44	57.95	55.55	53.39	49.19
71	65.14	62.40	58.88	56.46	54.29	50.04
72	66.12	63.36	59.82	57.37	55.18	50.89
73	67.10	64.33	60.75	58.29	56.07	51.75
74	68.08	65.29	61.69	59.20	56.97	52.60
75	69.07	66.26	62.62	60.12	57.86	53.46
76	70.05	67.22	63.56	61.04	58.76	54.31
77	71.03	68.18	64.50	61.95	59.66	55.17
78	72.02	69.15	65.44	62.87	60.56	56.03
79	73.00	70.11	66.38	63.79	61.45	56.89
80	73.98	71.08	67.31	64.71	62.35	57.75

Appendix A. CallPath Server Supported PBXs

AIX CallPath Server/6000

Table 22. Switches and Switch Connections Supported by CallPath Server/2 and					
Supported Switch ¹	CallPath Server/2		AIX CallPath Server/6000		IBM Switch Reference
	Local ^{2,3}	Remote ⁴	Local ^{2,3}	Remote ⁴	
Aspect		X		X	-
AT&T DEFINITY Generic 3	1	X	3	X	CallPath Services Reference for AT&T DEFINITY Generic 3 PBX, SC38-3058
AT&T DEFINITY 5ESS		X		X	CallPath Services Reference for AT&T DEFINITY 5ESS CO Switch, SC30-3558
Ericsson MD110 ⁵		X		X	-
Integral 33X ⁶		X		X	-
Northern Telecom DMS-100	2	X	3	X	CallPath Services Reference for Northern Telecom DMS-100 CO Switch, SC30-3548
Northern Telecom Meridian 1 Meridian Link 4.0	2	X	3	X	CallPath Services Reference for Northern Telecom Meridian 1 PBX, SC38-3057
Northern Telecom Meridian 1 Meridian Link 2.0 and 3.0		X		X	CallPath Services Reference for Northern Telecom Meridian 1 PBX, SC38-3057
NEC APEX 2400/7400 IMS ⁵		X		X	CallPath Services Reference for NEC APEX 2400 IMS, SC18-2302
ROLM 9751 CBX Release 9005	1	X		X	CallPath Services Reference for ROLM CBX (Release 9005), SC38-3056
ROLM 9751 CBX Release 9006	1	X		X	CallPath Services Reference for ROLM CBX (Release 9006), SC38-3056
SDX ⁵		X		X	-

Notes:

1. Contact your IBM Marketing Representative for the switches available in your country.
2. For local connections, the number of direct-attached switch connections is provided.
3. Local switch connections support the CallPath Services Architecture Version 1 enhancements.
4. Remote connections are provided through CallPath SwitchServer/2 or original equipment manufacturer (OEM) gateways.
5. Switch connections are provided by the switch manufacturer.
6. Two direct-attached AT&T DEFINITY Generic 3 switch connections cannot reside in the same CallPath Server/2.

7. Two direct-attached ROLM 9751 switch connections cannot reside in the same CallPath Server/2.

Appendix B. Related Business Partner Offerings

Much of the information contained in this appendix has been provided by IBM Business Partners. IBM is not responsible for the accuracy of such information, or for any warranties or representations, made expressly or by implication, concerning any services or products described in this appendix. This appendix was current at the time of printing but is constantly under review. For the most current list please contact Larry Edwards at larrye@rtptnotes.

B.1 Call Management Applications

B.1.1 ALE Systems

B.1.1.1 PRODUCT NAME:

MLPS Mortgage Loan Production System

B.1.1.2 PRODUCT DESCRIPTION:

MLPS (Mortgage Loan Production System) is a comprehensive, integrated software product designed specifically for the purpose of Originating, Processing and Closing a myriad of loan types. MLPS was designed to operate on IBM's Midrange AS/400 in both a traditional Fixed Function CRT environment or in a true Client/Server OS/2 workstation. MLPS has seamlessly incorporated such Advanced Technology as Image, Fax support, Telephony, Artificial Intelligence, Wireless Communications, just to name a few.

B.1.1.3 KEY BENEFITS:

ALE's product family was developed to lend automation and reduce the cost of both Loan Origination and Loan Collections (see DLCS). ALE has accomplished this goal by intuitively integrating the benefits of today's technology as they lend functionality to enhance end user productivity.

B.1.1.4 CALLPATH PRODUCTS USED:

- CallPath/400
- DirectTalk/2

B.1.1.5 SWITCHES SUPPORTED (Where Applicable):

Those supported by IBM

B.1.1.6 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Available

B.1.1.7 REFERENCES:

Available upon request

B.1.1.8 PRICING:

Available upon request

B.1.1.9 CONTACT NAME/ADDRESS:

Technical contact: C. Wesley Lucas

Marketing contact: John C. Manasco

ALE Systems

1616 East Parham Road

Richmond, VA 23228

Phone: (804)262-5850

Fax: (804)262-8626

B.1.2 ALE Systems

B.1.2.1 PRODUCT NAME:

DLCS Delinquent Loan Collections System

B.1.2.2 PRODUCT DESCRIPTION:

DLCS (Delinquent Loan Collections System) was designed to provide the Collector with a convenient and uniform means for collecting all types of delinquent loans. DLCS has seamlessly incorporated many of today's Advanced Technology features such as Image and Telephony along with electronic interfaces to many popular Servicing systems as a means of collection and presenting information to automate the collections process.

B.1.2.3 KEY BENEFITS:

ALE's product family was developed to lend automation and reduce the cost of both Loan Collections and Loan Origination (see MLPS). ALE has accomplished this goal by intuitively integrating the benefits of today's technology as they lend functionality to enhance end user productivity.

B.1.2.4 CALLPATH PRODUCTS USED:

- CallPath/400
- DirectTalk/2

B.1.2.5 SWITCHES SUPPORTED (Where Applicable):

Those supported by IBM

B.1.2.6 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Available

B.1.2.7 REFERENCES:

Available upon request

B.1.2.8 PRICING:

Available upon request

B.1.2.9 CONTACT NAME/ADDRESS:

Technical contact: C. Wesley Lucas
Marketing contact: John C. Manasco
ALE Systems
1616 East Parham Road
Richmond, VA 23228
Phone: (804)262-5850
Fax: (804)262-8626

B.1.3 Communicator Asystance Systems (CAS)

B.1.3.1 PRODUCT NAME:

CASTEL - Intelligent Call Management

B.1.3.2 PRODUCT DESCRIPTION:

AS/400 Computer Telephony Integration (CTI) application software.

B.1.3.3 KEY FEATURES:

- Automated outbound dialing - predictive, auto, preview
- Inbound call routing - handles matching inbound calls to existing database information and transfers (screen pop) both to the most appropriate agent. Host based routing and business rules processing.
- Blend agent capability allows agents to handle both inbound and outbound calls.
- Services and consulting for integration to existing applications - eliminates CallPath integration work and custom programming.

B.1.3.4 KEY BENEFITS:

- Improve the quality and quantity of your customer contacts with Intelligent Call Management software from CAS. Our sophisticated call center software increases the productivity and efficiency of your customer contact business.
- Intelligent Call Management increases calling efficiency, agent productivity, customer satisfaction and sales revenue, while reducing call center operating expenses.

B.1.3.5 CALLPATH PRODUCTS USED:

- CallPath/400
- SwitchServer/2

B.1.3.6 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Product literature
- Video tape
- Demo
- On-site visit
- Full development lab

B.1.3.7 PRICING:

Host based pricing (model AS/400). Ranging from \$15,000 - \$50,000.

B.1.3.8 CONTACT NAME/ADDRESS:

Larry McAllister
14 Summer Street
Malden, MA 02148
Phone: (617) 324-0140 X615
Fax: (617) 324-0277
E-mail: CAS@Tiac.net

B.1.4 Cothorn Computer Systems, Inc. (CCS)

B.1.4.1 PRODUCT NAME:

CallPro for OS/400

B.1.4.2 PRODUCT DESCRIPTION:

CallPro is the premier implementation and management tool for IBM's CallPath/400 telephony software. CallPro greatly simplifies and speeds the process of incorporating CallPath/400 functions into your new or existing AS/400 applications. All CallPath/400 API's and telephony environment definitions are supported by CallPro. Application programming requirements vary from a few lines of code to none at all, depending on the desired results. The average CallPath/400 installation using CallPro can be placed into production in less than a week.

B.1.4.3 KEY FEATURES:

- Intelligent Answering
- Host Based Call Routing
- Call Transfer with Data
- Agent Consultation with Data
- Workstation Telephony Control
- Intelligent Outbound Dialing
- Call Detail capture and reporting
- Abandoned Call capture and reporting
- Real-time Call Monitor
- ANI to AS/400 database cross-reference
- Menu and table drive installation and maintenance
- Multiple AS/400 support
- IVR support available
- Windows application support

B.1.4.4 KEY BENEFITS:

- Reduced CallPath/400 implementation costs
- Provides for a quick CallPath/400 implementation
- Eliminates the need for CallPath knowledgeable staff
- Easy to use and maintain
- Flexible for use with future applications

B.1.4.5 CALLPATH PRODUCTS USED:

- CallPath/400 V2R3/V3R1 - V3R6
- SwitchServer/2 (if required per switch)

B.1.4.6 SWITCHES SUPPORTED (Where Applicable):

All telephone switches and respective functions as supported by the IBM CallPath/400 licensed product.

B.1.4.7 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Product Sales Flyer
- General Information guide
- Corporate Profile Flyer
- PC Electronic Presentation
- Site visits

B.1.4.8 REFERENCES:

Reference list available upon request

B.1.4.9 PRICING:

User based pricing; Prices available upon request

B.1.4.10 CONTACT NAME/ADDRESS:

Mike Woodson
CallPro Account Manager
Cothern Computer Systems, Inc.
120 N. Congress St., Suite 700
Jackson, MS 39201
Phone: 1-800-844-1155; (601)969-1155
Fax: (601)969-1184

B.1.5 Cothorn Computer Systems, Inc. (CCS)

B.1.5.1 PRODUCT NAME:

CallPro Server for AIX

B.1.5.2 PRODUCT DESCRIPTION:

CallPro Server for AIX provides complete application integration and management tools to enable use of IBM's AIX CallPath Server/6000 licensed product. All custom programming requirements for CallPath Server API's are eliminated. CallPro Server for AIX executes in a true client/server environment, with all setup, management, and reporting functions residing on the AIX Server. End-user application interfaces as well as person service first party control, resides on the client. Supported clients are AIX and DOS/Windows. Additional clients will be available in the future.

B.1.5.3 KEY FEATURES:

- Intelligent Answering
- Host Based Call Routing
- Call Transfer with Data
- Agent Consultation with Data
- Workstation Telephony Control
- Intelligent Outbound Dialing
- Call Detail capture and reporting
- Abandoned Call capture and reporting
- Real-time Call Monitor
- ANI database cross-reference
- Menu and table drive installation and maintenance

B.1.5.4 KEY BENEFITS:

- Reduced CallPath Server/6000 implementation costs
- Provides for a quick CallPath Server/6000 implementation
- Eliminates the need for CallPath knowledgeable staff
- Easy to use and maintain
- Flexible for use with future applications

B.1.5.5 CALLPATH PRODUCTS USED:

- AIX CallPath Server/6000
- SwitchServer/2 (if required per switch)

B.1.5.6 SWITCHES SUPPORTED (Where Applicable):

All telephone switches and respective functions as supported by the IBM AIX CallPath Server/6000 licensed product.

B.1.5.7 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Product Sales Flyer
- Corporate Profile Flyer
- General Information Guide
- Site visits

B.1.5.8 REFERENCES:

Reference list available upon request

B.1.5.9 PRICING:

User based pricing; Prices available upon request

B.1.5.10 CONTACT NAME/ADDRESS:

Mike Woodson
CallPro Account Manager
Cothern Computer Systems, Inc.
120 N. Congress St., Suite 700
Jackson, MS 39201
Phone: 1-800-844-1155; (601)969-1155
Fax: (601)969-1184

B.1.6 DalTech International, Inc.

B.1.6.1 PRODUCT NAME:

DTI/Incoming

B.1.6.2 PRODUCT DESCRIPTION:

DTI/Incoming enables a solution for Screen Pop with ease of installation.

DTI/Incoming is set up to send information and/or start an application.

DTI/Incoming has been installed and actually saved one company one-third of the time to process an order; thus, reducing the staff by 33%. DTI/Incoming coordinates the screen and the phone, enabling the agent to know who is calling before the call is answered. This works with existing software programs, so no training or downtime is required.

B.1.6.3 KEY FEATURES:

- Screen pop
- Screen synchronization

B.1.6.4 KEY BENEFITS:

- Saves employee time
- Saves customer money
- Can process more business faster
- Can do more work with fewer employees

B.1.6.5 CALLPATH PRODUCTS USED:

- IBM CallPath/400
- IBM CallPath/CICS
- IBM CallPath Server/2 or CallPath Server/6000
- IBM CallPath SwitchServer/2
- IBM CallPath CallCoordinator

B.1.6.6 SWITCHES SUPPORTED (Where Applicable):

- ROLM, Northern Telecom, AT&T, Aspect

B.1.6.7 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Product literature
- Demonstrations

B.1.6.8 REFERENCES:

- Available on request

B.1.6.9 PRICING:

- Dependent on configuration

B.1.6.10 CONTACT NAME/ADDRESS:

DalTech International, Inc.
14275 Midway Road, Suite 220
Dallas, Texas 75244
Phone: (214)458-7744
800-878-9873
Fax: (214)490-6156
Primary Contact: George Miller, President

B.1.7 DalTech International, Inc.

B.1.7.1 PRODUCT NAME:

DTI/Orphan

B.1.7.2 PRODUCT DESCRIPTION:

DTI/Orphan tracks abandoned calls. If a caller hangs up before the call is complete, the DTI/Orphan places the call in a file for future access. This file can be used with reports and can be used to recall any caller who hung up.

B.1.7.3 KEY FEATURES:

- Saves information on the abandoned caller

B.1.7.4 KEY BENEFITS:

- Saves employee time
- Recalls customers who hung up
- Can process more business faster

B.1.7.5 CALLPATH PRODUCTS USED:

- IBM CallPath/400
- IBM CallPath/CICS
- IBM CallPath Server/2 or CallPath Server/6000
- IBM CallPath SwitchServer/2
- IBM CallPath CallCoordinator

B.1.7.6 SWITCHES SUPPORTED (Where Applicable):

- ROLM, Northern Telecom, AT&T, Aspect

B.1.7.7 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Product literature
- Demonstrations

B.1.7.8 REFERENCES:

- Available on request

B.1.7.9 PRICING:

- Dependent on configuration

B.1.7.10 CONTACT NAME/ADDRESS:

DalTech International, Inc.
14275 Midway Road, Suite 220
Dallas, Texas 75244
Phone: (214)458-7744
800-878-9873
Fax: (214)490-6156
Primary Contact: George Miller, President

B.1.8 DalTech International, Inc.

B.1.8.1 PRODUCT NAME:

DTI/Call Router

B.1.8.2 PRODUCT DESCRIPTION:

DTI/Call Router dynamically routes calls to the last agent, account receivable, security or wherever your application needs call to be routed. No more entering the information into the switch when your data base can automatically and instantly look up the information and route the call.

B.1.8.3 KEY FEATURES:

- Routes calls dynamically

B.1.8.4 KEY BENEFITS:

- Saves employee time
- Can process more business faster
- Can do more work with fewer employees

B.1.8.5 CALLPATH PRODUCTS USED:

- IBM CallPath/400
- IBM CallPath/CICS
- IBM CallPath Server/2 or CallPath Server/6000
- IBM CallPath SwitchServer/2
- IBM CallPath CallCoordinator

B.1.8.6 SWITCHES SUPPORTED (Where Applicable):

- ROLM, Northern Telecom, AT&T, Aspect

B.1.8.7 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Product literature
- Demonstrations

B.1.8.8 REFERENCES:

- Available on request

B.1.8.9 PRICING:

- Dependent on configuration

B.1.8.10 CONTACT NAME/ADDRESS:

DalTech International, Inc.
14275 Midway Road, Suite 220
Dallas, Texas 75244
Phone: (214)458-7744
800-878-9873
Fax: (214)490-6156
Primary Contact: George Miller, President

B.1.9 DalTech International, Inc.

B.1.9.1 PRODUCT NAME:

DTI/Transfer

B.1.9.2 PRODUCT DESCRIPTION:

DTI/Transfer coordinates the transfer of voice and data. When a call needs to be transferred, the receiving agent does not have to ask the caller for all of the information a second time. The information can, however, be different from the information that the first agent needed. For example, if the call is transferred to accounts receivable, A/R information will appear on the receiving agent's screen. On the other hand, the actual screen can be transferred, if desired. The use of DTI/Transfer allows agents in different cities to work as if they were side by side.

B.1.9.3 KEY FEATURES:

- Builds applications to work with the phone switches

B.1.9.4 KEY BENEFITS:

- Saves employee time
- Saves customer money
- Can process more business faster
- Can record and index conversations
- Can do more work with fewer employees

B.1.9.5 CALLPATH PRODUCTS USED:

- IBM CallPath/400
- IBM CallPath/CICS
- IBM CallPath Server/2 or CallPath Server/6000
- IBM CallPath SwitchServer/2
- IBM CallPath CallCoordinator

B.1.9.6 SWITCHES SUPPORTED (Where Applicable):

- ROLM, Northern Telecom, AT&T, Aspect

B.1.9.7 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Product literature
- Demonstrations

B.1.9.8 REFERENCES:

- Available on request

B.1.9.9 PRICING:

- Dependent on configuration

B.1.9.10 CONTACT NAME/ADDRESS:

DalTech International, Inc.
14275 Midway Road, Suite 220
Dallas, Texas 75244
Phone: (214)458-7744
800-878-9873
Fax: (214)490-6156
Primary Contact: George Miller, President

B.1.10 DalTech International, Inc.

B.1.10.1 PRODUCT NAME:

DTI/Sentry

B.1.10.2 PRODUCT DESCRIPTION:

DTI/Sentry will detect Toll Fraud. Toll Fraud continues to be a big problem. DTI/Sentry can watch a call coming into a switch and tracks the call as it transfers through the system. If the call makes an attempt to dial out without proper authorization, the call is cancelled before it is completed. Even calls coming in on the PBX modem, can be monitored. This is a feature every PBX should have.

B.1.10.3 KEY FEATURES:

- Toll fraud detection

B.1.10.4 KEY BENEFITS:

- Saves customer money

B.1.10.5 CALLPATH PRODUCTS USED:

- IBM CallPath/400
- IBM CallPath/CICS
- IBM CallPath Server/2 or CallPath Server/6000
- IBM CallPath SwitchServer/2
- IBM CallPath CallCoordinator

B.1.10.6 SWITCHES SUPPORTED (Where Applicable):

- ROLM, Northern Telecom, AT&T, Aspect

B.1.10.7 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Product literature
- Demonstrations

B.1.10.8 REFERENCES:

- Available on request

B.1.10.9 PRICING:

- Dependent on configuration

B.1.10.10 CONTACT NAME/ADDRESS:

DalTech International, Inc.
14275 Midway Road, Suite 220
Dallas, Texas 75244
Phone: (214)458-7744
800-878-9873
Fax: (214)490-6156
Primary Contact: George Miller, President

B.1.11 DalTech International, Inc.

B.1.11.1 PRODUCT NAME:

DTI/Patient Reminder

B.1.11.2 PRODUCT DESCRIPTION:

DTI/Patient Reminder is an automatic dialing and logging program for doctors, clinics, and any professional organization that must remind patients of appointments, medicine. DTI/Patient Reminder automatically dials and plays a recorded voice to tell the patient what he or she needs to know. DTI/Patient Reminder can require them to give responses by voice or touch-tone. Will dial back, if the phone is busy or no one answers. DTI/Patient Reminder logs all call and responses. The calling office can record their own set of instruction or needed responses.

B.1.11.3 KEY FEATURES:

- Appointment reminder

B.1.11.4 KEY BENEFITS:

- Saves employee time
- Saves customer money
- Can process more business faster
- Can do more work with fewer employees

B.1.11.5 CALLPATH PRODUCTS USED:

- IBM CallPath/400
- IBM CallPath/CICS
- IBM CallPath Server/2 or CallPath Server/6000
- IBM CallPath SwitchServer/2
- IBM CallPath CallCoordinator

B.1.11.6 SWITCHES SUPPORTED (Where Applicable):

- ROLM, Northern Telecom, AT&T, Aspect

B.1.11.7 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Product literature
- Demonstrations

B.1.11.8 REFERENCES:

- Available on request

B.1.11.9 PRICING:

- Dependent on configuration

B.1.11.10 CONTACT NAME/ADDRESS:

DalTech International, Inc.
14275 Midway Road, Suite 220
Dallas, Texas 75244
Phone: (214)458-7744
800-878-9873

Fax: (214)490-6156

Primary Contact: George Miller, President

B.1.12 DalTech International, Inc.

B.1.12.1 PRODUCT NAME:

DTI/Where's My Order?

B.1.12.2 PRODUCT DESCRIPTION:

DTI/Where's My Order? was established to meet a company's requirement of processing calls. When a caller calls in, within 300 milliseconds, the DTI/Where's My Order? looks to see if an order has been placed within the last seven (7) days or if an order is pending. If there is an order pending, the call is routed to a recorded voice that tells the customer the status of the order and where the order is located. DTI/Where's My Order? can interface with some of the major shipping companies who have tracking systems. In one installation 40% of all calls were handled automatically. DTI/Where's My Order? interfaces with the client's existing software systems.

B.1.12.3 KEY FEATURES:

- Automatically processes shipping inquiries

B.1.12.4 KEY BENEFITS:

- Saves employee time
- Saves customer money
- Can process more business faster
- Can do more work with fewer employees

B.1.12.5 CALLPATH PRODUCTS USED:

- IBM CallPath/400
- IBM CallPath/CICS
- IBM CallPath Server/2 or CallPath Server/6000
- IBM CallPath SwitchServer/2
- IBM CallPath CallCoordinator

B.1.12.6 SWITCHES SUPPORTED (Where Applicable):

- ROLM, Northern Telecom, AT&T, Aspect

B.1.12.7 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Product literature
- Demonstrations

B.1.12.8 REFERENCES:

- Available on request

B.1.12.9 PRICING:

- Dependent on configuration

B.1.12.10 CONTACT NAME/ADDRESS:

DalTech International, Inc.
14275 Midway Road, Suite 220
Dallas, Texas 75244
Phone: (214)458-7744
800-878-9873
Fax: (214)490-6156
Primary Contact: George Miller, President

B.1.13 DalTech International, Inc.

B.1.13.1 PRODUCT NAME:

DTI/Fill in the Blank

B.1.13.2 PRODUCT DESCRIPTION:

DTI/Fill in the Blank was developed for the Consumer Affairs Department of a Fortune 500 company. When a caller calls in, information is retrieved from the incoming call to fill in as much data on the screen as possible. This is a time save and an anti-harrassment feature. The side benefit to this is the agent knows who is calling. This is great for companies that need to determine who is calling.

B.1.13.3 KEY FEATURES:

- Builds applications to work with the phone switches

B.1.13.4 KEY BENEFITS:

- Saves employee time
- Saves customer money
- Can process more business faster
- Can do more work with fewer employees

B.1.13.5 CALLPATH PRODUCTS USED:

- IBM CallPath/400
- IBM CallPath/CICS
- IBM CallPath Server/2 or CallPath Server/6000
- IBM CallPath SwitchServer/2
- IBM CallPath CallCoordinator

B.1.13.6 SWITCHES SUPPORTED (Where Applicable):

- ROLM, Northern Telecom, AT&T, Aspect

B.1.13.7 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Product literature
- Demonstrations

B.1.13.8 REFERENCES:

- Available on request

B.1.13.9 PRICING:

- Dependent on configuration

B.1.13.10 CONTACT NAME/ADDRESS:

DalTech International, Inc.
14275 Midway Road, Suite 220
Dallas, Texas 75244
Phone: (214)458-7744
800-878-9873
Fax: (214)490-6156
Primary Contact: George Miller, President

B.1.14 Digital DataVoice

B.1.14.1 PRODUCT NAME:

LinkServer

B.1.14.2 PRODUCT DESCRIPTION:

LinkServer provides enhanced ACD and IVR functions to CallPath-supported PBX's, ACD's and Central Office switches in an open, client/server environment. LinkServer provides call information and call control as well as voice processing functions to existing mainframe, midrange and LAN systems. LinkServer allows a company to enhance its "legacy" systems with CTI features in a 3270 environment while also moving to workstations.

B.1.14.3 KEY FEATURES:

- Provides "screen pop" to CICS programs running at 3270 type terminals
- Provides features to blended 3270, 5250, Windows, OS/2 and UNIX terminal environments
- Provides skills-based call routing with unlimited skills
- Integrates with most existing IVR systems to speak ACD queue position and expected wait time as well as full IVR functions while in queue
- Prompt caller for information and transfer information to agent

B.1.14.4 KEY BENEFITS:

- Reduces call center personnel and transmission expense by reducing the call setup time for new and transferred calls
- Call centers with blended terminal environments can use LinkServer for all systems
- Time spent in queue can be used more effectively to enhance sales and improve quality of service
- Abandoned calls can be reduced and handled automatically
- Callers can request a callback rather than wait in queue

B.1.14.5 CALLPATH PRODUCTS USED:

- CallPath Server/2
- CallPath Server/6000

B.1.14.6 SWITCHES SUPPORTED (Where Applicable):

Any CallPath supported switch

B.1.14.7 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Literature and demonstration available

B.1.14.8 REFERENCES:

Available on request

B.1.14.9 PRICING:

\$75,000 to \$250,000 depending on configuration

B.1.14.10 CONTACT NAME/ADDRESS:

Wayne Reichert, Dir. CTI Services

Digital DataVoice

3928 Beau D'Rue Drive

Eagan, MN 55122

Phone: (612)452-0300 x118

B.1.15 Evolving Systems, Inc.

B.1.15.1 PRODUCT NAME:

ESI Environment (ESIE)

Voice Data Integration System (VDIS)

B.1.15.2 PRODUCT DESCRIPTION:

ESIE is an application programming interface (API) for the development of robust RS/6000 UNIX transaction based processing systems.

VDIS is an API based on ESIE that includes control of multiple telephony and computer systems.

Using the combination of ESIE and VDIS, Evolving Systems has built customized voice and data integration solutions providing:

- Caller Identification and Intelligent Call Routing
- Screen Synchronization
- Call History
- Call Transfer with Data
- Call Interflow
- Load Balancing
- Preview, Progressive and Predictive Dialing
- Call Progress Detection
- Automatic Dial Back and Scheduling
- Voice Messaging
- Call Conferencing
- Supervisor Call Monitoring
- Scripting
- Call Reporting
- Outbound List and Campaign Management
- FAX Server Integration
- Interactive Voice Response
- Audiotext

B.1.15.3 KEY FEATURES:

- ESIE:
 1. Software fault tolerance
 2. Powerful debug utilities
 3. Report and message distribution
 4. Sophisticated UNIX message handling
 5. API library
- VDIS:
 1. Built using ESIE

2. Call history and event tracking
3. Switch communications
4. API library for custom development of Call Processing Systems

B.1.15.4 KEY BENEFITS:

The key benefits of using the ESIE and VDIS software are:

- Ease of custom software development for Voice and Data applications
- Ease of systems maintenance and support
- Flexibility to operate in multiple data and telephony environments
- Scalability to support large distributed Call Processing environments
- Architected for the Client/Server environment

B.1.15.5 CALLPATH(R) PRODUCTS USED:

CallPath/6000
 DirectTalk/6000
 DirectTalk/2(tm)
 SwitchServer/2
 CallCoordinator/2(tm)

B.1.15.6 SWITCHES SUPPORTED (Where Applicable):

AT&T
 ROLM/Siemens
 Aspect
 Summa 4
 Northern Telecom
 Rockwell

B.1.15.7 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

Evolving Systems has marketing literature and demonstrations of potential Call Center solutions readily available. On-site marketing assistance is available as well by contacting Evolving Systems directly.

B.1.15.8 REFERENCES:

Contact Evolving Systems directly for Reference information. Clients include leaders from industry segments such as:

- Regional telephone providers
- Financial institutions
- Computer hardware and software suppliers
- Communications hardware and software suppliers
- Retail
- Long distance communications providers
- Building materials
- Utilities

B.1.15.9 PRICING:

Contact Evolving Systems

B.1.15.10 CONTACT NAME/ADDRESS:

Mr. Skip Evans

Phone: (303)689-1488; FAX: (303)689-1399

Evolving Systems, Inc.

8000 E. Maplewood Ave.

Englewood, CO 80111

B.1.16 IBM Corporation

B.1.16.1 PRODUCT NAME:

CallPath CallCoordinator/2

CallPath CallCoordinator for Windows

B.1.16.2 PRODUCT DESCRIPTION:

With IBM's CallPath CallCoordinator products, working with either OS/2 or DOS/Windows, PC users can enjoy the many advantages of advanced telephony - with little or no modification of their workstation or host applications. A licensed software product, CallCoordinator provides programs that perform call management functions between the computer and your telephone system. It allows you to implement voice/data solutions quickly - without building a new application system for call management.

By building simple files, you can easily create comprehensive call management solutions that coordinate your existing business applications with your telephone system.

B.1.16.3 KEY FEATURES:

- Intelligent answering
- Coordinated voice/data transfer
- Consultation function
- Programmable QuickKeys
- Host application transaction files
- Outbound dialing function
- Answering function
- Call Center Reporting
- Interface with
 - DirectTalk/2 and DirectTalk/6000
 - S/370, AS/400, ASCII
 - DDE

B.1.16.4 KEY BENEFITS:

- Be more responsive to customers
- Have access to more information before answering questions
- Give faster, more informed answers
- Enter data with fewer errors
- Access multiple host applications concurrently

B.1.16.5 CALLPATH PRODUCTS USED:

- CallPath Server
- CallPath CallCoordinator/2
- CallPath CallCoordinator for Windows

B.1.16.6 SWITCHES SUPPORTED (Where Applicable):

All CallPath supported switches

B.1.16.7 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Product literature
- Application briefs
- Demonstrations

B.1.16.8 REFERENCES:

Available upon request

B.1.16.9 PRICING:

Available upon request

B.1.16.10 CONTACT NAME/ADDRESS:

Please contact your local IBM representative or call 1-800-IBM-4211 extension 149.

B.1.17 IBS Corporation

B.1.17.1 PRODUCT NAME:

CONFerence & Evaluator

B.1.17.2 PRODUCT DESCRIPTION:

Call Center Quality Monitoring, Management and Interactive Coaching

B.1.17.3 KEY FEATURES:

- Representative observation simultaneous to voice monitoring
- Interactive representative coaching simultaneous to voice conferencing
- One-to-one, one-to-many, many-to-many data conference simultaneous to voice conferencing
- Generic features to simplify CallPath transfer function eliminating need to custom code application and security integrity interface

B.1.17.4 KEY BENEFITS:

- Improve Call Center quality
- Automates Call Center rep coaching and training
- Eliminates paper based evaluation system
- Archives Call Center representative quality results and history
- Pin-point weakness in Call Center representative skills
- Maintains data integrity during CallPath transfer modes
- Allows CallPath to operate in non-standard security environments without custom coding

B.1.17.5 CALLPATH PRODUCTS USED:

- CallPath/CICS
- CallPath/400

B.1.17.6 SWITCHES SUPPORTED (Where Applicable):

Any

B.1.17.7 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Call 800-346-2894

B.1.17.8 REFERENCES:

Over 800 customers. References available upon request.

B.1.17.9 PRICING:

Available upon request.

B.1.17.10 CONTACT NAME/ADDRESS:

Mark Pacelli
IBS Corporation
12626 High Bluff Drive
San Diego, CA 92130
Phone: (619)792-0273

B.1.18 LHS Communications Systems, Inc.

B.1.18.1 PRODUCT NAME:

ICC

B.1.18.2 PRODUCT DESCRIPTION:

ICC is a middleware software package which defines an open platform for system integration of EDP-based telephony applications in networked or stand-alone Call Centers.

B.1.18.3 KEY FEATURES:

- PBX independent Call Center solution using CallPath Server/2
- Integrated ACD functions with access to host data via C-APIs.
- Integrated dialer functions with access to host data via C-APIs.
- Integrated Queue management.
- Complete set of statistics with data export capabilities.
- Complete set of online displays.
- Language support for 6 languages: German, English, French, Italian, Spanish, and Dutch with integrated help functions and multilingual support across the Call Center.
- Real-time allocation of agents and overflows to relieve bottlenecks.
- Agent desk application for computer based telephony with an open DDE interface for host data integration.
- Open systems concept to use EDP tools like databases, data warehouses, report generators and workflow management via API interfaces.
- API interfaces for integration of VRUs, wallboards, waitfields, announcements and answering machines.

B.1.18.4 CALLPATH PRODUCTS USED:

CallPath Server/2

B.1.18.5 REFERENCES:

With over 200 installations worldwide it would be difficult to list here. Available upon request.

B.1.18.6 PRICING:

Dependent upon configuration.

B.1.18.7 CONTACT NAME/ADDRESS:

John Bartkus
LHS Communications Systems, Inc.
400 Perimeter Center Terrace
Suite 575
Atlanta, GA. 30346
Phone: (770)671-9777

B.1.19 MicroAutomation, Inc.

B.1.19.1 PRODUCT NAME:

CallCenter/6000

B.1.19.2 PRODUCT DESCRIPTION:

The CallCenter/6000 product integrates PBXs, Voice Response Units (VRUs), databases and agent workstations into a cohesive client/server-based call management system.

CallCenter/6000 is a fully customizable, total call center solution that utilizes IBM's CallPath Services Architecture to provide state-of-the-art inbound and outbound call management functionality without the need for proprietary hardware.

CallCenter/6000 interfaces with various IVR units, providing IVR applications with Automatic Number identification (ANI) and Dialed Number Identification Service (DNIS) information generated by the telephone system. This allows the IVR to intelligently answer a call and to dynamically allocate IVR ports.

CallCenter/6000 provides detailed MIS and error logs to help supervisors and managers track agent productivity and call center operations. The daily MIS log contains information such as agent talk time, agent work time, ANI, and DNIS for each call received.

CallCenter/6000 includes Application Programming Interfaces (APIs) that enable integration with various workstation applications to perform basic telephony functions, such as answering a call or transferring a call. APIs are available for OS/2, Microsoft Windows, AIX and UNIX environments.

CallCenter/6000 includes a SQL Query Server that provides access to standard Relational Database Management Systems (RDBMS) such as Sybase, Oracle, and DB2. SQL databases can be local or remotely attached for greater flexibility.

B.1.19.3 KEY FEATURES:

- Supports intelligent answering using ANI and DNIS
- Supports coordinated voice/data transfer and conferencing
- Preview dialing
- Interfaces with DirectTalk, Periphonics, Conversant, Intervoice and WorkForce VRUs
- Supports agents on intelligent workstations or standard VT terminals
- Provides APIs for OS/2, Windows 3.x, Windows 95, AIX and UNIX
- Interfaces with most standard relational database offerings such as DB2, Sybase and Oracle
- Maintains call center statistics
- Provides report generation and MIS reporting
- Interfaces with call center applications residing locally or on a mainframe
- Fully customizable for customer's environment
- Supports switch-to-switch transfers (when supported by switch)
- Optional Features
 - Predictive Dialer
 - Load Balancing
 - SoftFone

B.1.19.4 KEY BENEFITS:

- Flexible architecture
- Improves customer service
- Increases agent productivity
- Reduces call center manpower requirements
- Employs standard hardware and software architecture
- Reduces call center costs
- Requires no proprietary hardware
- Design structured for flexibility and growth
- Provides high return on investment
- Supports high call volumes capacity

B.1.19.5 CALLPATH PRODUCTS USED:

- CallPath/6000 with SwitchServer/2
- CallPath Server/6000 or CallPath Server/2
- DirectTalk/2

B.1.19.6 SWITCHES SUPPORTED (Where Applicable):

All CallPath enabled switches

B.1.19.7 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Product brochures
- Product demonstrations at our McLean, VA facilities

B.1.19.8 REFERENCES:

Available upon request

B.1.19.9 PRICING:

Available upon request

B.1.19.10 CONTACT NAME/ADDRESS:

Dennis Aanderud
MicroAutomation, Inc.
8201 Greensboro Drive, Suite 611
McLean, VA 22102
Phone: (703) 847-9865
Fax: (703) 847-9870
daanderud@microaut.com

B.1.20 MicroAutomation, Inc.

B.1.20.1 PRODUCT NAME:

MicroDip

B.1.20.2 PRODUCT DESCRIPTION:

MicroDip provides coordinated data communications capability between the AT&T Conversant Interactive Voice Response (IVR) system and IBM's CallCoordinator/2 (CC/2) product.

By synchronizing caller data provided by the switch with the voice call, MicroDip enables the Conversant IVR to use Automatic Number Identification (ANI) and Dialed Number Identification Service (DNIS) information to intelligently answer calls and to dynamically allocate IVR ports. Additionally, MicroDip can be used to coordinate the voice and the data during call transfers from the Conversant IVR and the call center agents utilizing CallCoordinator.

MicroDip is designed to operate in both Ethernet and Token-Ring environments. MicroDip is written in the C language and utilizes Berkeley sockets (or compatible TCP/IP sockets) to communicate with the Conversant IVR. MicroDip takes into account the special architecture of the AT&T Conversant IVR as it relates to interprocess communications and error reporting. As such, trace and error logging functions are integrated into the Conversant IVR trace and error facilities.

MicroDip allows you to bring a new dimension to your Conversant IVR by utilizing the CTI functions of IBM's CallPath family of products to provide advanced IVR features.

B.1.20.3 KEY FEATURES:

- Interfaces directly with AT&T Conversant IVR and IBM's CallCoordinator/2's Host Application Transaction (HAT) facility
- Trace and error logging functions integrated into AT&T Conversant trace and error logging facilities
- Supports either Token Ring or Ethernet LAN configurations
- Supports intelligent answering using ANI and DNIS
- Supports coordinated voice/data transfer and conferencing
- Fully customizable for customer's environment

B.1.20.4 KEY BENEFITS:

- Increased utility of your installed AT&T and IBM systems
- Enables intelligent call answering and routing
- Improved customer service
- Employs standard hardware and software architecture
- Requires no proprietary hardware
- Designed for flexibility and growth
- High return on investment

B.1.20.5 CALLPATH PRODUCTS USED:

- CallPath Server/2
- CallPath Server/6000
- SwitchServer/2
- CallCoordinator/2

B.1.20.6 SWITCHES SUPPORTED (Where Applicable):

All CallPath enabled switches

B.1.20.7 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Product brochures
- Product demonstrations at our McLean, VA facilities

B.1.20.8 REFERENCES:

Available upon request

B.1.20.9 PRICING:

Available upon request

B.1.20.10 CONTACT NAME/ADDRESS:

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daanderud@microaut.com

B.1.21 MicroAutomation, Inc.

B.1.21.1 PRODUCT NAME:

MicroFax/2

B.1.21.2 PRODUCT DESCRIPTION:

MicroFax/2 is a CallPath-enabled product that allows IBM's FaxRouter/2 product to take advantage of the Computer-Telephony Integration (CTI) functions of CallPath. Using MicroFax/2, FaxRouter/2 can automatically route incoming faxes to designated groups or individuals based on Automatic Number Identification (ANI) and Dialed Number Identification Service (DNIS) information.

MicroFax/2 interacts with the FaxRouter/2 server to intercept incoming faxes and reroute them according to predefined routing criteria. As incoming faxes are being processed by the FaxRouter/2 Server, MicroFax/2 consults a routing table to determine the proper group or individual to route the fax. The routing criteria can identify and classify the incoming fax according to the area code, exchange, or telephone number of the caller. Additionally, faxes can be rerouted based on the telephone number the caller dialed to reach the FaxRouter/2 system.

The incoming fax is then delivered by FaxRouter/2 to the workstation of the intended recipient(s). Using the standard FaxRouter/2 functions, users can view, save, delete, print, and forward faxes from their workstation.

MicroFax/2 consists of a FaxRouter/2 User Exit and a CallPath interface application. IBM's FaxRouter/2 Server is required to implement MicroFax/2. Additionally, a system running CallPath Server/2 or CallPath Server/6000 must be operational in order for MicroFax/2 to receive ANI and DNIS information from the telephone switch.

MicroFax/2 allows you to bring a new dimension to your FaxRouter/2 product by utilizing the CTI functions of IBM's CallPath family of products to provide advanced fax routing features.

B.1.21.3 KEY FEATURES:

- Allows IBM's FaxRouter/2 to take advantage of the CTI functions of CallPath
- Automatically routes incoming faxes to the proper group or individual
- Fully customizable for customer's environment

B.1.21.4 KEY BENEFITS:

- Flexible Architecture
- Employs standard hardware and software architecture
- Requires no proprietary hardware
- Designed for flexibility and growth

B.1.21.5 CALLPATH PRODUCTS USED:

- CallPath Server/2
- CallPath Server/6000
- FaxRouter/2

B.1.21.6 SWITCHES SUPPORTED (Where Applicable):

All CallPath enabled switches

B.1.21.7 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Product brochures
- Product demonstrations at our McLean, VA facilities

B.1.21.8 REFERENCES:

Available upon request

B.1.21.9 PRICING:

Available upon request

B.1.21.10 CONTACT NAME/ADDRESS:

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Fax: (703) 847-9870
daanderud@microaut.com

B.1.22 MicroAutomation, Inc.

B.1.22.1 PRODUCT NAME:

MicroFonics

B.1.22.2 PRODUCT DESCRIPTION:

MicroFonics provides coordinated data communications capability between the Periphonics Interactive Voice Response (IVR) system and IBM's CallCoordinator/2 product.

By synchronizing caller data provided by the switch with the voice call, MicroFonics enables the Periphonics IVR to use Automatic Number Identification (ANI) and Dialed Number Identification Service (DNIS) information to intelligently answer calls and to dynamically allocate IVR ports. Additionally, MicroFonics can be used to coordinate the voice and the data during call transfers from the Periphonics IVR and the call center agents utilizing CallCoordinator.

MicroFonics is designed to operate in both Ethernet and Token-Ring environments. It is written in the C language and utilizes Berkeley sockets (or compatible TCP/IP sockets) to communicate with the Periphonics IVR. MicroFonics runs as a daemon process on a Periphonics IVR system and communicates with a CallCoordinator/2 workstation system running on an IBM compatible PC. A Periphonics IVR application communicates with MicroFonics through a set of interface functions. Up to 2,000 bytes of user-defined data and switch-provided information can be passed between an IVR system running MicroFonics and a CallCoordinator client application.

MicroFonics allows you to bring a new dimension to your Periphonics IVR by utilizing the CTI functions of IBM's CallPath family of products to provide advanced IVR features.

B.1.22.3 KEY FEATURES:

- Interfaces directly with Periphonics IVR and IBM's CallCoordinator/2's Host Application
- Transaction (HAT) facility
- Trace and error logging functions integrated into Periphonics trace and error logging facilities
- Supports either Token Ring or Ethernet LAN configurations
- Supports intelligent answering using ANI and DNIS
- Supports coordinated voice/data transfer and conferencing
- Fully customizable for customer's environment

B.1.22.4 KEY BENEFITS:

- Increased utility of your installed Periphonics and IBM systems
- Enables intelligent call answering and routing
- Improved customer service
- Employs standard hardware and software architecture
- Requires no proprietary hardware
- Designed for flexibility and growth
- High return on investment

B.1.22.5 CALLPATH PRODUCTS USED:

- CallPath Server/2
- CallPath Server/6000
- SwitchServer/2
- CallCoordinator/2

B.1.22.6 SWITCHES SUPPORTED (Where Applicable):

All CallPath enabled switches

B.1.22.7 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

Product brochures

B.1.22.8 REFERENCES:

Available upon request

B.1.22.9 PRICING:

Available upon request

B.1.22.10 CONTACT NAME/ADDRESS:

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B.1.23 MicroAutomation, Inc.

B.1.23.1 PRODUCT NAME:

MicroForce/2

B.1.23.2 PRODUCT DESCRIPTION:

MicroForce/2 is a licensed product that provides an interface between the Edify Workforce Interactive Voice Response (IVR) systems and IBM CallPath. MicroForce/2 allows Edify Workforce applications to take advantage of the Computer Telephony Integration (CTI) functions of CallPath. Using MicroForce/2, Edify Workforce applications can provide advanced CTI features such as dynamic port allocation, intelligent answering, and coordinated voice/data transfers.

MicroForce/2 supplements the standard Edify Workforce functions with functions that exploit IBM's CallPath capabilities. As calls are being processed by the Edify Workforce system, MicroForce/2 provides the Workforce application(s) with Automatic Number Identification (ANI) and Dialed Number Identification Service (DNIS) information. ANI information allows the Workforce application to identify the caller and, optionally, tailor the script to the caller. DNIS information allows the Workforce application to dynamically allocate IVR ports according to the needs of the callers.

For Edify systems configured to support software agents, coordinated voice and data transfers can be implemented thereby allowing agents to receive a "screen pop" when calls are transferred from the IVR. Moreover, MicroForce/2 allows a call center using Edify Workforce to take advantage of all the CTI products available from IBM and MicroAutomation.

MicroForce/2 consists of Edify Workforce library functions and a CallPath interface application. Additionally, a system running CallPath Server/2 or CallPath Server/6000 must be installed in order for MicroForce/2 to interface with the telephone switch.

MicroForce/2 allows you to bring a new dimension to your Edify Workforce applications by utilizing the CTI functions of IBM's CallPath family of products to provide advanced computer-telephony features.

B.1.23.3 KEY FEATURES:

- Provides interface between Edify Workforce and IBM CallPath
- Supports either Token Ring or Ethernet LAN configurations
- Supports intelligent answering using ANI and DNIS
- Allows dynamic port allocation
- Supports coordinated voice/data transfer and conferencing
- Coordinated voice and data transfers can be implemented to allow for a "screen pop" when calls are transferred from the IVR
- Fully customizable for customer's environment

B.1.23.4 KEY BENEFITS:

- Flexible Architecture
- Increased agent productivity
- Improved Customer Service
- Employs standard hardware and software architecture
- Designed for flexibility and growth
- High return on investment

B.1.23.5 CALLPATH PRODUCTS USED:

- CallPath Server/2
- CallPath Server/6000

B.1.23.6 SWITCHES SUPPORTED (Where Applicable):

All CallPath enabled switches

B.1.23.7 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Product Application Briefs
- Product demonstrations at our McLean, VA facilities

B.1.23.8 REFERENCES:

Available upon request

B.1.23.9 PRICING:

Available upon request

B.1.23.10 CONTACT NAME/ADDRESS:

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B.1.24 MicroAutomation, Inc.

B.1.24.1 PRODUCT NAME:

MicroMate

B.1.24.2 PRODUCT DESCRIPTION:

MicroMate is an enhancement to the IBM CallCoordinator for Windows product that allows CallCoordinator to interface with various System/370, AS/400 and ASCII Host Emulators. MicroMate expands CallCoordinator's standard support for PC3270 and Rumba emulation to support Attachmate Extra! For Windows and Software Corporation of America's TalkThru for Windows.

MicroMate interacts with the CallCoordinator for Windows HAT facility to provide full Extended High Level Language Application Programming Interface (EHLLAPI) support for CallCoordinator HAT functions. Using MicroMate, CallCoordinator for Windows can be configured to interface with legacy IBM S/370 and S/390 mainframes, IBM AS/400 minicomputers, and UNIX-based systems, such as the IBM RS/6000.

MicroMate consists of a Windows Dynamic Load Library (DLL) which contains functions that support the complete set of CallCoordinator HAT features. Moreover, MicroAutomation can tailor MicroMate to support your unique host emulator upon request.

MicroMate allows you to tailor CallCoordinator for Windows for your needs in order to utilize the full CTI functionality of IBM's CallPath family of products.

B.1.24.3 KEY FEATURES:

- Allows interfaces between IBM's CallCoordinator for Windows and various System/370, AS/400 and ASCII Host Emulators
- Supports either Token Ring or Ethernet LAN configurations
- Provides full Extended High Level Language Application Programming Interface (EHLLAPI) support for CallCoordinator HAT functions
- Allows CallCoordinator for Windows to be configured to interface with legacy IBM System/370 and System/390 mainframes, IBM AS/400 minicomputers and UNIX-based systems
- Fully customizable for customer's environment

B.1.24.4 KEY BENEFITS:

- Increased utility of CallCoordinator for Windows
- Can be tailored to support your unique host emulator upon request
- Employs standard hardware and software architecture
- Requires no proprietary hardware
- Designed for flexibility and growth
- High return on investment

B.1.24.5 CALLPATH PRODUCTS USED:

- CallPath Server/6000
- CallPath CallCoordinator for Windows

B.1.24.6 SWITCHES SUPPORTED (Where Applicable):

All CallPath enabled switches

B.1.24.7 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Product Application Briefs

B.1.24.8 REFERENCES:

Available upon request

B.1.24.9 PRICING:

Available upon request

B.1.24.10 CONTACT NAME/ADDRESS:

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B.1.25 MicroAutomation, Inc.

B.1.25.1 PRODUCT NAME:

MicroRoute/2

B.1.25.2 PRODUCT DESCRIPTION:

MicroRoute/2 is an OS/2 based product that utilizes the functions and features of the IBM CallPath Services Architecture to provide host-based routing for call centers. Host-based routing is a Computer-Telephony Integration (CTI) feature that allows an incoming call to be routed to an ACD queue or direct extension based on caller identification information retrieved from a host computer.

MicroRoute/2 utilizes Automatic Number Identification (ANI) information and/or Dialed Number Identification Service (DNIS) information to analyze and route incoming calls according to pre-defined criteria. Customer profile information can be maintained on a local PC, LAN Server or mainframe computer.

When the switch notifies MicroRoute/2 of an incoming call, MicroRoute/2 accesses the caller's record from the host database and routes the call to an ACD or direct extension based on information retrieved from the host database. Currently, MicroRoute/2 interfaces with AT&T G3, Northern Telecom Meridian 1 and ROLM 9751 9006.2 PBXs that provide an adjunct switch routing capability.

B.1.25.3 KEY FEATURES:

- Interfaces directly with CallPath Server
- Supports either Token Ring or Ethernet LAN configurations
- Utilizes ANI and DNIS information to analyze and route incoming calls to direct extensions
- Fully customizable for customer's environment

B.1.25.4 KEY BENEFITS:

- Flexible Architecture
- Increased agent productivity
- Improved Customer Service
- Employs standard hardware and software architecture
- Requires no proprietary hardware
- Designed for flexibility and growth
- High return on investment

B.1.25.5 CALLPATH PRODUCTS USED:

- CallPath Server/2
- CallPath Server/6000

B.1.25.6 SWITCHES SUPPORTED (Where Applicable):

All CallPath enabled switches (refer to product description)

B.1.25.7 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Product Application briefs
- Product demonstrations at our McLean, VA facilities

B.1.25.8 REFERENCES:

Available upon request

B.1.25.9 PRICING:

Available upon request

B.1.25.10 CONTACT NAME/ADDRESS:

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8201 Greensboro Drive, Suite 611
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Phone: (703) 847-9865
Fax: (703) 847-9870
daanderud@microaut.com

B.1.26 MicroAutomation, Inc.

B.1.26.1 PRODUCT NAME:

MicroServer

B.1.26.2 PRODUCT DESCRIPTION:

MicroServer provides coordinated data communications capability between the IBM DirectTalk/6000 Voice Response Unit (VRU) and IBM's CallCoordinator/2 (CC/2) product. By synchronizing caller data provided by the switch with the voice call, MicroServer enables the DirectTalk/6000 VRU to use Automatic Number Identification (ANI) and Dialed Number Identification Service (DNIS) information to intelligently answer calls and to dynamically allocate VRU ports. Additionally, MicroServer can be used to coordinate the voice and the data during call transfers from the DirectTalk/6000 VRU and call center agents utilizing CallCoordinator.

MicroServer is designed to operate in both Ethernet and Token-Ring environments. MicroServer is written in the C language and utilizes Berkeley sockets (or compatible TCP/IP sockets) to communicate with the DirectTalk/6000 VRU. MicroServer takes into account the special architecture of the IBM DirectTalk/6000 VRU as it relates to interprocess communications and error reporting. As such, trace and error logging functions are integrated into the DirectTalk/6000 VRU trace and error facilities.

MicroServer allows you to bring a new dimension to your DirectTalk/6000 VRU by utilizing the CTI functions of IBM's CallPath family of products to provide advanced VRU features.

B.1.26.3 KEY FEATURES:

- Provide interface between the IBM's DirectTalk/6000 IVR and IBM's CallCoordinator/2's Host Application Transaction (HAT) facility
- Trace and error logging functions integrated into DirectTalk/6000 trace and error logging facilities
- Supports either Token Ring or Ethernet LAN configurations
- Provides intelligent answering using ANI and DNIS
- Supports coordinated voice/data transfer and conferencing
- Fully customizable for customer's environment

B.1.26.4 KEY BENEFITS:

- Increased utility of your installed switch and IBM systems
- Enables the VRU to intelligently answer calls and dynamically allocate VRU ports
- Improves customer service
- Employs standard hardware and software architecture
- Requires no proprietary hardware
- Designed for flexibility and growth
- Provides high return on investment

B.1.26.5 CALLPATH PRODUCTS USED:

- CallPath Server/2
- CallPath Server/6000
- CallCoordinator/2
- DirectTalk/6000

B.1.26.6 SWITCHES SUPPORTED (Where Applicable):

All CallPath enabled switches

B.1.26.7 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Product brochures
- Product demonstrations at our McLean, VA facilities

B.1.26.8 REFERENCES:

Available upon request

B.1.26.9 PRICING:

Available upon request

B.1.26.10 CONTACT NAME/ADDRESS:

Dennis Aanderud
MicroAutomation, Inc.
8201 Greensboro Drive, Suite 611
McLean, VA 22102
Phone: (703) 847-9865
Fax: (703) 847-9870
daanderud@microaut.com

B.1.27 Nabnasset Corporation

B.1.27.1 PRODUCT NAME:

Voice Enhanced Services Platform (VESP)

B.1.27.2 PRODUCT DESCRIPTION

Voice Enhanced Services Platform (VESP) is the advanced call center management product developed by Nabnasset Corporation. VESP software integrates computers and telephones and voice and data. It manages workflow across multiple platforms including ACDs, PBXs, IVRs and desktop and host computers. As a call moves from the PBX/ACD to a voice response unit or to an agent, VESP gathers and stores information from any participating client application. While the call is occurring, VESP is automatically developing a voice/data call history from the instant the call arrives. In a typical VESP enabled call center, VESP performs multiple functions on each incoming call.

B.1.27.3 KEY FEATURES:

VESP software components interact to execute complex call management functions. These functions include:

- Platform integration
- Voice and Data Integration
- Agent Desktop integration
- Call Routing
- Management Set up, Tracking and Reporting.

B.1.27.4 KEY BENEFITS:

VESP is based on three design fundamentals:

- A COBRA (Common Object Request Broker)- based client/server module for flexible application development.
- Standards compliance for hardware independence.
- A network-based location for centralized or decentralized call center processing

B.1.27.5 CALLPATH PRODUCTS USED:

CallPath Server/6000

B.1.27.6 SWITCHES SUPPORTED

All CallPath supported switches

B.1.27.7 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations)

- Product brochures
- Demonstrations

B.1.27.8 REFERENCES:

Available upon request

B.1.27.9 PRICING:

Dependent upon configuration

B.1.27.10 CONTACT NAME AND ADDRESS:

Carol Wennerstrand
15 Craig Rd.
Acton, MA 01720
Phone (508) 787-2800
Fax (508) 787-2834

B.1.28 Quality Consulting Services, Corporation

B.1.28.1 PRODUCT NAME:

QCall

B.1.28.2 PRODUCT DESCRIPTION:

QCall is a complete call center solution, integrating CallPath/6000 technology with flexible client/server architecture to produce a simple-to-use, intelligent call routing and control mechanism tailored to your particular business environment. QCall enables your diverse computing platforms and telephony components to work together, ensuring maximum efficiency and customer service.

B.1.28.3 KEY FEATURES:

- Network Call Routing reroutes overflow calls in real time. QCall computes the average wait time for each call in an ACD and, when system overload conditions prevail, reroutes calls automatically to another switch, operator, or interactive information center.
- Interswitch Transfer/Call Conferencing coordinates voice and data transfer anywhere, anytime, even between switches: from a voice response unit (VRU) to an operator, from one operator to another, or from an operator to a VRU. When a caller providing data to a VRU requests transfer to an agent, the caller and the data arrive at the right place at the same time.
- Distributed Operations remove the requirement to colocate your service staffs with QCall. A QCall server on one coast easily relays information to operators on another, exchanging data at the same time with various distributed platform-independent clients.
- Open Interface Design accommodates all of your information requirements, including the requirements unique to your operating environment, incorporating custom call handling applications regardless of the language/platform combination on which they were built.
- MIS Reporting accumulates real-time statistics for each inbound or outbound call, even if a call is transferred, collecting data such as time in queue and time on hold, who handles the call, and other call-related information for extraction to a database.
- Real-time Architecture includes failure recovery mechanisms as well as processing monitors that detect and avoid system failure. QCall is a true real-time system, delivering 24 x 7 operation.
- Preview Outbound Dialing confirms information and makes the correct call with a single operator keystroke.
- Multiple Logon and Off guarantees operator access. Single operators can initiate multiple QCall sessions, preventing unexpected workstation downtime from locking operators out. Access is reestablished by simply logging on to another machine.

B.1.28.4 KEY BENEFITS

QCall represents a breakthrough in call center operation. Your business takes advantage of an intelligent, flexible call center solution that increases call center uptime and expands the number of telephony applications available. QCall reduces the time it takes to complete caller transactions while protecting customers from having to provide the same information multiple times. With multiple logon and conferencing, agents handle greater volumes of calls more efficiently, while QCall's network call routing keeps caller wait times to an absolute minimum.

B.1.28.5 CALLPATH PRODUCTS USED:

- CallPath Server/6000
- DirectTalk/6000
- SwitchServer/2

B.1.28.6 CONTACT NAME/ADDRESS:

Tom Leonard
Quality Consulting Services, Corporation
3350 Scott Blvd. Suite 6402
Santa Clara, CA 95054
Phone: (408) 562-0880
Fax: (408) 562-0889

B.1.29 The Info Group

B.1.29.1 PRODUCT NAME:

OutLook

B.1.29.2 PRODUCT DESCRIPTION:

OutLook is an executive information system for CallPath-based call centers. It provides both visual display and reporting capabilities using the robust data collected via CallPath through CTI. A very significant feature is the inclusion of call activity, VRU and line of business data such as call value. OutLook is OS/2-based and uses a relational database.

B.1.29.3 KEY FEATURES:

- Integrates data from OutLook, Business Applications, ACD and VRU's
- Real-Time Visual Displays
- Comprehensive Reporting
- Multi-User Access
- Graphical User Interface

B.1.29.4 KEY BENEFITS:

- Empowers call center management based on more complete data
- Various personnel in the organization can customize the information to suit their individual needs
- It ensures quality service through in process inspection of call activity
- It also combines line of business with traditional call center data

B.1.29.5 CALLPATH PRODUCTS USED:

- IBM CallPath CICS/MVS or CICS/VSE
- IBM CallPath/400
- IBM CallPath/2
- IBM CallPath/DOS for Windows
- IBM CallPath/6000

B.1.29.6 SWITCHES SUPPORTED (Where Applicable):

All CallPath supported switches

B.1.29.7 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Product literature and demonstrations

B.1.29.8 REFERENCES:

Available

B.1.29.9 PRICING:

\$15,000 to \$75,000 U.S.

B.1.29.10 CONTACT NAME/ADDRESS:

Rich Alexander
THE INFO GROUP
46 Park Street
Framingham, MA 01701
Phone: (508)872-8383

B.1.30 The Info Group

B.1.30.1 PRODUCT NAME:

CP*Bridge

B.1.30.2 PRODUCT DESCRIPTION:

In a joint development program with IBM, THE INFO GROUP has developed a link between CallPath running under CICS and applications operating under IMS. CP*Bridge provides a seamless integration between these environments. Customers with IMS applications can take full advantage of all CallPath Services Architecture capabilities.

B.1.30.3 KEY FEATURES:

- Multiple System Connections
- Multiple IMS Regions
- Inbound/Outbound Applications
- Intelligent Answer
- Coordinated Voice/Data Transfer
- Voice Response Unit Support

B.1.30.4 KEY BENEFITS:

Enables IMS applications to take advantage of CallPath and Computer Telephone Integration

B.1.30.5 CALLPATH PRODUCTS USED:

- IBM CallPath CICS/MVS or CICS/VSE

B.1.30.6 SWITCHES SUPPORTED (Where Applicable):

All CallPath supported switches

B.1.30.7 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Product literature and demonstrations

B.1.30.8 REFERENCES:

Available

B.1.30.9 PRICING:

Available on request

B.1.30.10 CONTACT NAME/ADDRESS:

Rich Alexander
THE INFO GROUP
46 Park Street
Framingham, MA 01701
Phone: (508)872-8383

B.1.31 TKM Communications Inc.

B.1.31.1 PRODUCT NAME:

TKMcall

B.1.31.2 PRODUCT DESCRIPTION:

TKMcall is a set of CallPath/400 enabled modules that reside on an AS/400 and allow an organization to integrate their existing AS/400 applications and their telephony environment with minimal or no changes to their applications.

B.1.31.3 KEY FEATURES:

- Automated caller identification and call redirection
- Coordinated call and screen transfer to the most appropriate agent
- Automated preview and predictive dialing integrated into the applications
- Graphical client-server call detail capture into Windows or OS/2
- On-line simultaneous access to terminal and telephone statistics
- Central LAN or HOST file control of multiple remote Meridian/1's
- Turnkey Collections, Fundraising and Telemarketing Applications with integrated telephony functions

B.1.31.4 KEY BENEFITS:

- Customer's investment in current applications protected
- New telephony functions integrated directly into Client-server and Midrange applications
- Reduced call durations and 1-800 costs
- Improved agent inbound and outbound calls throughput
- Increased control of complex and diverse call center environments

B.1.31.5 CALLPATH PRODUCTS USED:

- CallPath/400

B.1.31.6 SWITCHES SUPPORTED (Where Applicable):

- NT DMS-100, NT Meridian/1, AT&T Definity

B.1.31.7 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Literature as required

B.1.31.8 REFERENCES:

- Scotiabank, Ault Foods, Diversey Chemical, Allied Credit

B.1.31.9 CONTACT NAME/ADDRESS:

Fred Gallagher, President
TKM Communications Inc.
60 Columbia Way, Suite 300
Markham, Ontario L3R 0C9
Phone: (905)470-5252
Fax: (905)470-7008

B.1.32 TKM Communications Inc.

B.1.32.1 PRODUCT NAME:

TKMcdr

B.1.32.2 PRODUCT DESCRIPTION:

TKMcdr is the next generation of Call Centre Management tools. Through on-line connections to the Meridian/1's ACD, CDR and Meridian Link ports as well as to the Host Application, TKMcdr captures and displays call statistics that were previously impossible to monitor in a real-time environment. Statistics are captured for every inbound or outbound call to the Call Center and are displayed dynamically on a Graphical Workstation.

B.1.32.3 KEY FEATURES:

- Displays statistics by agent available time, talk time, on-hold time and terminal time
- Host statistics include orders processed, accumulated order value, collections worked, etc.
- Compares current agent statistics to department targets or averages
- Captures call queue time for each call and displays it to the answering agent
- Will dynamically pace each agent to achieve personal and department goals
- Captures Abandoned Call detail by customer and alerts the supervisor who abandoned
- Will automatically return an abandoned call on behalf of the next available agent
- Open Client-Server architecture

B.1.32.4 KEY BENEFITS:

- Improve agent productivity: graphically see the relationship between an agent's telephone time, their costs and their revenue generation to determine the most effective way to increase their productivity
- Advertising effectiveness: instantly see and track the increased calls that result from new 1-800 campaigns. Run multiple campaigns and graphically see which one is the most effective.
- Customer server: never lose another call due to unforeseen inbound call peaks
- Improve upSelling: see at a glance how the agents are doing with an UpSelling campaign. Dynamically judge how much time can be spent on UpSelling at any instant.

B.1.32.5 CALLPATH PRODUCTS USED:

- CallPath/400

B.1.32.6 SWITCHES SUPPORTED (Where Applicable):

- NT Meridian/1, AT&T (in process)

B.1.32.7 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Literature as required

B.1.32.8 REFERENCES:

- Ault Foods, Allied Credit

B.1.32.9 CONTACT NAME/ADDRESS:

Fred Gallagher, President
TKM Communications Inc.
60 Columbia Way, Suite 300
Markham, Ontario L3R 0C9
Phone: (905)470-5252
Fax: (905)470-7008

B.1.33 TKM Communications Inc.

B.1.33.1 PRODUCT NAME:

TKMredirect

B.1.33.2 PRODUCT DESCRIPTION:

TKMredirect will automatically redirect inbound calls based on the caller's number or the number they called. Calls can be redirected to either a predefined set of numbers in database or to a pool of remote agents that have called in and signed-on to a Telecomputing server. TKMredirect will be attractive to organizations such as fast food outlets which publish a single number yet need to connect callers to the closest outlet within a city to process and deliver the order.

B.1.33.3 KEY FEATURES:

- Recognizes called and calling numbers for local, long distance and 1-800 calls
- Will search a local PC database, CD-ROM or an attached host database for matches
- Calls are redirected prior to "ring-back", therefore callers only hear a single ring
- Callers never know that their call was redirected to an alternate site or agent
- Calls can be redirected based on any combination of calling or called number
- Calls can be redirected as they initially arrive or as they overflow from an ACD queue
- On-line simultaneous access to terminal and telephone statistics
- Centralized control of multiple remote call centers
- Supports both PBX and Centrex environments

B.1.33.4 KEY BENEFITS:

- Provides the ability to outsource an entire centralized Call Center into distributed agents
- Reduced fis payroll costs because peak call loads can be diverted to off-premise agents
- Allows a distributed retail or financial services organization to publish a single "vanity" telephone number without investing in a Call Center infrastructure
- Implement a Telecomputing environment "over-night" transparently to your customers
- Improved Customer Service levels without expanding the Call Center

B.1.33.5 CALLPATH PRODUCTS USED:

- CallPath/400, CallPath Server/2

B.1.33.6 SWITCHES SUPPORTED (Where Applicable):

- NT DMS-100, NT Meridian/2, AT&T

B.1.33.7 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Literature as required

B.1.33.8 REFERENCES:

- Scotiabank, 241 Pizza

B.1.33.9 CONTACT NAME/ADDRESS:

Fred Gallagher, President
TKM Communications Inc.
60 Columbia Way, Suite 300
Markham, Ontario L3R 0C9
Phone: (905)470-5252
Fax: (905)470-7008

B.2 Inbound/Outbound Dialing

B.2.1 DalTech International, Inc.

B.2.1.1 PRODUCT NAME:

DTI/Outbound Dialer

B.2.1.2 PRODUCT DESCRIPTION:

DTI/Outbound Dialer is used to pass the dialed number from the computer to the telephone switch. The number can be retrieved from the display screen or from a file of telephone lists and passed directly to the switch. This provides for a faster, more accurate dial. The versatility of this product can detect busy and no answer. The efficiency of this software is a time saver.

B.2.1.3 KEY FEATURES:

- Allows for a more timely, accurate outbound dial

B.2.1.4 KEY BENEFITS:

- Saves employee time
- Saves customer money
- Can record and index conversations
- Can do more work with fewer employees

B.2.1.5 CALLPATH PRODUCTS USED:

- IBM CallPath/400
- IBM CallPath/CICS
- IBM CallPath Server/2 or CallPath Server/6000
- IBM CallPath SwitchServer/2
- IBM CallPath CallCoordinator

B.2.1.6 SWITCHES SUPPORTED (Where Applicable):

- ROLM, Northern Telecom, AT&T, Aspect

B.2.1.7 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Product literature
- Demonstrations

B.2.1.8 REFERENCES:

- Available on request

B.2.1.9 PRICING:

- Dependent on configuration

B.2.1.10 CONTACT NAME/ADDRESS:

DalTech International, Inc.
14275 Midway Road, Suite 220
Dallas, Texas 75244
Phone: (214)458-7744
800-878-9873
Fax: (214)490-6156
Primary Contact: George Miller, President

B.2.2 Digital Systems International, Inc.

B.2.2.1 PRODUCT NAME:

Mosaix Solutions - Predictive Call Blending

B.2.2.2 PRODUCT DESCRIPTION:

Mosaix V, Predictive Call Blending is a productivity tool that integrates with IBM's CallPath CTI solution and allows call center managers to drive toward higher quality levels and productivity at the same time, while preserving the high quality levels experienced with dedicated inbound agents. This product preserves and enhances investments made in existing ACD technology.

By reading the ACD CTI information through CallPath, the Mosaix V Predictive Call Blending algorithm predicts the number of inbound agents required to meet predetermined user-set goals for agent service levels (such as answer 90% of all calls within 15 seconds). When "blend" agents are not needed to achieve this goal or service level they are automatically transitioned to other activities such as outbound calling.

B.2.2.3 KEY FEATURES:

- Dynamic adjustments of the number of agents in an inbound ACD split to meet an inbound service level, predetermined by user
- The algorithm used relies on real time statistics and data captured via the CTI interface from the ACD
- Predictive blend agents are moved to service calls

B.2.2.4 KEY BENEFITS:

Four key benefits are realized by using predictive blend:

- Assurance of meeting inbound service levels
- Preservation of ACD reporting and feature set (ACD reports on agent activities since agents are connected to the ACD rather than Mosaix)
- Increased outbound activity
- Higher outbound quality (lower abandonment rate)

B.2.2.5 CALLPATH PRODUCTS USED:

- CallPath Server/2

B.2.2.6 SWITCHES SUPPORTED (Where Applicable):

- Meridian 1
- Rolm 9751

B.2.2.7 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Product brochures
- Specification sheets
- Product video

B.2.2.8 REFERENCES:

Will be making first customer deliveries in the first half of 1995

B.2.2.9 PRICING:

Variable, depending on customer needs and overall Mosaix solution purchased.

B.2.2.10 CONTACT NAME/ADDRESS:

Stephen King
Product Manager
Digital Systems International
6464-185th Avenue N.E.
Redmond, WA 98052-6736
Phone: (206)867-3416

B.2.3 Easyphone S.A.

B.2.3.1 PRODUCT NAME:

Easyphone

B.2.3.2 PRODUCT DESCRIPTION:

Easyphone software is a powerful cost effective solution for both inbound and outbound telemarketing applications with full call blending capabilities. Easyphone is made up of several modules that work together to provide a highly advanced call center management system. Due to its ease of operation, agents can spend more time talking and less time training.

B.2.3.3 KEY FEATURES:

- Powerful scripting tool.
- Preview, power and predictive dialing modes.
- Real-time statistics monitoring for supervisors.
- Many databases supported.

B.2.3.4 KEY BENEFITS:

- Process up to three times as many calls without increasing human resources
- Increase agent talktime by 57 minutes in the hour, (outbound)
- Easy to use scripting tool reduces agents' training time.
- Allows supervisors to pinpoint campaign weaknesses immediately.
- Agents can be assigned to several campaigns at once, handling both incoming and outgoing calls simultaneously.

B.2.3.5 CALLPATH PRODUCTS USED:

- CallPath Server/6000
- CallPath Server/2
- DirectTalk/2

B.2.3.6 SWITCHES SUPPORTED (Where Applicable):

All CallPath supported switches + Alcatel 4300

B.2.3.7 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Literature
- Demonstrations

B.2.3.8 REFERENCES:

Available

B.2.3.9 PRICING:

Available on request. User based pricing with fixed cost for server.

B.2.3.10 CONTACT NAME/ADDRESS:

Joao Paulo (J.P.) Almeida
Easyphone S.A.
Av. Combatentes 43, 8
1600 Lisboa
Portugal
Phone: +351 1 720 5050
Fax: +351 1 720 5090

B.2.3.11 US DISTRIBUTOR:

Michael Baker
KIVA Group
19 Kilton Rd.
Bedford, NH03110
Phone (603)668-6966

B.2.4 Melita International

B.2.4.1 PRODUCT NAME:

PhoneFrame

B.2.4.2 PRODUCT DESCRIPTION

As a leader and worldwide provider of Call Center business solutions, Melita International offers telecommunication products for telemarketing, collections and customer service in virtually all vertical markets. In addition to predictive dialing Melita features Dynamic Inbound/Outbound call handling. This option manages both inbound and outbound calls automatically for each agent.

Melita's new PhoneFrame CS is the latest in a series of inbound/outbound call processing systems, and features Melita's Universal Server platform on an IBM RISC System/6000.

B.2.4.3 KEY FEATURES:

- Constant monitoring of factors within a campaign such as hit rate, length of call and call handlers history.
- Regulates appropriate screens, dialing speeds and call connections
- Distinguishes "live" connects from tone intercepts, answering systems and no answers.
- Delivers voice and screen displays simultaneously for each inbound or outbound call.
- Dynamically accepting, processing and routing inbound and outbound calls to the same call handler increases productivity.

B.2.4.4 KEY BENEFITS:

- Only live calls are connected to call handlers
- Delivers 200 to 500% more live contacts per hour than a manual system
- Increases productivity of call handlers
- The unique capability to process and manage both inbound and outbound calls, provides one system for all of your telephone customer contact campaigns.

B.2.4.5 CALLPATH PRODUCTS USED:

CallPath Server/6000

B.2.4.6 SWITCHES SUPPORTED

All CallPath supported switches

B.2.4.7 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations)

- Product brochures
- Demonstrations

B.2.4.8 REFERENCES:

Available upon request

B.2.4.9 PRICING:

Dependent upon configuration

B.2.4.10 CONTACT NAME AND ADDRESS:

John Tibbles
5051 Peachtree Corners Circle
Norcross, GA 30092
(770) 409-4604

B.2.5 TKM Communications Inc.

B.2.5.1 PRODUCT NAME:

TKMdialer

B.2.5.2 PRODUCT DESCRIPTION:

TKMdialer will automatically select and place outbound calls using call queues delivered by an integrated database, CD-ROM or attached Host. TKMdialer automatically connects a successful outbound call to an agent, therefore eliminating time spent on dialing, call setup and requeuing busy, ring no answer or operator intercept calls.

B.2.5.3 KEY FEATURES:

- Supports preview, power and predictive dialing campaigns
- Integrated Accounts Receivable, Collections, Fundraising and Order Entry interfaces
- Easy to tailor for campaigns supporting individual agents or pools of agents
- Supports blended inbound and outbound campaigns
- Open Client-Server architecture
- Supports hands-free dialing
- On-line simultaneous access to terminal and telephone statistics
- Centralized control of multiple remote call centers
- Supports both PBX and Centrex environments

B.2.5.4 KEY BENEFITS:

- Improve Collections and Fund Raising contributions by 100%
- Increase average orders per day for TeleSales personnel from 50 to 100%
- Move to paper-free outbound call campaigns

B.2.5.5 CALLPATH PRODUCTS USED:

- CallPath/400
- CallPath Server/2

B.2.5.6 SWITCHES SUPPORTED (Where Applicable):

- NT DMS-100, NT Meridian/1, AT&T

B.2.5.7 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Literature as required

B.2.5.8 REFERENCES:

- Ault Foods, Allied Credit, Diversey Chemical

B.2.5.9 CONTACT NAME/ADDRESS:

Fred Gallagher, President
TKM Communications Inc.
60 Columbia Way, Suite 300
Markham, Ontario L3R 0C9
Phone: (905)470-5252
Fax: (905)470-7008

B.3 Contact Management

B.3.1 Appintec Corp.

B.3.1.1 PRODUCT NAME:

ActionWare400 - CallProWare module

B.3.1.2 PRODUCT DESCRIPTION:

ActionWare400 is a Contact and Activity Management system suitable for database direct marketing, sales, client management, account management, general office management.

B.3.1.3 KEY FEATURES:

CallProWare provides an integrated link to CallPath/400 for automated telephony applications. Selected IBM CallPath/400 compatible switches are supported.

B.3.1.4 KEY BENEFITS:

- Faster/more accurate call processing
- All Activity data recorded on the Contact Record enabling companies to "Think with One Mind, Speak with One Voice"

B.3.1.5 CALLPATH PRODUCTS USED:

- CallPath/400

B.3.1.6 SWITCHES SUPPORTED (Where Applicable):

All CallPath compatible switches

B.3.1.7 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Product literature

B.3.1.8 REFERENCES:

- Siemens-ROLM
- Porsche Cars of North America
- Marcom

B.3.1.9 PRICING:

Pricing for ActionWare400 begins at \$12,500 and the add-on module CallProWare is \$6,250 for 5-User packs.

B.3.1.10 CONTACT NAME/ADDRESS:

Eva Gregory
Appintec Corp.
5801 Christie Ave., Suite 500
Emeryville, CA 94608
Phone: (510)450-1550
Fax: (510)450-1561

B.3.2 Brock Control Systems, Inc.

B.3.2.1 PRODUCT NAME:

- TakeControl Sales
- TakeControl Field Sales
- TakeControl Call Center/Telemarketing
- TakeControl Customers Support/Help Desk
- TakeControl Consumer Affairs

B.3.2.2 PRODUCT DESCRIPTION:

The Brock TeleControl series software automates your complete sales cycle, seamlessly closing the loop from lead generation and account management to after-sale customer support. And by combining the power of the TakeControl Sales, Marketing, Customer Care applications with Brock's centralized relational database, you can make all three easier and more efficient than ever - resulting in measurable benefits throughout your company.

The TakeControl series solutions are easy-to-run systems with complete menus, screens and report formats - and can also interface with a wide range of applications and relational databases across a variety of platforms. Standard productivity tools include reporting and communications as well as the ability to change the appearance of screens and menus, design custom reports, re-define function keys and create additional new user interfaces.

This totally integrated approach offers unique flexibility, enterprise-wide information management plus the option to automate incrementally, one department or function at a time. And with more than 950 customers and 25,000 users world-wide, Brock has the experience to provide you with the right information management solution to control either your enterprise-wide application or department-specific information needs.

B.3.2.3 KEY FEATURES:

- Open Systems Architecture
- Database Independence
- Enhanced Windows functionality

B.3.2.4 KEY BENEFITS:

- Product seniority
- Advanced technical support and documentation
- Installation and customization assistance
- Business and technical consulting

B.3.2.5 CALLPATH PRODUCTS USED:

- CallPath/6000

B.3.2.6 SWITCHES SUPPORTED (Where Applicable):

- ROLM 9751
- NT Meridian SL/1
- AT&T G3
- Siemens

B.3.2.7 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Product literature, demonstrations, electronic slide shows
- Call Brock for more information

B.3.2.8 REFERENCES:

Call Brock

B.3.2.9 PRICING:

Call Brock

B.3.2.10 CONTACT NAME/ADDRESS:

Jim Cavedo
2859 Paces Ferry Road, Suite 1000
Atlanta, GA 30339
Phone: (404)431-1290
Fax: (404)431-1201

B.3.3 Early, Cloud and Company

B.3.3.1 PRODUCT NAME:

CallFlow

B.3.3.2 PRODUCT DESCRIPTION:

CallFlow is a CICS based distributed software solution for Call Center automation available on CICS/MVS and CICS/6000. As an enterprise level client/server application, CallFlow provides inbound and outbound capabilities for customer contact applications, such as customer service, telemarketing, account management and collections. CallFlow is designed for high volume call processing. CallFlow also has a client extension component designed to provide a graphical environment for its administration and development. CallFlow is also integratable with various graphical client applications which need to be call center enabled through the CallFlow Agent interface.

B.3.3.3 KEY FEATURES:

CallFlow provides call center automation capabilities including application generation, electronic workflow, computer telephony integration, fulfillment, call result reporting, enterprise information integration and center management.

B.3.3.4 KEY BENEFITS:

Provide unique functionality for access to corporate data systems. CallFlow is based on a middleware architecture that simplifies the creation of interfaces to legacy systems. Key benefits include: providing faster answers to customers, the ability to handle more calls, improved efficiency and improvements in customer satisfaction.

B.3.3.5 CALLPATH PRODUCTS USED:

- CallPath CICS
- CallPath Server
- TADS integration
- DirectTalk (optional)

B.3.3.6 SWITCHES SUPPORTED (Where Applicable):

Any CallPath supported switch, Aspect, Rockwell.

B.3.3.7 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Product literature is available by contacting (401)849-0500 or 1-800-322-3042

B.3.3.8 REFERENCES:

Available upon request

B.3.3.9 CONTACT NAME/ADDRESS:

Early, Cloud and Company
Aquidneck Corporate Park
Newport, RI 02842
Gary Krueger - Vice President Sales and Marketing
Marc Desrosiers - Marketing Director
Ellice Uffer - Public Relations
Julie Fitzpatrick - Product Manager
Literature - 1-800-322-3042

B.3.4 Early, Cloud and Company

B.3.4.1 PRODUCT NAME:

Teleservicing Control System (TCS)

B.3.4.2 PRODUCT DESCRIPTION:

TCS is an integrated call center application running on the MVS and AS/400 platforms. Designed to automate inbound and outbound telephone business, TCS is a toolkit used to generate applications for sales, customer services, collections and account management functions. TCS is designed for high call volume processing.

B.3.4.3 KEY FEATURES:

- Speed dialing
- Predictive dialing
- IVR interface
- ANI/DNIS for intelligent answering
- Electronic workflow
- Application generation
- Center Management

B.3.4.4 KEY BENEFITS:

- Improves productivity and reduces costs by streamlining operations and facilitating the sharing of data
- Ease of use
- Applicable for: banking, insurance and large call centers

B.3.4.5 CALLPATH PRODUCTS USED:

- CallPath/400
- CallPath SwitchServer/2
- CallPath CICS
- TADS integration
- DirectTalk (optional)

B.3.4.6 SWITCHES SUPPORTED (Where Applicable):

Any CallPath supported switch, Aspect and Rockwell.

B.3.4.7 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Product literature is available by contacting (401)849-0500 or (800)322-3042.

B.3.4.8 REFERENCES:

Refer to vendor

B.3.4.9 CONTACT NAME/ADDRESS:

Early, Cloud and Company
Aquidneck Corporate Park
Newport, RI 02842
Gary Krueger - Vice President Sales and Marketing
Marc Desrosiers - Marketing Director
Ellice Uffer - Public Relations
Julie Fitzpatrick - Product Manager
Literature - 1-800-322-3042

B.3.5 Information Management Associates, Inc. (IMA)

B.3.5.1 PRODUCT NAME:

EDGE TeleBusiness Software System

B.3.5.2 PRODUCT DESCRIPTION:

EDGE is a UNIX-based configurable call center application environment designed to help clients manage their sales, marketing, telemarketing, telesales, order processing and customer service.

B.3.5.3 KEY FEATURES:

- Account Management
- Database Marketing
- Customer Service
- Work Flow Management
- Automatic Callback Scheduling
- Forms Generation/Literature Fulfillment

B.3.5.4 KEY BENEFITS:

- Comprehensive RS/6000 based call center application solution. Tailorable to a customer's unique environment.
- Links to Oracle, Informix, Sybase
- 3270 Gateway
- Integrated fax capability
- IMA consulting and services

B.3.5.5 CALLPATH PRODUCTS USED:

- CallPath Server/6000
- CallPath Server/2

B.3.5.6 SWITCHES SUPPORTED (Where Applicable):

- Edge works with the stated CallPath Server products, thus Edge can support all CallPath Server supported switches.

B.3.5.7 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- EDGE Brochure
- EDGE Customer "Profiles" (references)
- Demonstrations

B.3.5.8 REFERENCES:

Available upon request

B.3.5.9 PRICING:

Available upon request

B.3.5.10 CONTACT NAME/ADDRESS:

Mary Fiorello
Information Management Associates, Inc.
One Corporate Drive, Suite 414
Shelton, CT 06484
Phone: 800-776-0462

B.3.6 Information Management Associates, Inc. (IMA)

B.3.6.1 PRODUCT NAME:

TELEMAR
TELEMAR/PC

B.3.6.2 PRODUCT DESCRIPTION:

TELEMAR is a comprehensive AS/400 solution consisting of 12 fully integrated modules and customer service functions of a client. TELEMAR/PC is a windows/laptop sales force automation application that is fully integrated with TELEMAR.

B.3.6.3 KEY FEATURES:

- Account Management - reporting and analysis module
- Campaign Management - reporting and analysis module
- Opportunity Management
- Telecall - integrates TELEMAR with CallPath/400
- TELEMAR/PC - provides seamless integration between the field sales reps and corporate marketing functions

B.3.6.4 KEY BENEFITS:

- Integrated enterprise-wide solution for both headquarters, marketing and field sales automation
- Architected interfaces to CallPath/400, predictive dialers and fax

B.3.6.5 CALLPATH PRODUCTS USED:

- CallPath/400

B.3.6.6 SWITCHES SUPPORTED (Where Applicable):

- AT&T Definity G3
- Teleos
- Northern Telecom Meridian
- ROLM 9751 Rel 5 & 6

B.3.6.7 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- TELEMAR Brochures
- TELEMAR Customer "Profiles" (references)
- Consulting brochures
- Demonstrations

B.3.6.8 REFERENCES:

Available upon request

B.3.6.9 PRICING:

Available upon request.

B.3.6.10 CONTACT NAME/ADDRESS:

Britt Bast

Information Management Associates, Inc.

One Corporate Drive, Suite 414

Shelton, CT 06484

Phone: 800-776-0462

B.3.7 Marketing Information Systems, Inc.

B.3.7.1 PRODUCT NAME:

MSM - Marketing and Sales Management System

B.3.7.2 PRODUCT DESCRIPTION:

MSM is a relationship marketing application that resides on top of your central sales and marketing database. MSM serves as the central nervous system for your sales and marketing organization, coordinating and recording all customer and prospect activities. It is an enterprise-wide solution which includes modules for telemarketing, telesales, customer service, campaign management, lead management and field sales force automation. The primary system runs the AS/400 with the field sales force program, MSM/Remote, running in Windows on PCs or laptops. The newest member in the MSM software family, MSM/Windows, is a client/server module that extends all the functions and features of MSM/400 to the familiar, widely used Microsoft Windows operating system.

B.3.7.3 KEY FEATURES:

The call center management module within MSM is designed for complex sales environments and can support multiple campaigns simultaneously. The smart scripting module not only directs call flow, but also updates main database elements. This module can be used for both inbound and outbound call management, and can service the most sophisticated marketing research requirements. MSM maintains call history which can be used to manage the ongoing relationship with contacts.

B.3.7.4 KEY BENEFITS:

The MSM system, while sophisticated, is highly flexible and does not require any programming involvement. For example, scripts can be changed while they are being used, and campaign cues can be managed dynamically within the call center. In addition, the flexible integration capabilities of the system allow it to interface to other back-end data servers such as mainframes or UNIX systems for retrieving data at the point of call or updating other databases with orders or other requests.

B.3.7.5 CALLPATH PRODUCTS USED:

- CallPath/400

B.3.7.6 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Contact Marketing Information Systems in Evanston for literature and product demonstrations

B.3.7.7 REFERENCES:

Available upon request

B.3.7.8 PRICING:

Varies depending on number of units and modules utilized.

B.3.7.9 CONTACT NAME/ADDRESS:

Jolynn Kennedy
Marketing Information Systems
1840 Oak Avenue, Suite 400
Evanston, Illinois 60201
Phone: (847)491-3885
Fax: (847)491-0682

B.4 Consulting/Integration Services

B.4.1 Call Center Enterprises, Inc.

B.4.1.1 PRODUCT NAME:

Call Center Consulting and Systems Integration

B.4.1.2 PRODUCT DESCRIPTION

Plan, design and implement customer contact strategies using best of class technologies, and operations methods and procedures.

B.4.1.3 KEY FEATURES:

Unparalleled hands-on industry experience with the leading PBX-integrated and standalone switches, and with the leading CTI solutions. Complete design-through-cutover services across voice and data technologies.

B.4.1.4 KEY BENEFITS:

- Rapid design and deployment
- Total end-to-end solutions
- Platform independence = optimal solution
- Design for "future proof" evolution

B.4.1.5 CALLPATH PRODUCTS USED:

- CallPath CICS
- CallPath/6000
- CallPath Server

B.4.1.6 SWITCHES SUPPORTED (Where Applicable):

- AT&T G3/ASAI
- Northern Telecom Meridian 1/Meridian Link
- ROLM 9751/CallBridge
- Aspect Application Bridge
- Rockwell/Transaction Link (Both Galaxy and Spectrum)

B.4.1.7 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Brochures
- Application briefs

B.4.1.8 REFERENCES:

Available upon request

B.4.1.9 PRICING:

\$1,000 to \$1,500 U.S. per day Time and Materials billing rate

B.4.1.10 CONTACT NAME/ADDRESS:

Bruce A. Calhoon
1140 Kildaire Farm Road, Suite 200
Cary, NC 27511
Phone: (919)469-0982
Fax: (919)469-0439

B.4.2 DalTech International, Inc.

B.4.2.1 PRODUCT NAME:

DTI/Services

B.4.2.2 PRODUCT DESCRIPTION:

Integrates the user's current application to any custom Voice or CTI solution. Can use the first caller products, but prefer to use the fully functional third party product CallPath from IBM. Applications can be created to any user's specifications. Can fully integrate with the IVR's to establish state of the art processing which puts the customer distinctly ahead of their competition. These can include Intelligent Answering, Coordinated Voice and Data Transfer, Consultation, Host-Based Routing, Abandoned Call Information, Computer Assisted Dialing, Intelligent Dialing, Predictive Dialing, Call Detail Recording, Customer Reporting, Custom Design, Initiate Outbound Calls, Redirect Inbound Calls, Manage Calls and Transfer Calls. Complete processing using ANI, CLIFF, DNIS, and DID.

B.4.2.3 KEY FEATURES:

Builds applications to work with the phone switches.

B.4.2.4 KEY BENEFITS:

- Saves employee time
- Saves customer money
- Can process more business faster
- Can index calls or faxes automatically
- Can record and index conversations
- Can do more work with fewer employees

B.4.2.5 CALLPATH PRODUCTS USED:

- IBM CallPath/400
- IBM CallPath/CICS
- IBM CallPath Server/2 or CallPath Server/6000
- IBM CallPath SwitchServer/2
- IBM CallPath CallCoordinator

B.4.2.6 SWITCHES SUPPORTED (Where Applicable):

- ROLM, Northern Telecom, AT&T, Aspect

B.4.2.7 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Product literature
- Demonstrations

B.4.2.8 REFERENCES:

- Available on request

B.4.2.9 PRICING:

- Dependent on configuration

B.4.2.10 CONTACT NAME/ADDRESS:

DalTech International, Inc.
14275 Midway Road, Suite 220
Dallas, Texas 75244
Phone: (214)458-7744
800-878-9873
Fax: (214)490-6156
Primary Contact: George Miller, President

B.4.3 Dynatech Integrated Systems

B.4.3.1 PRODUCT NAME:

Solution Provider

B.4.3.2 PRODUCT DESCRIPTION:

Solution provider.

B.4.3.3 KEY FEATURES:

Integration of PBX systems, interactive voice data and user applications.

B.4.3.4 KEY BENEFITS:

Turnkey solution provider

B.4.3.5 CALLPATH PRODUCTS USED:

CallPath, CallCoordinator, DirectTalk

B.4.3.6 SUPPORT AVAILABLE (Product Literature, Demonstrations):

Dynatech is a system integrator providing solutions that integrate PBX and interactive voice data into PC or workstation applications. This includes coordinating the phone and workstation an end users desk responding to a clients request. Dynatech capabilities span, requirements, definition, design, software development, implementation, testing and training to deliver a turnkey solution.

A Dynatech capability brochures is available upon request.

B.4.3.7 PRICING:

Defined on a per project basis.

B.4.3.8 CONTACT NAME/ADDRESS:

John Faircloth
9790 Paxtuxent Woods Dr.
Suite C
Columbia, MD 21046
Phone: (410)995-6422

B.4.4 IBM Canada Call Centre Solutions (CCS)

B.4.4.1 PRODUCT NAME: Call Centre Solution Services

B.4.4.2 PRODUCT DESCRIPTION:

IBM Canada Call Centre Solutions provide a full range of services to give you the support your organization needs to optimize voice and data integration in your call centre. These services include:

- Integrated Call Centres Implementations
- TeleBusiness Consulting
- Application Development
- Project Management
- Training and Education
- Installation Services
- Turn-key Solutions offering advanced CTI functions such as:
 - Intelligent Call Transferring
 - Host Directed Skills-Based Routing
 - Intelligent Load Balancing
 - Real-time Monitoring and Administration

B.4.4.3 KEY FEATURES:

- Leverage alternative delivery channels through your call centre
- Deliver incoming call information to agent workstations
- Personalize call interactions
- Reduced customer waiting time and improve customer service
- Synchronize transfer of customer data with voice calls
- Measure agent performance
- Optimize corporate investment in data and voice technology

B.4.4.4 KEY BENEFITS:

- Over 120 experienced CTI/IVR professionals
- Understanding of CTI from both development and implementation perspectives
- Committed to understanding business requirements before making recommendations
- Deliver solutions that address all of your needs - from strategy and planning, to design and implementation
- Successful CTI and IVR project management experience

B.4.4.5 CALLPATH PRODUCTS USED:

- CallPath Server/2
- CallPath Server/6000
- SwitchServer/2
- DirectTalk/2
- DirectTalk/6000

B.4.4.6 SWITCHES SUPPORTED (Where Applicable):

All CallPath supported switches

B.4.4.7 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

Brochures, Product Literature, Demonstrations upon request

B.4.4.8 REFERENCES:

Available upon request

B.4.4.9 PRICING:

Available upon request

B.4.4.10 CONTACT NAME/ADDRESS:

Rob Woods
IBM Canada Call Centre Solutions
3600 Steeles Ave. East
Markham, Ontario L3R 9Z7
Phone: (905)316-1597
Fax: (905)316-2165

B.4.5 The Info Group

B.4.5.1 PRODUCT NAME:

CallPath System Integration Services

B.4.5.2 PRODUCT DESCRIPTION:

THE INFO GROUP offers turnkey solution services for CallPath implementation. THE INFO GROUP will provide pre-installation project management, installation and training services, and management reports using the OutLook system, business application integration assistance, hot-line and on-site customer support.

B.4.5.3 KEY FEATURES:

- Project planning and cost analysis
- System design
- Integration and programming services
- Education and training
- On-going technical support

B.4.5.4 KEY BENEFITS:

- Effective analysis of application implementation time frames and costs
- Reduce application startup time
- Immediate access to a high level of MIS and telecommunication expertise for the project period
- An effective method of staff education

B.4.5.5 CALLPATH PRODUCTS USED:

- IBM CallPath CICS/MVS or CICS/VSE
- IBM CallPath/400
- IBM CallPath/2
- IBM CallPath/DOS for Windows
- IBM CallPath/6000

B.4.5.6 SWITCHES SUPPORTED (Where Applicable):

All CallPath supported switches

B.4.5.7 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Product literature and demonstrations

B.4.5.8 REFERENCES:

Available

B.4.5.9 PRICING:

As specified by proposal

B.4.5.10 CONTACT NAME/ADDRESS:

Rich Alexander
THE INFO GROUP
46 Park Street
Framingham, MA 01701
Phone: (508)872-8383

B.4.6 UNIVOC Services, Inc.

B.4.6.1 PRODUCT NAME:

CallPath and TADS Call Center Integration Services

B.4.6.2 PRODUCT DESCRIPTION

Univoc is a company specialized in Computer Telephony integration. We offer various Call Center turnkey client-server solutions based on the RS/6000. Univoc provides project planning, architecture, design, pilot and implementation consulting services.

B.4.6.3 KEY FEATURES:

- Project planning and analysis
- Solution architecture and design
- Implementation
- Post-implementation support

B.4.6.4 KEY BENEFITS:

- Immediate access to skilled CTI personnel
- Quick and cost effective implementation
- On-going technical support and training

B.4.6.5 CALLPATH PRODUCTS USED:

- CallPath/600
- IBM's TADS/6000 Call Management software
- DirectTalk/6000, DirectTalk Mail and DirectTalk/2

B.4.6.6 SWITCHES SUPPORTED (Where Applicable):

Those supported by IBM.

B.4.6.7 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

Product literature available upon request

B.4.6.8 REFERENCES:

Available upon request

B.4.6.9 PRICING:

Dependent on configuration.

B.4.6.10 CONTACT NAME/ADDRESS:

Jean-Guy Charon
430 McGill St. Suite 401
Montreal, Quebec H2Y 2G1
Phone: (514)878-3338 X2020
Fax: (514)878-9270

Appendix C. Interactive Voice Response Solutions

C.1 Business Applications

C.1.1 Business Communications Integrator, Inc. (BCI, Inc.)

C.1.1.1 PRODUCT NAME:

TeleSTART

C.1.1.2 PRODUCT DESCRIPTION:

A telephone absence reporting system (tone button or voice recognition) that records employee input and notifies supervisors by voice message and paging (if available). TeleSTART can be customized to automatically update existing time and attendance systems.

C.1.1.3 KEY FEATURES:

- Time Stamped Messages
- Immediate Management Notification
- Open PC Platform
- Automated Reports
- Automatic Phone Answering
- Host Computer Interface

C.1.1.4 KEY BENEFITS:

- Accurate Records
- Accountability
- More Time to React
- Reduces Workload
- Reduced Operations Cost
- Leverages Current Investment

C.1.1.5 CALLPATH PRODUCTS USED:

- DirectTalk/2

C.1.1.6 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Conference calls
- Demonstrations
- Flyers
- Proposal Assistance

C.1.1.7 REFERENCES:

Available upon request

C.1.1.8 PRICING:

Range from \$4,000 to \$8,000 U.S. depending on degree of customization. (Price does not include hardware or DirectTalk/2 license)

C.1.1.9 CONTACT NAME/ADDRESS:

Mr. G.E. "Jerry" Huber

Phone: (317)464-3460, T/L 554-3460

FAX: (317)873-9184

IBMMAIL: USS24HG4 at IBMMAIL

COMPUSERVE: 74323,1406

PROFS: X\$2GEHUR at CHGVMIC1

C.1.2 Business Communications Integrator, Inc. (BCI, Inc.)

C.1.2.1 PRODUCT NAME:

DOCStat

C.1.2.2 PRODUCT DESCRIPTION:

A telephone based registry system that allows health care professionals to register their arrival or departure from a campus by means of any tone button telephone. It also provides automatic notification of important medical test results or other urgent messages whenever the subscriber calls the system. Any authorized user can call to the system to learn the status of a subscriber. Interface to existing systems is optional.

C.1.2.3 KEY FEATURES:

- Access From Any Phone
- Automated Emergency Notification
- Optional Host Interface
- Automated Record Keeping
- Message Forwarding
- Flexible Customization

C.1.2.4 KEY BENEFITS:

- Accurate Records
- Interfaces to Existing Systems
- Low Cost
- Immediate Access to Information
- Enhances Professional Communications
- Easy to Use

C.1.2.5 CALLPATH PRODUCTS USED:

- DirectTalk/2

C.1.2.6 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Conference calls
- Demonstrations
- Flyers
- Proposal Assistance

C.1.2.7 REFERENCES:

Available upon request

C.1.2.8 PRICING:

Range from \$4,000 to \$8,000 U.S. depending on degree of customization. (Price does not include hardware or DirectTalk/2 license, but are available from BCI)

C.1.2.9 CONTACT NAME/ADDRESS:

Mr. G.E. "Jerry" Huber

Phone: (317)464-3460, T/L 554-3460

FAX: (317)873-9184

IBMMAIL: USS24HG4 at IBMMAIL

COMPUSERVE: 74323,1406

PROFS: X\$2GEHUR at CHGVMIC1

C.1.3 Business Communications Integrator, Inc. (BCI, Inc.)

C.1.3.1 PRODUCT NAME:

CareLink

C.1.3.2 PRODUCT DESCRIPTION:

A telephone based system that automates outbound calling to monitor elderly, incapacitated, or medically ill persons at home. The system presents a series of pertinent questions about the individuals well being and solicits health sign information. The called party can request transfer to an operator or health care professional, if necessary. If responses are outside of previously established parameters, the call is immediately transferred to an appropriate person or emergency personnel are notified. Record keeping provides a means for tracking and documenting the called persons responses and requirements over a long period of time. Subscribers to this service have many options for personalized greetings to the called party and message exchange through a subscriber mailbox.

C.1.3.3 KEY FEATURES:

- Scheduled Outbound Calls
- Individualized Parameters
- Automated Record Keeping
- Emergency Notification
- Access to New Market
- Message Exchange

C.1.3.4 KEY BENEFITS:

- Consistent Contact
- Subscriber Personalization
- Non-disruptive System Growth
- Subscriber Peace of Mind
- Reliable Reporting to Subscriber
- Related Services Opportunity

C.1.3.5 CALLPATH PRODUCTS USED:

- DirectTalk/2

C.1.3.6 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Conference calls
- Demonstrations
- Flyers
- Proposal Assistance

C.1.3.7 REFERENCES:

Available upon request

C.1.3.8 PRICING:

Price depends on degree of customization (contact Jerry Huber to discuss requirements)

C.1.3.9 CONTACT NAME/ADDRESS:

Mr. G.E. "Jerry" Huber

Phone: (317)464-3460, T/L 554-3460

FAX: (317)873-9184

IBMMAIL: USS24HG4 at IBMMAIL

COMPUSERVE: 74323,1406

PROFS: X\$2GEHUR at CHGVMIC1

C.1.4 DalTech International, Inc.

C.1.4.1 PRODUCT NAME:

DTI/How Much?

C.1.4.2 PRODUCT DESCRIPTION:

DTI/How Much? is a calculation where a caller can get and estimate by use of Caller ID or the ANI (Caller telephone number). An example is when a Home Owner or Potential Home Owner makes a call to determine how much of a home loan can the caller qualify. This product is versatile.

C.1.4.3 KEY FEATURES:

- Allows for a more timely answer to the caller's request

C.1.4.4 KEY BENEFITS:

- Saves employee time
- Saves customer money
- Allows customer to get answer to a confidential question
- Can do more work with fewer employees

C.1.4.5 CALLPATH PRODUCTS USED:

- IBM DirectTalk/2
- IBM DirectTalk/6000

C.1.4.6 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Product literature
- Demonstrations

C.1.4.7 REFERENCES:

- Available on request

C.1.4.8 PRICING:

- Dependent on configuration

C.1.4.9 CONTACT NAME/ADDRESS:

DalTech International, Inc.
14275 Midway Road, Suite 220
Dallas, Texas 75244
Phone: (214)458-7744
800-878-9873
Fax: (214)490-6156
Primary Contact: George Miller, President

C.1.5 DalTech International, Inc.

C.1.5.1 PRODUCT NAME:

DTI/Financial I

C.1.5.2 PRODUCT DESCRIPTION:

DTI/Financial I returns balances for checking account and loans. Can be used at banks, savings and loans, credit unions, insurance companies and other financial oriented businesses. The system interfaces with most host computers. The balance can be retrieved in a confidential manner and is highly secured.

C.1.5.3 KEY FEATURES:

- Allows for a more timely answer to the caller's request

C.1.5.4 KEY BENEFITS:

- Saves employee time
- Saves customer money
- Allows customer to get answer to a confidential question
- Can do more work with fewer employees

C.1.5.5 CALLPATH PRODUCTS USED:

- IBM DirectTalk/2
- IBM DirectTalk/6000

C.1.5.6 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Product literature
- Demonstrations

C.1.5.7 REFERENCES:

- Available on request

C.1.5.8 PRICING:

- Dependent on configuration

C.1.5.9 CONTACT NAME/ADDRESS:

DalTech International, Inc.
14275 Midway Road, Suite 220
Dallas, Texas 75244
Phone: (214)458-7744
800-878-9873
Fax: (214)490-6156
Primary Contact: George Miller, President

C.1.6 DalTech International, Inc.

C.1.6.1 PRODUCT NAME:

DTI/Register

C.1.6.2 PRODUCT DESCRIPTION:

DTI/Register is designed to allow the calling party to register for an occasion, electronically. The occasion could be a seminar, an appointment, school meeting or any other type of gathering. The caller can request directions to the event, be informed of special air fare, available hotels and other pertinent data.

C.1.6.3 KEY BENEFITS:

- Saves employee time
- Saves customer money
- Allows customer to get pertinent information electronically
- Can do more work with fewer employees

C.1.6.4 CALLPATH PRODUCTS USED:

- IBM DirectTalk/2
- IBM DirectTalk/6000

C.1.6.5 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Product literature
- Demonstrations

C.1.6.6 REFERENCES:

- Available on request

C.1.6.7 PRICING:

- Dependent on configuration

C.1.6.8 CONTACT NAME/ADDRESS:

DalTech International, Inc.
14275 Midway Road, Suite 220
Dallas, Texas 75244
Phone: (214)458-7744
800-878-9873
Fax: (214)490-6156
Primary Contact: George Miller, President

C.1.7 DalTech International, Inc.

C.1.7.1 PRODUCT NAME:

DTI/MedAlert

C.1.7.2 PRODUCT DESCRIPTION:

DTI/MedAlert will remind a patient of a scheduled appointment, allow the patient to confirm the intent to meet the appointment or, optionally, change the appointment to a more convenient time. This can be an outbound call from the appointment office or an inbound call from the patient to confirm or to change an appointment

C.1.7.3 KEY BENEFITS:

- Saves employee time
- Saves customer money
- Allows customer to get pertinent information electronically
- Can do more work with fewer employees

C.1.7.4 CALLPATH PRODUCTS USED:

- IBM DirectTalk/2
- IBM DirectTalk/6000

C.1.7.5 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Product literature
- Demonstrations

C.1.7.6 REFERENCES:

- Available on request

C.1.7.7 PRICING:

- Dependent on configuration

C.1.7.8 CONTACT NAME/ADDRESS:

DalTech International, Inc.
14275 Midway Road, Suite 220
Dallas, Texas 75244
Phone: (214)458-7744
800-878-9873
Fax: (214)490-6156
Primary Contact: George Miller, President

C.1.8 DalTech International, Inc.

C.1.8.1 PRODUCT NAME:

DTI/What Do I Owe?

C.1.8.2 PRODUCT DESCRIPTION:

DTI/What Do I Owe? can be used by any organization that anticipated the receipt of funds. This versatile product can serve account payable, tax collection, water billing, electrical billing and many, many more functions.

C.1.8.3 KEY BENEFITS:

- Saves employee time
- Saves customer money
- Allows customer to get pertinent information, in confidence, electronically
- Can do more work with fewer employees

C.1.8.4 CALLPATH PRODUCTS USED:

- IBM DirectTalk/2
- IBM DirectTalk/6000

C.1.8.5 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Product literature
- Demonstrations

C.1.8.6 REFERENCES:

- Available on request

C.1.8.7 PRICING:

- Dependent on configuration

C.1.8.8 CONTACT NAME/ADDRESS:

DalTech International, Inc.
14275 Midway Road, Suite 220
Dallas, Texas 75244
Phone: (214)458-7744
800-878-9873
Fax: (214)490-6156
Primary Contact: George Miller, President

C.1.9 DalTech International, Inc.

C.1.9.1 PRODUCT NAME:

DTI/Take My Order

C.1.9.2 PRODUCT DESCRIPTION:

DTI/Take My Order can interface to almost any host system and can take order information over the telephone. This can be handled through the use of touch tone telephones or, optionally, voice recognition.

C.1.9.3 KEY BENEFITS:

- Saves employee time
- Saves customer money
- Allows customer to place an order electronically
- Can do more work with fewer employees

C.1.9.4 CALLPATH PRODUCTS USED:

- IBM DirectTalk/2
- IBM DirectTalk/6000

C.1.9.5 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Product literature
- Demonstrations

C.1.9.6 REFERENCES:

- Available on request

C.1.9.7 PRICING:

- Dependent on configuration

C.1.9.8 CONTACT NAME/ADDRESS:

DalTech International, Inc.
14275 Midway Road, Suite 220
Dallas, Texas 75244
Phone: (214)458-7744
800-878-9873
Fax: (214)490-6156
Primary Contact: George Miller, President

C.1.10 DalTech International, Inc.

C.1.10.1 PRODUCT NAME:

DTI/HELLLP!

C.1.10.2 PRODUCT DESCRIPTION:

DTI/HELLLP! will automate the typical Help Desk function by answering general, less complex, frequently asked questions. DTI/HELLLP! running on DirectTalk/2 or DirectTalk/6000 will interface with almost any host processor and will provide high customer satisfaction.

C.1.10.3 CALLPATH PRODUCTS USED:

- IBM DirectTalk/2
- IBM DirectTalk/6000

C.1.10.4 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Product literature
- Demonstrations

C.1.10.5 REFERENCES:

- Available on request

C.1.10.6 PRICING:

- Dependent on configuration

C.1.10.7 CONTACT NAME/ADDRESS:

DalTech International, Inc.
14275 Midway Road, Suite 220
Dallas, Texas 75244
Phone: (214)458-7744
800-878-9873
Fax: (214)490-6156
Primary Contact: George Miller, President

C.1.11 Ficke & Associates, Inc.

C.1.11.1 PRODUCT NAME:

Rims and AnswersIV

C.1.11.2 PRODUCT DESCRIPTION:

Rims is a Response information Management System.

AnswersIV is an innovative set of Voice Response Applications specifically designed for government agencies at all levels.

C.1.11.3 KEY FEATURES:

- Touch-Tone interactive voice response
- Voice recognition (Continuous and discrete)
- Text-To-Speech or Speech Synthesis
- TDD for the hearing impaired
- Multiple language support
- T1 or analog support
- Facsimile integration
- outbound dialing
- Predictive dialing
- Professional speech recording and loading
- Computer-telephony integration
- Call-Data synchronized delivery
- On line credit card verification
- Support for multiple host connections
- Turnkey voice response scripts
- Built-in security validation
- Historical records maintained
- Statistical reporting packages
- script customization

C.1.11.4 KEY BENEFITS

- Improved customer operator transfer
- 24 hour a day-7 days a week access
- Reduced personnel involvement
- Information distribution
- Immediate access to information
- Elimination of manual data entry
- Rapid turnaround of payments
- Access to agency/corporate procedures & policies via phone
- Improved work flow
- Immediate update of databases
- Immediate integration with existing host databases

C.1.11.5 CALLPATH PRODUCTS USED:

- IBM DirectTalk/6000

C.1.11.6 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Yes

C.1.11.7 CONTACT NAME/ADDRESS:

Dean Blachowski, Senior Sales Consultant
4733 Cornell Rd.
Cincinnati, OH 44241
Phone: (513)474-7728

C.1.12 Innovative Data Solutions

C.1.12.1 PRODUCT NAME:

Hotel Casino Guest Message, Wakeup Service

C.1.12.2 PRODUCT DESCRIPTION:

DirectTalk/2 based product which features guest messaging, and wakeup services. This product does not use DT/2 messaging feature. DB/2 is used for all mailbox and messaging management functions. SMDI supported for Centrex and PBX's supported by Voice Technology Group's VoiceBridge II product. SMDI enables busy, no-answer greetings, MWI (message waiting lights) as well as application routing. Management reports for wakeup and mailbox usage.

Link to Property Management System allows the front desk to Check-In, Check-Out, Re-Check-in, Move Room. All messages are either suspended, removed, or moved within DT/2 to support front desk requests.

C.1.12.3 KEY FEATURES:

- SMDI support
- DB/2 for mailbox and message management
- Property Management Link for front desk transactions

C.1.12.4 CALLPATH PRODUCTS USED:

DirectTalk/2

C.1.12.5 SWITCHES SUPPORTED (Where Applicable):

All major switches supported. Centrex and VTG's Voice Bridge for SMDI.

C.1.12.6 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

p.Product literature and demonstrations available through Innovative Data Solutions

C.1.12.7 PRICING:

\$15 to \$20K U.S. plus system software and hardware

C.1.12.8 CONTACT NAME/ADDRESS:

- Bob Cassidy, Innovative Data Solutions
- 163 Route 130 North
- Building I, Suite D
- Bordentown, NJ 08505

C.1.13 Innovative Data Solutions, Inc.

C.1.13.1 PRODUCT NAME:

Admin PhoneMail

C.1.13.2 PRODUCT DESCRIPTION:

DirectTalk/2 based product which is a full featured PhoneMail system. This product does not use DT/2 messaging feature. DB/2 is used for all mailbox and messaging management functions. SMDI supported for Centrex and PBX's supported by VTG's VoiceBridge II product. SMDI enables busy, noanswer greetings, MWI (message waiting lights) as well as application routing. Management reports for mailbox usage. In addition to normal phonemail functions, this product supports mailbox lookup by name, distribution lists, name announcements, message introductions, check receipt of message as well as paging.

C.1.13.3 KEY FEATURES:

- Expanded PhoneMail functions
- SMDI support
- DB/2 for mailbox and message management
- Product expandability using DB/2

C.1.13.4 CALLPATH PRODUCTS USED:

DirectTalk/2

C.1.13.5 SWITCHES SUPPORTED (Where Applicable):

All major switches supported. Centrex and VTG's VoiceBridge for SMDI.

C.1.13.6 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

Product literature and demonstrations available through Innovative Data Solutions.

C.1.13.7 PRICING:

\$9 - \$20K plus system software and hardware.

C.1.13.8 CONTACT NAME/ADDRESS:

- Bob Cassidy, Innovative Data Solutions
- 163 Route 130 North
- Building I, Suite D
- Bordentown, NJ 08505

C.1.14 Innovative Data Solutions, Inc.

C.1.14.1 PRODUCT NAME:

Child Support Hotline

C.1.14.2 PRODUCT DESCRIPTION:

DirectTalk/6000 based product which supports caller inquiry for child support payment and tax information. This product uses a local database for 24/7 service. Database extracts are loaded into the database each day. This product is English and Spanish. The hotline runs on a single 72 port system and receives approximately 18,000 callers per day. A link to the ROLM PhoneMail allows the caller to be connected directly to their case worker.

C.1.14.3 KEY FEATURES:

- Local database support
- English and Spanish

C.1.14.4 CALLPATH PRODUCTS USED:

DirectTalk/2

C.1.14.5 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

Product literature and demonstrations available through Innovative Data Solutions

C.1.14.6 PRICING:

Upon request

C.1.14.7 CONTACT NAME/ADDRESS:

- Bob Cassidy, Innovative Data Solutions
- 163 Route 130 North
- Building I, Suite D
- Bordentown, NJ 08505

C.1.15 Innovative Data Solutions, Inc.

C.1.15.1 PRODUCT NAME:

Banking - Credit Card Account Inquiry

C.1.15.2 PRODUCT DESCRIPTION:

DirectTalk/6000 based product which supports caller inquiry for credit card account activity. This product interfaces to an IBM CICS host using 3270 emulation. Credit card processing is through FDR services.

C.1.15.3 KEY FEATURES:

- FDR system support

C.1.15.4 CALLPATH PRODUCTS USED:

DirectTalk/6000

C.1.15.5 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

Product literature and demonstrations available through Innovative Data Solutions

C.1.15.6 PRICING:

Upon request

C.1.15.7 CONTACT NAME/ADDRESS:

- Bob Cassidy, Innovative Data Solutions
- 163 Route 130 North
- Building I, Suite D
- Bordentown, NJ 08505

C.1.16 Interlogic Systems Inc.

C.1.16.1 PRODUCT NAME:

Share-A-Ride

C.1.16.2 PRODUCT DESCRIPTION:

Share-A-Ride is a stand alone DirectTalk/2 application that allows individuals to call into a voice response system, register as a carpooler, and obtain the names of other carpoolers whose commuting habits are similar. The system automatically finds matches based on the registrants personal information entered through their telephone.

C.1.16.3 KEY FEATURES:

Very user friendly, plays names and work phone numbers of matches, allows participants to change their personal data any time, performs outbound calling every six months for survey purposes.

C.1.16.4 KEY BENEFITS:

This application is helping reduce traffic congestion, pollution, and is assisting governments in promoting High Occupancy Vehicle Lanes.

C.1.16.5 CALLPATH PRODUCTS USED:

- DirectTalk/2

C.1.16.6 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- The Government of Ontario has produced a variety of literature (posters, pamphlets, etc.) and individuals can call into the system.

C.1.16.7 REFERENCES:

Available upon request

C.1.16.8 PRICING:

Please call.

C.1.16.9 CONTACT NAME/ADDRESS:

Mr. Vikas Gupta
2 Robert Speck Parkway
Suite 750
Mississauga, Ontario L4Z 1H8
Phone: (905)803-1118

C.1.17 Interlogic Systems Inc.

C.1.17.1 PRODUCT NAME:

Student Registration System

C.1.17.2 PRODUCT DESCRIPTION:

Allows students to register for courses, pay for courses by credit card, and includes the ability to transfer and withdraw from courses as well as grade enquiry.

C.1.17.3 KEY FEATURES:

Credit card authorization, built-in voice mail type capabilities, fully automated and flexible solution.

C.1.17.4 KEY BENEFITS:

Streamlines the registration process for educational institutions and allows them to handle a greater number of calls without increased staff levels.

C.1.17.5 CALLPATH PRODUCTS USED:

- DirectTalk/2

C.1.17.6 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Posters
- Calendars
- Advertisement clips
- Demonstrations

C.1.17.7 REFERENCES:

Available upon request

C.1.17.8 PRICING:

Please call

C.1.17.9 CONTACT NAME/ADDRESS:

Mr. Vikas Gupta
2 Robert Speck Parkway
Suite 750
Mississauga, Ontario L4Z 1H8
Phone: (905)803-1118

C.1.18 Interlogic Systems Inc.

C.1.18.1 PRODUCT NAME:

Locater

C.1.18.2 PRODUCT DESCRIPTION:

This product determines locations of desired objects based on the caller's postal code. The caller can attempt to find the closest location of a restaurant, retail store, etc. to them or perform a search of all available locations within a specified radius from their point of reference.

C.1.18.3 KEY FEATURES:

Very precise in determining locations, easily customizable for specific needs.

C.1.18.4 KEY BENEFITS:

Allows a user-friendly and efficient method of determining locations.

C.1.18.5 CALLPATH PRODUCTS USED:

- DirectTalk/2

C.1.18.6 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Product demonstration

C.1.18.7 REFERENCES:

Available upon request

C.1.18.8 PRICING:

Please call

C.1.18.9 CONTACT NAME/ADDRESS:

Mr. Vikas Gupta
2 Robert Speck Parkway
Suite 750
Mississauga, Ontario L4Z 1H8
Phone: (905)803-1118

C.1.19 IBM Corporation

C.1.19.1 PRODUCT NAME:

DirectTalk/2 Pack

C.1.19.2 PRODUCT DESCRIPTION:

DirectTalk/2 Pack is a pre-packaged DirectTalk/2 solution. It provides the capability of ordering this voice processing system with all of the appropriate hardware and software. In addition, services such as custom applications, on-site installation, system upgrades, requirements definition and custom software servers are available. IBM has also developed turnkey applications, such as:

- Certificate of Deposit Information
- Checking
- Credit Cards
- Customer Policy Inquiry
- Funds Transfer
- Help Desk
- Individual Retirement Account
- Insurance Bill Inquiry
- Loans
- Order/Inventory Status
- Prescription Refill
- ProBranch Telephone Loans
- Savings
- Third Party Benefits Enrollment
- Verification of Merchant Check Coverage

C.1.19.3 KEY FEATURES:

The following features comprise the DirectTalk/2 Pack turnkey applications:

- CERTIFICATE OF DEPOSIT INFORMATION
 - Current balance
 - Current interest rate/annual percentage yield
 - Maturity Date
 - Next interest payment
- CHECKING
 - Current balance
 - Current clearance information
 - Last # transactions
 - Interest paid
 - Stop payment
- CREDIT CARDS
 - Current balance/available
 - Next payment due
 - Finance charge/rate
 - Last payment made
 - YTD interest
 - Increase limit
- CUSTOMER POLICY INQUIRY
 - Benefits
 - Subscriber Accounts
- FUNDS TRANSFER
- HELP DESK

- Broadcast messaging
- Reset devices
- Problem tickets
- Outbound calls: Field service /outages
- Call routing
- Transfer to person/voice mail
- INDIVIDUAL RETIREMENT ACCOUNT
 - Current balance
 - Current interest rate
- INSURANCE BILL INQUIRY
 - Current account balances
 - Current billing status
 - Account information
 - Account status
- LOANS
 - Current balance
 - Payment information
 - Late payment information
 - Loan payment
 - Last year's interest
 - Last # transactions
- ORDER AND INVENTORY STATUS
 - Inventory status inquiry
 - Current order status inquiry
 - Transfer to CSR
 - Merchant account status
 - Warranty adjustment status
- PRESCRIPTION REFILL
 - Receive refill request from affiliated nursing homes
 - Enter ID/Rx/location number
 - Receive order confirmation
- ProBranch TELEPHONE LOANS
 - Provides autotext information on various credit cards, new car, used car, line-of-credit and home equity loans
 - Performs online "what-if" calculations
 - Integrated into neural network for online loan qualification
 - Fulfillment though FAX or call-back from loan officer
- SAVINGS
 - Current balance
 - Last # transactions
 - Interest paid
- THIRD PARTY BENEFITS ENROLLMENT
 - Transfer to CSR
 - Enrollment process
 - Request reports
 - Billing

C.1.19.4 KEY BENEFITS:

- One stop shopping for DirectTalk/2
- Integrated full function financial applications
- Complete line of IVR services available

C.1.19.5 CALLPATH PRODUCTS USED:

DirectTalk/2

C.1.19.6 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Product brochures
- Demonstration line at 1-800-IBM-4211

C.1.19.7 REFERENCES:

Available upon request

C.1.19.8 PRICING:

Available upon request

C.1.19.9 CONTACT NAME/ADDRESS:

Please call IBM at 1-800-IBM-4211 for more information on DirectTalk/2 Pack

C.1.20 IBM Corporation

C.1.20.1 PRODUCT NAME:

IBM Source

C.1.20.2 PRODUCT DESCRIPTION:

The primary target marketplace for IBM Source is the newspaper and yellow pages industry. IBM Source is an interactive audiotext and consulting solution that provides all the tools necessary to develop and maintain informational and interactive telephone applications. Integration with a database for collection of information from callers allows businesses to provide demographic and lead generation type information for themselves and their advertisers.

IBM Source has several components which can be purchased separately:

1. SourceBuilder: application shells and reusable modules for rapid application development
2. SourceFinancials: provides financial information (stocks, bonds, mutual funds, etc.)
3. SourcePersonals: run a Voice Personal service within your own organization
4. SourceAutomotive: searchable classifieds for automobiles
5. SourceHomes: searchable classified for homes
6. SourceCustom: the IBM Source team will work with customers to create applications for their own unique needs

IBM Source runs on an IBM RS/6000, running AIX and DirectTalk/6000. Current database used is DBaseIV, but can be Progress, Sybase or any other database.

C.1.20.3 KEY FEATURES:

- SourceBuilder: 34 reusable, parameter-driven application shells
- SourceBuilder's SourceMonitor: on-line, point-in-time view of system activity
- SourceBuilder's SourceAdvisor: on-line, graphical display of call counts
- SourceFinancials portfolio application allows individuals to store up to 10 ticker symbols with a phone number and PIN, for retrieval and playback of current status at any time
- SourcePersonals roaming feature: listen to other personal messages within the same category (male-to-female, female-to-male) as current personal mailbox
- Automated call counts for all applications, which can be downloaded and used on any PC spreadsheet package for ad-hoc reporting
- Automated assignment and re-assignment of passwords for mailboxes

C.1.20.4 KEY BENEFITS:

- Quickly and easily create localized applications
- Open systems platform
- Database independent

C.1.20.5 CALLPATH PRODUCTS USED:

DirectTalk/6000

C.1.20.6 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- On request, from contact (see below) and Application Brief (GK20-2626-00)

C.1.20.7 REFERENCES:

- The Hartford Courant, Hartford, CT
- Pulitzer Technologies at St. Louis Post Dispatch, St. Louis, MO

C.1.20.8 PRICING:

Variable, depending upon components purchased and hardware configuration.
About \$90,000 to \$320,000 including hardware, software and services.

C.1.20.9 CONTACT NAME/ADDRESS:

- Ann-Marie Hoher
- IBM Corporation
- 1 Commercial Plaza
- Hartford, CT 06103

C.1.21 Meinert Engineering Co.

C.1.21.1 PRODUCT NAME:

Generalized Direct Talk Order Entry and Inventory Update System

C.1.21.2 PRODUCT DESCRIPTION:

Including support for specialized hand held terminals for entering orders and current inventory.

C.1.21.3 KEY FEATURES/BENEFITS:

- Verification of transmission of orders and inventory data
- Test for order duplication
- Audio confirmation of order information, product shipment date and back order status.

C.1.21.4 CALLPATH PRODUCTS USED:

DirectTalk/2 and DirectTalk/6000

C.1.21.5 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

Literature and demos. Data Solutions

C.1.21.6 PRICING:

Price is based on application and customer needs.

C.1.21.7 CONTACT NAME/ADDRESS:

- Chris Meinert
- PO Box 44
- Library, PA 15129
- Phone: (412)835-7424

C.1.22 MicroAutomation, Inc.

C.1.22.1 PRODUCT NAME:

MicroAct/2

C.1.22.2 PRODUCT DESCRIPTION:

MicroAct/2 is an enhancement to IBM's DirectTalk/2 family of products that provides connectivity between the IBM DirectTalk/2 Voice Response Unit (VRU) and MicroAutomation's CallCenter/6000 offering. Using MicroAct/2, DirectTalk/2 applications can utilize the Computer Telephony integration (CTI) functions of CallCenter/6000 to provide advanced features such as dynamic port allocation, intelligent answering, coordinated voice/data transfer and transfer load balancing.

MicroAct/2 supplements the standard DirectTalk/2 functions with functions that exploit CallCenter/6000's CTI capabilities. As calls are being processed by DirectTalk/2, MicroAct/2 provides the DirectTalk/2 application(s) with Automatic Number Identification (ANI) and Dialed Number Identification Services (DNIS) information. ANI information allows the DirectTalk/2 application to identify the caller and, optionally, tailor the script to the caller. DNIS information allows the DirectTalk/2 application to dynamically allocate VRU ports according to the needs of the callers.

MicroAct/2 consists of a set of DirectTalk/2 User Actions, a DirectTalk/2 General Server Interface (GSI), and a TCP/IP communication application. The DirectTalk/2 system must be configured with TCP/IP to communicate with CallCenter/6000.

MicroAct/2 allows you to bring a new dimension to your DirectTalk/2 applications utilizing the CTI functions of CallCenter/6000 and CallPath to provide advanced computer-telephony features.

C.1.22.3 KEY FEATURES:

- Interfaces directly with IBM's DirectTalk/2
- Supports either Token Ring or Ethernet LAN configurations
- Supports intelligent answering using ANI and DNIS
- Coordinated voice and data transfers can be implemented to allow for a "screen pop" when calls are transferred from the VRU.
- Allocates VRU ports according to the needs of the caller
- Allows the option to tailor the script to the caller

C.1.22.4 KEY BENEFITS:

- Increases utility of DirectTalk/2
- Employs standard hardware and software architecture
- Requires no proprietary hardware
- Design structured for flexibility and growth
- Provides high return on investment

C.1.22.5 CALLPATH PRODUCTS USED:

- CallPath Server/2
- CallPath Server/6000
- DirectTalk/2

C.1.22.6 SWITCHES SUPPORTED (Where Applicable):

All CallPath enabled switches

C.1.22.7 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Product brochures
- Product demonstrations at our McLean, VA facilities

C.1.22.8 REFERENCES:

Available upon request

C.1.22.9 PRICING:

Available upon request

C.1.22.10 CONTACT NAME/ADDRESS:

Dennis Aanderud
MicroAutomation, Inc.
8201 Greensboro Drive, Suite 611
McLean, VA 22102
Phone: (703) 847-9865
Fax: (703) 847-9870
daanderud@microaut.com

C.1.23 MicroAutomation, Inc.

C.1.23.1 PRODUCT NAME:

MicroTalk/2 Outbound Dialer

C.1.23.2 PRODUCT DESCRIPTION:

MicroTalk/2 is an enhancement to IBM's DirectTalk/2 family of products that provides outbound dialing functionality. The MicroTalk/2 Outbound dialer can be configured as a standalone unit to provide automated outbound dialing functionality or with IBM CallPath to provide preview and progressive dialing functionality.

In a standalone environment, MicroTalk/2 is a DirectTalk/2 application that automatically executes outbound dialing campaigns stored in a local or remote DB2 database. Customers are contacted by MicroTalk/2 and played a pre-recorded message when connected. MicroTalk/2 can be configured to play a pre-recorded message when a live person answers or when an answering machine answers the calls. Campaigns can be configured to attempt as many callbacks as necessary to complete the campaign. Campaign records are automatically updated by MicroTalk/2 with call analysis information from the call attempt.

When configured with IBM's CallPath and CallCoordinator products, MicroTalk/2 can provide full preview and progressive dialing functionality. Using the MicroTalk/2 Outbound Dialer product, designated call center agents will be able to utilize DirectTalk/2 VRU ports to initiate outbound calls, perform call analysis, and connect to live customers. Agents accessing preview dialing campaigns are presented with a screen of information identifying the customer to be called and then given the option of dialing or skipping the entry. Agents accessing progressive dialing campaigns are automatically connected to customers and simultaneously provided with a screen of information on the customer. MicroTalk/2 can be customized to interface with your host application to provide a screen pop specific to your environment.

Using MicroTalk/2, you can bring a new dimension to your DirectTalk/2 VRU by implementing standard outbound dialing applications or preview and progressive dialing applications.

C.1.23.3 KEY FEATURES:

- Enhancement to IBM's DirectTalk/2
- Standalone unit for automated outbound dialing
- Supports preview and progressive outbound dialing using IBM CallPath
- Campaign records automatically updated
- Can be customized to interface with specific host applications to provide screen pops

C.1.23.4 KEY BENEFITS:

- Increases utility of DirectTalk/2
- Employs standard hardware and software architecture
- Requires no proprietary hardware
- Design structured for flexibility and growth
- Provides high return on investment

C.1.23.5 CALLPATH PRODUCTS USED:

- DirectTalk/2
- CallPath Server/2 (optional)
- CallPath Server/6000 (optional)
- CallCoordinator (optional)

C.1.23.6 SWITCHES SUPPORTED (Where Applicable):

All switches that provide T1 or analog (2500 set) connectivity

C.1.23.7 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Product brochures
- Product demonstrations at our McLean, VA facilities

C.1.23.8 REFERENCES:

Available upon request

C.1.23.9 PRICING:

Available upon request

C.1.23.10 CONTACT NAME/ADDRESS:

Dennis Aanderud
MicroAutomation, Inc.
8201 Greensboro Drive, Suite 611
McLean, VA 22102
Phone: (703) 847-9865
Fax: (703) 847-9870
daanderud@microaut.com

C.1.24 New Brunswick Telephone

C.1.24.1 PRODUCT NAME:

Telephone Services/6000

- Application Series
 - NBTel Express
 - Name That Number
- Tool Series
 - Phrase Management

C.1.24.2 PRODUCT DESCRIPTION:

Telephone Services/6000 represents a suite of applications and tools that have been proven by New Brunswick Telephone and other Canadian telcos to enhance customer service and generate new revenue streams.

C.1.24.3 KEY FEATURES:

NB Tel Express: A customer service IVR application using DirectTalk/6000 that allows a customer to:

- Check their current account balance, date and amount of last payment
- Inquire on long distance charges on their bill
- Self provision (turn on and off) selected services
- Review a catalogue of products and services

Name That Number: A reverse directory assistance application that provides:

- the ability to access name and locality of subscribers spoken in the customers language of choice by inputting a telephone number on a touch tone phone.
- Billing on a per transaction basis

Phrase Management: A reusable tool set which can be used to build complete IVR applications:

- Reduces number of recorded segments required
- 20,000 phrases recorded from 400,000 listings
- Includes: phrase database, pre-coded phrases, application code for the management and use of phrases

C.1.24.4 KEY BENEFITS:

NB Tel Express

- Improves customer service by providing 7/24 access to traditional "Sales Office" functions
- Enhances customer satisfaction by allowing customer control of service provisioning
- Significantly reduces the cost of provisioning certain phone features, by almost 90%
- Provides more qualified leads for new products and services resulting in lockout of competition and new guaranteed revenue streams

Name That Number

- New revenue generating service
- Additional information for users of enhanced services: Call Display, Call Return, Pay per Use Call Return
- Short response time enhances customer satisfaction and probability of repeat use
- Targets qualified leads for follow-on marketing campaigns

C.1.24.5 CALLPATH PRODUCTS USED:

- DirectTalk/6000

C.1.24.6 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Product literature

C.1.24.7 REFERENCES:

Available upon request

C.1.24.8 PRICING:

Available upon request

C.1.24.9 CONTACT NAME/ADDRESS:

Kirk McElwain
 IBM Canada Ltd.
 Suite 1000
 400 Main street
 Saint John, New Brunswick E2E 4N5
 Phone: (506)632-3817

C.1.25 On-Line Support, Inc.

C.1.25.1 PRODUCT NAME:

Motor Vehicle Registration System

C.1.25.2 PRODUCT DESCRIPTION:

This system allows vehicle owners to renew their vehicle registration by phone. The system accesses a Unisys mainframe, verifies vehicle and amounts owed, collects credit card information, updates mainframe with registration information, logs transactions and produces detail and summary reports.

C.1.25.3 KEY FEATURES:

Allows for collection of unpaid fines owing against the vehicle during re-registration.

C.1.25.4 KEY BENEFITS:

- 24 hour/day service delivery
- Real time Unisys mainframe interaction

C.1.25.5 CALLPATH PRODUCTS USED:

- DirectTalk/2

C.1.25.6 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- We can provide System summary information and can make a demo phone number available on request.

C.1.25.7 CONTACT NAME/ADDRESS:

Derek MacEwen
On-Line Support, Inc.
P.O. Box 2968
Charlottetown, PEI C1A 8C5
Phone: (902)368-3305
Fax: (902)368-2446

C.1.26 Quality Consulting Services, Corporation

C.1.26.1 PRODUCT NAME:

QCS ACD Logon Server

C.1.26.2 PRODUCT DESCRIPTION:

QCS builds software tools that expand the functionality of IBM's DirectTalk/6000 product offering. QCS servers exploit DirectTalk's open programming interfaces to extend the system's versatile interactive voice response capability. The QCS ACD Logon Server provides your company with a toolset for managing DirectTalk/6000 channels as an ACD.

The ACD Logon Server logs on to the DirectTalk/6000 channels automatically, either individually or as ACD groups. The server also monitors channel performance, recovers channels in non-operational time, and changes a channel's PIN in real time, without removing the entire system from operation.

C.1.26.3 KEY FEATURES:

- Auto Logon eliminates the need for you to log on to the channels in a DirectTalk/6000 ACD group manually. The server automatically logs on to individual channels or to entire groups as soon as your DirectTalk/6000 systems come up, even when the channels in a group are distributed over several trunk lines.
- Logout turns off a bad extension or an entire group without affecting other lines.
- Channel Monitor accumulates information about call duration, call distribution, and other call statistics. It acts as a centralized status monitor, checking the status of an ACD and reporting bad channels to an ASCII terminal, while assisting you in load-balancing and implementing other adjustments to your ACD configuration.
- Channel Trace turns on the DirectTalk/6000 channel trace function for selected individual channels, all of the channels on a trunk, or all of the trunks on a single DirectTalk system.
- Change PIN ID corrects duplicate channel PINs on the fly, recording the correct number in a configuration file to ensure that the problem does not reoccur when you recycle the system.

C.1.26.4 KEY BENEFITS:

The QCS ACD Logon Server increases system and call center uptime, expanding your ability to handle customer calls efficiently while maintaining a high level of customer service. In addition, the speed with which you can identify and fix bad channels decreases maintenance time and costs.

C.1.26.5 CALLPATH PRODUCTS USED:

- DirectTalk/6000

C.1.26.6 CONTACT NAME/ADDRESS:

Tom Leonard
Quality Consulting Services, Corporation
3350 Scott Blvd. Suite 6402
Santa Clara, CA 95054
Phone: (408) 562-0880
Fax: (408) 562-0889

C.1.27 Quality Consulting Services, Corporation

C.1.27.1 PRODUCT NAME:

QMon

C.1.27.2 PRODUCT DESCRIPTION:

QCS builds software tools that expand the functionality of IBM's DirectTalk/6000 product offering. QCS servers exploit DirectTalk's open programming interfaces to extend the system's rich interactive voice response capability. QMon is a call center management tool that monitors and maintains remote DirectTalk/6000 systems, your own custom applications, and QCS's QCall, ACD Logon, and APPC servers. By integrating server-specific SNMP subagents, flexible APIs, and a graphical user interface, QMon provides a single point-and-click control panel on your current TCP/IP network management station from which to access information about your entire call center.

C.1.27.3 KEY FEATURES:

- Unified DirectTalk/6000 Operations stop and restart 3270 sessions and custom servers, remove channels and vpacks from service, check channel status, and shut down or restart multiple systems from a single QMon window. Password protection enables anyone to review the operating information but permits only authorized people to change a system's operating status.
- Unified QCall, ACD Logon Server, and APPC Server Operations monitor and control remote servers from the same QMon control panel. Separate logons are not longer required to query current server status, change server configurations, and update runtime variables
- Unified Call Center Application Operations deliver event information from any call center application to network managers such as NetView/6000, OpenView, or PolyCenter, even if the application currently does not write to the system error log. The QMon message reports security, hardware, software, applications, and communications problems, ranking the severity of each problem and flagging particularly critical items on which the network manager should act.
- Automatic Problem Notification minimizes disruption of call center operations. You are alerted immediately to critical problems, receiving a numeric or alphanumeric page directly from the RISC System/6000 requiring attention. Email messages can also be forwarded as immediate pages.
- True 24 x 7 operation combines built-in component redundancy, mirror imaging of files, and sophisticated network management to support constant system availability.

C.1.27.4 KEY BENEFITS:

QMon consolidates call center management, equipping your network management station with a single point of control and resolution for call center applications and system problems. By eliminating the need for separate logons and multiple windows to manage multiple servers, applications, and problem types, QMon streamlines call center maintenance, regardless of how many components are involved. QMon's SNMP-based client/server architecture and APIs ensure compatibility with your current network configuration and give you the flexibility to grow the management function as your call center grows.

C.1.27.5 CALLPATH PRODUCTS USED:

- CallPath Server/6000
- DirectTalk/6000
- SwitchServer/2

C.1.27.6 CONTACT NAME/ADDRESS:

Tom Leonard
Quality Consulting Services, Corporation
3350 Scott Blvd. Suite 6402
Santa Clara, CA 95054
Phone: (408) 562-0880
Fax: (408) 562-0889

C.1.28 Quality Consulting Services, Corporation

C.1.28.1 PRODUCT NAME:

QCS LU6.2 APPC Server

C.1.28.2 PRODUCT DESCRIPTION:

QCS builds software tools that expand the functionality of IBM's DirectTalk/6000 product offering. QCS servers exploit DirectTalk's open programming interfaces to extend the system's rich interactive voice response capability. The QCS LU6.2 APPC Server offers voice applications high-speed, secure access to data on an IBM host.

The QCS LU6.2 APPC Server provides CICS and DirectTalk/6000 with a communication bridge that allows applications on both ends to exchange data through SNA Services LU6.2 protocol.

C.1.28.3 KEY FEATURES:

- Protocol Manager invokes the correct protocol driver based on predefined configurations.
- Health Monitor checks the DirectTalk/6000 system for problems and reports them locally or via a remote network management facility (such as Netview).
- Application Manager registers the caller, updates caller information, collects transaction information, and enables information exchange between the client and the server.
- Performance Log captures throughput and response time information for each transaction and, if required, transfers the information to a printable file.
- Trace Log measures and tracks a variety of information about caller transactions, including the start/stop times and the content of calls.
- Dynamic Configuration adjusts the system configuration on the fly, without taking your system off line.

C.1.28.4 KEY BENEFITS:

DirectTalk/6000 voice applications that require IBM host-based information are traditionally constructed using 3270 emulation. The QCS LU6.2 APPC Server relies on the faster LU6.2 data protocol, providing your customers with faster response times. The server utilizes full-duplex capability and invokes parallel sessions to ship information to and from the IBM host quickly and reliably. This reduction in data traffic usually leads to significant reductions in RISC System/6000 overhead.

C.1.28.5 CALLPATH PRODUCTS USED:

- DirectTalk/6000

C.1.28.6 CONTACT NAME/ADDRESS:

Tom Leonard
Quality Consulting Services, Corporation
3350 Scott Blvd. Suite 6402
Santa Clara, CA 95054
Phone: (408) 562-0880
Fax: (408) 562-0889

C.1.29 TKM Communications Inc.

C.1.29.1 PRODUCT NAME:

TKMalert

C.1.29.2 PRODUCT DESCRIPTION:

TKMalert will enhance Automated Teller Machine (ATM) Help Desk productivity by providing an automated service call dispatch system. TKMalert will perform automatic problem identification and resolution through the intelligent filtering of ATM alerts, trouble ticket creation and the automation of the voice call, alpha-numeric page or fax process to the designated Branch or Third Party Servicer. For service or follow up calls requiring agent participation, TKMalert will automatically dial the site and display the trouble ticket on the agent's terminal while the call is in process.

C.1.29.3 KEY FEATURES:

- Supports preview and power dialing for the automated dispatch of service calls
- Support for unattended automated voice messages sent to Branches or Third Party Servicers
- Supports unattended fax and alpha-numeric service dispatch
- Intelligent alert queuing, thresholding and re-alert processes
- Automatic open or reset of ATM units
- Support for IBM NetView and Info/Management environments
- Integrated inbound caller identification and problem update routing and processing
- Open Client-Server architecture
- On-line access to ATM and Servicer statistics
- Supports both PBX and Centrex environments

C.1.29.4 KEY BENEFITS:

- Automated handling of 90% of all ATM alerts
- Reduce the elapsed time between alert notification and service call dispatch to less than 45 seconds
- Increase ATM service levels from 20 to 30%
- Reduced Help Desk facilities and personnel costs

C.1.29.5 CALLPATH PRODUCTS USED:

- DirectTalk/2

C.1.29.6 SWITCHES SUPPORTED (Where Applicable):

- NT DMS-100, NT Meridian/1, AT&T

C.1.29.7 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Literature as required

C.1.29.8 REFERENCES:

- Scotiabank, CDSL, others

C.1.29.9 CONTACT NAME/ADDRESS:

Fred Gallagher, President
TKM Communications Inc.
60 Columbia Way, Suite 300
Markham, Ontario L3R 0C9
Phone: (905)470-5252
Fax: (905)470-7008

C.1.30 TKM Communications Inc.

C.1.30.1 PRODUCT NAME:

TKMfund

C.1.30.2 PRODUCT DESCRIPTION:

TKMfund provides interactive voice response access to mutual funds account management, prices and market commentary functions.

C.1.30.3 KEY FEATURES:

- Current mutual fund price access
- Mutual funds historical rates of return
- Individual fund descriptions
- Market commentaries by individual fund managers
- Account balances, previous transactions and pending trades
- Account market value by fund and by account
- English, French, Cantonese, and Spanish support
- Multiple currencies within the same account
- Fax-on-Demand of mutual fund prices, account details and T3s or T5s
- Open Client-Server architecture

C.1.30.4 KEY BENEFITS:

- Improve agent productivity
- 24 hours per day client access
- Increased order volume
- Higher client retention rate
- Increased market competitiveness
- Reduced redemption

C.1.30.5 CALLPATH PRODUCTS USED:

- DirectTalk/2, DirectTalk/6000

C.1.30.6 SWITCHES SUPPORTED (Where Applicable):

- NT DMS-100, NT Meridian/1, AT&T

C.1.30.7 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Literature as required

C.1.30.8 REFERENCES:

- Baycom, Scotiabank, 20/20, Templeton

C.1.30.9 CONTACT NAME/ADDRESS:

Fred Gallagher, President
TKM Communications Inc.
60 Columbia Way, Suite 300
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Phone: (905)470-5252
Fax: (905)470-7008

C.1.31 TKM Communications Inc.

C.1.31.1 PRODUCT NAME:

TKMquote

C.1.31.2 PRODUCT DESCRIPTION:

The TKMquote application, a proven solution in the Canadian Discount Brokerage environment, provides an interactive voice response access to stock markets for security quotes, market indices, personalized stock lists, account inquiries and trade order entry, 24 hours per day, independent of host access.

C.1.31.3 KEY FEATURES:

- Access to all the major Canadian and American exchanges
- Supports quotes, options, puts and calls
- Personalized library list retrieval of multiple stocks with just a single key-stroke
- Print, fax or display of trade requests
- Account inquiries
- Open Client-Server architecture

C.1.31.4 KEY BENEFITS:

- Improve agent productivity
- 24 hours per day client access
- Increase order volume
- Higher client retention rate
- Increased market competitiveness

C.1.31.5 CALLPATH PRODUCTS USED:

- DirectTalk/2

C.1.31.6 SWITCHES SUPPORTED (Where Applicable):

- NT DMS-100, NT Meridian/1, AT&T

C.1.31.7 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Literature as required

C.1.31.8 REFERENCES:

- Scotia Securities

C.1.31.9 CONTACT NAME/ADDRESS:

Fred Gallagher, President
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Markham, Ontario L3R 0C9
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Fax: (905)470-7008

C.1.32 UNIVOC Services, Inc.

C.1.32.1 PRODUCT NAME:

Personal CompuTeller (PCTeller)

C.1.32.2 PRODUCT DESCRIPTION:

Univoc's Personal CompuTeller is a software that turns your personal computer into a home banking facility offering direct access to your bank accounts. You can do all your everyday banking quickly, conveniently and in the privacy of your own home just by sitting down at your keyboard! All your bank account information is stored in archives on your hard disk. Since the PCTeller includes an interface with a financial management program, you can export information to it, making it easier for you to see where your money is going.

The Univoc PCTeller is an add-on module to your existing Phone Banking DirectTalk/6000 IVR application allowing you to offer the same banking functionality to your PC and Phone users.

C.1.32.3 KEY BENEFITS:

Adding the PCTeller to your existing DirectTalk/6000 IVR provides Banks with speed to market and allows you to competitively offer alternative banking options while minimizing the development effort to add new function. Using DT/6000 as the core of this solution allows you to capitalize on a single back-end infrastructure for both applications and provides similar functionality to the two types of users. Use your Personal CompuTeller to:

- Consult your banking archives and export information to a financial management program;
- Pay your telephone, hydro, heating and credit card bills, etc;
- Transfer funds from one account to another;
- Check the records on your most recent transactions (past 14 days);
- Find out your account balance.

C.1.32.4 CALLPATH PRODUCTS USED:

- DirectTalk/6000

C.1.32.5 SWITCHES SUPPORTED (Where Applicable):

Those supported by IBM.

C.1.32.6 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

Product literature and demonstration diskette available upon request.

C.1.32.7 REFERENCES:

- The National Bank of Canada

C.1.32.8 CONTACT NAME/ADDRESS:

Jean-Guy Charon
430 McGill St. Suite 401
Montreal, Quebec H2Y 2G1
Phone: (514)878-3338 X2020
Fax: (514)878-9270

C.1.33 Voice Data Solutions, Inc.

C.1.33.1 PRODUCT NAME:

Information Hotline

C.1.33.2 PRODUCT DESCRIPTION:

The application leads the caller through a decision tree to determine what information is needed, and provides the information requested. This application has been used to provide employment verification for lenders, availability of products or jobs and other information types.

C.1.33.3 KEY FEATURES:

The application provides information to the caller from a remote host DB/2 data base, a LAN server DB/2 data base or a local data base.

C.1.33.4 KEY BENEFITS:

No customer service representatives are involved in these transactions

C.1.33.5 CALLPATH PRODUCTS USED:

DirectTalk/2

C.1.33.6 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Brochures are available on request

C.1.33.7 PRICING:

Customization will be required

C.1.33.8 CONTACT NAME/ADDRESS:

Sara Liles
PO Box 68081
Raleigh, NC 27613
Phone (919)846-4706

C.1.34 Voice Data Solutions, Inc.

C.1.34.1 PRODUCT NAME:

Help Desk

C.1.34.2 PRODUCT DESCRIPTION:

The application is used by I?S system help desk and provides the availability and status of various systems, applications and networks; automated log off capabilities; and, if necessary, routing of the call to the proper area of expertise, along with population of the screen.

C.1.34.3 KEY FEATURES:

The application uses a remote CICS data base.

C.1.34.4 KEY BENEFITS:

The application handles an average of 20% of the calls to the help desk without intervention by a service representative.

C.1.34.5 CALLPATH PRODUCTS USED:

DirectTalk/2, CallPath/2, CallCoordinator

C.1.34.6 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Brochures are available on request

C.1.34.7 PRICING:

Customization will be required

C.1.34.8 CONTACT NAME/ADDRESS:

Sara Liles
PO Box 68081
Raleigh, NC 27613
Phone (919)846-4706

C.1.35 Voice Data Solutions, Inc.

C.1.35.1 PRODUCT NAME:

Call Distribution

C.1.35.2 PRODUCT DESCRIPTION:

The application distributes calls received by a call center by collecting information from the caller, retrieving data from, a remote data base and leading the caller through a decision tree to determine the area of expertise required. When the call is sent to a customer service representative, the screen is populated.

C.1.35.3 KEY FEATURES:

The application accesses a remote DB/2 data base to gather information about the caller in order to determine the proper decision tree to use for routing.

C.1.35.4 KEY BENEFITS:

The caller is routed directly to a representative with the specialized knowledge to handle the specific situation.

C.1.35.5 CALLPATH PRODUCTS USED:

DirectTalk/2, CallPath/2, CallCoordinator

C.1.35.6 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Brochures are available on request

C.1.35.7 PRICING:

Customization will be required

C.1.35.8 CONTACT NAME/ADDRESS:

Sara Liles
PO Box 68081
Raleigh, NC 27613
Phone (919)846-4706

C.1.36 Voice Data Solutions, Inc.

C.1.36.1 PRODUCT NAME:

Benefits Enrollment

C.1.36.2 PRODUCT DESCRIPTION:

This application provides enrollment via touch tone telephone for employees and retirees to enroll for their company provided benefit plans, including medical, dental, vision, disability, flexible spending account and dependent care account.

C.1.36.3 KEY FEATURES:

The application accesses a host DB/2 data base to determine what the eligible plans for this individual are, allows the individual to choose the desired plan and provides the plan to the host for recording in the DB/2 data base.

C.1.36.4 KEY BENEFITS:

The majority of individuals are able to enroll without assistance from the representatives in the call center.

C.1.36.5 CALLPATH PRODUCTS USED:

DirectTalk/2, CallPath/2, CallCoordinator

C.1.36.6 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Brochures are available on request

C.1.36.7 PRICING:

Customization will be required

C.1.36.8 CONTACT NAME/ADDRESS:

Sara Liles
PO Box 68081
Raleigh, NC 27613
Phone (919)846-4706

C.1.37 Voice Data Solutions, Inc.

C.1.37.1 PRODUCT NAME:

Customer Satisfaction Survey

C.1.37.2 PRODUCT DESCRIPTION:

This application operates in a call center environment. After receiving service from a service representative, the customer is offered the opportunity to take a satisfaction survey. The application collects statistical information about the service received and solicits comments.

C.1.37.3 KEY FEATURES:

The application is enabled by the customer representative pressing two characters on the keyboard.

C.1.37.4 KEY BENEFITS:

The applications provides feedback for both the individual representative and the entire call center.

C.1.37.5 CALLPATH PRODUCTS USED:

DirectTalk/2, CallPath/2, CallCoordinator

C.1.37.6 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Brochures are available on request

C.1.37.7 PRICING:

Customization will be required

C.1.37.8 CONTACT NAME/ADDRESS:

Sara Liles
PO Box 68081
Raleigh, NC 27613
Phone (919)846-4706

C.1.38 Voice Data Solutions, Inc.

C.1.38.1 PRODUCT NAME:

Event Notification

C.1.38.2 PRODUCT DESCRIPTION:

This application places an out-going telephone call when certain events take place or when certain dates have passed without some action being taken. The specific message is then read when the telephone is answered by either a person or an answering machine.

C.1.38.3 KEY FEATURES:

The application references a remote DB/2 data base to determine the "event keys", and obtain the telephone number to be called.

C.1.38.4 KEY BENEFITS:

No customer service representatives are involved in the transaction.

C.1.38.5 CALLPATH PRODUCTS USED:

DirectTalk/2

C.1.38.6 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Brochures are available on request

C.1.38.7 PRICING:

Customization will be required

C.1.38.8 CONTACT NAME/ADDRESS:

Sara Liles
PO Box 68081
Raleigh, NC 27613
Phone (919)846-4706

C.1.39 Voice Integrators, Inc.

C.1.39.1 PRODUCT NAME:

Employee Benefit Hotline

C.1.39.2 PRODUCT DESCRIPTION:

Enables employees to both inquire and update critical employee benefit information via their touch tone phone.

C.1.39.3 KEY FEATURES:

Inquire on general benefits, profit sharing, payroll deductions, and investment options, listen to information on plans offered, change investment/profit sharing options, complete enrollment for insurance and investment options, register for education and training, hear about employment opportunities (job postings), complete employee surveys, call routing.

C.1.39.4 KEY BENEFITS:

Improve productivity of human resource personnel, reduce peak load call volumes, provide 7 day a week, 24 hour a day access, eliminate unnecessary paper handling.

C.1.39.5 CALLPATH PRODUCTS USED:

- Either DirectTalk/2 or DirectTalk/6000

C.1.39.6 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Brochure available

C.1.39.7 REFERENCES:

- DirectTalk/2

Blue Cross Blue Shield of Maine, CIGNA Systems Division, Florida East Coast Industries, National Life of Vermont, Rochester Regional Transit

- DirectTalk/6000

Blue Cross Blue Shield of Rhode Island, Commercial Union Insurance Co., Michigan Consolidated Gas Co., Robert Plan Insurance Co., Smith Barney, University of Central Florida

C.1.39.8 PRICING:

Approx. \$20,000 U.S.

C.1.39.9 CONTACT NAME/ADDRESS:

Thomas J. Chisholm
600 East Crescent Av
Upper Saddle River, NJ 07458

C.1.40 Voice Integrators, Inc.

C.1.40.1 PRODUCT NAME:

Student Registration

C.1.40.2 PRODUCT DESCRIPTION:

Automated Student Registration, saving the typical registration rush, backlogs, and paperwork.

C.1.40.3 KEY FEATURES:

Provides easy access to course information and registration; Verifies active student status; Performs credit check; Searches course availability and timing conflicts; Provides call routing

C.1.40.4 KEY BENEFITS:

Timely and efficient course registration; Improved productivity of registrar's office personnel; Reduces peak load call volumes during registration; Provides 7 day a week, 24 hour a day access; Eliminates unnecessary paper generation, handling, and mailing expenses; Elimination of on-hold and abandoned calls.

C.1.40.5 CALLPATH PRODUCTS USED:

- Either DirectTalk/2 or DirectTalk/6000

C.1.40.6 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Brochure available

C.1.40.7 REFERENCES:

- DirectTalk/2

Blue Cross Blue Shield of Maine, CIGNA Systems Division, Florida East Coast Industries, National Life of Vermont, Rochester Regional Transit

- DirectTalk/6000

Blue Cross Blue Shield of Rhode Island, Commercial Union Insurance Co., Michigan Consolidated Gas Co., Robert Plan Insurance Co., Smith Barney, University of Central Florida

C.1.40.8 PRICING:

Approx. \$25,000 U.S.

C.1.40.9 CONTACT NAME/ADDRESS:

Thomas J. Chisholm
600 East Crescent Av
Upper Saddle River, NJ 07458

C.1.41 Voice Integrators, Inc.

C.1.41.1 PRODUCT NAME:

Account Payable Inquiry Line

C.1.41.2 PRODUCT DESCRIPTION:

Vendors can access accounts payable information quickly and efficiently.

C.1.41.3 KEY FEATURES:

Retrieval of invoice information; Receive status information regarding payment; Copy of check requests; Access to multiple invoices.

C.1.41.4 KEY BENEFITS:

Increases responsiveness to vendors; Reduction of on-hold and abandoned calls; Call savings on phone expenses; Improved productivity of A/P clerks

C.1.41.5 CALLPATH PRODUCTS USED:

- Either DirectTalk/2 or DirectTalk/6000

C.1.41.6 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Brochure available

C.1.41.7 REFERENCES:

- DirectTalk/2

Blue Cross Blue Shield of Maine, CIGNA Systems Division, Florida East Coast Industries, National Life of Vermont, Rochester Regional Transit

- DirectTalk/6000

Blue Cross Blue Shield of Rhode Island, Commercial Union Insurance Co., Michigan Consolidated Gas Co., Robert Plan Insurance Co., Smith Barney, University of Central Florida

C.1.41.8 PRICING:

Approx. \$15,000 U.S.

C.1.41.9 CONTACT NAME/ADDRESS:

Thomas J. Chisholm
600 East Crescent Av
Upper Saddle River, NJ 07458

C.1.42 Voice Integrators, Inc.

C.1.42.1 PRODUCT NAME:

Insurance Infoline

C.1.42.2 PRODUCT DESCRIPTION:

Allows automation of some of the routine tasks within Customer Service.

C.1.42.3 KEY FEATURES:

Billing Inquiry; Claims Status; Coverage Verification; Cash Value; Provider Eligibility; Request Information to be Sent; Listen to Product Information; Report Address Change; Call Routing

C.1.42.4 KEY BENEFITS:

Improved customer service; Elimination of on-hold and abandoned calls; Improved productivity for customer service personnel; Savings on phone expenses; Provide 7 day a week, 24 hour a day access; Reduction in future headcount

C.1.42.5 CALLPATH PRODUCTS USED:

- Either DirectTalk/2 or DirectTalk/6000

C.1.42.6 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Brochure available

C.1.42.7 REFERENCES:

- DirectTalk/2

Blue Cross Blue Shield of Maine, CIGNA Systems Division, Florida East Coast Industries, National Life of Vermont, Rochester Regional Transit

- DirectTalk/6000

Blue Cross Blue Shield of Rhode Island, Commercial Union Insurance Co., Michigan Consolidated Gas Co., Robert Plan Insurance Co., Smith Barney, University of Central Florida

C.1.42.8 PRICING:

Approx. \$15,000 U.S.

C.1.42.9 CONTACT NAME/ADDRESS:

Thomas J. Chisholm
600 East Crescent Av
Upper Saddle River, NJ 07458

C.1.43 Voice Integrators, Inc.

C.1.43.1 PRODUCT NAME:

Enhanced Helpline

C.1.43.2 PRODUCT DESCRIPTION:

Allows automation of some of the routine tasks within a Help Desk

C.1.43.3 KEY FEATURES:

Broadcast Messaging; Reset Terminals/Printers; Cancel TSO/VM ID's; Reset Passwords; Open/Close Problem Tickets; Outbound Call Notification of System Outages; Call Routing

C.1.43.4 KEY BENEFITS:

Timely problem resolution; Elimination of on-hold and abandoned calls; Improved productivity for Help Desk personnel; Savings in length of calls; Increased responsiveness to end user; Return of investment less than one year.

C.1.43.5 CALLPATH PRODUCTS USED:

- Either DirectTalk/2 or DirectTalk/6000

C.1.43.6 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Brochure available

C.1.43.7 REFERENCES:

- DirectTalk/2

Blue Cross Blue Shield of Maine, CIGNA Systems Division, Florida East Coast Industries, National Life of Vermont, Rochester Regional Transit

- DirectTalk/6000

Blue Cross Blue Shield of Rhode Island, Commercial Union Insurance Co., Michigan Consolidated Gas Co., Robert Plan Insurance Co., Smith Barney, University of Central Florida

C.1.43.8 PRICING:

Approx. \$35,000

C.1.43.9 CONTACT NAME/ADDRESS:

Thomas J. Chisholm
600 East Crescent Av
Upper Saddle River, NJ 07458

C.1.44 Voice Integrators, Inc.

C.1.44.1 PRODUCT NAME:

VII Dealer/Product Locator

C.1.44.2 PRODUCT DESCRIPTION:

Enables callers to inquire about the location of a companies product or service.

C.1.44.3 KEY FEATURES:

Voice Integrators Dealer/Product Locator Service provides callers with ease access to convenient location information via the touch tone phone. A customer calls into the DirectTalk system and enters the qualifying data (zip code or telephone number). The Dealer/Product locator interacts with the customer database to retrieve the location.

C.1.44.4 KEY BENEFITS:

Provides 7X24 hour access, reduces or eliminates on hold or abandon calls, offloads CSR from tedious, repetitious tasks, reduction of 800 costs, reduces peak loads.

C.1.44.5 CALLPATH PRODUCTS USED:

- DirectTalk/2 or DirectTalk/6000

C.1.44.6 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Brochure available

C.1.44.7 REFERENCES:

- DirectTalk/2
BC/BS of Maine.
- DirectTalk/6000
Mishcon, Mitsubishi

C.1.44.8 PRICING:

Approx. \$25,000 U.S.

C.1.44.9 CONTACT NAME/ADDRESS:

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Phone (201) 818-6600

C.1.45 Voice Integrators, Inc.

C.1.45.1 PRODUCT NAME:

VII On-Line Transportation Schedules and Infoline

C.1.45.2 PRODUCT DESCRIPTION:

Enables callers to inquire schedules, fares and other transit services available.

C.1.45.3 KEY FEATURES:

Voice Integrators On-Line Transportation Schedules and Infoline provides easy access for callers to inquire into schedules and fares of mass transit systems. Travelers can request information on specific routes by supplying the appropriate route number. If the route number is not known, a list is given and the caller can continue without having to hang up and redial. The DirectTalk is connected to the database to provide interactive communication of route, schedule and fare information.

C.1.45.4 KEY BENEFITS:

Off-loads approximately 70% of all incoming calls, provides 7X24 hour access, reduces or eliminates on hold or abandoned calls, offloads CSR from tedious, repetitious tasks, delivers accurate up-to-date information.

C.1.45.5 CALLPATH PRODUCTS USED:

- DirectTalk/2 or DirectTalk/6000

C.1.45.6 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Brochure available

C.1.45.7 REFERENCES:

- DirectTalk/2
Rochester Transit

C.1.45.8 PRICING:

Approx. \$15,000 U.S.

C.1.45.9 CONTACT NAME/ADDRESS:

Thomas J. Chisholm
600 East Crescent Av
Upper Saddle River, NJ 07458
Phone (201) 818-6600

C.1.46 Voice Integrators, Inc.

C.1.46.1 PRODUCT NAME:

VII Job Applicant Screening Solution

C.1.46.2 PRODUCT DESCRIPTION:

Enables employers to qualify potential job applicants.

C.1.46.3 KEY FEATURES:

Voice Integrators Job Applicant Screening Solution provides a mechanism to allow potential job applicants to call into the DirectTalk system and answer a series of questions as it relates to the job opening. Once the candidate answers the first series of questions, the answers are scored and if the caller passes the criteria is then guided through a second phase of qualifying questions. These responses are scored, and if the caller again passes the test, he/she is asked to leave more detailed information for later call back. All applicants responses are stored for later retrieval and reporting requirements.

C.1.46.4 KEY BENEFITS:

Off-loads pre-qualification work from the HR departments, provides 7X24 hour access, screen potential candidates automatically, provides reports and statistics automatically.

C.1.46.5 CALLPATH PRODUCTS USED:

- DirectTalk/2 or DirectTalk/6000

C.1.46.6 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Brochure available

C.1.46.7 REFERENCES:

- DirectTalk/2
- DirectTalk/6000

Providian, TSSG

C.1.46.8 PRICING:

Approx. \$17,500 U.S.

C.1.46.9 CONTACT NAME/ADDRESS:

Thomas J. Chisholm
600 East Crescent Av
Upper Saddle River, NJ 07458
Phone (201) 818-6600

C.1.47 Voice Integrators, Inc.

C.1.47.1 PRODUCT NAME:

VII Customer Survey Application

C.1.47.2 PRODUCT DESCRIPTION:

Enables companies to automatically deploy customer surveys.

C.1.47.3 KEY FEATURES:

Voice Integrators Customer Survey Application allows companies to develop surveys for their customer base. Once the survey has been inputted, the application allows the caller to step through the survey and answer a series of questions. The DirectTalk stores the responses for later retrieval and reporting requirements.

C.1.47.4 KEY BENEFITS:

Eliminates development and costs of paper surveys, off-loads employee data entry and reporting, provides 7X24 hour access, provides reports and statistics automatically.

C.1.47.5 CALLPATH PRODUCTS USED:

- DirectTalk/2 or DirectTalk/6000

C.1.47.6 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Brochure available

C.1.47.7 REFERENCES:

- DirectTalk/2
 - DirectTalk/6000
- BC/BS of GA, Atlantic Electric

C.1.47.8 PRICING:

Approx. \$7,500 U.S.

C.1.47.9 CONTACT NAME/ADDRESS:

Thomas J. Chisholm
600 East Crescent Av
Upper Saddle River, NJ 07458
Phone (201) 818-6600

C.1.48 Voice Integrators, Inc.

C.1.48.1 PRODUCT NAME:

VII Direct Data Link

C.1.48.2 PRODUCT DESCRIPTION:

Provides "C" server API modules for direct data access from DirectTalk

C.1.48.3 KEY FEATURES:

Voice Integrators VII Direct Data Link is a series of modules that allows your DirectTalk application to communicate with your databases directly. Databases supported are Oracle, Sybase, Informix and DB/2 (2 and 6000). In addition, LU6.2 servers are also available.

C.1.48.4 KEY BENEFITS:

Eliminates custom development, efficient proven technology

C.1.48.5 CALLPATH PRODUCTS USED:

- DirectTalk/2 or DirectTalk/6000

C.1.48.6 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Brochure available

C.1.48.7 REFERENCES:

- DirectTalk/2
SDMS
- DirectTalk/6000
Mishcon, University of Florida, Providian, BC/BS of NJ

C.1.48.8 PRICING:

Approx. \$17,500 U.S.

C.1.48.9 CONTACT NAME/ADDRESS:

Thomas J. Chisholm
600 East Crescent Av
Upper Saddle River, NJ 07458
Phone (201) 818-6600

C.1.49 Voice Integrators, Inc.

C.1.49.1 PRODUCT NAME:

VII Queue Announce

C.1.49.2 PRODUCT DESCRIPTION:

VII Queue Announce provides ACD queue announcements for callers.

C.1.49.3 KEY FEATURES:

Voice Integrators Queue Announce provides specific ACD queue announcements for callers. VII Queue Announce application is supported on any CallPath compliant switch.

C.1.49.4 KEY BENEFITS:

Eliminates custom development, efficient proven technology

C.1.49.5 CALLPATH PRODUCTS USED:

- CallPath Server/2 or 6000 with DirectTalk/2 or DirectTalk/6000

C.1.49.6 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Brochure available

C.1.49.7 REFERENCES:

- DirectTalk/2
GE, Shimano
- DirectTalk/6000
Medco

C.1.49.8 PRICING:

Approx. \$15,000 U.S.

C.1.49.9 CONTACT NAME/ADDRESS:

Thomas J. Chisholm
600 East Crescent Av
Upper Saddle River, NJ 07458
Phone (201) 818-6600

C.2 Voice Recognition / Text-to-Speech

C.2.1 Alternate Access

C.2.1.1 PRODUCT NAME:

Recognition Resource Server for DirectTalk/6000

C.2.1.2 PRODUCT DESCRIPTION:

The Intellivoice Recognition Resource Server provides voice recognition capabilities to DirectTalk/6000 (Release 1.4.0 or greater).

C.2.1.3 KEY FEATURES:

- Network based client/server implementation
- Speaker Independent Recognition of up to 31 continuous digits spoken in a natural manner, without the need for beeps and pauses between digits
- Speaker Independent Recognition discrete vocabularies of up to 1,000 words
- Languages available include Standard American English, U.K. English, French, European French, German and Central American Spanish. Other languages are under development and being tested for future release.

C.2.1.4 KEY BENEFITS:

- Client/server implementation allows all DirectTalk/6000 Clients' telephone lines to have access to the Recognition Resource Server(s)
- Access to system for callers with rotary telephone sets
- Hands free, eyes free access to DirectTalk/6000 applications
- Applications can be designed to operate faster than with DTMF
- Network savings due to reduced call time
- Natural method of interaction makes caller more comfortable with voice procession technology, and thus more apt to use the system

C.2.1.5 CALLPATH PRODUCTS USED:

IBM CallPath DirectTalk/6000

C.2.1.6 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Sales engineering
- Product literature
- Demonstrations

C.2.1.7 REFERENCES:

Available upon request

C.2.1.8 PRICING:

Intellivoice List Pricing excluding the following PC configurations is \$3,150 U.S. per recognition channel, and configurations are sold in groups of 4 channels up to a maximum of 16 channels per PC server. Please call for configuration details.

The Intellivoice Recognition Resource requires PC's that are LAN attached to the DirectTalk/6000 clients. PC specifications are as follows:

- 468/50 processor (or better)
- VGA Adapter and Monitor
- 80 MB Fixed Disk
- 8 MG RAM or greater
- v.32MNP5/v.42bis modem
- LAN Card (contact Intellivoice for information re. LAN cards)
- LAN Work Place for DOS (software ver 4.1 or greater)
- pcAnywhere (ver. 4.5 or greater)

C.2.1.9 CONTACT NAME/ADDRESS:

Kelly Lumpkin

Alternate Access: An authorized distributor for Intellivoice Communications, Inc.

4205 City of Oaks Wynd, Suite 350

Raleigh, NC 27612

Tel/Fax (919)781-8371

C.2.2 Alternate Access

C.2.2.1 PRODUCT NAME:

BeSTspeech/2

C.2.2.2 PRODUCT DESCRIPTION:

Text-to-Speech for the IBM DirectTalk/2

C.2.2.3 KEY FEATURES:

- Most widely used text-to-speech software in the industry
- Multiple languages available.
- Male and female voice
- Unlimited vocabulary
- Access to remote systems (news service, stock quote)
- All software product (no hardware required)
- Dynamic resource available to any port on DirectTalk/2 system

C.2.2.4 KEY BENEFITS:

- Handles alphanumeric text (names, addresses, directions, e-mail, schedules)
- Increases power of interactive voice response
- Information is always up to date
- Leaves valuable hardware slots available for other applications
- Easy installation and maintenance

C.2.2.5 CALLPATH PRODUCTS USED:

IBM CallPath DirectTalk/2

C.2.2.6 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Sales engineering
- Product literature
- Demonstrations

C.2.2.7 PRICING:

\$1,500 per process

C.2.2.8 CONTACT NAME/ADDRESS:

Kelly Lumpkin

Alternate Access: An authorized distributor for Berkeley Speech Technologies, Inc..

4205 City of Oaks Wynd, Suite 350

Raleigh, NC 27612-5314

Tel/Fax (919)781-8371

C.2.3 Alternate Access

C.2.3.1 PRODUCT NAME:

BeSTspeech/6000

C.2.3.2 PRODUCT DESCRIPTION:

Text-to-Speech for the IBM DirectTalk/6000

C.2.3.3 KEY FEATURES:

- Most widely used text-to-speech software in the industry
- Multiple languages available.
- Male and female voice
- Unlimited vocabulary
- Access to remote systems (news service, stock quote)
- Dynamic resource available to any port on DirectTalk/2 system

C.2.3.4 KEY BENEFITS:

- Handles alphanumeric text (names, addresses, directions, e-mail, schedules)
- Increases power of interactive voice response
- Information is always up to date

C.2.3.5 CALLPATH PRODUCTS USED:

IBM CallPath DirectTalk/6000

C.2.3.6 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Sales engineering
- Product literature
- Demonstrations

C.2.3.7 PRICING:

\$2,500 per process

C.2.3.8 CONTACT NAME/ADDRESS:

Kelly Lumpkin

Alternate Access: An authorized distributor for Berkeley Speech Technologies, Inc.

4205 City of Oaks Wynd, Suite 350

Raleigh, NC 27612-5314

Tel/Fax (919)781-8371

C.2.4 BBN Corporation

C.2.4.1 PRODUCT NAME:

HARK Recognizer

C.2.4.2 PRODUCT DESCRIPTION:

Large vocabulary, speaker-independent, continuous, real-time speech recognition software engine.

C.2.4.3 KEY FEATURES:

- Vocabularies and grammar are easily customizable to an application with HARK Developer Toolkit
- No speech collection is required
- Same engine can be used for large or small recognition tasks
- Leading speed and accuracy

C.2.4.4 KEY BENEFITS:

- Software only for ease of deployment
- Client server architecture enables scalability with usage growth
- Services can be added to existing hardware/software
- Multiple speech enabled applications can leverage the speech-server resources

C.2.4.5 CALLPATH PRODUCTS USED:

DirectTalk/6000

C.2.4.6 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Product literature
- Customer press releases
- Telephone demonstrations available

C.2.4.7 REFERENCES:

Volt Delta Resources, Time Warner, Thomas Cook, VoiceCom

C.2.4.8 PRICING:

\$2,070 to \$4,400 U.S. per channel of recognition based on application size. One channel can service several telephone ports depending on the application.

C.2.4.9 CONTACT NAME/ADDRESS:

Patrick McHugh
Business Development Manager
BBN HARK
70 Fawcett St.
Cambridge, MA 02138
Phone: (617)873-2936

C.2.5 Berkeley Speech Technologies

C.2.5.1 PRODUCT NAME:

BeSTspeech/2

C.2.5.2 PRODUCT DESCRIPTION:

BeSTspeech/2 is a Text-to-Speech Engine for DirectTalk/2

C.2.5.3 KEY FEATURES:

- Software solution for DirectTalk/2
- Real Time Synthesis of natural speech from any text accessible to DirectTalk/2
- Multiple text to speech channels run as a pool of shareable resources
- Languages available: English, French, German, Italian, Spanish, Brazilian Portuguese, Cantonese and Mandarin. Other languages available upon special request include: Russian, Dutch, Arabic, Korean, Japanese and Malay.
- Both male and female voices

C.2.5.4 KEY BENEFITS:

Dynamic Text information can be immediately accessed by callers over the telephone. Applications include:

- Electronic mail access
- Name and address verification
- Reverse directory assistance
- Employee scheduling
- Dispatch information
- Product descriptions
- News information
- Medical records access
- Prototyping DirectTalk/2 applications

C.2.5.5 CALLPATH PRODUCTS USED:

IBM CallPath DirectTalk/2

C.2.5.6 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Sales engineering
- Product literature
- On-line demonstrations

C.2.5.7 REFERENCES:

Available upon request.

C.2.5.8 PRICING:

BeSTspeech/2 list price is \$1,500 U.S. per resource.

C.2.5.9 CONTACT NAME/ADDRESS:

Sales

Berkeley Speech Technologies, Inc.

2246 Sixth Street

Berkeley, California 94710

Phone: (510)841-5083

Fax: (510)841-5093

E-mail: bst@bst.com Homepage: <http://www.bestspeech.com>

C.2.5.10 Distributor

Kelly Lumpkin

Alternate Access

4205 City of Oaks Wynd suite 350

Raleigh, NC 27612-5314

Phone/Fax: (919)781-8371

C.2.6 Berkeley Speech Technologies

C.2.6.1 PRODUCT NAME:

BeSTspeech/6000

C.2.6.2 PRODUCT DESCRIPTION:

Best Speech/6000 is a Text-to-Speech Engine for DirectTalk/6000

C.2.6.3 KEY FEATURES:

- Software solution running on RS/6000 with DirectTalk/6000
- Real Time Synthesis of natural speech from any text accessible to DirectTalk/6000
- Multiple text to speech channels run as a pool of shareable resources
- Languages available: English, French, German, Italian, Spanish, Brazilian Portuguese, Cantonese and Mandarin. Other languages available upon special request include: Russian, Dutch, Arabic, Korean, Japanese and Malay.
- Both male and female voices

C.2.6.4 KEY BENEFITS:

Dynamic Text information can be immediately accessed by callers over the telephone. Applications include:

- Electronic mail access
- Name and address verification
- Reverse directory assistance
- Employee scheduling
- Dispatch information
- Product descriptions
- News information
- Medical records access
- Prototyping DirectTalk/6000 applications

C.2.6.5 CALLPATH PRODUCTS USED:

IBM CallPath DirectTalk/6000

C.2.6.6 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Sales engineering
- Product literature
- On-lin demonstrations

C.2.6.7 REFERENCES:

Available upon request.

C.2.6.8 PRICING:

Best Speech/6000 list price is \$3,000 U.S. for one sharable resource or \$2,500 per resource for multi-resource deliveries. Each resource can be shared across several incoming phone lines.

C.2.6.9 CONTACT NAME/ADDRESS:

Sales

Berkeley Speech Technologies, Inc.

2246 Sixth Street

Berkeley, California 94710

Phone: (510)841-5083

Fax: (510)841-5093

E-mail: bst@bst.com Homepage: <http://www.bestspeech.com>

C.2.7 Quality Consulting Services, Corporation

C.2.7.1 PRODUCT NAME:

QCS Text-to-Speech Server

C.2.7.2 PRODUCT DESCRIPTION:

QCS builds software tools that expand the functionality of IBM's DirectTalk/6000 product offering. QCS servers exploit DirectTalk's open programming interfaces to extend the system's rich interactive voice response capability. The QCS Text-to-Speech Server provides your company's voice response applications with speech synthesis capability, accepting ASCII text from a DirectTalk/6000 application and converting the text to speech output.

C.2.7.3 KEY FEATURES:

- Continuous Text speaks text of your choice to callers, relaying messages, product descriptions, news, or any similar information.
- Database Fields convey the contents of any field of information, such as a name, address, or telephone number, spoken with appropriate intonation.
- Regular Spell and Clear Spell help callers understand "difficult" words by spelling them out one letter at a time, with clarification if necessary (such as "m as in Mary").
- Multiple Language Versions accommodate English and Spanish speakers (standard). French, German, Italian, and Japanese versions are also available.
- True 24 x 7 operation combines built-in component redundancy, mirror imaging of files, and sophisticated network management to ensure constant system availability.

C.2.7.4 BENEFITS:

The QCS Text-to-Speech server makes a wide variety of information available to every caller. When the nature of an application means that pre-recording voice segments is impractical, text-to-speech is the optimum solution. There is no requirement for agent intervention to translate or read information. Dynamic information can be conveyed without the necessity of recording new voice segments and is easy to change on the fly. Because the application reads what it sees, different information is conveyed to callers as soon as it is keyed in.

Text-to-speech represents a cost-effective solution when applications offer callers information such as the contents of an electronic mail message, the names or addresses of local dealers, or news updates.

C.2.7.5 CALLPATH PRODUCTS USED:

- DirectTalk/6000

C.2.7.6 CONTACT NAME/ADDRESS:

Tom Leonard
Quality Consulting Services, Corporation
3350 Scott Blvd. Suite 6402
Santa Clara, CA 95054
Phone: (408) 562-0880
Fax: (408) 562-0889

C.2.8 Quality Consulting Services, Corporation

C.2.8.1 PRODUCT NAME:

QCS Speech Recognition Server

C.2.8.2 PRODUCT DESCRIPTION:

QCS builds software tools that expand the functionality of IBM's DirectTalk/6000 product offering. QCS servers exploit DirectTalk's open programming interfaces to extend the system's rich interactive voice response capability. The QCS Speech Recognition Server provides your company's DirectTalk/6000 voice response applications with speech recognition capabilities.

The QCS Speech Recognition Server converts spoken input to digital data, enabling callers to conduct a voice response transaction vocally and avoid the requirement for a DTMF handset. The server, under DirectTalk/6000 application control, accepts voice data from a caller and streams the voice in real time to a speech recognition process running on a system situated on the local area network.

The server can incorporate a number of different speech recognition technologies, including

- BBN Hark
- Corona
- Voice Processing Corporation

The server can also interface with your in-house voice recognition engine.

C.2.8.3 KEY FEATURES:

- Continuous Digits let callers speak digits just as if they were carrying on a normal conversation, without interposing a "beep" between each digit.
- Vocabulary Expansion lets you build on to the server's vocabulary, including terms and grammar specific to your callers and line of business.
- Multiple Language accommodates English and Spanish speakers (standard). French, German, Italian, and Japanese versions are also available upon request.
- True 24 x 7 operation combines built-in component redundancy, mirror imaging of files, and sophisticated network management to ensure constant system availability.

C.2.8.4 KEY BENEFITS:

In the United States today, approximately 25 percent of telephone users do not have or cannot use DTMF handsets. The QCS Speech Recognition Server expands the market for your company's automated services, making such services available to callers who are physically disabled or elderly or who have only rotary phones. Because the interface is completely familiar, your services reach callers with a minimum of confusion.

By eliminating the need for data input through the telephone keypad, speech recognition reduces the amount of time it takes to complete each caller's transaction, reducing network costs and increasing customer satisfaction.

C.2.8.5 CALLPATH PRODUCTS USED:

- DirectTalk/6000

C.2.8.6 CONTACT NAME/ADDRESS:

Tom Leonard
Quality Consulting Services, Corporation
3350 Scott Blvd. Suite 6402
Santa Clara, CA 95054
Phone: (408) 562-0880
Fax: (408) 562-0889

C.3 Voice Mail / Facsimile / Paging

C.3.1 Alternate Access

C.3.1.1 PRODUCT NAME:

FaxFX

C.3.1.2 PRODUCT DESCRIPTION:

Fax Server software system for the IBM DirectTalk/6000.

C.3.1.3 KEY FEATURES:

- Fax-on-demand
- Supports one to 128 fax modems
- Fax store-and-forward
- Fax mail
- Fax depository
- Supports document scanners

C.3.1.4 KEY BENEFITS:

- Quick response to customer inquiries (literature, pricing, etc. sent on demand)
- Receive faxes at remote fax machines anywhere in the world

C.3.1.5 CALLPATH PRODUCTS USED:

IBM CallPath DirectTalk/6000

C.3.1.6 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Sales engineering
- Product literature
- Demonstrations

C.3.1.7 PRICING:

\$2,500 to \$5,000 based on RS/6000; Fax modems are additional

C.3.1.8 CONTACT NAME/ADDRESS:

Kelly Lumpkin

Alternate Access: An authorized distributor for Devcom Mid-America, Inc.

4205 City of Oaks Wynd, Suite 350

Raleigh, NC 27612-5314

Tel/Fax (919)781-8371

C.3.2 Devcom Mid-America, Inc.

C.3.2.1 PRODUCT NAME:

FaxFX

C.3.2.2 PRODUCT DESCRIPTION:

FaxFX allows you to send, receive, view, print and perform optical character recognition of fax images. This is a software product running on the RS/6000 that uses Class 2 and Class 2.0 fax modems connected serially via S1, S2, 8 port or 128 port board.

C.3.2.3 KEY FEATURES:

Very flexible because it is all software based on the RS/6000. Unlimited number of modem connections. Availability of client/server and OCR options.

C.3.2.4 KEY BENEFITS:

- Interface for programmers using shell scripts or command line interface
- DirectTalk interface available
- Interface for users via dumb terminal or GUI client/server interface
- Product is developed on the RS/6000 thus the latest and greatest versions are available on IBM
- Client/Server module that supports; Windows, Windows 95, Windows NT, MAC and UNIX clients.

C.3.2.5 CALLPATH PRODUCTS USED:

DirectTalk/6000

C.3.2.6 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- FaxFX and FaxFX c/s and FaxFAX for DirectTalk literature
- 30 day evaluation copy available

C.3.2.7 REFERENCES:

DirectTalk - North Carolina IBM office.
Over 4,000 installations on UNIX systems
#1 selling fax software on IBM RS/6000

C.3.2.8 PRICING:

FaxFX - \$2,500 to \$5,000 U.S.
FaxFX c/s option - \$250/user U.S.
FaxFX OCR option - \$2,500 U.S.

C.3.2.9 CONTACT NAME/ADDRESS:

Jennifer Selman
Devcom Mid-America, Inc.
2603 W. 22nd Street, Suite 23
Oak Brook, IL 60521
Phone: (708)574-3600
Fax: (708)572-0508

C.3.3 IBM Corporation

C.3.3.1 PRODUCT NAME:

DirectTalkMail

C.3.3.2 PRODUCT DESCRIPTION:

DirectTalkMail is a powerful easy-to-use full function voice messaging system that coexists and integrates with other voice processing applications.

DirectTalkMail turns your IBM AIX DirectTalk/6000 voice platform into a complete voice messaging system for your business.

C.3.3.3 KEY FEATURES:

- Standard easy-to-use interface
- Administration across the enterprise network
- Multiple PBX integration
- AMIS compliance
- Open systems architecture
- Seamless integration between all DirectTalk and CallPath voice processing applications
- Internet WWW interface

C.3.3.4 KEY BENEFITS:

- Cost effective alternative to specialized hardware based voice messaging systems
- DirectTalkMail can be integrated with FAX, E-mail, screen phone, and pager technologies to allow DirectTalkMail to be the single source of communicating with the office
- Eliminates the need of having one voice messaging system per PBX
- Total administrative automation
- With DirectTalk/6000's open development platform, complete control of DirectTalkMail is in the hands of the user

C.3.3.5 CALLPATH PRODUCTS USED:

DirectTalk/6000

C.3.3.6 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Product literature

C.3.3.7 REFERENCES:

Available upon request

C.3.3.8 PRICING:

Available upon request

C.3.3.9 CONTACT NAME/ADDRESS:

IBM Corporation

Denny Adams

Phone (813)787-2854

C.3.4 Quality Consulting Services, Corporation

C.3.4.1 PRODUCT NAME:

QCS FAX Server

C.3.4.2 PRODUCT DESCRIPTION:

QCS builds software tools that expand the functionality of IBM's DirectTalk/6000 product offering. QCS servers exploit DirectTalk's open programming interfaces to extend the system's rich interactive voice response capability. The QCS FAX Server works with DirectTalk/6000 to provide your customers with fax-back-on-demand services.

The QCS Fax Server provides your callers with a self-service fax request line. Using the QCS Fax Server, your company can send product and pricing information, promotional information, registration forms, purchase orders, or any other printed material automatically in response to telephone requests. Dynamic information, such as account statements and sales reports, can be assembled and sent any time to a fax modem anywhere in the world.

Server interfaces currently support Devcom's FaxFX and Silicon Graphics' Flex Fax. The DirectTalk/6000 graphical user interface easily supports creation of custom voice applications that offer precisely the fax services your particular callers require.

C.3.4.3 KEY FEATURES:

- Modem Pool Polling routes calls to the first available modem, guaranteeing the quickest processing possible.
- Application-Sensitive Communication Layer directs calls immediately to the particular server, host, or other network node on which information resides.
- Custom Greetings present callers with your company's own unique greeting.
- Password Protection avoids sending sensitive information to unauthorized callers.
- Option Validation and Processing checks and confirms all options selected by the caller before the caller hangs up.
- Fax Build generates updated information (such as an account statement or a sales report) for faxing.
- Cancel Request permits callers to cancel fax requests any time before the material is sent.
- Advanced Administration simplifies system modifications such as adding modems and users or installing and updating software, freeing system administrators for more complex system and network requirements.
- Store and Forward (optional) delays sending a fax until it is required.
- Broadcast Fax (optional) faxes material to an entire distribution list.
- True 24 x 7 operation combines built-in component redundancy, mirror imaging of files, and sophisticated network management to ensure constant system availability.

C.3.4.4 KEY BENEFITS:

The QCS FAX Server streamlines the process for responding to information requests from all callers—both customers and your own staff, who can access company information via fax from any telephone. The QCS Fax Server represents a simple solution to resource planning and allocation problems—especially when you anticipate a high volume of requests for

information at unpredictable times. In addition, a larger volume of requests can be handled in a shorter period of time.

C.3.4.5 CALLPATH PRODUCTS USED:

- DirectTalk/6000

C.3.4.6 CONTACT NAME/ADDRESS:

Tom Leonard
Quality Consulting Services, Corporation
3350 Scott Blvd. Suite 6402
Santa Clara, CA 95054
Phone: (408) 562-0880
Fax: (408) 562-0889

C.3.5 Voice Data Solutions, Inc.

C.3.5.1 PRODUCT NAME:

Voice Mail with Paging

C.3.5.2 PRODUCT DESCRIPTION:

This application provides a full function voice mail system, and pages the recipient when a call arrives.

C.3.5.3 KEY FEATURES:

The application provides paging capabilities through several paging companies.

C.3.5.4 KEY BENEFITS:

The application notifies the recipient when a call has arrived, eliminating the need to constantly check for voice mail messages.

C.3.5.5 CALLPATH PRODUCTS USED:

DirectTalk/2

C.3.5.6 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Brochures are available on request

C.3.5.7 PRICING:

Customization will be required

C.3.5.8 CONTACT NAME/ADDRESS:

Sara Liles
PO Box 68081
Raleigh, NC 27613
Phone (919)846-4706

C.3.6 VoiceRite, Inc.

C.3.6.1 PRODUCT NAME:

DirectFax/2

C.3.6.2 PRODUCT DESCRIPTION:

DirectFax/2 is a "Fax-On-Demand" enhancement to IBM's DirectTalk/2. DirectFax/2 expands DirectTalk/2 beyond voice interactive response and into Fax-On-Demand. Now anyone with a touch tone phone and a fax machine can have instant access information on your host computer, reports and images.

C.3.6.3 KEY FEATURES:

- Utilizes DirectTalk/2's easy to use script language
- Images can be easily added into the fax server through faxing, scanning or drawing
- Documents can be assigned a classification and description, so that the caller can receive verbal confirmation on the selected document
- Reports, invoices, electronic mail, and pricing incorporating graphic logos may be faxed by the system by capturing screen information from a host, receiving a file or reading information from a database

C.3.6.4 KEY BENEFITS:

- Improve customer service
- Reduce response time
- Decrease mailing costs
- Free personnel to perform other tasks

C.3.6.5 CALLPATH PRODUCTS USED:

DirectTalk/2

C.3.6.6 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Product literature

C.3.6.7 REFERENCES:

Available upon request

C.3.6.8 PRICING:

\$3,500 U.S.

C.3.6.9 CONTACT NAME/ADDRESS:

Joshua P. Schrager
VoiceRite, Inc.
229 Southwest 11 Street
Miami, FL 33134
Phone: (305)858-6917 or T/L 235-3848
Fax: (305)442-3671 or T/L 235-3671

C.3.7 VoiceRite, Inc.

C.3.7.1 PRODUCT NAME:

DirectFaxMail/2

C.3.7.2 PRODUCT DESCRIPTION:

DirectFaxMail/2 is an enhancement to IBM's DirectTalk/2 system.

DirectFaxMail/2 manages your company's inbound faxes more efficiently by routing them to the recipient's nearest fax machine or storing them in a personal electronic fax mailbox. Users can listen to the fax descriptions and retrieve the stored documents remotely from anywhere in the world.

DirectFaxMail/2 merges voice and electronic fax storage capabilities, letting callers record a voice segment describing the contents of any fax. When a fax is received, the recipient can be automatically notified of the location and description of the fax by phone, e-mail or pager message. If faxes were stored in a mailbox, the recipient can decide if they need to be retrieved.

C.3.7.3 KEY FEATURES:

- Callers dial into a single phone number and enter the recipient's extension or name over a touch-tone phone
- Faxes are routed automatically to the recipient's nearest fax machine or fax mailbox
- May specify up to three fax phone numbers
- Each fax mailbox owner can, at any time, call his fax mailbox and change his forwarding status to either direct incoming faxes to a specified fax machine or to store them in a fax mailbox

C.3.7.4 KEY BENEFITS:

- External customers no longer need to keep track of several of your company's fax-machine phone numbers
- Merges voice and electronic fax storage capabilities

C.3.7.5 CALLPATH PRODUCTS USED:

DirectTalk/2

C.3.7.6 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Product literature

C.3.7.7 REFERENCES:

Available upon request

C.3.7.8 PRICING:

\$3,500 U.S.

C.3.7.9 CONTACT NAME/ADDRESS:

Joshua P. Schrager

VoiceRite, Inc.

229 Southwest 11 Street

Miami, FL 33134

Phone: (305)858-6917 or T/L 235-3848

Fax: (305)442-3671 or T/L 235-3671

C.3.8 VoiceRite, Inc.

C.3.8.1 PRODUCT NAME:

DirectPage/2

C.3.8.2 PRODUCT DESCRIPTION:

DirectPage/2 is a technological enhancement to IBM's DirectTalk/2 system. DirectPage/2 gives you the ability to use an alphanumeric pager as a computer screen and a telephone keypad as a keyboard to access information at any time, anywhere in the country.

C.3.8.3 KEY FEATURES:

- Gives you the ability to receive hundreds of characters of text at the touch of a button
- Applications can be created for callers to request information via a touch tone telephone such as: electronic calendar, electronic mail, product pricing and description, location and status of service calls, page message via host and emergency notification
- Requested information is instantly displayed on your pager, scrolled and saved into pager memory

C.3.8.4 KEY BENEFITS:

- Easy and cost effective way to stay in touch with your office
- Access to a wide range of information remotely

C.3.8.5 CALLPATH PRODUCTS USED:

DirectTalk/2

C.3.8.6 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Product literature

C.3.8.7 REFERENCES:

Available upon request

C.3.8.8 PRICING:

\$3,500 U.S.

C.3.8.9 CONTACT NAME/ADDRESS:

Joshua P. Schrager
VoiceRite, Inc.
229 Southwest 11 Street
Miami, FL 33134
Phone: (305)858-6917 or T/L 235-3848
Fax: (305)442-3671 or T/L 235-3671

C.4 Consulting/Integration Services

C.4.1 Charles Palmer, Inc.

C.4.1.1 PRODUCT NAME

DirectTalk/6000 Operations Training

C.4.1.2 PRODUCT DESCRIPTION

A one day lecture and lab training class for personnel responsible for the monitoring and control of production DirectTalk/6000 systems.

C.4.1.3 KEY FEATURES

- This training class is customized to the user's environment in order to provide meaningful instruction to the students.
- The class is taught on-site using development and/or production systems that are familiar to the student.

C.4.1.4 KEY BENEFITS

- Students are taught to recognize normal indications of operation.
- Students are taught to recognize key indications of failures
- students are taught how to restore normal operation.

C.4.1.5 CALLPATH PRODUCTS USED

DirectTalk/6000

C.4.1.6 MARKETING SUPPORT AVAILABLE

A course outline and sample pages from the student handout

C.4.1.7 PRICES

Negotiated daily rate plus travel and living for the instructor (One day of time needed for customization of the class to the user's environment prior to teaching).

C.4.1.8 CONTACT NAME/ADDRESS

Chuck Palmer
21 Periwinkle Dr.
Olmsted Township, OH 44138
Phone: (216)235-9460

C.4.2 Charles Palmer, Inc.

C.4.2.1 PRODUCT NAME

DirectTalk/6000 Application design and development

C.4.2.2 PRODUCT DESCRIPTION

An experienced team leader to design and develop end-user applications using IBM's DirectTalk/6000 system.

C.4.2.3 KEY FEATURES

- Ability to translate business processes into application design documents.
- Ability to translate application design documents into functioning production applications.
- Former IBM DirectTalk/6000 instructor.

C.4.2.4 KEY BENEFITS

- Efficient program design
- Standardization of application routines
- Cross-training of full time staff
- Independent contractor

C.4.2.5 CALLPATH PRODUCTS USED

DirectTalk/6000

C.4.2.6 MARKETING SUPPORT AVAILABLE

Resume and references.

C.4.2.7 PRICES

Negotiated hourly rate plus travel and living expenses.

C.4.2.8 CONTACT NAME/ADDRESS

Chuck Palmer
21 Periwinkle Dr.
Olmsted Township, OH 44138
Phone: (216)235-9460

C.4.3 Diversified Data Services, Inc.

C.4.3.1 PRODUCT NAME

Computer systems integrator

C.4.3.2 PRODUCT DESCRIPTION

Diversified Data Services, Inc. is a professional computer systems integrator, committed to helping organizations manage their information systems and resources more efficiently. It is our goal to develop long-term business partnerships with our clients. The three main services we provide are Systems Integration Services, Contract Programming and Consulting and Data Entry and Conversion Services.

Diversified Data Services offers a complete solution in the area of integrated telephony Linked Products and Services. This service allows any telephone to interface with a computer database. This practice is well accepted in the financial industry as automated "bank-by-phone services". The service arms of many other organizations are just beginning to realize the potential savings that Telephony Systems can provide.

C.4.3.3 CALLPATH PRODUCTS USED:

DirectTalk/2

C.4.3.4 CONTACT NAME/ADDRESS:

Tom Dudek
602 North Charlotte St.
Lancaster, PA 17603
Phone: (717)399-7042
Fax: (717)399-7048

C.4.4 IDAC Consulting Services Inc.

C.4.4.1 PRODUCT NAME/SERVICES:

Software Development, Project Management, Consulting

C.4.4.2 PRODUCT DESCRIPTION:

IDAC provides software development and system integration services for UNIX (AIX, RS/6000) based distributed and client/server environments. IDAC specializes in the development of Interactive Voice Response applications and the integration of IVR with Call Centre solutions, local/distributed databases, On Line Transaction Processing applications, FAX servers, and Image/Work Flow applications.

C.4.4.3 KEY BENEFITS:

IDAC's expertise in system integration and software development in a distributed UNIX environment provides our customers with a total solution, from the telephone interface to the caller interface of the IVR application to the existing legacy application.

IDAC is committed to understanding customers' business requirements in order to provide a high quality, reliable, custom solution. We combine software development standards with state of the art project management skills to ensure that projects do not exceed schedules and budgets.

C.4.4.4 CALLPATH PRODUCTS USED:

- DirectTalk/6000
- DirectTalkMail
- CallPath Server/6000

C.4.4.5 REFERENCES:

Standard Life
National Bank of Canada

C.4.4.6 PRICING:

Services provided on an hourly or fixed price basis.

C.4.4.7 CONTACT NAME/ADDRESS:

Ted Beck
IDAC Consulting Services Inc.
10 King Street East, Suite 900
Toronto, Ontario M5C 1C3
Phone: (416)410-5036
Fax: (416)363-2195

C.4.5 Quality Consulting Services, Corporation

C.4.5.1 PRODUCT NAME:

QCS Development Services

C.4.5.2 PRODUCT DESCRIPTION:

QCS builds software tools that expand the functionality of IBM's DirectTalk/6000 product offering. QCS servers exploit DirectTalk's open programming interfaces to extend the system's rich interactive voice response capability.

QCS also develops customized computer telephony integration solutions. QCS specializes in solutions for companies requiring applications that must run 24 hours a day, 7 days a week, applying to the design and implementation of these solutions in-depth understanding and experience in all areas of computer telephony integration, including host based routing, intelligent answering services (ANI and DNIS), and coordinated voice and data transfer.

QCS consultants respect your business needs. Solutions are based on their knowledge of the requirements for successful computer telephony integration and their analysis of your company's business goal.

The majority of our solutions involve carefully designed DirectTalk/6000 and CallPath/6000 applications hosted on the IBM RISC System/6000 running AIX. Because QCS can develop applications that run on each individual product as well as applications that require DirectTalk/6000 and CallPath/6000 to work together, the solution offered always represents the simplest and most effective use of the technology.

When appropriate, QCS can also develop applications for a variety of other UNIX platforms.

QCS offers services to assist you in all phases of application development, test, and production. We offer the complete range of services, from application discovery and call flow analysis to system monitoring, maintenance, and follow-up. Our goal is to develop and support the computer telephony integration solution for your particular need. QCS has developed products for use in numerous industries, including finance and insurance, manufacturing, utilities, and communications.

DirectTalk/6000 Development Services

- Voice application design, development, and documentation
- Voice recording and editing
- Custom server design and development
- System integration

CallPath/6000 Development Services

- Application design, development and documentation
- Programmer/operator training
- Application programmer training
- Hardware and software installation
- Support system validation

Computer Telephony Integration Services

- Business requirements, call flow, and call traffic measurement and analysis
- Telephone switch alternative analysis, and selection, and switch programmer/administrator training

C.4.5.3 CONTACT NAME/ADDRESS:

Tom Leonard
Quality Consulting Services, Corporation
3350 Scott Blvd. Suite 6402
Santa Clara, CA 95054
Phone: (408) 562-0880
Fax: (408) 562-0889

C.4.6 UNIVOC Services, Inc.

C.4.6.1 PRODUCT NAME:

IBM DirectTalk Integration Services

C.4.6.2 PRODUCT DESCRIPTION

Univoc is a company specialized in Computer Telephony integration. We offer various Call Center turnkey client-server solutions based on the RS/6000. Univoc provides project planning, architecture, design, pilot and implementation consulting services.

C.4.6.3 KEY FEATURES:

- Project planning and analysis
- Solution architecture and design
- Implementation
- Post-implementation support

C.4.6.4 KEY BENEFITS:

- Immediate access to skilled CTI personnel
- Quick and cost effective implementation
- On-going technical support and training

C.4.6.5 CALLPATH PRODUCTS USED:

- CallPath/600
- IBM's TADS/6000 Call Management software
- DirectTalk/6000, DirectTalk Mail and DirectTalk/2

C.4.6.6 SWITCHES SUPPORTED (Where Applicable):

Those supported by IBM.

C.4.6.7 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

Product literature available upon request

C.4.6.8 REFERENCES:

Available upon request

C.4.6.9 PRICING:

Dependent on configuration.

C.4.6.10 CONTACT NAME/ADDRESS:

Jean-Guy Charon
430 McGill St. Suite 401
Montreal, Quebec H2Y 2G1
Phone: (514)878-3338 X2020
Fax: (514)878-9270

C.4.7 Voice Data Solutions, Inc.

C.4.7.1 PRODUCT NAME:

Custom Developed Application

C.4.7.2 PRODUCT DESCRIPTION:

Voice Data Solutions, Inc. is expert in designing and developing DirectTalk/2 voice applications and in integration with the CallPath/2 family of products.

C.4.7.3 KEY FEATURES:

Specific areas of integration include remote data base access, script development and the integration of voice and data.

C.4.7.4 KEY BENEFITS:

The caller will get consistent information in a timely fashion. Employees who normally answer the telephone will feel less stress and be able to accomplish other work. Some environments experience a reduction in head count.

C.4.7.5 MARKETING SUPPORT AVAILABLE (Product Literature, Demonstrations):

- Brochures are available on request

C.4.7.6 PRICING:

Customization will be required

C.4.7.7 CONTACT NAME/ADDRESS:

Sara Liles
PO Box 68081
Raleigh, NC 27613
Phone (919)846-4706

Appendix D. Special Notices

This publication is intended to help account system engineers, consultants, marketing representatives and voice specialist systems engineers to plan a Call Center using the IBM CallPath family of products. The information in this publication is not intended as the specification of any programming interfaces that are provided by the IBM CallPath Family of products. See the PUBLICATIONS section of the IBM Programming Announcement for CallPath Server, CallPath CallCoordinator/2, CallPath CallCoordinator for Windows, CallPath CallCoordinator CICS, CallPath/400, CallPath SwitchServer/2, CallPath DirectTalk/2 and CallPath DirectTalk/600 for more information about what publications are considered to be product documentation.

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ACF/VTAM	AIX
AIXwindows	Application System/400
AS/400	BookManager
C Set ++	C/400
CallCoordinator/2	CallCoordinator
CallPath	CallPath/400
CallPath/6000	CallPath CICS/MVS
CallPath SwitchServer/2	CallPath CICS/VSE
CallPath/2	CICS
CICS/ESA	CICS/MVS
CICS/VSE	CICS/6000
Common User Access	CUA
DB2	DirectTalk/2
DirectTalk/6000	DirectTalk
FlowMark	IBM
IBM Business Partner	IMS
MQSeries	MVS
MVS/ESA	MVS/XA
NetView	Operating System/2
Operating System/400	OS/2
OS/400	Personal System/2
POWERserver	POWERstation
Presentation Manager	ProBranch
PROFS	Proprinter
PS/ValuePoint	PS/1
PS/2	RISC System/6000
RPG/400	RS/6000
S/370	S/390
SOM	SP
SwitchServer/2	SwitchServer
System/370	System/390
System/36	System Object Model
SystemView	VSE/ESA
VTAM	Workplace Shell
400	

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PhoneMail	Siemens Company
Rolm	Siemens Rolm Communications Incorporated
SAS	SAS Institute, Incorporated
Sentry	American Telephone and Telegraph Company
Signature	Samsung Electronics America, Incorporated
Sprint	Sprint Communications Company
SX	Intel Corporation
Sybase	Sybase Corporation
System 7	Apple Computer, Incorporated
TalkThru	Software Corporation of America
TCS	TCS Software Publishing
Touch-Tone	American Telephone and Telegraph Company
Unisys	Unisys Corporation
VMS	Digital Equipment Corporation

Other trademarks are trademarks of their respective companies.

Appendix E. CallPath and DirectTalk Publications

The publications listed in this section are considered particularly suitable for a more detailed discussion of the topics covered in this redbook.

E.1 DirectTalk/2

- *DirectTalk/2 General Information and Planning*, GB35-4403
- *DirectTalk/2 Installation*, SB35-4406-01
- *DirectTalk/2 Administrator's Guide*, SB35-4405
- *DirectTalk/2 Application Development User's Guide*, SB35-4408
- *DirectTalk/2 User's Quick Reference*, SX23-1501
- *DirectTalk/2 Application Programmer's Guide*, SB35-4404

E.2 DirectTalk/6000 and DirectTalkMail

- *DirectTalk/6000 General Information and Planning*, GC22-0100-04
- *DirectTalk/6000 Getting Started*, SC22-0110-01
- *DirectTalk/6000 Master Index*, SC22-0111-04
- *DirectTalk/6000 Installation*, SC22-0101
- *DirectTalk/6000 Configuration and Administration*, SC22-0103
- *DirectTalk/6000 Voice Application Development*, SC22-0102
- *DirectTalk/6000 Problem Determination*, SC22-0105
- *DirectTalk/6000 Programming for the Signalling Interface*, SC33-1155
- *DirectTalk/6000 Programming for Signalling System 7*, SC33-1206
- *DirectTalk/6000 DirectTalkMail Administration Guide*, SC33-1222
- *DirectTalk/6000 DirectTalkMail Guide*, SC33-1221
- *9291 Single Digital Trunk Processor Installation, Maintenance, and Parts Catalog*, SY33-2092
- *9295 Multiple Digital Trunk Processor Installation, Maintenance, and Parts Catalog*, SY33-2091

E.3 CallPath Services and Servers

- *CallPath Services CSTA Reference for Switch*, SC33-1765
- *CallPath Server General Information*, GC31-6241
- *CallPath CICS and CallPath SwitchServer/2 General Information*, GC34-2401
- *CallPath Server Planning, Installation, and Problem Determination Guide*, SC31-6242

- *CallPath Developer's Toolkit Programming Guide and Reference*, SC31-6243
- *CallPath Services Programmer's Reference*, SC31-6824
- *Using CallPath SwitchServer/2*, SC34-2406
- *CallPath/400 Programmer's Reference*, SC33-1366
- *CallPath/400 Programming Hints and Techniques*, GG66-3215
- *CallPath Services switch reference manuals*:
 - *CallPath Services Reference for AT&T DEFINITY Generic 3 PBX*, SC38-3058
 - *CallPath Services Reference for AT&T 5ESS CO Switch*, SC30-3558
 - *CallPath Services Reference for NEC APEX/NEAX IMS*, SC18-2302
 - *CallPath Services Reference for Northern Telecom DMS-100 CO Switch*, SC30-3548
 - *CallPath Services Reference for Northern Telecom Meridian 1 PBX*, SC38-3057
 - *CallPath Services Reference for ROLM 9751 CBX Release 9005 or 9006*, SC38-3056
 - *CallPath Services Reference for Siemens Hicom 300*, SC34-2403

E.4 CallCoordinator

- *CallPath CallCoordinator for OS/2 and Windows General Information*, GC22-0074
- *CallPath CallCoordinator/2 System Administrator's Guide*, SC22-0076
- *CallPath CallCoordinator/2 User's Guide*, SC22-0075
- *CallPath CallCoordinator/2 Quick Reference*, SC22-0079
- *CallPath CallCoordinator/2 Server System Administrator's Guide*, SC22-0077
- *CallPath CallCoordinator/2 Archive System Administrator's Guide*, SC22-0078
- *CallPath CallCoordinator/2 Messages*, SC30-3620
- *CallPath CallCoordinator for Windows System Administrator's Guide*, SC31-6255

E.5 Telephony Development Application System (TADS)

To obtain a copy of the following manuals, contact:

IBM Canada Ltd.
 Voice/Data Solutions Centre
 H6/370
 3600 Steeles Avenue East
 Markham, Ontario
 Canada L3R 9Z7
 General Inquiries: +1-905-316-1560

- *Telephony Development Application System General Information Manual Version 3.20*
- *TADS Telephony Server Version 3.20 Administrator's Guide*
- *Telephony Application Development System, Programmer's Guide and Reference Version 3.20*

E.6 Redbooks on CD-ROMs

Redbooks are also available on CD-ROMs. **Order a subscription** and receive updates 2-4 times a year at significant savings.

CD-ROM Title	Subscription Number	Collection Kit Number
System/390 Redbooks Collection	SBOF-7201	SK2T-2177
Networking and Systems Management Redbooks Collection	SBOF-7370	SK2T-6022
Transaction Processing and Data Management Redbook	SBOF-7240	SK2T-8038
AS/400 Redbooks Collection	SBOF-7270	SK2T-2849
RISC System/6000 Redbooks Collection (HTML, BkMgr)	SBOF-7230	SK2T-8040
RISC System/6000 Redbooks Collection (PostScript)	SBOF-7205	SK2T-8041
Application Development Redbooks Collection	SBOF-7290	SK2T-8037
Personal Systems Redbooks Collection (available soon)	SBOF-7250	SK2T-8042

How To Get ITSO Redbooks

This section explains how both customers and IBM employees can find out about ITSO redbooks, CD-ROMs, workshops, and residencies. A form for ordering books and CD-ROMs is also provided.

This information was current at the time of publication, but is continually subject to change. The latest information may be found at URL <http://www.redbooks.ibm.com>.

How IBM Employees Can Get ITSO Redbooks

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- **Tools disks**

To get LIST3820s of redbooks, type one of the following commands:

```
TOOLS SENDTO EHONE4 TOOLS2 REDPRINT GET SG24xxxx PACKAGE
TOOLS SENDTO CANVM2 TOOLS REDPRINT GET SG24xxxx PACKAGE (Canadian users only)
```

To get lists of redbooks:

```
TOOLS SENDTO WTSCPOK TOOLS REDBOOKS GET REDBOOKS CATALOG
TOOLS SENDTO USDIST MKTTOOLS MKTTOOLS GET ITSOCAT TXT
TOOLS SENDTO USDIST MKTTOOLS MKTTOOLS GET LISTSERV PACKAGE
```

To register for information on workshops, residencies, and redbooks:

```
TOOLS SENDTO WTSCPOK TOOLS ZDISK GET ITSOREGI 1996
```

For a list of product area specialists in the ITSO:

```
TOOLS SENDTO WTSCPOK TOOLS ZDISK GET ORGCARD PACKAGE
```

- **Redbooks Home Page on the World Wide Web**
<http://w3.itso.ibm.com/redbooks>
- **IBM Direct Publications Catalog on the World Wide Web**
<http://www.elink.ibm.link.ibm.com/pb1/pb1>

IBM employees may obtain LIST3820s of redbooks from this page.

- **ITSO4USA category on INEWS**
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- **Fax** — send orders to:

United States (toll free)	1-800-445-9269
Canada	1-403-267-4455
Outside North America	(+45) 48 14 2207 (long distance charge)

- **1-800-IBM-4FAX (United States) or (+1) 415 855 43 29 (Outside USA)** — ask for:

Index # 4421 Abstracts of new redbooks
Index # 4422 IBM redbooks
Index # 4420 Redbooks for last six months

- **Direct Services** - send note to softwareshop@vnet.ibm.com

- **On the World Wide Web**

Redbooks Home Page	http://www.redbooks.ibm.com
IBM Direct Publications Catalog	http://www.elink.ibm.link.ibm.com/pbl/pbl

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Glossary

This glossary defines all terms and abbreviations used in this publication that may be new or unfamiliar as well as previously defined terms that you may want to look up.

This glossary includes terms and definitions from the *Dictionary of Computing*, SC20-1699.

The following cross-references are used in this glossary:

Contrast with. — This refers to a term that has an opposed or substantively different meaning.

See. — This refers the reader to multiple-word terms in which this term appears.

See also. — This refers the reader to terms that have a related, but not synonymous, meaning.

Synonym for. — This indicates that the term has the same meaning as a preferred term, which is defined in the glossary.

Acronyms are defined under their expanded form.

action. One of a set of predefined tasks that an application performs. Actions modify the properties of an object or manipulate the object in some way. See also *object*.

action bar. The area at the top of a window that contains choices currently available in the application program that a user is running.

action code. In the Work With Files pop-up window, a number assigned to an action that CallPath SwitchServer/2 performs on the file next to which you type the action code.

activate. To put into an operational state.

adapter. A piece of hardware that connects a computer and an external device.

administrator. See *network administrator*, *system administrator*.

advanced program-to-program communications (APPC). An implementation of the SNA LU 6.2 protocol that allows interconnected systems to communicate and share the processing of programs. See *logical unit 6.2*.

alert. An error message sent to the problem management focal point. See also *problem management focal point*.

alias. A name used to identify a network resource to a domain. Aliases are similar to network names but can be used only through the full-screen interface. See also *network name*.

API. Application program interface.

APPC. Advanced program-to-program communications.

application. A program or set of programs that perform a task, for example, a payroll application.

application program. A program used to connect and communicate with stations in a network, enabling users to perform application-oriented activities. This is sometimes referred to as a program within this book.

application program interface (API). A protocol boundary between an application program and a computer control program. The CallPath Services API consists of program calls that an application program can invoke in order to request functions be performed by the CallPath Services subsystem component of the computer or by a telephone switch. The API also consists of messages that the program can request be sent to it by the switch or by the CallPath Services subsystem.

architecture. See *computer architecture*, *network architecture*, *systems network architecture*.

asynchronous. Pertaining to the lack of regular time relationship; unpredictable with respect to the execution of program instructions. Contrast with *synchronous*.

Automatic Call Distribution (ACD). this telephone system software feature allows a high volume of incoming calls to be distributed efficiently to a group of agents. Most call centers use ACD software or dedicated ACD switches to direct the flow of calls and manage call center resources such as trunks and agent work shifts. Statistics included in ACD offerings are used to determine the volume of calls received,

their duration, number of abandoned, agent activity and related information.

Automatic Number Identification . network carrier offering that provides billing number of an incoming caller to the telephone system receiving the call. If the call is coming from a residence, the billing number and phone number are the same. If the call is being made from a business with a telephone system, the billing number is usually the main number of the telephone system. The individual extension number is not provided.

back up. To copy information onto a diskette or fixed disk for record keeping or recovery purposes.

buffer. A memory area reserved for use in performing input/output operations.

byte. The amount of storage required to represent one character.

Call Center . any department or area of a business which receives or makes large volumes of telephone calls in support of the organization's mission.

Calling Line Identification (CLID) . information passed through the network which supplies the phone number of the actual phone originating an incoming call.

Call Management Application . application which utilizes a CallPath Services Architecture enabler and provides the coding to provide functions such as coordinated voice/data transfer, intelligent answering, preview dialing etc.

CallPath/400. IBM's application enabler for the AS/400 environment; utilizes the CallPath Services Architecture API.

CallPath CallCoordinator CICS/MVS . IBM's call management product for the CICS/MVS environment; requires CallPath CICS/MVS.

CallPath CICS/MVS . IBM's application enabler for the CICS/MVS operating environment; utilizes the CallPath Services Architecture API.

CallPath CICS/VSE . IBM's application enabler for the CICS/VSE operating environment; utilizes the CallPath Services Architecture API.

CallPath Services. An architecture that defines communication between a computer and a telephone switch so that a program on the computer can monitor and influence the actions of the switch. The CallPath Services functions are presented to the

program in the form of an application program interface.

CallPath Services subsystem. The component of the computer control program that supports the CallPath Services application program interface and provides mapping between a CallPath Services program call or message and the protocols supported by a particular switch. See also *program call*.

cancel. (1) To end a task before it is completed. (2) An action that removes the current panel or window without processing it and returns to a previous one.

CBX . computerized branch exchange; the ROLM 9751 CBX is the switch (PBX) manufactured and marketed by ROLM.

CDR (Call Detail Record) . a unit of information created by a switch which contains data about a completed call, such as the time the call began, its duration and date, the originating extension, and the number called.

Central office (CO) switch . A telephone switching system that resides in the telephone service provider's network. There are different types of central office switches, depending upon the role of the switch within the telephone network. Commonly, a central office switch connects customer lines to other customer lines or customer lines to trunks and is the point at which local subscriber lines terminate for switching to other lines or trunks.

CCITT. *Comite Consultatif International Telegraphique et Telephonique.* The International Telegraph and Telephone Consultative Committee.

character. A letter, digit, or other symbol that is used as part of the organization, control, or representation of data.

choice. An item a user can select. Choices appear in selection fields, selection lists, action bars, and pull-downs.

close. To end an activity and remove it from the screen.

command prompt. In OS/2, a displayed symbol, such as C:\, where a user enters commands.

Communications Manager. A component of the OS/2 program that lets a workstation connect to a host computer and use the host resources as well as the

resources of other personal computers to which the workstation is attached, either directly or through a host. Communications Manager provides APIs so that users can develop their own applications.

computer architecture. The organizational structure of a computer system, including hardware and software.

CONFIG.SYS. A file that contains configuration options for an OS/2 program installed on a workstation.

configure. To describe to a system the devices, optional features, and programs installed on the system.

connection. An association established between functional units for conveying information.

context-sensitive help. Synonym for *contextual help*.

contextual help. Information about a field or other display element on which the cursor is positioned that is provided to the user upon request. Synonym for *context-sensitive help*. Contrast with *extended help*.

conversation. (1) A temporary connection between an application program and an APPC session. (2) A connection between two transaction programs over an LU-LU session that allows them to communicate with each other while processing a transaction.

critical event. An event within the CallPath SwitchServer/2 system that causes a NetView alert to be generated and the program to stop.

CSTA. Computer Supported Telecommunications Applications. Term originally used by ECMA to describe its CTI standards activities.

cursor. A symbol displayed on the screen and associated with an input device (for example, a keyboard) used to indicate where input from the device will be placed.

data. The coded representation of information for use in a computer. Data has certain attributes such as type and length.

data file. A collection of user data that is not a program.

deactivate. To take out of an operational state.

dedicate. To assign a system resource, such as an input/output device, a program, or a whole system, to one application or purpose.

default. A value, attribute, or option that is assumed when no option is explicitly specified.

delete. To remove, for example, to delete a file.

delimiter. A character or flag that groups or separates items of data.

device. An input/output unit, such as a terminal, display, or printer.

directory. A list of the files that are stored on a diskette or disk. A directory also contains information about the file size and date of last change.

Dialed Number Identification Service (DNIS) . information passed through the network which supplies the "800" number a caller dialed to reach an organization.

Direct Inward Dialing (DID) . telephone system software feature which allows callers to call directly to a user's phone without going through a switchboard operator.

DirectRoute/2 . IBM's call management product for the PS/2 OS/2 EE Token Ring LAN environment. Provides CallPath-like functions such as intelligent answering and coordinated voice/data transfer. Though not a member of the CallPath family today, IBM has issued a statement of direction that DirectRoute will migrate to CallPath Services Architecture and will run on the CallPath for Workstations platform.

DirectTalk . IBM's voice processing systems available on the PS/2 and RS/6000 platforms. DirectTalk/2 and DirectTalk/6000 provide voice response, host access and other functions.

disk. A magnetic disk unit. See also *diskette*.

diskette. A disk enclosed in a protective container that is removable from the hardware. See *disk*.

display. A visual presentation of data.

domain. A set of transaction programs and servers that allocate shared resources within a single logical system.

domain controller. A communications server that manages communications within a domain and between domains.

drive. The device used to read and write data on disks or diskettes.

dump. To copy data from memory onto an external medium such as a diskette or printer.

Enabler . See CallPath Services Architecture Enable.

ECMA. European Computer Manufacturers Association. Standards body responsible for the development of CSTA.

enter. An action performed by pressing the Enter key. This action causes the computer to receive and process user input.

entry field. A panel element, usually with its boundaries indicated, where a user types information.

error. An unexpected result from a program command or action.

error log. A file that stores error information. See *log*.

Ethernet. A communications protocol in which all stations monitor the cable (the ether) during their own transmission.

exit. An action that ends the current function and returns to a higher-level function. See also *cancel*.

extended help. An action available from Help panels that provides users with current information about the application panel rather than a particular item on the panel. Contrast with *contextual help*.

field. An area in a record or on a panel used to contain data.

field delimiters. Symbols, usually parentheses or brackets, surrounding or within an entry field that indicate the limits of the entry field.

file. A collection of related data that is stored and retrieved by an assigned name.

file name. (1) The name used by a program to identify a file. (2) The portion of the identifying name that precedes the extension.

file name extension. An optional three-letter code that can be used as the second part of an OS/2 file name and that is separated from the file name by a period. Extensions are used to more specifically identify the name of the file.

filespec. The name and location of a file. The format depends upon the storage medium of a file, for example, c:\path\filename.ext.

fixed disk. A flat, circular, nonremovable plate with a surface layer on which data can be stored by magnetic recording.

formatted diskette. A diskette on which track and sector control information has been written. Contrast with *unformatted diskette*.

full-screen mode. A form of screen presentation in which the contents of an entire screen can be displayed at once.

function key. A key that causes a specified sequence of operations to be performed when it is pressed.

function key area. The area at the bottom of a panel that identifies function key assignments that are available on that panel.

Help. A feature that provides assistance and information to the user. See *contextual help* and *extended help*.

help for help. General information about the types of help information available to assist users of an application.

HAT . See Host Access Tables.

Host . as used in this document, host refers to any processor where a customer's business application —

which will be enhanced with CallPath functions — resides.

Host Access Tables . as set of tables containing procedures for interaction between the DirectRoute/2 workstation and the host. When the tables are executed, the actions specified in the tables are carried out on the host.

IBM Token-Ring network. IBM Token-Ring network is a high-speed local area network to which a variety of IBM products can be connected.

initial setting. The value for a profile setting, for example, the selection character, provided by the application when the field is first presented.

input. The information entered into a computer for processing or storage.

input device. A device such as a keyboard in a data processing system through which data can be entered into the system.

installation. The process of placing an application on the fixed disk of a workstation.

interface. (1) A set of verbs used by a program to communicate with another program. (2) A shared boundary between two or more entities. An interface might be a hardware component to link two devices together or it might be a portion of memory or registers accessed by two or more computer programs. See *screen interface*.

integrated services digital network (ISDN). A set of standards that govern access to digital transmission networks. Two standard interfaces have been defined. One is called the *basic rate interface*, and provides for two 64 Kbps channels ("B" channels) that can carry either data or digital voice, and a 16 Kbps D channel for signaling and management. The other interface is called the *primary rate interface*, and consists of twenty-three 64 Kbps B channels (30 in Europe) that can carry either data or digital voice, and a 64 Kbps D channel for signaling and management.

ISDN. Integrated services digital network.

KB. Kilobyte.

keyboard. A systematic arrangement of keys by which a machine is operated or by which data is entered.

keys help. An action in help panels that gives users a listing of the key assignments for the current application.

kilobyte (KB). A term meaning 1024 bytes.

load. (1) To move data or programs into memory. (2) To place a diskette into a disk drive.

local. Pertaining to a system or device accessed directly without use of a telecommunications line. Contrast with *remote*.

local workstation. A workstation that is connected directly to a system without the need for data transmission facilities. Contrast with *remote workstation*.

lock. In CallPath SwitchServer/2, a means of preventing unauthorized access to the application without preventing access to other applications.

log. To record, for example, to log all event messages to the system events buffer.

logging on. See *login*.

logical unit (LU). In SNA, a port through which a user accesses the SNA network to communicate with another user and through which users can access the functions provided by system services control points.

logical unit 6.2 (LU 6.2). A particular type of SNA LU that provides a connection between resources and transaction programs running on different network nodes. See also *advanced program-to-program communications (APPC)*.

logical unit profile. A set of parameters that define a local and partner LU.

login. The process that allows a user to access the system.

LU. Logical unit.

MB. Megabyte.

megabyte. A term meaning 1 048 576 bytes.

memory. (1) The storage on electronic chips, for example, random access memory or read-only memory. (2) Program-addressable storage from which instructions and other data can be loaded directly into registers for subsequent execution or processing. See also *storage*.

memory allocation. An operating system function that assigns memory areas to tasks. Synonym for *storage allocation*.

menu. (1) A displayed list of items from which a user can make a selection. (2) A displayed list of available machine functions from which a user can make a selection.

message. (1) The information that the computer presents to a user in response to a user action or internal process. (2) Information that originates in a switch or is generated by the CallPath Services subsystem. The CallPath Services subsystem translates the information, if necessary, into a message format defined by CallPath Services before presenting the message to a program.

More. See also *scrolling arrows*.

multiple selection list. A type of selection field that allows users to select more than one choice.

NAU. Network addressable unit.

network. A configuration of data processing devices and software connected for information interchange.

network address. An address, consisting of subarea and element fields, that identifies a link, a link station, or a network addressable unit.

network addressable unit (NAU). In SNA, a logical unit, physical unit, or system services control point. An NAU is the origin or destination of information transmitted through the path control network. See also *network name*.

network administrator. The person responsible for the installation, management, control, and

configuration of a network. The network administrator defines the resources to be shared and user access to the shared resources, and determines the type of access those users can have.

network architecture. The logical structure and operating principles of a computer network. See *Systems Network Architecture*.

network name. In SNA, a symbolic name by which users refer to an NAU, a link station, or a link. See *network addressable unit*.

node. Any machine in a network, for example, a communications controller.

object. Anything that you can modify or manipulate through the screen interface by selecting an action to perform on the object. See also *action*.

online. (1) Pertaining to a user's ability to interact with a computer. A description of a user's access to a computer by means of a screen. (2) Pertaining to the operation of a functional unit that is under the continuous control of a computer.

operating system. The software that controls the running of programs. An operating system may provide services such as resource allocation, input/output control, and data management.

operation. A program step performed by a computer.

option. A selectable item on an action bar.

panel. A particular arrangement of information grouped together for presentation on the screen to the user. See also *window*.

password. A unique string of characters that a program, computer operator, or user must supply to fulfill security requirements before gaining access to data.

PBX. Private branch exchange.

pop-up window. A bordered area of the screen that supplements the primary window.

private branch exchange (PBX). A switching system located on a customer's premises that concentrates the number of inside (extension) lines into a smaller number of outside lines (trunks). Many PBXs also provide advanced voice and data communication features.

Private Automatic Branch Exchange (PABX) . a telephone system connected to and from the public telephone network. Similar to a PBX but with a greater degree of automation. Commonly referred to as "telephone system".

problem determination. The process of determining the source of a problem.

problem management focal point. A node in a network that supplies management services for problem analysis and diagnosis for a sphere of control. A problem management focal point is a node where alerts are processed by a program to provide network status information. See also *alert*, *node*.

profile. (1) An object that contains information about the characteristics of a computer system or application. (2) In Communications Manager, a part of a configuration file.

program call. The means by which a program requests a CallPath Services function.

prompt. A displayed message that requests input from the user or gives operational information.

protocol. The set of rules governing the operation of functional units of a communication system that must be followed for communication to take place.

PSTN. Public Switched Telephone Network. The telephone network to which private telephones, PABXs, ACDs and key systems are connected.

pull-down. An extension of the action bar that displays a list of one or more choices that are available for a selected action bar choice.

PWSCS. See *Virtual Machine Programmable Workstation Communication Services*.

QuickKeys . Combinations of two keys set by the system administrator that provide a shortcut to the user in selecting a host function from a DirectRoute/2 workstation.

RAM. Random access memory.

random access. An access mode in which records can be read from, written to, or removed from a file in any order.

random access memory (RAM). A memory device into which data is entered and from which data is retrieved in a nonsequential manner.

read-only. A type of access to data that allows it to be read but not copied, printed, or modified. See also *write-protected*. Contrast with *write-enabled*.

remote. (1) Pertaining to a system, program, or device that is accessed through a telecommunication line. (2) In APPC, indicates that the partner logical unit or transaction program is not at the local node.

remote workstation. A workstation that is indirectly connected to the system and needs data transmission facilities. Contrast with *local workstation*.

request. In SNA, a message unit that signals initiation of an action or protocol.

requester. The name given to a workstation containing a user program that requests a resource. Contrast with *server*.

request unit (RU). A message unit that contains control information, for example, a request code. Synonym for *request*.

RU. Request unit.

run. To cause a program, object, utility, or other machine function to be performed.

save. To retain a copy for future use while continuing operations.

SCAI. Switch Computer Applications Interface. Term used by ANSI to describe its CTI standards activities.

screen. The physical surface of a display device upon which information is presented to the user. See also *panel* and *screen interface*.

screen interface. The display device that allows a user to interact with and perform operations on a system, program, or device.

scroll. To move all or part of a display image vertically or horizontally so new data is displayed at one edge as preceding data is no longer displayed at the opposite edge.

scrolling arrows. (1) A type of scrolling information used on character screens. Scrolling arrows consist of the word *More* followed by symbols indicating the direction in which more information is available. (2) The left, right, upward, and downward arrow keys, which the user can press to display new data to the left, right, top, or bottom of the current display image.

SDLC. Synchronous Data Link Control.

select. To choose an item in a panel, action bar, or menu.

selection field. A field containing a list of choices from which the user can make one or more selections.

server. The general name for a workstation that provides a service for a requesting workstation. Contrast with *requester*.

service data. In CallPath SwitchServer/2, data that CallPath SwitchServer/2 collects while it is running, for example, traffic, performance, and system messages data.

session. A logical connection between two stations or NAUs that allows them to communicate.

session limit. In SNA, the maximum number of concurrently active LU—LU sessions a particular LU can support.

shutdown. The procedure required before the computer is switched off to ensure that data and configuration information is not lost.

SNA. Systems network Architecture.

SNA network. The part of the user application network that conforms to the formats and protocols of SNA. It enables reliable transfer of data among users

and provides protocols for controlling the resources of various network configurations. The SNA network consists of NAUs, boundary function components, and the path control network.

SSCP. System services control point.

STARTUP.CMD. A command file that contains the startup options for an OS/2 program.

storage. A media used to save information, such as a fixed disk. See also *memory*.

storage allocation. Synonym for *memory allocation*.

subdirectory. A directory contained within another directory in a file system hierarchy.

switch. Equipment that makes, breaks, or changes the connections between telephone lines in order to establish, terminate, or change a telephone call. Private branch exchange switches reside on a customer's premises, whereas central office switches reside within the telephone service provider's network.

synchronous. Pertaining to two or more processes that depend upon the occurrences of specific events such as a common timing signal. Contrast with *asynchronous*.

Synchronous Data Link Control (SDLC). A communications protocol for managing synchronous, code-transparent, serial-by-bit information transfer over a link connection. Transmission exchanges can be duplex or half-duplex, over switched or nonswitched links.

system. A computer and its associated devices and programs. See also *workstation*.

system administrator..

(1) In CallPath SwitchServer/2, the person responsible for configuring the system, monitoring traffic, maintaining data files, and determining and isolating problems.

(2) In Communications Manager, the person responsible for installing, configuring, and setting up local communications networks, and ensuring the proper use of Communications Manager on all supported hardware.

system services control point (SSCP). In SNA, a control point in a host node that provides network services for dependent nodes.

Systems Network Architecture. The description of the logical structure, formats, protocols, and operational sequences for transmitting information units through the networks and also the operational sequences for controlling the configuration and operation of networks.

task. A set of one or more sequences of instructions treated by a control program as an element of work to be accomplished.

telephone switch. See *switch*.

telephony. The use or operation of systems for the transmission of voice or data communication between separate points.

terminal. In data communication, a device, usually equipped with a keyboard and display screen, capable of sending and receiving information.

Token-Ring network. See *IBM Token-Ring network*.

TP. Transaction program.

trace. A record of data that provides a history of events that occurred in a system.

transaction. In Communications Manager, an exchange between a workstation and a program, between two workstations, or between two programs that accomplishes a particular action or result.

transaction program (TP). A program that uses the APPC API to communicate with a partner application program at a remote node.

transmit time. The time taken by CallPath SwitchServer/2 to process a message.

unformatted diskette. A diskette that contains no data and no track or sector format information. Contrast with *formatted diskette*.

user interface. The hardware, software, or both that allows a user to interact with and perform operations on a system, program, or device. See *interface*.

verb. An API command.

Versit. From the word "diversity", Versit is a initiative founded by Apple Computer, AT&T, IBM and Siemens to promote interoperability while preserving freedom of equipment choice.

Communication Services (VM PWSCS)

Virtual Machine Programmable Workstation. An IBM product that enables communications between CallPath SwitchServer/2 and certain CallPath Services hosts.

VM PWSCS. Virtual Machine Programmable Workstation Communication Services.

voice response unit (VRU). Hardware or software, or both, that fields incoming calls by playing one or more prerecorded messages. The messages may require the caller to provide additional information by pressing buttons on a touch-tone telephone keypad. The sequence of messages played may be determined dynamically by this additional input.

VRU. Voice response unit.

window. An area of the screen with visible boundaries, through which panel information is displayed. See also *panel*.

window title. A title that identifies a window and associates it with an application.

workstation. A terminal or personal computer, usually connected to a mainframe or within a network, at which a user can run applications. See also *system*.

wrap. A condition that occurs when a file or buffer is full and new data overlays existing data, causing the loss of existing data.

write-enabled. The condition that allows a file or memory area to be written into. Contrast with *write-protected*.

write-protected. The condition that restricts a file or memory area from being written into by a user or a

program not authorized to do so. See also *read only*. Contrast with *write-enabled*.

X.25. In data communication, a recommendation of the CCITT that defines the interface between data terminal equipment and packet switching networks.

X.25 network. A service that provides packet-switched data transmission that conforms to Recommendation X.25 adopted by the CCITT.

Abbreviations

ABBREVIATION	MEANING		
ACD	Automatic Call Distribution	IDNX	Integrated Digital Network Exchange
ANI	Automatic Number Identification	LHP	Log History Process
API	Application Programming Interface	LAN	Local Area Network
CBX	Computerized Branch Exchange	LWX	LAN/WAN Exchange
CICS	Customer Information Control System	MIS	Management Information System
CSTA	Computer Supported Telecommunications Applications	MRO	MultiRegion Operation
DNIS	Dialed Number Identification Service	PBX	Private Branch Exchange
ECMA	European Computer Manufacturers Association	PSTN	Public Switched Telephone Network
HAT	Host Access Table	SCAI	Switch Computer Applications Interface
		VPU	Voice Processing Unit
		VRU	Voice Response Unit
		VSAM	Virtual Storage Access Method
		VTAM	Virtual Telecommunication Access Method
		WAN	Wide Area Network

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