Lucent Technologies
Bell Labs Innovations

MERLIN LEGEND® Communications System Application Notes

The Internet Connection (Single-User Access)

ABSTRACT:

These application notes describe how to install and configure the Ascend Pipeline™ 25-Px with a MERLIN LEGEND Communications System, Release 4.0 or later to provide Internet access for a single PC. The Pipeline 25-Px enables a single user to have high-speed Internet access (that is, speeds up to 128 Kbps) over a digital facility (for example, ISDN NI-BRI or AT&T Custom PRI) on the MERLIN LEGEND system.

These application notes are intended for Lucent Technologies' internal support personnel. The information in these application notes applies specifically to Release 4.0 or later of MERLIN LEGEND Communications System.

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Table of Contents

Hardware Requirements

To use the Ascend Pipeline 25-Px, you must have the following hardware:

• a MERLIN LEGEND Communications System, Release 4.0 or later that has ISDN NI-BRI or AT&T Custom PRI facilities and an available MLX port

• a PC (running Windows® 3.x, Windows 95, or Windows NT), Macintosh, or UNIX® workstation that has a 10Base-T Ethernet network interface card and a serial communications port capable of transmitting data at 9600 bits per second

Software Requirements

The following software must be installed on the user's PC, Macintosh, or UNIX workstation:

• TCP/IP

 NOTE:
 TCP/IP is automatically provided with Windows 95. If you have a PC running Windows 3.x, a Macintosh, or a UNIX workstation, you must install TCP/IP software.

• Internet tools (for example, browser, email, and ftp) usually provided by your Internet service provider

Internet Service Provider Requirements

The user must have an Internet account (that is, a residential or consumer account) that dynamically assigns an IP address on each call. The Internet service provider will provide the following information to the user:

• the domain name server (s) (DNS). (Otherwise, the user should set the software to accept the DNS dynamically.)

• the account name or ID

• the account password

• the type of password authentication protocol used

• the dial access numbers for the Internet service provider

Pipeline 25-Px Components

This product (model # P25-1S-PX) consists of the following components:

• a Pipeline 25-Px that provides an S interface

• a 10Base-T Ethernet crossover cable that connects the Pipeline 25-Px to the network access card in the user's PC

• an RJ-48C ISDN cable that connects the Pipeline 25-Px to the MLX jack on the MERLIN LEGEND system

• a DB-9 to DB-25 serial cable adapter for use when connecting the Control port on the Pipeline 25-Px to a serial port on a PC. (This cable is used to administer to the Pipeline 25-Px.)

• a power supply

- a user's guide

Overview

The Pipeline 25-Px allows an Internet service provider to dynamically assign an IP address to the device. This capability enables the Pipeline 25-Px to be used on standard consumer Internet access accounts, which are considerably less expensive than business accounts or local area network (LAN) access. However, the Pipeline 25-Px only connects one user to the account. Because the Pipeline 25-Px can only make outgoing calls, it cannot connect a world-wide web (WWW) server to the Internet or perform other server-side applications.

To support the Pipeline 25-Px, the MERLIN LEGEND system must have an ISDN facility. If the MERLIN LEGEND system does not have an ISDN facility, the customer can add a single BRI facility to the MERLIN LEGEND system and use the two "B channels" as lines for both Internet access and regular voice lines. To add a BRI facility to the MERLIN LEGEND system, the customer must add an ISDN NI-BRI module, which provides eight ports. The BRI facility connects to one port on this module. If the MERLIN LEGEND system already has a PRI facility, the customer can use one of the channels on the existing ISDN facility rather than adding a BRI facility.

The Pipeline 25-Px connects to the network card in a PC that has Internet software and an account with an Internet service provider. The Pipeline 25-Px connects to an MLX port that can access an ISDN facility on the MERLIN LEGEND system. Figure 1 shows how the Pipeline 25-Px connects to the PC and the MERLIN LEGEND system.
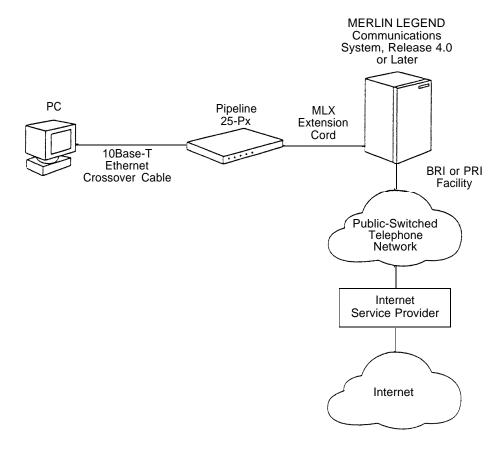
Figure 1. Diagram of a Pipeline 25-Px with a MERLIN LEGEND Communications System.

The maximum speed of the connection between the Pipeline 25-Px and the Internet service provider depends on the number of B channels used by the MERLIN LEGEND system and the speed of the ISDN service provided by your local telephone company. The maximum speed for one B channel on a BRI or PRI facility may be 56 or 64 Kbps depending on the service provided by your local telephone company. The maximum speed for two B channels on a BRI or PRI facility may be 112 or 128 Kbps.

One Pipeline 25-Px enables Internet access for one PC. If the customer wants Internet access for multiple PCs, the customer must purchase one Pipeline 25-Px for each PC. Multiple PCs can share a smaller number of ISDN facilities for Internet access, similar to how multiple users share facilities for voice calls.

Customers can also use the Pipeline 25-Px in applications that require a user to dial into a server located on a remote LAN. An example of such an application is a user at a branch site accessing information on a server on the main-site LAN. In this example, the Pipeline 25-Px would be located at the remote site and would be used to dial into the server located on the main site LAN (that is, the far-end device). The far-end device must be able to terminate a digital connection and establish a connection with the Pipeline 25-Px using the industry-standard Point-to-Point Protocol (PPP) and/or Multichannel PPP (MP) and dynamically assign an IP address to the Pipeline 25-Px. Examples of such a far-end device area remote node LAN access server (such as those used by Internet service providers) and an ISDN router capable of answering incoming calls.

For more technical information about the Pipeline 25-Px, see the Ascend home page at *www.ascend.com.*

Installation and Administration

You must administer the MERLIN LEGEND system, install and administer the Pipeline 25-Px, and configure the PC.

Administer the MERLIN LEGEND System

To administer the MERLIN LEGEND system:

1. Program the MLX adjunct port to **2bData.**

2. Assign the ISDN facilities to the extension to which the Pipeline 25-Px is connected. These facilities may also be assigned to other extensions to allow for the sharing of lines with voice calls. You can assign access to ISDN facilities in the following ways:

   - direct facility termination

   - dial access to pools

   - Automatic Route Selection (ARS)

     NOTE:
     - You cannot use direct facility terminations (DFTs) if the user wants to access both B channels since Pipeline uses the same dial prefix for each of the two calls made on the two B channels.

     - Make sure you assign to the extension the appropriate dial access to the pool.

     - If ARS is used, either all lines on the MERLIN LEGEND system must be capable of carrying data traffic (for example, all lines are BRI) or ARS is set up to route data calls to data-capable facilities.

3. If PRI facilities are used, administer a data-capable service (for example, SDN or Accunet®) for the lines that the Pipeline 25-Px will use and make sure the PRI is provisioned for the corresponding service from the local telephone company.

Install and Administer the Pipeline 25-Px

To install and administer the Pipeline 25-Px:

1. Install the Pipeline 25-Px as described in the Chapter 2 of the *Ascend Pipeline 25-Px User's Guide.*

   NOTE:
   Do not connect any telephones or data devices (for example, fax machines or modems) into the PHONE 1 or PHONE 2 jacks on the Pipeline 25-Px. These jacks are not supported in this configuration.

2. Refer to Chapter 3 of the *Ascend Pipeline 25-Px User's Guide* and set the following options on the Pipeline 25-Px:

   - Set "Dial #" to the telephone number the Pipeline 25-Px must dial to access the Internet service provider. If the Pipeline 25-Px must dial a code to select the ISDN facility on the MERLIN LEGEND system (that is, a pool access code for pooled lines, a specific line number, or the ARS selection mode), enter the code in front of the telephone number for the Internet service provider.

   - Set the "Switch Type" to **AT&T Point to Point (P-T-P).**

- Set the "Data Svc" to **56K** or **64K.** (This value depends on the speed of the ISDN service available from your local telephone company.)

- Set "My Name" to the account name provided by the Internet service provider (that is, your login ID).

- Set "Send Auth" to the authentication protocol provided by the Internet service provider.

- Set "Send PW" to the account password provided by the Internet service provider.

Configure the PC

To configure the PC:

1. Administer TCP/IP on the PC. You must administer the following TCP/IP settings:

   - Set the IP assignment to "static."

   - Set the IP address. The PC must be on the same subnet as the Pipeline 25-Px. To ensure that the addresses of the Pipeline 25-Px and PC are compatible (that is, on the same subnet), make the last digit of the last number of the IP address different by only one. (Each set of four numbers that comprise the IP address must be greater than 100.) For example, the Pipeline 25-Px default IP address is 100.222.111.101, so set the PC IP address to 100.222.111.102.

   - Set the subnet mask so that the two addresses will be on the same subnet (for example, 255.255.255.0).

   - Set the Gateway to the IP address of the Pipeline 25-Px. (The Pipeline 25-Px acts as the Gateway to the Internet service provider.)

   - Enter the DNS information provided by the Internet service provider.

2. Install the Internet software. For "Host," you can enter the Internet account name (that is, login ID).

   NOTE:
   Make sure you do not re-administer the TCP/IP setting information, which was set in step 1.

Troubleshooting

Problem 1: You cannot connect to the Internet service provider.

You may be experiencing network busy or Internet service provider port busy.

Check the WAN light on the front of the Pipeline 25-Px to monitor the existence of a dialed connection. The WAN light comes on when the Pipeline 25-Px attempts to dial a call. If the call connects successfully, the WAN light stays on until the call is disconnected. If the call fails to complete, the light goes out when the call attempt is abandoned. When the call failed to complete because of a network or Internet service provider port busy, the length of time that the WAN light was on was approximately 5 seconds or less.

The WAN LED remaining on briefly (5 seconds or less) indicates that there are redial attempts, which are probably caused by either a network or an Internet service provider port busy. The WAN LED remaining on (20 seconds or more) indicates a working dialed connection to the Internet service provider.

Problem 2: The call keeps dropping during a session.

Try increasing the "Idle" setting in the Pipeline 25-Px. By default, "Idle" is set to 120 seconds.

Problem 3: After you log onto the Internet account, the first page displayed appears completely, but the status indicator shows that the page is not displayed completely.

After approximately 30 seconds, check to see that the "act" (activity) LED on the front of the Pipeline 25-Px is blinking, indicating Ethernet traffic. If the "act" LED is not blinking, cause the Internet software to send an Ethernet packet before the Pipeline 25-Px's 2-minute Idle timeout disconnects the call. For example, click the Stop button and then the Reload button in your Internet browser.

Problem 4: The call completes for a few seconds and then disconnects.

Verify the settings for "Send Auth" and "Send PW" on the Pipeline 25-Px.

Problem 5: After you launch the Internet software, the Pipeline 25-Px WAN LED blinks on briefly a number of times (implying that redials are being performed to overcome a busy condition), the WAN LED then remains on, and your Internet software displays an error message that the server does not have a DNS entry.

Click the OK button and then click the Home button in your Internet browser.

Glossary

Domain Name Server - A server on the Internet sued to map host names, such as *www.lucent.com,* to host IP addresses, such as 101.101.101.101. A lookup in the server is required each time a new host is accessed.

IP Address - A numerical address that uniquely identifies each computer on the Internet. The IP address consists of four numbers (between 0 and 255) separated by periods.

MP - Multichannel PPP.

Multichannel PPP - A variation of PPP that allows connections using multiple B channels as a single, larger channel.

Point-to-Point Protocol - A protocol for TCP/IP routers and PCs to communicate over dial-up and leased-line WAN connections using TCP/IP connections.

PPP - Point-to-Point Protocol.

Subnet Mask - To facilitate intra-network routing, a single IP network can be divided into many subnets by using some of the MS bits of the host address portion of the IP address as a subnet ID.

TCP/IP - A communications protocol used to internetwork computers. This is the protocol used on the Internet and in many enterprise networks.