

TechSmith<sup>®</sup> Foray<sup>™</sup> PPPxe "PPP"§ Server  
Installation and Reference Guide

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Manual version 2.80 1/29/2023

RSA Data Security, Inc. MD5 Message-Digest Algorithm

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## PREFACE

# Using This Manual

Welcome to the TechSmith® Foray™ PPP Server Installation and Reference Guide. This guide is intended for network administrators and others who will be installing, configuring and operating a Foray PPP Server. We recommend that you review chapters 1 and 2 carefully before you install and configure your server.

The instructions in this guide assume that you are familiar with basic DOS operating system commands, and that you know how to use a text editor to edit configuration files (such as CONFIG.SYS). Some of the installation instructions also assume that you can install a network interface card or other adapter board in your PC.

For your convenience, we have also included a README.1ST file in your Foray PPP Server software bundle. README.1ST contains information about the Foray software package, it reviews the minimum server hardware and software requirements and provides a “Quick Start” installation information checklist for your convenience. It lists those items of information that you will need during the installation process. We recommend printing and completing this list prior to performing the install.

We would also like to suggest that you check our Web site at <http://www.techsmith.com> or our FTP site at <ftp.techsmith.com> for the most recent version of this software.

## Chapter Summaries

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This guide contains the following chapters. Each chapter begins with a brief summary and a table of contents for the topics covered in that chapter. We have also included a comprehensive index at the end of the guide for your convenience.

### **Preface**      **Using this Manual**

This opening section provides a brief overview of the manual’s content and conventions, your Technical Support alternatives and information regarding product evaluation and registration.

### **Chapter 1**   **Foray PPP Server Introduction**

This chapter will assist you in getting to know your Foray PPP Server. It provides an overview of the server's hardware, software

and functionality features.

**Chapter 2 Installing the Foray PPP Server**

This chapter begins with a review of the hardware and software requirements for a successful installation. It then covers the gathering of key network and site information and concludes with the actual installation process.

**Chapter 3 User Authentication & Callback**

Maintaining the security of your network's information is a top priority. In this chapter we explain how to use the Security and User Admin options to configure your Foray PPP Server to provide CHAP, PAP, Novell NetWare authentication and user callback.

**Chapter 4 Server Software Licensing & Validation**

This chapter will provide you with the information you need to register your software. It also explains how to use your Registration Key to enable additional ports on your server.

**Chapter 5 Foray PPP Server Operation**

This chapter reviews the operational and administrative features of your server. These include an explanation of the console display, descriptions of the various runtime commands, and the purpose and location of your log files.

**Chapter 6 Foray PPP Server Advanced Configuration Options**

Your server has many configuration options that can be used to tailor its abilities to your environment. Many of these are contained in the ACS.INI file. The ACS.INI options and their impact are discussed here.

**Chapter 7 Foray PPP Server Run-Time Messages**

Your Foray PPP Server provides constant status messages on its operation. This chapter contains a directory of the Foray PPP Server system messages and their meanings.

**Appendix A The 4 Port Serial Card**

The 4 Port Serial Card allows your server to expand its capabilities. This appendix provides a guide to the installation of your 4 Port Serial Card.

**Appendix B The DigiBoard Xem System**

The DigiBoard Xem System expands your server's capacity to 8, 16, 24 or 32 ports. An overview of the installation, complete with hints and tips, is provided in this appendix.

## Index

### Conventions "Conventions:Used in the Manual"§

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For ease of use and clarity, this manual uses the following conventions:

- File names, directory names, and acronyms appear in upper case (e.g., AUTOEXEC.BAT).
- If you are required to press keyboard keys, they will appear in small caps. "ENTER", for example, means that you press the enter key.
- Whenever a plus sign (+) is used between key names, you should press the keys at the same time. For example, "Press CTRL+C" means that you press the ctrl key and hold it down while you press the c key.
- A comma (,) between key names means that you must press the keys in sequence. "Press Y, RETURN" means that you press the Y key and release it, then press RETURN.
- Commands that you would have to type are shown in Courier 10 point text. These might be command names, switches, or any other text you enter from your keyboard. The text should be entered exactly as it appears in the documentation. To perform a command, type the command name and then press the enter key.
- Variable information appears in *italics*. For example, if you are asked to enter a parameter that calls for a *filename*, you must type the name of a file. System message explanations often include a value of "*nnnn*", where "*nnnn*" is a number; or "*xxxx*" where "*xxxx*" is a text string.
- Occasionally, the syntax of a command will allow you to make mutually exclusive choices. These are enclosed in parentheses, separated from each other by a vertical bar or pipe symbol (|). To enter the optional information, type only your choice, not the parentheses or pipe symbol. For example:

diag = (0|1)

means that you enter either:

diag = 0 or diag = 1

- Examples of actual files are listed in Courier 8 point.
- Throughout this manual, references to Micro Channel Architecture bus PCs will be abbreviated to "MCAxe "MCA"§". References to Industry Standard (AT) Architecture bus PCs will be abbreviated "ISA".



## Foray PPPxe "PPP"§ Server Technical Supportxe "Technical Support:Contacting"§

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If you need help installing or operating Foray PPPxe "PPP"§ Server, we suggest the following process.

- First, visit our Web and FTP sites. It is very possible that our Technical Support staff has come across a similar problem before and has documented a process for resolving it. Both sites contain FAQ documents, White Paper publications and product support notes. We can be found at:

Internet web site: <http://www.techsmith.com>  
"http://www.techsmith.com"§

FTP site: <ftp.techsmith.com>

- If you still require technical assistance, use the SUPPORT.TXTxe "SUPPORT.TXT"§ file in this bundle to document your problem. You can then forward your problem to us either by e-mail or FAX at:

E-Mail: [foray@techsmith.com](mailto:foray@techsmith.com)

FAX: (517) 333-1888

## Product Updatesxe "Product Updates"§

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TechSmith is constantly updating its products and its product information. The latest versions of our electronically distributed products and product information can be found at our Web and FTP sites.

Internet web site: <http://www.techsmith.com>  
"http://www.techsmith.com"§

FTP site: <ftp.techsmith.com>

Evaluation copies of our products are also available from most popular online information services, including CompuServexe "CompuServe"§, America OnLinexe "America OnLine"§ and others.

## Product Evaluationxe "Product Evaluation"§, Registrationxe "Registration"§ and Ordering

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The Foray PPPxe "PPP"§ Server product is available for evaluation as an electronically distributed single port fully functional software package. You may evaluate the software for 30 days. To continue using the product after 30 days you must purchase a license.

To purchase a software license "software license" which will enable your one port evaluation copy to become a registered version, use the included order form ORDER.TXT "ORDER.TXT". Submit your order to us at one of the following locations:

E-mail: foray@techsmith.com "foray@techsmith.com"

FAX: (517) 333-1888

Mail: TechSmith Corporation "TechSmith Corporation"  
PO Box 4758  
East Lansing, MI 48826-4758

Internet web site: <http://www.techsmith.com>  
"http://www.techsmith.com"

To obtain further information about site, multi-server and OEM licenses contact us by e-mail at foray@techsmith.com "foray@techsmith.com".

## Chapter 1

# Introduction to the Foray PPPxe "PPP"§ Serverxe "Foray PPP Server:Introduction"§

Compatibility and security are key considerations in expanding the availability of your network's resources. Your Foray PPPxe "PPP"§ Server incorporates many features that will enable you to create the best solution for your environment. This chapter provides an overview of the product and its features. It also covers the minimum requirements for a successful installation.

Foray PPPxe "PPP"§ is a secure server-based solution for your remote accessxe "remote access"§ needs. It uses the Internet community's Point-to-Point Protocol (PPP) and provides support for both the Internet Protocol (IPxe "IP"§) and Novellxe "Novell"§'s IPXxe "IPX"§ protocol. Foray PPP Server will enable your employees, customers and consultants, using remote workstations, to dial in over standard telephone lines and gain access to corporate Internet links and other LAN resources.

### Topics

**Foray PPPxe "PPP"§ Server Features**  
**Page 2**

**Foray PPPxe "PPP"§ Server Requirements**  
**Page 3**

## Foray PPP Server Features

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The Foray PPP Server will support your efforts to expand the accessibility of your TCP/IP and IPX network resources with the following features.

### Remote Access Security

- Optional user authentication using PAP, CHAP or an existing Novell NetWare authentication server.
- Optional user callback available with Microsoft Windows 95, Windows NT 3.51 and Foray PPP Client.

### Remote Access

- Support of the following PPP protocols: LCP, PAP, CHAP, IPCP, IP, IPXCP, IPX, CBCP.
- Support of forced dynamic assignment of IP addresses during IPCP negotiation.

### Supported Features

- 1 - 4 port configurations using serial cards with 16550 UARTs. Slower 16450 and 8250 UARTs are also supported at reduced speeds.
- 8, 16, 24 and 32 port versions using Digiboard Xem intelligent communication cards.
- Van Jacobson TCP header compression and IPX header compression for enhanced performance over dial-up lines.
- DNS address assignment for Windows 95 and Windows NT.
- Proxy ARP and either proxy or passthru BootP.
- Optional IP broadcast passthru for RFC netbios.
- Most standard PPP TCP/IP workstation packages.

Tested workstation packages for PCs include Frontier's Super TCP, FTP's PC TCP, Novell's Lan Workplace for DOS, Spry's Internet in a Box,

Netmanage's Chameleon, Trumpetxe "Trumpet"§, Windows 95xe "Windows 95"§ and Windows NTxe "Windows NT"§ and IBM's OS/2 Warp.

Tested packages for the Macintoshxe "Macintosh"§ include Merits MacPPP and Internet Valet.

See CLIENTS.TXT for more information on supported software packages.

- IPXxe "IPX"§ support using Windows 95xe "Windows 95"§, Windows NTxe "Windows NT"§ and their native drivers. TechSmith also offers an optional Foray PPPxe "PPP"§ Clientxe "Foray PPP Client"§ workstation driver for both Windows 3.1xe "Windows 3.1"§ and Windows for Workgroups 3.11xe "Windows for Workgroups 3.11"§. See CLIENTS.TXT for additional information on configuring several of the supported Client workstation drivers.
- Administrative support software including a passwordxe "password"§ file maintenance utility, serial port analyzer and an installation and configuration utility.

## Foray PPPxe "PPP"§ Serverxe "Foray PPP Server:Requirements"§ Requirements

To ensure a successful implementation, we recommend the following minimum requirements for your Foray PPPxe "PPP"§ Server.

- For a standard 1, 4 or 8 port configuration, a dedicated IBM PC-compatible microcomputer, with either an Industry Standard Architecture (ISAx "ISA"§) bus or a Micro-Channel Architecture (MCAX "MCA"§) bus. The minimum CPU requirement is a 386DX 40 MHz. The Foray PPPxe "PPP"§ Server software will require additional processing power as additional port configurations are added.
- MS DOSxe "MS DOS"§ or PC DOS 5.0xe "PC DOS 5.0"§ or above. Foray PPPxe "PPP"§ Server does not support alternative operating systems such as DR-DOSxe "DR-DOS"§.

We also recommend that you not use any command shellxe "command shell"§ other than COMMAND.COMxe "COMMAND.COM"§, including NDOS.COMxe "NDOS.COM"§, 4DOS.COMxe "4DOS.COM"§, or other command shell replacements or enhancers.

- 10 MB of free disk drive spacexe "disk drive space"§ for ongoing connection activity and storage of diagnostic logs.
- 1MB of RAMxe "RAM:required"§ is required for the 1, 2 and 4 port configurations. 2 MB is required for the 8, 16, 24 and 32 port versions.
- 16550xe "16550"§ UART ports are suggested for best performance. Foray

PPP Server will support older 16450 UARTs and 8250 UARTs, but at reduced speeds.

- A 16-bit, 32-bit or PCI network interface card (NIC) and a DOS ODI device driver.
- A modem for each port. 14.4Kb V.32bis or 28.8 V.34 high speed modems are supported and recommended. We have tested and developed Foray PPP Server strings for a variety of modem models.

Some modems use DIP switches for setting certain modes. If your modem uses DIP switches, you will need to refer to your modem manual to determine the settings that correspond to the commands listed below.

Foray PPP Servers require the following modem configuration:

- Factory settings loaded (usually command &F). Issue this command first, to reset the modem's default settings.
- Off-line echo deactivated (usually command E0).
- DCD (Data Carrier Detect) reflects true status of carrier (usually command &C1).
- DSR (Data Set Ready) always on while modem is powered up (usually command &S0).
- Track DTR (Data Terminal Ready). When the DTR line turns off, the modem hangs up the phone line and switches to the command mode (usually command &D2).
- Bps rate adjustment disabled (command varies by modem). This causes the modem to maintain the computer-to-modem bps rate even if the modem-to-modem connection is at a lower bps rate.
- Bidirectional RTS/CTS (Request To Send/Clear To Send) flow control enabled (command varies by modem).
- Enabling “verbose result codes” mode will cause the modem to return connection information, including baud rate and error correction/data compression protocol (command varies by modem). This is particularly useful in diagnosing connection problems.
- Auto-answer must be off (usually the default).
- Auto-reliable enabled. This will cause the modem to attempt to establish the most reliable connection it can (command varies by modem).

Note: Many modems are described as “Hayes compatible”

"Hayes compatible"§". This generally means that the modemxe "modem"§ supports the Hayes Smartmodem 1200 command set. That command set does not include performance enhancements like hardware flow control, error correction, or compression. It is common for the commands for flow control and error correction on "Hayes compatible" modems from other manufacturers to differ from those used by the modems Hayes currently produces. Our strings for Hayes modems depend on the default setup of the specific model. Generally, you cannot use a Hayes product specific string for a non-Hayes modem, even though it may be "Hayes compatible". To accommodate most "Hayes compatible" modems not tested by TechSmith, we have included a "Genericxe "Generic:modems"§" modem choice.

Although TechSmith has tested and documented specifications for many models, modem manufacturers may change their specifications from time to time. If you have a problem using the recommended modem string supplied for use with Foray PPPxe "PPP"§ Server, you can try using a string supplied for a similar modem from the same manufacturer. You can also consult MODEMS.TXT for addition information on creating a custom modem string. If you continue to experience problems with your modem, please contact TechSmith Technical Supportxe "Technical Support"§ using the information in the manual's Preface, *Using This Manual*.

## Chapter 2

# Installing the Foray PPPxe "PPP"§ Serverxe "Foray PPP Server:Installing"§

This chapter will lead you through the Foray PPPxe "PPP"§ Server installation process. The chapter begins with an outline of the installation process followed by several useful installation tips. These are then followed by the actual installation process. We recommend that you review the chapter carefully at least once prior to the actual installation.

The instructions in this chapter assume that you are familiar with basic DOS operating system commands, and that you know how to use a text editor to edit configuration files (such as CONFIG.SYS.) The instructions also assume that you can successfully install a network interface card or other adapter board in your PC.

We also suggest that you print the README.1STxe "README.1ST"§ file included in your Foray PPPxe "PPP"§ Server bundle. This file contains useful information about the Foray software and a "Quick Startxe "Quick Start"§" reference page that covers the system information which will be required by the installation program.

Topics	
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## Outline of the Installation Procedure

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A successful install is usually the result of careful planning and a proven process. Your Foray PPPxe "PPP"§ Server installation is no exception. Please review the following outline of the basic steps involved in your upcoming server installation. The actual installation process begins later in this chapter. The steps include:

- Preparing your PC hardware and system software for Foray PPPxe "PPP"§ Server installation;
- Verifying your network connection on the PC prior to the installation of Foray;
- Installing the Foray PPPxe "PPP"§ Server software and providing the associated network information and;
- Establishing a dial-up (modem) connection between the workstation and the Foray PPPxe "PPP"§ Server.

## Special Considerations for Evaluation Software Usersxe "Evaluation Software Users:Special Considerations"§

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As an evaluation user of the Foray PPPxe "PPP"§ Server product, we welcome your interest in our products and would like to make your experience with them as productive as possible. Please take note of the following items that apply specifically to your installation.

- The evaluation copy is a fully functional single port version of the server software. The only difference between it and the registered version is a performance restriction. The evaluation copy will function normally for two hours following its initialization. Once the server has been operating for two hours, it will disconnect the current user and reinitialize itself. Following reinitialization, the connection will be restricted to 9600 baud and header compression will be disabled for IP and IPX sessions. Registering your current installation of Foray PPPxe "PPP"§ Server will remove these restrictions instantly. This is done with an individualized registration key provided by TechSmith. For more information on this process, refer to *Chapter 4, Registration & Key Validation*.
- The installation process performs a system diagnostic to establish default port and modem settings for later use. To take advantage of this feature, as a one port evaluation user, you should select a port and connect your modem prior to the installation process.
- Your opinion as an evaluation user is extremely important to us. We

encourage you to give us your comments and recommendations regarding your experience with our products. Send your comments to [foray@techsmith.com](mailto:foray@techsmith.com).

## Installation Tips

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The following tips are provided in an effort to avoid conflicts you may otherwise encounter later in your installation process.

- **Network and application issues**: Make sure that the computer you will be using for the Foray PPP Server is working correctly on your LAN *before* your server installation begins.
- **High memory conflicts**: To reduce the possibility of upper memory conflicts on the server PC, we recommend that you use a diagnostic utility to determine the memory addresses your network and video adapters use before you start to install Foray. You can use MSD.EXE, a diagnostic utility that Microsoft supplies with Windows and MS-DOS (version 6.0 and later), to do this. Additional information on MSD.EXE can be found in the Microsoft product documentation.
- **Modems**: The Foray PPP Server supports most modems. TechSmith works with customers and modem manufacturers on a continuing basis to review modems for use with Foray. If, during the install, your modem appears to be unsupported, please review the MODEMS.TXT file.
- **Multiple Servers**: If you are installing more than one Foray PPP Server, you will need a unique registration key for each machine. The server software will not function if it detects another server with an identical software registration key.

## Installing the Server PC

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The Foray PPP Server installation process starts with the preparation of your PC hardware and system software.

- Verify that the machine you have chosen to use as the Foray PPP Server meets the requirements outlined in Chapter 1.
- Collect any tools you will need to remove and install adapter cards in the Server PC.

- Gather the system setup manuals for this machine, the manual for the network interface card, and the network workstation setup documentation. If you are installing the Foray PPPxe "PPP"§ Server on an MCAxe "MCA"§ PC, you will also need the reference disk for this machine.
- Remove any unnecessary adapter cards, such as bus mouse or secondary video adapter cards, and any associated software that may have been enabled to support them.
- Install any additional communication cards.
- If you intend to use your existing Novell NetWare server for authentication, you will have to download a copy of TechSmith's Security NLM (TSCSS.NLMxe "TSCSS.NLM"§), if you have not already done so, and install it on your Novell server at this time. TechSmith's Security NLM is available in compressed form (4ANLMXXX.ZIP, where XXX is the version number) from our web site, <http://www.techsmith.com>.

Prior to loading TSCSS.NLM, load the following Novell NLMs: STREAMS.NLM, CLIB.NLM, TLI.NLM and IPXS.NLM. These NLMs are resident on NetWare servers, but are not usually loaded by default.

The next step is to verify your network connection and to assemble your network and system port information.

- Verify the network connectivity of the server PC by establishing a connection with the network.
- If you have not already done so, we suggest that you print the README.1STxe "README.1ST"§ file. When completed, it will serve as a "Quick Startxe "Quick Start"§" reference for the system information that will be required by the installation program.
- Determine and record the network adapter card's make and model.

Record the IRQ valuesxe "IRQ values"§, I/O addresses, and upper memory block (UMB) (if any) the network card uses. All cards have an I/O address associated with them, typically in the range from 100 to 3FF (hex), and an IRQ value, ranging from 2 to 15.

- Determine the IRQ values that other system components, such as serial ports, are using. (If your Server is an MCA system, skip this step.)

COM1 typically uses IRQ4 and COM2 typically uses IRQ3. Record the type and IRQ, if any, your video adapter uses.

You are now ready to install the Foray PPPxe "PPP"§ Server software. Once the installation process begins you will be asked to verify or supply much of the information acquired in the previous steps. Should you make an

entry error at any point, you can always select BACKxe "BACK"§ to return to the previous screen. When you are finished with a particular screen, select NEXTxe "NEXT"§ to continue on to the next item.

- Your Foray PPPxe "PPP"§ Server software comes bundled in a compressed (.ZIP) filexe "ZIP file:Uncompressing"§. This file needs to be uncompressed to a separate directory on your server's hard drive.
- Change your default drive to the drive and directory on which the uncompressed Foray PPPxe "PPP"§ Server software is located.
- If this install involves installing more than one Foray PPPxe "PPP"§ Serverxe "Foray PPP Servers:Installing additional"§ on your network, you will need a unique registration key for each server you install. **The server software will not function if it detects another server with an identical software registration keyxe "registration key:Installing additional servers"§.**
- If this is an evaluation installation, a registration key is not required. Multiple copies of the evaluation software may be run on a single network simultaneously.
- The information you will be entering during the installation process is stored in a file named ACS.INIxe "ACS.INI"§. For more information on your ACS.INI configuration options, consult *Chapter 6, Advanced Server Configuration Options*.
- Invoke the installation process by typing:

```
install
```

Please follow the screen prompts carefully.

The initial Installation screen displays the TechSmith Licensingxe "Licensing"§ Agreement. Please read the agreement carefully. Selecting ACCEPTxe "Selecting ACCEPT"§ indicates that you agree to its conditions and terms.

- During the installation process, your NET.CFGxe "NET.CFG:Changes"§ file is copied and then altered. If a NET.CFG file is not found, one is provided by default. You may want to check this file to confirm that it is configured properly for your network.
- Following the initial installation, your Foray PPP Server will display the "!!Security disabled" message. This is a server status message and does not indicate that an error has occurred. Once you have enabled Security and established the appropriate user remote access information, this message will not appear.

- Due to the wide variety of memory managers available, the installation process does not automatically alter your CONFIG.SYSxe "CONFIG.SYS:Installation changes"§ file. We suggest that you use a text editor to review the CONFIG.SYS file, and edit the file as necessary to conform to the following requirements:
  - \* Delete the entries for any memory managers other than EMM386xe "EMM386"§, such as QEMM.SYSxe "QEMM.SYS"§.
  - \* Retain the EMM386 device driver with the NOEMSxe "NOEMS"§ command line parameter. Use the X command line parameter to exclude the memory regions that your network card uses.
  - \* Retain the HIMEM.SYSxe "HIMEM.SYS"§ device driver and the DOS=HIGH,UMB entries.
  - \* Remove all device drivers, such as MOUSE.SYSxe "MOUSE.SYS"§, leaving only those that the network operating system requires.
  - \* Remove any disk caches or RAM drivesxe "RAM drives"§ such as SMARTDRV.SYSxe "SMARTDRV.SYS"§ or RAMDRV.SYSxe "RAMDRV.SYS"§.
  - \* Set FILES=10
  - \* Set BUFFERS=12.
  - \* Remove the STACKS and BREAK lines, if present.
  - \* Replace the DEVICEHIGHxe "DEVICEHIGH"§ keyword in any entries with the DEVICE keyword.
- When the installation is finished, the system prompt will be displayed.

At this point, the Foray PPPxe "PPP"§ Server software installation is complete. To function correctly, the server needs to incorporate all the changes it made to the system files through a system reboot. Before rebooting the server, remember to remove any diskettes from the diskette drive. Once the system has been restarted, the Foray PPP Server software should execute automatically.

We recommend using the PINGxe "PING"§ command from the Foray PPP Server console to verify your server installation at this time. To use PING you would enter:

PINGxe "PING"§ n.n.n.n

Where n.n.n.n is the network address of another TCP/IP machine on your network. A successful response is an indication that the major components of the server installation were installed correctly.

The Foray PPPxe "PPP"§ Server is now ready for remote access users. To assist you in setting up your users we have included a CLIENTS.TXTxe "CLIENT.TXT"§ file. This file is continually updated and lists our recommendations for successful remote user software combinations. We suggest visiting our Web site at <http://www.techsmith.com> to obtain the latest version of this document.

## Chapter 3

# User Authentication & Callback

Implementing on the server & assigning passwords & assigning user IDs

Your Foray PPP Server works with your existing LAN resources to restrict remote access through the use of PAP, CHAP, Novell & NetWare authentication and user callback.

This chapter will assist you in implementing and managing your Foray PPP Server's user authentication features.

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Security Overview	Page 12
Setting Up the Foray PPP Server for User Authentication	Page 12
User Administration for Local File Security	Page 13
Disabling Security on the Server	Page 13

## Security System Features

---

User authentication determines whether a remote user is allowed access to your LAN resources. The Foray PPP Server allows you to choose:

- Optional user authentication using PAP, CHAP or Novell NetWare authentication.
- Optional user callback available with Microsoft Windows 95, Windows NT 3.51 and Foray PPP Client.

## Security Overview

---

If you have enabled security on your Foray PPP Server, each user will be required to provide a valid user ID and password prior to establishing a successful connection. As the server administrator, you can add new users to the database, change the privileges and passwords of existing users or delete users from the database. The server will disconnect a workstation that attempts to login with an incorrect user ID or password.

The server can also provide mandatory user callback. The server administrator can enable callback capability on a user by user basis.

## Setting Up the Foray PPP Server for User Authentication

---

To enable your Foray PPP Server to support user authentication, you will need to do the following:

- Use the SHUTDOWN command to exit the server.
- Reboot the server.
- After the server reboots, you will see the Server Initialization screen.
- Select the SECURITY option.
- Select the Security Type you will be using; Local File Security, Novell Server Security or None. (Note: The Novell Security Server option will only function properly if the server is attached to a Novell network and the TechSmith Security NLM has been installed on the Novell server. The TechSmith Security NLM



(TSCSS.NLMxe "TSCSS.NLM"§) is available for download in its compressed form (4ANLMXXX.ZIP, where XXX is the version number) from our web site, <http://www.techsmith.com>.)

- If you have selected Local Filexe "Local File:Security"§, you will next select which protocol(s) to use. Your choices are either PAPxe "PAP"§ or CHAP alone, or CHAP as the primary with PAP as the secondary (fallback) or PAP as a primary with CHAP as the secondary xe "CHAP"§.
- If you selected Novell Server Securityxe "Novell Server Security"§, only the PAP protocol is selected by default.
- When finished, select SAVE.

### User Administration for Local Filexe "Local File:Security"§ Securityxe "Passwords:Implementing"§xe "security\:\on workstations"§xe "workstation\:\passwords"§xe "password\:\changing\:\on workstation"§

The Foray PPP Server will automatically attempt to detect a user database once Local Filexe "Local File:Security"§ security has been selected. If it fails to detect an existing user database, you will be prompted to create one at that time. You must input users PRIOR to running your server with Local Filexe "Local File:Security"§ security enabled. If you enable Local Filexe "Local File:Security"§ security and run the server without any registered users, the server will not allow a successful connection. To administer your user database after it has been created, use the following process.

- Use the SHUTDOWNxe "SHUTDOWN"§ command to exit the server.
- Reboot the server.
- After the server reboots, you will see the Server Initialization screenxe "Server Initialization screen"§.
- Select the USER ADMIN option.
- Add your user names, passwords and callbackxe "callback"§ settings.
- When finished, select Quit.

### Disabling Securityxe "Disabling Security"§ on the Server

To disable user authentication on the Foray PPPxe "PPP"§ Server:

- Use the SHUTDOWNxe "SHUTDOWN"§ command to exit the server.
- Reboot the server.

- After the server reboots, you will see the Server Initialization screenx  
"Server Initialization screen"§.
- Select the SECURITY option.
- Under Security Type select DISABLE ALL DIAL-IN SECURITY.
- When finished, select SAVE.

Any user database entries you have made will be saved, but will be ignored.

## Chapter 4

# Server Software Registration "Licensing" & "Licensing:Server software" & Validation

When you have made the decision to purchase a Foray PPP Server software license "Server software license", this chapter will explain the registration process. It will cover ordering your product options and how to use your TechSmith registration key to enable your server's functionality.

### Topics

**Registering "Licensing" Your Foray PPP Server Software**  
**Page 16**

**Installing Your Registration Key "Registration Key"**  
**Page 16**

## Registering "Licensing" Your Foray PPP Server Software

---

To obtain a Foray PPP Server software license, you will need to supply us with some basic customer information. As an aid in gathering this information, we have included an order form in your software bundle in a file named ORDER.TXT.

You will notice that along with your customer information, we ask you to provide the Product ID number. (This number was generated when you initially entered your user information during the product evaluation install.) If you did not record this number or do not have the information readily available, the Product ID number can be found on the Server Initialization screen that appears briefly whenever the server is rebooted.

Your order should be submitted to us according to the information on ORDER.TXT that applies to your desired port configuration. You can send your order to us at:

E-mail: foray@techsmith.com

FAX: (517) 333-1888

Mail: TechSmith Corporation  
P.O. Box 4758  
East Lansing, MI 48826-4758

Phone: (517) 333-2100 ext. 400

When TechSmith receives this information, we will generate a personalized registration key and send the key back to you.

## Entering Your Registration Key "Installing Your Registration Key"

---

To enter your registration key:

- Use the SHUTDOWN command to reboot your server.
- After the server reboots, you will see the Server Initialization screen.
- Select the REG INFO "REGISTER FORAY" button.
- A registration screen will be displayed, listing your company name and Product ID. There will also be fields available to enter the number of ports you have purchased for your server and your Registration Key.

- Enter your Registration Key as "Registration Key" exactly as it appears on the document you received from TechSmith.  
**Note: Entering a Registration Key incorrectly will cause the server to fail. If this occurs, it can be corrected by following this process again and entering the correct number.**
- Enter the number of ports supported by this server in the field provided.  
**Note: Your registration key enables a specific number of ports. Entering a larger number will cause the server to fail. If this occurs, it can be corrected by following this process again and entering the correct number.**
- Select SAVE as "SAVE CONFIG" to save your changes.
- Select EXIT.
- Reboot the server.

Your server is now registered. Depending on the configuration you have chosen, you may need to install additional server hardware and modems to accommodate your expanded capabilities. Once your hardware has been installed you can use the configuration options in the Foray initialization screen to setup your new remote access ports.

## Chapter 5

# Foray PPP Serverxe "Foray PPP Server:Operations"§ Operations

While your server is performing its ongoing function of providing remote access, it is constantly monitoring the activity it processes. By default, only certain messages are displayed and only specific information is maintained in your log files. As the network administrator, you can use messages displayed on the server screen to monitor various server processes. You can also enable additional diagnostic messages for each process and log the messages to a file for future reference.

This chapter describes the console display, server messages, configuration options, operator commands, diagnostic tools and the purpose and location of your supporting files. If you would like greater detail on any of the system messages, you can refer to *Chapter 6, Server Run-Time Messages*.

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Using Multiple Servers	
<b>Executing the Server Software</b>	<b>Page 20</b>
<b>Server Console Display</b>	<b>Page 20</b>
Diagnostic Windowxe "Diagnostic Window"§	
Console Windowxe "Console Window"§	
Log Windowxe "Log Window"§	
<b>Interpreting Server Messages</b>	<b>Page 21</b>
Message Formats	
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Information Displays, Shutdown, and Quit	
Line Control	
<b>Server Log Filesxe "Server Log Files"§</b>	<b>Page 28</b>
Dial-In Log File	
Diagnostic Log File	

## Serverxe "Server:Overview"§ Overview

---

As we have discussed earlier, the Foray PPPxe "PPP"§ Server is a dedicated PC on your local area network, through which remote users can access your TCP/IPxe "TCP/IP"§ and IPXxe "IPX"§ LAN resources. A remote user initiates a PPP link using a TCP/IP and or IPX communications driver to dial in to a modem attached to the server. The server software relays messages from remote users to your LAN. It intercepts messages from the LAN to the remote users, compresses them to improve performance, and sends them through the server's serial ports to the modems. The server automatically logs all remote dial-ins and provides optional user authentication using PAPxe "PAP"§, CHAP or Novell NetWare securityxe "Novell NetWare security"§xe "CHAP"§.

### Using Multiple Serversxe "Using Multiple Servers"§

---

Each Foray PPPxe "PPP"§ Server can support multiple serial ports (The one port evaluation server being the notable exception). The number of sessions available on your network is the factor that limits the number of Foray PPP Servers you can install. If you are using multiple servers, you will want to consider how best to distribute the load of user calls among them. Consider whether all remote users should have access to all the dial-in lines, or whether some users should be restricted to certain lines or servers. You can use server passwordxe "password"§ security to deny unauthorized users access to a particular server.

## Executing the Server Softwarexe "Server Software:Executing"§

---

Your server software should execute automatically as a result of the server boot process. Occasionally it may be necessary to perform system maintenance and other administrative functions. Once these are completed, you must reboot the server and allowing the startup process to run its normal course. However, if you would like to start the server manually, you can execute the server software by entering the following command line at the DOS prompt:

```
STARTUPxe "4ASTART"§
```

If there are no network sessions available or if the ACS.INIxe "ACS.INI"§ file is missing or incorrectly configured you will get errors at initialization. To pinpoint the source of the errors, refer to Chapter 6, *Server Run-Time Messages*, for the meaning of specific error messages.

## Server Console Display

---

Your server display is divided into three areas: the Diagnostic (Diagxe "Diag"§) window, the Console (Conxe "Con"§) window, and the Log windowxe "Log window"§. Only the Diagnostic and Log windows are displayed by default. The Console window is displayed by request.

### Diagnostic Windowxe "Diagnostic Window"§ (Diagxe "Diag"§)

During normal server operation, all the diagnostics are disabled and few, if any, messages will appear in the Diagxe "Diag"§ window. Should you have the need to call TechSmith Technical Support, they may direct you to turn on specific diagnostic messages, which will then appear here. These messages display noncritical information and detailed displays of packet contents, primarily for debugging purposes. Other displays that appear in this window, when activated, are performance statistics, virtual circuit statistics, the process identifier list, and help messages.

You can use the DIAGxe "DIAG"§ command, described in the *Server Command Reference* section later in this chapter, to write the messages that appear in this window to a text file. When you use this command, messages continue to appear in the Diagxe "Diag"§ window, but are also time stamped and saved in the C:\FORAY\ACS.LOGxe "ACS.LOG"§xe "LOG"§ file.

### Console Windowxe "Console Window"§ (Conxe "Con"§)

The console window (Conxe "Con"§) echoes your keyboard commands. To have your keyboard entries saved in a file, you can use the CONxe "CON"§ command, described in this chapter's *Server Command Reference* section. The file will be located at C:\FORAY\ACS.LOGxe "ACS.LOG"§xe "LOG"§ file. If you would like more information on LOG files, you can refer to the *Server Log Files*xe "Server Log Files"§ section later in this chapter.

### Log Windowxe "Log Window"§

Most of the messages generated during normal server activity will appear in the Log windowxe "Log window"§, including those pertaining to initialization, termination, connection and disconnection. You also have the ability to save these messages in a text file by using the LOGxe "LOG"§ command. This will cause a copy of each message to be time stamped and saved in the C:\FORAY\DIAGxe "DIAG"§.LOG file.

## Interpreting Server Messagesxe "Server Messages:Interpreting"§

Normal server processes and any activity from your remote workstations will



generate messages that appear in the server Log and Diagnostic windows. Some messages are displayed during normal server operation, while others are only displayed if you have enabled Diagnostics for a particular server process or remote connection. Most messages are informational and others indicate an error. Important error messages or serious warnings (such as disabling passwords) are prefixed with "!!xe "!"§". For example:

```
!!Security disabled
```

## Message Formats "Message Formats"§

---

Most messages have two parts: a prefix, which identifies the process that generated the message, and the message text. To look up the meaning of specific message text, refer to Chapter 6, *Server Run-Time Messages*. You can list the process identifiers used on your server by entering this server command:

```
PIDS
```

This will result in the following display appearing in the Diagnostics window:

No.	Name	Lbl
1:	LOGxe "LOG"§	Log
2:	CONSOLExe	Conxe
3:	DIAGxe "DIAG"§	Diagxe
6:	EXECxe "EXEC"§	Exec
7:	ECHOxe "ECHO"§	Echo
15:	DISPORTSxe	DPrt
18:	ROUTERxe	Rtr
21:	IPARPxe "IPARP"§	ARP
27:	P001	P001
59:	L001	L001

The first column displays the internal process number; the second column is the process name, and the third is the process IDxe "process ID"§ that is used as the message prefix. For processes that control a serial port, the port number is displayed after the process ID.

IDs/message prefixes are:

ARPxe "ARP"§      IP ARP cache maintenance.

Conxe "Con"§ The Console window process.

Diagxe "Diag"§      The Diag window process. This window displays the response to some commands, such as HELPxe "HELP"§, and high volume diagnostic messages.

DPrtxe "DPrt"§      The process that responds to the PORTS and CPORTS commands, displaying port information.

- Echoxe "Echo"§ The loopback (ping) process. This facility is used for testing and performance monitoring.
- Execxe "Exec"§ The executive monitor process. This process interprets keyboard commands such as HELPxe "HELP"§.
- Lnnn Low level port drivers, where nnn is the line number [001-024] (Example: L001 = COM1, L002 = COM2).
- Log The log window process. This process manages the display of standard and selected diagnostic messages on the console.
- Pnnn (where Pnnn corresponds to the LineID assigned to this port in the ACS.INIxe "ACS.INI"§ configuration file). This process manages asynchronous (serial) ports for remote workstation dial-in.
- Rtrxe "Rtr"§ The Routerxe "Router"§ process. The router process directs packets appropriately to and from the workstations, Foray Server and the LAN.
- Seqxe "Seq"§ The transient process involved in start-up sequencing.

## Server Command Referencexe "Server Command Reference"§

Once your server is configured and initialized, you can enter commands from the server console keyboard at any time. The commands, which affect various server processes, fall into general groups:

- Commands that toggle server diagnostic displays on or off;
- Commands that display server statistics;
- Informational commands that access HELPxe "HELP"§ and display the version number of the server software, and;
- The SHUTDOWNxe "SHUTDOWN"§ and QUITxe "QUIT"§ commands, which terminate all server processes.

Server commands are not case sensitive and may be entered with any combination of upper and lowercase letters. The command arguments (reset, baud, etc.) are, however, case sensitive.

### Information Displaysxe "Information Displays"§, Shutdown, and Quit

<u>Command</u>	<u>Action</u>
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CPORTSxe "CPORTS"§	Displays the Modem ID, Line ID, and status of each
--------------------	--

port. The reported status may be one of the following:

Message	Meaning
Available (idle)	Port is available for use
Port not open	Could not open port, hardware problem
Unavailable	Port is not available for use
PPPxe "PPP"§ dial in	Active third party IP dial in
MLID dial in	Active TechSmith product dial in
HELPxe "HELP"§	Displays a brief summary of the available server commands in the Diagnostic window.

IPINFOxe "IPINFO"§ Displays the server's current IP configuration.

*Lnnn* HELPxe "*Lnnn* HELP"§xe "HELP"§ Displays a brief overview of the available commands for a specific process, where *nnn* is the line number.

*Lnnn* lcparamxe "*Lnnn* lcparam"§xe "lcparam"§  
(Where *nnn* is the line number.) Displays messages representing the state of parameter negotiation for PPPxe "PPP"§ connection with a remote device, in the following format:

```
LCP Negotiated Parameters:
MRU: nnnn
MTU: nnnn
Rcv CMap: nnnnnnnh
Xmt Cmap: nnnnnnnh
Rcv A/C: nn [Y | N]
Xmt A/C: nn [Y | N]
Rcv Prot: nn [Y | N]
Xmt Prot: nn [Y | N]
PPPFlags: nnnnh
RelFlags: nnnnh
TSC SPX: [Y | N]
PPPOpen: nnnnh
Rcv Auth: nnnnh
Xmt Auth: nnnnh
RcvVJSlots: nn
XmitVJSlots: nn
IP Addr: nnn.nnn.nnn.nnn
```

*Lnnn* statsxe "*Lxnn* stats"§  
(Where *nnn* is the line number.) Displays messages pertaining to link status, in the following format:

```
Lnnn: L2 Link Status: nnn
L1 Congestion nn% yy/cc
L0 Write Congestion: nnnnn
Proc: AAA r/w: nnnn /mmmmm
C : X r/w: nnnn /mmmm
Err : CRC/Frame: nnn/mmm
```

Line 1 reports the current FSMxe "FSM"§ (finite state machine) state.

Line 2 reports that the L1 process is *nn* percent congested. *yy* is the maximum number of frames on queues, and there are currently *cc* frames on queues.

Line 3 reports measurement of physical (low level) congestion. 65565 indicates that the line is disconnected.

Line 4 is a count of frames by protocol type, where AAA is the protocol type, *nnnn* is the number of frames read and *mmmm* is the number of frames written. The protocol might be:

LCP:	Link Control Protocol	Link Control Protocol"; negotiates link parameters
PAP	"PAP";	Used for PPP authentication
IPCP:	IP Control Protocol	IP Control Protocol"; negotiates IP specific parameters
IP:	Internet Protocol	Internet Protocol"
IPX	"IPX";	(NetWare) IPX and SPX frames

Line 5 displays information about the number and type of HDLC/A frames, where *nnnn* is the number of frames read, *mmmm* is the number of frames written, and *X* is:

I: (Information)	Reliable HDLC/A data frames
UI: (Unnumbered Information)	PPP Datagrams
RR: (Receiver ready)	Acks
RNR (Receiver Not Ready)	Flow control
REJ (Reject)	Nak

Line 6 reports error counts: the Frame Check Sequence (hash code) or framing failed. There were *nnn* CRC failures and *mmm* malformed frames.

*Lnnn* HDLC/A Status (Where *nnn* is the line number.) Displays messages reporting HDLC status, in the following format:

```
HDLC/A Status
Next seq expected: nn
Next seq to send: nn
Last NR received: nn
RNR Flag: nn
N(S) Timer: nn
N(R) Timer: nn
Read Queue Cnt: nn
Pending send cnt: nn
Waiting ACK cnt: nn
```

These items indicate various parameters for PPP and HDLC/A links. Normally, this information is only used by TechSmith Technical Support in their problem resolution efforts.

PATHLOG Displays the current path to the main log file.

PATHDIAG Displays the current path to the diagnostic log file.

PIDS Lists the process IDs in the Diagnostic window, and shows the port number for processes that are associated with a serial port.

*PING*x *"PING"*§ *n.n.n.n* (where *n.n.n.n* is a known IP address.) Used to confirm the network connection between your server and the machine at the specified IP address. Successful connections are logged in the ACS.LOGx *"ACS.LOG"*§x *"LOG"*§ file.

*PORTS*x *"PORTS"*§ Displays the Modem ID and status of each port.

*PORTS Pnnn*x *"PORTS Lnnn"*§ (where *nnn* corresponds to the LineID assigned to this port in the ACS.INIx *"ACS.INI"*§ configuration file.) Displays a summary of the status and connection parameters for the modem attached to this line.

*Pnnn CLOSE*x *"CLOSE CONNECTION"*§  
This command causes the server to briefly lower the DTR signal, disconnecting the serial line and initializing the modem if one is attached.

*Pnnn HELP*x *"Pnnn HELP"*§x *"HELP"*§ Displays a brief overview of the available commands for a specific process, where *nnn* is the port ID number.

*Pnnn status*x *"Pnnn status"*§ Displays information about the current configuration of an active line in the Log windowx *"Log window"*§. For example, entering

P101 status

would produce a display similar to the following:

```
P101: Process status:  
Diagnostics are OFF  
Port: 4  
State: 1  
Modem Initialization string:  
AT&F1ATE0&B1&H1&M5&R2&A3S0=1|  
Modem quit string:  
ATS0=0|
```

*SHUTDOWN*x *"SHUTDOWN"*§ Shuts down the server once it has become inactive. This command immediately disables any inactive ports, preventing remote users from initiating new connections. The server then waits until all active connections have been terminated before quitting.

*VER*x *"VER"*§ Displays your server version information in the Diagnostic window.

*QUIT*x *"QUIT"*§ Starts termination of all server processes. Terminates any active sessions, closes all of your Log files, resets your modems and returns you to the DOS prompt.

## Line Control "Line Control"

---

### **Dial-In** "Dial-In:Line Control"

In the following commands, *Pnnn* identifies a Foray PPP Server dial-in line, where *nnn* corresponds to the Line ID assigned to this port in the ACS.INI configuration file.

<u>Command</u>	<u>Action</u>
----------------	---------------

---

—

*Pnnn close* "Pnnn close" If the line is active, this command causes the server to briefly lower the DTR signal, disconnecting the serial line and initializing the modem if one is attached.

*Pnnn baud* "Pnnn baud" *mmmmm*

where *mmmmm* is the new baud rate. If the line is active, this command causes the server to disconnect the serial line by briefly lowering DTR. It then initializes the modem if one is attached, and attempts to change the serial port speed to the value entered. For example, if you enter

P003 baud 19200

the server will attempt to change the serial port speed to 19,200 bps.

## Diagnostics "Diagnostics"

---

You will not need to use any of these commands during normal server operation. Since writing diagnostic information to the screen slows performance, you should generally leave all diagnostics off. If you have problems, however, TechSmith Technical Support may direct you to use these commands to turn on diagnostic messages for one or more server processes.

<u>Command</u>	<u>Action</u>
----------------	---------------

---

—

*ARP* "ARP" Toggles diagnostic. messages for IP ARP cache maintenance process.

*CON* "CON" Toggles file logging of console messages. When it is on, console commands entered from the keyboard and displayed in the console window are also written to the diagnostic log file *ACS.LOG* "ACS.LOG" "LOG".

*DIAG* "DIAG" Toggles file logging for the Diagnostic window. When it is on, diagnostic messages displayed in the *Diag* "Diag" window are also written to the diagnostic log file *ACS.LOG* "ACS.LOG" "LOG".

ECHOxe "ECHO:Diagnostics"§ Toggles diagnostic messages for the Echo process.

Lnnnxe "Lnnn:Diagnostics"§ Toggles diagnostic messages for low level port drivers.

LOGxe "LOG"§ Toggles file logging for the Log windowxe "Log window"§ process. When logging is on, messages displayed in the Log window are also written to diagnostic log file DIAGxe "DIAG"§.LOG.

Pnnnxe "Pnnn:Diagnostics"§ Toggles diagnostic messages for dial-in asynchronous lines, where nnn corresponds to the Line ID assigned to this port in the ACS.INIxe "ACS.INI"§ configuration file.

RRIPxe "RRIP"§ Toggles diagnostics for the IPX RIP router process

RTRxe "RTR"§ Toggles diagnostics for the main packet router process. These diagnostic messages are useful for diagnosing LAN protocol problems.

#### Statisticsxe "Statistics"§

---

The following commands turn on statistics displays. You will not need to use them for normal server operation, but if you are having problems with the server, TechSmith Technical Support may direct you to enable them.

#### Command Action

---

PSTATSxe "PSTATS"§ Displays a summary of performance statistics for each server process in the Diagxe "Diag"§ window. (See PSTATS and PSTATSXxe "PSTATSX"§ Commands, below.)

PSTATSXxe "PSTATSX"§ Resets the PSTATSxe "PSTATS"§ statistics counters after displaying their values.

VSTATSxe "VSTATS"§ Displays summary statistics for each virtual circuit in the diagnostic window. (See VSTATS Command, below.)

#### **PSTATSxe "PSTATS"§ and PSTATSXxe "PSTATSX"§ Commands**

These commands display information used to monitor server diagnostics and performance. The PSTATSxe "PSTATS"§ display consists of a Cycles message and multiple statistics lines, one for each server process, as shown below.

```
Cycles: 1044354340 cps: 6294
Log: Msg: 0 c: 0 t: 0
Con: Msg: 22 c: 140 t: 0
Diag: Msg: 0 c: 0 t: 0
Exec: Msg: 3 c: 24 t: 0
Echo: Msg: 4 c: 72 t: 0
```

DPr: Msg: 0 c: 0 t: 0  
Com1: Msg: 287 c: 15462 t: 0

The PSTATSXxe "PSTATSX"§ command displays only the first line, prior to resetting the PSTATSXxe "PSTATSX"§ statistics.

The format for the cycles line is:

Uptime: *hh:mm:ss* cps: *mmmmm*

Where *hh:mm:ss* is the total time in hours, minutes and seconds through all processes since either startup or the last reset with PSTATSXxe "PSTATSX"§, and *mmm ... m* is the average number of cycles per second.

The format for the process line is:

PPPP: Msg: *oooo* c: *mmmmmmmm* t: *nnnn*

Where PPPP is the process IDxe "process ID"§, *oooo* is the number of messages received since the last reset, *mmm ... m* is the total number of bytes received by this process from the network, serial port, or other source, and *nnnn* is the throughput rate -- the average number of bytes per second since the last reset with PSTATSXxe "PSTATSX"§.

### **VSTATSxe "VSTATS"§ Command**

This command displays information on virtual circuits created when the server is initialized. The display consists of two lines for each virtual circuit, as shown in the sample below.

```
103:27 Com1 07 ECHO  
src:Echo c:00h secs: 156983 n: 8
```

The format of the circuit display is:

```
[PID1 | WORKSTATION_ID] PID2  
src:PPPP c:nn secs: tttttt n: ppppp
```

The first parameter is the process IDxe "process ID"§ of one side of the circuit (PID1), or, for a dial-out line, the name of the workstation running a modem pooling connection. The second parameter, PID2, is the process ID of the other side of the circuit.

The second line gives information about session activity. Resetting the statistics counters with PSTATSXxe "PSTATSX"§ does not affect this line.

PPPP the process IDxe "process ID"§ (for example Netb or R102) of the last message source.

nn the message type. (for example, 00 = normal data packet. For additional information about message types, contact TechSmith Technical Support).

ttt ... t the time elapsed since the last activity, in seconds. (for example, @600 indicates that there has been no activity for one hour).



ppppp            the total number of message packets exchanged.

## Server Log Filesxe "Server Log Files"§

---

Your Foray PPPxe "PPP"§ Server maintains two log files. Both are placed by default in the C:\FORAY directory, but you can use the LOGxe "LOG"§ and DIAGxe "DIAG"§ keywords in the ACS.INIxe "ACS.INI"§ file to specify another location (See *Chapter 4, Server Configuration Options*). The dial-in log file, ACS.LOGxe "ACS.LOG"§, automatically records information about remote connections to the server. You can use it to determine when users are dialing in, who is dialing in (if the users supply user IDs) and the duration of their connection. These files provide vital information for administrative applications; as an example, monitoring the amount of traffic on your server lines.

The diagnostics log file, DIAGxe "DIAG"§.LOGxe "LOG"§, can be useful in diagnosing problems with your server. Messages are only logged in this file if you set the DIAG or LOG keyword in the ACS.INIxe "ACS.INI"§ file to 1, or if you use the DIAG or LOG command at the server console to toggle logging on. Otherwise, the DIAG.LOGxe "DIAG.LOG"§ file contains only system initialization and system quit messages. A new DIAG.LOG file is created following each server initialization. The old DIAG.LOG file is renamed DIAG.nnn, where *nnn* begins at 001 and is incremented with each successive backup copy.

## Dial-in Log Filexe "Dial-in Log File"§

---

When a workstation connects to the server directly or remotely, the server automatically writes an entry to the ACS.LOGxe "ACS.LOG"§xe "LOG"§ file. It writes another entry when the workstation disconnects for any reason or when the server is shut down or initialized. If you have enabled console input logging, the server will also log all console keyboard input from the server to this file. You can enable console input logging by entering the CONxe "CON"§ command from the console keyboard or by setting the CON keyword in the ACS.INIxe "ACS.INI"§ file to 1.

**A word of caution: If left running continuously, your Foray PPP Server will append to this file indefinitely. We recommend that you purge the file if it becomes inconveniently large.**

## Dial-in log entriesxe "Dial-in log entries"§

When a workstation connects to the network, it creates an entry like the following:

```
mmm dd hh:mm:ss (T) ANSWERED LINE:Rxnn [connect msg]
    User Login
    User: [user ID]
    From: [user location]
```

where:

mmm dd The month (three alpha characters, Jan through Dec) and the day (two digits).

hh:mm:ss The time in 24 hour format.

(T) Indicates that this is a connect or disconnect entry. Other values that can appear here are: (D for a system initialization entry, (U) for user message sent to the server from a workstation, or (Q) for a system quit entry.

Pnnn Identifies the dial-in line, where nnn is the port number on this server.

connect msg Describes the type of connection. For a direct connect line, DIRECT appears here; for a modem connection, the word CONNECT is followed by the baud rate, and information about the modem's compression scheme. This information differs for each modem.

userID Displays the user identifier sent by the workstation at dial-in. 'UNKNOWN' means the workstation did not send an ID.

user location Displays the user location sent by the workstation at dial-in. 'UNKNOWN' means the workstation did not send a user location.

When a user disconnects from the server, the server makes an entry similar to the following in the log file:

```
mmm dd hh:mm:ss (T) DISC-L LINE:Rxnn SEC:sssss
```

This message includes the month, date, time and line identification (Rxnn) as described for the connection entry above. It also gives the duration of the connection in seconds.

### **Message logging** "Message logging" §

Remote access workstations using third party TCP/IPxe "TCP/IP" § software can use the WinSock API to send a UNIX-like syslog message from a user application to the server. The server displays the message in the server console log window and writes the message to the ACS.LOGxe "ACS.LOG" §xe "LOG" § file. In the ACS.LOG, user messages have a log message type of 'U':

```
mmm dd hh:mm:ss: (U) Rxnn: message string
```

In the console log window, these messages have a "User:" prefix:

```
Rxnn: User: message string
```

If you activated diagnostic output for the LOGxe "LOG" § process, the log window message will also be written to the DIAGxe "DIAG" §.LOG file:

```
mmm dd hh:mm:ss: (L) Rxnn: User: message string
```

Messages longer than 26 characters will be truncated in the log window and

DIAGxe "DIAG"\$.LOGxe "LOG"\$. Messages longer than 150 characters will be truncated in the ACS.LOGxe "ACS.LOG"\$.

### **Sample ACS.LOGxe "ACS.LOG:Sample"\$xe "ACS.LOG"\$xe "LOG"\$ file**

The following is a log file fragment, showing entries for dial-in connections, disconnections, system initialization and system shutdown.

```
FORAY1 : Aug 24 19:36:49 :(I) ***** System Initialization *****
FORAY1 : Aug 24 19:36:49 :(I) _ TechSmith Foray PPPxe "PPP"$ Server _
FORAY1 : Aug 24 19:36:49 :(I) Rel: 2.61.00 Aug 22 1995 17:41:20
FORAY1 : Aug 24 19:36:49 :(I) Ser# 000000
FORAY1 : Aug 24 19:36:49 :(I) Registered to:
FORAY1 : Aug 24 19:36:49 :(I) TECHSMITH CORP.
FORAY1 : Aug 24 19:37:35 :(T) ANSWERED LINE:P002 CONNECT 26400/ARQ/V34/LAPM/V42BIS
FORAY1 : Aug 24 19:38:44 :(T) DISC REDIRECTION UID:(null) 69 Sec.
FORAY1 : Aug 24 19:39:19 :(T) ANSWERED LINE:P002 CONNECT 28800/ARQ/V34/LAPM/V42BIS
FORAY1 : Aug 24 19:39:23 :User Login
FORAY1 : Aug 24 19:39:23 : User: j.smith
FORAY1 : Aug 24 19:39:23 : From: UNKNOWN
FORAY1 : Aug 24 19:55:19 :(T) DISC REDIRECTION UID:j.smith 960 Sec.
FORAY1 : Aug 24 20:42:56 :User Login
FORAY1 : Aug 24 20:42:56 : User: w.clinton
FORAY1 : Aug 24 20:42:56 : From: UNKNOWN
FORAY1 : Aug 24 20:42:56 :(T) DISC REDIRECTION UID:w.clinton 3 Sec.
FORAY1 : Aug 24 20:43:37 :(T) ANSWERED LINE:P004 CONNECT 14400/V32/NONE
FORAY1 : Aug 25 07:42:43 :User Login
FORAY1 : Aug 25 07:42:43 : User: r.limbaugh
FORAY1 : Aug 25 07:42:43 : From: UNKNOWN
FORAY1 : Aug 25 07:42:43 :(T) DISC REDIRECTION UID:r.limbaugh 0 Sec.
FORAY1 : Aug 25 09:02:08 :(Q) ***** Shutdown (Quit) completed *****
```

### **Diagnostic Log Filexe "Diagnostic Log File"\$**

---

If you have set DIAGxe "DIAG"\$=1 in your ACS.INIxe "ACS.INI"\$ file, when the server initializes, it creates a diagnostic log file called DIAG.LOGxe "DIAG.LOG"\$xe "LOG"\$. If a previous diagnostic file exists, the server renames the old file DIAG.LG1 and creates a new DIAG.LOG. When you issue the LOG command at the server console, messages that appear in the Log windowxe "Log window"\$ are also sent to this file. Entering LOG again toggles this file logging off. The DIAG command works the same way, to toggle file logging for the messages that appear in the console's Diagnostics window.

Each message written to the file begins with the date, the time in 24 hour format and a one-letter code that identifies the source of the message:

- I = Initialization
- M = Special Modem Diagnostic
- D = Diagxe "Diag"\$ window
- C = Conxe "Con"\$ window
- L = Log windowxe "Log window"\$
- Q = Normal server termination

Log and Diagxe "Diag"\$ window messages begin with a process IDxe "process ID"\$, such as IPXxe "IPX"\$ or R101. These are described in the *During Normal Operation* section. The following is a

fragment of a diagnostic file "diagnostic file:Sample"§.

```
FORAY1 : Aug 24 19:37:22 :(D) P002: Ringing...
FORAY1 : Aug 24 19:37:35 :(L) P002: Answered, starting login...
FORAY1 : Aug 24 19:37:35 :(L) P002: Connect msg:
FORAY1 : Aug 24 19:37:35 :(L) CONNECT 26400/ARQ/V34/LAPM/V42BIS
FORAY1 : Aug 24 19:37:35 :(D) P002: EVN: 2 old: 0 -> 1 v: 0400h
FORAY1 : Aug 24 19:37:35 :(D) L002: EVN: 0 old: 1 -> 6 v: 0005h
FORAY1 : Aug 24 19:37:35 :(D) L002: L2CBs MaxAlloc'd: 2
FORAY1 : Aug 24 19:37:35 :(D) L002: Sent MRU: 1500
FORAY1 : Aug 24 19:37:35 :(D) L002: Sent Cntrl Map: 00002000h
FORAY1 : Aug 24 19:37:35 :(D) L002: Sent Auth: C223
FORAY1 : Aug 24 19:37:35 :(D) L002: Sent Prot Comp
FORAY1 : Aug 24 19:37:35 :(D) L002: Sent AC Comp
FORAY1 : Aug 24 19:37:38 :(D) L002: Rcv'd LCP CONFIG REQ
FORAY1 : Aug 24 19:37:38 :(D) L002: Rcv'd CMAP: 000A0000h
FORAY1 : Aug 24 19:37:38 :(D) L002: Rcv'd Magic Number
FORAY1 : Aug 24 19:37:38 :(D) L002: Rcv'd Prot Comp
FORAY1 : Aug 24 19:37:38 :(D) L002: Rcv'd AC Comp
FORAY1 : Aug 24 19:37:38 :(D) L002: Rcv'd callbackxe "callback"§
FORAY1 : Aug 25 03:35:10 :(D) P004: Ringing...
FORAY1 : Aug 25 03:35:23 :(L) P004: Answered, starting login...
FORAY1 : Aug 25 03:35:23 :(L) P004: Connect msg:
FORAY1 : Aug 25 03:35:23 :(L) CONNECT 28800/ARQ/V34/LAPM
FORAY1 : Aug 25 03:35:24 :(D) P004: EVN: 2 old: 0 -> 1 v: 0400h
FORAY1 : Aug 25 03:35:24 :(D) L004: EVN: 0 old: 1 -> 6 v: 0005h
FORAY1 : Aug 25 03:35:24 :(D) L004: Sent MRU: 1500
FORAY1 : Aug 25 03:35:24 :(D) L004: Sent Cntrl Map: 00002000h
FORAY1 : Aug 25 03:35:24 :(D) L004: Sent Auth: C223
FORAY1 : Aug 25 03:35:24 :(D) L004: Sent Prot Comp
FORAY1 : Aug 25 03:35:24 :(D) L004: Sent AC Comp
FORAY1 : Aug 25 03:35:24 :(D) L004: Rcv'd LCP CONFIG REQ
FORAY1 : Aug 25 03:35:24 :(D) L004: Rcv'd MRU: 1500
FORAY1 : Aug 25 03:35:24 :(D) L004: Rcv'd CMAP: 00002000h
FORAY1 : Aug 25 03:35:24 :(D) L004: Rcv'd Prot Comp
FORAY1 : Aug 25 03:35:24 :(D) L004: Rcv'd AC Comp
FORAY1 : Aug 25 03:35:24 :(D) L004: Rcv'd HDLCxe "HDLC"§/A
FORAY1 : Aug 25 03:35:24 :(D) L004: Rcv'd Gen Comp
FORAY1 : Aug 25 03:35:24 :(D) L004: Rcv'd callbackxe "callback"§
FORAY1 : Aug 25 08:58:36 :(L) Exec:
FORAY1 : Aug 25 09:01:47 :(L) Exec: close connection
FORAY1 : Aug 25 09:02:00 :(L) Exec: Rcv'd Shutdown message
FORAY1 : Aug 25 09:02:00 :(L) Exec: Rcv'd quit message
FORAY1 : Aug 25 09:02:01 :(L) Exec: Rcv'd quit message
FORAY1 : Aug 25 09:02:01 :(L) DPrt: Closed
FORAY1 : Aug 25 09:02:01 :(L) Echo: Closed
FORAY1 : Aug 25 09:02:08 :(L) P002: Closed
FORAY1 : Aug 25 09:02:08 :(L) P003: Closed
FORAY1 : Aug 25 09:02:08 :(L) P001: Closed
FORAY1 : Aug 25 09:02:08 :(L) P004: Closed
FORAY1 : Aug 25 09:02:08 :(L) L004: Closed
FORAY1 : Aug 25 09:02:08 :(L) L003: Closed
FORAY1 : Aug 25 09:02:08 :(L) L002: Closed
FORAY1 : Aug 25 09:02:08 :(L) L001: Closed
FORAY1 : Aug 25 09:02:08 :(Q) ***** Shutdown (Quit) completed *****
```

## Chapter 6

# Server Advanced Configuration

## "Configuration:Advanced Options" § Options "Server Advanced Configuration Options" §

Because each network is unique, your Foray PPP Server was designed to be extremely versatile. To accomplish this, your server maintains a configuration file named ACS.INI § "ACS.INI" §. It contains user definable information for customizing the configuration of your server and its serial ports.

This chapter will explain what your ACS.INI § "ACS.INI" § file is, how information is logically arranged within the file and how you can tailor this information, either manually or with options from the Server Initialization screen, to best benefit your network environment.

Topics	
<b>ACS.INI § "ACS.INI" § Configuration File</b>	<b>Page 34</b>
<b>ACS.INI § "ACS.INI" § file format</b>	<b>Page 34</b>
<b>Editing ACS.INI § "ACS.INI" §</b>	<b>Page 34</b>
<b>ACS.INI § "ACS.INI" § Parameters</b>	<b>Page 35</b>
xe "LAN gateway\configuration" § xe "LAN gateway\ACS.INI" § xe "ACS.INI" § xe "configuration files\ACS.INI" §	

## ACS.INI Configuration File

---

The ACS.INI file contains information for configuring your server and its serial ports. The file must be located in the default FORAY directory, for the server to function properly. When you installed your Foray PPP Server, the installation program replaced many of the default keyword values with settings that were a reflection of your server and modem environments. Occasionally, as your network environment changes, you will want those changes to be reflected in your ACS.INI file. You can make those changes through the configuration options on the Server Initialization screen or manually, using the command and syntax listings in this chapter.

### ACS.INI File Format

---

Your ACS.INI file contains two types of entries: group names, and entries that assign a value to a keyword. Neither type is case-sensitive. An example of how the group names and related keyword entries are organized is shown below:

```
[group_name]
keyword = value           ;comment
keyword = value           ;comment
keyword = value           ;comment
[group_name]
keyword = value           ;comment
```

You do not want to use quotes to delimit strings in this file. Any characters preceded by a semicolon are interpreted as comments and are ignored by the server.

#### Groups

Group names are enclosed in square brackets. Spaces are not allowed within the brackets; spaces outside the brackets are ignored. Groups may appear in any order within the ACS.INI file, but each group name should be unique. If a group name appears more than once, the server will use only the keyword entries following the first appearance, ignoring any entries which follow the second appearance.

#### Keywords

A keyword entry consists of a valid keyword, an equals sign (=), and a valid value. Keyword entries may appear in any order within a group. If a keyword appears more than once, the server will use only the first entry, ignoring subsequent entries.

A listing of valid group names and keywords can be found in the ACS.INI

"ACS.INI"§ Syntax section later in this chapter.

## xe "ACS.INI\:\:editing"§Editing ACS.INIxe "ACS.INI"§

---

Changes to your ACS.INIxe "ACS.INI"§ file are normally made through selections in your Server Initialization screen. However, as a text file, you can edit the ACS.INI file with any simple text editor. We recommend making a backup copy of your ACS.INI file prior to making any changes. **Note: You may want to exercise caution if you are editing the file with a word processor. Most word processors insert unwanted control characters into the text when the file is saved in their native format. These characters will corrupt your file and may prevent the server from functioning.**

Keywords are organized into the following functional groups:

[PCLanACSxe "PCLanACS"§] Sets global parameters for Foray PPP Servers, including how long the server will wait for activity before timing out.

[ACS-filesxe "ACS-files"§] Specifies the names of the dial-in log file, and the diagnostic log file.

[Defaultxe "Default:ACS.INI Group"§] Specifies default modem settings that are used for all ports, unless overridden in the MODEM groups.

[Modem $nn$ xe "Modem $nn$ :ACS.INI Group"§] where  $nn$  is the modem number, between 0 and 31. Specifies settings for each serial port, including line ID, initialization and quit strings, dial prefix and suffix, and baud rate. **Additional entries for individual ports are only necessary if a different modem from the default will be used.**

[DXxe "DX"§] Turns on diagnostic services for server processes.

[PPP\_LCPxe "PPP\_LCP"§] Sets initial PPP Link Control Protocol parameters.

[PPP\_IPXCPxe "PPP\_IPXCP"§] Sets initial PPP IPX Control Protocol parameters.

[PPP\_IPCPxe "PPP\_IPCP"§] Sets PPP IP Control Protocol parameters.

[Routerxe "Router"§] Sets the server's internal network number and other router parameters.

[LogicalBoardsxe "LogicalBoards"§] Specifies logical board assignments for each protocol stack.

[Securityxe "Security:ACS.INI Group"§] Specifies the server's security and

authentication options.

## xe "ACS.INI\parameters"§ACS.INIxe "ACS.INI"§ Parameters

---

Valid group names and keywords are essential to the proper functioning of your server. Below we have listed the proper syntax for each valid keyword within each group. The valid values for each keyword are given to the right of the equals sign (=).

### **[xe "PCLanACS group"§xe "ACS.INI:PCLanACS group"§PCLanACS] group**

xe "ConnectTimeOut keyword"§ConnectTimeOut = *num\_seconds*

After the server answers a call from a workstation, ConnectTimeOut determines how long the server will wait for the workstation to identify itself. If the workstation does not respond within the specified period, the server resets the modem. The minimum time out value is 120 seconds, and this is the default. The maximum is 65535 seconds.

xe "Inactivity keyword"§Inactivity = *num\_seconds*

Determines how often the port driver will query the client process to see whether the connection is still active. If the client process indicates that there has been no significant activity since the previous query, the server resets the modem. In the absence of other activity, IPX heartbeat packets will not prevent an inactivity timeout. The default is 0; which instructs the server to never execute a modem disconnect due to a timeout.

ReduceXmitWindEstByxe "ReduceXmitWindEstBy:Keyword"§ = *num\_packets*

During the start-up process, the gateway calculates the maximum number of packets it will place in the queue for transmission to any given workstation. The calculation is based on the initial amount of available free memory found on the gateway. During periods of heavy use, the cumulative effects of this calculation could cause the gateway to run out of memory, resulting in a system failure. The ReduceXmitWindEstBy parameter proactively corrects this by reducing the gateway's initial packet estimate by *num\_packets*. This parameter will not allow the number of packets to be smaller than 3. The default value for ReduceXmitWindEstBy is 2.

StartingComPort = ( 0 | 4 )



xe "StartingComPort keyword"§

Sets the number of the first Com port the server will use. If you are using internal serial cards with 4 ports or less, this value should be 0. If your server will require more than 4 ports, you will be using a DigiBoard configuration and this number should be set to 4. The default is 0.

**[xe "ACS-files group"§xe "ACS.INI\groups\ACS-files group"§ACS-files] group**

xe "log\ACS.INI keyword"§Log = *dial-in\_log\_file\_name*

Specifies the name of the file that records information about remote connections to the server. The default is C:\Foray\ACS.LOGxe "ACS.LOG"§.

xe "diag\ACS.INI keyword"§Diag = *diagnostic\_log\_file\_name*

Specifies the name of the file that records messages from the Log and Diagnostic windows on the server screen. Messages are sent to this file only when you have issued the Log or Diag commands. The default is C:\Foray\DIAG.LOGxe "DIAG.LOG"§.

xe "Modemnn group"§xe "DEFAULT group"§xe "ACS.INI\groups\DEFAULT group"§xe "ACS.INI\groups\Modemnn group"§

**[DEFAULT] and [MODEM] groups**

The [DEFAULT] and [MODEM] groups specify Line ID and modem settings.

The DEFAULT group establishes the default values for all of the server's modems. Individual modems that differ from the DEFAULT group settings are defined using a MODEM group.

**How Modem Groups Correspond To Port Numbersxe "Modemnn group\correspondence to port numbers"§xe "port numbers\and Modemnn groups"§**

Modem groups in the ACS.INIxe "ACS.INI"§ file are numbered beginning with zero (0). Each group corresponds to one of the communication ports controlled by the server. For example, the group MODEM0 describes the modem attached to the first port, which is COM1; MODEM1 describes the modem attached to COM2, etc. If your server contains a DigiBoard, the first DigiBoard port is COM5, attached to MODEM0.

## **Modem And Default Section Keywords**

**ModemId keyword** § *ModemId = name*

Assigns a name to this modem on the network. This identifier may be up to 8 characters long, and can not contain spaces or special characters. It need not be unique. The default is MODEM.

**LineId\:\ACS.INI keyword** § *LineId = name*

Identifies the port on the network. You can enter your own four-character LineId keyword, or you can allow the server to assign Line Ids. If you do not enter a Line ID, the first line you enable without specifying a LineId defaults to L001. If the server finds duplicate Line Id keywords, it generates a new ID by incrementing the last character of the duplicate name. L001 becomes L002, L009 becomes L00A, X is replaced by Y, Z is replaced by A, etc.

**ModemInit keyword** § *ModemInit = string*

This is the modem initialization string. The string is normally terminated with a carriage return symbol, indicated by entering ^M. The default is no string.

**ModemQuit keyword** § *ModemQuit = string*

This is the modem disconnect string. This string is sent to the modem when your Foray PPP Server is shut down. To include a carriage return in this string, use ^M.

**baud rate\:\BaudRate keyword** § *baud rate\:\setting* § *setting the baud rate* § *BaudRate = 1200 | 2400 | 4800 | 9600 | 19200 | 38400 | 57600*

This is the start-up connection speed, entered as a number (e.g., 19200; do not include any commas). The default is 57600 bps for ports with 16550 UARTs. For ports using slower UARTs the maximum speed and the default are both 19200. Attempts to override these limitations with the BaudRate command will be ignored.

**[PPP\_LCP group] \:\ACS.INI\:\groups\:\PPP\_LCP group" § PPP\_LCP" § | Group**

The following keywords set starting points for PPP LCP negotiations.

xe "MRU keyword"§MRU = *packet\_size*

Maximum Receive Unit sets the starting point for negotiating the largest packet size that the server will accept. Enter the packet size in bytes. The default value of this keyword is 1500.

xe "R\_CMAP keyword"§R\_CMAP = *control\_map*

Defines Receive Control Mapping for characters that must be escaped out. Do not change the value of this keyword unless directed to do so by TechSmith Technical Support. Default is 0x000A0000.

xe "R\_AUTH keyword"§R\_AUTH = ( 0 | PAPxe "PAP"§ | CHAPxe "CHAP"§ )

Receive Authentication enables PAPxe "PAP"§ or CHAPxe "CHAP"§ passwordxe "password"§ authentication for dial-in users. If this keyword is set to PAP the server will use PAP to authenticate a password before it allows a workstation to access LAN services. Setting this keyword to CHAP will direct the server to use CHAP for user authentication. Setting this keyword to 0 disables password checking. The default is set to 0, and this is the keyword value in the sample ACS.INIxe "ACS.INI"§.

xe "R\_AUTH keyword"§R\_MIN\_AUTH = PAPxe "PAP"§

Receive Minimum Authentication enables the authentication process to use PAPxe "PAP"§ passwordxe "password"§ authentication as an alternative when the preferred authentication method specified in R\_AUTH is CHAPxe "CHAP"§. This command is optional. If R\_MIN\_AUTH is not specified, it will default to the value specified in R\_AUTH.

**[xe "PPP IPCP group"§xe "ACS.INI\:\groups\:\PPP IPCP group"§PPP IPCPxe "PPP IPCP"§] Group**

ALLOW\_STATIC\_IP\_ADDRxe "ALLOW\_STATIC\_IP\_ADDR:keyword"§ = ( N | Y )

ALLOW\_STATIC\_IP\_ADDR specifies whether or not dialup workstations are allowed to specify their own IP address. The default value is N (No). If the value Y (Yes) is used, dialup workstations will be allowed to specify their own IP address, however it will not be required. Workstations requesting an IP address will be assigned one by the server, based on the address value specified in IP\_ADDR.

BOOTP\_PROXYxe "BOOTP\_PROXY:keyword"§= ( Y | N )

Bootp Proxy enables the server to handle client BootP requests rather than passing them on to the LAN. If this is enabled, the server will respond to the clients BootP request with the IP address that would normally be assigned

through IPCP. If this is disabled, a BootP server should be present on the LAN to respond to the client with an IP address assignment. Default = Y.

xe "IP\_ADDR keyword"\$IP\_ADDR = *address*

IP Address specifies the address that the server itself will use. When workstations request an IP address, the server will either assign them consecutively, beginning with the next sequential address (if IP\_DYNAMIC has been selected), or assign them this address (if IP\_DYNAMIC has not been selected). If IP\_DYNAMIC has been selected, there must be enough consecutive addresses available (not assigned elsewhere) to assign one to the server and one to each additional port that requests one. Enter the address as a dotted decimal value.

IP\_DYNAMICxe "IP\_DYNAMIC:keyword"\$ = ( Y | N )

IP Dynamic determines whether the server should assign client addresses from its IP address pool during IPCP negotiation. Default = Y. IP Dynamic should normally be enabled unless all clients are using pre-assigned (static) IP addresses.

xe "IP\_MASK keyword"\$IP\_MASK = *address*

Specifies the IP subnet mask. Enter the address as a dotted decimal value. If subnets are not used, enter the appropriate network mask for the class of IP address. For example:

Class A: 255.0.0.0

Class B: 255.255.0.0

Class C: 255.255.255.0

xe "IP\_DEF\_GATE keyword"\$IP\_DEF\_GATE = *address*

IP Default Gateway is the address of the default router. If you do not have a router use 0.0.0.0, the default value.

PRI\_DNS\_SRVRxe "PRI\_DNS\_SRVR:keyword"\$=*address*

SEC\_DNS\_SRVRxe "SEC\_DNS\_SRVR:keyword"\$=*address*

Primary DNS Server and Secondary DNS Server are used to designate the IP address of the primary and secondary Domain Name Servers. Enter each address as a dotted decimal value. Default is 0.0.0.0. This parameter is primarily used to support the Windows 95xe "Windows 95"\$ and Windows NTxe "Windows NT"\$ environments.

PRI\_NBNS\_SRVRxe "PRI\_NBNS\_SRVR:keyword"\$=*address*

SEC\_NBNS\_SRVRxe "SEC\_NBNS\_SRVR:keyword"\$=*address*

Primary NBNS Server and Secondary NBNS Server are used to designate the IP address of the primary and secondary NetBIOS Domain Name Servers. Enter each address as a dotted decimal value. Default is 0.0.0.0. This parameter is primarily used to support the Windows 95 "Windows 95" and Windows NT "Windows NT" environments.

xe "R\_VJ\_COMP keyword"§R\_VJ\_COMP = ( 0 | 1 )

Receive Van Jacobson Compression toggles Van Jacobson Compression for received packets on or off. Setting this keyword to 1 turns Van Jacobson compression ON, 0 turns it OFF. This keyword is set to 1 in the sample ACS.INI; default is 0.

xe "R\_VJ\_SLOTS keyword"§R\_VJ\_SLOTS = *number\_of\_slots*

Receive Van Jacobson slots controls the number of active compression slots, which may range from 4 to 16. Too few active slots will impair performance, but each slot requires additional memory. Default is 4, which will be acceptable in most cases. If you are running an application which opens multiple TCP connections, or are running multiple TELNET sessions under Windows, you may need to set this higher.

**[xe "PPP\_IPXCP group"§xe "ACS.INI\groups\PPP\_IPXCP group"§PPP\_IPXCPxe "PPP\_IPXCP"§] Group**

The following keywords enable or disable IPX header compression.

xe "R\_HDR\_COMP keyword"§R\_HDR\_COMP = *number\_of\_slots*

Receive Header Compression sets the number of receive slots for IPX header compression, which may range from 3 to 16. Note that 1 and 2 are not legal values for this keyword. The default for this keyword is 5 and this value should be acceptable in most cases. Too few active slots will impair performance, but each additional slot requires additional memory.

To force IPX header compression OFF for all sessions, set R\_HDR\_COMP to 0, which is the default.

[xe "Router group"§xe "ACS.INI\groups\Router group"§Routerxe "Router"§] Group

The following keywords set router parameters.

xe "NetworkId keyword"§NetworkId = *internal\_network\_number*

If you will be using IPX, you will need to specify the NetWare network number of the server's internal network. The server's internal network is similar in concept to the internal network inside NetWare 3x and 4x servers. It allows the server's network adapter to serve as a common access point for the server's remote users. The network number can be up to eight characters hexadecimal, and it must be unique with respect to all other network addresses to be assigned to LANs, WANs, other server internal network addresses, and other LAN servers. This keyword is ignored if IPX routing is not enabled.

RouteIPBroadcastsxe "RouteIPBroadcasts:keyword"§ = ( Y | N )

Route IP Broadcasts determines whether IP broadcast packets are to be forwarded. Default = Y.

xe "RouteNetbios keyword"§RouteNetbios = ( 0 | 1 )

Route NetBIOS toggles whether workstations loading Novell NetBIOS on top of the workstation driver can access NetBIOS resources on the LAN. Setting this keyword to 1 allows workstations configured this way to access NetBIOS resources; setting it to 0 filters out NetBIOS traffic. Some software packages, most notably Windows 95xe "Windows 95"§ and Windows for Workgroups 3.11, require this capability to effectively use their network browsing features. Disabling RouteNetbios, if it is not required, enhances server performance. Default is 0.

**[xe "LogicalBoards group"§xe "ACS.INI:groups\LogicalBoards group"§LogicalBoardsxe "LogicalBoards"§] Group**

The keywords in this section indicate which network frame types the server will use for various protocols. NetWare ODI network drivers assign a logical board number to each frame type. This is currently determined in NET.CFG, where the order in which the frame types are listed corresponds to the ID number of the logical board to which each frame type is assigned. The first frame type listed in NET.CFG will go to the first logical board, the second frame type will go to the second logical board, and so on. The following keywords control assignment of frame types to logical boards.

xe "IPXLogicalBoardID keyword"§IPXLogicalBoardID = *board\_ID\_number*

IPX Logical Board ID is the number of the logical board that the IPX protocol is bound to. The default is 1. To disable remote IPX/SPX support, set this keyword to 0.

xe "IPLogicalBoardID keyword"§IPLogicalBoardID = *board\_ID\_number*

IP Logical Board ID is the number of the logical board that the IP protocol is bound to. The default is 2. To disable remote TCP/IPxe "TCP/IP"§ support, set this keyword to 0.

**[xe "DX group"§xe "ACS.INI\groups\DX group"§xe "diagnostics\DX group in ACS.INI"§DX] (diagnostics) group**

xe "*process\_ID keywords*"§*process\_ID* = ( 0 | 1 )

The keywords in this section are the server process identifiers. For each process identifier, you can determine whether or not diagnostic messages are automatically displayed on the server console monitor when you start the server. You can use the log and diag keywords to automatically write log and diagnostic window output to a file whenever the server starts. During normal operation, allow these keywords to default to 0, which displays no diagnostic messages. To display diagnostic messages for any process, set the flag for that process to 1.

You can set these flags using the arguments ( 0 | 1 ), ( YES | NO ), ( ON | OFF ), or ( TRUE | FALSE ). The arguments are not case sensitive.

log = ( 0 | 1 )

Setting this diagnostic flag to 1 sends the log window output to a file.

diag = ( 0 | 1 )

Setting this diagnostic flag to 1 sends the diagnostic window output to a file.

con = ( 0 | 1 )

Setting this diagnostic flag to 1 sends server keyboard input to a file.

*line\_ID* = ( 0 | 1 )

Setting this diagnostic flag to 1 turns on diagnostics for the process that manages the selected Foray PPP Server port. The line identifiers set in the groups [MODEM0] through [MODEM31] are all process identifiers.

*Lnnn* = ( 0 | 1 )

Setting this diagnostic flag to 1 turns on PPP line driver diagnostics for line driver number *nn*.

*arp* = ( 0 | 1 )

Setting this diagnostic flag to 1 turns on ARP cache maintenance diagnostics.

*rtr* = ( 0 | 1 )

Setting this diagnostic flag to 1 turns on router diagnostics.

### **[Security] group**

The keywords in this section indicate which type of authentication the server will use.

**AUTH\_SYS\_TYPE** *exe "AUTH\_SYS\_TYPE"§ = security\_option*

Determines the type of authentication the gateway will use. The server will not initialize without a valid AUTH\_SYS\_TYPE. If the AUTH\_SYS\_TYPE entry is missing, or if the keyword is set to an invalid value, the server displays an error message and will not start. There is no default value for this keyword.

The valid keyword entries for this command are:

NONE

The gateway does not require user authentication (NOT recommended.)

LOCALFILE

The gateway will use it's own authorization system to validate workstation connection requests.

NOVELL

The gateway will use the Novell NetWare authorization system to validate workstation connection requests.



## Chapter 7

# Server Run-Time Messages

As a network administrator, you depend on feedback to monitor, troubleshoot and maintain your network environment. Your Foray PPP Server provides a constant stream of status messages on every activity it performs. These messages can be viewed on the console screen and saved in log files for later use.

This chapter describes the functions of the various classifications of messages along with detailed listings of all the messages and their meanings. Whenever possible the messages have been arranged in alphabetical order within each message classification group. Many messages begin with a double exclamation point (!!) symbol. This symbol has been ignored for the purpose of alphabetizing.

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Echo Messages	
IP Protocol Manager Messages	
IPX Header Compression Messages	
PPP Transport messages	
IP Header Compression (Van Jacobson) messages	

## Initialization "messages\:\:initialization"§xe "initialization messages"§xe "error messages\:\:initialization"§ Messages

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The following messages may occur during the server initialization process. Some of these messages are informational only. Others notify you of errors that have occurred, causing the server to terminate and return to the DOS prompt.

!!ACS IP address not allowed	The value found in the ACS.INI file was not a valid IP configuration.
!!ACS IP_ADDR not a valid number !!ACS IP_MASK not a valid number !!ACS IP_DEF_GATE not a valid number	The named value did not appear in the ACS.INI as a valid hex or dotted decimal number.
!!Couldn't get protocol ID for [ IPX   IP   ARP ]	Unable to properly connect to NetWare stack. Possible coding error in ACS.INI or NET.CFG. Contact TechSmith Technical Support.
!!Default router not on ACS network	The value found in the ACS.INI file was not a valid IP configuration.
!!Error: <i>mn</i> bind <i>xxxx</i> stack	The LAN server's attempt to bind protocol stack <i>xxxx</i> returned error <i>mn</i> . A coding error in the ACS.INI or NET.CFG prevented the server from associating a logical board ID with protocol <i>xxxx</i> .
!!Error <i>n</i> from ReadIniString	ReadIniString returned an error code <i>n</i> , where <i>n</i> may be: 2        Read failure 4        Oversized string 5        File open error 8        Invalid group name 11       Unexpected End of File This message indicates that your ACS.INI file is invalid.
!!Error: <i>mn</i> getting <i>xxxx</i> pid	The LAN server attempted to get configuration information for process ID <i>xxxx</i> listed in NET.CFG. This might indicate miscoding of a logical board ID or a missing protocol statement in NET.CFG, or a driver that failed to load correctly.
!!Error reg [ ARP   IP   IPX ] stack: <i>mn</i>	Unable to properly connect to NetWare stack, where <i>mn</i> is an error code.
!!File not found: acs.ini	The LAN server could not find the ACS.INI parameter file in the correct directory.
!!'HookLSL.exe' not found	The LAN server was unable to link to HOOKLSL.EXE. Verify that HOOKLSL.EXE was loaded, and that it was able to find the ODI interface, LSL.COM.
!!Internal net id same as LAN	The value of the NetworkID keyword entered in the [Router] group of the ACS.INI illegally matched the network ID for the LAN segment.
!!Invalid command '#include'	The LAN server read a file name included in the initialization file as all blanks.
!!IP address mask invalid	The value found in the ACS.INI file was not a valid IP configuration.
!!IP net mask not specified	A warning message. The IP_MASK parameter in the ACS.INI file is missing.
IP interface found	Informational message at start up, indicating that the LAN server can provide IP services to the remote workstations.

!!IPX/SPX detected, but not supported	The server has detected an unnecessary IPX/SPX protocol stack.
LAN IPX Network number: <i>nnnnnn</i>	Informational message indicating that the LAN server is located on NetWare network number <i>nnnnnn</i> .
Maximum serial ports: <i>nn</i>	An informational message displayed during server initialization, where <i>nn</i> is the maximum number of simultaneous asynchronous connections allowed.
!!NetBIOS detected, but not supported	The server has detected an unnecessary NetBIOS protocol stack.
!!NetLib detected, but not supported	The server has detected an unnecessary NetLib protocol stack.
!!No network interface found	The server could not find any network service loaded. When this happens, the server exits to DOS. User should confirm that the appropriate drivers are loaded.
<i>operation: reason for failure</i>	(Dx only) The following messages indicate errors that occurred while the server was trying to process a passwordxe "password"§: OPEN: File name too long Path to files is too long. OPEN: Index file Could not open <i>filename</i> . OPEN: Data file Could not open <i>filename</i> . CLOSE: Index file Could not close the index file CLOSE: Data file Could not close the data file CHECK: Bad user id Did not recognize user IDxe "user ID"§ CHECK: File I/O error Could not read file CHECK: Bad passwordxe "password"§ Did not recognize password CHANGE: Can't write file Could not write passwordxe "password"§ change to file CHANGE: Can't flush file Could not write passwordxe "password"§ change to file ACS: Malformed packet Unable to process packet ACS: Password not required Not expecting passwordxe "password"§
!!Password file not found, R_AUTH enabled	The R_AUTH keyword in the ACS.INI file is set to require passwordxe "password"§ validation, but the server was unable to find the necessary local security files. The server exits to DOS.
Program psp: <i>nnnh</i>	Informational message giving the memory load point of ACS.EXE, where <i>nnnh</i> is a hexadecimal address.
Port <i>nn</i> , duplicate LineID fixup, was <i>sss</i> is <i>yyy</i>	The server found duplicate line ID numbers for port <i>nn</i> . The old value, <i>sss</i> , was duplicated on another port. The server generated a new port name, <i>yyy</i> , and assigned it to this port.
!!Read failed, ini '#include' file: <i>filename</i>	The server could not read the specified initialization file.
Runtime avail memory: <i>nnnn</i>	Indicates free memory after the server completes initialization.

Startup memory pool: DOS avail memory: <i>nnnn</i>	An informational message for TechSmith Technical Support.
!!String too long xxxx...	A string in the ACS.INI exceeds the maximum length for that parameter. The second line of the message displays the first 38 characters of the string.
!!Unable to open log file	Could not open the log file in the location specified in the ACS.INI file. This error could mean that the disk is full, that you do not have write permission, or that the path is invalid.
!!Unable to open diag file	Could not open the diagnostic file. This error could mean that the disk is full, that you do not have write permission, or that the path is invalid.
!!Using IP class default	A warning message. The IP_MASK parameter in the ACS.INI file is missing.
!!Wrong version of 'HOOKLSL.EXE' for ACS	The server executable and HOOKLSL versions do not match. Please load the current version of HOOKLSL.EXE. If a current version of HOOKLSL.EXE is not available, contact TechSmith Technical Support.
!!NetBIOS detected, but not supported	The server has detected an unnecessary NetBIOS protocol stack.
!!IPX/SPX detected, but not supported	
!!NetLib detected, but not supported	

## xe "messages\:\:run-time"§xe "run-time messages"§xe "error messages\:\:run-time"§Runtime Errors

The following errors are generally caused by failing or corrupted disk drives.

Critical error [reading   writing] on drive [A B C...]	DOS unable to read or write to the indicated drive.
Critical error on device [xxxx]	DOS reports a critical error on device xxxx, where xxxx is a device driver name.
Bad FAT on drive [ A   B   C ...]	DOS reports a file allocation table error on the indicated drive.

## LOG and DIAG Window Messagesxe "messages\:\:diagnostic"§xe "diagnostics\:\:messages"§xe "error messages\:\:diagnostic"§

The following messages are displayed in the server's Diag or Log windows. If you have activated file logging in the Diag or Log window, each message will be time stamped and written to the diagnostic file DIAG.LOG. Some messages are only generated during the initialization or termination of the server and are so labeled below. Those messages whose descriptions begin with "(Dx only)" will only appear if the diagnostic toggle is turned on for that process.

## Common Messages

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These messages are issued by more than one process. (xxxx is replaced with the appropriate process ID, such as Echo.)

xxxx: Closed	(Termination only) Process xxxx received and processed a quit command.
xxxx: Diagnostics are [on off]	Process xxxx received a diagnostic toggle command, resulting in the diagnostic state shown.
xxxx: Exit	The process terminated normally.
xxxx: Exit 1	The process terminated early.
xxxx: Init	(Dx only) The process xxxx received a start-up command.
xxxx: !!QAdd failed vc: nnnn	The server was unable to route a packet, where nnnn is a virtual circuit number. This may indicate a misconfigured server. Contact TechSmith Technical Support.
xxxx: Rcv'd CALA VC: nnn	(Dx only) The process received a CALA (Call Accept) packet, and will set up a virtual circuit. This is part of the normal initialization phase.
xxxx: Rcv'd CALR vc:nnnn	(Dx only) Process xxxx received a call request from the network interface process for virtual circuit nnnn, and responded by sending a call acceptance. This is part of the normal virtual circuit connect sequence.
xxxx: Rcv'd CLRR	(Dx only) Process xxxx received a disconnect request. It disconnected the session and returned a confirmation. This is part of the normal virtual circuit disconnect sequence.
xxxx: Rcv'd RESR	The process received a disconnect (reset) request, and disconnected the session.

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ARP Cache Manager Messages  
"messages\:\diagnostic\:\asynchronous driver"  
"diagnostics\:\asynchronous driver"  
"error messages\:\diagnostic\:\asynchronous driver"

The Address Resolution Protocol (ARP) is part of the IP protocol suite. The ARP Cache Manager issues these messages directly. Additional messages related to ARP are issued by the IP Protocol Manager. These are documented separately in the IP Protocol Manager section.

ARP: !!Wks using cached LAN address: nnn.nnn.nnn.nnn	A remote workstation attempted to use IP address nnn.nnn.nnn.nnn, which is registered in the server's ARP cache as belonging to a workstation on the LAN. The server discarded the packet.
ARP: Timeout: mnn.nnn.nnn.nnn	(Dx only) The ARP cache manager removed an IP address that had timed out. nnn.nnn.nnn.nnn is the address that it removed. This is a normal occurrence.
ARP: !!Malformed ARP packet: discarded	The ARP cache manager received an invalid ARP packet from the LAN. This may indicate a failing or misconfigured system

	on the LAN.
ARP: !!Duplicate IP address: <i>nnn.nnn.nnn.nnn</i>	The ARP cache manager discovered a LAN workstation using the same address as a remote workstation, or an address reserved for a remote workstation. This indicates an invalid address assignment on the network. Contact your network administrator.
ARP: Rcv'd ARP request: responding	(Dx only) The ARP cache manager received an ARP request from the LAN, for an IP address that the server manages. The server will return an ARP response to the requester.

## Asynchronous Connection Manager Messages "Messages:Asynchronous Connection Manager"§

(M) messages do not appear on the screen, but are placed in the Diagnostic log file.

Pnnn: Baud rate invalid or limited by UART type	The user has attempted to set an invalid baud rate or a baud rate that is too high for the UART being used.
Pnnn: Dialing: <i>xxx...x</i>	The server is performing a Callback function to the number <i>xxx...x</i> .
Pnnn: (M) Received modem Dx, port: <i>nn</i> (M) p: <i>nn xxx...x</i>	(Dx only) The modem on com port number <i>nn</i> returned this string (which may be many lines long) in response to a modem diagnostic string.
Pnnn: (M) Sent Dx, port: <i>nn</i> (M) <i>xxx...x</i>	(Dx only) The server sent a string from Modem Diagnostics to com port number <i>nn</i> . The second line of the message displays the first 38 characters of the string.
Pnnn: (M) Timeout modem Dx reply, port: <i>nn</i>	The modem waited for a response to the diagnostic message from the modem, then timed out.
Pnnn: Modem connect message: CONNECT <i>xxx...x</i>	(Where <i>xxx...x</i> is a modem connect identification) The second line is a message that the modem generates when a remote user connects. See the modem manual for further information about the characteristics of the connection.
Pnnn: Modem CONNECT timeout	The modem answered an incoming call, but did not receive a valid connect message before timing out.
Pnnn: Modem <cr> timeout	The LAN server received an invalid connect message from the modem. This may indicate an inappropriate modem initialization string.
Pnnn: Trimming CONNECT msg	The server read an excessively long connect message. It truncated the message. This may indicate an inappropriate modem initialization string.
Pnnn: Trimming pre-CONNECT msg	The server read an excessive number of characters without reading a connect message. It discarded the excess characters. This may indicate an inappropriate modem initialization string.

## Asynchronous I/O Manager Messages

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xe "messages\:\diagnostic\:\asynchronous driver"\$xe "diagnostics\:\asynchronous driver"\$xe "error messages\:\diagnostic\:\asynchronous driver"\$

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Direct Connect	The LAN server did not find a modem initialization string for this port, so it defaulted to direct connect status.
Framing error p: nn	A serial port detected a data framing error on port nn. A mismatch of baud rates between the server and the modem can cause the server to display this message. It can also be generated as part of a normal modem disconnect.
Invalid write (D)	A DigiBoard write command failed. Contact TechSmith Technical Support.
!!Modem not attached or off or CTS not asserted	The process expected a modem on this port, but did not detect one. It will try to reset the port at 60 second intervals. You can use the BLOCK command to disable the port.
Overrun error p: nn	A serial port detected an overrun error on port nn. This error should not occur on a properly installed server; contact TechSmith Technical Support.
Read error (D): <i>nnnh</i>	On an asynchronous server, a DigiBoard read returned an error code ( <i>nnnh</i> hex) that the server did not understand. If this error message is displayed under circumstances other than during the disconnection of a modem or serial cable, please contact TechSmith Technical Support.
!!Timeout modem initialization xxxx..	The process sent a modem initialization string, but did not receive a timely "OK<cr><lf>" response. The second line of the message displays the first 38 characters of the string returned from the modem, if any.
Trailer flag not found	The process detected a PPP framing error on a received frame, and discarded the frame.
Warning FIFO not enabled, p: <i>nn</i>	The server did not detect a 16550 UART on port <i>nn</i> .

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Echo Messagesxe "messages\:\diagnostic\:\echo"\$xe "diagnostics\:\echo"\$xe "error messages\:\diagnostic\:\echo"\$

Echo is a diagnostic and testing facility similar to a "ping" service.

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Echo: Rcv'd: nnnnn	(Dx only) The server reflected a packet of nnnnn characters back to the source.
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PPP Transport messagesxe "messages\:\:diagnostic\:\:PPP transport"\$xe  
 "diagnostics\:\:PPP transport"\$xe "error messages\:\:diagnostic\:\:PPP transport"\$xe  
 "messages\:\:diagnostic\:\:Rxnn"\$xe "diagnostics\:\:Rxnn"\$xe "error  
 messages\:\:diagnostic\:\:Rxnn"\$

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In the messages below, xxxx is replaced by the appropriate process ID, such as L001.

xxxx: 0 Len data: nn nn nn nn nn	The server received an invalid frame while attempting to negotiate options for PPP LCP frame types.
xxxx: Line noise? (A/C)	The server detected an invalid PPP frame and discarded it.
xxxx: Alloc (lines: nn) Queues: aa -> bb	The server allocated queue slots based on available memory and the maximum possible number of remote connections, where nn is the number of connections the server can have, and aa and bb are the unconstrained and constrained number of slots.
xxxx: Assigned IP Addr: nnn.nnn.nnn.nnn	The preceding message is part of the PPP TCP/IPxE "TCP/IP"\$ control protocol negotiation. See the current PPP Request for Comment (RFC) for further details.
xxxx: CHAP hash value too short xxxx: CHAP username too short	A malformed CHAP packet has been received.
xxxx: EVN: nn: FSM_M vector xxxx: EVN: nn old: aa -> bb v: cccch	These messages indicate state transition actions, a result of PPP link or control protocol negotiation.
xxxx !!Invalid CRC CB: nn nn nn nn nn nn nn (Repeated)	This PPP frame failed the CRC check, and was discarded.
xxxx !!Invalid L2_CB Sig	An internal control block was corrupted. Contact TechSmith Technical Support.
xxxx: L2CBs MaxAlloc'd: nn	Informational message, indicating the L2 control block high water mark.
xxxx: Line noise? (Protn)	The server found an internal PPP frame inconsistency of type n, and discarded the frame.
xxxx: Silent discard (protocol_type)	The server received another type of frame before completing LCP negotiation. The message may include the protocol type of the received frame. The server discarded the frame.
xxxx: !!L3 Reset uDataCount: nn L2_CB: nn nn nn nn	This message is followed by eight lines of hex digits, which may be of use to TechSmith Technical Support. A higher level process detected an inconsistent data block, and the block was discarded. nn is the data remaining from the frame at the time the process detected the inconsistency.
xxxx: N(R) Timeout	The server did not receive an acknowledgment for an outstanding packet within the timer period of HDLC_T1. Under normal circumstances, you may see this message occasionally. A large number of timeout messages probably indicates a communications problem. Contact TechSmith Technical Support.



xxxx: N(S) Timeout	(Dx only) An acknowledgment could not be piggybacked, and was sent as an RR frame.
xxxx: !!Out of L2_CBs	No more control blocks are available. Contact TechSmith Technical Support.
xxxx: PPP PROT REJ	The remote workstation sent a frame with an unknown protocol ID. The server returned a protocol reject.
xxxx: Rcv'd IPCP CONFIG REQ xxxx: Rcv'd IPCP CONFIG ACK xxxx: Rcv'd IPCP CONFIG NAK xxxx: Rcv'd IPCP CONFIG REJ xxxx: Rcv'd IPCP TERM REQ xxxx: Rcv'd IPCP TERM ACK xxxx: Rcv'd IPCP CODE REJ xxxx: Rcv'd unknown IPCP type xxxx: Rcv'd IP ADDR: <i>nnn.nnn.nnn.nnn</i> xxxx: Rcv'd invalid IP ADDRESS fldlen xxxx: Rcv'd IP ADDRESS: <i>nnn.nnn.nnn.nnn</i> xxxx: Rcv'd invalid IP COMPR fldlen xxxx: Rcv'd VJ Comp: <i>nn:n</i> xxxx: Rcv'd ?? Comp: <i>nnnn</i> xxxx: Rcv'd Rej IP_ADDRESS xxxx: Rcv'd Rej IP_ADDRESS xxxx: Rcv'd VJ Rej: <i>nnnh nn:n</i> xxxx: Rcv'd Unk Rej: <i>nn</i> for <i>mm</i>	These messages are part of the PPP TCP/IPxe "TCP/IP"§ control protocol negotiation. See the current PPP Request for Comment (RFC) for further details.
xxxx: Rcv'd LCP CONFIG REQ xxxx: Rcv'd LCP CONFIG ACK xxxx: Rcv'd LCP CONFIG NAK xxxx: Rcv'd LCP CONFIG REJ xxxx: Rcv'd LCP TERM REQ xxxx: Rcv'd LCP TERM ACK xxxx: Rcv'd LCP CODE REJ xxxx: Rcv'd LCP PROT REJ xxxx: Rcv'd LCP ECHO REPLY xxxx: Rcv'd LCP DISCARD REQ xxxx: Rcv'd unknown LCP type xxxx: Rcv'd MRU: <i>nnnn</i> xxxx: Rcv'd invalid fldlen xxxx: Rcv'd CMAP: <i>nnnnnnnh</i> xxxx: Rcv'd AUTH: <i>nnnh</i> xxxx: Rcv'd AC Comp xxxx: Rcv'd Code ID: <i>xxxxxx</i> xxxx: Rcv'd Prot Comp xxxx: Rcv'd HDLC/A xxxx: Rcv'd Gen Comp xxxx: Rcv'd Magic Number xxxx: Rcv'd Unk: <i>nn</i> for <i>mm</i>	These messages show the remote workstation's request for negotiation options for PPP LCP frame types. See RFC1661 for further information.
xxxx: Rcv'd duplicate CHAP ID: xxxx: Rcv'd unexpected CHAP ID: Packet discarded xxxx: Rcv'd too many CHAP responses xxxx: Rcv'd invalid CHAP ID:	A CHAP response packet has been received from the client that is either malformed or out of sequence.
xxxx: Rcv'd unknown CHAP type:	An unsupported CHAP packet has been received from the client.
xxxx: Rcv'd CHAP AUTH Response	This message is part of the PPP CHAP authentication protocol.
xxxx: Rcv'd PAP AUTH REQ xxxx: Rcv'd PAP AUTH ACK xxxx: Rcv'd PAP AUTH NAK xxxx: Rcv'd unknown PAP type	These messages are part of the PPP PAP authentication protocol.

xxxx: Rcv'd invalid control type: <i>nnh</i>	The server did not recognize a frame's control type ( <i>nn</i> hex).
xxxx: Rcv'd I Frame	(Dx only) The server received a reliable (I) frame.
xxxx: Rcv'd REJ Frame	The server received a reject (REJ) frame.
xxxx: Rcv'd RR Frame	(Dx only) An acknowledgment (RR) frame was received.
xxxx: Rcv'd UI Frame	(Dx only) A datagram (UI) frame was received.
xxxx: Rej'd AC comp	The workstation rejected address control field compression.
xxxx: !!Rej'd Authentication	The workstation rejected the server's request for authentication. The server disconnected the workstation. This may be the result of a misconfigured workstation.
xxxx: Rej'd Gen comp	The workstation rejected general compression.
xxxx: Rej'd HDLC/A	The workstation is unable to use TechSmith's reliable communication protocol.
xxxx: Rej'd Prot comp	The workstation rejected protocol compression.
xxxx: Rej'd UNK: <i>nn</i>	The workstation rejected an unknown element of type <i>nn</i> .
xxxx: Rej Frame: Line noise?	The received frame failed consistency checking.
xxxx: Rej Frame rc: <i>nn</i>	The server rejected a malformed frame, return code <i>nn</i> .
xxxx: Security rc: <i>nn</i> xxxx: Sending PAP Auth Req	These messages are part of the PPP PAP authentication protocol.
xxxx: Sent CHAP AUTH Success xxxx: Sent CHAP AUTH Failure xxxx: Sent CHAP Challenge	These messages are part of the PPP CHAP authentication protocol.
xxxx: Sent IP Addr (S): <i>nnn.nnn.nnn.nnn</i> xxxx: Sent IP Addr (D): <i>nnn.nnn.nnn.nnn</i> xxxx: Sent VJ Comp: <i>nn:n</i> xxxx: Sent IP Addr: <i>nnn.nnn.nnn.nnn</i>	These messages are part of the PPP TCP/IPxe "TCP/IP"§ control protocol negotiation.
xxxx: Sent MRU: <i>nnnn</i> xxxx: Sent Cntrl Map: <i>nnnnnnnnh</i> xxxx: Sent Auth: <i>nnnn</i> xxxx: Sent Prot Comp xxxx: Sent AC Comp xxxx: Sent HDLC/A xxxx: Sent Gen Comp	These messages show the server's request for negotiation options for PPP LCP frame types.
xxxx: Sent I Frame	(Dx only) The server sent a reliable (I) frame.
xxxx: Sent REJ Frame	The server sent a reject frame.

xxxx: Sent RR Frame	(Dx only) The server sent an acknowledgment (RR) frame.
xxxx: Short Frame: Line noise?	There were too few characters for a valid received frame.

IP Protocol Manager Messages  
 "messages\:\:diagnostic\:\:IP"§xe "diagnostics\:\:IP"§xe "error messages\:\:diagnostic\:\:IP"§xe  
 "messages\:\:diagnostic\:\:IPX/SPX"§xe "diagnostics\:\:IPX/SPX"§xe "error  
 messages\:\:diagnostic\:\:IPX/SPX"§

The IP protocol manager process generates these messages. (xxxx is replaced with the appropriate process ID, such as L001)

xxxx: ARP add: <i>nnn.nnn.nnn.nnn</i>	(Dx only) The ARP cache manager added IP address <i>nnn.nnn.nnn.nnn</i> .
xxxx: !!ARP add failed	The ARP cache manager was unable to add an IP address to the cache. Contact TechSmith Technical Support.
xxxx: ARP cache full, dropping LRU addr	The server needed to add an IP address to the ARP cache, but there were no empty slots. The server freed the least recently used LRU entry.
(xxxx: ARP found: <i>nnn.nnn.nnn.nnn nn</i> )	(Dx only) The ARP cache manager found IP address <i>nnn.nnn.nnn.nnn</i> in <i>nn</i> tries. This is an informational message.
xxxx: ARP not found: <i>nnn.nnn.nnn.nnn</i>	(Dx only) The ARP cache manager did not find IP address <i>nnn.nnn.nnn.nnn</i> in the cache. This is an informational message.
xxxx: IP address not part of subnet: <i>nnn.nnn.nnn.nnn</i>	A remote workstation is using an IP address that is not on the server's subnet. Although the server supports this IP configuration, it is unusual. It may indicate a problem in the server or workstation configuration.
xxxx: IP: Bcast from <i>nnn.nnn.nnn.nnn</i>	(Dx only) The process received a broadcast from <i>nnn.nnn.nnn.nnn</i> .
xxxx: IP: Caller not on ACS subnet IP: ACS IP <i>nnnn</i> IP: Caller IP <i>nnnn</i>	These three messages appear when a dial up user requests an IP address that is not on the subnet of the server. The second and third lines show the addresses of the caller and the server. This is not illegal but is not recommended.
xxxx: IP: Can't resolve destination	(Dx only) The IP process couldn't map the IP address to a destination.
xxxx: IP: Code <i>nn</i> reading; re-syncing	(Dx only) Debug message. The server received and discarded a packet with errors. The IP process is re-synchronizing with L3.
xxxx: IP: Couldn't L3 CMD_WRITE	(Dx only) L3 would not accept a packet bound for a remote user.
xxxx: IP: Dst: <i>nnn.nnn.nnn.nnn</i>	(Dx only) The IP process is displaying part of an IP packet header, showing the packet destination.
xxxx: !!Duplicate IP addr on network	The server detected another station on the network claiming the server's IP address.
xxxx: !!Impossible usIPIndex occurred	Contact TechSmith Technical Support.

xxxx: IPXL4: L3 %xx congested, pitching	(Dx only) The outbound line is congested and the process is discarding the packet.
xxxx: L4: L3 Disc. 1	(Dx only) L3 disconnected before any packets were read. L4 is aborting.
xxxx: IP: MAC Addr AA:BB:CC:DD:EE	(Dx only) The IP packet has been resolved to MAC address AA:BB:CC:DD:EE
xxxx: L4: NCPs open	(Dx only) The L4 process is open and ready to process packets.
xxxx: IP: No cfg for IPX (logical board n)	You have not loaded an ODI network driver.
xxxx: No IP router: nnn.nnn.nnn.nnn	A workstation attempted to send a packet to IP address nnn.nnn.nnn.nnn, but the server could not find a router and discarded the packet. The workstation or server may be misconfigured, or the IP address may have been entered incorrectly on the workstation (for example, by mis-typing the IP address in a ping command).
xxxx: IP: Regular IP	(Dx only) Received an IP packet.
xxxx: IP: Src: nnn.nnn.nnn.nnn	(Dx only) The IP process is displaying part of an IP packet header, showing the packet source.
xxxx: !!L4: Unexpected ACS pkt type xx	Contact TechSmith Technical Support.

IPX Header Compression Messages  
 xe "messages\:\:diagnostic\:\:echo"\$xe  
 "diagnostics\:\:echo"\$xe "error messages\:\:diagnostic\:\:echo"\$

The CIPX section of the Foray PPP Server L4 process generates the following messages, relating to IPX header compression. (xxxx: is replaced with the appropriate process ID, such as L100)

xxxx: CIPX: Allocated nnn rcv, mmm xmt	Indicates that IPX header compression is enabled for a line. The server has allocated nnn receive slots and mmm transmit slots.
xxxx: CIPX: Compression OK	(Dx only) The server successfully compressed a packet.
xxxx: !!CIPX: Compression failed with corrupted return code	IPX header compression failed. Contact TechSmith Technical Support.
xxxx: CIPX: Decompression OK	(Dx only) The server successfully decompressed a packet.
xxxx: !!CIPX: Decompression failed with corrupted return code	IPX header decompression failed for a packet. Contact TechSmith Technical Support.
xxxx: CIPX: Not active for line	The line is not using IPX header compression.
xxxx: CIPX: Rcv'd control packet	(Dx only) CIPX received a control packet from the workstation.
xxxx: !!CIPX: Rcv'd unknown packet type. Flags: nnh	CIPX received an unknown packet type. The message displays a hexadecimal representation of the 'flags' byte from the unknown packet.

xxxx: !!CIPX: Rcv'd REJECT packet. Flags: <i>nnh</i>	CIPX received a CIPX reject control packet from the workstation. The message displays a hexadecimal representation of the 'flags' byte from the rejected packet.
xxxx: !!CIPX: Rcv'd invalid 'Task Number Included' flag	CIPX received a packet with the 'Task Number Included' flag improperly set.
xxxx: !!CIPX: Rcv'd invalid 'Use Last Slot' flag	CIPX received a packet with the 'Use Last Slot' flag improperly set.
xxxx: !!CIPX: Rcv'd invalid Slot Number	CIPX received a packet with a bad slot number in it.
xxxx: CIPX: Wrote linebound CIPX control packet: <i>nnh nnh nnh</i>	The server wrote a CIPX control packet to the workstation. The message displays a hex dump of the packet.

---

## IP Header Compression (Van Jacobson "Van Jacobson:compression messages") messages "messages:IP Header Compression")

---

Your Foray PPP Server has the ability using TCP/IP "TCP/IP" over PPP "PPP" to negotiate Van Jacobson header compression. The Van Jacobson compression section of the L4 process generates these messages. (xxxx: is replaced with the appropriate process ID, such as L100 or X-01)

xxxx: !!VJ: Alloc: not enough RCV slots	Contact TechSmith Technical Support.
xxxx: VJ: Allocated <i>nn</i> rcv, <i>mm</i> xmt	Reports the number of Van Jacobson slots the process has allocated, where <i>nn</i> is the number of receive slots and <i>mm</i> the number of transmit slots.
xxxx: !!VJ: Comp: Invalid SLCompCB	A protocol failure has occurred. Contact TechSmith Technical Support.
xxxx: !!VJ: Comp: Unexpected VJ frame	Contact TechSmith Technical Support.
xxxx: !!VJ: Free: Invalid SLCompCB	Contact TechSmith Technical Support.
xxxx: VJ: In: Compressed TCP	(Dx only) Received a compressed TCP pkt
xxxx: !!VJ: In: Decomp err on UNCOMP_TCP	The process received a corrupted Van Jacobson packet from the workstation.
xxxx: !!VJ: In: Decomp err on COMP_TCP	The process received a corrupted Van Jacobson packet from the workstation.
xxxx: VJ: In: Waiting for CID	(Dx only) This message indicates normal Van Jacobson resynchronization.
xxxx: VJ: In: Uncompressed TCP	(Dx only) The process received an uncompressed TCP packet.
xxxx: !!VJ: Not enough RSlots	Contact TechSmith Technical Support.
xxxx: !!VJ: Not enough TSlots	Contact TechSmith Technical Support.

---

xxxx: VJ: Out: Compressed TCP	(Dx only) The LAN server sent a compressed TCP packet.
xxxx: !!VJ: Out: Compressor out unk	Contact TechSmith Technical Support.
xxxx: VJ: Out: IP	(Dx only) The LAN server sent an IP packet.
xxxx: VJ: Out: Uncompressed TCP	(Dx only) The server sent an uncompressed TCP packet.
xxxx: !!VJ: SetTossFlag: Invalid SLCompCB	Contact TechSmith Technical Support.
xxxx: !!VJ: Uncomp: Too long	The LAN server received a bad packet from the workstation.
xxxx: !!VJ: Uncomp: Too short	The LAN server received a bad packet from the workstation.
xxxx: !!VJ: Uncomp: Bad UCID <i>mn</i>	The LAN server unexpectedly received a Van Jacobson packet from the workstation.
xxxx: !!VJ: Uncomp: Bad CCID <i>mn</i>	The LAN server unexpectedly received a Van Jacobson packet from the workstation.
xxxx: !!VJ: Uncomp: Invalid SLCompCB	Contact TechSmith Technical Support.
xxxx: !!VJ: Uncomp: Unexpected VJ frame	The LAN server unexpectedly received a Van Jacobson packet from the workstation.

## Appendix A

# The 4 Port Serial Cardxe "4 Port Serial Card"§

This chapter will introduce you to your optional high speed multi-port serial card. This chapter covers the installation process and contains several useful installation tips. We recommend that you review the chapter carefully prior to the actual installation of the card.

The instructions assume that you can install a network interface card or other adapter board in your PC.

We also suggest that you read the README.1ST file on your Foray PPP Server diskette. This file may contain additional information about the serial card that is not available in the manual.

Topics	
<b>Outline of the Installation Procedure</b>	<b>Page 55</b>
<b>Installation Tips</b>	<b>Page 55</b>
<b>Installing the 4 port Serial Adapter Board</b>	<b>Page 55</b>

## Outline of the Installation Procedure

---

Successful installation of your Serial Communications card will require you to:

- Prepare your PC hardware and system software for your serial card;
- Install the serial card, providing the associated port assignment information, and
- Verifying the functionality of the installed serial card with your modems.

## Installation Tips "Installation Tips:4 Port Serial Card"§

---

The following tips are provided in an effort to avoid conflicts you may otherwise encounter later in your installation process.

- **Modems:** Your new serial card will support most modems. TechSmith works with customers and modem manufacturers on a continuing basis to review modems for use with our cards. If your modem appears to be having difficulty after you have installed your new serial card, please contact our Technical Support department for assistance.
- **Available Expansion Card Slots:** The Foray PPP Server 4 port serial card requires one vacant 16-bit card slot.
- **COM Ports:** On ISA installations, you must remove or disable existing serial ports that use the standard I/O ports (3F8h,2F8h,2E8h,3E8h). For ports on the system motherboard, refer to the manufacturer's documentation.
- **Port Interrupt Defaults:** When you install your 4 port serial card, the default interrupt for port 3 is Int10. This may conflict with settings commonly used by your existing network adapter cards. Therefore, we recommend assigning another available interrupt to this port to avoid possible conflicts.
- **Obtaining Port Information:** We recommend that you run a system diagnostic utility prior to the installation. You should take note of the current IRQ and I/O interrupt assignments. If you are running MS-DOS, we recommend running MSD.EXE from the C:\DOS directory. Refer to the *Installation* chapter in your 4 Port Serial Adapter Board User's Manual.



## Installing the 4 port Serial Adapter Board

---

The installation process begins with the preparation of your PC hardware and system software.

### 4 Port Serial Adapter Board Installation and Configuration

1. The 4-port 16550 serial communication card supports use of the standard I/O addresses, for COM1, COM2, COM3 and COM4 and allows flexible selection of IRQ for each port through on-board jumpers.
2. This board has been configured with the factory default interrupt settings of IRQ3, IRQ4, IRQ10 and IRQ11, and the standard COM port I/O values. The board does, however, allow you to designate the interrupts assigned to each COM port. We recommend that prior to configuring your adapter board, you run a system diagnostic utility, such as MSD.EXE, to determine your existing interrupt settings. You may find that IRQ10, the default for COM3, is already in use by your network card. If this, or any other situation, results in an IRQ conflict, you will need to choose another unassigned IRQ value and change the adapter board's settings appropriately. Consult the adapter board manual for specific information on changing interrupt settings.
3. Install the 4 Port Serial Adapter board in your target PC, following the instructions that come with the board. You can place the board in any available 16-bit slot.
4. Run the UART check program, QUERYCOM.EXE, provided with Foray PPP Server (and installed in the C:\FORAY directory) to confirm installation.

If the serial board is properly installed, the QUERYCOM should display information similar to the following (the exact values may vary depend on your system configuration):

```
QUERYCOM UART Detection Utility
Version 2.02.00 Built Dec 11 1995 09:42:43
Copyright (C) 1991 - 1995 TechSmith Corporation. All Rights Reserved.
```

```
Scanning for UARTs...
Port Type IRQ
02E8 16550A 11
02F8 16550A 3
03E8 16550A 10
03F8 16650A 4
```

If you see this message, you have successfully installed the 4 Port Serial board.

If QUERYCOM is unable to detect the 16550 chips, review your serial card installation and verify that any existing serial ports are fully disabled. If you can not install the serial card successfully, contact TechSmith Technical Support.

5. The last step is to verify your modem connection and to assign your system port information.

Your 4 port Serial Adapter Board installation is now complete. At this point, you can connect additional modems to the ports and use the Port Setup option on the Foray PPP Server initialization screen to configure the server to use the additional ports.

## APPENDIX B

# The DigiBoard Xem System "DigiBoard Xem System"§

If your Foray PPP Server is configured to support 8 or more ports, then your server package probably includes the DigiBoard Xem system.

This chapter will introduce you to your optional high speed DigiBoard Xem system. The system consists of an Xem host adapter card and one or more DigiBoard PORTS modules. This chapter covers the installation process and contains several useful installation tips. We recommend that you review the chapter carefully prior to the actual installation of the card.

The instructions assume that you can successfully install a network interface card or other adapter board in your PC.

We also suggest that you read the README.1ST file on your Foray PPP Server bundle.

Topics	
<b>Outline of the Installation Procedure</b>	<b>Page 58</b>
<b>Installation Tips</b>	<b>Page 58</b>
<b>Installing the DigiBoard Xem System</b>	<b>Page 58</b>

## Outline of the Installation Procedure

---

Please review the following outline of the basic steps involved in your DigiBoard system installation. The actual installation process begins later in this chapter.

The steps include:

- Preparing your PC hardware and system software for the DigiBoard system installation, and;
- Installing the DigiBoard system.

## Installation Tips "Installation Tips:DigiBoard"§

---

The following tips are provided in an effort to avoid conflicts you may otherwise encounter later in your installation process.

- **Network and application issues:** Make sure that the Server PC is working correctly on your LAN *before* you install your DigiBoard.
- **Select a unique I/O port address:** The DigiBoard host adapter card requires its own dedicated I/O port address. This address can not be used by any other device in your system. Consult your DigiBoard Installation Guide for valid I/O address choices. Once you have chosen an address, make a note of it. You will be required to use this address to set DIP switch settings on the host card and to enter it again during the installation of your device driver software.
- **Select an IRQ line.** The DigiBoard host adapter requires a dedicated IRQ line. Select an IRQ line which is not currently being used by another device, such as a Network or Video Adapter.
- **Select an unused Upper Memory Block (UMB).** The DigiBoard host adapter requires an unused 32k UMB. You will want to insure that the UMB you select is not being used by another device, such as a memory mapped Network adapter.
- **Download and review the latest drivers and installation instructions.** TechSmith maintains the latest device drivers and their installation instructions on our FTP site. To obtain these files, download 4AXEM.ZIP from our FTP site, <ftp.techsmith.com>.

## Installing the DigiBoard Xem System

---

The next step is to install the host adapter card in the Foray PPP Server. If you

have already installed the host adapter card, using the DigiBoard Installation Guide, you can skip to step 4 to test begin configuring the card.

## DigiBoard Xem Host Adapter Card Installation and Configuration

---

1. Included with your DigiBoard Xem System is the *DigiBoard Installation Guide*. We recommend that you read the *Introduction* (A product overview), the *Installation Section* that pertains to your server's architecture and the *Appendix* (Which covers avoiding memory conflicts).
2. If you are installing the ISA DigiBoard host adapter card, select a free 32k upper memory block address and dedicated I/O starting address. Generally, you should give the DigiBoard the D0000h memory block assignment. You can move most memory mapped network cards to C8000h. However, some network cards, primarily Token Ring cards, require memory in the D0000h segment. The segment starting at E0000h is available on many computers. If the video adapter is not an EGA or VGA, the C000h segment is usually available.

Note: In making your selections, remember that some network cards use memory in the upper memory block region, as do video cards. Also remember that all network cards use an I/O address.

Set the switches on the DigiBoard to match your I/O port address selection according to the instructions in your *DigiBoard Installation Guide*.

If you are installing DigiBoard MC/Xem version board in an MCA system, the configuration program will automatically find the memory and I/O address from the PS/2's Programmable Option Select (POS).

3. Install the DigiBoard card in the server, following the installation instructions in the *DigiBoard Installation Guide*. The ISA version requires a 16-bit "AT" slot.
4. To begin configuring the DigiBoard device driver, change to the FORAY directory on your gateway computer and invoke the DigiBoard driver configuration program by entering the following commands:  

```
cd \foray  
xemcfg
```
5. Within the DigiBoard driver configuration program, you must configure each DigiBoard installed in the gateway machine and set the DigiCHANNEL configuration parameters for each board as follows:

**Window Size** The default Window Size parameter is 32k.

**Memory Window** Set the Memory Window parameter to the high DOS memory address you identified in step 2.

- I/O Port** Set the I/O Port parameter to the I/O address you selected in step 2.
- IRQ #** Select an IRQ # that will not conflict with other devices in the machine.
- # Brd Chnls** Enter the number DigiBoard EBI modules you have and the number of ports each module contains. The total number of ports available will be displayed as **# Brd Chnls** (8,16, 24 or 32.)
- Start Chnl #** Set the Start Chnl # parameter to 4.

**Driver Support** The default is EBIOS.

6. You must also set Channel parameters for each DigiBoard installed on the gateway. Set the channel parameters as follows:

- Baud** Set the Baud parameter for each channel to 38400.
- Mode** The Mode parameter should default to 8,N,1 for each channel, and this is the correct value. If Mode does not default to this value, change the Mode parameter for each channel to 8,N,1.
- RX Flow** Set the RX Flow parameter for each channel to RTS.
- TX Flow** Set the TX Flow parameter for each channel to CTS.

Once you have set the parameters for the first channel correctly, choose **Set All**. This duplicates the parameters for the first channel in all other channels on the board.

7. Next, set **Options** for each DigiBoard installed on the gateway, as follows:

Enable Char Ready Flag

Set the Char Ready Flag option for each channel to **Enabled**.

8. Once you have set all of the parameters for each board correctly, choose **Quit** and **Save** the DigiBoard driver. (*Be sure to answer "Y" to the prompt "Save Changes to Disk for Re-Boot?"*.) The configured device driver, XEMDOS5.SYS, is now in the FORAY directory.
9. Once you have exited the DigiBoard driver configuration program, you will need to edit your CONFIG.SYS file to load the DigiBoard driver. If you have not already done so, edit the file to add the following lines:

```
DEVICE=C:\FORAY\XEMDOS5.SYS
DEVICE=C:\FORAY\XEM5INIT.SYS
```

10. Reboot the server computer. When the DigiBoard initializes, you should see messages similar to the following:

```
DigiBoard Xem DOS Driver
Version 4.0.0
Copyright (C) DigiBoard, Inc. 1993
Board 00: Mem D0000h, Port 324h - Support Successfully Loaded.
```

```
DigiBoard Xem DOS Driver Initializer
Version 1.0.0
Copyright (C) DigiBoard, Inc. 1993
Board 00: Mem D0000h, Port 324h - 32 of 32 ports successfully initialized
```

If you see these messages, you have installed and configured your DigiBoard correctly.

If the driver is unable to initialize the board successfully, check your CONFIG.SYS file to verify that the device driver entries are correct. Use the DigiBoard driver configuration program (XEMCFG.EXE) to review the parameters for the board(s).

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