LANDP® Family



Problem Determination

Version 6.0

GC34-6047-00

LANDP® Family



Problem Determination

Version 6.0

GC34-6047-00

Note

Before using this information and the product it supports, be sure to read the general information in “Notices” on page 265.

First Edition (February 2002)

This book is based on the previous edition, *LANDP Family Problem Determination Version 5.0,* GC33-5533-00, which remains applicable and current for users of LANDP® Version 5.0.

This edition applies to LANDP Family Version 6 (Program number 5724–B16) and to all subsequent releases and modifications, until otherwise indicated in new editions. Make sure you are using the correct edition for the level of product.

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Contents

About this book vii
Who should read this book vii
What you need to know vii
How this book is organized. viii
Conventions used in this book. viii
Related Information ix

Summary of Changes xi

Part 1. Problem Determination Information 1

Chapter 1. Introduction 3
Trace tools 4
Utility programs 5
Return codes 5
Messages 7
Alerts 7

Chapter 2. LANDP trace tools - DOS 9
Starting the trace tool server 10
Using the trace tool screens 11
Displaying trace files 14
Trace choices 15

Chapter 3. LANDP trace tools - OS/2, Windows, and Linux 39
EHCTRACW 40
EHCPDT (OS/2 and Windows only) 44
EHCTRACF 49
EHCLIP program services 49
MQSeries Link Server logging 51

Chapter 4. Support 53
Guidelines for requesting assistance 53
Documentation required by IBM 54
PDPACK utility 57
VERSION utility 59
Identifying and getting LANDP fixes 64
Problem determination flowcharts. 64

Part 2. Return Codes, Messages, and Alerts 79

Chapter 5. Loading return codes 81
Loading return codes 82

Chapter 6. LANDP return codes 123
ASCII-EBCDIC translation server (EHCDBTR) 127

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CICS interface server (EHCTRAN) 128
Compression server (EHCCOMP) 130
Cryptographic interface () 131
DDE access server (EHCLAD) 133
Electronic journal and store-for-forwarding servers. 136
Financial printer server (PR47X2##) 141
IBM 4748 printer server 145
IBM 4770 printer server 148
LANDP global return codes 150
LANDP Internet Protocol (EHCLIP). 155
LANDP link server 158
Local resource management server (EHCLRMGR) 160
Magnetic stripe reader/encoder server (MSRE47##) 163
MQSeries Link server (EHCMQ##). 166
Native X.25 server (X25NAT##) 169
Object post box server (OPBS) 173
ODBC query server (EHCODB##) 175
PIN pad server (PINP47##) 177
Printer manager server (PRTMGR). 180
Program-to-Program communications server (PPC##) 181
Query server (EHCSQL##) 184
Query server utility programs. 188
Remote change management services (RCMS) 189
Shared-file servers (SHFILE##) 193
Shared-file utility programs 204
SNA server (SNA##) 205
Supervisor local functions 210
System manager server 212
TCP/IP wide area communications server 218
VisualAge® Generator support 220

Chapter 7. LANDP family messages. 221
LANDP loading messages 221
LANDP for DOS messages 223
LANDP for OS/2 messages 228
REXX application programming support 229

Chapter 8. LANDP alerts. 231
Electronic journal server 233
Financial printer server. 234
Forwarding server 235
LANDP 3270 emulator 236
Magnetic stripe reader/encoder (MSR/E) server 237
Personal identification number (PIN) pad server 239
Remote change management services (RCMS) 241
Shared DOS directory server. 242
Shared-File server 244
Store-for-forwarding server 246
Synchronous data link control (SDLC). 247
SNA server 252

X.25 data link control (DLC) 252

Chapter 9. 3270 emulator operator information area 257
Deriving the status indicator codes 257
Status indicator codes 259
SBCS operator information layout 262
DBCS operator information layout 263

Appendix. Notices 265
Trademarks and service marks 266

Glossary 269

Bibliography 295
IBM LANDP Family 295
IBM Financial Branch System Services Licensed Programs 295
IBM Financial Branch System Integrator Licensed Programs 295
IBM Transaction Security System 295
Banking Self-Service 295
IBM workstations. 295
IBM Local Area Network 296
IBM 3270 296
Wide Area Communications 296
IBM NetView 297
IBM Financial I/O Devices. 297
Encryption and Decryption 298
IBM VisualAge C++ 298
IBM VisualAge Generator 298
IBM VisualAge Smalltalk 299
Java 299
IBM Personal Communications 299
IBM Communications Server 299
WorkSpace On-Demand 299
MQSeries 299

Index 301

Sending your comments to IBM 311

About this book

This book provides information about the following IBM® LAN Distributed Platform (LANDP®) Family products:

- LANDP Family Version 6.0 with its components:
  - LANDP for DOS
  - LANDP for OS/2®
  - LANDP for Windows
  - LANDP for Linux

Note: This book no longer provides information about IBM LANDP for AIX®. Refer to the previous edition of this book, *LANDP Family Problem Determination Version 5.0*, GC34-5533-00, for information about this product.

This book describes how to use trace tools, diagnostic programs, alerts, and return code information and messages to:

- Debug code while developing LANDP application programs and user servers
- Resolve problems that occur while using LANDP family components
- Record, display, and interpret trace information
- Look up and interpret LANDP return codes and alerts
- Work with IBM support representatives
- Maintain program versions and fix levels
- Install LANDP program fixes

Who should read this book

This book is for application programmers, system programmers, and system administrators who do the following:

Application programmers
: Design, develop, test, and debug application programs

System programmers
: Adapt host applications and communication software

System administrators
: Manage and monitor database systems, host systems, branch networks, and LANDP workgroups

What you need to know

Before you use this book, you should be familiar with:

- The operating system environments in which you use LANDP
- The programming languages used with LANDP
- The concepts and operation of the communications, databases, system management, and I/O devices that you use

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If you work with wide-area communication servers, then you should be familiar with System Network Architecture (SNA) protocols, and with Synchronous Data Link Control (SDLC), Token-Ring Data Link Control, or X.25 Data Link Control.

If you work with LANDP internal communication servers, then you should be familiar with either Network Basic Input/Output System (NetBIOS), or with Transmission Control Protocol/Internet Protocol (TCP/IP).

If you work with alert notifications, then you should be familiar with the NetView® program and SNA networks.

How this book is organized

This book has two parts:

Part 1, “Problem Determination Information” describes how to use LANDP diagnostic tools, programs, and information.

Part 2, “Return Codes, Messages, and Alerts” contains lists of return codes, messages, and alerts, grouped by platform, program, and server.

Conventions used in this book

The following conventions are used in this book.

A term that is used for the first time, or whose meaning is important for you to understand, is shown, in italics, like this: *term*. A definition of the term usually follows. It might also appear in “Glossary” on page 269.

An online element, such as a check box, field name, menu choice, or push button, is shown, in bold text, like this: **Return code**.

A value that either you or the system must supply is shown like this:

Open the file EHCTRC*xx*.DAT, where *xx* is the value of the workstation identifier.

A hexadecimal value is shown like this: X'00000421'.

DB2 Universal Database®

In this book, all references to DB2® or DB2/2 apply to IBM DB2 for OS/2 and to IBM DB2 Universal Database®.

Windows

In this book, all references to Windows apply to Microsoft Windows NT, Microsoft Windows 2000, and Microsoft Windows XP Professional, unless indicated otherwise.

Linux

In this book, all references to Linux apply to RedHat, SuSE, TurboLinux and Caldera distributions of Linux, unless indicated otherwise.

File names in Linux are usually lowercase versions of those shown in this book. In addition, for executable Linux files (for example, the LANDP servers), there are no filename extensions.

For example, the LANDP for Windows TCP/IP wide area communication server is EHCTCP.EXE and the LANDP for Linux TCP/IP wide area communication server is *ehctcp*.

Parameters on LANDP functions are usually preceded by a '/' character, but for Linux, the '/' character is replaced by a '-' character.

Related Information

The LANDP family is supported by the following books. In this book, references to other LANDP books use the shortened titles shown here. For the full titles and order numbers of these publications, and a comprehensive list of LANDP-related literature, refer to "Bibliography" on page 295.

LANDP Introduction and Planning
: This book provides a brief description of the components and features of the LANDP family, and gives information about planning a LANDP system.

LANDP Installation and Customization
: This book provides information about installing, customizing, and distributing the LANDP family.

LANDP Programming Reference
: This book describes the application programming interfaces that are used to develop user servers and client applications.

LANDP Programming Guide
: This book gives guidance on writing application programs to use the interfaces described in the *LANDP Programming Reference*.

LANDP Problem Determination
: This book describes how to use the trace tools, diagnostic programs, alerts, and return codes to debug code while developing LANDP applications and user servers, or to resolve problems while using LANDP family components.

LANDP Servers and System Management
: This book provides detailed information on the LANDP servers, and describes how to manage and administer a LANDP system.

Web site

For more information about LANDP, please visit our web site at:

http://www.ibm.com/software/ts/landp/

Summary of Changes

This manual has been updated to describe the changes made to LANDP in Version 6.

The major changes in this version are:

- The removal of support of LANDP for AIX.
- The addition of support for Linux. LANDP for Linux can run on any of the following Linux distributions:
  - Red Hat
  - SuSE
  - TurboLinux
  - Caldera
- The addition of Java wrappers and Java Beans for the most popular LANDP servers.
- The addition of support for mixed NetBIOS and TCP/IP LAN transports. This enables easy migration of workgroups from NetBIOS to TCP/IP.
- The addition of the LANDP link server. This enables clients in one LANDP workgroup to use servers in another LANDP workgroup.
- The use of InstallShield to make it easier to install LANDP.
- The addition of a new graphical editor for customization.
- A description of the LANDP utility program PDPACK has been added.

This manual has also been restructured for Version 6. In particular, the chapters describing the trace tools of LANDP for OS/2 and LANDP for Windows have been combined, and the chapters describing the return codes from LANDP for DOS, LANDP for OS/2, and LANDP for Windows, have also been combined.

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Part 1. Problem Determination Information

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Chapter 1. Introduction

This chapter introduces the tools, programs, and information that are used to diagnose LANDP problems.

The LANDP family includes the following diagnostic aids:

- Tools for error logging and event tracing
- Utility programs for checking the version and program fix levels of LANDP programs and components
- Utility programs for installing program fixes
- Codes for loading errors, initialization errors, and run-time errors returned by LANDP programs and servers
- System services for alert notification, resolution notification, and messages

These diagnostic aids are designed to support non-defect problem determination. If you cannot determine the cause of a problem, or if you believe that the problem is caused by a LANDP program defect, then contact an IBM support representative.

For guidelines about working with support representatives and the information required to diagnose problems, refer to Chapter 4, “Support” on page 53.

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Trace tools

LANDP trace tools provide services for:

- Testing and debugging LANDP application programs
- Diagnosing problems occurring at the production site
- Obtaining information about resource usage

You do not need to use trace tools in daily operations, but they are essential if a problem occurs. You, or an IBM support representative, can use information from the trace tools to determine the cause of the problem.

Trace tool functions are generally provided by a trace server and a display trace program.

The trace server records events that occur while LANDP programs are running.

The display trace program provides a way to display and work with trace conditions, status settings, and other data.

The trace server and the display trace program work together to detect errors or abnormal situations, and to provide information about LANDP program operations.

Trace tools operate in each of the LANDP environments.

The trace server

The trace server is notified about events through special calls from other servers and application programs. Each call provides the address of the *trace control block* that contains the trace or log information. The trace control block is a data block. If it is valid, then the trace server writes a new trace or log record.

The display trace program

The display trace program has a menu interface that you can use to see trace information and log data from various sources.

Depending on the LANDP environment, the program might display:

- Trace data from the trace server memory buffer
- Data from other trace areas, such as data link control (DLC)
- Screens saved in separate files
- Trace and log files
- Current conditions and status settings

Trace data is displayed in the order it was stored. You can use the display trace program to change the conditions and status settings.

Loading trace tools

Load the trace tools into memory using the LOADER program or the LOADERE program. For information about the loading programs and loading statements, refer to the *LANDP Installation and Customization* book.

For information about loading parameters, specifying values, and using trace tools, refer to the following chapters:

- Chapter 2, “LANDP trace tools - DOS” on page 9
- Chapter 3, “LANDP trace tools - OS/2, Windows, and Linux” on page 39

Utility programs

LANDP includes the utility programs VERSION, APPLYFIX and PDPACK to help with maintenance.

VERSION

The VERSION utility program checks the version of LANDP program components, and the level of the latest last-installed Authorized Program Analysis Report (APAR). Information about a component and its version and APAR level can be either displayed, or written to a file. This information is useful when diagnosing problems, or when working with IBM support representatives.

The VERSION utility program runs on LANDP for DOS, LANDP for OS/2, LANDP for Windows, and LANDP for Linuxworkstations. For information about using the VERSION utility program, refer to “VERSION utility” on page 59.

APPLYFIX

The APPLYFIX utility program installs program fixes on LANDP program components, and keeps a record of the installed changes. It runs on your LANDP customization workstation. For information about using it, refer to the *LANDP Installation and Customization* book.

PDPACK

The PDPACK utility program can be used to collect some of the information that is required to determine why a LANDP workstation has failed.

This information is placed in an archive file that you can then send to your IBM support representative.

For further information about the PDPACK utility program, refer to “PDPACK utility” on page 57.

Return codes

A *return code* is a value returned to a program to indicate the result of an operation.

A *loading* return code is returned to the user when the utility programs LOADER or LOADERE are used to load LANDP components. Refer to Chapter 5, “Loading return codes” on page 81 for details of the values of the loading return codes.

A LANDP return code is a value returned by a *router* or *server* to indicate the result of a function or service request made by an application program. Router and server return codes are stored at different offsets in the Connectivity Programming Request Block (CPRB).

An operation is successful only if the router and server return codes are both zero. If a return code is nonzero, then it is in the form: X'0100*nnnn*', where *nnnn* might represent two ASCII characters.

This book contains return code listings grouped by LANDP server program. The listings include the hexadecimal return code and, if appropriate, the corresponding ASCII character.

Router return codes

A router return code is stored at offset 4 in the CPRB:

Zero	The request reached the server.
Nonzero	The request did not reach the server.

Server return codes

A server return code is stored at offset 40 in the CPRB:

Zero	The server processing is error-free.
Nonzero	Server processing error.

Return code classes

The first character in the ASCII return code denotes the class of the return code:

I *Intervention required*.

These return codes are returned when the error (or fault) is of a type that can be corrected by workstation operators or technical service personnel.

L *LAN services error*.

These return codes can occur as a result of any function request to any server.

P *Programming error*.

These return codes can occur while developing or debugging application programs. They should not occur during the daily operation of error-free programs.

U *Device error* (Unable to access equipment).

These return codes occur when LANDP software cannot carry out a request. The most likely cause is a hardware error or fault.

For more information about return codes, refer to either:

- Chapter 5, “Loading return codes” on page 81

or

- Chapter 6, “LANDP return codes” on page 123

Messages

On some platforms, LANDP displays messages in addition to, or instead of, generating return codes.

For example:
- In response to an unexpected event
- When something undesirable could occur
- To convey information about an operation

For a list of LANDP messages, refer to Chapter 7, “LANDP family messages” on page 221.

Alerts

An *alert* is generally a message sent to a management services focal point, or to a network operator, to identify a problem or an impending problem.

In the NetView environment, an alert is a high-priority event that warrants immediate attention.

In the LANDP environment, an alert is an unsolicited record sent to the network operator by a network component that has detected a problem. An alert provides:
- A 32-bit alert ID number
- A problem severity indicator and problem description
- A list of probable causes, (including user, install, or failure)
- A list of recommended actions for the operator
- Additional subvectors (SVs) with subfields (SFs)

It also provides further subvectors.

The LANDP system manager server provides alert notification, resolution notification, and messages to the NetView operator based on the *generic alert architecture*.

LANDP program components and applications in the LANDP workgroup send alert information to the network operator, in the same way that SNA nodes do. The NetView program on the host acts as the alert receiver. The LANDP system manager server does not check alert codes; they are understood only by the NetView program.

References to further information about alerts

For information about managing alerts and using the alert functions, refer to the *LANDP Servers and System Management* book.

For information about programming and the alert functions, refer to the *LANDP Programming Reference* book.

For information about subvectors and alert codes, refer to the *SNA Formats* book.

For lists of alerts, refer to Chapter 8, “LANDP alerts” on page 231.

The information in the alert listings is for users who are familiar with NetView programs and SNA networks. For information about these, refer to the *SNA Formats* book.

For the full titles and order numbers of these books, refer to “Bibliography” on page 295.

Chapter 2. LANDP trace tools - DOS

This chapter describes how to use the LANDP for DOS trace tools. Use these tools to debug LANDP application programs and to diagnose problems on LANDP for DOS workstations at the production site.

LANDP for DOS trace functions are provided by the diagnostic and debugging tool (DDT) server. Although the DDT server does not accept double-byte character set (DBCS) data as input, it can display DBCS data entered through the parameter area. The last character can get lost so you should check the data in hexadecimal format.

Functions for displaying trace screens or information in the trace buffer are provided by the LANDP for DOS trace display programs.

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Starting the trace tool server

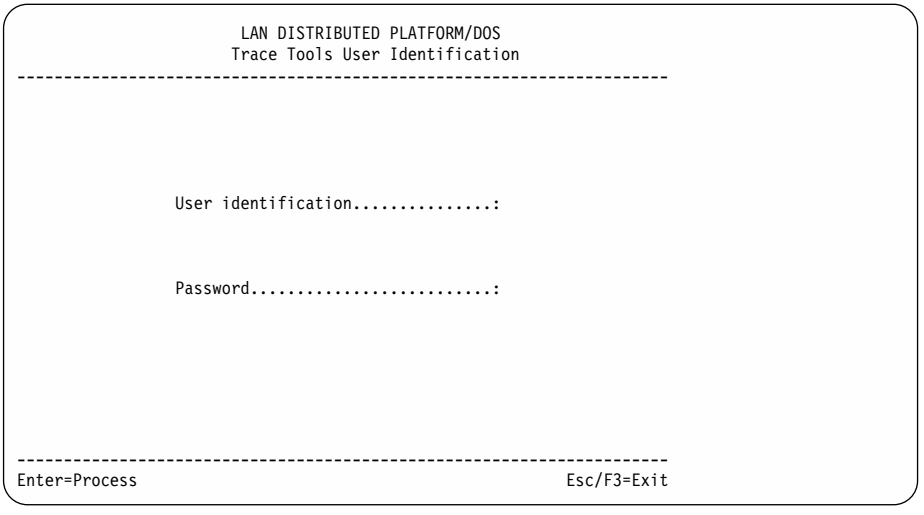
Start the DDT server by pressing a hot key combination. This hot key combination is defined at customization time. The default hot key combination is Alt+NumLock.

When the server starts, you see one of the following screens:

- LANDP for DOS Debugging Tools screen if access to the trace tools through the system manager server was not selected
- A screen requesting user identification and a password for the DTP server

The authorization level required to work with trace tools is security level S. The authorization level is verified in one of the two following ways:

- When no user is signed on, you see a screen requesting user identification:



  The data you enter is sent to the system manager server for verification. After it has been verified, you see the LANDP for DOS Debugging Tools screen.

  Note: If you attempt to start the trace tools without proper authorization, or if you enter an incorrect password more than three times, the system revokes access.

- If a user is already signed on, the server verifies that this user has authorization level S.

Using the trace tool screens

The LANDP for DOS trace tool screens are as follows:

```
L A N D P / D O S   D e b u g g i n g   T o o l s

        1. - Communications



        2. - Supervisor



             Enter option:



Esc/F3=Return
```

```
S u p e r v i s o r   D e b u g g i n g   T o o l s


        1. - Functions trace

        2. - Routines trace

        3. - EHCLIP trace

        4. - Display routines trace active/inactive

        5. - Remote requests included/Excluded

        6. - Stop/start tracing

             Enter option:


Esc/F3=Return
```

```
C o m m u n i c a t i o n s

    1. - SDLC Trace                  6. - DCA DLC Trace

    2. - X.25 Network Errors         7. - DCA DLC Information

    3. - X.25 Adapter Trace          8. - Token Ring DLC Trace

    4. - SNA Trace                   A. - Start X.25 Adapter Trace

    5. - Native X.25 Trace           B. - Stop X.25 Adapter Trace




            Enter option:

Esc/F3=Return
```

1. After the LANDP for DOS Debugging Tools screen, go to the next level in the hierarchy by typing the number or letter of a menu choice.
2. Return to the previous level in the hierarchy by pressing the Esc or F3 key.
3. Exit the trace tools by pressing the Esc or F3 key from the LANDP for DOS Debugging Tools screen.

Notes:

1. Communication screens are not displayed on non-gateway workstations.
2. The DCA DLC Information choice is available only when the IBM Financial Branch System Integrator (PC/Integrator) is installed. Refer to the *IBM Financial Branch System Integrator, Version 1.0: Programmer's Reference Manual* for more information.
3. The Start X.25 Adapter Trace and Stop X.25 Adapter Trace choices are used only when working with the IBM X.25 Interface Coprocessor/2 adapter.

Saving screen contents

When the contents of a screen can be saved,

```
F2 = Save
```

is displayed in the lower left corner of the screen. Pressing the F2 key instructs the program to save the current screen in a file named TR$*xxxxn*.DAT.

This file is used by IBM support representatives when diagnosing problems. "GETTRACE program" on page 14 describes how to see the contents of the TR$*xxxxn*.DAT file.

The value of *xxxx* depends on the choice selected on the LANDP for DOS Debugging Tools screen:

Value	Selected Choice
LIPT	EHCLIP Trace

FUNC Functions Trace
ROUT Routines Trace
SDLC SDLC Trace
X25E X.25 Network Errors
X25T X.25 Adapter Trace
SNAT SNA Trace
NATT Native X.25 Trace
DCAT DCA DLC Trace
DCAI DCA DLC Information
TRDL Token-Ring DLC Trace

The value of *N* is a letter from A to Z that is assigned dynamically by the trace tool, and wraps around from Z back to A.

Saving trace buffer contents

When the contents of the trace buffer can be saved, `F5 = SaveAll` is displayed in the lower part of the screen. Pressing the F5 key saves the entire DDT buffer in a file named TR$*xxx*A*N*.DAT.

The number of trace pages that are available is set by the `\P:nn` parameter on the DDT.EXE loading statement.

This file is used by IBM support representatives when diagnosing problems. “EHCTRALL program” on page 14 describes how to see the contents of the TR$*xxx*A*xxx*.DAT. file.

The value of *xxx*A depends on the choice selected on the LANDP for DOS Debugging Tools screen:

Value	Selected choice
SNAA	SNA Trace
FUNA	Functions Trace
LIPA	EHCLIP Trace

The value of *N* is a letter from A to Z that is assigned dynamically by the trace tool, and wraps around from Z back to A.

Displaying trace files

To view trace files that contain saved screen data or a trace tool buffer, use the trace tool programs GETTRACE and EHCTRALL.

These programs do not accept DBCS data as input. If you loaded LANDP for DOS in SBCS mode, then you must display the trace files in SBCS mode. If you loaded LANDP for DOS in DBCS mode, then you must display the trace files in DBCS mode.

GETTRACE program

The GETTRACE program displays the contents of a TR$*xxxxN*.DAT file created by saving a screen with the F2 key. Use GETTRACE to:

- Display a file
- Change a file format to standard DOS ASCII

The GETTRACE program resides in the LANDP customization directory. You can run the program without loading LANDP for DOS.

EHCTRALL program

The EHCTRALL program displays the contents of the trace buffer saved as TR$*xxx*A*N*.DAT files created by saving the trace buffer with the F5 key. Use EHCTRALL to:

- Display a file
- Change the display format from standard DOS ASCII or hexadecimal

The EHCTRALL program resides in the LANDP subdirectory under the customization directory. You can run the program without loading LANDP for DOS.

Trace choices

The choices, **Communication Traces** and **Supervisor Traces** from the trace tool menu, are described in this section.

Communication traces

LANDP for DOS trace tools support the following communication traces:

- Synchronous data link control (SDLC) trace
- X.25 network errors
- X.25 adapter trace
- Systems network architecture (SNA) trace
- Native X.25 trace
- Direct communication adapter (DCA) data link control (DLC) trace
- DCA DLC information
- Token-ring DLC trace
- Start X.25 adapter trace
- Stop X.25 adapter trace

SDLC trace

```
S D L C   T r a c e


xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx




 vvvvv uuuuu yyyyy zzzzz wwwww




F2 = Save   Esc/F3 = Return
```

The displayed values are as follows:

xx... A message up to 240 bytes long. This is useful for support representatives when diagnosing SDLC problems.

The xx... message entries have the following meanings:

Entry	Meaning
o	Open received from SNA.
0	Information frame received (code passed to SNA).
2	Second SNRM received from primary (disconnection).
6	Inactivity code passed to SNA.
A	Modem active.

C Reset and restart SDLC and SNA.
E Information frame sent to primary.
F Modem transition to off.
G Modem transition to on.
I Interrupt from adapter.
M Interrupt from modem.
O CTS error.
P Transmit error.
T Timer interrupt.
Z Adapter missing.
n1 SDLC adapter error.
n2 SDLC adapter error.
n3 SDLC adapter error.
n4 SDLC adapter error.
n5 SDLC adapter error.
n6 SDLC adapter error.
p Invalid supervisory frame received.
q Invalid information frame received.
r Frame received is too long.
s Invalid NR count received.
t CD error.
u DSR error.
v CTS error.
w Transmit timer error.
x DSR fails to drop.
z DMA error.
IT*x* Timer elapsed:
- **ITa** Inactive timer ending.
- **ITb** Inactive timer receiving.
- **ITc** DSR drop error timer.
- **ITd** CTS drop error timer.
- **ITe** DCE disconnect error timer.
- **ITf** Wait transmit timer.
- **ITg** DSR drop timer (switched).
- **ITh** DCE disconnect timer.
- **ITi** Interrupt not defined.
- **ITj** SNRM send timer.
- **ITk** Line inactivity timer (10 to 65 seconds).
- **ITl** Transmit error timer.
- **IMx** Modem malfunction.

Notes:

1. IT*x* (*x* = timer interrupt) should appear when the timer expires.
2. IM*x* (*x* = line changed) should appear when the SDLC adapter detects a modem malfunction.
3. The characters following IT*x* and IM*x* depend on the SDLC program function.
4. Normal line activity will appear as `000EE0E0EEEEE0000000`.
5. Interrupt messages show line trouble. Two examples follow:

```
...00EE00ITk    shows       interrupt timer inactivity
...00EE00IMTF   shows       interrupt modem transition off
```

6. The sequence of characters matches SDLC adapter status and lines.

vv... The number of SDLC buffers. This includes the buffers defined by the user, plus two buffers reserved by the SNA server.

uu... The number of buffers that are used.

yy... The maximum number of buffers used in the session.

zz... The number of *no more buffers* conditions detected by the SNA server. This is reset when a buffer becomes available.

ww... The total number of *no more buffers* conditions detected by the SNA server. These conditions can cause host computer message retries, low performance, and disconnections. The effects depend on the line definition.

Note: If the values for `zz` and `ww` are often greater than zero, specify more buffers and customize the SNA server again.

X.25 network errors

```
X.2 5   N e t w o r k   E r r o r s
        xxxxx         yyyyy         zzzzz          vvvvv         wwwww

aa  bbbb ccccccccccc dddddd
aa  bbbb ccccccccccc ddddddd
aa  bbbb ccccccccccc ddddddd
aa  bbbb ccccccccccccccc eeee
aa  bbbb cccc eeee ccccccccccccccc









aa  bbbb ccccccccccc ddddddd
aa  bbbb ccccccccccc ddddddd
F2 = Save   Esc/F3 = Return
```

The displayed values are as follows:

xx... The number of X.25 buffers.

yy... The memory pool size. This is only significant when working with the X.25 coprocessor.

zz... The maximum number of buffers that can be used in the session.

vv... The number of buffers that are being used.

ww... The number of *no more buffers* conditions detected by the communication server.

aa One of the following values:
- **01** Request control block with nonzero return code.
- **02** Adapter reply with nonzero return code.
- **03** Incoming packet (clear).
- **04** Incoming packet (reset).

bb... Length.

cc... Header for the adapter. This is internal information, and does not appear for the X.25 coprocessor.

dd... X.25 packet.

ee... Reply different from zero.

The X.25 Network Error Trace menu displays only exception condition information traces. See the “Bibliography” on page 295 for a list of books about X.25 and wide area communication.

X.25 adapter trace (coprocessor)

```
X.2 5   A d a p t e r   T r a c e                                  p

T                    Data
aa  ccccccccccccccc ccccccccccccccc  ccccccccccccccc ccccccccccccccc
aa  ccccccccccccccc ccccccccccccccc  ccccccccccccccc ccccccccccccccc









aa  ccccccccccccccc ccccccccccccccc  ccccccccccccccc ccccccccccccccc
aa  ccccccccccccccc ccccccccccccccc  ccccccccccccccc ccccccccccccccc
F2 = Save   Esc/F3 = Return   PgUp/PgDn = Page
```

The displayed values are as follows:

p The number of this screen or page.

aa One of the following values:
- **FR** Frame received.
- **FS** Frame sent.
- **FC** Control.
- **PS** Packet sent.
- **PR** Packet received.

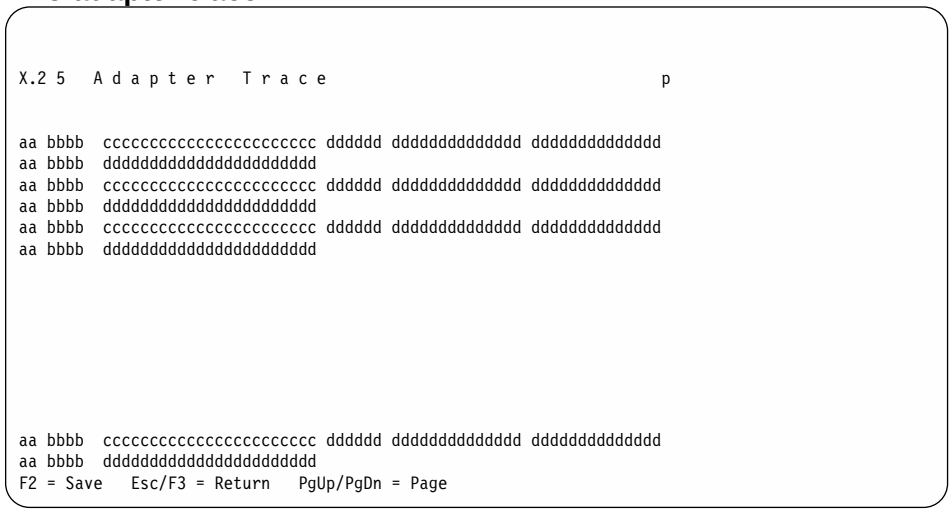
cc... X.25 frame or packet.

The X.25 Adapter Trace menu displays a trace of the X.25 messages most recently sent or received while working with the X.25 coprocessor. The displayed information shows frames and packets that have been sent to, or received from, the network.

There are three pages of information. Up to 20 messages can be displayed on a page. Press the PgUp and PgDn keys to scroll from one page to another.

If working with the X.25 adapter, see also “X.25 adapter trace” on page 20. For a list of books on X.25 and wide area communication topics, see “Bibliography” on page 295. For detailed information on X.25 packets, refer to the Post Telegraph Telephone (national post and telecommunication authority, PTT) specifications for your country.

X.25 adapter trace



The displayed values are as follows:

p The number of this screen or page.

aa One of the following values:
- **01** Outgoing packet.
- **02** Reply.
- **03** Incoming packet.
- **04** Incoming packet, but truncated.
- **05** Unspecified.

bb... Length.

cc... The header for the adapter. This is internal information.

dd... X.25 packet.

The X.25 Adapter Trace menu displays a trace of the X.25 messages most recently sent or received while working with the X.25 adapter. The displayed information shows frames and packets that have been sent to, or received from, the network.

There are three pages of information. Up to 20 messages can be displayed on a page. Use the PgUp and PgDn keys to scroll from one page to another.

If working with the X.25 coprocessor, see “X.25 adapter trace (coprocessor)” on page 19. For books on X.25 and wide area communication topics, see “Bibliography” on page 295. For detailed information on X.25 packets, refer to the PTT specifications for your country.

Start X.25 adapter trace

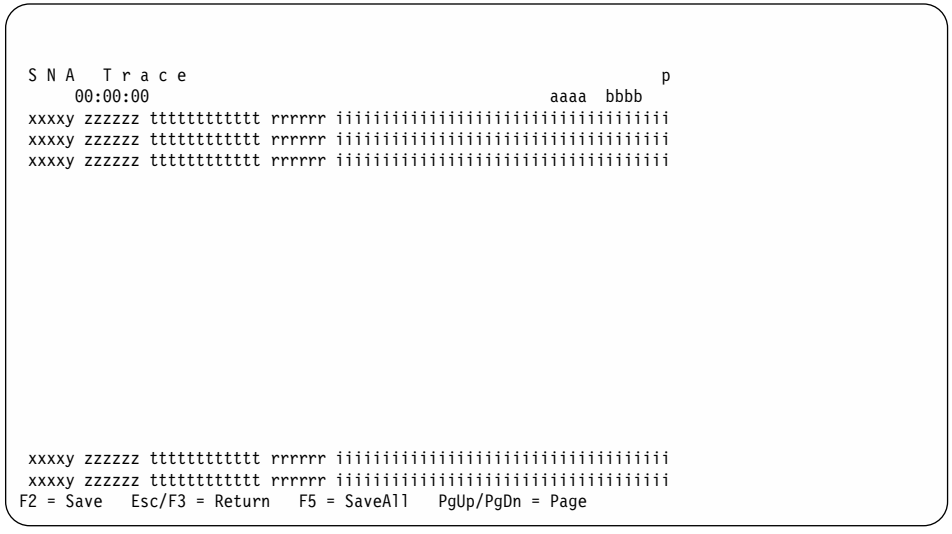
This choice activates the X.25 adapter trace. Select this choice only when working with the IBM X.25 Interface Coprocessor/2 adapter.

The Start X.25 Adapter Trace choice only *activates* the collection of X.25 communication data. To *display* collected data, select the X.25 Adapter Trace choice. See “X.25 adapter trace” on page 20 for more information.

Stop X.25 adapter trace

The Stop X.25 Adapter Trace choice deactivates the collection of X.25 communication data.

SNA trace



The displayed values are as follows:

00:00:00 The time stamp of the latest SNA data trace.

aa... The number of records sent, in hexadecimal.

bb... The number of records received, in hexadecimal.

p The number of this screen or page.

xx... The entry sequence number, in hexadecimal.

y The direction of the message: `S` denotes sent, and `R` denotes received.

zz... The protocol status. This is internal information.

tt... The transmission header (TH), in hexadecimal.

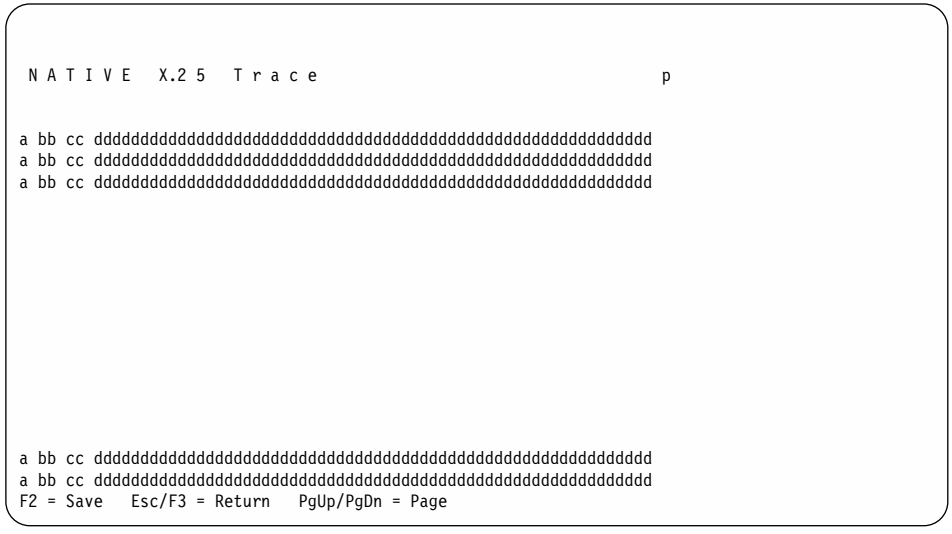
rr... The request/response header (RH), in hexadecimal. If RH is not used, this field contains the information bytes.

ii... Information bytes (RU), in hexadecimal. The maximum number of bytes that fit on a line is displayed.

The SNA Trace choice displays a trace of the SNA messages most recently sent and received. The received messages are highlighted.

You can select the number (3 through 70) of SNA trace pages with the `LOADER SNA## \P:nn` statement (where *nn* is the number of pages). Up to 22 messages can be displayed on a page. Use the PgUp and PgDn keys to scroll from one page to another.

Native X.25 trace



The displayed values are as follows:

a One of the following values:
- **I** Input message.
- **0** Output message.

bb The workstation identifier.

cc The session identifier.

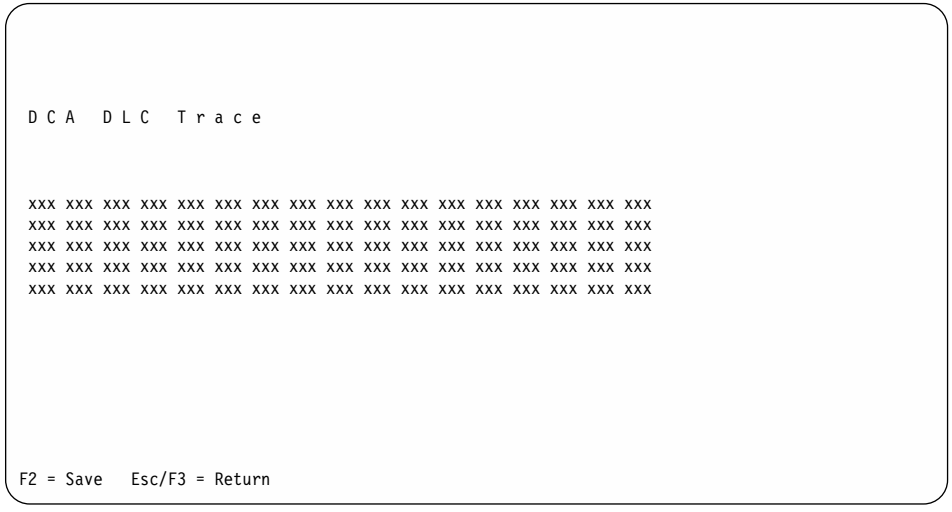
dd... Message.

The Native X.25 Trace choice displays a trace of the native X.25 messages most recently sent and received.

There are three pages of information. Up to 22 messages can be displayed on a page. Use the PgUp and PgDn keys to scroll from one page to another.

DCA DLC trace

The screen displayed by the direct communication adapter (DCA) data link control (DLC) trace looks like this:



The displayed 3-character *xxx* strings are all the functions performed. The functions are grouped as follows:

- Input through the device cluster adapter
- Output through the device cluster adapter
- Input to the SNA server or the INT X'6B' handler
- Output to the SNA server or the INT X'6B' handler

The values are as follows:

Input through the device cluster adapter:

D*nn* A data frame has been received. *nn* is the session identifier, with the following possible values:

80 DCA virtual session.

This session is used to send and receive virtual volume data for a personal computer system DCA-attached to a 4700 processor.

82 DCA virtual session.

This session is used for all the SNA traffic, including virtual volume data for a personal computer system attached to a gateway.

UFF A null frame has been received.

Output through the device cluster adapter:

o*mm* An **80**-scan code has been sent, meaning DCA initialized notification. *mm* is the status value.

s*mm* An **81**-scan code has been sent, meaning attention. *mm* is the status value.

a*mm* A **98**-scan code has been sent, meaning positive acknowledgment. *mm* is the status value.

n*mm* An **A3**-scan code has been sent, meaning negative acknowledgment. *mm* is the status value.

w*mm* A **98**-scan code has been sent, meaning stop sending. *mm* is the status value.

t*mm* An **A3**-scan code has been sent, meaning restart sending. *mm* is the status value.

The following are possible values for the status value:

00 Scan code successfully sent.

01 Scan code not sent. Scan code queue full.

Input to the SNA server or to the INT X'6b' handler:

S00 Initialization call received from the supervisor.

E00 Disconnection call received from the supervisor.

O*nn* Output a buffer to the line call received from the SNA server or from the INT X'6B' handler. *nn* is the session identifier.

I*nn* Input a buffer to the line call received from the SNA server or from the INT X'6B' handler. *nn* is the session identifier.

G*nn* Get a free buffer to the buffer pool call received from the SNA server or from the INT X'6B' handler. *nn* is the session identifier.

F*nn* Release a buffer to the buffer pool call received from the SNA server or from the INT X'6B' handler. *nn* is the session identifier.

The following are possible values for the session identifier:

80 DCA virtual session. This session is used to send and receive virtual volume data for a personal computer system DCA-attached to a 4700 processor.

82 DCA virtual session. This session is used for all the SNA traffic, including virtual volume data for a personal computer system attached to a gateway or to a token-ring network.

Output to the SNA server or to the INT X'6b' handler:

R*nn* A message has been received. *nn* is the session identifier, with the same possible values as for input to the SNA server or to the INT X'6B' handler.

A06 DCA reset in process. No link established.

A07 DCA reset successfully ended. Link established.

DCA DLC information

```
D C A   D L C   I n f o r m a t i o n


     # buffers in buffer pool ..................... nnnnn
     # buffers in use............................. nnnnn
     Min. free buffers.......................... nnnnn
     Total times buffer pool was empty.......... nnnnn
     4700 Indicator (online = 1)................ 0000n
     # consecutive NACK's ....................... nnnnn
     Total # max . NACK's ...................... nnnnn
     # of resets................................. nnnnn
     # of time-outs............................. nnnnn
     # times 4700 has no buffers................ nnnnn
     # elements in queue to be sent............. nnnnn
     # elements in queue receive................ nnnnn




F2 = Save   Esc/F3 = Return
```

Token-Ring DLC trace

```
T o k e n - R i n g   D L C   T r a c e

eeeeeeeeeeee rrrrrrrrrrrr gggggggg ffffffff ss oo ll pp nn cc
mmmmmmmmmmmmmmmmmmmmmm kkkk vvvvv uuuuu yyyyy zzzzz wwwww

COMD ST ES:BX aaaa bbbb cccc dddd ‖ COMD ST ES:BX aaaa bbbb cccc dddd
COMD ST ES:BX aaaa bbbb cccc dddd ‖ COMD ST ES:BX aaaa bbbb cccc dddd
COMD ST ES:BX aaaa bbbb cccc dddd ‖ COMD ST ES:BX aaaa bbbb cccc dddd
COMD ST ES:BX aaaa bbbb cccc dddd ‖ COMD ST ES:BX aaaa bbbb cccc dddd









COMD ST ES:BX aaaa bbbb cccc dddd ‖ COMD ST ES:BX aaaa bbbb cccc dddd

F2 = Save   Esc/F3 = Return
```

The displayed values are as follows:

ee... The encoded address of the adapter.

rr... The ring address of the adapter.

gg... The group address of the adapter.

ff... The functional address of the adapter.

ss The maximum number of service access points (SAPs).

oo The number of open SAPs.

ll The maximum number of link stations.

pp The number of open link stations.

nn The number of available link stations.

cc The adapter configuration.

mm... The adapter microcode level.

kk... The most recent ring status issued.

vv... The number of buffers that are defined.

uu... The number of buffers that are currently in use.

yy... The maximum number of buffers that have been used in the session.

zz... The number of *no more buffers* conditions detected by the SNA server. This is reset when a buffer becomes available.

ww... The total number of *no more buffers* conditions detected by the SNA server. These conditions can cause host computer message retries, low performance, and disconnections.

COMD The IEEE 802.2 token-ring command or asynchronous entry point.

ST The status.

Note: If the values for zz and ww are often greater than zero, then specify more buffers and customize the SNA server again.

The Token-Ring DLC Trace menu displays a trace of the token-ring data link control flow. The trace description is as follows:

```
INTR ST   ES:BX   aaaa bbbb cccc dddd
  Dir.Interrupt
    ST      Return code
    ES:BX   CCB address

INIT ST   ES:BX   aaaa bbbb cccc dddd
  Dir.Initialize
    ST      Return code
    ES:BX   CCB address
    dddd    Bring-up return code

OADP ST   ES:BX   aaaa bbbb cccc dddd
  Dir.Open.Adapter
    ST      Return code
    ES:BX   CCB address
    dddd    Open return code

OSAP ST   ES:BX   aaaa bbbb cccc dddd
  Dlc.Open.Sap
    ST      Return code
    ES:BX   CCB address
    aa      SAP value
    bbbb    SAP station ID

RSAP ST   ES:BX   aaaa bbbb cccc dddd
  Receive (for SAP)
    ST      Return code
    ES:BX   CCB address
    aa      Receive options
    bbbb    Station ID

TEST ST   ES:BX   aaaa bbbb cccc dddd
  Transmit.Test.Cmd
    ST      Return code
    ES:BX   CCB address
    aa      Stripped FS field
    bb      Remote SAP value
   ccccdddd Four last bytes of remote address

OSTA ST   ES:BX   aaaa bbbb cccc dddd
  Dlc.Open.Station
    ST      Return code
    ES:BX   CCB address
    aa      Remote SAP value
    bbbb    Link station ID
```

```
    cccc    Local SAP

UA   ST   ES:BX   aaaa bbbb cccc dddd
  Dlc.Connect.Station
    ST      Return code
    ES:BX   CCB address
    bbbb    Station ID

RSTA ST   ES:BX   aaaa bbbb cccc dddd
  Receive (for Link Station)
    ST      Return code
    ES:BX   CCB address
    aa      Receive options
    bbbb    Station ID

XMIT ST   ES:BX   aaaa bbbb cccc dddd
  Transmit.I.Frame
    ST      Return code
    ES:BX   CCB address
    aa      Stripped FS field (High byte)
    aa      Remote SAP        (Low byte)
    bbbb    Station ID
    cccc    Data length

ASAP 00   ES:BX   aaaa bbbb cccc dddd
  Receive SAP appendage
    ES:BX   Buffer address
    aa      Message type

ARCV 00   ES:BX   aaaa bbbb cccc dddd
  Receive data appendage
    ES:BX   Buffer address
    aa      Message type
    bbbb    Station ID
    cccc    Received data length

CSTA ST   ES:BX   aaaa bbbb cccc dddd
  Dlc.Close.Station
    ST      Return code
    ES:BX   CCB address
    bbbb    Station ID

DLCS 00   ES:BX   aaaa bbbb cccc dddd
  DLC status appendage
    aaaa    DLC status
    bb      Remote SAP value
   ccccdddd Remote node address

CSAP ST   ES:BX   aaaa bbbb cccc dddd
  Dlc.Close.Sap
    ST      Return code
    ES:BX   CCB address
    bbbb    Station ID

STAT ST   ES:BX   aaaa bbbb cccc dddd
  Statistics
```

```
    ST      Return code
    ES:BX   CCB address
    aaaa    Options
    bbbb    Station ID
   ccccdddd Log buffer address

FLOW ST   ES:BX   aaaa bbbb cccc dddd
  Dlc.Flow.Control
    ST      Return code
    ES:BX   CCB address
    aaaa    Options
    bbbb    Station ID

BUFF ST   ES:BX   aaaa bbbb cccc dddd
  Buffer.Free
    ST      Return code
    ES:BX   CCB address
    bbbb    Station ID
    cccc    Buffers left in pool

STAU ST   ES:BX   aaaa bbbb cccc dddd
  Dir.Status
    ST      Return code
    ES:BX   CCB address
    aaaa    Options
    bbbb    Station ID

AACH 00   ES:BX   aaaa bbbb cccc dddd
  Appendage Adapter Check
    ES:BX   Appendage entry point
    aaaa    Status

ARST 00   ES:BX   aaaa bbbb cccc dddd
  Appendage Ring Status
    ES:BX   Appendage entry point
    aaaa    Status

APCE 00   ES:BX   aaaa bbbb cccc dddd
  Appendage PC Error
    ES:BX   Appendage entry point
    aaaa    Status

AV   00   ES:BX   aaaa bbbb cccc dddd
  AV SNA Function Call
    ES:BX   Appendage entry point
    --aa    Advise type

RLOG ST   ES:BX   aaaa bbbb cccc dddd
  Dir.Read.Log
    ST      Return code
    ES:BX   Appendage entry point
    bbbb    Log length
  ccccdddd  Log buffer address
```

Supervisor traces

LANDP for DOS trace tools support the following supervisor traces:

- Functions trace
- Routines trace
- EHCLIP trace
- Display routines trace active or inactive
- Remote requests included or excluded
- Stop or start tracing

Functions trace

```
FUNCTIONS TRACE  vv ww/ww/ww xx:xx:xx yy% (internal functions included) z
                                                          LAN_Suffix=
aaaaaa b cc dddddddd eeeeeeee ff gggg hhhh iiii jjjj kkkk zzzz llllllllll
mm.mmm n oooooooo pp qqqqqqqq rr ssssssss tttt uuuu vvvv wwxx yyyyyyyyyyy
aaaaaa b cc dddddddd eeeeeeee ff gggg hhhh iiii jjjj kkkk zzzz llllllllll
mm.mmm n oooooooo pp qqqqqqqq rr ssssssss tttt uuuu vvvv wwxx yyyyyyyyyyy
```

```
aaaaaa b cc dddddddd eeeeeeee ff gggg hhhh iiii jjjj kkkk zzzz llllllllll
mm.mmm n oooooooo pp qqqqqqqq rr ssssssss tttt uuuu vvvv wwxx yyyyyyyyyyy

F2=Save Esc/F3=Return F4=Inc/Excl F5=SaveAll PgUp/PgDn=Page F9=Hex/Char
```

The displayed heading values are as follows:

Values	Description
vv	The local workstation ID.
ww...	The current date when selecting the menu choice.
xx...	The current time (hh:mm:ss) when selecting the menu choice.
yy%	The maximum percentage of supervisor (max % SPV) buffer pool expense. This helps decide whether to use a smaller buffer pool to save memory, or a larger buffer pool.

Note: When loading the supervisor, specify the required buffer pool with the /K:*mmm* parameter. See the *LANDP Installation and Customization* book for information about the supervisor loading statement.

z The page number.

Only 15 parameters are displayed. For the Z*n* function, data parameters are displayed to show the required information for each specific situation.

The Functions Trace displays a trace of the last application program calls to the supervisor. It displays the CPRB and the PARMLIST fields (on-request and on-completion) that correspond to the called function. The on-completion information is highlighted.

The following describes each of the fields displayed by the Functions Trace.

on-Request

aa.. Time at request (hhmmss)
b Event (request=1)(Z=3) (RMTREQ NoWait=4) (GETRPLY=5)
cc Function ID
dd.. Resource origin
ee.. Server name
ff Origin workstation ID
gg.. Request PARMLIST length
hh.. Request DATA length
ii.. Reply PARMLIST length
jj.. Reply DATA length
kk.. Origin process ID
zz.. Time out for the request
ll.. Input PARMLIST content

on-Completion

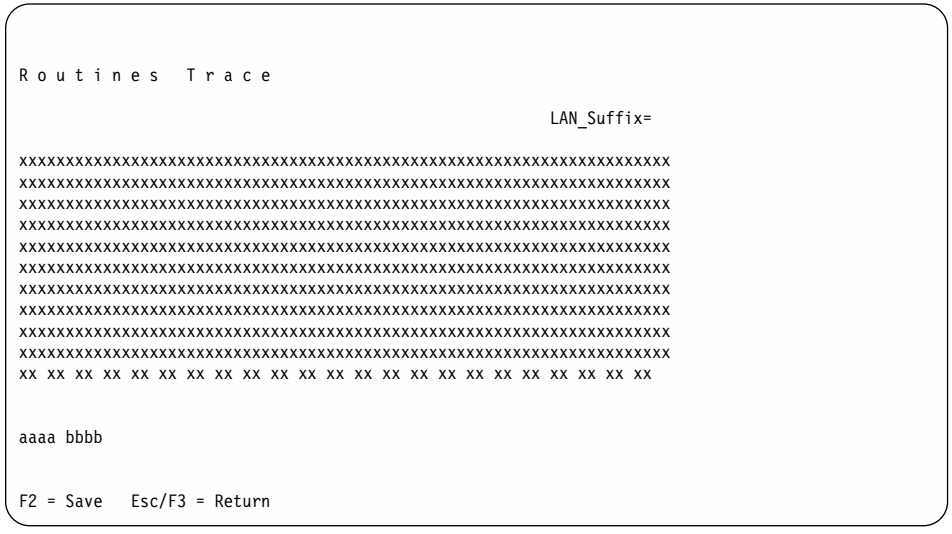
mm.. Elapsed time (ss.mmm)
n Event (reply=2)(Z=3)
oo.. Supervisor/Server return code
pp Function ID
qq.. Server name
rr Server workstation ID
ss.. Resource origin
tt. Replied PARMLIST length
uu.. Replied DATA length
vv.. Destination process ID
ww Internal flags
xx Internal counter
yy.. Output PARMLIST content values

Select the number of functions trace pages to be displayed with the loading parameter **/P**.

If loading the server into workstation memory, the number of pages can range from 3 to 40. If loading the server into expanded memory, the number of pages can range from 3 to 30. Up to 22 messages can be displayed on a page. Use the PgUp and PgDn keys to scroll from one page to another.

Pressing the F4 key includes or excludes the calls and displays or does not display the calls between servers. Press the F9 key to display the supervisor and server return codes, function code, and `PARMLIST` fields in hexadecimal format.

Routines trace



The displayed values are as follows:

xx... Event and data information. This is used by support representatives when diagnosing LAN problems.

aa... The number of *out of buffer* conditions for the local workstation.

bb... The number of *out of buffer* conditions for the remote request.

The Routines Trace choice displays a trace of LAN events and supervisor counters.

EHCLIP trace

EHCLIP, the LANDP Internet Protocol program, uses the trace tool server to log information about external and internal errors and statistics. This information can be helpful when diagnosing errors or tracking communication problems.

The EHCLIP program logs errors and statistics only if the trace tool server is running:

```
EHCLIP T r a c e               Traces started                          p
                                                                   aaaa bbbb


cccc ddddd ee  ffff.fff g hh iiiii jjjjj kkkkk lllllllllllllllllllllllll
cccc ddddd ee  ffff.fff g hh iiiii jjjjj kkkkk lllllllllllllllllllllllll
cccc ddddd ee  ffff.fff g hh iiiii jjjjj kkkkk lllllllllllllllllllllllll
cccc ddddd ee  ffff.fff g hh iiiii jjjjj kkkkk lllllllllllllllllllllllll
cccc ddddd ee  ffff.fff g hh iiiii jjjjj kkkkk lllllllllllllllllllllllll
cccc       ee  ffff.fff g    mmmmm nnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnn
cccc       ee  ffff.fff g    mmmmm nnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnn
cccc       ee  ffff.fff g    mmmmm nnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnn
cccc       ee  ffff.fff g    mmmmm nnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnnn


     *** TRACE DATA LOST ***

F2=Save Esc/F3=Retrn F5=SaveAll Up/Dn=Page F6=Stat F9=Hex/Char F10=On/Off
```

The displayed values are as follows:

aa... The number of datagrams sent.
bb... The number of datagrams received.
p The number of this screen or page.

The remaining information on this screen shows three types of trace lines. These are:

- Communication trace line, where the displayed values are:

  cc... The sequence number of the trace line.

  dd... The datagram length.

  ee The remote workstation ID.

  ff... Time (ssss.mmm).

  g The identifier of the trace line type, where the values can be as follows:
  I Input datagram.
  O Output datagram.

  The other entries (h to l) on the line are used by IBM support representatives.

- Error or statistics line, where the displayed values are:

  cc... The sequence number.

  ee The workstation identifier. This field does not always contain information.

  ff... Time (ssss.mmm).

  g This field value is always T in error or statistics lines.

  mm... An EHCLIP return code. When an error occurs, the return code displayed in this field starts with the characters CE.

  nn... Data associated with the error returned by EHCLIP or statistics data. The following are displayed:
  – Error code
  – Data associated with the error
  – Remote workstation ID if the error is related to a single session

  See for a list of error codes returned by the EHCLIP program.

  Statistics return codes start with the characters CS. They are issued when a session is established or interrupted, or when you request them by pressing the F6 key. This information can be useful when tracking network problems or diagnosing errors. See for a list of statistics codes returned by the EHCLIP program.

- Information line

  This line displays the message `TRACE DATA LOST` when you stop or start the traces by pressing the F10 key.

EHCLIP program and TCP/IP tools: You can also use TCP/IP tools to diagnose external communication errors that effect the EHCLIP program. For example, TCP/IP tools might be helpful for these error conditions:

Error Condition	TCP/IP Tools
Unable to contact a remote workstation	Use the TCP/IP **ping** program to test contacting the workstation. The program sends an echo request and waits for a reply from the workstation.
Frequent loss and retransmission of datagrams, which results in poor performance	Use TCP/IP statistics operator commands to diagnose the following: • Lack of space in the TCP/IP input buffers on the destination workstation. This can be caused by overload conditions. • Corruption of datagrams. This can be caused by unreliable communication circuits.
TCP/IP communication errors	Use TCP/IP internal trace tools, if available, to diagnose these errors.

Refer to TCP/IP documentation for more information about diagnosing communication problems.

Display routines trace Active or Inactive

Use the Display Routines Trace Active and Display Routines Trace Inactive choices to start and stop the display of supervisor and LAN or EHCLIP traces on the screen.

Routines traces are useful for IBM support representatives when diagnosing network problems.

Note: The data that appears on the screen can overlap data from LANDP applications or other programs.

When workstation operation is suspended, the routines trace can be used to determine the cause. This trace tool operates in a similar way to a data-scope analyzer that displays network activity on the screen.

If the DDT server is not active, the routines trace can be started and deactivated by pressing Ctrl+Tab+Backspace. This hot key combination is controlled by the supervisor.

The display routines trace choices are not available when working in DBCS mode.

Remote requests Included or Excluded

Use the Remote Requests Included and Remote Requests Excluded choices to include or exclude the remote incoming requests in the function trace.

Stop or start tracing

Use the Stop Tracing choice to stop tracing SNA, supervisor functions, and EHCLIP. When you stop tracing, you can save the buffer contents to track any specific problem you want to solve.

Use the Start Tracing choice to start the traces.

Chapter 3. LANDP trace tools - OS/2, Windows, and Linux

This chapter describes how to use the LANDP trace tools that are provided by LANDP for OS/2, LANDP for Windows, LANDP for Linux. Use these tools to debug LANDP application programs, or to diagnose problems on LANDP for OS/2, LANDP for Windows, or LANDP for Linux workstations.

The following trace tool functions are provided:

EHCTRACW This server records in memory, or on disk, the trace events and errors that occur while LANDP programs are running.

EHCPDT This program displays, prints, or records on disk, trace and error log data from various sources. The program runs in OS/2®or Windows, but not Linux.

EHCTRACF This program formats the contents of an event trace file produced by EHCTRACW or EHCPDT.

The EHCTRACW server and EHCPDT program work together to detect errors or abnormal situations, and to provide information about LANDP program operations.

Because the trace-viewing program EHCPDT cannot be run in a Linux window, to view a LANDP for Linux trace file you must either transfer the trace file to a Windows or OS/2 workstation, and view it there using EHCPDT, or format the trace file using the EHCTRACF program, and then view it using any ASCII text editor.

Note: You can run the program EHCPDT on a Windows or OS/2 workstation, without LANDP being installed there.

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EHCTRACW

Loading the EHCTRACW server

The EHCTRACW server can be loaded at LANDP initialization time, immediately after the supervisor, or at any other time. The preferred loading method is during initialization because any errors that occur while initializing the server are written to the error log file. You can then check the trace and log files for any problems that occur during the loading process.

If the trace server is not loaded, the system creates two ASCII files with the filename extensions .LGD and .TRP. You can check these files for information about errors. The files are also created if a trap or an OS/2 SYS3175 message occurs at any time.

Using the EHCTRACW server

The EHCTRACW server does the following:

- Writes to a file errors that occur at LANDP program run time. This is called *error logging*.
- Records the sequence in which a series of events occur. This is called *event tracing*.

If the EHCTRACW server is running, error logging to disk is always active. Event tracing is optional and depends on the setting of the EHCTRACW loading parameter.

Note: If servers are loaded in background mode, loading errors cannot be displayed. To see the errors, you must consult the error log file.

Error logging

The trace tool writes to the log file, all errors that might cause LANDP, or a specific LANDP server, to stop running.

The tool logs the following errors, for example:

- Errors that occur while initializing LANDP, or a LANDP server
- Errors that occur while running LANDP, or a LANDP server
- Internal software and hardware errors that occur while running LANDP

Return codes: Return codes correspond, either to errors that a LANDP program component detects during its loading process, or to internal errors that the component detects at run time. Return codes are displayed in the **return code** field of the error log file. You can change the format of the displayed return codes (for example, from hexadecimal to decimal).

LANDP program components detect system internal software errors and also errors that occur while processing a request. The errors have a corresponding LANDP program server return code in the CPRB that the requester receives. An entry in the error log file contains the detected system error.

Most system internal errors are generated by the operating system.

OS/2 errors are documented in OS/2 product manuals. Refer to “Bibliography” on page 295 for a list of OS/2 books. Consult the relevant operating system documentation for information about errors in Windows or Linux.

Log entries:

Table 1. LANDP Trace Tools: Contents of error log entries

Item	Description
No.	The entry sequence number
Date	The date when the logged event occurs
Time	The time when the logged event occurs
Product ID	The LANDP component identifier
Level ID	The LANDP product release level
Bucket	A reserved field
Component PC	The workstation ID of the workstation where the calling program runs
Component	The name of the calling program
Function	A reserved field
Event	A reserved field
Return code	Either a LANDP return code or an internal, software or hardware, error code
Record class	The error class, with one of the following values: **F** Fatal **W** Warning or Attention **E** Error
Format number	An unused field, reserved for future use
Data	An item containing the following fields: • The name of the system component where the error was found. This will be: – LANDP/2 for LANDP for OS/2 – LANDP/NT for LANDP for Windows – LANDP/L for LANDP for Linux • Information reserved for an IBM support representative

Event tracing

The EHCTRACW server operates under the following status settings:

Setting	Status
Memory	Stores event traces and log records in memory. This is the default setting.
File	Copies event traces and log records to a data file.
No	Loads the trace server, but does not activate event tracing.

Notes:

1. If you specify the Memory setting, trace information is available only while LANDP is running.
2. If you specify the File setting, trace information is always available. You can consult the file whether or not LANDP programs are running.

Although this setting has lower performance than the other options, it is a good choice when you are determining the cause of a problem that is difficult to reproduce.

3. If trace conditions do not exist and trace status is set to a status other than No, all trace records are stored.

Set the trace status when loading the EHCTRACW server by specifying a parameter and one of the previously listed status settings. Include in the loading statement the parameter **/T**, followed by one of these settings:

- MEMORY
- FILE
- NO

For example:

```
LOADER EHCTRACW /T:FILE
```

The /MT parameter specifies the maximum number of trace entries. For example, /MT:7500 gives a trace file of approximately 3MB, which can be compressed using common archiving utilities (for example, PKZIP or gzip) to approximately 40KB, and /MT:50000 gives a trace file of approximately 20MB, which can be compressed to approximately 400KB.

Note that for Linux, the parameters are -T and -MT.

By default, the active status setting is Memory. Refer to the *LANDP Installation and Customization* book for information about loading statements, parameters, and default values.

The EHCTRACW server traces all supervisor functions on the workstation where EHCTRACW is loaded. It logs any errors in a file. The log and trace files have the following file name format:

Trace file	EHCTRC*xx*.DAT
Log file	EHCLOG*xx*.DAT

where *xx* is the workstation identifier.

The items contained in each trace event entry are:

Table 2. LANDP Trace Tools: Contents of trace event entries

Item	Description
No.	The entry sequence number
Date	The date when the logged event occurred
Time	The time when the logged event occurred
Product ID	The LANDP component identifier
Level ID	The LANDP product release level
Bucket	A reserved field
Component PC	The ID of the workstation where the calling program runs
Component	The name of the calling program
Function	The CPRB function field
Event	The CPRB verb type field
Return code	Either the supervisor return code or the server return code fields defined in the CPRB.
Record class	T for a normal trace entry F, W, or E for logged errors (refer to “Error logging” on page 40)
Format number	An unused field, reserved for future use
Data	An item containing the following fields: **Origin data** Origin workstation ID Process origin Instance ID origin **Destination data** Destination workstation ID Process destination Instance ID destination **Request parameter length** Qp: **Request data length** Qd: **Reply parameter length** Pp: **Reply data length** Pd: **Replied parameter length** Dp: **Replied data length** Dd: **Request parameter area** QpA **Request data area** QdA **Reply parameter area** PpA **Reply data area** PdA

EHCPDT (OS/2 and Windows only)

The EHCPDT program displays, prints, and saves, error log and event trace information. It is a stand-alone program that runs under OS/2 or Windows.

You can start the EHCPDT program at any time, whether or not LANDP programs are running. Start the program from an OS/2 or Windows command prompt, or by double-clicking on the EHCPDT program object.

If the supervisor and EHCTRACW server are loaded when the EHCPDT program starts, the contents of the trace in memory are automatically displayed in a window trace area .

To display the contents of an event trace or error log file, from the OS/2 or Windows command prompt, enter `EHCPDT` *`filename`*.

To display the contents of an event trace or error log file under OS/2 or Windows, use one of the following methods:

- Drag the trace or log file object, and drop it onto the EHCPDT program object.
- Open the trace or log file by double-clicking on the object.

  Note: This method requires association settings. You specify these in the Settings or Properties notebook of the EHCPDT object on OS/2, or by using the FileTypes tab of the Folder Options dialog in the Control Panel on Windows.

On OS/2, traces that are generated while the EHCPDT program is running do not display until you refresh the window, using the vertical scroll bar. This prevents traces from displaying continuously and allows you to control when you want to display new trace information.

On Windows, the default behaviour of EHCPDT is to continuously display traces in real time, but this can be toggled on and off using the Freeze Trace button.

You can save traces that are displayed by EHCPDT, either as trace or log format files, or as ASCII files, saving either the currently selected records, or all records.

If you save the trace in ASCII format, you can save either the currently selected fields or all fields. You can set the hexadecimal display option to save the fields in hexadecimal form.

The EHCPDT window shown in Figure 1 on page 45 displays a typical LANDP trace file. Note the presence of normal trace entries, and also a log entry halfway down the display, which does not contain all the header information or the normal data fields. For simplicity, only the Windows version is described here, but the OS/2 tool operates in the same way, unless otherwise noted.

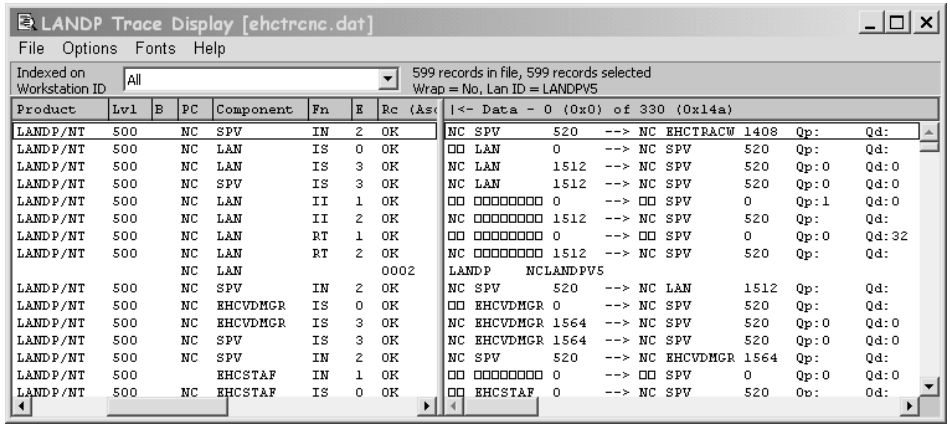


Figure 1. The EHCPDT trace viewing tool (Windows)

The window is divided into two halves: the header display on the left, and the data display on the right. The header contains information about the function call being traced; for example, a time-stamp, the PC-ID of the workstation invoking the function, the function code and the return code obtained.

Figure 2 shows all the header fields that can be displayed. The width of the columns in the header display area can be adjusted to show more clearly the information that you want to see.

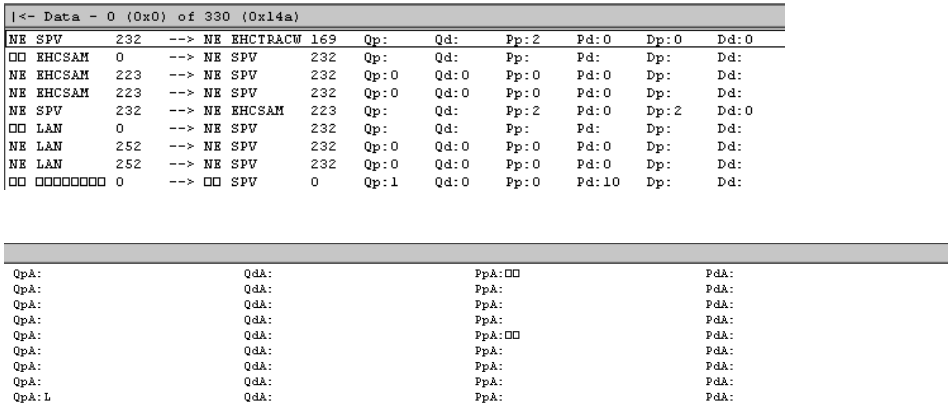
No.	Date	Time	Product	Lvl	B	PC	Component	Fn	E	Rc (Hex)	Rc (Ascii)	C	Fmt
00000	22/02/01	09:57:28.84	LANDP/NT	500		NE	SPV	IN	2	00000000	OK	T	1
00001	22/02/01	09:57:29.14	LANDP/NT	500		NE	EHCSAM	IS	0	00000000	OK	T	0
00002	22/02/01	09:57:29.15	LANDP/NT	500		NE	EHCSAM	IS	3	00000000	OK	T	0
00003	22/02/01	09:57:29.15	LANDP/NT	500		NE	SPV	IS	3	00000000	OK	T	0
00004	22/02/01	09:57:29.15	LANDP/NT	500		NE	SPV	IN	2	00000000	OK	T	2
00005	22/02/01	09:57:29.46	LANDP/NT	500		NE	LAN	IS	0	00000000	OK	T	0
00006	22/02/01	09:57:29.46	LANDP/NT	500		NE	LAN	IS	3	00000000	OK	T	0
00007	22/02/01	09:57:29.46	LANDP/NT	500		NE	SPV	IS	3	00000000	OK	T	0
00008	22/02/01	09:57:29.47	LANDP/NT	500		NE	LAN	II	1	00000000	OK	T	0

Figure 2. EHCPDT header information

Above these areas is the status display which shows the number of records in the file, whether the file has wrapped around to the beginning, and the workgroup ID. The status bar also contains the Index drop-down box, which is explained in more detail later, or the Freeze Trace button when viewing an in-memory trace (that is, when LANDP is running with an active trace server).

Figure 3 on page 46 shows the data display area in more detail. Due to the size of the data display area, this figure has been split for clarity. The header at the top of the data display area contains information about the current position of the display relative to the total display area. Each row in the display represents a trace entry that contains several information fields.

To the left of the arrow is information about the origin of the request, and immediately to the right of the arrow is information about the destination of the request and the size of the CPRB sent. After this you can see the lengths of the request parameter, the request data, the reply parameter and the reply data areas (Qp:, Qd:, Pp:, and Pd:, respectively). The width of the columns in the header display area can be adjusted to show more clearly the information that you want to see.



|<- Data - 0 (0x0) of 330 (0x14a)

NE SPV	232	--> NE EHCTRACW	169	Qp:	Qd:	Pp:2	Pd:0	Dp:0	Dd:0
□□ EHCSAM	0	--> NE SPV	232	Qp:	Qd:	Pp:	Pd:	Dp:	Dd:
NE EHCSAM	223	--> NE SPV	232	Qp:0	Qd:0	Pp:0	Pd:0	Dp:	Dd:
NE EHCSAM	223	--> NE SPV	232	Qp:0	Qd:0	Pp:0	Pd:0	Dp:	Dd:
NE SPV	232	--> NE EHCSAM	223	Qp:	Qd:	Pp:2	Pd:0	Dp:2	Dd:0
□□ LAN	0	--> NE SPV	232	Qp:	Qd:	Pp:	Pd:	Dp:	Dd:
NE LAN	252	--> NE SPV	232	Qp:0	Qd:0	Pp:0	Pd:0	Dp:	Dd:
NE LAN	252	--> NE SPV	232	Qp:0	Qd:0	Pp:0	Pd:0	Dp:	Dd:
□□ □□□□□□□□	0	--> □□ SPV	0	Qp:1	Qd:0	Pp:0	Pd:10	Dp:	Dd:

QpA:	QdA:	PpA:□□	PdA:
QpA:	QdA:	PpA:	PdA:
QpA:	QdA:	PpA:	PdA:
QpA:	QdA:	PpA:	PdA:
QpA:	QdA:	PpA:□□	PdA:
QpA:	QdA:	PpA:	PdA:
QpA:	QdA:	PpA:	PdA:
QpA:	QdA:	PpA:	PdA:
QpA:L	QdA:	PpA:	PdA:

Figure 3. Data display area of EHCPDT

After the lengths the first 26 bytes of the request parameter, request data, reply parameter and reply data areas themselves (QpA:, QpA:, PpA:, and PdA: respectively) are displayed.

By default, all information is displayed in ASCII, but the data can be displayed in Hex format by selecting the appropriate item in the 'Options' menu. Choose the 'Select Items...' option to control which fields you can see in the display. See Figure 4 on page 47.

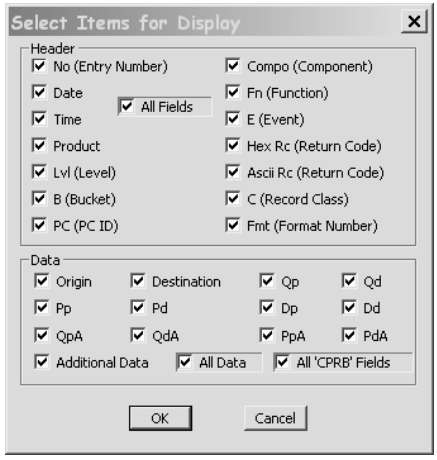


Figure 4. Select Items for Display window

Using this window you can select or de-select individual items to be displayed, and you can toggle the entire header or display fields on or off using the appropriate tick boxes.

It is also possible to filter the trace file, so that, for example, you can view only a subset of trace entries from a large trace file.or example. Choose the 'Trace Filter ...' option from the 'Options' menu. See Figure 5.

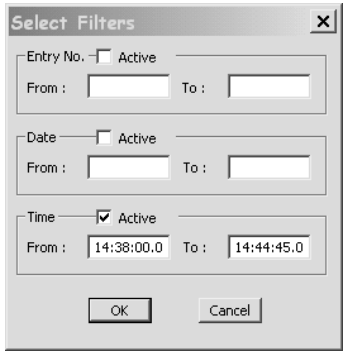


Figure 5. Select Filters window

Using the Select Filters window, your filter can be based on the trace entry numbers, the dates and times of the trace entries, or a combination of all three of these options. This can be useful for quickly finding relevant trace entries when you know the time of a problem that you wish to investigate.

Another kind of filter is provided if you choose the 'Index on...' option from the 'Options' menu. Using the 'Index on ... ' option you can display only trace entries that match a given workstation-ID, component, function, return code, origin or destination. Once the type of data to search on is specified, the valid search criteria are displayed in the

drop-down box on the status bar. Individual trace records can be examined by double-clicking on the entries shown. The record is then displayed in a new window as shown in Figure 6.

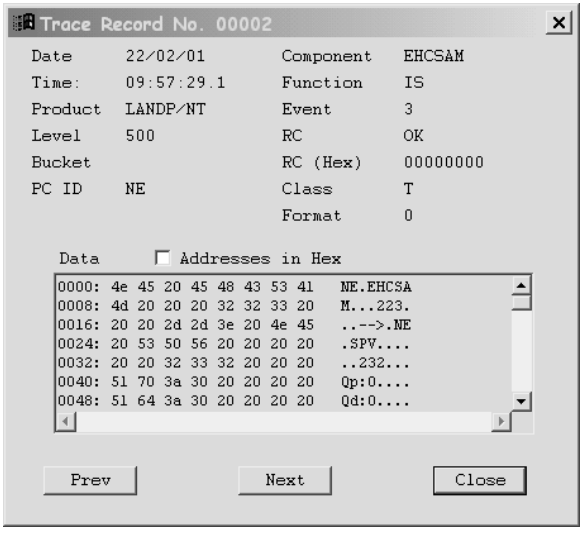


Figure 6. Individual trace record display

Note: On OS/2 the filter and index functions are combined in a single 'Select Records' dialogue window that is accessed from the Options Menu.

EHCTRACF

The EHCTRACF program formats the contents of an event trace file into an ASCII file. The ASCII file can be viewed using any ASCII text editor.

The event trace file may have been produced by loading EHCTRACW with the /T:FILE parameter, or by using the **Save** option in EHCPDT.

The output file contains four heading lines followed by one line for each trace (or log) record.

To use EHCTRACF, enter the following:

```
EHCTRACF tracefile[/O:outputfile] [/H]
```

where:

tracefile Is the name of the LANDP trace file to be formatted.

outputfile Is the name of the file to contain the formatted trace. If the /O: parameter is not specified, the output file defaults to the path name and file name of the trace file with extension FMT.

/H specifies that the Parameter and Data areas are to be formatted in hexadecimal.

Note that , for Linux, the parameters are -O and -H.

EHCLIP program services

The following topics contain information about internal and communication data traces and error logs that are generated by LANDP trace tools and the EHCLIP program.

Internal and communication traces

EHCLIP, the LANDP Internet Protocol program, can trace internal and communication data. To request traces of internal routines or communication data, specify the parameters **/T** or **/C**, respectively, in the EHCLIP.EXE loading statement.

If EHCLIP is started in the foreground, the trace output is directed to the screen, which is the default. To direct the trace output to an ASCII file or to the EHCTRACW server, specify the parameter **/O** and a value on the loading statement. Refer to the *LANDP Installation and Customization* book for information about loading programs, loading statements, and parameter values.

Communication traces contain the following items:

- COMM, which is the communication trace identifier
- Datagram length
- Remote workstation identifier
- Time, in the format *hh.mm.ss.mmm*
- Trace line type identifier, which can take the following values:
  - **I** Input datagram
  - **O** Output datagram

Other entries that appear on the communication trace line are used by IBM support representatives.

Logging errors and statistics

EHCLIP uses the EHCTRACW server to log information about external and internal errors and statistics. This information can be helpful when diagnosing errors or tracking communication problems.

The format of EHCLIP log entries is:

Table 3. LANDP Trace Tools: Format of EHCLIP log entries

Field	Entry
Component field	EHCLIP
Return code	'1'
Data	Error code Data associated with the error Remote workstation ID if the error is related to a single session

Refer to "LANDP Internet Protocol (EHCLIP)" on page 155 for a list of error codes and statistics returned by the EHCLIP program.

EHCLIP program and TCP/IP tools

You can also use TCP/IP tools to diagnose external communication errors that effect the EHCLIP program. For example, TCP/IP tools might be helpful for these error conditions:

Table 4. TCP/IP Tools: Communication errors and EHCLIP program

Error Condition	TCP/IP Tools
Unable to contact a remote workstation	Use the TCP/IP **ping** program to test that there is a connection to the workstation. The program sends an echo request and waits for a reply from the workstation.
Frequent loss and retransmission of datagrams, which results in poor performance	Use TCP/IP statistics operator commands to diagnose the following: • Lack of space in the TCP/IP input buffers on the destination workstation. This can be caused by overload conditions. • Corruption of datagrams. This can be caused by unreliable communication circuits.
TCP/IP communication errors	Use TCP/IP internal trace tools, if available, to diagnose these errors.

Refer to TCP/IP documentation for more information about diagnosing communication problems.

MQSeries Link Server logging

When loaded with the **/M** parameter, the MQSeries Link Server creates log files containing messages of a given level.

When the log level is specified as *debug*, using the parameter **/M:D**, the log files contain information that includes both informational level messages and messages that provide more detail to help application development and problem determination. For more information about the MQSeries Link Server loader parameters, refer to the *LANDP Initialization and Customization* book.

Log file naming

There are two types of log file:

the log file for the MQSeries Link Server

the log files for the LANDP applications that use the MQSeries Link Server

The name of the MQSeries Link Server log file always starts with the characters '##'. The remainder of the log file name contains a time stamp.

The names of the application log files start with the ID of the workstation where the application was started. The remainder of the log file name contains a time stamp.

Log file names have the format XXhhmmss.ddd, where:

XX is either ## or a workstation ID
hh is hours
mm is minutes
ss is seconds
ddd is the day of the year, represented as a number in the range 001 thru 366

Log file contents

Each entry in a log file has the format **Time SessionId Message-Number Message-Text**, where:

Time is the local time, represented as *hh:mm:ss*, where:

hh are hours
mm are minutes
ss are seconds

SessionId is the identifier defined by the LANDP MQSeries Link Server.

The first two characters of the identifier are the ID of the workstation that issued the RMTREQ. The next five characters of the identifier are the process identifier of the program that issued the RMTREQ. The last two characters of the identifier are the ID of the MQSeries Link Server as defined in the CPRB (for example, the server name EHCMQ01 has an ID of 01). Note that these last two characters are always present in an application log file entry, but might not be there in a link server log entry.

Message-Number is the reference that is used to retrieve the Message-Text from the LANDP message file.

Message-Text is the text of the message.

Chapter 4. Support

If you have a LANDP problem that you cannot resolve by using the problem determination tools or the information contained in the LANDP books, contact your IBM country support.

When reporting a problem, try to isolate the problem and provide IBM with clear and concise documentation about the problem. If possible, describe how to re-create the problem.

This chapter contains some guidelines for requesting support, and gives tips for collecting the information required by the support representatives. It includes a guide to using the VERSION utility, a description of LANDP's maintenance strategy, and flowcharts to help you isolate a problem and provide IBM with the correct documentation.

For information on applying program fixes, see the *LANDP Installation and Customization* book.

Guidelines for requesting assistance

Before requesting assistance with a problem, consider the following:

- LANDP family components work with other software products, including operating systems and application programs.

  It is possible that another software product is causing the problem. Test your operating environment to ensure that it is a LANDP component that is causing the problem.
- Support representatives require a detailed account of the problem and its supporting data.

  When you report a problem, make sure that you have available the information described in "Documentation required by IBM" on page 54. Support representatives use this information to determine the cause of a problem. Also, be prepared to answer any of the following questions:
  - In which operating environment did the problem occur?
  - What are the service and release levels of the failing component?
  - What diagnostic information relates to the problem?
  - What was the sequence of events causing the problem?
  - What recovery actions did you try?
  - Can you re-create the problem?
  - What is the severity of the problem?
  - Are you able to continue productive work?
- Make sure that you provide the support representative with a detailed description of the problem, a method of reproducing it, and all supporting data. Also, make sure that any files or media that you send to IBM can be restored and used by support representatives.
- Where the key combination ″Alt-Numlock″ is referred to in the flowcharts, this is the default key setting to obtain access to the DDT trace program.

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Documentation required by IBM

The list of items that might be required to determine the cause of a particular problem varies according to the operating system, transport protocol, and so on. The following checklist identifies some of the key information that might be needed by the support representatives. It should not be treated as an exhaustive list, and should be supplemented with whatever pertinent information can be provided.

Most of these items are referred to in the flowcharts that follow. Items 19 thru 22 are not mentioned in the flowcharts, but 19 and 20 on page 55 are always required. Item 21 might be requested for a Windows problem, and item 22 should be provided if available.

1. The diskette or diskettes, from which a personal computer system can be booted. Take these from one or more workstations as requested. These are needed to reproduce the error.
2. CONFIG.*
3. AUTOEXEC.BAT (This is not required for an OS/2 PWS (personal workstation))
4. VERSION.TXT, which is generated by running VERSION.EXE in the LANDP subdirectory of the workstation where the problem is occurring. Refer to “VERSION utility” on page 59 for more information.
5. AUTOFBSS.BAT (for a DOS or Windows PWS) or AUTOFBSS.CMD (for an OS/2 PWS)
6. Function traces showing the errors in EHCTRC*XX*.DAT and EHCTRC*XX*.LOG on OS/2 machines where *xx* is the PWS ID. On DOS PWSs, use the function traces, ensuring that the error is shown and that internal traces are included.
7. An SNA trace showing the error. Provide all three pages if they are available.
8. A routines trace.
9. An SDLC trace.
10. An X.25 adapter trace and X.25 Network Errors trace. Start the trace before attempting to re-create the error.
11. A native X.25 trace.
12. A token-ring DLC trace.
13. Details of the current Corrective Service Diskette (CSD) level of your Operating System.
14. An OS/2 Communications Manager trace with the LU Application Custom Feature Request-level Interface (LUA_RUI) and the appropriate Data Link Control (DLC) options selected.
15. Details of all hardware used in your configuration. Include the number and type of PWS used and all adapters installed, together with any interrupt levels used and memory addresses set.
16. Details of the programs loaded in the system memory. For DOS and Windows machines, run the MEM/DEBUG command. For OS/2 machines, run the PSTAT command. The output can be piped to a file using the > symbol. For example:

    ```
    PSTAT > filename
    MEM /DEBUG > filename
    ```

Send this output to IBM.

17. COMMON.SPC, LANCONF.SPC, and possibly MODELS.SPC on the workgroup configuration machine.
18. LAN.CFG.
19. Problem description. A full description of the problem, how it occurs, what it affects, and how it can be re-created. If the problem occurred following system changes, describe these changes.
20. Operating system and release level. To determine this, enter the following:
    - DOS
      Ver > filename
      (Where filename is the name of an output file)
    - OS/2
      Syslevel > filename
      (Where filename is the name of an output file)
    - Windows
      WINMSD
      (This shows a window from which the current operating system level can be noted)
    - Linux
      uname -a > filename
      (Where filename specifies the file that contains the operating system information)
21. Output from REGEDT32, the Windows registry editor utility.
22. .LGD and .TRP files (OS/2, Windows, and Linux). These files are produced by a system trap.

LANDP function traces

Collect the function traces covering the period during which the error occurred. If particular actions are required to initiate the problem, describe these actions, making reference to timestamps in the traces.

The use of LANDP trace servers is detailed in Chapter 2, “LANDP trace tools - DOS” on page 9, and Chapter 3, “LANDP trace tools - OS/2, Windows, and Linux” on page 39.

Communications traces

On DOS workstations, communications trace facilities are provided by LANDP and should be obtained as appropriate (see “Communication traces” on page 15).

- On workstations using IBM Communications Server:

```
PPC server options:   Select tracing: API - APPC
                                      DLCs - appropriate
                                      Events - none
```

- On workstations using Microsoft SNA server:

```
SNA server options:   Select tracing: API - LUA-RUI
                                      DLCs - appropriate
                                      Events - none
```

Hardware configuration

If the problem is isolated to specific hardware configurations or appears to be hardware related, provide details of workstation types and model numbers, installed adapters, interrupt levels, memory address settings, and so on.

Event log (Windows only)

To view the event log, use the Event Viewer (part of Windows Administrative Tools). A LANDP error is reported in the Application Log at the machine in which it occurs. Using the Event Viewer, you can save this log in a file. This file should be be sent to IBM when you report a problem.

Note: For the printer server, PR47X2##.EXE, the parameter `/T` can be added to the LOADER statement. This generates the printer event log PR4742.TXT, which should be sent to IBM when reporting a problem.

System log (Linux only)

The support team might request a copy of the system log from a failing Linux workstation. This log is usually located in the file */var/log/messages*, which is only viewable by a user who has root privileges.

Dump file (OS/2 only)

A dump file might be requested by the support team. It can be obtained as follows:

- To produce a dump automatically, add the following statements to CONFIG.SYS

  ```
  TRAPDUMP=ON
  TRACEBUF=64
  TRACE=ON
  ```

- Alternatively, a dump can be produced at any time by pressing the Ctrl-Alt-Numlock keys twice. This produces a dump of the entire system memory on diskette. Therefore, make sure that an adequate supply of blank formatted disks is available.

PDPACK utility

The LANDP utility program PDPACK can be used to collect some of the information required to determine the cause of a LANDP problem. However, it does not collect trace files from other software products (for example, IBM Communications Server or Microsoft SNA Server).

The PDPACK utility program is distributed automatically along with the runtime files to all workstations in a LANDP workgroup.

PDPACK utility on DOS, OS/2, and Windows

The PDPACK utility program is distributed in a self-extracting archive called PDPACKET.EXE. From within the LANDP working directory, type the command:

```
PDPACKET
```

tro extract the utility.

To use the PDPACK utility program, issue the following command:

```
PDPACK xxxxx
```

where *xxxxx* is the PMR number that you received from IBM for your problem.

If you do not have a PMR number for your problem, issue the following command from the working LANDP directory:

```
PDPACK
```

If you have a PMR number - *xxxxx* - for your problem, an archive file called pd*xxxxx*.zip, where *xxxxx* is your PMR number, will be created by the PDPACK utility.

If you do not have a PMR number, and the ID of the failing workstation is *yy*, an archive file called pdpack*yy*.zip will be created by the PDPACK utility.

If the PDPACK utility cannot find the PMR number or the workstation ID, an archive file called pdoutput.zip will be created.

The PDPACK utility also produces a log file called packlog.txt. This log file provides a record of what information has been collected in the archive file that it created. Only the archive file should be sent to your IBM service representative.

If you want to view the contents of the archive file, copy the archive file to a new directory and view its content using any suitable application.

PDPACK utility on Linux

If pdpack runs on a LANDP for Linux workstation, issue the following command from the working LANDP directory:

```
pdpack  [-q] [-p xxxxx] [-i [full | [none]] [-help]
```

The options are:

xxxxx is the PMR number that you have received from IBM for this problem.

The LANDP for Linux version of pdpack supports the following options:

-q, --quiet	Quiet mode selected
-p, --pmr <xxxxx>	xxxxx is the PMR supplied by your IBM support representative
-i, --interactive <full | none>	Interactive mode selected
--help	Displays the help message

If *Quiet mode* is selected, the utility will not display any information and will not prompt the user for input. In this mode, the utility creates its own temporary directories and files. packlog.txt is available for viewing after pdback finishes.

If *Interactive mode* is selected, pdpack prompts the user for a response before it creates or deletes any directories. A parameter value **full** or **none** is also required when this mode is selected. *Interactive mode* is the default mode for pdpack under Linux.

Under Linux, the Linux utilities, tar and gzip, are used to produce the archive file that you should send to your IBM service representative.

The archive file created by the PDPACK utility program is pd*xxxxx*.zip (LANDP for DOS, LANDP for OS/2, and LANDP for Windows) or pd*xxxxx*.tar.gz (LANDP for Linux), where *xxxxx* is the PMR number.

Note: If you do not have a PMR number for your problem, use the command PDPACK without any parameters. The archive file created by the PDPACK utility program will be called pdpack*yy*.zip, where *yy* is the ID of the workstation on which PDPACK has run, or pdoutput.zip, if the workstation id is not known.

A log file called packlog.txt is also created by the PDPACK utility program. This file is used to record what information has been collected in the archive file.

VERSION utility

The VERSION utility helps in LANDP maintenance and problem determination. It determines the current version level of LANDP components, and tracks maintenance fixes installed on the components. IBM requires this information when you report a problem. (For further information about the VERSION utility, see the *LANDP Family Installation and Customization Guide*, Chapter 20.)

More information is produced by the VERSION utility on Linux than is produced by VERSION on DOS, OS/2 or Windows. The next section describes the VERSION utility on DOS, OS/2 and Windows. A later section in this chapter describes VERSION on Linux.

VERSION utility on DOS, OS/2, and Windows

The VERSION utility performs the following functions:

- Determines the current version of the component program files
- Determines the last authorized program analysis report (APAR) applied to:
  - LANDP components
  - FBSS, PC/Integrator, and PC Integrator/2 programs
- Displays the program name, program version, and last-applied APAR level

When you run the VERSION utility, it creates a file called VERSION.TXT. The VERSION program writes to this file the component program name, version, and APAR information.

You can run the VERSION utility on a LANDP for DOS, LANDP for OS/2, or LANDP for Windows customization workstation, or or any LANDP workstation.

Starting VERSION

Start the VERSION utility from the EHCMAINT directory on the customization workstation, or from the directories that contain the LANDP components on the production site workstation.

To start the utility:

1. Complete *one* of the following steps:
   - Customization workstations: Make EHCMAINT the current directory.
   - Production site workstations: Make the directory that contains the LANDP components the current directory.
2. Enter the following command:

   `VERSION [`*`path1`*`] [/O:`*`path2`*`]`

   where:

   path1 Is the path and drive that the VERSION program searches. Specify the path and drive where the LANDP programs reside.

   Note: If you do not specify this parameter, the VERSION utility searches only the current directory and the LANDP reserved subdirectories.

path2 Is the path and drive where the VERSION utility places the output file, VERSION.TXT.

Note: If you do not specify this parameter, the VERSION program places VERSION.TXT in the current directory.

Reading the output from VERSION

The VERSION utility generates a line of output for each LANDP component.

If information is missing, a line appears in this format:

```
ID=ssssssss                    ID not found
```

The LANDP component *ssssssss* does not include the identifier information.

If a program fix has been applied incorrectly, a line appears in this format:

```
ID=ssssssss                    Wrong fix format
```

The LANDP program fix for component *ssssssss* is applied incorrectly.

For information and procedures for installing program fixes, see the *LANDP Installation and Customization* book.

If a component is correctly installed and all information is available, a line appears in this format:

```
ID=ssssssss     VL=vrmxx     nnnnnnn     ppppppp
```

ID=*ssssssss* Is the name of the component.

VL=*vrmxx* Is the version level; *vrmxx* can be:

- **D6000** LANDP for DOS Version 6
- **O6000** LANDP for OS/2 Version 6
- **N6000** LANDP for Windows Version 6
- **L6000** LANDP for Linux Version 6
- **B6000** Servers common between LANDP for DOS and LANDP for OS/2
- **S6000** Servers common between LANDP for OS/2 and LANDP for Windows
- **U6000** Servers common between LANDP for DOS and LANDP for Windows
- **P6000** Servers common between LANDP for OS/2, LANDP for Windows, and LANDP for DOS
- **K6000** Servers common between LANDP for OS/2, LANDP for Windows, and LANDP for Linux
- **H6000** Servers common between LANDP for OS/2 and LANDP for Linux
- **Z6000** Servers common between LANDP for Windows and LANDP for Linux
- **A6000** Servers common between LANDP for DOS, LANDP for OS/2, LANDP for Windows, and LANDP for Linux

Note: For the FBSS products, PC/Integrator, and PC Integrator/2, *v* is the version and *r* is the release.

m is the modification level.

xx is a sequence number that corresponds to the number of modifications applied to the LANDP program.

nnnnnnn Is the last APAR applied to the program.

ppppppp Is the filename of the component.

Example output from a LANDP workstation in a workgroup:

```
LANDP Version Utility 10/29/01 at 08:48:39 (Built: Oct 23 2001)

Directory: .

ID=EHCAUTO  VL=N6000          EHCAUTO.EXE
ID=EHCCINFO VL=A6000          EHCCINFO.EXE
ID=EHCFREE  VL=N6000          EHCFREE.EXE
ID=EHCINFO  VL=N6000          EHCINFO.EXE
ID=EHCMAP   VL=N6000          EHCMAP.DLL
ID=EHCPDT   VL=N6000          EHCPDT.EXE
ID=EHCTRACF VL=S6000          EHCTRACF.EXE
ID=EHCTRACW VL=N6000          EHCTRACW.EXE
ID=EHCUTILS VL=N6000          EHCUTILS.DLL
ID=EHCWINNT VL=N6000          EHCWINNT.DLL
ID=EHCXLATE VL=N6000          EHCXLATE.DLL
ID=LAN      VL=N6000          LAN.EXE
ID=LOADER   VL=N6000          LOADER.EXE
ID=SPV      VL=N6000          SPV.EXE
ID=SVPCPRBN VL=N6000          SVPCPRBN.EXE
ID=VARPARM  VL=A6000          VARPARM.EXE
ID=VARPARM  VL=A6000          VARPARMWEXE

End of file (rc = 0)
```

Version Utility on Linux

The *version* utility program on Linux behaves slightly differently from the VERSION utility on DOS, OS/2, or Windows. Rather than looking at a single directory, *version* looks at the current environment.



On Linux, the *version* utility program:

- Determines the actual executable file that will be run within the currently defined environment
- Determines the current version of the component program files
- Determines the last authorized program analysis report (APAR) or program temporary fix (PTF) that has been applied to the LANDP component
- Determines the library levels and their locations within the system
- Displays the program name, service level, APAR or PTF level, library dependencies and path of the program executable for LANDP for Linux

The utility writes the program-related information to a file *version.text*.

The *version* utility program has two parts.

The first part is a shell script called *version*.

The second part is an executable file called *ehcvlext* which reads the program version and APAR or PTF level from a given LANDP object.

The files *servers.lst* and *userserv.lst* are used by *version* to determine what components it should be looking for.

Starting version on a LANDP for Linux workstation: Before starting the *version* utility, ensure that you are running from a shell with the current LANDP environment set up.

To run *version*, issue the following command:

```
version [-o output]
```

where *output* is the name of the output file. The default is version.txt.

Reading the output from** version **run on Linux: On Linux, each component's information is displayed in the following format:

```
<component name>
----------------------
Actual Executable Location: <path to executable>
Program Information:        <Output as Version on other platforms>
Library Dependencies:
        <Information about Library dependencies>
```

Example output from a LANDP workstation (extract):

```
LANDP Version Utility Wed Oct 24 17:16:59 BST 2001

loader
--------------
Actual Executable Location: /opt/ibm/landp/l60/bin/loader
Program Information      :ID=LOADER VL=L6000 loader
Library Dependencies:
         libc.so.6 => /lib/i686/libc.so.6 (0x40029000)
         /lib/ld-linux.so.2 => /lib/ld-linux.so.2 (0x40000000)
================================================================================
spv
--------------
Actual Executable Location: /opt/ibm/landp/l60/bin/spv
Program Information      :ID=EHCFREE VL=N6000 spv
Library Dependencies:
         libpthread.so.0 => /lib/i686/libpthread.so.0 (0x40029000)
         libehcmap.so.6 => /opt/ibm/landp/l60/lib/libehcmap.so.6 (0x4003e000)
```

```
        libc.so.6 => /lib/i686/libc.so.6 (0x40066000)
        libehclnx.so.6 => /opt/ibm/landp/l60/lib/libehclnx.so.6 (0x40196000)
        /lib/ld-linux.so.2 => /lib/ld-linux.so.2 (0x40000000)
        liberz.so.6=> /opt/ibm/landp/l60/lib/liberz.so.6 (0x401de000)
================================================================================
```

Identifying and getting LANDP fixes

To identify and get fixes, find the APAR number for your problem, and get the fix described by the APAR.

Finding the APAR number

You can find APAR numbers in RETAIN® (IBM's remote technical assistance information network) if you have access to it. If not, obtain the APAR number from your IBM branch office.

To find LANDP information on RETAIN, you need the following:

Prefix: HBnnnnn for APARs
UBnnnnn for CSDs

Library: Program Product 'A'

Getting the fixes from the Internet

To help you maintain your LANDP installation, the LANDP team documents the latest level of maintenance for every module in information text files. The complete maintenance package, including the text files, is available on the web at:

`http://www.software.ibm.com/ps/products/landp/fixes`

The fixes are compressed in ZIP format and converted to a self-extracting executable file. To obtain all the fixes, execute the `IIxxxxx.EXE`, where `xxxxx` varies for each version (10946 for Version 5).

Applying fixes

The APPLYFIX program is used to unpack and apply the program fixes. For further information about the APPLYFIX program, see the *LANDP Family Installation and Customization Guide*

LANDP maintenance strategy

Maintenance of the LANDP product is performed on a file by file basis. Therefore, complete product updates are not normally required. Each file has an embedded level number, called a VL number, that is incremented by one with each shipped fix to that file. A fix to an individual file might solve more than one problem. However, there might be dependencies on other files within the product.

The VL number is 000 for all files when the product is released. But, when fixes are applied to the product, the VL number for individual files varies according to the number of fixes applied to each file. Fixes to LANDP files are cumulative. Therefore, for a given VL number, all the fixes to a file are included.

Problem determination flowcharts

The flowcharts that follow cover LANDP problem determination in two main categories:

- Load time problems
- Run time problems

Use these flowcharts as a guide to problem determination, and to ensure that you provide IBM with the correct documentation. The flowcharts refer to the documentation list on page 54. When a chart directs the reader to another chart, a page reference is at the foot of the page in bold type.

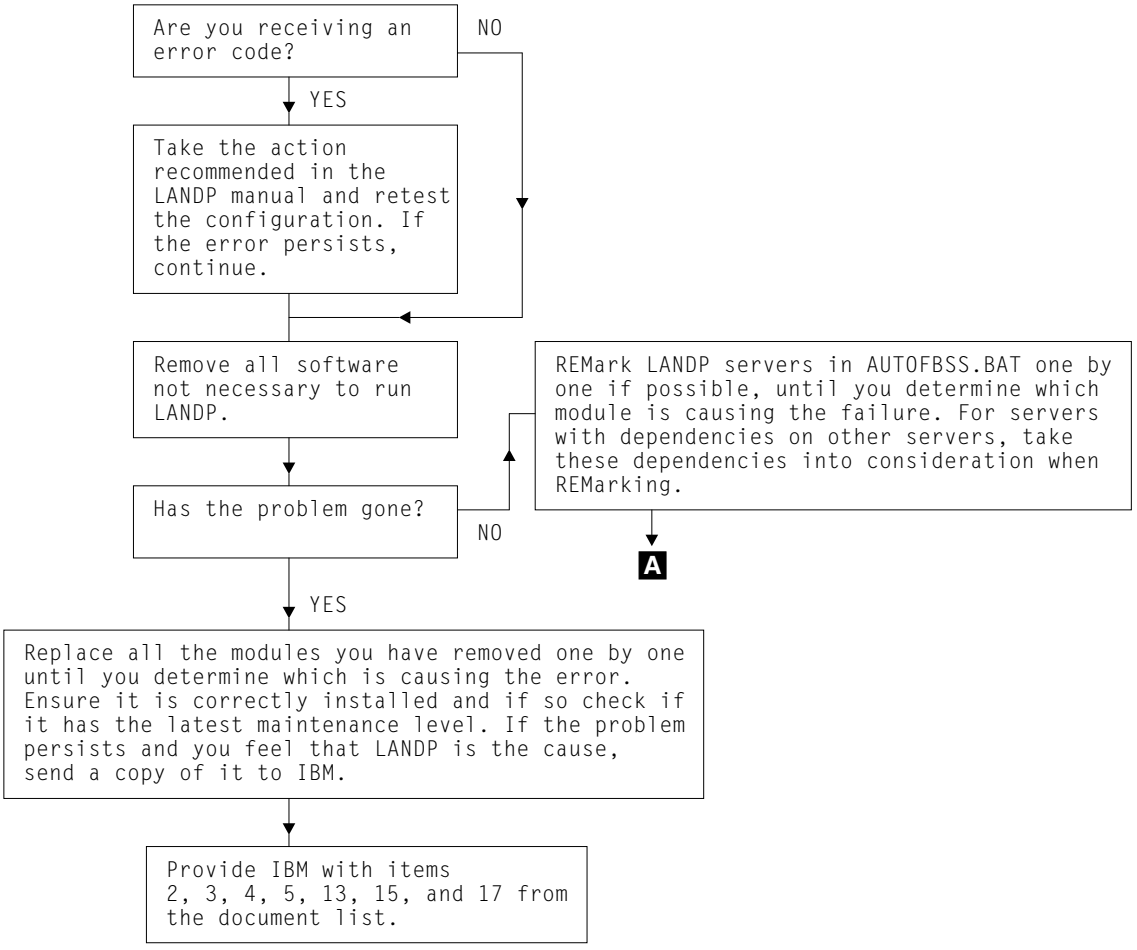
Load time problems

Before working through the flowcharts, ensure that you have met the following minimum requirements for loading:

1. All hardware components necessary for any DLCs (SDLC, X.25 coprocessor, and so on) are correctly installed in your PWS and are using suitable memory addresses and interrupt levels.
2. Sufficient system memory is available to load the LANDP modules.
3. Any paths listed at customization time are available on your PWS (for example, System Manager profiles or RCMS log paths).
4. ECHO ON is set in your AUTOFBSS.BAT file, so that any error messages are displayed at load time.
5. If you are using Expanded memory, it is correctly installed and the hardware is working correctly.

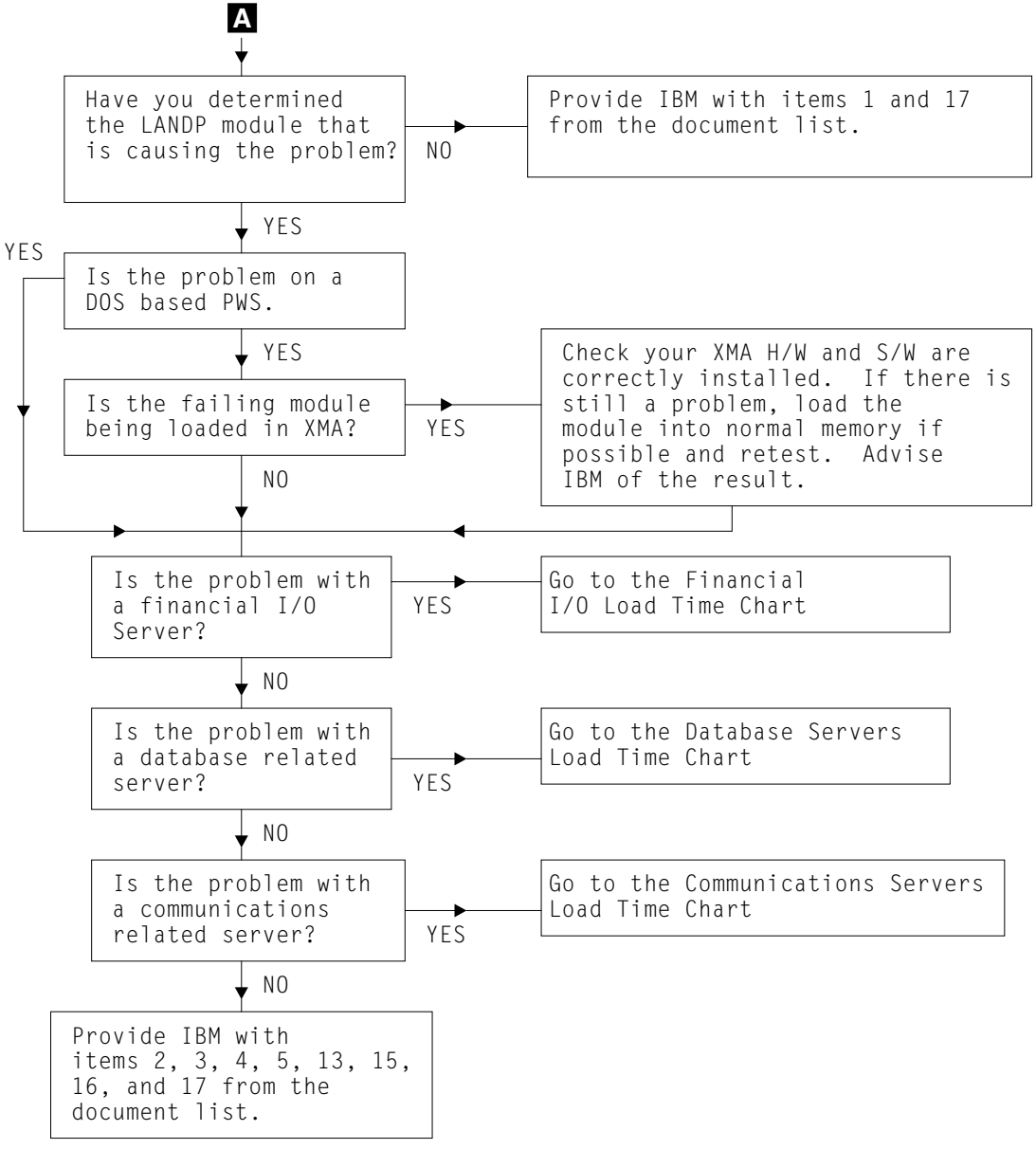
Note: In LANDP for OS/2, it is possible to modify the AUTOFBSS.CMD and replace the DETACH statements with STARTs. This runs servers in different OS/2 sessions. Once AUTOFBSS has completed, inspect the various sessions for an error or return code.

Start of load time problem flowcharts



The document list starts on page 54

Figure 7. Load time problem determination flowchart 1 (Part 1 of 2)

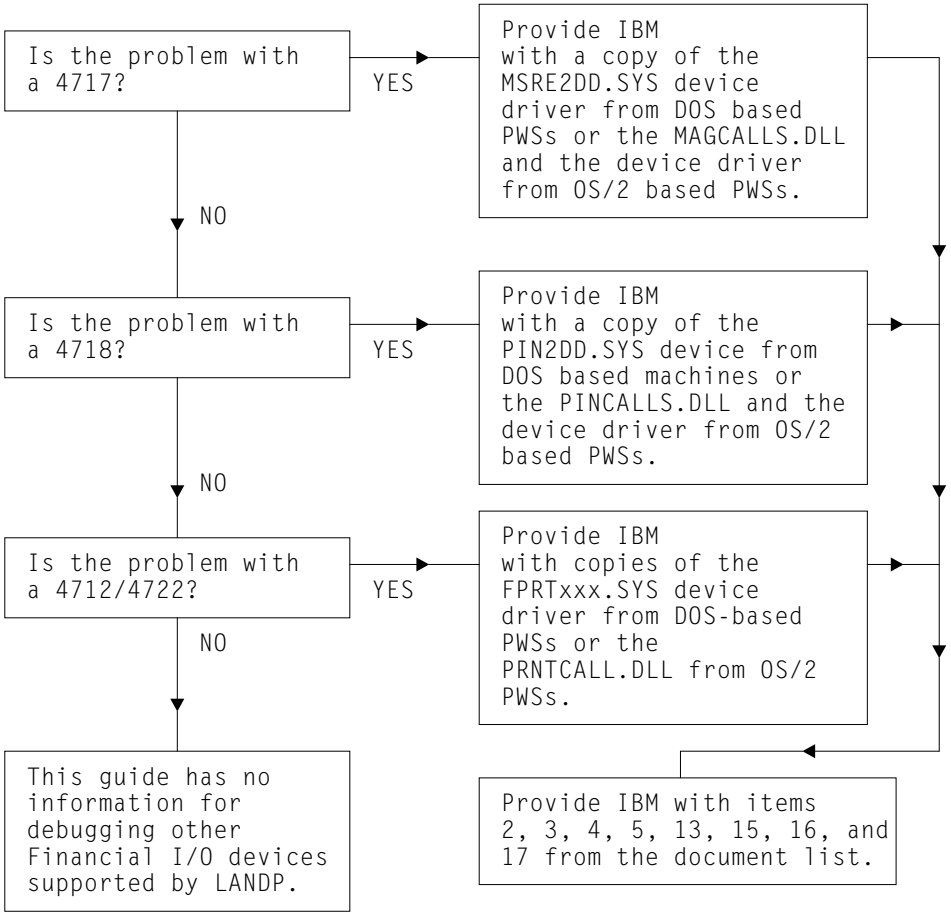


The document list starts on page 54
"Financial I/O servers problems at load time" on page 68
"Database server problems at load time" on page 69
"Communication server problems at load time" on page 70

Figure 7. Load time problem determination flowchart 1 (Part 2 of 2)

Financial I/O servers problems at load time

When a large number of files is needed to analyse a problem it might be easier to provide IBM with a copy of the diskette produced at LANDP customization time. Include on this diskette any files, such as CONFIG.SYS, that are modified to run in your system.

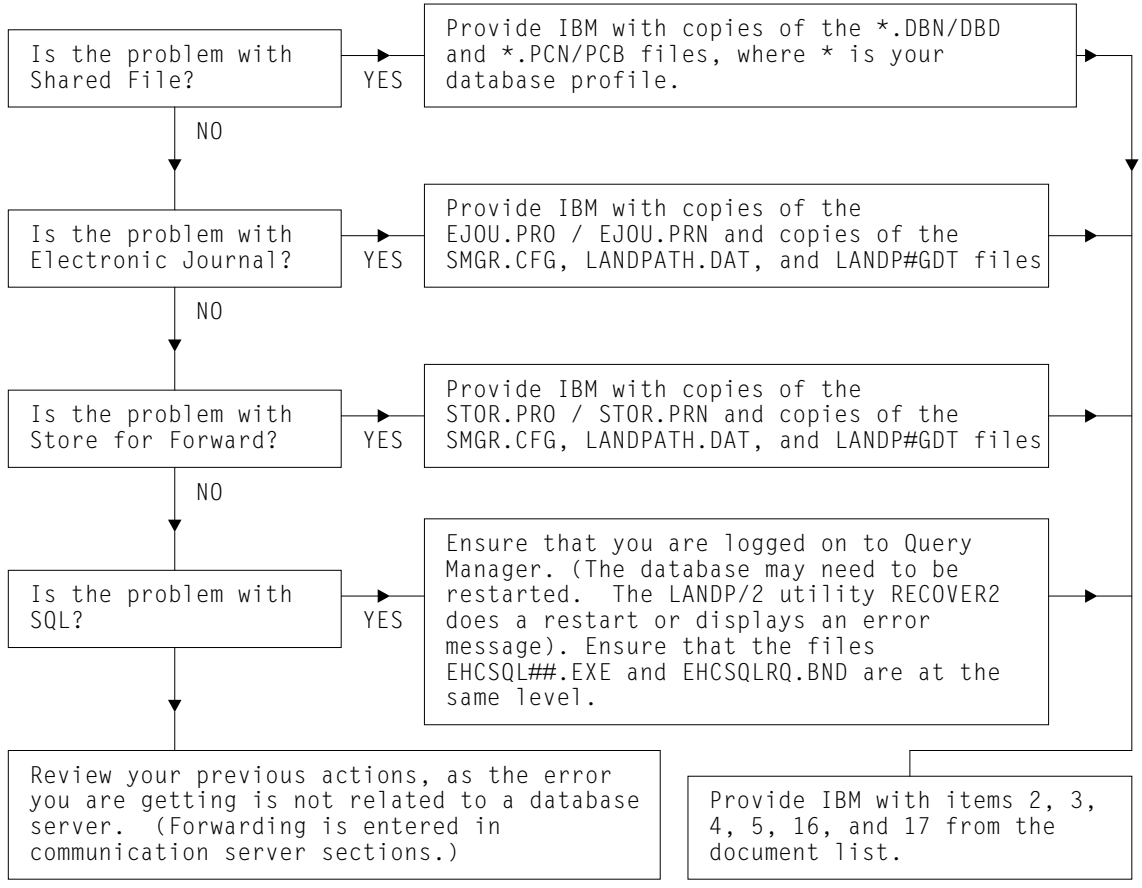


The document list starts on page 54

Figure 8. Financial I/O servers load time problem determination flowchart

Database server problems at load time

When a large number of files is needed to analyse a problem, it might be easier to provide IBM with a copy of the diskette produced at LANDP customization time. Include on this diskette any files, such as CONFIG.SYS, that are modified to meet your system needs.



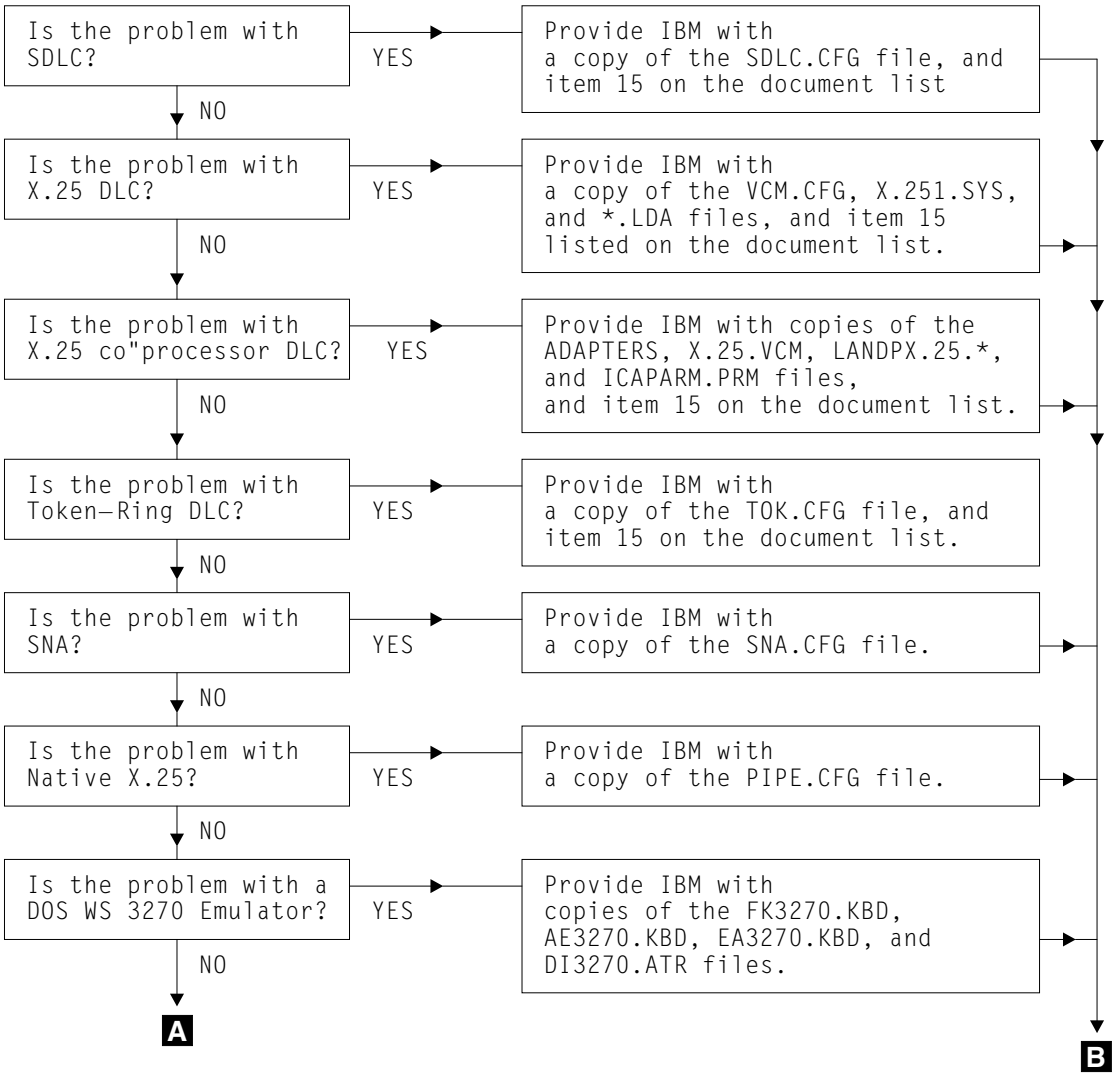
The document list starts on page 54

Figure 9. Database server diagnosis flowchart at load time

Communication server problems at load time

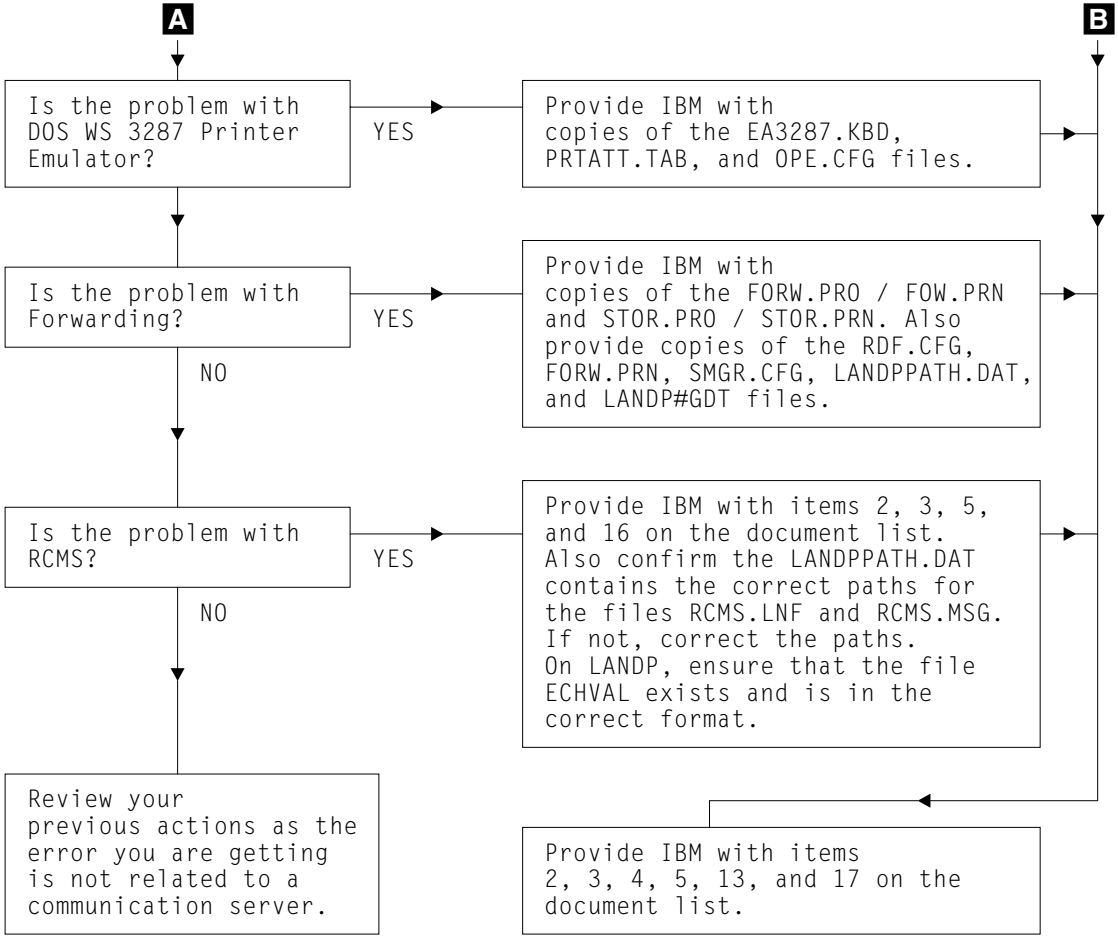
When a large number of files is needed to analyse a problem, it might be easier to provide IBM with a copy of the diskette produced at LANDP customization time. Include on this diskette any files, such as CONFIG.SYS, that are modified to meet your system needs.

Note: DLC support in OS/2 is provided by OS/2 Communications Manager.



The document list starts on page 54

Figure 10. Communication server diagnosis flowchart at load time (Part 1 of 2)



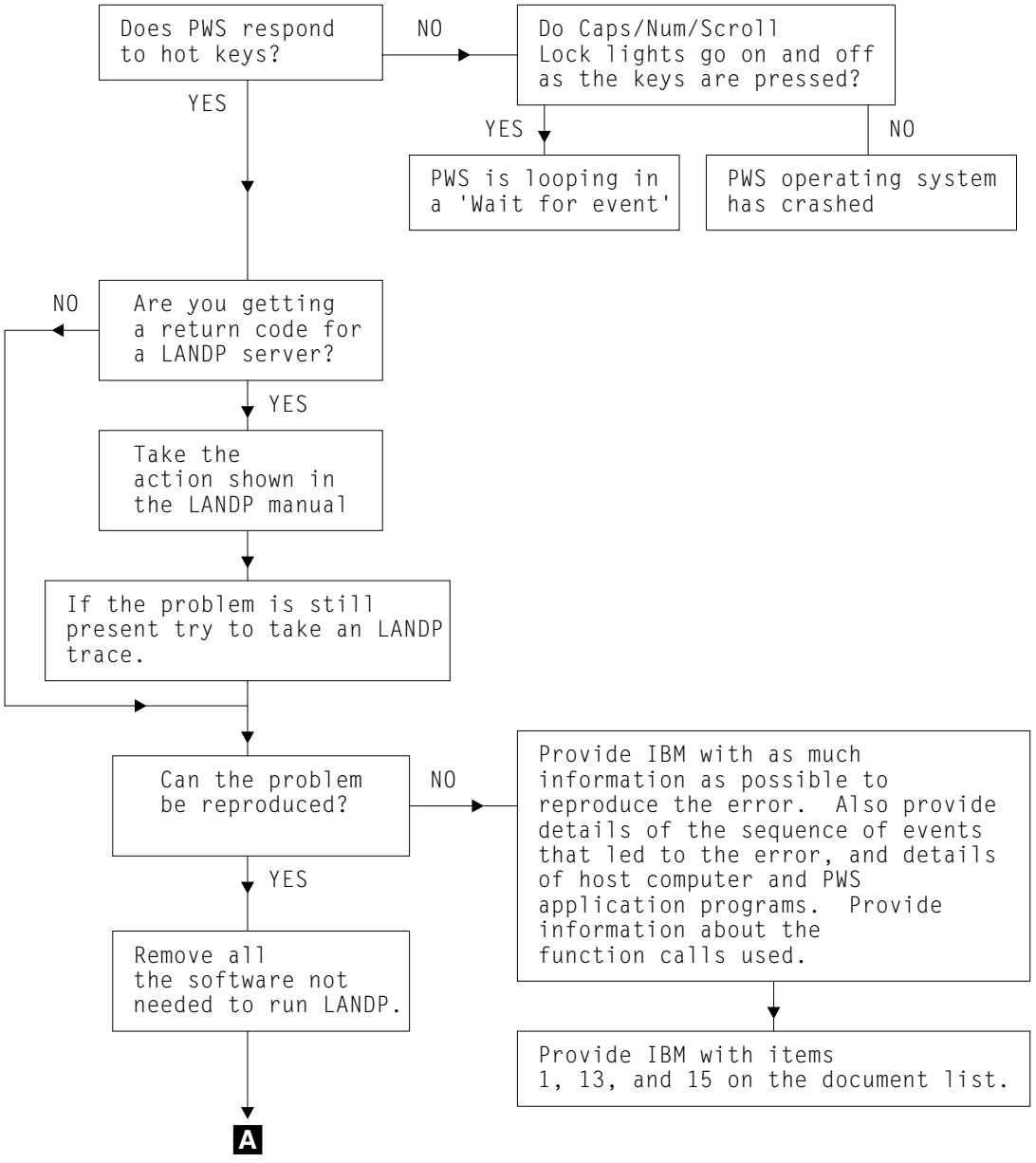
The document list starts on page 54

Figure 10. Communication server diagnosis flowchart at load time (Part 2 of 2)

Run time problems

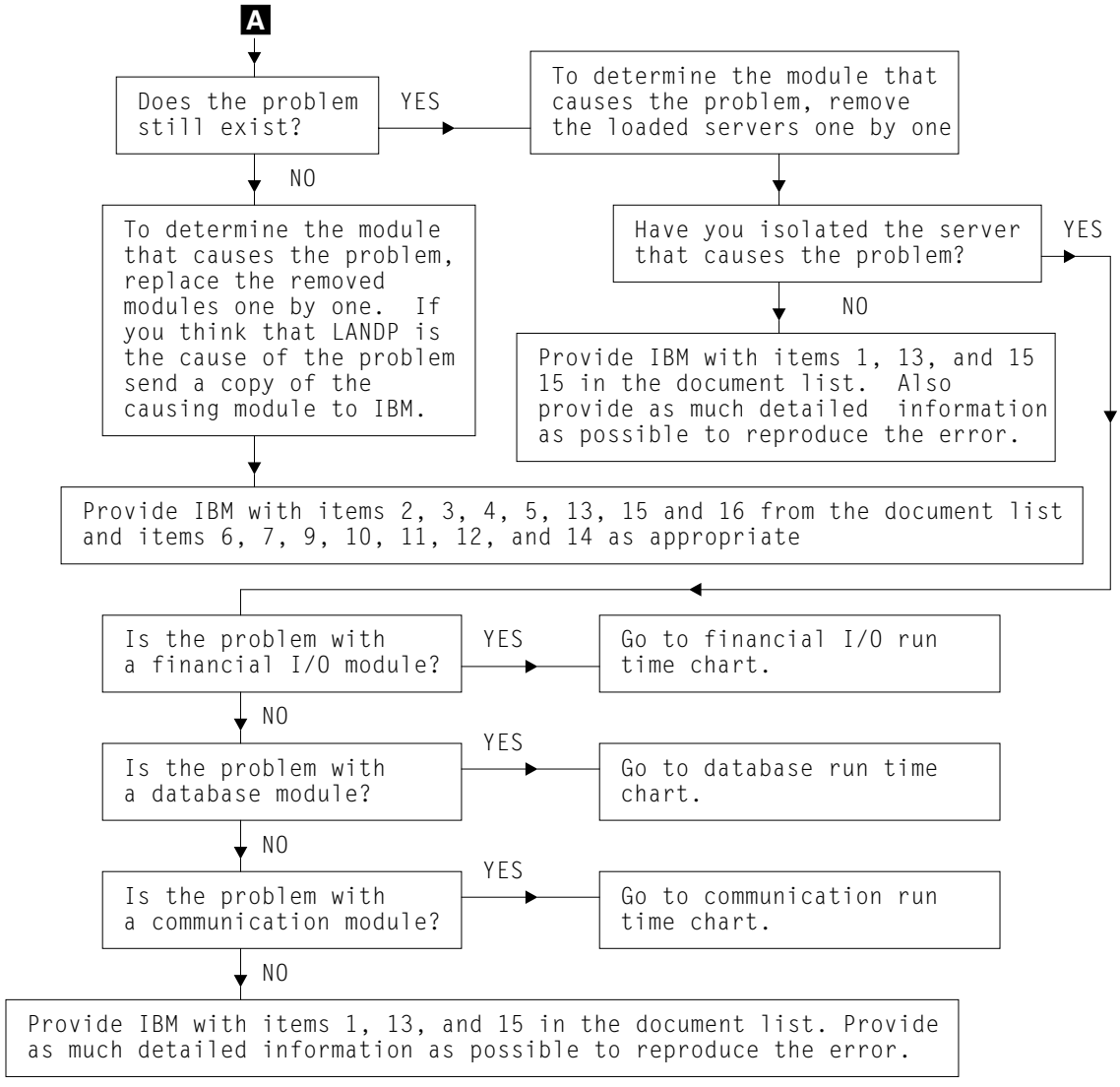
When a large number of files is needed to analyse a problem, it might be easier to provide IBM with a copy of the diskette produced at LANDP customization time. Include on this diskette any files, such as CONFIG.SYS, that are modified to meet your system needs. Copy the traces to a separate directory.

Start of run time problem flowcharts



The document list starts on page 54

Figure 11. Run time diagnosis flowchart (Part 1 of 2)



The document list starts on page 54
"Financial I/O device problems at run time" on page 75
"Database server problems at run time" on page 76
"Communication server problems at run time" on page 77

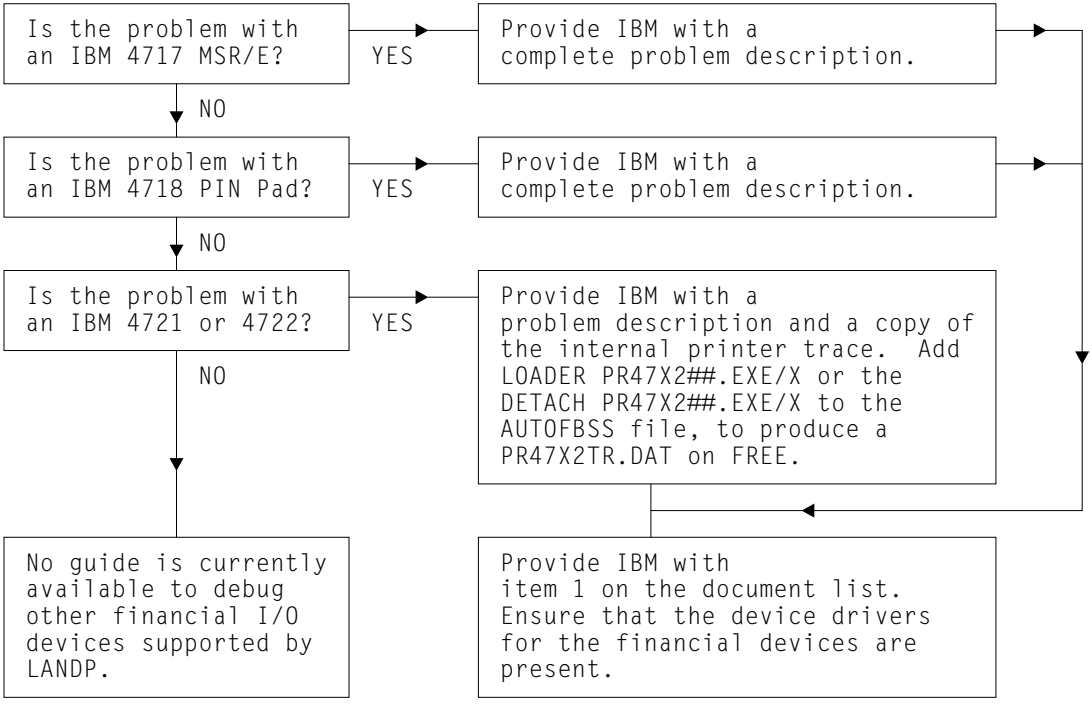
Figure 11. Run time diagnosis flowchart (Part 2 of 2)

Financial I/O device problems at run time

Ensure you have the latest version of the financial I/O device drivers, and the appropriate LANDP servers. If LANDP is reporting a hardware error, check all the hardware including personal computer systems, financial I/O devices, and cabling.

The most common errors are listed below:

- Invalid entries in the CONFIG.SYS file
- Incorrect format definitions
- Incorrect page definitions for documents, journals, and cutforms
- Incorrect customization of device drivers
- Incorrect switch settings
- Interaction with other non-standard device drivers



The document list starts on page 54

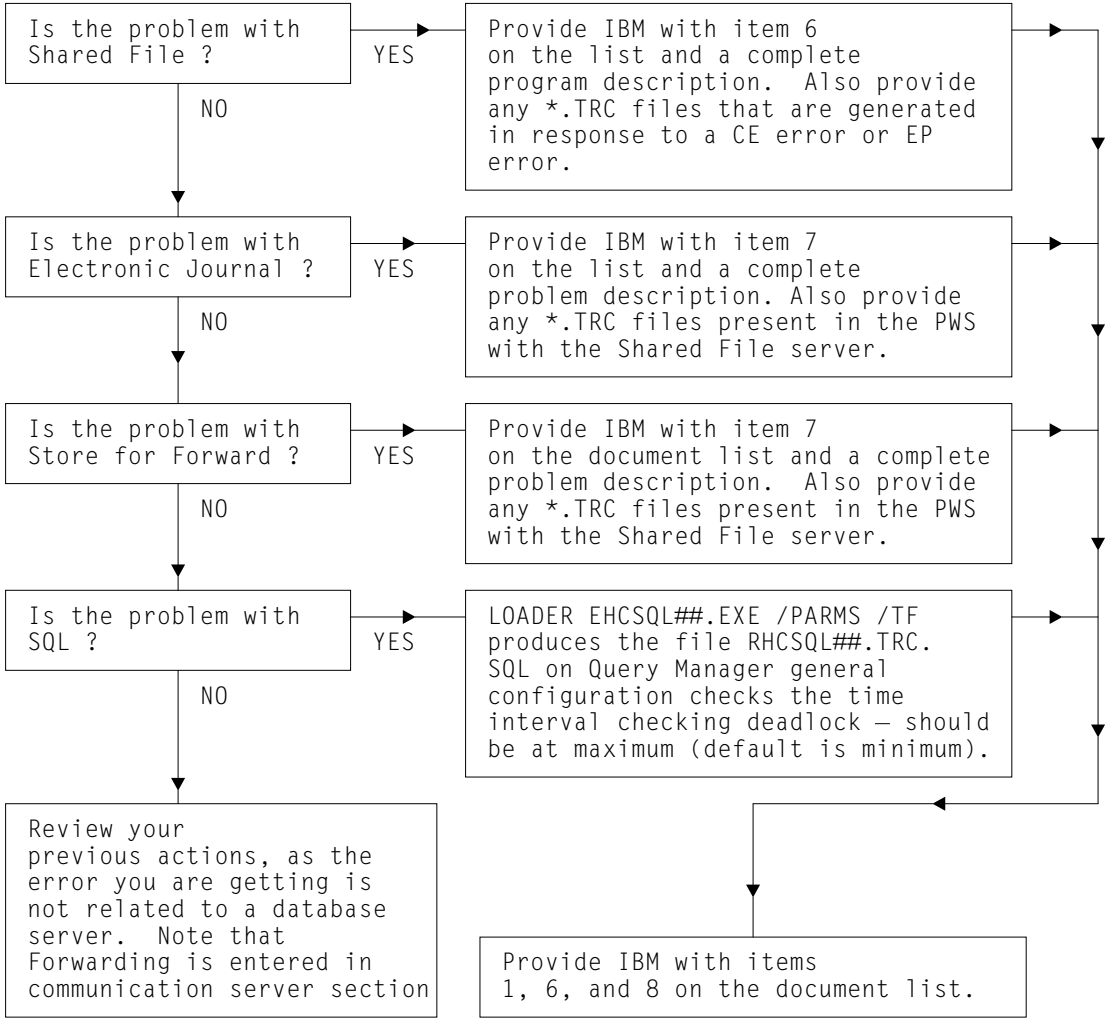
Figure 12. Financial I/O device diagnosis flowchart at run time

Database server problems at run time

Ensure you have the appropriate LANDP servers. The most common errors:

- Not enough file handles.
- Not enough Shared File sessions.

Note: The *.TRC files are created in response to critical (CE) errors or primary I/O (EP) errors. The name of the files have the format DDHHMMSS.TRC, where DD is the day, HH is the hours, MM is the minutes, and SS is the seconds.



The document list starts on page 54

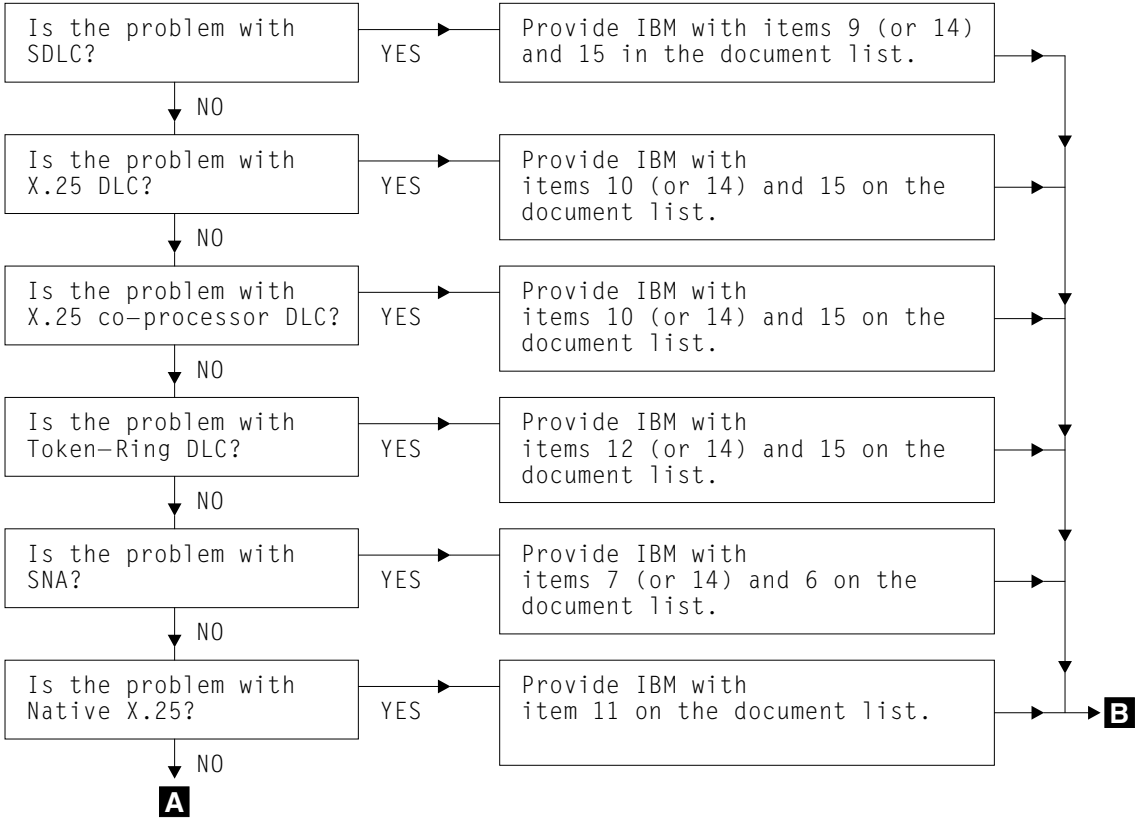
Figure 13. Database server diagnosis flowchart at run time

Communication server problems at run time

Ensure you have the latest version of the DLC device drivers, and the appropriate LANDP servers. If LANDP is reporting a hardware error, check all the hardware including personal computer systems, personal computer system cards, and cabling. The most common errors are listed below:

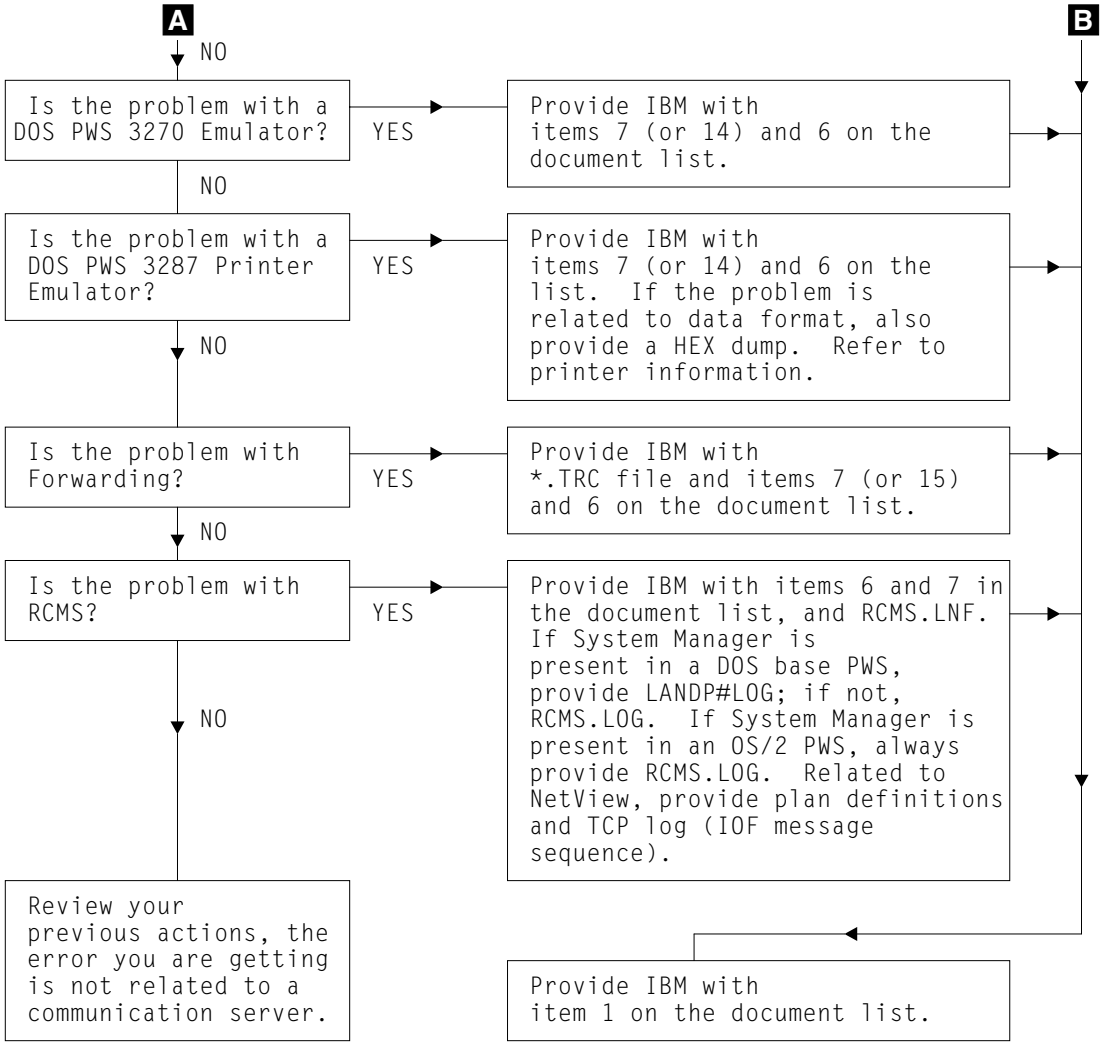
- Non-valid entries in the CONFIG.SYS file
- Not enough SNA buffers
- Incorrect customization entries for LOCADDR

Note: When working with LANDP/2, the DLCs are supported by OS/2 EE Communications Manager.



The document list starts on page 54

Figure 14. Communication server diagnosis flowchart at run time (Part 1 of 2)



The document list starts on page 54

Figure 14. Communication server diagnosis flowchart at run time (Part 2 of 2)

Part 2. Return Codes, Messages, and Alerts

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Chapter 5. Loading return codes

This chapter lists the return codes provided by the LOADER and LOADERE programs while you load LANDP family components, programs, or servers. The return codes are displayed as hexadecimal values, with decimal values in parentheses, like this: **X'40' (64)**.

The LOADER and LOADERE programs display loading return codes in one of the following formats:

DOS RC = *xx*, where the value *xx* is the return code. For more information, refer to the *DOS Technical Reference* book.

OS/2 RC(*OS/2*)=xx where the value xx is the OS/2 error code or RC = *xx*, where the value *xx* is the LANDP error code.

Windows or Linux

In a message, such as:

```
EHC0586: Missing parameter or syntax error (RC = 0x50)
```

where RC = 0x50 is a LANDP return code.

Notes:

1. During the loading process, an interrupt conflict between LAN and X.25 adapters can cause system problems. For information about hardware compatibility, refer to the *LANDP Introduction and Planning* book.
2. User server loading return codes range from X'E0' thru X'EF' (224 thru 239).
3. Refer to for the solution to a possible problem when loading EHCWINNT.DLL in LANDP for Windows.
4. LANDP for OS/2, LANDP for Windows, or LANDP for Linux:
   Some programs also send error information to the LANDP trace tools. Refer to “LANDP Internet Protocol (EHCLIP)” on page 155 for a list of codes.
   If the EHCTRACW trace server is loaded before these programs, the log file, the trace file, or both, might have more details about loading errors.
5. In the following tables, all file names are shown in uppercase, but on Linux platforms the file names used are all in lowercase.

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Loading return codes

Table 5 on page 83 lists all the return codes provided by the LOADER and LOADERE programs.

Table 5. Loading return codes

X'01' (1)	DOS	VARDAT	The configuration file of DCADLC (DCA.CFG) does not exist.	Add the file if it is missing or remove the entry from the VARDAT.CFG file.
		VARPARM	A syntax error was detected in the VARPARM.SPC file.	Correct the LAN.CFG record. Note that the identifier of the error location is also displayed.
	DOS, OS/2, Windows, and Linux	NEWCFG	Both files *xxxxxxxx*.PCN and *xxxxxxxx*.PCB exist.	Delete either the *xxxxxxxx*.PCN file or the *xxxxxxxx*.PCB. file.
	Windows MVDM Relay	EHCVDSPV	EHCVDVXD.DLL not found or damaged.	Ensure that the current directory contains the LANDP run and that this workstation is customized to run the MVDM.
X'02' (2)	DOS	VARDAT	The configuration file of SDLC (SDLC.CFG) does not exist.	Add the file if it is missing or remove the entry from the VARDAT.CFG file.
		VARPARM	An FBSSPATH.DAT file error was detected.	Make sure the file and path exist.
	DOS, OS/2, Windows, and Linux	NEWCFG	Both files *xxxxxxxx*.DBN and *xxxxxxxx*.DBD exist.	Delete either the *xxxxxxxx*.DBN file or the *xxxxxxxx*.DBD file.
	Windows NT MVDM Relay	EHCVDSPV	Internal error.	Contact an IBM support representative.
X'03' (3)	DOS	VARDAT	The configuration file of token-ring DLC (TOK.CFG) does not exist.	Add the file if it is missing or remove the entry from the VARDAT.CFG file.
		VARPARM	An FBSS#GDT error was detected.	Make sure the file and path exist.
	DOS, OS/2, Windows, and Linux	NEWCFG	Both files EJOU.PRN and EJOU.PRO exist.	Delete either the EJOU.PRN file or the EJOU.PRO file.
	Windows NT MVDM Relay	EHCVDSPV	Internal error.	Contact an IBM support representative.

Table 5. Loading return codes (continued)

X'04' (4)	DOS	VARDAT	The configuration file of X25DLC (X25.CF1) does not exist.	Add the file if it is missing or remove the entry from the VARDAT.CFG file.
		VARPARM	A LAN.CFG or GWY.CFG error was detected.	Make sure the LAN.CFG file exists, and if the workstation is a gateway, also make sure the GWY.CFG file exists.
	DOS, OS/2, Windows, and Linux	NEWCFG	Both files STOR.PRN and STOR.PRO exist.	Delete either the STOR.PRN file or the STOR.PRO file.
	Windows NT MVDM Relay	EHCVDSPV	Not enough memory.	Check the available memory.
X'05' (5)	DOS	VARDAT	The configuration file of X.25 circuits (VCM.CFG) does not exist.	Add the file if it is missing or remove the entry from the VARDAT.CFG file.
		VARPARM	A DEVSP47.TAB error was detected.	Make sure the file and path exist.
	DOS, OS/2, Windows, and Linux	NEWCFG	Both files FORW.PRN and FORW.PRO exist.	Delete either the FORW.PRN file or the FORW.PRO file.
X'06' (6)	DOS	VARDAT	The auxiliary file VCM.WRK cannot be opened or has a hardware error.	Try the operation again. If the problem persists, check the hardware.
		VARPARM	VARPARM.SPC contains a 'suffix' keyword for a workgroup that you had customized as not having a 'suffix'.	Remove the 'suffix' keyword from the VARPARM.SPC file.
X'08' (8)	DOS	General loading	There is not enough storage to load this server. More storage is required to load the server on this personal computer system.	Free or add storage. Refer to the *LANDP Introduction and Planning* book for information about storage requirements.
X'0A' (10)	Windows NT MVDM Relay	EHCVDSPV	Command line is not valid.	Correct the command parameters and reissue the command.
X'0B' (11)	Windows NT MVDM Relay	EHCVDSPV	EHCVDSPV could not be unloaded. Either it is not loaded or it is not safe to unload it at this time,	None.
X'14' (20)	Windows NT MVDM Relay	EHCVDSPV	EHCVDMGR server is not running.	Ensure that the MVDM Relay is customized for this workstation and that EHCVDMGR is loaded.
X'15' (21)	Windows NT MVDM Relay	EHCVDSPV	Internal error.	Contact an IBM support representative.

Table 5. Loading return codes (continued)

X'16' (22)	Windows NT MVDM Relay	EHCVDSPV	Internal error.	Contact an IBM support representative.
X'17' (23)	Windows NT MVDM Relay	EHCVDSPV	Internal error.	Contact an IBM support representative.
X'18' (24)	Windows NT MVDM Relay	EHCVDSPV	Internal error.	Contact an IBM support representative.
X'19' (25)	Windows NT MVDM Relay	EHCVDSPV	Too many VDM sessions.	Close any VDM session that is not in use, and try again.
X'1A' (26)	Windows NT MVDM Relay	EHCVDSPV	Internal error.	Contact an IBM support representative.
X'1B' (27)	Windows NT MVDM Relay	EHCVDSPV	Internal error.	Contact an IBM support representative.
X'1C' (28)	Windows NT MVDM Relay	EHCVDSPV	Internal error.	Contact an IBM support representative.
X'1D' (29)	Windows NT MVDM Relay	EHCVDSPV	Internal error.	Contact an IBM support representative.
X'1E' (30)	Windows NT MVDM Relay	EHCVDSPV	Internal error.	Contact an IBM support representative.
X'1F' (31)	Windows NT MVDM Relay	EHCVDSPV	Internal error.	Contact an IBM support representative.
X'21' (33)	DOS	VARDAT	There is an unexpected record length in the VARDAT.CFG file.	Correct the entry in the VARDAT.CFG file.
X'22' (34)	DOS	VARDAT	The number of buffers in the DCADLC record is not correct. The number of buffers must be in decimal format and in the range 10 thru 100.	Correct the entry in the VARDAT.CFG file.
X'23' (35)	DOS	VARDAT	There are several DCADLC records in the VARDAT.CFG file. The VARDAT.CFG file can contain only one DCADLC record.	Remove the extra entries in the file.
X'24' (36)	DOS	VARDAT	The number of buffers in the SDLC record is not correct. The number of buffers must be in decimal format and in the range 8 thru 80.	Correct the entry in the VARDAT.CFG file.

Table 5. Loading return codes (continued)

X'25' (37)	DOS	VARDAT	The physical unit (PU) address in the SDLC record is not in hexadecimal format.	Correct the entry in the VARDAT.CFG file.
X'26' (38)	DOS	VARDAT	The identification number in the SDLC record is not in hexadecimal format.	Correct the entry in the VARDAT.CFG file.
X'27' (39)	DOS	VARDAT	There are several SDLC records in the VARDAT.CFG file. The VARDAT.CFG file can contain only one SDLC record.	Remove the extra entries in the file.
X'28' (40)	DOS	VARDAT	The number of buffers in the TRDLC record is not correct. The number of buffers must be in decimal format and in the range 16 thru 216.	Correct the entry in the VARDAT.CFG file.
X'29' (41)	DOS	VARDAT	The workstation local administration address in the TRDLC record is not in decimal format.	Correct the entry in the VARDAT.CFG file.
X'30' (48)	DOS	VARDAT	The host local administration address in the TRDLC record is not in decimal format.	Correct the entry in the VARDAT.CFG file.
X'31' (49)	DOS	VARDAT	The identification number in the TRDLC record is not in hexadecimal format.	Correct the entry in the VARDAT.CFG file.
X'32' (50)	DOS	VARDAT	The host and workstation local administration address fields are identical in the TRDLC record.	Change the address in one of the fields in the VARDAT.CFG file.
X'33' (51)	DOS	VARDAT	The host or workstation local administration address fields have the first byte set to greater than 7 in the TRDLC record. The first byte must be less than 8.	Correct the entry in the VARDAT.CFG file.
X'34' (52)	DOS	VARDAT	The host or workstation local administration address fields are in conflict with the existing fields in the configuration file.	Correct the entry in the VARDAT.CFG file.
X'35' (53)	DOS	VARDAT	There are several TRDLC records in the VARDAT.CFG file. VARDAT.CFG can contain only one TRDLC record.	Correct the entry in the VARDAT.CFG file.

Table 5. Loading return codes (continued)

X'36' (54)	DOS	VARDAT	The number of buffers in the X25DLCNA record is not correct. The number of buffers must be in decimal format and in the range 20 thru 2000.	Correct the entry in the VARDAT.CFG file.
X'37' (55)	DOS	VARDAT	The length for the X.25 network user address in the X25DLCNA record is not correct. The length must be in the range 5 thru 15.	Correct the entry in the VARDAT.CFG file.
X'38' (56)	DOS	VARDAT	The X.25 network user address in the X25DLCNA record is not in decimal format.	Correct the entry in the VARDAT.CFG file.
X'39' (57)	DOS	VARDAT	There are several X25DLCNA records in the VARDAT.CFG file. VARDAT.CFG can contain only one X25DLCNA record.	Remove the extra entries in the file.
X'40' (64)	DOS	General loading	The started DOS version does not correspond to the expected version.	Install DOS at the correct level and restart the system.
		VARDAT	The connection type in the X25DLCSA record is not B, I, O, or P.	Correct the entry in the VARDAT.CFG file.
	OS/2, Windows, and Linux	General loading	On OS/2, SPV.EXE and EHCOS2.DLL do not match. On Windows NT, SPV.EXE does not match EHCWINNT.DLL.	Try the following: • On OS/2, Windows, or Linux: Run the VERSION.EXE program, and check the VL values. Refer to “VERSION utility” on page 59 for information about the program. • On OS/2: Check the LIBPATH statement to see which EHCOS2.DLL file is being accessed.
X'41' (65)	DOS	General loading	The number of permitted servers (31) has been exceeded.	Rerun configuration and redistribute the servers on the network.
		VARDAT	The number of permanent circuits in the X25DLCSA record is not correct.	Correct the entry in the VARDAT.CFG file.
	OS/2, Windows, and Linux	General loading	The number of permitted servers (100) has been exceeded.	Rerun configuration and redistribute the servers on the network.

Table 5. Loading return codes (continued)

X'42' (66)	DOS	General loading	A server with this name is already loaded.	Check the AUTOFBSS.BAT file.
		VARDAT	The number of permanent circuits in the X25DLCSA record is not present.	Correct the entry in the VARDAT.CFG file.
	OS/2, Windows, and Linux	General loading	A server with this name is already loaded or another loader session is running simultaneously.	Check the AUTOFBSS.CMD file.
X'43' (67)	DOS	General loading	Interrupt 64 is missing in the loader phase of the server.	Review the code of the named server and replace the updated module.
		VARDAT	The filler in the X25DLCSA record does not contain blanks.	Correct the entry in the VARDAT.CFG file.
	OS/2	General loading	Reserved.	None.
	Windows	General loading	User not authorized.	Log on as an administrator and try again.
	Linux	General loading	User not authorized to create session.	Log on as user with the necessary permission and try again.
X'44' (68)	DOS	General loading	There is not enough storage to load this server. More storage is required to load the server on this personal computer system.	Free or add storage. Refer to the *LANDP Introduction and Planning* book for information about storage requirements.
		VARDAT	An old subscriber address length in the X25DLCSA record is not correct. The length must be in decimal format and have a value in the range 0 thru 15.	Correct the entry in the VARDAT.CFG file.
	OS/2, Windows, and Linux	General loading	There is not enough memory.	Check the available memory.
	Linux	General loading	Could not create message pipe between loader and server.	Check that a pipe (loader.pipe) exists in the current working directory. If so, rename it and try again.

Table 5. Loading return codes (continued)

X'45' (69)	DOS	General loading	A loader parameter has been specified that is not valid.	Check the AUTOFBSS.BAT file.
		VARDAT	An old subscriber address in the X25DLCSA record is not in decimal format.	Correct the entry in the VARDAT.CFG file.
	OS/2, Windows, and Linux	General loading	SPV is not loaded.	SPV must be loaded before loading any server or application.
X'46' (70)	DOS	General loading	The following might be true: • After the supervisor is loaded, other servers cannot be loaded. • You are trying to load EHCWGMDI when Microsoft Windows 3.1 software or part of LANDP for DOS is already loaded, or EHCWVDMI is in the same VM as the LANDP kernel. • You are trying to load EHCWVDMI when EHCWGMDI, Microsoft Windows 3.1, or EHCVMSD.386 is not installed. • You are trying to load the supervisor when EHCWGMDI is loaded, but EHCVMSD.386 is not installed.	Check the loading sequence. Install the modules correctly by following the steps specified in the *LANDP Installation and Customization* book.
		VARDAT	A new subscriber address length in the X25DLCSA record is not correct. The length must be in decimal format and have a value in the range 0 thru 15.	Correct the entry in the VARDAT.CFG file.
	OS/2, Windows, and Linux	General loading	SPV is already loaded and running.	Unload SPV with EHCFREE.
X'47' (71)	DOS	General loading	The expanded memory manager (EMM) is not installed or the EMM version is not 4.0.	Install the EMM device driver.
		VARDAT	A new subscriber address in the X25DLCSA record is not in decimal format.	Correct the entry in the VARDAT.CFG file.
	OS/2, Windows, and Linux	General loading	The operating system returned an error to a system call.	Check the error log for information about the system error.

Table 5. Loading return codes (continued)

X'48' (72)	DOS	General loading	The EMM detected a malfunction in the memory manager software. This condition does not occur when the EMM is operating correctly.	Check the software.
		VARDAT	An identification number in the X25DLCSA record is not in hexadecimal format.	Correct the entry in the VARDAT.CFG file.
	OS/2, Windows, and Linux	General loading	A timeout occurred during server loading.	Try the following: Check the error log file for a possible server loading error. Check the **T** parameter value in the server loading statement. Check the LAN timeout value.
X'49' (73)	DOS	General loading	The EMM detected a malfunction in the memory manager hardware.	Run diagnostic tests on the expanded memory manager to determine the source of the problem.
		VARDAT	An old subscriber address in the X25DLCSA record is repeated for the same connection type.	Correct the entry in the VARDAT.CFG file.
	OS/2	General loading	Reserved for future use.	None.
	Windows	General loading	A server was registered as a service in a different directory.	Either change the directory or remove the registration (by using the /R: option in the loader statement) and try again.
X'4A' (74)	DOS	General loading	There is not enough expanded memory available.	Install the EMM device driver without any parameters and verify the available pages and frames. If it is not possible to increase the number of pages or frames, this server must be loaded in conventional memory.
		Shared DOS directory	The file SHRDIR.PRO is not correct.	Erase the file and run SHRSHARE again.
X'4B' (75)	DOS	General loading	This server is not allowed in expanded memory.	Load the server using the LOADER program instead of the LOADERE program.

Table 5. Loading return codes (continued)

X'4C' (76)	DOS	General loading	An attempt was made to load a server without using LOADER or LOADERE, as appropriate.	Put the correct statement in the AUTOFBSS.BAT file.
X'4D' (77)	DOS	General loading	The FREE program cannot be executed because the LANDP programs are not loaded correctly or the system authorization level required for loading the program is missing.	Sign on with the appropriate system authorization level and rerun the FREE program. If the problem persists, the LANDP programs cannot be unloaded using the FREE program.
X'4E' (78)X'4E' (78)	DOS	General loading	The following might be true: • After the supervisor is loaded, other servers cannot be loaded. • You are trying to load EHCWGMDI when Microsoft Windows 3.1 software or part of LANDP for DOS is already loaded, or EHCWVDMI is in the same VM as the LANDP kernel. • You are trying to load EHCWVDMI when EHCWGMDI, Microsoft Windows 3.1, or EHCVMSD.386 is not installed. • You are trying to load the supervisor when EHCWGMDI is loaded, but EHCVMSD.386 is not installed.	Check the loading sequence. Install the modules correctly by following the steps specified in the *LANDP Installation and Customization* book.
	Linux	General loading	The Linux mapping layer has failed to initialize.	
X'4F' (79)	DOS	General loading	The command line in the DDT.EXE, FREE.EXE, EHCWGMDI.EXE, EHCWVDMI.EXE, EHCCONN.EXE, or EHCREL.EXE module is not valid.	Correct the command line syntax.
	OS/2	MVDM relay	EHCVDMVD.SYS is not correctly installed, or it is missing.	Check the `DEVICE=PATH\EHCVDMVD.SYS` statement in the CONFIG.SYS file.

Table 5. Loading return codes (continued)

X'50' (80)	DOS	VARDAT	The record identifier in the VARDAT.CFG file is not correct.	Correct the entry in the VARDAT.CFG file.
	OS/2, Windows, and Linux	General loading, and MVDM Relay	The command line is not valid.	Check the AUTOFBSS.CMD file.
	DOS, OS/2, Windows, and Linux	EHCLIP, EHCTCP, PPC, LAN, loader, and supervisor	Load parameters are not valid. Values are out of range.	Check the load command line parameters in the AUTOFBSS.BAT or AUTOFBSS.CMD files.
	OS/2, Windows, and Linux	EHCFREE	No server specified.	Specify a server as a parameter (SPV to free all servers).
X'51' (81)	DOS	VARDAT	Once updated, there are several X.25 circuits with the same connection type and subscriber address.	Correct the entry in the VARDAT.CFG file.
	DOS, OS/2, Windows, and Linux	EHCLIP, LAN, and supervisor	A local workstation identifier is not valid. The valid characters are the uppercase letters of the alphabet and the numbers 0 thru 9. Blank is valid only as the second position in the workstation identifier.	Check the workstation identifier in all AUTOFBSS.BAT or AUTOFBSS.CMD load command lines where it is specified.
X'52' (82)	DOS	VARDAT	Once updated, there are several X.25 circuits with the same identification number and subscriber address.	Correct the entry in the VARDAT.CFG file.
	DOS, OS/2, Windows, and Linux	EHCLIP, LAN, and supervisor	The following might be true: • The workstation identifier is unknown: the identifier was not found in the LAN.CFG file. • EHCLIP: The INET address of a remote workstation was not resolved.	Try the following: • Check the workstation identifiers in AUTOFBSS.BAT or AUTOFBSS.CMD and the LAN.CFG files. • EHCLIP: Check the remote workstation identifier definitions to TCP/IP (**hosts** file and network **names** server, if used), and whether they are accessible.

Table 5. Loading return codes (continued)

X'53' (83)	DOS	VARDAT	The X.25 circuit is not found in the present configuration.	Correct the entry in the VARDAT.CFG file.
	DOS and OS/2	AS/400 router	An error occurred while reading the AS/400 router configuration record from the disk. The AS/400® router cannot process information in the GWY.CFG file.	Replace the GWY.CFG file.
	DOS, OS/2, Windows, and Linux	EHCLIP, LAN, and supervisor	An error occurred while reading the LAN.CFG file.	Check the hard disk or diskette where LAN.CFG is stored.
X'54' (84)	DOS	VARDAT	An error occurred in the attempt to pack or unpack bytes.	Change the record shown to hexadecimal format.
	DOS and OS/2	AS/400 router	The AS/400 router configuration record does not exist.	Put GWY.CFG in the same directory as the EHCR400.EXE file.
	DOS, OS/2, Windows, and Linux	EHCLIP, LAN, and supervisor	The LAN.CFG file was not found.	Put the LAN.CFG file in the same directory as the SPV.EXE and LAN.EXE or EHCLIP.EXE files.
X'55' (85)	DOS	VARDAT	The value in the **Included-in-Packet-Call** field in the X25DLCNA record is not correct. The only valid values are 0, 1, and 2.	Correct the entry in the VARDAT.CFG file.
	DOS and OS/2	AS/400 router	The AS/400 router configuration record is not correct.	Replace the GWY.CFG file.
	DOS, OS/2, Windows, and Linux	EHCLIP, LAN, and supervisor	The LAN.CFG or RESALIAS.CFG files have a format that is not valid.	Replace the LAN.CFG or RESALIAS.CFG files with the correct version.
X'56' (86)	DOS, OS/2, Windows, and Linux	EHCLIP, LAN, and supervisor	There is a duplicated workstation identifier in the network.	Reload LANDP with the correct workstation identifiers.
X'57' (87)	DOS, OS/2, Windows, and Linux	EHCLIP, LAN, and supervisor	An error occurred while reading the SPV.CFG file.	Check the hard disk or diskette where SPV.CFG is stored.
	OS/2, Windows, and Linux	MVDM relay	The LSI loader program received a 'function not supported' return code. One of the DOS box settings is incompatible with your configuration.	Check the DOS box settings.

Table 5. Loading return codes (continued)

X'58' (88)	DOS, OS/2, Windows, and Linux	EHCLIP, LAN, and supervisor	The SPV.CFG file was not found.	Put the SPV.CFG file in the same directory as the SPV.EXE file.
X'59' (89)	DOS, OS/2, Windows, and Linux	EHCLIP, LAN, and supervisor	The SPV.CFG file has a format that is not valid. Or, in the DOS environment only, the EHCUSER.CFG file has a format that is not valid.	Replace the SPV.CFG or EHCUSER.CFG file with the correct version.
X'5A' (90)	OS/2, Windows, and Linux	Trace server	A trace file error has occurred.	Check the disk.
X'5B' (91)	OS/2, Windows, and Linux	Trace server	A log file error has occurred.	Check the disk.
X'5C' (92)	OS/2, Windows, and Linux	Trace server	A parameter in the loading statement is not valid.	Correct the syntax of the loading statement.
X'5D' (93)	OS/2, Windows, and Linux	Trace server	A general internal error has occurred.	Check the operating system error in the log file.
	DOS, OS/2, Windows, and Linux	EHCLIP, LAN, and supervisor	The workstation identifier of the SPV load command does not match the workstation identifier of the LAN or EHCLIP load command line (LANDP for DOS only).	Check the workstation identifiers of the AUTOFBSS.BAT load command.
X'5E' (94)	DOS, OS/2, Windows, and Linux	EHCLIP, LAN, and supervisor	Either the IP address used for a remote workstation is not valid, or communication hardware or software is not available.	• For TCP/IP, check the IP address definitions, and the status of TCP/IP and the communication adapters. • For NetBIOS, check that the adapter is installed and that the LAN support program is installed and configured correctly. • For DOS, check that enough adapter work space has been defined for the number of sessions required.

Table 5. Loading return codes (continued)

X'5F' (95)	DOS, OS/2, Windows, and Linux	EHCLIP, LAN, and supervisor	There are insufficient resources. Either the adapter names capacity has been exceeded, or the LAN adapter installed or the LAN support program parameters do not allow the number of NetBIOS resources (sessions, commands, and names) needed to start the LANDP programs.	Try the following: • Increase the LAN support program parameters or unload other applications using NetBIOS. • On OS/2 workstations, check the NetBIOS resources assigned through the PROTOCOL.INI file. If OS/2 LAN server or LAN requester is installed, consider the resources assigned through the IBMLAN.INI file.
X'60' (96)	DOS	Communication servers	The SNA SDLC configuration record SDLC.CFG does not exist.	Put SDLC.CFG in the directory with the SDLC.COM file.
	OS/2, Windows, and Linux	Communication servers	Reserved.	None.
X'61' (97)	DOS	Communication servers	The SNA SDLC configuration record SDLC.CFG is not correct.	Replace the SDLC.CFG configuration record.
	OS/2, Windows, and Linux	Communication servers	Reserved.	None.
X'62' (98)	DOS	Communication servers	The record SNA.CFG or PIPE.CFG does not exist.	Put the record SNA.CFG in the directory with SNA##.EXE, or put the record PIPE.CFG in the directory with the X25NAT##.EXE file.
	OS/2, Windows, and Linux	Communication servers	An error occurred while opening the SNA.BID or PIPE.CFG configuration files. The files might be missing or damaged.	Put the configuration file SNA.BID or PIPE.CFG into the current directory or use DPATH. If you still get this return code, customize again and reload LANDP.
X'63' (99)	DOS	Communication servers	An error occurred while reading the SNA SDLC configuration record from disk. The SNA SDLC server cannot process the information in the SDLC.CFG file.	Replace the SDLC.CFG file.
	OS/2, Windows, and Linux	Communication servers	Reserved.	None.

Table 5. Loading return codes (continued)

X'64' (100)	DOS	Communication servers	The records SNA.CFG, PIPE.CFG, or SDLC.CFG are not correct.	Replace the SNA.CFG, PIPE.CFG, or SDLC.CFG files.
	OS/2, Windows, and Linux	Communication servers	The configuration file PIPE.CFG is not correct.	Replace the PIPE.CFG file.
X'65' (101)	DOS	Communication servers	One of the following might be true: • An error was detected while reading the SNA.CFG, PIPE.CFG, or SDLC.CFG record. • The configuration file SNAPOOL.CFG exists, but has an incorrect internal format. • The configuration file EHCTCP.INI is missing or has an incorrect format.	Try one of the following: • Replace the SNA.CFG, PIPE.CFG, or SDLC.CFG files. • Correct the internal format of the SNAPOOL.CFG file. • Ensure that the EHCTCP.INI file is present and has the correct format.
	OS/2, Windows, and Linux	Communication servers	One of the following might be true: • An error occurred while reading the configuration files SNA.BID or PIPE.CFG. The files could be missing or damaged. • The format of the configuration file SNAX25D.CFG is not correct. • The format of the configuration file SNAPOOL.CFG is not correct. • The configuration file EHCTCP.INI is missing or has an incorrect format.	Either customize again and reload LANDP, or correct the file format.
X'66' (102)	DOS	Communication servers	The data link control (DLC) server was not found.	Install the appropriate DLC server.
	OS/2, Windows, and Linux	Communication servers	Reserved for future use.	None.
X'67' (103)	DOS	Communication servers	Reserved.	None.
	OS/2, Windows, and Linux	Communication servers	An operating system error occurred while initializing a communication server.	

Table 5. Loading return codes (continued)

X'68' (104)	DOS	Communication servers	EHCTCP server: TCP/IP is not working in this workstation.	Ensure that TCP/IP is operational before loading LANDP.
	OS/2, Windows, and Linux	Communication servers	PPC server: A communications server error has occurred. EHCLINK and EHCTCP servers: TCP/IP is not working in this workstation.	PPC server: Make sure the communications server ASCII-EBCDIC translation table has been defined. EHCTCP server: Ensure that TCP/IP is operational before loading LANDP.
X'69' (105)	DOS	Communication servers	The X25DLC record VCM.CFG does not exist or the TRDLC configuration record TOK.CFG does not exist.	Put the record VCM.CFG into the directory with X25DLC.EXE or put TOK.CFG into the directory with the TRDLC.EXE file.
	OS/2	Communication servers	An error occurred while opening the VCM.CFG configuration file. The file could be missing or damaged.	Put the configuration file VCM.CFG into the directory with X25NAT##.EXE. If you still get this return code, customize again and reload LANDP.
X'6A' (106)	DOS	Communication servers	The X25DLC record VCM.CFG is not correct or the TRDLC configuration record TOK.CFG is not correct.	Replace the VCM.CFG or TOK.CFG files.
	OS/2, Windows, and Linux	Communication servers	The configuration file VCM.CFG is not correct.	Replace the VCM.CFG file.
X'6B' (107)	DOS	Communication servers	An error was detected while reading the X25DLC VCM.CFG or TOK.CFG record.	Replace the VCM.CFG or TOK.CFG files.
	OS/2	Communication servers	An error occurred while reading the VCM.CFG file. The file might be missing or damaged.	Replace the VCM.CFG file. If you still get this return code, customize again and reload LANDP.
X'6C' (108)	DOS	Communication servers	Either the communication adapter is not installed or the X.25 Coprocessor/2 support software is not loaded.	Either install the communications adapter or load the X.25 Coprocessor/2 support software.
X'6D' (109)	DOS	Communication servers	The SNA server is not loaded on the workstation with TRDLC.	Perform customization again to have SNA and TRDLC on the same workstation.
X'6E' (110)	DOS	Communication servers	Either the token-ring adapter is not installed, or the IBM LAN support program is not loaded.	If the adapter is not installed, install it. If the LAN support program is not loaded, perform customization again to have the modules copied onto the operational diskette.

Table 5. Loading return codes (continued)

X'6F' (111)	DOS	Communication servers	An error was detected on interrupt X'5C'. A return code that is not valid was received from the adapter.	Contact your system programmer.
X'70' (112)	DOS	Emulators, operator interface, and local resource manager	The DI3270, AE3270, EA3270, OPE.CFG, OPE.MSG, FK3270, or PRTATT.TAB file does not exist.	Add the missing files to the directory using EMU3270.EXE, EMU3287.EXE, or OPER.EXE file.
X'71' (113)	DOS	Emulators, operator interface, and local resource manager	An error was detected while reading the DI3270, AE3270, EA3270, OPE.CFG, or FK3270 file.	Replace the DI3270, AE3270, EA3270, OPE.CFG, or FK3270 file.
	OS/2	MVDM relay	EHCBOXM.EXE is already loaded.	Do not run EHCBOXM.EXE again.
X'72' (114)	DOS	Emulators, operator interface, and local resource manager	The DI3270, AE3270, EA3270, OPE.CFG, or FK3270 file is not correct.	Replace the DI3270, AE3270, EA3270, OPE.CFG, or FK3270 file.
	OS/2 and Windows	MVDM relay	The specified configuration file name is not correct or the file does not exist.	Check the command line and correct the configuration file name specified.
X'73' (115)	DOS	Emulators, operator interface, and local resource manager	The command line parameters are not valid, or the command line and OPE.CFG do not agree.	Check the parameters on the command line and correct them.
	OS/2 and Windows	MVDM relay	Formats in the configuration file are not correct.	Check the valid record formats of the configuration file, and correct them..
X'74' (116)	DOS	Emulators, operator interface, and local resource manager	The PRTATT, OPE, or EA3287 record is not correct.	Replace the PRTATT, OPE, or EA3287 file.
	OS/2 and Windows	MVDM relay	The user exit routine name or the user exit DLL name specified is not correct, or the DLL was not found.	Check the record type U, or correctly install the DLL specified in the configuration file.

Table 5. Loading return codes (continued)

X'75' (117)	DOS	Emulators, operator interface, and local resource manager	The screen size requested is not supported by the user's display adapter or the current display mode. It could be that: • The screen has more than 24 rows but the display adapter is not EGA, VGA, SuperVGA, or XGA • The screen has more than 42 rows but the display adapter is not VGA, SuperVGA, or XGA; or the display is in 43 line mode • The screen has more than 80 columns (for example, 132) but the display adapter is not SuperVGA or XGA, or the SuperVGA adapter does not provide a 132-column text mode with enough rows for the requested screen size	Specify a different screen size, install a new display adapter, or (for the second case) do not use 43 line mode.
X'76' (118)	DOS	Emulators, operator interface, and local resource manager	The workstation does not have a printer adapter installed.	Install the printer adapter and reload the LANDP programs.
X'77' (119)	DOS	Emulators, operator interface, and local resource manager	Information in the OPE record is not valid.	Customize again and reload the LANDP programs.
X'78' (120)	DOS and OS/2	AS/400 router	The workstation identifier of SPV does not match the workstation identifier of the AS/400 router.	Correct the incorrect workstation identifier and rerun the LANDP program or rerun customization.
X'79' thru X'7F' (121 thru 127)	DOS	Emulators, operator interface, and local resource manager	Reserved for future use.	None.
X'7D' (125)	DOS and OS/2	RCMS	The system is unable to read FBSSPATH.DAT or there is an error in its contents.	Make sure FBSSPATH.DAT is in the same directory as the RCMS server, or rerun the GETTING distribution procedure. Refer to the *LANDP Installation and Customization* book for information about the GETTING procedure.

Table 5. Loading return codes (continued)

X'7E' (126)	DOS and OS/2	RCMS	An RCMS load parameter error has occurred. There are either too few parameters or there are errors in the parameters.	Check the load parameters and their values in the LOADER command.
X'7F' (127)	DOS and OS/2	RCMS	An error occurred while reading system files. The files could be damaged or the path was not found.	Make sure the system and process file paths exist, and the system files (RCMS.LNF or RCME.MDG) and translation tables are in the specified path.
X'80' (128)	DOS	VARDAT	An I/O error occurred while trying to seek or read from the VARDAT.CFG file.	Re-create the file and try again.
	DOS, OS/2, Windows, and Linux.	Printer servers	The DEVPARM file was not found.	Put DEV47xx.TAB into the same directory as the printer server and reload the LANDP programs.
	DOS and OS/2		There is not enough memory to load COMMAND.COM.	Load some programs into the expanded memory to free some memory.
X'81' (129)	DOS	VARDAT	An I/O error occurred while trying to seek, write, or read from the DCA.CFG file.	Re-create the file and try again.
	DOS, OS/2, Windows, and Linux.	Printer servers	An error occurred while reading the 4710/12/20/22/48 printer server table records from disk. The 4710/12/20/22/48 printer server cannot process the information in this file.	Replace the DEV47xx.TAB file.
X'82' (130)	DOS	VARDAT	An I/O error occurred while trying to seek, write, or read from the SDL.CFG file.	Re-create the file and try again.
	DOS, OS/2, Windows, and Linux.	Printer servers	The financial output adapter is not correctly installed or it is faulty.	Correctly install the financial output adapter and check all connections. If the problem persists, replace the financial output adapter.

Table 5. Loading return codes (continued)

X'83' (131)	DOS	VARDAT	An I/O error occurred while trying to seek, write, or read from the TOK.CFG file.	Re-create the file and try again.
	DOS, OS/2, Windows, and Linux.	Printer servers	The configuration file TES.CFG or TES4748.CFG was not found.	Put TES.CFG or TES4748.CFG file into the same directory as the printer server and reload the LANDP programs.
X'84' (132)	DOS	VARDAT	An I/O error occurred while trying to seek, write, or read from the X25.CF1 file.	Re-create the file and try again.
	DOS, OS/2, and Windows	Printer servers	An error occurred while reading the configuration file.	Customize again and reload the LANDP programs.
X'85' (133)	DOS	VARDAT	An I/O error occurred while trying to seek, write, or read from the VCM.CFG file.	Re-create the file and try again.
	DOS, OS/2, Windows, and Linux.	Printer servers	Parameters are not valid.	Check the loading command line and reload the LANDP programs.
X'86' (134)	DOS, OS/2, Windows, and Linux.	Printer servers	An operating system error has occurred.	Check the operating system environment.
X'87' (135)	DOS and OS/2	Printer servers	The DOS or OS/2 operating system version is not for Korea, People's Republic of China, or Taiwan.	Check the operating system environment.
X'88' (136)	DOS and OS/2	Printer servers	Reserved for future use.	None.
X'89' (137)	DOS	VARPARM	The second level is the error subcode. If the error is a syntax error, then the third level is the name of the keyword, for example 'suffix'.	Look up the error subcode in Table 6 on page 116.
X'8A' (138)	DOS and OS/2	Printer servers	The KS to PC conversion routine (KS2PCALL.SYS or KS2PCALL.DLL) is not loaded.	Add one of the following to the CONFIG.SYS file: • Specify `DEVICE=KS2PCALL` • Include a path for KS2PCALL.DLL in the LIBPATH statement.

Table 5. Loading return codes (continued)

X'8B' (139)	DOS, OS/2, Windows, and Linux	NEWCFG	System error trying to access the DOS REN command. The second level is the number of the file where the verification error is produced. The third level is the error subcode.	Look up the error subcode in Table 7 on page 117.
X'8C' (140)	DOS, OS/2, Windows, and Linux	NEWCFG	Verification error. The same file exists with the name given in customization and the name used at run time. The second level is the number of the file where the verification error is produced. The N in the file type shows the new file. The third level is the error subcode.	Look up the error subcode in Table 7 on page 117.
X'8D' (141)	DOS	VARDAT	Input/Output error. The second level is the number of the record in VARDAT.CFG where the error occurs. The third level is the error subcode.	Look up the error subcode in Table 8 on page 118.
X'8E' (142)	DOS	VARDAT	Format error. The second level is the number of the record in VARDAT.CFG where the error occurs. The third level is the error subcode.	Look up the error subcode in Table 9 on page 119.
X'8F' (143)	DOS	VARDAT	File error. The second level is the number of the record in VARDAT.CFG where the error occurs. The third level is the error subcode.	Look up the error subcode in Table 10 on page 122.

Table 5. Loading return codes (continued)

X'90' (144)	OS/2	Query server	There is a command line parameters syntax error.	Correct the loading statement.
		Shared-file distributor server	The file SFDSRV.CFG does not exist.	Place the file SFDSRV.CFG into the same path where the AUTOFBSS.CMD file is running.
		Shared-file replicator server	The file SFRSRV.CFG does not exist.	Place the file SFRSRV.CFG into the same path where the AUTOFBSS.CMD file is running.
	DOS, OS/2, Windows, and Linux	Shared-file server	The *.DBD database configuration file does not exist.	Place the *.DBD file into the same path where the AUTOFBSS.CMD (on OS/2) or AUTOFBSS.BAT (on Windows or Linux) file is running.
X'91' (145)	OS/2	Query server	A parameter value is out of range.	Check the loading statement parameter values.
		Shared-file replicator server	The *.PCB database configuration file does not exist.	Place the *.PCB file into the same path where the AUTOFBSS.CMD file is running.
	DOS, OS/2, Windows, and Linux	Shared-file server	The *.PCB database configuration file does not exist.	Place the *.PCB file into the same path where the AUTOFBSS.CMD (on OS/2) or AUTOFBSS.BAT (on Windows or Linux) file is running.
X'92' (146)	OS/2	Query server	An error occurred while reading a services file (OS/2 error) or the file was not found.	Verify that SERVICES.CFG exists and has the required format.
X'93' (147)	OS/2	Query server	Incorrect values were found in the services file (SRV error).	Change the SERVICES.CFG file.
	DOS, OS/2, Windows, and Linux	Shared-file server	The database description (DBD) referred to in a program control block (PCB) does not exist. The previous error message shows the PCB and DBD names.	Check the shared-file definition and update it, as required.

Table 5. Loading return codes (continued)

X'94' (148)	OS/2	Query server	EHCSQLRQ.EXE could not be started.	Try the following: • Make sure enough memory is available and the requestor program EHCSQLRQ.EXE is in place. • Make sure there are enough resources in the system.
	DOS, OS/2, Windows, and Linux	Shared-file server	One of the following might be true: • A key name referred to in a PCB does not match the specified DBD. • A segmented key length was defined to have 0 or more than 255 bytes. The maximum allowed key length is 255 bytes. The sum of the lengths of the key segments cannot be greater than 255 bytes.	Try one of the following: • Check the database definition (DBD) and update it, as required. • Check the lengths of the segmented keys and make corrections, as required.
X'95' (149)	OS/2	Query server	A shared-memory allocation error has occurred.	Make sure enough memory is present and a segment called FBSQxxxx.EHC does not exist in the system.
		Shared-file distributor server	The file SFDSRV.CFG is damaged.	Place a correct SFDSRV.CFG file into the same path where the AUTOFBSS.CMD file is running.
		Shared-file replicator server	The file SFRSRV.CFG is damaged.	Place a correct SFRSRV.CFG file into the same path where the AUTOFBSS.CMD file is running.
	DOS, OS/2, Windows, and Linux	Shared-file server	A data or index file and a database description (DBD) do not match. The previous error message shows the DBD, PCB, or SEQ files.	Check and update the database definition.

Table 5. Loading return codes (continued)

X'96' (150)	OS/2	Query server	A memory allocation error has occurred.	Make sure enough memory is available in the system.
	DOS, OS/2, Windows, and Linux	Shared-file server	The log file does not exist when running OPENLOG.EXE.	Make sure the LOG.DAT file exists on the LOGPATH file path or in the root of the C drive. • If it does not exist, run GENLOG.EXE. • If it does exist, refer to the hardware problem determination information provided with the personal computer system.
X'97' (151)	OS/2	Query Server	A process initialization error has occurred.	Try the following: • Check the requestor placement and make sure it is the correct program. • Check whether the database manager (DBM) recognizes the configuration name and password.
		Shared-file distributor server	An operating system input/output (I/O) error has occurred.	For more information, refer to “Critical errors (DOS)” on page 200 and “Primary input/output errors” on page 202.
		Shared-file replicator server	An operating system input/output (I/O) error has occurred.	For more information, refer to “Critical errors (DOS)” on page 200 and “Primary input/output errors” on page 202.
	DOS, OS/2, Windows, and Linux	Shared-file server	An operating system input/output (I/O) error has occurred.	For more information, refer to “Critical errors (DOS)” on page 200 and “Primary input/output errors” on page 202.
X'98' (152)	OS/2	Query server	The database needs recovery.	Try the following: • Verify that the database does not need to run recovery procedures. • Run RESTORE2.
	DOS, OS/2, Windows, and Linux	Shared-file server	Backout (rollback) and/or forward recovery was carried out. (This is normal after a system or shared-file server failure.)	Rerun the AUTOFBSS file.

Table 5. Loading return codes (continued)

X'99' (153)	OS/2	Query server	There is a program control block (PCB) table opening error.	Check whether all the database descriptions (DBDs) defined in EHCSQLTB define existing database tables.
	DOS, OS/2, Windows, and Linux	Shared-file server	A configuration change is not allowed. The configuration file does not match information in the current log file.	Run the backup procedure and create a new LOG.DAT file.
X'9A' (154)	OS/2	Query server	A PCB table opening error or control field error has occurred. The field EHCSQLCL in a defined DBD table does not exist or has a type that is not correct.	Create or correct the field.
		Shared-file distributor server	Parameters specified in the loading statement are not valid.	Correct the syntax of the loading statement.
		Shared-file replicator server	Parameters specified in the loading statement are not valid.	Correct the syntax of the loading statement.
	DOS, OS/2, Windows, and Linux	Shared-file server	Parameters specified in the loading statement are not valid.	Correct the syntax of the loading statement.
	OS/2, Windows, and Linux	Service Availability Manager	EHCSAM could not obtain sufficient resources (for example, memory).	Check system logs for error messages relating to this failure.
X'9B' (155)	OS/2	Query server	A PCB table opening error or defined key column error has occurred. A field that is a key column for a PCB does not exist or has a type that is not correct.	Create or correct the field.
	DOS, OS/2, Windows, and Linux	Shared-file server	The record length defined in a database description (DBD) exceeds the maximum allowed length, or the record split size is too small.	Try one of the following: • Check the database definition and update it, as required. • Check the record split size that was defined during customization.
	OS/2, Windows, and Linux	Service Availability Manager	EHCSAM could not find the EHCSAM configuration profile (EHCSAM.CFG).	Check that the correct version of EHCSAM.CFG is in the current directory.

Table 5. Loading return codes (continued)

X'9C' (156)	OS/2	Object post box server	The SERVICES.CFG file was not found in the directory where the AUTOFBSS file is running or reading problems occurred because of physical errors. The SERVICES.CFG file is generated during LANDP workgroup configuration.	Put the SERVICES.CFG file into the directory where the AUTOFBSS file is running.
		Query Sever	A PCB table opening error or index find error has occurred. The EHCSQLTB table has been damaged.	Check the application programs to ensure that they do not access this table.
	OS/2, Windows, and Linux	Service Availability Manager	EHCSAM found errors in the EHCSAM configuration profile (EHCSAM.CFG).	Check that the correct version of EHCSAM.CFG is in the current directory.
X'9D' (157)	OS/2	Object post box server	The SERVICES.CFG file, generated during LANDP workgroup configuration, does not contain expected information.	Replace the SERVICES.CFG file.
		Query Server	A log file opening error has occurred. The log file could not be opened.	Check whether the access path exists and that the log file is not in use by another process.
	DOS, OS/2, Windows, and Linux	Shared-file server	The SERVICES.CFG file, generated during network configuration, does not contain expected information.	Replace the SERVICES.CFG file.
X'9E' (158)	OS/2	Query server	A log format type error has occurred. The existing log file does not have an adequate format.	Generate a correct EHCSQLOG.DAT file with the GENLOG2 utility or delete the existing log file.
	DOS, OS/2, Windows, and Linux	Shared-file server	An index is defined for DBCS support, but the system is not in DBCS mode.	
X'9F' (159)	OS/2	Query server	A TYPELOG2 utility error occurred while reading a log file record.	Contact an IBM support representative.

Table 5. Loading return codes (continued)

X'A0' (160)	DOS and OS/2	Electronic journal server	The server profile EJOU.PRO is missing.	Place the EJOU.PRO file on the path of the electronic journal server, or check and update the electronic journal definitions.
		Forwarding server	There is a loader command line error.	Either the **/O:** command line parameter is missing (this does not apply to DBCS mode), or the **/T:**, **/K:**, or **/H:** command line parameter specifies a value that is not valid.
		Searcher server	The server profile is missing. The files EJOU.PRO, STOR.PRO, or both must be present.	Try one or more of the following: • Place the EJOU.PRO file on the path of the electronic journal server. • Check and update the electronic journal definitions. • Place the STOR.PRO file on the path of the store-for-forwarding server. • Check and update the store-for-forwarding definitions.
		Store-for-forwarding server	The server profile STOR.PRO is missing.	Place the STOR.PRO file on the path of the store-for-forwarding server, or check and update the store-for-forwarding definitions.

Table 5. Loading return codes (continued)

X'A1' (161)	DOS and OS/2	Electronic journal server	There is a loader command line error.	The **/K:** command line parameter specifies a value that is not valid.
		Forwarding server	The server profile is missing. The FORW.PRO file or the ASCII-to-EBCDIC translation table was not found.	Place the FORW.PRO file on the path of the forwarding server or do one of the following: • In SBCS mode, place the ASCII-to-EBCDIC table specified by the **/O:** command line parameter on the path of the forwarding server. • In DBCS mode, place the TRNSCALL.DLL file in the OS/2 LIBPATH.
		Searcher server	There is a LOADER command line error.	The **/K:** command line parameter specifies a value that is not valid.
		Store-for-forwarding server	There is a LOADER command line error.	The **/K:** command line parameter specifies a value that is not valid.
X'A2' (162)	DOS and OS/2	Electronic journal server	The buffer size is smaller than the shared-file server record length.	Increase the **/K:** command line parameter value, or reduce the split criteria in the electronic journal server profile.
		Searcher server	The buffer size is smaller than the shared-file server record length.	Increase the **/K:** command line parameter value, or reduce the split criteria in the electronic journal server profile.
		Store-for-forwarding server	The buffer size is smaller than the shared-file server record length.	Increase the **/K:** command line parameter value, or reduce the split criteria in the electronic journal server profile.

Table 5. Loading return codes (continued)

X'A6' (166)	OS/2	Query server	This is the wrong log file. The log file does not correspond to the accessed database.	Change the configuration of the log file.
		Shared-file distributor server	Resources required by the system are not available.	Reduce the system load and try again.
		Shared-file replicator server	Resources required by the system are not available.	Reduce the system load and try again.
	DOS, OS/2, Windows, and Linux	Shared-file server	The shared-file server does not have enough free storage to permit allocation of required additional buffers.	Reduce the number of additional buffers and try again.
X'A7' (167)	OS/2	Query server	A BACKUP2 or RESTORE2 error occurred while calling a database utility program.	Check the system software installation.
	OS/2, Windows, and Linux	Shared-file server	A shared-file server has a damaged FREECHAIN.	Start the shared-file server with the /R: parameter.
X'A8' (168)	OS/2	Query server	EHC unexpected response to a utility program: a utility program detected an unexpected return code from an EHCSQL## server.	Check the LANDP installation or contact the LANDP development team.
	DOS, OS/2, Windows, and Linux	Shared-file server	A log file was found that was either generated with an old SHFILE## server version or is not correct.	Run GENLOG.EXE.
	DOS	Shared-file server	The log file `log.dat` has been previously used on OS/2 or Windows NT by the shared file server with XLR (external logging replicator).	Ensure that the log is synchronised with the database. Then run the GENLOG command.
X'A9' (169)	OS/2	Query server	A user interrupted the RESTORE2 process. The database restoration did not finish because of user intervention.	Try again.
	DOS, OS/2, Windows, and Linux	Shared-file server	The *.SEQ collate table file does not exist.	Place the *.SEQ file into the directory where the AUTOFBSS file is running.

Table 5. Loading return codes (continued)

X'AA' (170)	OS/2	Forwarding server	The sign-on file was not found or it is not valid.	Place the sign-on file on the path of the forwarding server or check its format. Refer to the *LANDP Servers and System Management* book for information about the file format.
	DOS, OS/2, Windows, and Linux	Shared-file server	A duplicate key was found while re-indexing.	Contact the system operator.
X'AB' (171)	OS/2	Query server	The database does not exist.	Create a database using the query manager.
X'AC' (172)	OS/2	Query server	A program control block (PCB) table opening error has occurred. An EHCSQLTB read error was detected.	Try the following: • Verify that the EHCSQLTB table has the correct format and status of DBMs. • Log on the SQL services for the database. • Verify that the database exists.
	DOS	Shared-file server	An attempt was made to load a server without using the LOADER or LOADERE program, as appropriate (DOS environment only).	Put the correct statement in the AUTOFBSS file.
X'AD' (173)	DOS, OS/2, Windows, and Linux	Shared-file server	The secondary log file LOG2.DAT was not found.	Make the secondary log file available or specify log management with a unique log file.
X'AE' (174)	DOS, OS/2, Windows, and Linux	Shared-file server	The log file LOG.DAT is not at the same level as LOG2.DAT.	Try one of the following: • Copy the LOG2.DAT file to LOG.DAT. • Rename the LOG2.DAT file to LOG.DAT, then restart the shared-file server without dual log management.
X'AF' (175)	DOS, OS/2, Windows, and Linux	Shared-file server	The log file LOG2.DAT is not at the same level as LOG.DAT.	Try one of the following: • Copy the LOG.DAT file to LOG2.DAT. • Restart the shared-file server without dual log management.

Table 5. Loading return codes (continued)

X'B0' (176)	DOS	ASCII-EBCDIC translation server	The current country is not supported.	Check the environment.
	OS/2	Batch machine facility	A loading parameters error has occurred.	Check the loading statement in the AUTOFBSS.CMD file.
	DOS and OS/2	Batch machine facility	The loading parameters are not correct.	
	DOS, OS/2, Windows, and Linux	Shared-file server	The shared-file server cannot perform forward recovery because the log files are truncated.	Check the log files.
X'B1' (177)	DOS	ASCII-EBCDIC translation server	Translation tables are not available or not traced.	Copy TBLASC.088, TBLEBC.088, and TBLTAI.088 into a path specified with TRNSCALL (only Taiwan).
	OS/2	Batch machine facility	There is not enough memory to allocate client memory pool (DOS environment).	Check the available memory.
	DOS and OS/2	Batch machine facility	There is not enough memory to allocate the client memory pool (DOS environment only).	Check the available memory.
X'B3' (179)	OS/2	Batch machine facility	There is not enough space to communicate with the client workstation.	Check the space available in the environment.
X'B8' (184)	OS/2, Windows, and Linux	Service Availability Manager	EHCSAM is not active for this server.	To enable Shared File Server to run in XLR mode, EHCSAM must be running on this workstation. Ensure that EHCSAM starts successfully.
X'B9' (185)	OS/2, Windows, and Linux	Service Availability Manager	EHCSAM could not provide state information for this server.	Ensure that the correct version of EHCSAM.CFG is in the current directory. The `X/:nn` parameter identifies a valid XLR server pair.
X'BA' (186)	OS/2, Windows, and Linux	Service Availability Manager	EHCSAM could not change the active configuration for this XLR server.	Ensure that the correct version of EHCSAM.CFG is in the current directory. The `X/:nn` parameter identifies a valid XLR server pair.
X'BB' (187)	OS/2, Windows, and Linux	Service Availability Manager	The XLR server is not configured to run on this workstation.	Ensure that the correct version of EHCSAM.CFG is in the current directory. The `X/:nn` parameter identifies a valid XLR server pair.

Table 5. Loading return codes (continued)

X'BC' (188)	OS/2, Windows, and Linux	Service Availability Manager	EHCSAM could not set state information for this workstation.	Ensure that the correct version of EHCSAM.CFG is in the current directory. The `X/:nn` parameter identifies a valid XLR server pair.
X'C0' (192)	DOS, OS/2, Windows, and Linux	System manager and system manager operator	The command line loading parameters are not correct. The following might be true: • The **/D** (FBSS#GDT backup on a remote drive) loading parameter is not correct. • The **/O** (default NetView operator ID for the MO function) is not correct. • LANDP for Linux: An incorrect -r parameter has been specified.	Check the command line loading parameters. Refer to the *LANDP Installation and Customization* book for information about the loading parameters.
X'C1' (193)	DOS, OS/2, Windows, and Linux	System manager and system manager operator	The system cannot read the FBSSPATH.DAT or SMGR.CFG file. The file contents might be damaged.	Make sure FBSSPATH.DAT and SMGR.CFG are in the same directory as the system manager server, or rerun the customization utility program to get new copies.
X'C2' (194)	DOS, OS/2, Windows, and Linux	System manager and system manager operator	There is not enough disk space or memory.	Try the following: • Make sure that there is enough free space on the disk. • Make sure that the disk is working properly. • Make sure that there is enough available memory. • Make sure that the specified path exists.
X'C3' (195)	DOS, OS/2, Windows, and Linux	System manager and system manager operator	An error occurred while reading the FBSS#LOG file. The log file could be damaged, or the path was not found.	Try one or both of the following: • Make sure that the specified path exists. • Delete the current log file and reload the LANDP programs.

Table 5. Loading return codes (continued)

X'C4' (196)	DOS, OS/2, Windows, and Linux	System manager and system manager operator	An error occurred while reading the FBSS#ALR file. The alerts file could be damaged or the path was not found.	Try the following: • Make sure that the specified path exists. • Delete the current FBSS#ALR alerts file, and then reload the LANDP programs.
X'C5' (197)	DOS, OS/2, Windows, and Linux	System manager and system manager operator	An error occurred while reading the FBSS#GDT file. The global data file could be damaged or it was not found.	Try the following: • Make sure that the specified path exists. • Replace the file with a new one, or rerun customization.
X'C6' (198)	DOS, OS/2, Windows, and Linux	System manager and system manager operator	An error occurred while reading the FBSS#USP file. The user profile file might be damaged or it was not found.	Try the following: • Make sure that the specified path exists. • Replace the file with a new one, or rerun customization.
X'C7' (199)	DOS, OS/2, Windows, and Linux	System manager and system manager operator	An error occurred while reading the RDF.CFG file. The record file might be damaged, or it was not found.	Try the following: • Make sure that the specified path exists. • Replace the file with a new one, or rerun customization.
X'C8' (200)	DOS, OS/2, Windows, and Linux	System manager and system manager operator	The path for a system manager file is missing.	Rerun customization, assigning one path for each system manager file.
X'C9' (201)	DOS and OS/2	System manager and system manager operator	The system cannot read the FBSSPATH.DAT or SMOP.CFG file. The file contents might be damaged.	Make sure that the FBSSPATH.DAT or SMOP.CFG files are in the same directory as the system manager operator, or rerun customization to get new ones.
X'CA' (202)	DOS and OS/2	System manager and system manager operator	The system cannot read any of the system manager operator overlays (SMOPOV*.OVL) or the MS0.MSG file. The file contents might be damaged.	Make sure that the SMOPOV*.OVL overlays and the MS0.MSG file are in the path specified during customization.
X'D1' (209)	OS/2, Windows, and Linux	DDE access server	A system error has occurred.	

Table 5. Loading return codes (continued)

X'D2' (210)	OS/2, Windows, and Linux	DDE access server	There is not enough memory.	Check the available memory.
X'D7' (215)	OS/2, Windows, and Linux	MQSeries link server	The loader statement parameters are not valid.	Check the loading parameters and correct them. Refer to the LANDP Installation and Customization book for information about Loader parameters.
X'D8' (216)	OS/2, Windows, and Linux	MQSeries link server	The MQSeries Queue Manager is not available.	Check that the MQSeries Queue Manager is running.
X'D9' (217)	OS/2, Windows, and Linux	MQSeries link server	The MQSeries Link server does not have authority to connect to the MQSeries Queue Manager.	Check that the MQSeries Queue Manager configuration allows the MQSeries Link server to connect.
X'DA' (218)	OS/2, Windows, and Linux	MQSeries link server	The MQSeries Link server failed to connect to the MQSeries Queue Manager.	Refer to the log files for a detailed explanation. If necessary, change the loader parameters to switch on logging and then retry.
X'DB' (219)	OS/2, Windows, and Linux	MQSeries link server	An initialization error has occurred.	Refer to the log files for a detailed explanation, if necessary change the loader parameters to switch on logging and retry.
X'DC' (220)	OS/2, Windows, and Linux	MQSeries link server	An operating system I/O error has occurred.	Check that the Path parameter in the parameter list specifies a valid directory, and that the directory can be written to. Then retry.
X'E0' thru X'EF'(224 thru 239)	User server			

Table 6. VARPARM loading error return subcodes

Subcode	Diagnosis	Action
X'01' (1)	Syntax error in VARPARM.SPC	Correct the LANCONFG record.
X'02' (2)	Error in FBSSPATH.DAT	Make sure that the path and file exist.
X'03' (3)	Error in FBSS#GDT	Make sure that the path and file exist.
X'04' (4)	Error in LAN.CFG	Make sure that the LAN.CFG file exists.
X'05' (5)	Error in DEVSP47.TAB	Make sure that the path and file exist.
X'06' (6)	VARPARM.SPC contains a SUFFIX keyword for a workgroup that was customized as not having a SUFFIX.	Remove the SUFFIX keyword from VARPARM.SPC.

Table 7. NEWCFG loading error return subcodes

Subcode	Diagnosis	Action
X'01' (1)	XXXXXXXX.PCN and XXXXXXXX.PCB both exist.	Delete either XXXXXXXX.PCN or XXXXXXXX.PCB.
X'02' (2)	XXXXXXXX.DBN and XXXXXXXX.DBD both exist.	Delete either XXXXXXXX.PCN or XXXXXXXX.PCB.
X'03' (3)	EJOU.PRN and EJOU.PRO both exist.	Delete either EJOU.PRN or EJOU.PRO.
X'04' (4)	STOR.PRN and STOR.PRO both exist.	Delete either STOR.PRN or STOR.PRO.
X'05' (5)	FORW.PRN and FORW.PRO both exist.	Delete either FORW.PRN or FORW.PRO.

Table 8. VARDAT program — I/O error subcodes

Subcode	Diagnosis	Action
X'80' (128)	I/O error trying to seek or read from VARDAT.CFG	Recreate the file and retry.
X'81' (129)	I/O error trying to seek or read from DCA.CFG	Recreate the file and retry.
X'82' (130)	I/O error trying to seek or read from SDL.CFG	Recreate the file and retry.
X'83' (131)	I/O error trying to seek or read from TOK.CFG	Recreate the file and retry.
X'84' (132)	I/O error trying to seek or read from X25.CF1	Recreate the file and retry.
X'85' (133)	I/O error trying to seek or read from VCM.CFG	Recreate the file and retry.

Table 9. VARDAT program — Format error subcodes

Subcode	Diagnosis	Action
X'21' (33)	Unexpected record length in VARDAT.CFG	Correct the error in VARDAT.CFG.
X'22' (34)	Incorrect number of buffers in the DCADLC record; the number of buffers must be in decimal format and in the range 10 thru 100	Correct the error in VARDAT.CFG.
X'23' (35)	There are several DCADLC records in VARDAT.CFG; VARDAT.CFG can contain only one DCADLC record	Remove the extra entries.
X'24' (36)	Incorrect number of buffers in the DCADLC record; the number of buffers must be in decimal format and in the range 8 thru 80	Correct the error in VARDAT.CFG.
X'25' (37)	The physical unit (PU) address in the SDLC record is not in hexadecimal format	Correct the error in VARDAT.CFG.
X'26' (38)	The identification number in the SDLC record is not in hexadecimal format	Correct the error in VARDAT.CFG.
X'27' (39)	There are several SDLC records in VARDAT.CFG; VARDAT.CFG can contain only one SDLC record	Remove the extra entries.
X'28' (40)	Incorrect number of buffers in TRDLC record; the number of buffers must be in decimal format and in the range 16 thru 216	Correct the error in VARDAT.CFG.
X'29' (41)	Workstation local administration address in TRDLC record is not in decimal format	Correct the error in VARDAT.CFG.
X'30' (48)	Host local administration address in TRDLC record is not in hexadecimal format	Correct the error in VARDAT.CFG.
X'31' (49)	Identification number in TRDLC record is not in hexadecimal format	Correct the error in VARDAT.CFG.
X'32' (50)	Host and workstation local administration address fields are identical in TRDLC record	Change the address of one or the other field in VARDAT.CFG.
X'33' (51)	Host or workstation local administration address fields have the first byte > 7 in TRDLC record; the first byte must be less than 8	Correct the error in VARDAT.CFG.
X'34' (52)	Host or workstation local administration address fields are in conflict with the existing fields in the configuration field	Correct the error in VARDAT.CFG.

Table 9. VARDAT program — Format error subcodes (continued)

Subcode	Diagnosis	Action
X'35' (53)	There are several TRDLC records in VARDAT.CFG; VARDAT.CFG can contain only one TRDLC record	Remove the extra entries.
X'36' (54)	Incorrect number of buffers in X25DLCNA record; the number of buffers must be in decimal from and in the range 20 thru 2000	Correct the error in VARDAT.CFG.
X'37' (55)	Incorrect length for X.25 network user address in X25DLCNA record; the length must be in the range 5 thru 15	Correct the error in VARDAT.CFG.
X'38' (56)	X25 network user address in X25DLCNA is not in decimal format	Correct the error in VARDAT.CFG.
X'39' (57)	There are several X25DLCNA records in VARDAT.CFG	Remove the extra entries.
X'40' (64)	Connection type in X25DLCSA record is not B, I, O, or P	Correct the error in VARDAT.CFG.
X'41' (65)	The number of permanent circuits in X25DLCSA record is wrong	Correct the error in VARDAT.CFG.
X'42' (66)	The number of permanent circuits in X25DLCSA record is not present	Correct the error in VARDAT.CFG.
X'43' (67)	The filler in X25DLCSA record contains no blanks	Correct the error in VARDAT.CFG.
X'44' (68)	Incorrect old subscriber address length in X25DLCSA record	Correct the error in VARDAT.CFG.
X'45' (69)	Old subscriber address in X25DLCSA record is not in decimal format	Correct the error in VARDAT.CFG.
X'46' (70)	Incorrect new subscriber address length in X25DLCSA record	Correct the error in VARDAT.CFG.
X'47' (71)	New subscriber address in X25DLCSA record is not in decimal format	Correct the error in VARDAT.CFG.
X'48' (72)	Identification number in X25DLCSA record is not in hexadecimal format	Correct the error in VARDAT.CFG.
X'49' (73)	Old subscriber address in X25DLCSA record is repeated for the same connection type	Correct the error in VARDAT.CFG.

Table 9. VARDAT program — Format error subcodes (continued)

Subcode	Diagnosis	Action
X'50' (80)	The record identifier in VARDAT.CFG is incorrect.	Correct the error in VARDAT.CFG.
X'51' (81)	Once updated, there are several X.25 circuits with the same connection type and subscriber addresss.	Correct the error in VARDAT.CFG.
X'52' (82)	Once updated, there are several X.25 circuits with the same identification number and subscriber addresss.	Correct the error in VARDAT.CFG.
X'53' (83)	The X.25 circuit is not found in the present configuration.	Correct the error in VARDAT.CFG.
X'54' (84)	An error occurred in the attempt to pack or unpack bytes.	Change the record shown to hexadecimal format.
X'55' (85)	Incorrect value in 'Included-in-Packet-Call' field in X25DLCNA record; the only valid values are 0, 1, and 2	Correct the error in VARDAT.CFG.

Table 10. VARDAT program - File error subcodes

Subcode	Diagnosis	Action
X'01' (1)	Configuration file of DCADLC (DCA.CFG) does not exist	Add the file if it is missing, or remove the entry from VARDAT.CFG.
X'02' (2)	Configuration file of SDLC (SDLC.CFG) does not exist	Add the file if it is missing, or remove the entry from VARDAT.CFG.
X'03' (3)	Configuration file of token-ring DLC (TOK.CFG) does not exist	Add the file if it is missing, or remove the entry from VARDAT.CFG.
X'04' (4)	Configuration file of X25DLC (X25.CF1) does not exist	Add the file if it is missing, or remove the entry from VARDAT.CFG.
X'05' (5)	Configuration file of X.25 circuits(VCM.CFG) does not exist	Add the file if it is missing, or remove the entry from VARDAT.CFG.
X'06' (6)	Auxiliary file (VCM.WRK) cannot be opened, or has a hardware error	Retry. If the problem persists, check your hardware.

Chapter 6. LANDP return codes

LANDP return codes are values returned by LANDP server or routers as a result of a function or service request made by an application program. This chapter lists all the return codes returned by LANDP servers. The return codes are grouped according to which server or router is their source. Unless a specific operating system or platform is stated, the return codes apply to LANDP for DOS, LANDP for OS/2, LANDP for Windows, and LANDP for Linux.

"Return codes" on page 5 briefly describes LANDP return codes, including the types and classes of codes. It also describes how to interpret hexadecimal and ASCII return codes.

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Quick Guide

There are two types of LANDP return codes: router and server. Router return codes are stored at offset 4 in the CPRB. Server return codes are stored at offset 40 in the CPRB. Operations are successful only if both the router and the server return codes are zero.

The return code listings include the hexadecimal return code and, if available, the translated ASCII return code. The ASCII code appears in parentheses.

From some servers, the ASCII code gives an indication of the cause of the return code. For example, from the ASCII-EBCDIC server, **IP** indicates an **I**ncorrect **P**arameter and **NS** indicates that the function is **N**ot **S**upported.

From some other servers, the first character of the ASCII return code might show the return code class, as follows:

Character	Class
I	*Intervention required*. These return codes occur when workstation operators or technical service personnel can correct the error (or fault).
L	*LAN services error*. These return codes can occur in any function request to any server. These return codes are listed in “LANDP global return codes” on page 150. NetBIOS return codes are listed and described in *LAN Technical Reference IEEE 802.2 and NetBIOS Application Program Interfaces*, SC30-3587.
P	*Programming error*. These return codes can occur while developing or debugging application programs. They should not occur during daily operation with error-free programs.
U	*Device error* (Unable to access equipment) or other unexpected error. These return codes occur when LANDP software cannot carry out a request. The most likely cause is a hardware error (or fault).

The following table lists the LANDP servers in alphabetical order, shows which operating system platforms support them, and gives the page number where you can find the return codes listed:

Table 11. LANDP servers and return codes

Server name	Server	Platforms	Page number
EHCCOMP	Compression Server	DOS	130
EHCDBTR	ASCII-EBCDIC Translation Server	DOS	127
EHCLAD	DDE Access server	OS/2	133
EHCLINK	LANDP Link server	OS/2, Windows, and Linux	158
EHCLIP	LANDP Internet Protocol server	DOS, OS/2, Windows, and Linux	155
EHCLRMGR	Local Resource Management server	DOS	160
EHCMQ##	MQSeries Link server	OS/2 and Windows	166
EHCODB##	ODBC Query server	Windows	175
EHCSQL##	Query server	OS/2	184
EHCTCP	TCP/IP Wide Area Communications server	DOS, OS/2, Windows, and Linux	218
EHCTRAN	CICS Interface server	OS/2	128
ELECJO##	Electronic Journal server	DOS, OS/2, Windows	136
LAN	NetBIOS Transport server	DOS, OS/2, and Windows	150
MSRE47##	Magnetic stripe reader/encoder	DOS, OS/2, Windows, and Linux	163
OPBS	Object Postbox server	OS/2	173
PINP47##	PIN Pad server	DOS, OS/2, Windows, and Linux	177
PPC##	Program-to-program communications server	OS/2 and Windows	181
PR4748##	IBM 4748 Printer server	DOS, OS/2, and Windows	145
PR4770##	IBM 4770 Printer server	OS/2	148
PR47X2##	Financial Printer server	DOS, OS/2, and Windows	141
PRTMGR	Printer Manager server	DOS	180
RCMS	Remote Change Management server	DOS, OS/2, and Windows	189
SFORFORW	Store-for-forwarding server	DOS, OS/2, and Windows	136
SHFILE##	Shared-file server	DOS, OS/2, Windows, and Linux	193

Table 11. LANDP servers and return codes (continued)

Server name	Server	Platforms	Page number
SMGR	System Manager server	DOS, OS/2, and Windows	212
SNA##	SNA server	DOS, OS/2, and Windows	205
SPV	Supervisor	DOS, OS/2, Windows, and Linux	150
X25NAT##	Native X.25 server	DOS and OS/2	169

ASCII-EBCDIC translation server (EHCDBTR)

The following table shows the return codes that you might receive from the ASCII-EBCDIC translation server:

Table 12. Return codes from the ASCII-EBCDIC server

Return Code	Causing Function	Explanation	Action Required
X'00000000'	Any	Successful operation.	None
Programming Errors			
X'01004950' (**IP**)	AE, EA	A parameter is not correct.	Check the parameter.
X'01004844' (**HD**)	AE, EA	Half Double condition. The last byte of the source string is the first half of a DBCS character. The target string has this byte replaced by a NULL, and flag3 indicates D.	None
X'01004E53' (**NS**)		The function is not supported.	
X'01004253' (**BS**)	AE, EA	There is not enough buffer. The length of the target string is longer than the specified reply data length. The correct reply data length is returned in flag4. If the last byte of the source string is the first half of a DBCS character, the target string has this byte replaced by a NULL.	

CICS interface server (EHCTRAN)

The following table shows the return codes that you might receive from the CICS interface server:

Table 13. Return codes from the CICS interface server

Return Code	Causing Function	Explanation	Action Required
X'00000000'	Any	Successful operation.	None
X'01005030' (**P0**)	RC	No previous CC function has been requested.	
X'01005031' (**P1**)	Any	The function is not supported. The function code is not correct, or the combination of function code, parameters, and data is not consistent, or is not supported.	Correct the error in the program.
X'01005032' (**P2**)	Any	One of the following might be true: • Data lengths are not correct for this function. • The data length is not large enough to hold all the data arriving from a partner. Data is truncated to the specified length.	Correct the program.
X'01005033' (**P3**)	RC	There are no messages to read.	
X'01005038' (**P8**)	CC	A previous CC function in asynchronous mode has been issued with the same EventCode, and no return code has been issued with this EventCode.	
X'01005059' (**PY**)	Any	The environment is not supported.	
X'0100505A' (**PZ**)	Any	The parameter length is not valid.	
X'01005539' (**U9**)	Any	An OS/2 operating system error has occurred.	Check the log file.
X'FFFFFFF7'		A CICS OS/2 internal error has occurred.	
X'FFFFFFF8'		The program tried to cancel a previous request when there was none outstanding.	

Table 13. Return codes from the CICS interface server (continued)

Return Code	Causing Function	Explanation	Action Required
X'FFFFFFF9'	CC	CICS OS/2 accepted the request, but the transaction ended.	
X'FFFFFFFA'	CC	CICS OS/2 accepted the request, but did not finish processing it within the timeout period.	
X'FFFFFFFB'	CC	CICS OS/2 did not accept the request within the specified timeout period.	
X'FFFFFFFC'	CC	CICS OS/2 is no longer running.	
X'FFFFFFFD'	CC	CICS OS/2 is not running.	
X'FFFFFFFE'	CC	A value in the extended mode is not valid.	
X'FFFFFFFF'	CC	This error is caused by either a positive user data length for a null user data area, or a user data length of zero for a non-null data area.	

Compression server (EHCCOMP)

The following table shows the return codes that you might receive from the compression server, which can be used with the SNA server in LANDP for DOS environments:

Table 14. Return codes from the Compression server

Return Code	Causing Function	Explanation	Action Required
X'00000000'	Any	Successful operation.	None
X'01005032' (**P2**)	CM	There is not enough space in the reply data area to store the entire compressed request/response unit (RU).	
X'01005032' (**P2**)	CM, UC	The data lengths are not correct for the compressed data or decompress data functions.	Check the program.
X'01005032' (**P2**)	UC	There is not enough space in the reply data area to store the entire decompressed RU.	
X'01005034' (**P4**)	CM	Data compression was not performed because compressed data length is greater than uncompressed data length.	
X'01005034' (**P4**)	UC	The length given in the compression header and the length of the decompressed request/response unit (RU) do not match.	
X'01005037' (**P7**)	UC	The following might be true: • The run-length encoding (RLE) header is not correct: it does not equal 0X11. • The compression algorithm is wrong. • The encoded length is greater than 4096 bytes. • The actual length is greater than the encoded length. • The decompression control sequence is not valid.	

Cryptographic interface ()

The following abbreviations denote the functions that can cause cryptographic errors:

DC Decrypt
EC Encrypt
KG Key-generation
RD Resource directory functions

The following table shows the return codes that you might receive from the cryptographic interface:

Table 15. Return codes from the Cryptographic interface

Return Code	Causing Function	Explanation	Action Required
X'00000000'	EC, DC, KG, RD	Successful operation.	None
X'00A00004'	EC, DC, RD	The resource ID is not valid.	
X'00A00008'	EC, DC, KG, RD	The key record content is not valid or there is a key storage problem.	
X'00A0000A'	RD	The resource ID already exists.	
X'00A0000B'	RD	The resource directory is full: 32 entries are present.	
X'00A0000C'	RD	The key type is not valid.	
X'00A00033'	EC, DC, RD	The last block rule value is not valid.	
X'00A00034'	EC, DC, RD	The pad value is not valid.	
X'00A00035'	EC, DC	The initial chaining value (ICV) flag is not valid.	
X'00A00036'	DC	The padding flag is not valid.	
X'00A00050'	KG	The key out value is not valid.	
X'00A00061'	RD	The command type is not valid.	
X'00A05000'	EC, DC, KG, RD	The CPRB length is not valid.	
X'00A05001'	EC, DC, KG, RD	The function ID is not valid.	
X'00A05002'	EC, DC, KG, RD	The interface name length is not valid.	
X'00A05004'	EC, DC, EC, DC, KG, RD	The request `PARMLIST` length is not valid.	
X'00A05005'	EC, DC, KG, RD	The request `PARMLIST` length is not valid.	

Table 15. Return codes from the Cryptographic interface (continued)

Return Code	Causing Function	Explanation	Action Required
X'00A05006'	EC, DC	The request DATA length is not valid.	
X'00A05007'	EC, DC	The request DATA length is not valid.	
X'00A05008'	EC, DC, KG, RD	The pointer value is not valid.	
X'00A06000'	EC, DC, KG, RD	The resource directory file was not found.	
X'00A06001'	EC, DC, KG, RD	A file I/O error has occurred.	
X'00A06002'	EC, DC, KG, RD	A hardware failure has occurred.	
X'00A06003'	EC, DC, KG, RD	Hardware access was denied.	
X'00A07001'	EC, DC, KG, RD	The master key has not been installed.	
X'00A07002'	EC, DC, KG, RD	An irrecoverable interface error has occurred.	
X'00A07003'	RD	The key encrypting key was not installed.	
X'00A07004'	EC, DC, KG, RD	The encryption hardware support was not installed.	

DDE access server (EHCLAD)

The following table shows the return codes that you might receive from the dynamic data exchange (DDE) access server. They indicate programming errors.

Table 16. Return codes from the DDE access server

Return Code	Causing Function	Explanation	Action Required
X'00000000'	Any	Successful operation.	None
X'0100414E' (**AN**)	UN	Advice was not established. The hot link does not exist.	
X'01004345' (**CE**)	IC, ID, GD, RC	The allowed number of conversations was exceeded. The LANDP application has 189 open conversations.	Try again after closing any other conversation.
X'01004346' (**CF**)	AD, EC, GD, ID, KD, PD, RC, RD, TC, UN	The conversation ended. The DDE server application has closed the conversation. The conversation is no longer valid.	Open a new conversation using the same application and topic.
X'0100434C' (**CL**)	IC, ID, GD, RC	The conversation is locked. Another LANDP application has locked the access to this topic.	Try again later.
X'0100434F' (**CO**)	??	A conversation is open. There are open conversations for this application and topic, or the conversation is already locked.	Try again later.
X'01004454' (**DT**)	GD, KD, QA, PT	Data was truncated. The reply `DATA` area is too small. The reply `DATA` area contains only as much data as it can hold.	Increase the reply `DATA` area and request the function again.
X'0100454F' (**EO**)	IC, ID, GD, QA, RC	An error occurred while creating an object. The DDE access server could not open the window that manages this conversation.	
X'01004943' (**IC**)	AD, EC, GD, ID, PD, RC, RD, TC	The conversation is not valid. The conversation specified by the conversation handle does not exist.	
X'01004946' (**IF**)	EC, IC, ID, GD, LO, LP, PD, RC, UL	The format is not valid. The data received from the LANDP application does not conform to the DDE access server format.	Check the request `DATA`.

Table 16. Return codes from the DDE access server (continued)

Return Code	Causing Function	Explanation	Action Required
X'0100494D' (**IM**)	AD, EC, GD, ID, KD, PD, UN	The message is not valid. The DDE server application has not accepted the message that was received.	
X'01004950' (**IP**)	AD, EC, KD, PD, RD, TC, UN	The parameter size is not valid. The request `PARMLIST` size is zero.	Change the parameter size.
X'01004954' (**IT**)	KD, UN	The transaction is not valid. The transaction specified by the transaction handle does not exist.	
X'01004E41' (**NA**)	EC, GD, ID, KD, PD, RC, UN	The message was not accepted. The DDE server application did not process the message because it could not understand it. If the return code was caused by the KD function, the server has not accepted the 'request' or 'advice' request.	
X'01004E44' (**ND**)	PT	There is no data. The clipboard does not contain data in this format.	Enter or copy the data and try again.
X'01004E46' (**NF**)	LP	A file was not found. Either the files required for processing were not found or the path or drive does not exist.	Check the path, drive, and files.
X'01004E4C' (**NL**)	UL	The conversation is not locked. This LANDP application has not locked this topic.	
X'01004E4D' (**NM**)	AD, CT, EC, GD, IC, ID, KD, LO, NM, PD, PT, QA, RC, RD, TC, UN	There is no available memory. A system error occurred when requesting memory.	

Table 16. Return codes from the DDE access server (continued)

Return Code	Causing Function	Explanation	Action Required
X'01004E52' (**NR**)	GD, IC, ID, KD, RC, QA	The application did not respond. A DDE server application was not available when the DDE access server tried to start the conversation, or data was not available from the DDE server application.	Start the DDE access server or obtain the data later.
X'01004F45' (**OE**)	Any	An OS/2 operating system error has occurred. There was an unexpected return code from a system function call.	
X'0100504C' (**PL**)	AD, GD, IC, KD, PT, QA, RD	The reply `DATA` length is not valid. The reply `DATA` has size zero.	Repeat the request using a larger reply `DATA` area.
X'0100514C' (**QL**)	AD, CT, EC, GD, IC, ID, LO, LP, PD, RC, RD, UL	The request `DATA` length is not valid. The request `DATA` has size zero.	
X'01005345' (**SE**)	Any	A system error has occurred, that is an unexpected DDE access server error has occurred.	
X'01005441' (**TA**)	AD, RD	The transaction already exists. Data for this item has already been requested, but not obtained.	Obtain this data or open a new conversation for this application and topic.
X'01005445' (**TE**)	AD, RD	The allowed number of transactions was exceeded. The LANDP application has 189 open transactions.	Close any other transactions, and try again later.

Electronic journal and store-for-forwarding servers

The following codes are returned by the electronic journal server, the store-for-forwarding server, or both servers:

Table 17. Return codes from the electronic journal and store-for-forwarding servers

Return Code	Causing Function	Explanation	Action Required
X'00000000'	Any	Successful operation.	None
Electronic journal server only			
X'01004A30' (**J0**)	RL	There is no journal to release.	
X'01004A31' (**J1**)	IL, SL	The logical journal environment is not selected.	
X'01004A32' (**J2**)	SL	A new logical journal was not found or two (or more) SL functions occurred in sequence.	
X'01004A33' (**J3**)	SL	A previous logical journal was not found.	
X'01004A34' (**J4**)	Any	There was a problem accessing the specified journal control record.	
X'01004A35' (**J5**)	Any	The journal control record specified was not valid.	
X'01004A36' (**J6**)	Any	An attempt to replace the journal control record has failed.	
X'01004A37' (**J7**)	AL	The data set is already allocated.	
X'01004A38' (**J8**)	AL	The next data set is not empty.	
X'01004A39' (**J9**)	DA	Deallocation is not possible because the latest allocated data set already contains records.	
X'01004A41' (**JA**)	RR	Too many records are on hold.	
X'01004A42' (**JB**)	DL, UP	No record is on hold.	
X'01004A43' (**JC**)	AR, RL, RR	An electronic journal was not selected.	
X'01004A44' (**JD**)	AR, DA, IL, IP, RL, RS, RR, SL	The journal was not found.	
X'01004A45' (**JE**)	DA, SL	A data set is not allocated.	
X'01004A46' (**JF**)	RR	The accessed logical journal is not active.	

Table 17. Return codes from the electronic journal and store-for-forwarding servers (continued)

Return Code	Causing Function	Explanation	Action Required
X'01004A47' (**JG**)	RR	The accessed physical journal is not in use.	
X'01004A48' (**JH**)	DL	The record cannot be deleted because it belongs to another logical journal.	
X'01004A49' (**JI**)	UP	The record cannot be updated because it belongs to another logical journal.	
X'01004A4A' (**JJ**)	AL, SL	The physical or logical journal name is blank.	
X'01004A4B' (**JK**)	DL	The record has already been deleted.	
X'01004A4C' (**JL**)	RR	The delete flag is not equal to Y or N.	
X'01004A4D' (**JM**)	RR	The hold flag is not equal to H or N.	
X'01004A4E' (**JN**)	SL	There are too many logical journals.	
Electronic journal and store-for-forwarding servers			
X'01005030' (**P0**)		The function is not supported.	
X'01005031' (**P1**)	Any, except CS, IS, QD, SI, TB, TE, TI	This is an imbedded server call error.	Obtain more information through the system manager error log.
X'01005032' (**P2**)	AR, RR	The format name is unknown.	
X'01005033' (**P3**)	Any	The shared file is not initialized. (A GF function was not requested.)	
X'01005034' (**P4**)	Any, except UP	Transaction locking is not initialized. (A BT function was not requested.)	
X'01005035' (**P5**)	Any, except UP	The shared file is not initialized. (An OO function was not requested.)	
X'01005036' (**P6**)	AR, DL, RR	A separate session is already open. Function DL only applies to the store-for-forwarding server.	
X'01005037' (**P7**)	AR, RR	An entry is not available in separate session tables.	Try later.

Table 17. Return codes from the electronic journal and store-for-forwarding servers (continued)

Return Code	Causing Function	Explanation	Action Required
X'01005038' (**P8**)	AR, RR	A separate session cannot be opened.	
X'01005039' (**P9**)	AR, DL, RR, TS, UP	A separate session is not open.	
X'01005041' (**PA**)	AR, DL, RR, TS, UP	After an error occurred, the separate session could not be rolled back.	
X'01005042' (**PB**)	AR, DL, RR, TS, UP	A separate session could not be closed.	
X'01005043' (**PC**)	RR	A record satisfying the search criteria was not found.	
X'01005044' (**PD**)	RR	An internal error has occurred.	
X'01005045' (**PE**)	RR	The search definition is not correct or the search mode is not valid.	
X'01005046' (**PF**)	RR	A record matching the search criteria was not found after the maximum number of disk accesses.	
X'01005047' (**PG**)	Any	Initial handling was not done. This error causes an alert to be sent to the host. The TI function does not send alerts.	
X'01005048' (**PH**)	AR, UP	The field length is not the same as in the defined record format.	
X'01005049' (**PI**)	AR, UP	The field format is not the same as in the defined record format.	
X'0100504A' (**PJ**)	AR, DL, RR, UP	A separate session flag is in error.	
X'0100504B' (**PK**)	UP	The length of the record to be updated differs from the length of the provided record.	
X'0100504C' (**PL**)	UP	An update with a key field change is not allowed. (The key in the record to be updated differs from the key in the provided record.)	

Table 17. Return codes from the electronic journal and store-for-forwarding servers (continued)

Return Code	Causing Function	Explanation	Action Required
X'0100504D' (**PM**)	UP	The record definition differs.	
X'0100504E' (**PN**)	AR, DL, RR, UP	A separate session flag was used when no separate session was chosen.	
X'0100504F' (**PO**)	RR, RS	The record is locked by another workstation.	
X'01005050' (**PP**)	SL, TB, TE	The flag is not valid.	
X'01005051' (**PQ**)	AR	The request `DATA` length is greater than the buffer size (specified in the ***/K*** loading parameter) less 32.	
X'01005051' (**PQ**)	RR	The request `DATA` length is greater than X'0400'.	
X'01005052' (**PR**)	RR	The returned record is truncated.	Try the following: • If the sum of the actual record size and 32 is greater than the buffer size, increase the value of the ***/K*** loading parameter. • If the sum of the actual record size and 32 is greater than the reply `DATA` length, increase the reply `DATA` length.
X'0100505A' (**PZ**)	Any	The request or reply `PARMLIST` length is less than X'001A' (26 bytes).	
Store-for-forwarding server only			
X'01005330' (**S0**)	DL	The record cannot be deleted because it has not been sent by the forwarding facility.	
X'01005331' (**S1**)	CS	Incomplete status data was provided.	
X'01005331' (**S1**)	IS	The reply DATA length is too small.	
X'01005332' (**S2**)	AR, DL, DS, EN, IS, RR, RS, TB, TE	The data set was not found.	
X'01005333' (**S3**)	TB, TE	The session was not found.	
X'01005334' (**S4**)	SI	The data format has an error.	

Table 17. Return codes from the electronic journal and store-for-forwarding servers (continued)

Return Code	Causing Function	Explanation	Action Required
X'01005335' (**S5**)	CS, IS, QD, SI, TB, TE	The server is waiting for an SI request from the forwarding facility.	
X'01005336' (**S6**)	AR	The data set is disabled for adding records.	Issue an EN function.
X'010053371' (**S7**)	RR	Too many records are on hold.	
X'01005338' (**S8**)	UP	No records are held.	
X'01005339' (**S9**)	DL	The record number is not valid, or the record cannot be deleted.	
X'01005341' (**SA**)	RR	The retrieve mode flag is not set to R, D, or U.	

Financial printer server (PR47X2##)

The financial printer server supports the following document, passbook, and transaction printers:

- IBM 4009 Universal Banking Printer
- IBM 4712 Transaction Printer
- IBM 4722 Document Printer
- IBM 4772 Ink Jet Transaction Printer
- IBM 9055-002 Document Printer (SBCS support)
- IBM 9068-S01 Multi-purpose Passbook Printer (SBCS support)

Return codes from the financial printer server are listed in the following table:

Table 18. Return codes from the financial printer server

Return Code	Causing Function	Explanation	Action Required
X'00000000'	Any	Successful operation.	None
Intervention Required			
X'01004931' (**I1**)	Any	The device is not online or it is in the power-on-reset sequence.	
X'01004932' (**I2**)	Any	The device is not online.	Check for broken connections.
X'01004933' (**I3**)	CH, WR	The attention line shown in the parameter definition has been reached. Writing can continue to the end of the page.	For REMS: The read and verify process did not find data. There is an encoding error.
X'01004933' (**I3**)	RD	The following might be true: • No data was found on the magnetic stripe because the stripe is blank, there is no stripe, or the stripe is misplaced on the passbook. • An incorrect 'Devparm' for REMS was loaded. • No magnetic ink characters were found because either the characters are blank, or the characters are misplaced on the passbook or cheque.	

Table 18. Return codes from the financial printer server (continued)

Return Code	Causing Function	Explanation	Action Required
X'01004934' (**I4**)	CH, WR	The end of the journal, document, or passbook page was reached. The defined last line of the page has been written.	If the end is reached, the following are true: • On the first try, the line is printed correctly. • On retries, the line is not printed (except for a journal that begins a new page).
X'01004934' (**I4**)	CH, RD, WR	For REMS: The passbook has been replaced while a chained sequence of operations was executed. There is no passbook for REMS operations.	
X'01004935' (**I5**)	CH, RD, WR	The printer stop button has been pressed or the printer cover is open.	Press the start button or insert the document. Try the operation again.
X'01004936' (**I6**)	CH, CL, DF, EC, LL, OP, RD, WR	The printer is busy. The reason could be redirection.	Try again.
X'01004937' (**I7**)	CH, DF, LL, WR	Either the end of the journal, passbook, or document was reached, or the document, passbook, or journal has not been inserted yet.	If the end is reached, the following are true: • On the first try, the line is printed correctly. • On retries, the line is not printed.
X'01004939' (**I9**)	CH, DF, EC, LL, OP, RD, RM, WR	The resource is assigned to another workstation or another session.	
X'01004944' (**ID**)	Any	The printer's cover is open.	Close the cover.
X'01004947' (**IG**)	RD	Either there has been a longitudinal redundancy check (LRC) or parity error, or the data format is not valid.	Correct any data formatting error and retry the request. If the problem persists, obtain service.
X'01004952' (**IR**)	RD, WR	Intervention is required.	Press the A or B button to start printing.
Programming Errors Note: If flag1=P, the return code refers to the previous operation.			
X'01005031' (**P1**)		The function is not supported.	Check the request format and parameters.

Table 18. Return codes from the financial printer server (continued)

Return Code	Causing Function	Explanation	Action Required
X'01005032' (**P2**)	CH, CL, DF, EC, LL, OP, RD, RM, WR	The length is not correct. For the DF function, either the name in `DATA` is not a defined format description name, or the length is X'0000' or greater than X'0008'.	
X'01005033' (**P3**)	CH, CL, DF, EC, LL, RD, RM, WR	A previous open function is missing.	
X'01005034' (**P4**)	DF	Format parameters are not correct. An REMS component is not available.	
X'01005036' (**P6**)	AR, DU, WR	There is a data (download images) content error. Data goes beyond the end of the display.	
X'01005037' (**P7**)	RD, WR	The following might be true: • The passbook is not in an REMS position. • An REMS format parameter has not been loaded. • The passbook is no longer usable for an REMS operation: it has already been processed by a print operation. • The passbook width in format definition is not valid.	
X'01005038' (**P8**)	AR, CD, DU, WR	No operator panel component is available.	
X'01005039' (**P9**)	Any except CD, RD	An AR function is in progress.	Cancel the function or wait until it finishes processing.
X'0100505A' (**PZ**)	Any	The request or reply `PARMLIST` length is less than X'001A' (26 bytes).	
Device errors			
X'01005531' (**U1**)	Any	There is a printer or reader/encoder magnetic stripe (REMS) hardware malfunction.	A printer hardware malfunction can often be cleared by powering off and then powering on the printer. If the problem persists, obtain service.

Table 18. Return codes from the financial printer server (continued)

Return Code	Causing Function	Explanation	Action Required
X'01005532' (**U2**)	Any	There is a printer malfunction. The printer does not answer a status call (device time out).	Check the hardware installation. If the problem persists, obtain service.
X'01005534' (**U4**)	Any	This is an operating system error: an error occurred while making a system call.	Check whether the device driver is installed.
X'01005535' (**U5**)	Any	This is a device driver error.	Follow service reporting procedures.
X'01005536' (**U6**)	OP	The device driver is not installed.	
X'01005537' (**U7**)	OP	The printer ID byte is unknown.	
X'01005538' (**U8**)	Any	This is a server internal error.	Obtain software service.
X'01005539' (**U9**)	Any	A resource entry was not found in the configuration file. A session is not defined or the file is damaged.	

IBM 4748 printer server

The 4748 printer server supports the following printers:

- IBM 4748 Document Printer
- IBM 9055-001 Document Printer (DBCS support)
- IBM 9068-D01 Multi-purpose Passbook Printer (DBCS support)

Return codes from the 4748 printer server are listed in the following table:

Table 19. Return codes from the 4748 printer server

Return Code	Causing Function	Explanation	Action Required
X'00000000'	Any	Successful operation.	None
Intervention required			
X'01004931' (**I1**)	Any	The device is not online or it is in the power-on-reset sequence.	
X'01004932' (**I2**)	Any	The device is not online.	Check for broken connections.
X'01004933' (**I3**)	CH, WR	The attention line shown in the parameter definition has been reached. Writing can continue to the end of the page.	
X'01004934' (**I4**)	CH, WR	The end of the document or passbook page was reached. The defined last line of the page has been written.	If the end is reached, the following are true: • On the first try, the line is printed correctly. • On retries, the line is not printed.
X'01004935' (**I5**)	CH, WR	The printer stop button has been pressed, the cover of the printer is open, or the document was not inserted..	Press the start button, close the cover of the printer, or insert the document. Try the operation again.
X'01004937' (**I7**)	CH, DF, LL, WR	The end of the passbook, or document was reached. No writing is performed.	
X'01004938' (**I8**)	CH, WR	There is a server time out. The printer does not answer completion.	Try the request again.
X'01004939' (**I9**)	CH, DF, EC, LD, LL, OP, WR	The resource is assigned to another workstation.	
X'01004944' (**ID**)	Any	The printer's cover is open.	Close the cover.

Table 19. Return codes from the 4748 printer server (continued)

Return Code	Causing Function	Explanation	Action Required
X'01004947' (**IG**)	RD	There has been a longitudinal redundancy check (LRC) error, or a parity error, or the data format is invalid.	Correct any data formatting error and retry the request. If any problems persist, obtain service.
X'01004952' (**IR**)	WR	Intervention is required.	Press the A or B button to start printing.
Programming Errors Note: If flag1=P, the return code refers to the previous operation.			
X'01005031' (**P1**)		The function is not supported.	Check the request format and parameters.
X'01005032' (**P2**)	CH, CL, DF, EC, LD, LL, OP, WR	The length is not correct.	
X'01005033' (**P3**)	CH, DF, EC, LD, LL, WR	A previous open function is missing.	
X'01005034' (**P4**)	DF, LD	The format parameters are not correct.	
X'01005036' (**P6**)	WR	There is a data content error.	
X'0100505A' (**PZ**)	Any	A parameter length is not valid.	
Device errors			
X'01005531' (**U1**)	Any	There is a printer hardware malfunction.	A printer hardware malfunction can often be cleared by powering off and then powering on the printer. If the problem persists, obtain service.
X'01005532' (**U2**)	Any	There is a printer malfunction. The printer does not answer a status call (device time out).	Check the hardware installation. If the problem persists, obtain service.
X'01005534' (**U4**)	Any	This is an operating system error: an error occurred while making a system call.	Make sure that the device driver is installed.
X'01005535' (**U5**)	Any	There is a device driver error.	Follow the service reporting procedures.
X'01005536' (**U6**)	OP	The device driver is not installed.	
X'01005537' (**U7**)	OP	A printer ID byte is unknown.	
X'01005538' (**U8**)	Any	This is a server internal error.	Obtain software service.

Table 19. Return codes from the 4748 printer server (continued)

Return Code	Causing Function	Explanation	Action Required
X'01005539' (**U9**)	Any	A resource entry was not found in the configuration file. A session is not defined or the file is damaged.	

IBM 4770 printer server

The following codes are returned by the 4770 printer server. This server supports the IBM 4770 Universal Financial printer.

Table 20. Return codes from the 4770 printer server

Return Code	Causing Function	Explanation	Action Required
X'00000000'	Any	Successful operation.	None
Intervention required			
X'01004931' (**I1**)	Any	The device is not online or it is in the power-on-reset sequence.	
X'01004932' (**I2**)	Any	The device is not online.	Check for broken connections.
X'01004933' (**I3**)	CH, WR	The attention line shown in the parameter definition has been reached. Writing can continue to the end of the page. For REMS: The read and verify process did not find data. This is an encoding error.	
X'01004934' (**I4**)	CH, WR	The end of a journal, document, or passbook page was reached. The defined last line of the page has been written.	If the end is reached, the following are true: • On the first try, the line is printed correctly. • On retries, the line is not printed (except for a journal that begins a new page)..
X'01004936' (**I6**)	CH, CL, DF, EC, LL, OP, RD, WR	The printer is busy. The reason might be redirection.	Try the operation again.
X'01004937' (**I7**)	CH, DF, LL, WR	The end of the journal, passbook, or document was reached, or the journal has not been inserted yet.	If the end is reached, the following are true: • On the first try, the line is printed correctly. • On retries, the line is not printed.
X'01004939' (**I9**)	CH, DF, EC, LL, OP, RD, RM, WR	The resource is assigned to another workstation, or to another session.	
Programming Errors Note: If flag1=P, the return code refers to the previous operation.			
X'01005031' (**P1**)		The function is not supported.	Check the request format and parameters.

Table 20. Return codes from the 4770 printer server (continued)

Return Code	Causing Function	Explanation	Action Required
X'01005032' (**P2**)	CH, CL, DF, EC, LL, OP, RD, RM, WR	The length is not correct. For the DF function the name in `DATA` is not a defined format description name, or the length is X'0000' or greater than X'0008'.	
X'01005033' (**P3**)	CH, DF, EC, LL, RD, RM, WR	A previous open function is missing.	
X'01005034' (**P4**)	DF, RD	The format parameters are not correct. No REMS component is available.	
X'01005036' (**P6**)	WR	There is a data content error.	
X'0100505A' (**PZ**)	Any	The request or reply `PARMLIST` length is less than X'001A' (26 bytes).	
Device errors			
X'01005531' (**U1**)	Any	There is a printer or REMS hardware malfunction.	A printer hardware malfunction can often be cleared by powering off, and then powering on the printer. If the problem persists, obtain service.
X'01005532' (**U2**)	Any	There is a printer malfunction. The printer does not answer a status call (device time out).	Check the hardware installation. If the problem persists, obtain service.
X'01005534' (**U4**)	Any	An OS/2 operating system call error has occurred.	Make sure that the device driver is installed.
X'01005535' (**U5**)	Any	There is a device driver error.	Follow the service reporting procedures.
X'01005536' (**U6**)	OP	The device driver is not installed.	
X'01005537' (**U7**)	OP	A printer ID byte is unknown.	
X'01005538' (**U8**)	Any	An internal server error has occurred.	Obtain software service.
X'01005539' (**U9**)	Any	A resource entry was not found in the configuration file. A session is not defined or the file is damaged.	

LANDP global return codes

The following table lists the codes are returned when errors are detected by the LANDP client/server mechanism. The errors can occur in any function request to any server.

Table 21. LANDP global return codes

Return Code	Causing Function	Explanation	Action Required
X'01000402'	Any	The application is not initialized.	Issue the process supervisor local function IN.
X'01000404'	Any	The SPV.EXE program is not loaded.	Load the SPV.EXE program.
X'01000405'	Any	There is not enough memory to process the request.	
X'0100040A'	Any	The version ID in the connectivity programming request block (CPRB) passed to the computer supervisor is not supported by the resident portion of the computer supervisor, or the CPRB length is not valid.	Correct the version ID or the CPRB length.
X'01000602'	Any	The request `PARMLIST` length is not correct. It must be the length specified for each function and can never be longer than X'E09C' (57500 bytes).	
X'01000603'	Any	The sum of the request or reply `DATA` and the `PARMLIST` length exceeds X'E09C'(57500 bytes).	

Table 21. LANDP global return codes (continued)

Return Code	Causing Function	Explanation	Action Required
X'01000604'	Any	The reply PARMLIST length is not correct, or its address is invalid. The length must be that specified for each function and can never be longer than X'E09C'(57500 bytes). The following could be true: • The reply PARMLIST address is not valid and the replied PARMLIST length is nonzero. • The reply DATA address is not valid and the replied DATA length is nonzero. • The reply PARMLIST length is shorter than the replied length. • The reply DATA length is shorter than the replied length.	Correct the values.
X'01000606'	Any	The verb type in the CPRB passed to the computer supervisor is not recognized.	Correct the verb type.
X'0100060C'	Any	The request PARMLIST address is not valid. The request PARMLIST address is X'0000' and the request parameter length is nonzero.	Correct the request PARMLIST address.
X'0100060E'	Any	The request DATA address is not valid. The request DATA address is X'0000' and the request DATA length is nonzero.	Correct the request DATA address.
X'01000610'	Any	The reply PARMLIST address is not valid. The reply PARMLIST address is X'0000' and the reply PARMLIST length is nonzero.	Correct the reply PARMLIST address.
X'01000612'	Any	The reply DATA address is not valid. The reply DATA address is X'0000' and the reply DATA length is nonzero.	Correct the reply DATA address.
X'01004C30' (**L0**)	Any	The request DATA length or the reply DATA length exceeds X'E09C'(57500 bytes).	

Table 21. LANDP global return codes (continued)

Return Code	Causing Function	Explanation	Action Required
X'01004C31' (**L1**)	Any	The resource is not defined in the resources table of this workstation..	Check the configuration record.
X'01004C32' (**L2**)	Any	There is no session with the called server.	Connect the workstation where the requested server is installed. Windows: Check that the adapter number specified by the /N parameter on the LAN.EXE loader statement matches that bound to the NetBIOS protocol.
X'01004C33' (**L3**)	Any	A session is not defined. You are attempting to send a request to a workstation not defined in the LANDP workgroup configuration session table.	Check the configuration record.
X'01004C34' (**L4**)	Any	There is a data (download images) content error. Data goes beyond the end of the display.	
X'01004C35' (**L5**)	Any	The server is not loaded.	
X'01004C36' (**L6**)	Any	The system detected an irrecoverable error from a local workstation.	Try the following actions and then restart the workstation: OS/2 and Windows: Check the LANDP log file for information about the NetBIOS error that might be causing the problem. Windows: Check that the adapter number specified by the /N parameter on the LAN.EXE loader statement matches that bound to the NetBIOS protocol.
X'01004C37' (**L7**)	Any	The LAN adapter is not installed or the LAN support program is not loaded.	Cancel the function or wait until it finishes processing.

Table 21. LANDP global return codes (continued)

Return Code	Causing Function	Explanation	Action Required
X'01004C38' (**L8**)	Any	No response from the server; the specified timeout has been exceeded.	Try the request again, check the status of the workstation, or increase the timeout value.
X'01004C39' (**L9**)	Any	A LAN hardware failure has occurred.	Try the following: • OS/2 and Windows: Check the LANDP log file for information about the NetBIOS error that might be causing the problem. • Review all LAN connections and power-on status. • Correct any connection problems and start again, reloading any required LANDP components.
X'01004C41' (**LA**)	Any	The maximum number of supported applications was exceeded. Up to eight applications are supported at the same time.	Force an EJ function from any of the initialized applications to initialize a new one.
X'01004C42' (**LB**)	Any	The CPRB format or optional control block format is not valid.	
X'01004C44' (**LD**)	Any	Request inside hardware interrupt.	
X'01004C45' (**LE**)	Any	The LAN server is not loaded.	
X'01004C46' (**LF**)	Any	An optional parameter is not valid. LANDP for DOS: There is not enough free space in the buffer pool of the local workstation to process the request.	
X'01004C47' (**LG**)	Any	A message cannot be sent. LANDP for DOS: There is not enough free space in the buffer pool of the remote workstation to process the request.	

Table 21. LANDP global return codes (continued)

Return Code	Causing Function	Explanation	Action Required
X'01004C48' (**LH**)	Any	A response was received after the time-out value specified during configuration had been exceeded.	
X'01004C49' (**LI**)	Any	Illegal function code.	
X'01004C4A' (**LJ**)	Any	The system detected an access attempt without authorization level F.	
X'01004C4B' (**LK**)	Any	The system detected an attempt to accesss protected resources from an unexpected workstation.	Sign on to the system manager from this workstation.
X'01004C4C' (**LL**)	Any	A 'GETRPLY' reply handle is not valid. The reply handle is zero or there is no 'RMTREQ NoWait' outstanding with this handle.	Correct the value.
X'01004C4D' (**LM**)	Any	An SPV local function was called using 'RMTREQ NoWait'.	
X'01005537' (**U7**)	Any	The SPV.EXE program is not loaded.	Load the SPV.EXE program.

LANDP Internet Protocol (EHCLIP)

The following table lists the error codes that are placed in the log or trace file by EHCLIP, the LANDP Internet Protocol program. Refer to “EHCLIP trace” on page 35 (LANDP for DOS) or “EHCLIP program services” on page 49(LANDP for OS/2, LANDP for Windows, or LANDP for Linux) for information about the EHCLIP program and trace choices.

Table 22. EHCLIP return codes

Return Code	Explanation	Required Action
CE01	TCP/IP returned error data to the **open socket** function. EHCLIP cannot start.	Make sure that TCP/IP is operational.
CE02	TCP/IP returned error data to the **bind** function. EHCLIP cannot start.	If data is 48 (EADDRINUSE), the port number requested by EHCLIP could already be in use by another TCP/IP application. Stop the application, or start EHCLIP on all the LANDP workgroup workstations with the **/N** parameter. Refer to the *LANDP Installation and Customization* book for information about the parameter. If data is 49 (EADDRNOTAVAIL), either TCP/IP is not started or the TCP/IP network interface is not active. Make sure TCP/IP is operational.
CE03	TCP/IP returned error data to the **setsockopt** function. EHCLIP cannot start.	Make sure that TCP/IP is operational.
CE04	TCP/IP returned error data to the **ioctl** function. EHCLIP cannot start.	Make sure that TCP/IP is operational.
CE05	Workstation identifier ws_id is duplicated in the configuration. EHCLIP cannot start.	Correct the duplicated workstation identifier.
CE06	TCP/IP returned error data to the **gethostbyname** function for ws_id. Either the workstation identification corresponding to ws_id is not correctly defined in the TCP/IP ’hosts’ file or ’names’ server, or TCP/IP could not access the ’names’ server or open the ’hosts’ file. EHCLIP cannot start.	Check the contents of the ’hosts’ file or ’names’ server, or start EHCLIP with the /J parameter.
CE07	The local ws_id is duplicated as a related workstation. EHCLIP cannot start.	Correct the duplicated workstation identifier.

Table 22. EHCLIP return codes (continued)

Return Code	Explanation	Required Action
CE08	TCP/IP returned a null address for ws_id. EHCLIP cannot start.	Check the TCP/IP 'hosts' file format or 'names' server definition.
CE09	The remote workstation IP address is the same as the local workstation IP address.	Correct your TCP/IP configuration.
CE10	TCP/IP returned error data to the **sendto** function.	If data is 65 (EHOSTUNREACH), then the sendto failed because ws_id cannot be reached from the local workstation. If a session is still being established, then LIP checks alternative addresses for ws_id. If no address is reachable, then LIP cannot continue running. In this case, check the routing table and make sure there is a path to the remote workstation. If data is not 65, then LIP cannot continue running. Make sure TCP/IP is operational.
CE11	The **sendto** function failed because no TCP/IP output buffer space was available. EHCLIP retried the TCP/IP output function for lack of space in TCP/IP output buffers. This might be caused by an overloaded network. The session is continued.	
CE12	Message length data to be sent to ws_id is larger than the maximum allowed. An application tried to send more data than the maximum allowed. The message was not sent.	
CE20	TCP/IP returned error data to the **recvfrom** function. EHCLIP cannot continue running.	Make sure that TCP/IP is operational.
CE30	A session with ws_id has closed. EHCLIP closed a session with ws_id when a segmented message send operation could not be completed.	Session re-establishment procedures are started.
CE32	A session with ws_id has closed. EHCLIP closed a session with ws_id because contact was lost.	Session re-establishment procedures are started.
CE40	The system detected a configuration error. A remote ws_id and an INET address do not match local configuration data. The session with ws_id is not established.	Check local the TCP/IP 'hosts' file or 'names' server definitions.

Table 22. EHCLIP return codes (continued)

Return Code	Explanation	Required Action
CE41	The system detected a configuration error. A remote workstation reported that the local ws_id and the INET address do not match its configuration data. The session with ws_id is not established.	Check the remote workstation TCP/IP 'hosts' file or 'names' server definitions.
CE50	A storage allocation request has failed.	Check the availability of storage.
CS01	A session has been established with workstation ws_id.	
CS02	Remote workstation ws_id has closed the session.	
CSND	The number of datagrams sent to workstation ws_id.	
CSNE	The number of times a message could not be sent because of lack of space in the retransmission table.	
CSNW	The number of times a message could not be sent because the send window was not sufficiently open.	
CSPF	Minimum percentage of free space in the retransmission table during EHCLIP activity.	
CSRD	The number of datagrams sent to workstation ws_id that required retransmission.	
SL02	A load parameter is not valid. The reported load parameter is not correct. EHCLIP cannot start.	Check the parameter.
SL03	A load parameter is unknown. One of the load parameters is not recognized. EHCLIP cannot start.	Check the parameter.
SO01 through SO15	The operating system returned error data. This is an internal error. EHCLIP cannot continue running.	Contact your service representative.
SX00 through SX16	This is an internal error. Either the function is ignored, or EHCLIP might terminate.	Contact your service representative.

LANDP link server

The following codes are placed in the log by the LANDP link server:

Table 23. LANDP link server return codes

Code	Explanation	Required Action
CL1 through **CL2**	A problem has been detected when handling a request from a remote client. The reason is indicated by the number associated with the return code: **0** A request from the client is already in progress. **8** There is not enough shared memory **other** OS/2 return code (even on Windows or Linux)	Contact your service representative.
CN1 through **CN4**	An error was detected by TCP/IP while trying to connect a link. The TCP/IP return code is shown.	Check that the remote EHCLINK server is active.
GH1	TCP/IP is unable to resolve the host name to an IP address. The TCP/IP “gethostbyname” return code is shown.	Check the link name on the EHCLINK loading parameter. Check your local TCP/IP HOSTS file, if used. Check the name resolution with the TCP/IP PING command.
IN1 through **IN7**	An operating system error occurred. The OS/2 return code is shown.	Reboot your computer. If the error persists, contact your service representative.
INP	There is a loading parameter error. The index of the bad parameter is shown. If it is larger than the number of parameters, there is a parameter consistency error.	Correct the EHCLINK loading statement and reload the server.
INa through **INe**	A TCP/IP error occurred. The TCP/IP return code is shown.	Make sure that TCP/IP is operational and configured correctly.
MX1	The maximum number of TCP/IP connections has been exceeded. The maximum is shown.	Reduce the usage.
RD1 through **RD3**	Error returned reading data from TCP/IP. The TCP/IP return code is shown.	Check that the remote EHCLINK server is active.

Table 23. LANDP link server return codes (continued)

Code	Explanation	Required Action
SD1	Error returned sending data to TCP/IP. The TCP/IP return code is shown.	Check that the remote EHCLINK server is active.

Local resource management server (EHCLRMGR)

The following codes are returned by the local resource manager. The local resource manager returns two types of codes: LAN router and server.

Refer to “LANDP global return codes” on page 150 for LAN router return codes. The following table describes the server codes returned by the local resource management server:

Table 24. Return codes from the local resource management server

Return Code	Causing Function	Explanation	Action Required
X'00000000'	Pending functions	The function was accepted. It is processed when the current listing has finished.	
X'00000000'	CC	The previous pending function was canceled. The CC function has been processed successfully.	
X'00000000'	Other functions	The function was processed. The reply area reflects the new status.	
Intervention required			
X'01004931' (**I1**)	Any	The resource in request `PARMLIST` is not defined.	Check customization. See also code L1 under “LANDP global return codes” on page 150.
X'01004932' (**I2**)	Any	The resource in request `PARMLIST` is not loaded.	Check the initialization procedure. See also code L5 under “LANDP global return codes” on page 150.
Programming errors			
X'01005031' (**P1**)	Any	The function code is not valid.	
X'01005032' (**P2**)	Any	The length of request or reply `PARMLIST` or `DATA` is not valid for the function code.	
X'01005033' (**P3**)	Any	The request `PARMLIST` fields are not valid: the format is not valid or the data is unknown.	• Make sure the range in fields is valid. • Make sure the host or application identifiers are those assigned at customization time.

Table 24. Return codes from the local resource management server (continued)

Return Code	Causing Function	Explanation	Action Required
X'01005034' (**P4**)	Any	The request DATA fields are not valid: the format is not valid or the data is unknown.	Try the following: • Make sure the values in fields are valid. • Make sure the resource names have been assigned to 'PRTMGR' at customization time.
X'01005035' (**P5**)	Any, except GS, CM	The function was not accepted because status is incompatible with the function. The function was not processed.	Sometimes the current resource status is already the one requested by the function. Check the application program logic. The EC return code applies to all, except X.25 communication.
X'01005036' (**P6**)	Any, except CC, EC, EL, GS, SA, SE	The function was not accepted because a previous function is pending to be processed. The function is not processed.	Check the application program logic.
Device errors			
X'01005531' (**U1**)	Any	An irrecoverable local error has occurred. The function was not processed.	Restart the workstation. See also code L6 under "LANDP global return codes" on page 150.
X'01005532' (**U2**)	Any	An EHCLRMGR program error has occurred. The function was not processed.	Contact a support representative. See also the codes under "LANDP global return codes" on page 150, excluding OK, L1, L5, and L6.
X'01005533' (**U3**)	Any	A resource error has occurred. The function was not processed. A function call from the local resource manager to the requested resources failed. This error occurs when the local resource manager return code is P1 or P2, or when the replied DATA length is greater than the reply DATA length.	Contact a support representative.

Table 24. Return codes from the local resource management server (continued)

Return Code	Causing Function	Explanation	Action Required
X'01005534' (**U4**)	Any	A resource error has occurred. The function was not processed. A function call from the local resource manager to the requested resources failed. This error occurs when the requested resource return code is P3.	Contact a support representative.
X'01005535' (**U5**)	CA, CM	There is a disk error or a file was not found. An error occurred while trying to update the file OPE.CFG. The CA and CM functions were processed, but not in the fixed mode. This error occurs when the requested resource return codes are P4, P5, or P6.	Make sure that the file OPE.CFG exists, that the disk drive is ready, and that no I/O errors exist.
X'01005536' (**U6**)	Any	A resource error has occurred. The function was not processed. A function call from the local resource manager to the required resources failed. This error occurs with any of the requested resource return codes, excluding OK, P1, P2, P3, P4, P5, and P6.	Contact a support representative.

Magnetic stripe reader/encoder server (MSRE47##)

The magnetic stripe reader/encoder (MSR/E) server supports the following devices:

- IBM 4717 Magnetic Stripe Reader
- IBM 4717 Magnetic Stripe Reader/Encoder
- IBM 4777 Magnetic Stripe Reader
- IBM 4777 Magnetic Stripe Reader/Encoder

Note: This server also supports the MSR/E component of the IBM 4778 PIN Pad Magnetic Stripe Reader. Refer to for a list of PIN pad return codes.

The following codes are returned by the magnetic stripe reader/encoder (MSR/E) server:

Table 25. Return codes from the MSR/E server

Return Code	Causing Function	Explanation	Action Required
X'00000000'	CH, CL, DV, EC, KL, OP, RD	A synchronous function was performed.	None.
X'00000000'	AR, AT, WR, WT	An asynchronous function was started.	None.
Intervention required			
X'01004931' (**I1**)	Any	The device is not online or it is in power-on-reset sequence.	
X'01004932' (**I2**)	AR, CH, OP, RD, WR	The device cable is broken or the device is not attached.	Check the connection cable..
X'01004933' (**I3**)	OP	This personal computer system unit model is not supported by the MSR/E device.	Refer to the *LANDP Introduction and Planning* book for information about selecting hardware components and “Bibliography” on page 295 for publications about specific MSR/E devices.
X'01004935' (**I5**)	CH, RD	A previous function is in process.	Try again after the function finishes processing.
X'01004938' (**I8**)	OP	There are no more handles.	
X'01004939' (**I9**)	Any	The resource is already assigned.	
X'01004941' (**IA**)	OP	The device driver name is not correct, the device driver is not installed, or there is a device driver error.	
Programming errors			

Table 25. Return codes from the MSR/E server (continued)

Return Code	Causing Function	Explanation	Action Required
X'01005031' (**P1**)		The function is not supported.	Check the request format and parameters.
X'01005032' (**P2**)	Any	A length is not correct.	Check the data length parameters.
X'01005033' (**P3**)	AR, AT, CH, CL, DV, EC, KL, RD, WR, WT	A previous open is missing.	
X'01005034' (**P4**)	AT, DV, WR	A parameter is not valid.	Check the contents of `DATA`.
X'01005036' (**P6**)	AR, AT, CH, WR, WT	A character is not valid. Data passed does not agree with the parameters loaded in the MSR/E.	
X'01005037' (**P7**)	CH, RD	There is no data pending to pass to the application, or there is no status pending to pass to the application.	
X'01005038' (**P8**)	AR, AT, CH, CL, DV, EC, RD, WR, WT	A previous function is in progress.	Cancel the function or wait for it to finish processing.
X'0100505A' (**PZ**)	Any	The request or reply `PARMLIST` length is less than X'001A' (26 bytes).	
Device errors			
X'01005531' (**U1**)	Any	A general failure has occurred.	.
X'01005532' (**U2**)	Any	There is no response from the MSR/E device.	Check the hardware installation. If the problem persists, obtain service.
X'01005533' (**U3**)	Any	A transmission error has occurred, or the MSR/E device is attached to the wrong connector or adapter.	Check the hardware installation. If the problem persists, obtain service.
X'01005534' (**U4**)	Any	A device self-test failure or a DOS operating system error has occurred.	Check the hardware installation. If the problem persists, obtain service.
X'01005535' (**U5**)	Any	An MSR/E device internal error has occurred.	Run the personal computer system and MSR/E device diagnostic programs, and then follow the recommended action.

Table 25. Return codes from the MSR/E server (continued)

Return Code	Causing Function	Explanation	Action Required
X'01005536' (**U6**)	OP	The device driver name is not correct, the device driver is not installed, or there is a device driver error.	

MQSeries Link server (EHCMQ##)

The following return codes are returned by the MQSeries Link server. The list is followed by **General actions** that apply to many of the codes, as indicated in the list entries.

Table 26. Return codes from the MQSeries Link server

Return Code	Causing Function	Explanation	Action Required
X'0000'	Any	Successful operation.	None.
X'4248' (**BH**)	CQ, GQ, PQ	The wrong Qhandle value is input to CQ, GQ, or PQ. A Qhandle value of 0, passed to CQ, will cause this return code. This return code is also generated for GQ and PQ when the Qhandle either does not exist, or is allocated for use with a different queue or a different user.	Review the application code and modify as required.
X'4342' (**CB**)	Any	Connection Broken Error. This return code is generated when the LANDP MQSeries Link server loses its connection to the MQSeries Queue Manager. All MQSeries Link Server API calls will fail. The MQSeries reason code might give further details.	Check the status of the MQSeries Queue Manager. The application program should issue function CS to shutdown the session. Function CS will also generate the return code CB.
X'4351' (**CQ**)	BT, CP, ET, GQ, P1, PQ, RB	Connect Queue Error. The call to MQCONN gave a bad reason code. All following MQSeries Link server API calls will fail. The MQSeries reason code might give further details about the error.	Check the status of the MQSeries Queue Manager. The application should call function CS to shut down the session. However, if there is a Connect Queue Error, the function CS will issue the return code CB.
X'4451' (**DQ**)	ES, EJ	The call to MQDISC gave a bad reason code.	See **General actions** at the end of the table.
X'4552' (**ER**)	Any	There was a general failure.	See **General actions** at the end of the table.
X'4745' (**GE**)	GQ	The call to MQGET gave a bad reason code.	Check the MQSeries reason code found in the reply PARMLIST.

Table 26. Return codes from the MQSeries Link server (continued)

Return Code	Causing Function	Explanation	Action Required
X'4757' (**GW**)	GQ	When MQSeries generates a warning return code for MQGET, the LANDP MQSeries Link server returns GW. GW might also be returned when a field from an MQSeries structure cannot be processed (for example, when the message being retrieved has a reply queue name that is longer than 24 characters, that name is truncated when it is placed in the GQ Reply Parmlist). After GW is returned, the message is retrieved successfully.	Check the application log for more details.
X'4D58' (**MX**)	Any	The Maximum number of sessions has been reached.	Increase the Total number of permitted sessions by use of the loader /T parameter. If this is already at the maximum, further sessions could be catered for by configuring & customizing another MQSeries Link server.
X'4E4D' (**NM**)	GQ	No Message was returned by the MQGET.	This might not be an error. If it is, see **General actions** at the end of the table.
X'4F50' (**OP**)	GQ, PQ, P1	The PARMLIST options are incorrect.	Change the program.
X'4F51' (**OQ**)	GQ, PQ	The call to MQOPEN gave a bad reason code.	See **General actions** at end of list.
X'5031' (**P1**)		The function called is not supported by this server.	Check the request format and parameters.
X'5032' (**P2**)	Any	There is a length error.	Change the program.
X'5034' (**P4**)	Any	There is an error with the PARMLIST.	Change the program.
X'5045' (**PE**)	PQ, P1	The call to MQPUT gave a bad reason code.	See **General actions** at the end of the table.

Table 26. Return codes from the MQSeries Link server (continued)

Return Code	Causing Function	Explanation	Action Required
X'5342' (**SB**)	Any	The MQSeries Link server is already busy processing a previous request from the same session. If the MQSeries Link server receives an RMTREQ NoWait request, it must receive a GETRPLY before the next RMTREQ.	Change the program.
X'5351' (**SQ**)	CQ	The call to MQCLOSE gave a bad reason code.	See **General actions** at the end of the table.
X'5443' (**TC**)	Any	Thread Communication Error. The LANDP MQSeries Link server fails to launch a new thread, or a thread has been found in an unexpected state. The failure to launch a thread might be associated with system stress problems.	Check the application log for more details. If the thread is in a bad state, report the problem to your IBM service representative.
X'5445' (**TE**)	CP, ET	The call to MQCMIT gave a bad reason code.	See **General actions** at the end of the table.

General actions: Often, a return code from the MQSeries Link server is the result of a bad response from an MQSeries API call. When this occurs, check the MQSeries reason code in the Reply Parmlist against the MQSeries documentation. If logging is active, the MQSeries Link server's log file contains further details.

Native X.25 server (X25NAT##)

The following codes are returned by the native X.25 server (**LANDP for DOS and LANDP for OS/2 only**):

Table 27. Return codes from the native X.25 server

Return Code	Causing Function	Explanation	Action Required
X'00000000'	Any	Successful operation.	None.
Intervention required			
X'01004931' (**I1**)	RH, SH	No connection is established.	Check the application program's logic, the connection status, and the equipment.
X'01004932' (**I2**)	CN, RH, RL, SH	The modem is powered off or the communication adapter or cabling are malfunctioning.	Check the equipment. LANDP for OS/2: Check the Communications Server for OS/2 status.
X'01004933' (**I3**)	CN	No circuits are available.	
Programming errors			
X'01005030' (**P0**)	Any	LANDP for DOS: The process ID is not correct. The most probable cause is that a different application program has requested the OP or CN function. LANDP for OS/2: This error is returned when the application program attempts a function before an OP function request. It occurs at the start of processing, or when the LANDP session is being used by another application program.	
X'01005031' (**P1**)		The function is not supported.	Check the request format and parameters.

Table 27. Return codes from the native X.25 server (continued)

Return Code	Causing Function	Explanation	Action Required
X'01005032' (**P2**)	Any	There is a length error. Either • data lengths are not correct for the function or • the data length for the RH function is not large enough to contain all the data. The data has been truncated to the specified length. The length specified in the CPRB is insufficient for a message from the host. The message has been truncated to the specified length.	Correct the program.
X'01005033' (**P3**)	RH	There are no pending messages.	Check the request format and parameters.
X'01005033' (**P3**)	SH	The line is busy or the input/output buffers are full: the SH function is rejected.	Try the following: • Check the program logic and read queued messages before sending more. • Delay until other programs or the communication adapter have freed some buffers. • Allocate additional communication data link buffers.
X'01005034' (**P4**)	CN	A connection is not possible. A call message is incomplete.	
X'01005035' (**P5**)	CN	A previous CN is in progress, but a circuit is not yet established.	See **General actions** at the end of the table.
X'01005035' (**P5**)	RL	No previous CN was requested, an RL function is in progress, or the RL function cannot be accepted now.	Try again.
X'01005036' (**P6**)	SH	A message sent is accepted with an indication that the input buffer contains messages to be read.	Check the program. All answers should be read before sending new messages.

Table 27. Return codes from the native X.25 server (continued)

Return Code	Causing Function	Explanation	Action Required
X'01005037' (**P7**)	CN	A CN function has been requested for an incoming circuit, but no call has been received for this session.	On an incoming circuit, a CN function should only be requested after an RH function with flag1 set to "{" has been received.
X'01005038' (**P8**)	CN, DC	The circuit was previously established.	
X'01005039' (**P9**)	Any	The command was rejected. The session identifier specified in the request `PARMLIST` is not valid.	Check VCH.CFG, PIPE.CFG, and the configuration parameters.
X'0100505A' (**PZ**)	Any	The request or reply `PARMLIST` length is less than X'001A' (26 bytes).	
Device errors			
X'01005534' (**U4**)	CN, RH, RL, SH	There is a communication adapter malfunction.	
X'01005536' (**U6**)	Any	A software problem was detected. The wrong data was defined in a call packet of the VCM.CFG file or in a DC (X.25) function call.	
X'01005538' (**U8**)	Any	LANDP for DOS: The X25DLC.EXE program is not loaded. LANDP for OS/2: Either Communication Server for OS/2 or a link is not started.	
X'01005539' (**U9**)	Any	An OS/2 error has occurred. There is a lack of resources or an error in the operating system.	

Clear and reset packets

Native X.25 clear and reset packets can be generated and sent to the network by X.25 adapter support, X.25 coprocessor support, or the LANDP server.

Codes used in clear or reset packets sent by the X.25 adapter are explained in the *X.25 Adapter User's Guide*. The cause code is always 00.

Codes used in clear or reset packets sent by the X.25 coprocessor are processed in accordance with Telecommunication Standardization Sector (TSS) standards. [1]

Codes used in clear and reset packets sent by the LANDP server are as follows:

X'59' Data received before qualified logical link control (QLLC) connection established.

X'E1' Buffer pool empty: probable lost data.

X'E2' Connection busy: working with somebody else.

X'E3' Connection not accepting incoming calls.

X'E4' Application program name unknown.

X'E5' Call cleared from application program.

X'E6' Buffer full in local personal computer: session terminated.

X'E9' Application program does not accept calls.

X'EA' Reset received in an SVC.

The cause code is always set to zero.

1. Formerly Comite Consultatif International Telegraphique et Telephonique or International Consultative Committee on Telegraph and Telephone (CCIT).

Object post box server (OPBS)

The codes that are returned by the object post box server are listed in the following table.

Note: Messages displayed by this server are listed under “Batch machine facility, object post box server, and MAIL program” on page 228.

Table 28. Return codes from the object post box server

Return Code	Causing Function	Explanation	Action Required
X'00000000'	BO, LI, LO, RD, RM, SM, WM	The function was performed.	None.
X'01004331' (**C1**)	BO, LI, LO, RD, RM, SM, WM	The request parameter length is not correct.	
X'01004332' (**C2**)	BO, LI, LO, RD, RM, SM, WM	The request data length is not correct.	
X'01004333' (**C3**)	BO, LI, LO, RD, RM, SM, WM	A protocol error has occurred.	
X'01004334' (**C4**)	BO, LI, LO, RD, RM, SM, WM	The reply data length is not correct.	
X'01004335' (**C5**)	BO, LI, LO, RD, RM, SM, WM	The reply parameter length is not correct.	
X'01004336' (**C6**)		The function code is not valid.	
X'01004544' (**ED**)	LI, LO, RM, WM	The transaction closed successfully. There is no more data.	
X'01005031' (**P1**)	BO, LI, LO, RD, RM, SM, WM	The initialization process was not performed.	Try again later.
X'01005032' (**P2**)	SM	The destination user ID is not valid.	
X'01005033' (**P3**)	RM	A message is not available.	
X'01005034' (**P4**)	BO, LI, LO, RD, RM, SM, WM	The requestor user ID is not valid.	
X'01005035' (**P5**)	RM	The message is locked.	
X'01005231' (**R1**)	BO, LI, LO, RD, RM, SM, WM	There are no available resources to process the function now.	Free resources or try again later.

Table 28. Return codes from the object post box server (continued)

Return Code	Causing Function	Explanation	Action Required
X'01005531' (**U1**)	BO, LI, LO, RD, RM, SM, WM	An unexpected response was received from SHFILE##.	
X'01005532' (**U2**)	BO, LI, LO, RD, RM, SM, WM	An unexpected response was received from SMGR.	

ODBC query server (EHCODB##)

The codes that might be returned by the ODBC query server are listed in the following table.

Note: If you specify the /EL parameter in the LOADER command for EHCODB## (see the *LANDP Installation and Customization* book), the ODBC query server displays information messages on the Windows event log.

Table 29. Return codes from the ODBC query server

Return Code	Causing Function	Explanation	Action Required
X'00'	Any	The operation finished successfully.	None.
AD	Any	The specified function or operator is not valid.	Check the application.
DQ	Any	The requested function needs log in `Query`.	Check the program. Log in *Query* mode with the OQ function.
ED	Query	The end of the data rows was reached.	None (information).
EE	Query	The function RI could not obtain the data successfully.	Make sure that you are connected to the data source and retry.
FD	Any	The server has not been started.	Check the program or issue the GF function.
IE	Any	An internal error has occurred.	Contact a support representative for assistance. Save traces and EHCLANDP.TRP.
IQ	Query	The query handle is not valid, or there are no more handles left.	Check the program.
ME	Any	A memory allocation error has occurred: there is not enough memory.	Add memory to the server machine, or check the loading parameters and the LAN configuration.
NC	Any	The server is not closed: servicing is started.	None (information).
ND	Any	Data source, user ID, or password is incorrect, or the data source is not active.	Check that the data source, user ID, and password are correct, and retry.
NQ	Query	There is no open query for the requested handle.	Check the program.

Table 29. Return codes from the ODBC query server (continued)

Return Code	Causing Function	Explanation	Action Required
NS	Any	Either there are no more sessions for one of the client workstations, or the session handle is not valid.	Customize with additional sessions by increasing the EHCODB## loading parameter /S, or check the application.
NT	Any	The requestor PC-ID is not customized to be serviced.	Check the LAN configuration.
PE	Query	Parameters are expected. The statement contains **'?'** (parameter markers), but not enough were pre-fetched.	Check the program and use the SP function to pre-fetch parameters.
QE	Query	A query error has occurred.	Try the following: • Check the code and message in the data area. • Check the program.
SE	Any	A thread spawning error has occurred: the server cannot start a worker thread.	Check the EHCODB## loading parameters, /T and /MT.
TE	Any	Timeout occurred while trying to process the request. The request has been cancelled, therefore a rollback may be needed.	Retry. If the error persists, increase the EHCODB## loading parameter /W, or increase ODBC/DBMS throughput.
TL	Any	The length of the passed data or parameters is not valid.	Check the program.
YP	Any	GF function was already requested.	None (information).
YQ	Query	Already logged in query mode.	None (information).

PIN pad server (PINP47##)

The pesonal identification number (PIN) pad server supports the following devices:

- IBM 4718 PIN Key Pad
- IBM 4778 PIN Pad Magnetic Stripe Reader

Note: The PIN pad server also supports the magnetic stripe reader/encoder component of the 4778 device. It issues the same return codes as the MSR/E server, except for those codes caused by encoding functions, which are not supported by the 4778 PIN pad MSR device. Refer to for a list of MSR/E return codes.

The following codes are returned by the personal identification number (PIN) pad server:

Table 30. Return codes from the PIN pad server

Return Code	Causing Function	Explanation	Action Required
X'00000000'	CL, DV, EC, GA, IV, OP, IV, KL, LM, LK, LP, OP, RD, RN, VA, WD	A synchronous function was performed.	None.
X'00000000'	AR, AT	An asynchronous function was started.	None
Intervention required			
X'01004931' (**I1**)	Any	The device is not online or it is in power-on-reset sequence.	
X'01004932' (**I2**)	AR, OP, RD	The device cable is broken or the device is not attached.	Check the connection cable.
X'01004933' (**I3**)	AR, GA, IV, LM, LK, LP, VA	A referenced key is not loaded.	
X'01004934' (**I4**)	RD	The PIN is not valid.	
X'01004935' (**I5**)	RD	A previous function has not completed.	Try again.
X'01004936' (**I6**)	RD, AR(option M)	A button that is not valid was pressed.	
X'01004937' (**I7**)	AR (Options C and E)	This function cannot be used in clear mode.	Enter or load the master key in encrypted mode.
X'01004938' (**I8**)	OP	There are no more handles.	
X'01004939' (**I9**)	Any	The resource is assigned to another personal computer.	

Table 30. Return codes from the PIN pad server (continued)

Return Code	Causing Function	Explanation	Action Required
X'01004941' (**IA**)	OP	Either the device driver name is not correct, the device driver is not installed, or there is a device driver error.	
Programming errors			
X'01005031' (**P1**)		The function is not supported.	Check the request format and parameters.
X'01005032' (**P2**)	Any	A length is not correct.	Check the data length parameters.
X'01005033' (**P3**)	AR, AT, CL, DV, EC, GA, IV, KL, LM, LK, LP, RD, RN, VA, WD	A previous open is missing.	
X'01005034' (**P4**)	AR, DV, GA, IV, LM, LK, LP, VA	A flag is not valid.	Check the `PARMLIST` flags.
X'01005035' (**P5**)	AR, GA, LK, LM, VA	The key parity is not valid.	Correct the key.
X'01005036' (**P6**)	AR	A magnetic stripe reader track was not selected.	
X'01005036' (**P6**)	LP	A decimalization table is not valid.	Check the contents of `DATA`.
X'01005036' (**P6**)	VA	The message authentication code (MAC) is not valid.	Correct the contents of `DATA`.
X'01005037' (**P7**)	RD	There is no data pending to pass to the application.	
X'01005038' (**P8**)	AR, AT, CL, DV, GA, IV, LM, LK, LP, RN, VA	A previous function is in process.	Cancel the function or wait until it finishes processing.
X'01005039' (**P9**)	AR, AT, DV, EC, OP, RD, WD	The function is not supported. Magnetic stripe support is not attached or loaded, or a liquid crystal display (LCD) is not available.	
X'01005036' (**PZ**)	Any	The request or reply `PARMLIST` length is less than X'001A' (26 bytes).	
Device errors			
X'01005531' (**U1**)	Any	A general failure has occurred.	

Table 30. Return codes from the PIN pad server (continued)

Return Code	Causing Function	Explanation	Action Required
X'01005532' (**U2**)	Any	There is no response from the PIN pad device.	Check the hardware installation. If the problem persists, obtain service.
X'01005533' (**U3**)	Any	A transmission error has occurred, or the PIN pad device is attached to the wrong connector or adapter.	Check the hardware installation. If the problem persists, obtain service.
X'01005534' (**U4**)	Any	A device self-test failure or DOS operating system error has occurred.	Check the hardware installation. If the problem persists, obtain service.
X'01005535' (**U5**)	AR, IV, KL, LM, LK, LP, RD, RN	A PIN pad device internal error has occurred.	Run the personal computer system and PIN pad device diagnostic programs, and then follow the recommended action.
X'01005536' (**U6**)	OP	The device driver name is not correct, the device driver is not installed, or there is a device driver installation error.	
X'01005537' (**U7**)	AR, LM	The operation mode is not valid.	Correct the operation mode.

Printer manager server (PRTMGR)

The following codes are returned by the printer manager server:

Table 31. Return codes from the printer manager server

Return Code	Causing Function	Explanation	Action Required
X'00000000'	Any	Successful operation.	None.
Intervention required			
X'01004939' (**I9**)	AC	The function was denied. The requested parallel printer port is in use by another requester.	Try again later.
Programming errors			
X'01005031' (**P1**)		The function is not supported.	Check the request format and parameters.
X'01005033' (**P3**)	RL	The function was ignored. The previous AC function for the same parallel printer port is missing.	
X'01005036' (**P6**)	AC, RL	The adapter for the requested parallel printer port is not installed.	
X'01005039' (**P9**)	AC, RL	The function was denied. The name in the resource origin field is not known by the printer manager server.	Correct the name and request the function again, or rerun the customization program and define the requester as a user of the printer manager server.
X'0100505A' (**PZ**)	Any	The request or reply `PARMLIST` length is less than X'001A' (26 bytes).	

Program-to-Program communications server (PPC##)

The following codes are returned by the program-to-program communications (PPC) server:

Table 32. Return codes from the program-to-program communications (PPC) server

Return Code	Causing Function	Explanation	Action Required
X'00000000'	Any	Successful operation.	None.
Programming errors			
X'01005030' (**P0**)	Any, except OP	This error occurs when the transaction program requests any other function before an OP function. It occurs at the beginning or when the LANDP conversation has been released for some reason. The error also occurs if the transaction program calls PPC with an invalid conversation event/handle in the request parameter.	The program must request an OP function or correct the application program.
X'01005031' (**P1**)	Any	Either the function is not supported, or the function code is not correct, or the combination of function code, parameters, and data is not consistent or supported.	Correct the error in the program.
X'01005032' (**P2**)	Any	Data lengths are not correct for the specific function.	Correct the program.
X'01005033' (**P3**)	RD	There are no messages to read.	
X'01005034' (**P4**)	RD	A previously read message requires a response from the application program. This occurs when the transaction program requests an RD function with flag5=R. This means that the transaction program manages the sending of responses. Because the PPC server requests this response, the program must provide a positive or negative response.	
X'01005035' (**P5**)	Any	An OP function is in progress.	

Table 32. Return codes from the program-to-program communications (PPC) server (continued)

Return Code	Causing Function	Explanation	Action Required
X'01005036' (**P6**)	SD	The function was accepted and indicates that there is a message to read. This is provided as information for the application program, which in turn can issue an RD function to read this message.	None (information).
X'01005037' (**P7**)	CL, SD	The system is unable to send data because of a communication protocol error. The error might be caused by the following : • Trying to send data in 'receive' status • A response pending to be sent • Trying to send a response, but no response is pending	Check the transaction program logic and conversation status.
X'01005038' (**P8**)	OP	The function request was previously requested. A conversation is already established.	
X'01005039' (**P9**)	OP	The LU, mode_name, or tp_name identifier is not valid.	Check the Communications Server for OS/2, Windows, or Microsoft SNA Server, configuration file.
X'01005039' (**P9**)	RD, SD, CL, GS	The transaction program calls PPC without specifying a conversation event/handle.	Check the transaction program.
X'01005042' (**PB**)	Any	A request that is in progress has not replied.	
X'01005044' (**PD**)	Any	The PPC server has no data buffers to send data to, or receive data from, the Communications Server for OS/2 Warp or Windows, or the Microsoft SNA Server.	
X'0100505A' (**PZ**)	Any	A parameter length is not valid.	
Device errors			

Table 32. Return codes from the program-to-program communications (PPC) server (continued)

Return Code	Causing Function	Explanation	Action Required
X'01005531' (**U1**)	CL, OP, RD, SD	A conversation was not allocated for status reasons.	Check the transaction program logic, session status, conversation status, and equipment.
X'01005532' (**U2**)	OP	Conversation not allocated, try again later.	It might be possible to allocate the conversation by repeating the OP function after a suitable delay. (The cause of this error might, for example, be caused by a lack of free sessions and trying again later might find one free.) Limit the number of retries, because the allocation request might never succeed. Limit the frequency of retries to avoid network congestion.
X'01005538' (**U8**)	Any	Communications Server for OS/2 Warp or Windows, or the Microsoft SNA Server, is not started.	
X'01005539' (**U9**)	Any	An operating system error has occurred. It might be caused by a lack of system resources.	

Query server (EHCSQL##)

The following codes are returned by the query server:

Table 33. Return codes from the query server

Return Code	Mode	Explanation	Action Required
X'0'	Any	The operation finished successfully.	None.
(**AD**)	Any	The specified function or operator is not valid.	Check the application.
(**BL**)	'SHFILE##'	The database description (DBD) is locked.	Try again later.
(**DH**)	'SHFILE##'	A database description (DBD) hold is needed for this operation. Obtain it by requesting the EX function.	Check the program.
(**DJ**)	'SHFILE##'	A record lock is needed for this operation. Obtain the lock by requesting the functions HN, HP, HU, or KN, KP, KU.	Check the program.
(**DQ**)	Any	The requested function needs log in `Query`.	Check the program. Log in *Query* mode with the OQ function.
(**ED**)	Query	The end of data rows was reached.	None (information).
(**EE**)	Query	A structured query language (SQL) command error has occurred.	Try the following: • Check the code and message in the data area. • Check the program.
(**EP**)	'SHFILE##'	A primary error has occurred.	Try the following: • Check the SQL error code in the data area. • Check the program.
(**FD**)	Any	The server has not been started.	Check the program or issue the GF function.
(**GB**)	'SHFILE##'	The end of the record list was reached. There are no more records.	None (information).
(**GE**)	'SHFILE##'	No such record was found in GU, HU.	None (information).
(**IE**)	Any	An internal error has occurred.	Contact a support representative for assistance. Save traces.
(**II**)	'SHFILE##'	There is a unique index repeated value for IS or RP.	None (information).

Table 33. Return codes from the query server (continued)

Return Code	Mode	Explanation	Action Required
(**IQ**)	Query	The query handle is not valid or there are no more handles left.	Check the program.
(**LI**)	Any	Logging has been disabled.	Check the loading parameters.
(**ME**)	Any	A memory allocation error has occurred: there is not enough memory.	Add memory to the server machine or check the loading parameters and the LAN configuration.
(**NA**)	'SHFILE##'	This function needs the transaction opened.	Check the program.
(**NC**)	Any	The server is not closed: servicing is started.	None (information).
(**NO**)	Any	The requested function needs log in 'SHFILE##' mode.	Check the program. Log in 'SHFILE##' mode with the OO function.
(**NP**)	'SHFILE##'	The following might be true: • The program control block (PCB) is not valid or a PCB name was not supplied. • The table or column name supplied for a new PCB is not valid.	Check the program.
(**NQ**)	Query	There is no open query for the requested handle.	Check the program.
(**NS**)	Any	There are no more sessions for one of the client workstations or the session handle is not valid.	Customize with additional sessions by increasing the EHCSQL## loading parameter /S, or check the application.
(**NT**)	Any	The requestor PC-ID is not customized to be serviced.	Check the LAN configuration.
(**OC**)	'SHFILE##'	The maximum number of concurrent requests has been exceeded.	Try again later. If code OC is returned repeatedly, increase the EHCSQL## loading parameter /T.
(**OP**)	Any	An internal error has occurred.	Open pending. Deferred open mode. Issue `OpenDB2`.

Table 33. Return codes from the query server (continued)

Return Code	Mode	Explanation	Action Required
(**PE**)	'SHFILE##'	There are existing program control blocks (PCBs). The function requires erasing all PCB definitions that refer to the same database description (DBD).	Erase all the related PCBs, and then try again.
(**PE**)	Query	Parameters are expected. The statement contains **'?'** (parameter markers), but not enough were pre-fetched.	Check the program and use the SP function to pre-fetch parameters.
(**PL**)	Any	The log is playing.	No service can be issued while restoring a database.
(**QE**)	Query	A query error has occurred.	Try the following: • Check the code and message in the data area. • Check the program.
(**QI**)	'SHFILE##'	The qualifier for index creation or deletion is not valid.	Check the program.
(**RE**)	'SHFILE##'	Resources are exhausted.	Save the traces, and contact a support representative for assistance.
(**RL**)	'SHFILE##'	The resource is locked. Time-out expired without return. Statement interrupted.	Try again later. If the code RL is returned repeatedly, parallel processes might be locking the same data. In this case, to improve performance, modify the EHCSQL## loading parameters. Reduce the /T and /P parameters, keeping the /T value one more than the /P value.
(**SE**)	Any	A thread spawning error has occurred; the server cannot start a subprocess.	Check the **OS/2 THREADS** parameter.
(**TE**)	Any	The request was queued by the system.	Perform an RW function to avoid processing the request. If code TE is returned repeatedly, increase the EHCSQL## loading parameter /P.

Table 33. Return codes from the query server (continued)

Return Code	Mode	Explanation	Action Required
(**TI**)	'SHFILE##'	The type is not valid. The type of the field specified in the DD statement is not valid or not supported.	Try the following: • Check the program. • Verify the DD function input block.
(**TL**)	Any	The length of the passed data or parameters is not valid.	Check the program.
(**TO**)	'SHFILE##'	The transaction is open. The function requires a closed transaction.	Check the program.
(**YA**)	'SHFILE##'	The transaction is already open.	None (information).
(**YO**)	'SHFILE##'	Already opened in online mode ('SHFILE##')	None (information).
(**YP**)	Any	GF function was already requested.	None (information).
(**YQ**)	Query	Already logged in query mode.	None (information).

Query server utility programs

When using the query server utility programs, error codes are returned by either the query server or the query server utility programs. If the codes are returned by the query server, the corresponding server function and return code are displayed.

The following codes are returned by the query server utility programs:

Table 34. Return codes from the query server utility programs

Return code	Explanation	Required Action
X'**90**' (144)	The command line parameters contain a syntax error.	Change the command line.
X'91' (145)	A parameter value is out of range.	Change the parameter value.
X'9D' (157)	An error occurred while opening a log file. The log file could not be opened.	Make sure the access path exists and the log file is not in use by another process.
X'9E' (158)	There is an error in the log format type. The existing log file does not have a correct format.	Generate a correct file or delete the existing log file.
X'9F' (159)	A TYPELOG2 program error occurred while reading a log file record.	Contact a support representative.
X'A7' (167)	An error occurred while calling an OS/2 database utility program.	Check the system software installation.
X'A8' (168)	This is an unexpected return code from the query server.	Check the LANDP for OS/2 installation and server loading parameters.
X'A9' (169)	A user interrupted the process. The database recovery process did not finish because of operator intervention.	None.

Remote change management services (RCMS)

The following codes are returned by remote change management services (RCMS):

Table 35. Return codes from RCMS

Return Code	Explanation	Required Action
X'**082FF001**'	A logical block is out of range for recovery with the RETRIEVE command.	
X'**082FF004**'	No status is available.	
X'**0833F001**'	A logical block is out of range for recovery with the ADD or REPLACE DATA command.	
X'**328A0108**'	Unknown command.	
X'**32B00001**'	This is an operating system error for the ADD DATA command.	
X'**32B00002**'	This is a cryptographic error for the ADD DATA command.	
X'**32B00202**'	The ADD DATA command was rejected because the file name already exists.	
X'**32B10001**'	This is an operating system error for the REPLACE DATA command.	
X'**32B10002**'	This is a cryptographic error for the REPLACE DATA command.	
X'**32B10101**'	This is a coding or critical error	
X'**32B20001**'	This is an operating system error for the DELETE command.	
X'**32B20002**'	This is a cryptographic error for the DELETE command.	
X'**32B20104**'	'Delete' file was rejected. The file does not exist or the path cannot be found.	
X'**32B20204**'	'Delete' file is not authorized.	
X'**32B50001**'	This is an operating system error for the RETRIEVE command.	
X'**32B50002**'	This is a cryptographic error for the RETRIEVE command.	
X'**32B50003**'	'Retrieve' names was rejected because the directory is empty.	

Table 35. Return codes from RCMS (continued)

Return Code	Explanation	Required Action
X'**32B50201**'	'Retrieve' file was rejected. The file does not exist or no path was found.	
X'**32B60001**'	This is an operating system error for the RETRIEVE BY CATALOG command.	
X'**32B60002**'	This is a cryptographic error for the RETRIEVE BY CATALOG command.	
X'**32B60105**'	The RETRIEVE BY CATALOG was rejected. There is no file name in the specified catalog.	
X'**32B60201**'	The RETRIEVE BY CATALOG was rejected because the catalog cannot be found.	
X'**32B7001**'	This is an operating system error for the CLIST command.	
X'**32B7002**'	This is a cryptographic error for CLIST command.	
X'**32B7003**'	The 'CLIST' file is too big or run # overflow.	
X'**32B7004**'	The RCMS.ACK file cannot be accessed.	
X'**32B7005**'	The CLIST processing failed at the node.	
X'**32B7007**'	The 'CLIST' was executed but COMMAND.COM space was not recovered.	
X'**32B8001**'	This is an operating system error for the SEND MSG command.	
X'**32B80002**'	This is a cryptographic error for the SEND MSG command.	
X'**32B80003**'	Phase was not found.	
X'**32B80004**'	This is a system manager error for the SEND MSG command.	
X'**32B90001**'	This is an operating system error for the QUERY comm	
X'**32B90002**'	This is a cryptographic error for the QUERY command.	
X'**32B90003**'	Not all the acknowledge characters could be deleted for the QUERY command.	

Table 35. Return codes from RCMS (continued)

Return Code	Explanation	Required Action
X'**32BA0001**'	An INITSELF contents error occurred while releasing a held phase.	
X'**32BA0002**'	An operating system error occurred while updating a plan details file.	
X'**32BA0003**'	An operating system error occurred while getting a phase to process. Held phases remote release stopped.	
X'**32BA0004**'	An operating system error occurred while updating a plan details file and getting a phase to process. Held phases remote release stopped.	
X'**32BA0005**'	A translation error occurred while processing a plan details file record. Held phases remote release stopped.	
X'**32BA0006**'	An operating system error occurred while updating a plan details file and a translation error occurred while processing a plan details file record. Held phases remote release stopped.	
X'**32BA0007**'	An operating system error occurred while getting a phase to process, and the phase could not be found. Held phases remote release stopped.	
X'**32BA0008**'	A translation error occurred while processing a plan details file record, and the phase could not be found. Held phases remote release stopped.	
X'**32BB0001**'	This is a translation error.	
X'**32E90002**'	The cryptographic process failed and first-in-chain (FIC) could not be decrypted to get the command.	
X'**32E90201**'	The RCMS.LNF file cannot be found.	
X'**32E90202**'	The logical name is not valid.	

Table 35. Return codes from RCMS (continued)

Return Code	Explanation	Required Action
X'**32E90203**'	A negative response was received while sending data.	
X'**32E90204**'	A cancel request was received while receiving data.	
X'**32E90205**'	The protocol is not valid.	
X'**32E90206**'	The command ended because the session has been lost. RCMS cannot determine the cause of the session loss.	Check LANDP, Communications Manager, or VTAM® traces for possible causes.

Shared-file servers (SHFILE##)

The following codes are returned by the shared-file server, the shared-file distributor server, or the shared-file replicator server:

Table 36. Return codes from shared-file servers (SHFILE ##)

Return Code	Causing Function	Explanation	Action Required
X'00000000'	Any	Successful operation.	None.
X'00000000'	QP	The program control block (PCB) information has been returned.	None.
X'00000000'	RH	The header information has been returned.	None.
X'01004144' (**AD**)		The function is not supported.	
X'01004144' (**AD**)	FU, GU, HU, KU	A search parameter is not correct or cannot be found.	
X'0100424C' (**BL**)	EX, HN, HP, HU, IS, KN, KP, KU	The shared file is blocked by another workstation operating in batch mode, or another application is holding the database description (DBD) in exclusive use.	Rollback is recommended.
X'01004345' (**CE**)	Any	Critical Error: The first byte of `DATA` contains the return code. **OS/2 and Windows**: If this error is returned by the Shared-file distributor server, 12 bytes of the following additional information are returned in the reply data area: Server ID: the name of the server causing the error Workstation ID: the identifier of the workstation where the server causing the error is running Return code: the error code returned by the server	Refer to “Critical errors (DOS)” on page 200 for more information.
X'0100434F' (**CO**)	BT, OB	Job start is not allowed. The system is in the process of closing.	

Table 36. Return codes from shared-file servers (SHFILE ##) (continued)

Return Code	Causing Function	Explanation	Action Required
X'01004441' (**DA**)	RP	An attempt was made to replace a record with keys that cannot be changed. Updating records with keys that have this attribute is not allowed.	
X'01004442' (**DB**)	CB, OB	Batch opening was denied because the shared-file server is open for online work.	
X'01004448' (**DH**)	DL, HN, HP, HU, IS, KN, KP, KU, RP	The shared file must be on hold for this batch request.	
X'0100444A' (**DJ**)	DL, RP	The record is not on hold.	
X'0100444F' (**DO**)	BT, ET, OO	Online openings are denied because the shared-file server is open for batch requests.	
X'01004531' (**E1**)	CB, CO, CP, DL, ET, IS, RB, RP, ZD	Writing to, or reading from (RB only), the first log file has failed. The operation is not performed.	Try the operation again. Refer to “Critical errors (DOS)” on page 200 and “Primary input/output errors” on page 202 for more information.
X'01004532' (**E2**)	CB, CO, CP, DL, ET, IS, RB, RP, ZD	Writing to, or reading from (RB only), the second log file has failed. The operation is not performed.	Try the operation again. Refer to “Critical errors (DOS)” on page 200 and “Primary input/output errors” on page 202 for more information.

Table 36. Return codes from shared-file servers (SHFILE ##) (continued)

Return Code	Causing Function	Explanation	Action Required
X'01004550' (**EP**)	Any	A primary I/O error has occurred. This is an irrecoverable failure.	LANDP for DOS: Try adding the DOS program SHARE to the AUTOEXEC.BAT. You might also be able to prevent the error by adding the `/F:zz` parameter to the SHFILE loading statement in AUTOFBSS, specifying a large value for *zz*; this sets the maximum number of files that can be open at a time. For more information refer to the *LANDP Installation and Customization* book. LANDP for OS/2 and LANDP for Windows: See “Primary input/output errors” on page 202 for more information.
X'01004643' (**FC**)	DL, IS	Internal error; corrupt FREECHAIN	Restart the shared-file server with the /R: parameter.
X'01004644' (**FD**)	Any, except GF, SR, TS	The function was denied because a GF function has not been received.	
X'01004742' (**GB**)	FN, FP, GN, GP, HN, HP, KN, KP	Either the end of the shared file has been reached while processing an FN, GN, HN, or KN function, or the beginning of the shared file has been reached while processing an FP, GP, HP, or KP function. The next FN, GN, HN, or KN function returns the first record. The next FP, GP, HP, or KP function returns the last record.	
X'01004745' (**GE**)	FU, GU, HU, KU	The record with the specified key does not exist.	
X'01004945' (**IE**)	Any	An internal error has occurred.	Request support.

Table 36. Return codes from shared-file servers (SHFILE ##) (continued)

Return Code	Causing Function	Explanation	Action Required
X'01004949' (**II**)	IS, RP	The following might be true: • IS function: An attempt was made to insert a duplicate of a key that must be unique. This is not allowed. • RP function: An attempt was made to replace a record with keys that can be changed, but that must be unique. You cannot duplicate keys that must be unique.	
X'01004C49' (**LI**)	RB	The log file is inhibited.	A rollback operation is not possible.
X'01004D49' (**MI**)	QP	More information is pending.	
X'01004E41' (**NA**)	CP, DL, ET, HN, HP, HU, IS, KN, KP, KU, RB, RP	A transaction has not been opened.	
X'01004E42' (**NB**)	Any, except GF, OB, OO, RF, SR, TS	The function was denied because a batch process has not been opened.	
X'01004E43' (**NC**)	TS	The shared files have not been closed. A workstation ID and a process ID are in request `DATA` for open transactions.	
X'01004E4F' (**NO**)	BT, CP, DL, ET, FN, FP, FU, GN, GP, GU, HN, HP, HU, IP, IS, RB, RP, KN, KP, KU	The function is denied because online mode has not been initialized.	

Table 36. Return codes from shared-file servers (SHFILE ##) (continued)

Return Code	Causing Function	Explanation	Action Required
X'01004E50' (**NP**)	Any	Either the program control block (PCB) does not exist, or the PCB is not blanks or nulls. The following might also be true: QP function: The wrong PCB name was requested. Shared-file distributor server: A request was made to a PCB owned by a server that is either not loaded, or loaded but not ready to receive requests.	For the shared-file distributor server, load the server owned by the PCB.
X'01004E53' (**NS**)	OS	For shared-file server: No more sessions are available. For shared-file distributor and replicator servers: No more memory is available.	
X'01004E53' (**NS**)	Any	No session has been opened with the supplied session identifier.	
X'01004E54' (**NT**)	Any	The workstation is not customized to use the shared-file server.	

Table 36. Return codes from shared-file servers (SHFILE ##) (continued)

Return Code	Causing Function	Explanation	Action Required
X'01004F50' (**OP**)	Any	The log file is not open. Either the file is remote and was not accessible at server loading time, or the file does not exist and you must run the GENLOG utility program. The following might also be true: The initialization process has not ended. The server is not ready to work. The replicator server does not have an up-to-date shared file loaded. The server is executing the synchronization process. The replicator server is ending the synchronization process for a shared file.	When the shared-file servers return this error, a qualifier is also returned in the reply DATA area. It indicates what is causing the error. Try the following, depending on the cause of the error: **Qualifier** **What to do** **0** If the log file is not open, start the OPENLOG utility to try again to open it. See the *LANDP Servers and System Management* book for information about the utility program. **1** If the initialization process has not ended, wait until initialization ends, and then try the operation again. **2** If the server is not ready to work, load an up-to-date shared file. **3** If the server is executing the synchronization process, wait until the process finishes and then try the operation again.

Table 36. Return codes from shared-file servers (SHFILE ##) (continued)

Return Code	Causing Function	Explanation	Action Required
X'01005049' (**PI**)	GF, RF	The parameter for a GF or RF function is not valid. • GF function: The request DATA length must be at least X'0001' and have 'O' and 'B' in the first byte of the data area. • RF function: The request DATA length must be X'0000' or greater than X'0000' and have 'b', 'N', or 'F' in the first byte of the data area. (b represents a space character.)	
X'0100505A' (**PZ**)	Any	The request or reply PARMLIST length is less than X'001A' (26 bytes).	
X'0100524C' (**RL**)	HN, HP, HU, IS, KN, KP, KU, RP	The record is locked by another workstation. For the RP function, an attempt was made to replace a record with keys that can be changed, but that must be unique. You cannot duplicate keys that must be unique.	The following are recommended actions based on the reply DATA values: **Value** **Action** **R** Try again. **A** Rollback if you want to follow the deadlock avoidance protocol. Try again if you want to follow the deadlock detection protocol. **D** Rollback (deadlock detected).
X'0100544C' (**TL**)	Any	The specified request DATA length does not match the expected length for the requested function.	
X'0100544C' (**TL**)	FU, GU, HU, KU	When using direct indexed access mode, this code could be returned when the request DATA length is set to 1, instead of 0.	

Table 36. Return codes from shared-file servers (SHFILE ##) (continued)

Return Code	Causing Function	Explanation	Action Required
X'0100544F' (**TO**)	HL, IL	A transaction is open.	Close the transaction or close batch.
X'01005849' (**XI**)	GF	The state of the XLR server is in doubt because EHCSAM could not confirm whether the backup server has done a takeover since the last time this server was run.	If the backup did not take over, use the EHCXLR utility to override, and then perform another GF. If the backup did take over, start it first and then restart this server.
X'01005941' (**YA**)	BT	A transaction is already open.	
X'01005942' (**YB**)	OB	The shared file is already open in batch mode.	
X'0100594F' (**YO**)	OO	The shared file is already open in online mode.	
X'01005950' (**YP**)	GF	The shared file is already open.	

Critical errors (DOS)

When a critical error occurs, as indicated by return codes X'01004345', X'01004531', or X'01004532', the following information is returned in `DATA`:

- A 1-byte error code:
  X'96' Disk is write-protected.
  X'97' Unknown unit.
  X'98' Drive is not ready.
  X'99' Unknown command.
  X'9A' Cyclic redundancy check (CRC) error.
  X'9B' Bad drive request structure length.
  X'9C' Disk seek error.
  X'9D' Unknown media type.
  X'9E' Sector not found.
  X'A0' Device write fault.
  X'A1' Device read fault.
  X'A2' Hardware failure.
  X'A3' Sharing violation.
  X'A4' Lock violation.
  X'A5' Disk change not valid.
  X'A6' File control block (FCB) unavailable.
  X'A7' Sharing buffer overflow.
- The 4-byte record number of the record in-process when the error occurred. If the error occurred while opening or closing a file, the value 0 is returned.

- The name of the file where the error occurred. The file name is an ASCIIZ string consisting of a maximum of 80 bytes. An ASCIIZ string is a normal string that ends with a null character.

When a critical error occurs, the server creates a file that contains a trace of the internal work performed before the error occurred. The server creates the file on the default drive and directory.

The file name has the format:

HH*mmsshh*.TRC

where:

HH is hours.
mm is minutes.
ss is seconds.
hh is hundredths of seconds.

If you contact IBM for assistance, please supply the trace file *HHmmsshh*.TRC.

Critical errors (OS/2, Windows, and Linux)

When a critical error occurs, as indicated by return codes X'01004345', X'01004531', or X'01004532', the following information is returned in DATA:

- A 1-byte error code:
  X'13' Disk is write-protected.
  X'14' Unknown unit.
  X'15' Drive is not ready.
  X'16' Unknown command.
  X'17' Cyclic redundancy check (CRC) error.
  X'18' Bad drive request structure length.
  X'19' Disk seek error.
  X'1A' Unknown media type.
  X'1B' Sector not found.
  X'1D' Device write fault.
  X'1E' Device read fault.
  X'1F' Hardware failure.
  X'20' Sharing violation.
  X'21' Lock violation.
  X'22' Disk change not valid.
  X'23' File control block (FCB) unavailable.
  X'24' Sharing buffer overflow.
- The 4-byte record number of the record in-process when the error occurred. If the error occurred while opening or closing a file, the value 0 is returned.
- The name of the file where the error occurred. The file name is an ASCIIZ string consisting of a maximum of 80 bytes. An ASCIIZ string is a normal string that ends with a null character.

Shared-file servers

When a critical error occurs, the server creates a file that contains a trace of the internal work performed before the error occurred. The server creates the file on the default drive and directory.

The file name has the format:

HH*mmsshh*.TRC

where:

HH is hours.
mm is minutes.
ss is seconds.
hh is hundredths of seconds.

If you contact IBM for assistance, please supply the trace file *HHmmsshh*.TRC.

Primary input/output errors

When primary I/O errors occur, as indicated by return codes X'01004550', X'01004531', or X'01004532', the following information is returned in DATA:

- A 1-byte error code:
  X'02' File not found.
  X'03' Path not found.
  X'04' Too many open files.
  X'05' File access denied.
  X'06' Handle not valid.
  X'0C' Access code (file mode) not valid.
  X'0F' Drive number not valid.

  The following codes apply to LANDP for DOS only.
  X'64' Disk read error (attempt to read beyond end-of-file).
  X'65' Disk is full.
  X'66' File not assigned.
  X'67' File not open.
  X'DE' Transferred count not correct.

  The following code applies to LANDP for OS/2, LANDP for Windows, and LANDP for Linux only.
- The 4-byte record number of the record in-process when the error occurred. If the error occurred while opening or closing a file, the value 0 is returned.
- The name of the file where the error occurred. The file name is an ASCIIZ string consisting of a maximum of 80 bytes. An ASCIIZ string is a normal string that ends with a null character.

When a primary I/O error occurs, the server creates a file that contains a trace of the internal work performed before the error occurred. The server creates the file on the default drive and directory.

The file name is in the format HH*mmsshh*.TRC, where:

HH is hours.
mm is minutes.
ss is seconds.
hh is hundredths of seconds.

If you contact IBM for assistance, please supply the trace file *HHmmsshh*.TRC.

Shared-file utility programs

The following codes are returned by the shared-file BACKUP and RESTORE utility programs:

Table 37. Return codes from the shared-file utility programs

Return Code	Explanation	Required Action	Utilities
X'**00**' (000)	The program ended successfully.		Backup, Restore
X'**01**' (001)	Parameters are not valid.		Backup, Restore
X'**92**' (146)	Old and new log files can not be chained.		Restore
X'**96**' (150)	The log file does not exist.		Backup, Restore
X'**97**' (151)	An I/O error has occurred.		Backup, Restore
X'**98**' (152)	Transactions are open.		Backup
X'**A0**' (160)	The log file is empty.		Backup
X'**A1**' (161)	Another process is using the log file.		Backup, Restore
X'**A2**' (162)	The old log file does not exist.		Restore
X'**A8**' (168)	A log file is an old version.	Try running the GENLOG utility program to create a new log file.	Backup, Restore
X'**AD**' (173)	Log file LOG2.DAT was not found.		Backup, Restore
X'**AE**' (174)	Log file LOG.DAT is not at the correct level of LOG2.DAT.		Backup, Restore
X'**AF**' (175)	Log file LOG2.DAT is not at the correct level of LOG.DAT.		Backup, Restore
X'**B0**' (176)	Log file LOG.DAT is truncated. Forward recovery cannot be performed.		Restore
X'**B1**' (177)	Some data might not have been updated to data files, or data in the log file is needed by a parent server.		Backup

SNA server (SNA##)

The following codes are returned by the SNA server:

Table 38. Return codes from the SNA server.

Return Code	Causing Functions	Explanation	Action Required
X'00000000'	Any	Successful operation	None
Intervention required			
X'01004931' (**I1**)	RH, SH	An LU-LU session is not established.	
X'01004932' (**I2**)	CL, CN, RH, RL, SH, OP	Either • The communication adapter or the cabling is malfunctioning. or • The modem is powered off.	Check the equipment. On OS/2 or Windows it might be necessary to restart the communication server or the Microsoft SNA server.
Programming errors			
X'01005030' (**P0**)	CL, GS, OP, RH, RL, SH	A previous CN function was not requested or an RL is in progress.	
X'01005030' (**P0**)	DC, QC	The LU is pooled and contact has not been requested.	
X'01005031' (**P1**)		The function is not supported. The function code is not correct or the combination of function code, parameters, and data is not consistent or not supported.	Check the request format and parameters.
X'01005032' (**P2**)	RH	Length error. The reply `DATA` length specified in the CPRB is insufficient for a message from the host. The message has been truncated to the specified length.	Check the program.
X'01005032' (**P2**)	SH	Length error. The request `DATA` length specified in the CPRB must be between X'0000' and X'1000'. Refer to the *LANDP Programming Reference* book for more specific information.	Check the program.

Table 38. Return codes from the SNA server. (continued)

Return Code	Causing Functions	Explanation	Action Required
X'01005032' (**P2**)	CL, OP	There is a length error. The request DATA length specified does not correspond with that specified in the OP or CL function, or an INITSELF or TERMSELF was specified but was invalid.	Check the program.
X'01005032' (**P2**)	CN, GS, RL	There is a length error. The request DATA and reply DATA lengths specified in the CPRB must be X'0000'.	Change the program.
X'01005032' (**P2**)	DC, QC	Length error. The request DATA length specified in the CPRB must be X'006C'.	Change the program.
X'01005033' (**P3**)	RH	There are no pending messages.	
X'01005033' (**P3**) LANDP for DOS only	CL, CN, DC, OP, QC, RL, SH	The input/output buffers are full: the function was rejected.	Try one of the following: • Check the program logic and read queued messages before sending more. • Delay until other programs or the communication adapter have freed some buffers. • Allocate additional communication data link buffers.
X'01005033' (**P3**) Not LANDP for DOS	SH	Internal resources are temporarily unavailable. The SNA server acts appropriately.	The program should wait, and then try again.
X'01005034' (**P4**)	CL, OP, SH	A message pending in the input queue requires a response.	Make sure the program contains logic to read the message and try again. The required response is automatically sent when the message is read.

Table 38. Return codes from the SNA server. (continued)

Return Code	Causing Functions	Explanation	Action Required
X'01005034' (**P4**)	RH, CL, OP, SH	There is a previous message read with flag5=R that requires a response, or a response is required at end of chain if CN flag5 was M.	Check the program.
X'01005035' (**P5**)	OP	An OP function is in progress or the LU is already in session.	Check the program.
X'01005035' (**P5**)	SH	A previous SH function is in progress.	The program should wait and then try again.
X'01005035' (**P5**)	CN, RL	A previous CN function was requested but an LU is not yet active, or an RL function is in progress, but an LU is not yet inactive.	Try again later.
X'01005035' (**P5**)	DC, QC	The X.25 link control or the network cannot satisfy the call. Either the connection is already established or an RL function is in progress.	
X'01005036' (**P6**)	CL, OP, SH	A message sent was accepted with an indication that the input buffer contains messages to be read.	Check the program. All messages should be read before sending new messages.
X'01005037' (**P7**)	SH	Logic application error. The server detected an inconsistency between the function issued and the internal session status.	Check the program. Common situations are: • Trying to send a response, but no response is pending • A response to be sent is pending • A message is being received • Chaining protocol error • Bracket protocol error • Change direction protocol error • A contention situation has occurred • RTR must be sent between brackets

Table 38. Return codes from the SNA server. (continued)

Return Code	Causing Functions	Explanation	Action Required
X'01005038' (**P8**)	CL	A session is not established. The CL function was rejected.	
X'01005038' (**P8**)	SH	'Cancel' is not allowed unless a chain is in progress.	
X'01005038' (**P8**)	CN	An LU was previously contacted or an RL function is in progress.	
X'01005039' (**P9**)	Any	The session identifier is not valid. On DOS this might be because SNA.CFG and LAN.CFG (and SNAPOOL.CFG if used) do not agree. On OS/2 or Windows, the session is not defined to the communications server or Microsoft SNA server.	Check the configuration.
X'01005041' (**PA**)	SH	A host message or response must be received before sending.	
X'01005042' (**PB**)	CL, OP, SH	The station is set to quiesce status.	Wait for a host message to change the status.
X'01005043' (**PC**)	RH	Compressed data arrived with the wrong format, or data arrived compressed with an algorithm that is not supported.	Check the compressed data format and algorithm on the remote system.
X'01005045' (**PE**)	CN	OS/2 and Windows: Server-managed cryptography has been requested, but ACSRENCR.DLL and ACSRDECR.DLL either have not been copied to the required directory, or they are not valid.	Ensure that the correct DLLs are in use. The default DLLs supplied with the Communications Server for OS/2 Warp, or Windows, give you this error.
X'0100505A' (**PZ**)	Any	The `PARMLIST` length is not valid. It must be X'001A' (26 bytes).	
Device errors			

Table 38. Return codes from the SNA server. (continued)

Return Code	Causing Functions	Explanation	Action Required
X'01005531' (**U1**)	CL, CN, OP, RH, SH	Contact is pending. On OS/2 or Windows, the communications server or Microsoft SNA server might have terminated.	Check the host status and equipment. The LU might be pooled, and contact might be pending.
X'01005531' (**U1**)	DC, QC	The LU is pooled and contact is pending.	
X'01005532' (**U2**)	CN	A connection failure has occurred.	Wait, and then try again.
X'01005534' (**U4**)	Any	Bad status was received from the adapter. Normally, this is followed by a loss of contact.	If the session is re-established correctly, normal operation will resume. If the error persists, verify the adapter functions and connections.
X'01005536' (**U6**)	Any	A software problem was detected. Either wrong facilities were defined in a call packet of the VCM.CFG file or in a DC (X.25) function call.	
X'01005537' (**U7**)	RH	The compression server EHCCOMP.EXE is not loaded.	Load the server.
X'01005538' (**U8**) LANDP for DOS	Any	SDLC.COM, X25DLC.EXE, or TRDLC.EXE is not loaded.	
X'01005538' (**U8**) LANDP for OS/2 or LANDP for Windows	CN, DC, QC	The communications providing software is not loaded, or the link is not started.	
X'01005539' (**U9**)	Any	An operating system error has occurred.	Check the log file.

Supervisor local functions

The following codes are returned by the supervisor local functions:

Table 39. Return codes from the supervisor local functions:

Return Code	Causing Function	Explanation	Action Required
X'00000000'	Any	Successful operation.	None
Intervention required			
X'01004931' (**I1**)	Z5	The queue for asynchronous messages is full.	Try again later.
Programming errors			
X'01005031' (**P1**)		The function is not supported.	Check the request format and parameters.
X'01005032' (**P2**)	AA	The reply `DATA` length is not correct.	
X'01005032' (**P2**)	AS, DS, EE, QE, SP, Tn, TP, WM	The request `DATA` length is not correct.	
X'01005032' (**P2**)	II	A parameter is not correct.	
X'01005032' (**P2**)	Tn	The time interval is not correct.	
X'01005032' (**P2**)	WM	The interval in `PARMLIST` area is not correct.	
X'01005033' (**P3**)	AA, AS, II	The reply `DATA` area is insufficient.	
X'01005033' (**P3**)	EE	The longname specified in the request `DATA` does not match the longname specified at customization time.	
X'01005032' (**P3**)	II	The reply `PARMLIST` length is not correct.	
X'01005033' (**P3**)	II, QE, SP, TP	The request `PARMLIST` length is not correct.	
X'01005033' (**P3**)	Tn, EE	Either the timer is already on the desired status or a long name does not match a customized value.	
X'01005033' (**P3**)	WM	The interval is not correct.	
X'01005034' (**P4**)	AS	The semaphore handle is not valid.	
X'01005034' (**P4**)	AS, DS, QE, SP, TP	The window handle is not valid.	
X'01005034' (**P4**)	DS	The semaphore ID is not valid.	

Table 39. Return codes from the supervisor local functions: (continued)

Return Code	Causing Function	Explanation	Action Required
X'01005034' (**P4**)	EE	The name of the internal application to be started is not known.	
X'01005034' (**P4**)	SP, TP	The window handle or message value is not valid.	
X'01005034' (**P4**)	WM	The event is not valid.	
X'01005035' (**P5**)	AS	Too many semaphores are already associated.	
X'01005035' (**P5**)	SP	The event list has become too long.	
X'01005036' (**P6**)	TP	The event list is empty.	
X'01005036' (**P6**)	WM	The monitor is not supported.	
X'01005037' (**P7**)	QE, TP	The event ID is not valid. It must be the value received in the first parameter of the window procedure.	
X'01005037' (**P7**)	WM	There are too many threads.	
X'01005038' (**P8**)	QE, SP, TP	The program is not a Presentation Manager (PM) program. To request QE, SP, or TP functions, the program must be a PM application.	
X'01005039' (**P9**)	SP, Request NoWait	There are too many requests.	
X'0100505A' (**PZ**)	Any	The request or reply `PARMLIST` length is less than X'001A'.	

System manager server

The following codes are returned by the system manager server:

Table 40. Return codes from the system manager server.

Return Code	Causing Functions	Explanation	Action Required
X'00000000'	Any	Successful operation	None
Intervention required			
X'01004930' (**I0**)	AN, MO, UN	Support for sending alert notifications, resolution notifications, and messages to the NetView program is deactivated.	
X'01004930' (**I0**)	UM, WL	Logging is deactivated.	
X'01004931' (**I1**)	AN, MO, UN	The alerts file is full.	
X'01004931' (**I1**)	RL, RN, R1	The requested record was not found.	
X'01004932' (**I2**)	RL, R1	The record used as a base for the retrieval of another was not found.	
X'01004935' (**I5**)	SD	The date or time is not valid.	Check the contents of the request `DATA` area.
X'01004936' (**I6**)	AN, MO, UA, UN	Support is not defined for sending alert notifications, resolution notifications, and messages to the NetView program.	
X'01004936' (**I6**)	RL, R1, UL, WL	Logging is not defined.	
X'01004936' (**I6**)	UM, UO	Message operator support is not defined.	
X'01004937' (**I7**)	MO	Support is not available for double-byte character set (DBCS) translation.	
Programming errors			
X'01005031' (**P1**)		Either the function is not supported, or the function was not included during customization.	Check the request format and parameters.
X'01005032' (**P2**)	Any, except CN, RF, RI, RL, UA, UL, UM, or WL	The length of the request `DATA`, the reply `DATA`, the request `PARMLIST`, or the reply `PARMLIST`, is not correct.	Correct the request parameters, and then try again. For the AN, MO, and UN functions, correct the call parameters and try again.

Table 40. Return codes from the system manager server. (continued)

Return Code	Causing Functions	Explanation	Action Required
X'01005032' (**P2**)	RF	The request DATA length is not correct.	Correct the request parameters, and then try again.
X'01005032' (**P2**)	RL, R1	The following might be true: • The request DATA length is not correct. • The reply DATA length is not correct. • The sum of the record length and the user message is longer than X'0400'.	Correct the request parameters, and then try again.
X'01005032' (**P2**)	WL	The sum of the record header length and the specified request DATA length either exceeds the record length defined in customization, or is longer than X'0400' bytes.	Change the program.
X'01005033' (**P3**)	AU, AX	Either the user identifier already exists, or a user signon with the appropriate authorization level is missing.	
X'01005033' (**P3**)	CP, DU, GO, GU, RD, RL, RN, RU, RX, R1, SD, SU, UA, UD, UI, UL, UM, UO, UU, UX, XN	The function was not accepted. Either a user signon with the appropriate authorization level is missing, or the user identifier is not valid.	
X'01005033' (**P3**)	GI, GL, GP, GW	The function was not accepted. Either a user signon with the appropriate authorization level is missing, or the workstation identifier does not exist, or no user is signed on.	
X'01005033' (**P3**)	RE, RK, RO	The function was not accepted. A user signon with the appropriate authorization level is missing.	

Table 40. Return codes from the system manager server. (continued)

Return Code	Causing Functions	Explanation	Action Required
X'01005033' (**P3**)	RF	The function was not accepted. Either a user is not signed on, or a user signon with the appropriate authorization level is missing.	
X'01005033' (**P3**)	SF	The workstation or user identifier do not exist or no user is signed on.	
X'01005033' (**P3**)	SN, SO	The function was not accepted. The user identifier is not valid, another user is already signed on to the same workstation, or the maximum number of simultaneously signed-on users is exceeded.	
X'01005034' (**P4**)	GU, RD, RN, RU, RX, XN	The requested data is locked. Either a 'retrieve for update' command is in progress, or the requested data belongs to a signed-on user.	On reply, the `DATA` area contains the requested data.
X'01005034' (**P4**)	GO, RE, RK, RO	There is not enough reply `DATA` length. On reply, the `DATA` area does not contain all the users.	
X'01005034' (**P4**)	SN, SO, UO	The user profile was not found.	
X'01005034' (**P4**)	VR	Either the record definition is damaged, or a DBCS field validation was attempted when DBCS support was unavailable.	
X'01005035' (**P5**)	AU, AX, GU, RD, RU, RX	The requested data is locked. A 'retrieve for update' command is in progress or the requested data belongs to a signed-on user.	Try again later.
X'01005035' (**P5**)	SN, SO	The user profile or user data are locked. A 'retrieve for update' command is in progress.	Try again later.

Table 40. Return codes from the system manager server. (continued)

Return Code	Causing Functions	Explanation	Action Required
X'01005036' (**P6**)	AU, AX, CP, DU, GU, RN, RU, RX, SF, SN, SO, XN	The user profile file was not found.	Try again.
X'01005036' (**P6**)	RF	The function was not performed. The system was unable to read the password in the user profile.	
X'01005036' (**P6**)	RR, VR	The record definition file was not found.	
X'01005036' (**P6**)	SU, UD, UU, UX	An update is not allowed. A previous 'retrieve for update' command is missing.	
X'01005037' (**P7**)	AN, UN	The following might be true: • The LANDP files EHC#ALRN.DAT or EHC#RESN.DAT were not found. • The user files EHC#ALRU.DAT or EHC#RESU.DAT were not found. • The requested network management vector transport (NMVT) definition was either damaged or not found.	
X'01005037' (**P7**)	AU, AX, UD, UI, UO, UU, UX	The supplied data does not agree with the expected format.	
X'01005037' (**P7**)	DU, RD, RL, RN, R1, WL, XN	The supplied parameter does not agree with the expected format.	
X'01005037' (**P7**)	RF, SF	The function was not performed. The sign-off type is reserved.	
X'01005037' (**P7**)	RR, VR	The requested record definition was not found.	
X'01005037' (**P7**)	SN, SO	User signon is denied. The user profile was either destroyed, or modified without using the appropriate system manager functions.	

Table 40. Return codes from the system manager server. (continued)

Return Code	Causing Functions	Explanation	Action Required
X'01005038' (**P8**)	CP, RF, SN, SO	The password is not valid.	Try again.
X'01005038' (**P8**)	DU, UU, UX	Deleting or updating the user profile is denied. Either this is the only user with authorization level A, or this is the user who receives operator messages.	
X'01005038' (**P8**)	UO	A new user must have authorization level O.	
X'01005038' (**P8**)	VR	The data is not valid.	
X'01005039' (**P9**)	SN, SO	User signon is denied. The user is already signed on at another workstation.	
X'01005039' (**P9**)	DU	Deleting the user is denied. Either the user is signed on, or the user profile is locked, or the user data is locked.	Try again later.
X'01005039' (**P9**)	CP	The new password contains characters that are not valid.	
Device errors			
X'01005531' (**U1**)	RL, R1, WL	An irrecoverable error has occurred: the log file is destroyed.	Delete the log file and restart LANDP.
X'01005533' (**U3**)	AU, AX, CP, DU, GI, GL, GU, RD, RF, RU, RX, SF, SU, UU, UX	A server internal error has occurred	Report the problem.
X'01005535' (**U5**)	AN, AU, AX, CP, DU, MO, RD, RN, RL, RR, R1, SN, SO, SU, UN, UU, UX, VR, WL, XN	An error occurred while accessing a system file.	Try the request again. If the problem persists, it is probably a hardware error.
X'01005535' (**U5**)	RF, SF, UA, UD, UI, UL, UM, UO	An error occurred while accessing a system file. The update was made only in storage.	Try the request again. If the problem persists, it is probably a hardware error.
X'01005535' (**U5**)	GI, GL	An error occurred while accessing the FBSS#USP file. On reply, the `DATA` area contains the user ID.	

Table 40. Return codes from the system manager server. (continued)

Return Code	Causing Functions	Explanation	Action Required
X'01005535' (**U5**)	GP, GW	An error occurred while accessing the FBSS#USP file. On reply, the DATA area contains the workstation ID.	
X'01005535' (**U5**)	RE	An error occurred while accessing the FBSS#USP file. On reply, the DATA area might contain some user IDs.	
X'01005535' (**U5**)	GO, RO	An error occurred while accessing the FBSS#USP file. On reply, the DATA area **date and time of last signon** field is set to blanks.	

TCP/IP wide area communications server

For information about return codes obtained from SNA or PPC server API functions when using the TCP/IP Wide Area Communications server, refer to the relevant server section in this manual (“SNA server (SNA##)” on page 205, or “Program-to-Program communications server (PPC##)” on page 181).

The following codes are placed in the LANDP log or, on DOS, in the file EHCTCP.TRC:

Table 41. Return codes from the TCP/IP wide area communications server

Code	Explanation	Required Action
ALU	The LU name is inconsistent with LOCADDR. LOCADDR is shown.	Ensure constant difference between LOCADDR and numeric suffix of LU names.
CN1 through **CN8**	Error returned by TCP/IP during connection. The TCP/IP return code is shown.	Check that the session partner (for example, AnyNet®) is active.
CNP	The port number in EHCTCP.INI is not valid. The port number is shown.	Correct the port number in EHCTCP.INI and restart EHCTCP.
CNR	The RU size in the LU 6.2 conversation mode definition is not valid. The RU size is shown.	Correct the RU size and restart EHCTCP.
CNS	The number of sessions in the LU6.2 conversation mode definition is not valid. The number of sessions is shown.	Correct the mode definition in EHCTCP.INI and restart EHCTCP.
CNW	The number of contention winners in the LU6.2 conversation mode definition is not valid. The number of contention winners is shown.	Correct the mode definition in EHCTCP.INI and restart EHCTCP.
GH1	TCP/IP is unable to resolve the host name to an IP address. The TCP/IP “gethostbyname” return code is shown.	Check the name in the EHCTCP.INI file. Check your local TCP/IP HOSTS file if used. Check the host name resolution with the TCP/IP PING command.
IF1 through **IF3**	A definition in the EHCTCP.INI file is not found. IF1 shows the name sought, IF2 shows the type sought, and IF3 shows the value sought.	If the missing definition should be present, correct the EHCTCP.INI file and restart EHCTCP. If the missing definition should not be present, the most likely cause is incorrect parameters to a PPC server OP request, or an incorrect session number on a SNA server CN request. Correct this.

Table 41. Return codes from the TCP/IP wide area communications server (continued)

Code	Explanation	Required Action
IN1 through **IN7**	An operating system error occurred. The operating system return code is shown.	Reboot your computer. If the error persists, contact your service representative.
INC	The initialization file EHCTCP.INI contains data that is not valid. The offset of this data is shown.	Correct the contents of EHCTCP.INI and restart EHCTCP.
INF	The initialization file EHCTCP.INI has not been found.	Place EHCTCP.INI in the directory with LANDP and restart EHCTCP.
INL	The listening port in EHCTCP.INI is not valid. The port number is shown.	Correct the port number in EHCTCP.INI and restart EHCTCP.
INM	There is not enough memory available for the sessions.	Either make more memory available, or reduce the number of sessions, and restart EHCTCP.
INN	The listening value in EHCTCP.INI is not valid. The value is shown.	Correct the listening value in EHCTCP.INI and restart EHCTCP.
INP	There is a loading parameter error. The index of the bad parameter is shown.	Correct the EHCTCP loading statement and restart EHCTCP.
INa through **INe**	A TCP/IP error occurred. The TCP/IP return code is shown.	Make sure that TCP/IP is operational and configured correctly.
MX1	The maximum number of sessions has been exceeded. The maximum is shown.	Either increase the maximum or reduce session usage.
MX2	The maximum number of TCP/IP connections has been exceeded. The maximum is shown.	Reduce the session usage. On DOS, it might be possible to increase the number of TCP/IP connections available.
RD1 through **RD2**	Error returned reading data from TCP/IP. The TCP/IP return code is shown.	Check that a session partner (e.g. AnyNet) is active.
SD1	Error returned sending data to TCP/IP. The TCP/IP return code is shown.	Check that a session partner (e.g. AnyNet) is active.
TE1 through **TE2**	Unexpected TELNET command code or sub-negotiation code. The unexpected code is shown.	Contact your service representative.

VisualAge® Generator support

The following codes are returned by the VisualAge Generator support functions:

Table 42. Return codes from VisualAge Generator support functions

Return Code	Explanation	Action Required
General		
X'00000000'	Successful operation.	None
X'01005032' (**P2**)	Either REQBLK, or REPBLK, or both, are missing.	
Bit-Oriented data handling (EZHC2CH)		
X'00000000'	Successful operation.	None
X'01005031' (**P1**)	The function is not supported (not HC or CH).	
X'01005032' (**P2**)	The length is not valid. One of the following might be true: • The request DATA length is greater than zero, or the request PARMLIST length is zero. • The function is CH, but the reply PARMLIST length is not twice the request PARMLIST length. • The function is HC, but the request PARMLIST length is not twice the reply PARMLIST length. • There is a mismatch between the request and reply DATA lengths.	
X'01005034' (**P4**)	A hexadecimal character is not valid.	
ASCII-EBCDIC translation (EZAE2EA)		
X'00000000'	Successful operation	None
X'01005031' (**P1**)	The function is not supported (not AE or EA).	
X'01005032' (**P2**)	There is a mismatch between the request and reply data lengths.	

Chapter 7. LANDP family messages

Some LANDP family components display messages in addition to, or instead of, generating return codes. For example, they display or report messages in the following situations:

- In response to an unexpected event
- When something undesirable could occur
- To convey information about an operation

This chapter contains a list of LANDP product messages.

LANDP loading messages

The following messages are displayed or reported when loading LANDP family components.

EHCVAL utility program

Table 43. Messages from EHCVAL

Message Number	Message Text	Recommended Action
EHC0121E	FBSSPATH.DAT file is not correct.	Run customization again.
EHC0122E	Server name in FBSSPATH.DAT is not in a valid list.	Run customization again.
EHC0123I	The path *pathname* does not exist. Do you want to create it? (Yes=1 / No=2)	Answer 1 to create the path, or correct the path name.
EHC0125W	The *filename* does not exist.	Run customization again or correct the file name.
EHC0126W	*Filename* file already exists in *directoryname*. Do you want to update it? (Yes=1 / No=2)	Answer 1 to update the file.
EHC0130I	Checking files and subdirectories. Please wait.	None required.
EHC0131I	Process completed successfully.	None required.
EHC0132E	Error trying to read FBSSPATH.DAT file.	Try again. If the error persists, check the hardware.
EHC0134E	Error trying to create path.	Make sure the disk on which you are trying to create the path is not write-protected. If the error persists, check the hardware.

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Table 43. Messages from EHCVAL (continued)

Message Number	Message Text	Recommended Action
EHC0137E	Error trying to copy files.	Make sure the disk on which you are trying to copy the files is not write-protected. If the error persists, check the hardware.
EHC0138E	Error trying to delete files.	Make sure the disk on which you are trying to copy the files is not write-protected. If the error persists, check the hardware.
EHC0141E	Syntax error in FBSSPATH.DAT file. Drive not alphabetic.	Run customization again.
EHC0142E	Syntax error in FBSSPATH.DAT file. Missing :	Run customization again.
EHC0143E	Syntax error in FBSSPATH.DAT file. Missing \	Run customization again.
EHC0144E	Syntax error in FBSSPATH.DAT file. Character not allowed.	Run customization again.
EHC0145E	Syntax error in FBSSPATH.DAT file. Too many path levels.	Run customization again.
EHC0151E	Hardware error.	Check the hardware.
EHC0154E	Drive not ready.	Check the hardware.
EHC0155E	Invalid drive.	Make sure that you specified a valid drive letter. If the drive letter is correct, check the hardware.
EHC0159E	Invalid file or path name.	Correct the file or path name, or run customization again.
EHC0160E	File validation error.	One of the files to be validated is damaged. Re-create the file.

LANDP for DOS messages

The following messages are displayed or reported by LANDP for DOS.

File transfer facility and 3270 send/receive facility

The following messages are reported by the SEND and RECEIVE programs of the LANDP for DOS file transfer facility and 3270 send/receive facility. Messages 26 through 43 are reported only by the 3270 send/receive facility.

Note: If the SEND and RECEIVE programs are running and an error occurs, the error code returned coincides with the number of the last message produced.

Table 44. Messages from File transfer facility and 3270 send/receive facility

Message Number	Explanation	Recommended Action
0001	A host computer file specification was not entered in the command line.	Re-enter the command with a valid host computer file specification. Run customization again.
0002	The host computer file name or the data set name specified in the command line has a length that is not valid or contains a character that is not valid.	Re-enter the command with a valid host computer file name or data set name.
0003	The host computer file type specified in the command line has a length that is not valid or contains a character that is not valid.	Re-enter the command with a valid host computer file type.
0004	The host computer file mode specified in the command line has a length that is not valid or contains a character that is not valid.	Re-enter the command with a valid host computer file mode.
0005	A workstation file specification was not entered in the command line.	Re-enter the command with a valid workstation file specification.
0006	The workstation drive specified in the command line does not exist or contains a character that is not valid.	Re-enter the command with a valid workstation drive specification.
0007	The workstation file specified in the SEND command does not exist in the current directory on the specified drive.	Re-enter the command with the correct workstation file specification.
0008	The workstation path specified in the command line does not exist on the specified drive.	Re-enter the command with the correct workstation path specification.

Table 44. Messages from File transfer facility and 3270 send/receive facility (continued)

Message Number	Explanation	Recommended Action
0009	The workstation file could not be created or opened.	Check the workstation diskette, the workstation disk or diskette drive, and the workstation file attributes.
0010	An option entered in the command line, or in the DOS command processor environment, is not valid.	Try the following: • Re-enter the command with a valid option. • Check the options in the environment with the DOS SET command.
0011	Mutually exclusive options were entered in the command line and in the DOS command processor environment.	Try the following: • Re-enter the command with valid options. • Check the options in the environment with the DOS SET command.
0012	The workstation was unable to send the command to the host computer.	Check the workstation-to-host computer connection.
0013	The workstation was unable to establish a connection with the host computer.	Check the workstation-to-host computer physical connection. The emulator short name parameter does not match the loaded emulator.
0014	Either the workstation timed out while expecting data from the host computer, or an error occurred while receiving data.	
0015	Either the workstation timed out while expecting an acknowledgement from the host computer, or an error notification was received from the host computer.	
0016	The workstation disk or diskette is full.	Make space available on the workstation disk or diskette.
0017	The LANDP for DOS 3270 emulator is not present on the workstation.	Rerun LANDP configuration and define the LANDP for DOS 3270 emulator as a required option.
0018	A file with zero data length was received.	Check the host computer file.
0019	The workstation is transmitting data to the host computer.	Information only.
0020	The workstation is receiving data from the host computer or from the 4700 processor.	Information only.
0021	The workstation is transmitting the file transfer command to the 4700 processor.	Information only.

Table 44. Messages from File transfer facility and 3270 send/receive facility (continued)

Message Number	Explanation	Recommended Action
0022	The workstation is transmitting the file transfer command to the host computer.	Information only.
0023	The file has been transferred successfully.	Information only.
0024	An invalid parameter was found in the command line.	Re-enter the command with valid parameters.
0025	An error has occurred at the host computer.	Check the error message on the host computer session screen.
0026	Time-out expired while waiting for a host response.	Check the workstation-to-host connection or the error message displayed on the host computer session screen.
0027	The arrival sequence from the host is not allowed.	Check the workstation-to-host connection or the error message displayed on the host computer session screen.
0028	An unexpected message was received from the host. The message is displayed on the screen, as follows.	
0029	The specified time-out interval is not correct.	Enter a valid time-out value.
0030	An internal processing error has occurred.	Contact IBM to obtain service.
0031	The ASCII option is not supported when SEND or RECEIVE is running in a VDM under a DBCS version of OS/2.	If possible, use a DOS system to transfer the file. Alternatively, omit the ASCII option to transfer the file in binary format.
0032	The file being transferred contains invalid DBCS data and cannot be translated.	Correct the input file and re-enter the command.
0033	The ASCII—EBCDIC translate server (EHCDBTR) was not defined to LANDP.	Reconfigure your LANDP system to include the EHCDBTR server.
0034	The ASCII—EBCDIC translate server (EHCDBTR) was not loaded.	Ensure that the EHCDBTR server is loaded.
0035	The ASCII—EBCDIC translation server (EHCDBTR) detected an abnormal condition.	The EHCDBTR return codes are documented in . If you cannot determine the cause of the error, contact IBM for support.
0036	An internal processing error occurred during the Set DDM buffer function.	Contact IBM to obtain service.

Table 44. Messages from File transfer facility and 3270 send/receive facility (continued)

Message Number	Explanation	Recommended Action
0037	An internal processing error occurred during the Release DDM buffer function.	Contact IBM to obtain service.
0038	An internal processing error occurred during the Write DDM buffer function.	Contact IBM to obtain service.
0039	An internal processing error occurred during the Connect function.	Contact IBM to obtain service.
0040	An internal processing error occurred during the Disconnect function.	Contact IBM to obtain service.
0041	Time-out expired during the indicated DDM function.	Check the workstation-to-host connection and the error message displayed on the host computer session screen. If you cannot determine the cause of the error, contact IBM for support.
0042	An invalid sequence arrived from the host during the indicated DDM function.	Check the workstation-to-host connection and the error message displayed on the host computer session screen. If you cannot determine the cause of the error, contact IBM for support.
0043	An unexpected message arrived from the host during the indicated DDM function.	Check the workstation-to-host connection and the error message displayed on the host computer session screen. If you cannot determine the cause of the error, contact IBM for support.

Note: For messages 0041—0043, the indicated DDM function will be one of the following:

Open For Download
Open For Upload
Open For Messages
Insert
Data To Insert
Set Cursor
Get
Close
Error

High-Level language application program interface

The following messages are displayed by the high-level language application program interface (HLLAPI) of the IBM LANDP 3270 emulator.

Table 45. Messages from HLLAPI

Message Number	Message Text	Explanation
FHL000	LANDP High-Level Language API	This message is followed by the copyright notice.
FHL001	FBHLLAPI is installed and ready to use	The program has been successfully loaded and is available for use.
FHL003	FBHLLAPI is already loaded	The FBHLLAPI command is entered, but LANDP HLLAPI is already loaded and available.
FHL004	Unable to load FBHLLAPI	An error occurred while trying to load the program. The program is not available.
FHL005	Incorrect 3270 emulator loaded	The 3270 emulator is required. The correct emulator is not present.
FHL006	Incorrect level of the LANDP 3270 emulator	LANDP HLLAPI requires the 3270 emulator. The correct emulator is not available for use.
FHL007	LANDP 3270 emulator is not loaded	LANDP HLLAPI requires that the 3270 emulator is loaded, but it is not loaded.
FHL009	System error *nnnn*	An error was found while trying to load LANDP HLLAPI. *nnnn* is a four-digit diagnostic code.
FHL012	FBHLLAPI removed from memory	The operator specified **/u** on the command line. LANDP HLLAPI is removed.
FHL013	FBHLLAPI turned off, but not removed	The operator specified **/u** on the command line. LANDP HLLAPI has stopped processing, but memory is not released.
FHL014	FBHLLAPI is not loaded	The operator specified **/u** on the command line. LANDP HLLAPI is not installed.
FHL030	FBHLLAPI Trace. Request: *nn*	TRON (trace on) specified with the Set Session Parameters function or the operator specified **/t** in the command line. This message is displayed each time a function is invoked. *nn* contains the function number in hexadecimal. The trace messages may conflict with application program messages.
FHL031	FBHLLAPI Trace. Return code: *nnnn*	This message is displayed after FHL030. *nnnn* contains the return code in hexadecimal. The trace messages may conflict with application program messages.

LANDP for OS/2 messages

The following messages are displayed or reported by LANDP for OS/2.

Batch machine facility, object post box server, and MAIL program

The batch machine facility and object post box server (OPBS) display the following messages when abnormal situations occur.

Notes:

1. lists return codes issued by this server in the LANDP for OS/2 environment.
2. Chapter 5, “Loading return codes” on page 81 lists codes generated by this server during the loading process.

Table 46. Messages from batch machine and OPBS

Message Text	Explanation	Recommended Action
MAIL/OPBS server not initialized	The OPBS is waiting for the SHFILE## or SMGR servers to start.	Check the shared-file and system manager servers initialization.
Unexpected server RC : xx , function yy to server jjjjjjj	An unexpected response came from the specified server.	
Invalid LANDP user ID	The supplied user ID is not a valid SMGR user ID.	
Unknown user ID to the OPBS	The OPBS does not accept the ’given user’ as a ’destination user’ because the given user never issued a request to the OPBS. The LOG-ON command from the MAIL program does not generate an OPBS access, but issues ’sign-on’ to the SMGR.	
Server busy. Retry later.	The OPBS does not have an available SHFILE## session to process the request.	
File on hold. Retry later.	The requested message is still being updated (sent or received).	No further work can be done on it until the operation in process ends.

REXX application programming support

The dynamic link library EHCREXX.DLL, which provides support for REXX application development, provides the following messages in the REXX variable *result* when abnormal situations occur.

Table 47. Messages from REXX application programming support

Message Text	Explanation	User Response
EHCREXX: Incorrect number of arguments	A LANDP function has been called with the wrong number of arguments.	Check the number of arguments that are appropriate for the LANDP function.
EHCREXX: Stem variable name too long	A LANDP function has been called with a user-defined variable name of more than 32 characters.	Restrict user-defined variable names to 32 characters or fewer.
EHCREXX: Unable to obtain memory	The LANDP REXX interface could not get sufficient memory from the operating system.	Contact your Service representative if the problem persists.
EHCREXX: Unable to locate original CPRB	A RMTRPLY cannot be completed because the original CPRB has been lost.	Contact your Service representative if the problem persists.

In addition, the following messages are displayed when abnormal situations occur.

Table 48. Messages from REXX application programming support

Message Text	Explanation	User Response
EHXREXX: Error n registering <f>	The LANDP function **f** could not be registered with REXX.	Contact your Service representative if the problem persists.
EHXREXX: Error n de-registering <f>	The LANDP function **f** could not be de-registered from REXX.	Contact your Service representative if the problem persists.

Chapter 8. LANDP alerts

This chapter lists the alerts that are defined for LANDP programs, servers, or operations. The listings contain the following information:

- Alert ID number (32 bits)
- Problem severity indicator and problem description
- List of probable causes, including any user causes, install causes, or failure causes
- List of recommended actions for the operator
- Additional subvectors (SVs) with subfields (SFs) to be included in the alert

  This is a partial list. Required subvectors are not listed.

"Alerts" on page 7 briefly introduces alerts and LANDP alert functions management. The alert listings in this chapter are for users who are familiar with NetView programs and SNA networks. Refer to the books *LANDP Servers and System Management* and the *SNA Formats* book for additional information. See "Bibliography" on page 295 for full titles and order numbers.

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Alerts are described for the LANDP servers and programs listed in the following table:

Table 49. LANDP alerts

Server or Program	Operating System Platforms	Page
Electronic Journal server	DOS, OS2, and Windows	233
Financial Printer server	DOS, OS2	234
Forwarding server	DOS, OS2, and Windows	235
LANDP 3270 emulator	DOS	236
Magnetic Stripe Reader/Encoder server	DOS, OS2, Windows, and Linux	237
Personal Identification Number Pad server	DOS, OS2, Windows, and Linux	239
Remote Change Management Services	DOS	241
Shared DOS Directory server	DOS	242
Shared-file server	DOS, OS2, Windows, and Linux	244
Store-for-forwarding server	DOS, OS2, and Windows	246
Synchronous Data Link Control server	DOS	247
Systems Network Architecture (SNA) server	DOS	252
X.25 Data Link Control server	DOS	252

Electronic journal server

The following alert occurs when, during initialization, the electronic journal server cannot call the shared-file server successfully.

EJ1—Unsuccessful call to shared-file server

Alert ID number		X'434247A4'
Alert type	X'01'	Permanent
Alert description	X'7001'	Resources not active
Probable causes	X'7001' X'8002'	Local system operator Workstation configuration
User causes	X'7005'	Device is not in the proper position
Install causes	(none)	
Failure causes	(none)	
Actions	X'1004'	Perform LAN recovery procedures
Additional SVs	X'05' SV X'10' SF	Hierarchy or resource list Hierarchy name list First resource below sender Name = (Workstation group ID) Type = X'81' (Service point) Second resource below sender Name = LANDP Type = X'18' (Transaction program) Third resource below sender Name = (Workstation ID) Type = X'84' (Programmable workstation) Fourth resource below sender Name = X'C5D3C5C3D1D67B7B' (ELECJO## in EBCDIC) Type = X'19' (Program Product)

Financial printer server

The following alert occurs when a device used by the financial printer server reports an irrecoverable hardware error.

PS1—Hardware error

Alert ID number		X'030C2A29'
Alert type	X'01'	Permanent
Alert description	X'1201'	Printer error
Probable causes	X'6210'	Printer
User causes	(none)	
Install causes	(none)	
Failure causes	X'6210'	Printer
Actions	X'0300' X'3000' X'1806'	Check for damage Contact service representative Replace printer
Additional SVs	X'05' SV X'10' SF	Hierarchy or resource list Hierarchy name list First resource below sender Name = (Workstation group ID) Type = X'81' (Service point) Second resource below sender Name = LANDP Type = X'18' (Transaction program) Third resource below sender Name = (Workstation ID) Type = X'84' (Programmable workstation) Fourth resource below sender Name = X'D7D9F4F7E7F27B7B' (PR47X2## in EBCDIC) Type = X'13' (Printer)

Forwarding server

The following alert occurs when, during initialization, the forwarding server cannot call the store-for-forwarding server successfully.

FF1—Unsuccessful call to store-for-forwarding server

Alert ID number		X'434247A4'
Alert type	X'01'	Permanent
Alert description	X'7001'	Resources not active
Probable causes	X'7001' X'8002'	Local system operator Workstation configuration
User causes	X'7005'	Device is not in the proper position
Install causes	(none)	
Failure causes	(none)	
Actions	X'1004'	Perform LAN recovery procedures
Additional SVs	X'05' SV X'10' SF	Hierarchy or resource list Hierarchy name list First resource below sender Name = (Workstation group ID) Type = X'81' (Service point) Second resource below sender Name = LANDP Type = X'18' (Transaction program) Third resource below sender Name = (Workstation ID) Type = X'84' (Programmable workstation) Fourth resource below sender Name = X'C6D6D9E6C1D9C440' (FORWARD in EBCDIC) Type = X'19' (Program Product)

LANDP 3270 emulator

The following alert occurs when the data stream received from the host contains data that is not valid.

EM1—Data stream error

Alert ID number		X'6AA3491A'
Alert type	X'01'	Permanent
Alert description	X'2100'	Software error
Probable causes	X'1010'	Host program
User causes	(none)	
Install causes	(none)	
Failure causes	X'1010'	Host program
Actions	X'3110'	Contact the communication system programmer
Additional SVs	X'05' SV X'10' SF	Hierarchy or resource list Hierarchy name list First resource below sender Name = (Workstation group ID) Type = X'81' (Service point) Second resource below sender Name = LANDP Type = X'18' (Transaction program) Third resource below sender Name = (Workstation ID) Type = X'84' (Programmable workstation)

Magnetic stripe reader/encoder (MSR/E) server

The following alerts occur when errors are reported by devices used by the magnetic stripe reader/encoder (MSR/E) server.

MSR1—Hardware error

This alert occurs when an MSR/E device reports an irrecoverable hardware error.

Alert ID number		X'D365D39D'
Alert type	X'01'	Permanent
Alert description	X'1100'	Input device error
Probable causes	X'6114'	Magnetic stripe reader
User causes	(none)	
Install causes	(none)	
Failure causes	X'6114'	Magnetic stripe reader
Actions	X'0300' X'3000' X'1808'	Check for damage Contact service representative Replace MSR or MSR/E
Additional SVs	X'05' SV X'10' SF	Hierarchy or resource list Hierarchy name list First resource below sender Name = (Workstation group ID) Type = X'81' (Service point) Second resource below sender Name = LANDP Type = X'18' (Transaction program) Third resource below sender Name = (Workstation ID) Type = X'84' (Programmable workstation) Fourth resource below sender Name = X'D4E2D9C5F4F77B7B' (MSRE47## in EBCDIC) Type = X'00' (Unspecified Device)

MSR2—Device not connected

This alert occurs when an MSR/E device is not installed properly.

Alert ID number		X'F3F95A9C'
Alert type	X'01'	Permanent
Alert description	X'1100'	Input device error
Probable causes	X'6114'	Magnetic stripe reader
User causes	(none)	
Install causes	X'3451'	Device cable installed incorrectly
Actions	X'1500'	Correct installation problem
Failure causes	(none)	
Additional SVs	X'05' SV X'10' SF	Hierarchy or resource list Hierarchy name list First resource below sender Name = (Workstation group ID) Type = X'81' (Service point) Second resource below sender Name = LANDP Type = X'18' (Transaction program) Third resource below sender Name = (Workstation ID) Type = X'84' (Programmable workstation) Fourth resource below sender Name = X'D4E2D9C5F4F77B7B' (MSRE47## in EBCDIC) Type = X'00' (Unspecified Device)

Personal identification number (PIN) pad server

The following alerts occur when errors are reported by devices used by the personal identification number (PIN) pad server report errors.

PIN1—Hardware error

This alert occurs when a PIN key pad device reports an irrecoverable hardware error.

Alert ID number		X'F3E19DD1'
Alert type	X'01'	Permanent
Alert description	X'1100'	Input device error
Probable causes	X'6111'	Key pad
User causes	(none)	
Install causes	(none)	
Failure causes	X'6111'	Key pad
Actions	X'0300' X'3000' X'1800'	Check for damage Contact service representative Replace defective equipment
Additional SVs	X'05' SV X'10' SF	Hierarchy or resource list Hierarchy name list First resource below sender Name = (Workstation group ID) Type = X'81' (Service point) Second resource below sender Name = LANDP Type = X'18' (Transaction program) Third resource below sender Name = (Workstation ID) Type = X'84' (Programmable workstation) Fourth resource below sender Name = X'D7C9D5D7F4F77B7B' (PINP47## in EBCDIC) Type = X'29' (Keyboard)

PIN2—Device not connected

This alert occurs when a PIN key pad device is not installed properly.

Alert ID number		X'C4B87FBB'
Alert type	X'01'	Permanent
Alert description	X'1100'	Input device error
Probable causes	X'6111'	Key pad
User causes	(none)	
Install causes	X'3451'	Device cable installed incorrectly
Actions	X'1500'	Correct installation problem
Failure causes	(none)	
Additional SVs	X'05' SV X'10' SF	Hierarchy or resource list Hierarchy name list First resource below sender Name = (Workstation group ID) Type = X'81' (Service point) Second resource below sender Name = LANDP Type = X'18' (Transaction program) Third resource below sender Name = (Workstation ID) Type = X'84' (Programmable workstation) Fourth resource below sender Name = X'D7C9D5D7F4F77B7B' (PINP47## in EBCDIC) Type = X'29' (Keyboard)

Remote change management services (RCMS)

The following alert occurs when a hard disk used by RCMS reports an irrecoverable I/O error.

RC1—File operation error

Alert ID number		X'FAC0FE4C'
Alert type	X'01'	Permanent
Alert description	X'1312'	Disk operation error
Probable causes	X'6310'	DASD device
User causes	(none)	
Install causes	(none)	
Failure causes	X'6310'	Disk drive
Actions	X'F006' X'F0D0' X'82' SF	Reoccurrence of same error suggests media failure. Failing component location (Unit)
Additional SVs	X'05' SV X'10' SF	Hierarchy or resource list Hierarchy name list First resource below sender Name = (Workstation group ID) Type = X'81' (Service point) Second resource below sender Name = LANDP Type = X'18' (Transaction program) Third resource below sender Name = (Workstation ID) Type = X'84' (Programmable workstation) Fourth resource below sender Name = X'D9C3D4E2' (RCMS in EBCDIC) Type = X'19' (Program Product)

Shared DOS directory server

The following alerts occur when disks used by the shared DOS directory server report errors.

SH1—Error by disk read or write

This alert occurs when the hard disk used by shared directory support reports an irrecoverable I/O error.

Alert ID number		X'FAC0FE4C'
Alert type	X'01'	Permanent
Alert description	X'1312'	Disk operation error
Probable causes	X'6310'	DASD device
User causes	(none)	
Install causes	(none)	
Failure causes	X'6310'	Disk drive
Actions	X'F006' X'F0D0' X'82' SF	Reoccurrence of same error suggests media failure. Failing component location (Unit)
Additional SVs	X'05' SV X'10' SF	Hierarchy or resource list Hierarchy name list First resource below sender Name = (Workstation group ID) Type = X'81' (Service point) Second resource below sender Name = LANDP Type = X'18' (Transaction program) Third resource below sender Name = (Workstation ID) Type = X'84' (Programmable workstation) Fourth resource below sender Name = X'E2C8D9C4C9D94040' (SHRDIR in EBCDIC) Type = X'11' (Disk)

SH2—File full

This alert occurs when a hard disk used by shared directory support is full.

Alert ID number		X'FEBF883E'
Alert type	X'01'	Permanent
Alert description	X'1312'	Disk operation error
Probable causes	X'5001'	DASD media
User causes	X'7300'	File full
Actions	X'32A0' X'82' SF	Report the following (Unit)
Install causes	(none)	
Failure causes	(none)	
Additional SVs	X'05' SV X'10' SF	Hierarchy or resource list Hierarchy name list First resource below sender Name = (Workstation group ID) Type = X'81' (Service point) Second resource below sender Name = LANDP Type = X'18' (Transaction program) Third resource below sender Name = (Workstation ID) Type = X'84' (Programmable workstation) Fourth resource below sender Name = X'E2C8D9C4C9D94040' (SHRDIR in EBCDIC) Type = X'11' (Disk)

Shared-File server

The following alerts occur when the shared-file server detects errors.

SF1—Error by disk read

This alert occurs when a hard disk reports an irrecoverable I/O error.

Alert ID number		X'FAC0FE4C'
Alert type	X'01'	Permanent
Alert description	X'1312'	Disk operation error
Probable causes	X'6310'	DASD device
User causes	(none)	
Install causes	(none)	
Failure causes	X'6310'	Disk drive
Actions	X'F006' X'F0D0' X'82' SF	Reoccurrence of same error suggests media failure. Failing component location (Unit)
Additional SVs	X'05' SV X'10' SF	Hierarchy or resource list Hierarchy name list First resource below sender Name = (Workstation group ID) Type = X'81' (Service point) Second resource below sender Name = LANDP Type = X'18' (Transaction program) Third resource below sender Name = (Workstation ID) Type = X'84' (Programmable workstation) Fourth resource below sender Name = X'E2C8C6C9D3C57B7B' (SHFILE## in EBCDIC) Type = X'11' (Disk)

SF2—File full

This alert occurs when a disk used by the shared-file server is full.

Alert ID number		X'FEBF883E'
Alert type	X'01'	Permanent
Alert description	X'1312'	Disk operation error
Probable causes	X'5001'	DASD media
User causes	X'7300'	File full
Actions	X'32A0' X'82' SF	Report the following (Unit)
Install causes	(none)	
Failure causes	(none)	
Additional SVs	X'05' SV X'10' SF	Hierarchy or resource list Hierarchy name list First resource below sender Name = (Workstation group ID) Type = X'81' (Service point) Second resource below sender Name = LANDP Type = X'18' (Transaction program) Third resource below sender Name = (Workstation ID) Type = X'84' (Programmable workstation) Fourth resource below sender Name = X'E2C8C6C9D3C57B7B' (SHFILE## in EBCDIC) Type = X'11' (Disk)

Store-for-forwarding server

The following alert occurs when, during initialization, the store-for-forwarding server cannot call the shared-file server successfully.

SFF1—Unsuccessful call to shared-file server

Alert ID number		X'434247A4'
Alert type	X'01'	Permanent
Alert description	X'7001'	Resources not active
Probable causes	X'7001' X'8002'	Local system operator Workstation configuration
User causes	X'7005'	Device is not in the proper position
Install causes	(none)	
Failure causes	(none)	
Actions	X'1004'	Perform LAN recovery procedures
Additional SVs	X'05' SV X'10' SF	Hierarchy or resource list Hierarchy name list First resource below sender Name = (Workstation group ID) Type = X'81' (Service point) Second resource below sender Name = LANDP Type = X'18' (Transaction program) Third resource below sender Name = (Workstation ID) Type = X'84' (Programmable workstation) Fourth resource below sender Name = X'E2C6D6D9C6D6D9E6' (SFORFORW in EBCDIC) Type = X'19' (Program Product)

Synchronous data link control (SDLC)

The following alerts result from errors detected by synchronous data link control (SDLC).

S1—Unexpected SNRM command received

This alert occurs when, during the normal flow of traffic, a set normal response mode (SNRM) command is received.

Alert ID number		X'5E5000C5'
Alert type	X'01'	Permanent
Alert description	X'3300'	Link error
Probable causes	X'2104'	SDLC communication or remote node
User causes	(none)	
Install causes	(none)	
Failure causes	X'2104' X'F015'	SDLC communication or remote node SNRM received while in NRM
Actions	X'3302' X'3110'	If the problem occurs repeatedly contact a communication system programmer
Additional SVs	X'05' SV X'10' SF	Hierarchy or resource list Hierarchy name list First resource below sender Name = (Workstation group ID) Type = X'81' (Service point) Second resource below sender Name = LANDP Type = X'18' (Transaction program) Third resource below sender Name = (Workstation ID) Type = X'80' (Controller) Fourth resource below sender Name = X'E2C4D3C340404040' (SDLC in EBCDIC) Type = X'82' (Communication Controller)

S2—Invalid or unsupported frame received

This alert occurs when, during the normal flow of traffic, a frame that is not valid or not supported is received.

Alert ID number		X'9DA7063E'
Alert type	X'01'	Permanent
Alert description	X'3300'	Link error
Probable causes	X'2104'	SDLC communication or remote node
User causes	(none)	
Install causes	(none)	
Failure causes	X'2104' X'F020'	SDLC communication or remote node not valid, or unsupported command or response received
Actions	X'3302' X'3110'	If the problem occurs repeatedly contact a communication system programmer
Additional SVs	X'05' SV X'10' SF	Hierarchy or resource list Hierarchy name list First resource below sender Name = (Workstation group ID) Type = X'81' (Service point) Second resource below sender Name = LANDP Type = X'18' (Transaction program) Third resource below sender Name = (Workstation ID) Type = X'80' (Controller) Fourth resource below sender Name = X'E2C4D3C340404040' (SDLC in EBCDIC) Type = X'82' (Communication Controller)

S3—Frame exceeding allowable length received

This alert occurs when, during the normal flow of traffic, a frame which is too long is received.

Alert ID number		X'90E420E7'
Alert type	X'01'	Permanent
Alert description	X'3300'	Link error
Probable causes	X'2104'	SDLC communication or remote node
User causes	(none)	
Install causes	(none)	
Failure causes	X'2104' X'F023'	SDLC communication or remote node Received I-Field exceeded maximum length
Actions	X'3302' X'3110'	If the problem occurs repeatedly contact a communication system programmer
Additional SVs	X'05' SV X'10' SF	Hierarchy or resource list Hierarchy name list First resource below sender Name = (Workstation group ID) Type = X'81' (Service point) Second resource below sender Name = LANDP Type = X'18' (Transaction program) Third resource below sender Name = (Workstation ID) Type = X'80' (Controller) Fourth resource below sender Name = X'E2C4D3C340404040' (SDLC in EBCDIC) Type = X'82' (Communication Controller)

S4—Timer expired without being polled

The following alert occurs when, during the normal flow of traffic, the timer that controls the polling expires without receiving a poll.

Alert ID number		X'0E2DDF11'
Alert type	X'01'	Permanent
Alert description	X'3300'	Link error
Probable causes	X'2104' X'2031'	SDLC communication or remote node Line
User causes	X'0209'	Remote device power off
Actions	X'0200'	Check power
Install causes	(none)	
Failure causes	X'2104' X'3511'	SDLC communication or remote node Line
Actions	X'2010' X'3110'	Review link configuration detail data Contact a communication system programmer
Additional SVs	X'05' SV X'10' SF	Hierarchy or resource list Hierarchy name list First resource below sender Name = (Workstation group ID) Type = X'81' (Service point) Second resource below sender Name = LANDP Type = X'18' (Transaction program) Third resource below sender Name = (Workstation ID) Type = X'80' (Controller) Fourth resource below sender Name = X'E2C4D3C340404040' (SDLC in EBCDIC) Type = X'82' (Communication Controller)

S5—Modem power off

The following alert occurs when the remote modem is powered off.

Alert ID number		X'C9793D22'
Alert type	X'01'	Permanent
Alert description	X'3300'	Link error
Probable causes	X'2004' X'3601'	SDLC communication Local modem
User causes	X'0213'	Modem power off
Actions	X'0200'	Check power
Install causes	X'1202' X'3400'	Local modem Cable installed incorrectly
Failure causes	X'2004' X'3601' X'F035'	SDLC communication Local modem DSR dropped
Actions	X'0003' X'0301' X'0403'	Determine the reason for line shutdown Check cable and its connections Run modem tests
Additional SVs	X'05' SV X'10' SF	Hierarchy or resource list Hierarchy name list First resource below sender Name = (Workstation group ID) Type = X'81' (Service point) Second resource below sender Name = LANDP Type = X'18' (Transaction program) Third resource below sender Name = (Workstation ID) Type = X'80' (Controller) Fourth resource below sender Name = X'E2C4D3C340404040' (SDLC in EBCDIC) Type = X'82' (Communication Controller)

SNA server

The following alerts result from errors detected by the SNA server.

SN1—SNA protocol error

The SNA server detects this error in the following situations:

- Bracket error
- Chaining error
- Segmentation error
- Sequence number not valid
- Receiver in transmit mode
- Resource unknown or not valid

Alert ID number		X'0DB0DB49'
Alert type	X'01'	Permanent
Alert description	X'3100'	SNA protocol error
Probable causes	X'1022' X'1023'	Communication program Communication program in remote node
User causes	(none)	
Install causes	X'1501'	Incorrect customization parameters
Actions	X'1502'	Correct customization parameters
Failure causes	X'1022' X'1023'	Communication program Communication program in remote node
Actions	X'3110' X'32A0' X'82' SF	Contact communication system programmer. Report the following (Sense code)
Additional SVs	X'05' SV X'10' SF	Hierarchy or resource list Hierarchy name list First resource below sender Name = (Workstation group ID) Type = X'81' (Service point) Second resource below sender Name = LANDP Type = X'18' (Transaction program) Third resource below sender Name = (Workstation ID) Type = X'84' (Programmable workstation) Fourth resource below sender Name = X'E2D5C17B7B404040' (SNA## in EBCDIC)[1] Type = X'80' (Controller)
'': [1] ## is updated with the session ID.		

X.25 data link control (DLC)

The following alerts result from errors detected by X.25 data link control (DLC).

X1—Invalid or unsupported command received

This alert occurs when a received Q-frame is unexpected, unordered, invalid, or unsupported.

Alert ID number		X'11A865CF'
Alert type	X'01'	Permanent
Alert description	X'3320'	X.25 error
Probable causes	X'2052'	Logical link control
User causes	(none)	
Install causes	(none)	
Failure causes	X'2006' X'F020'	X.25 communication error Invalid or unsupported command or response received
Actions	X'3302' X'3107' X'32D0' X'82' SF X'82' SF X'82' SF	If the problem occurs repeatedly contact X.25 network information service Report the following: (DTE address called) (DTE address calling) (Local DTE address)
Additional SVs	X'05' SV X'10' SF	Hierarchy or resource list Hierarchy name list First resource below sender Name = (Workstation group ID) Type = X'81' (Service point) Second resource below sender Name = LANDP Type = X'18' (Transaction program) Third resource below sender Name = (Workstation ID) Type = X'84' (Programmable workstation) Fourth resource below sender Name = X'E7F2F5C4D3C34040' (X25DLC in EBCDIC) Type = X'82' (Communication Controller)

X2—DCE-Originated clear indication received

This alert occurs when the DTE receives a CLEAR_INDICATION packet containing a DCE-originated cause code and a diagnostic code.

Alert ID number		X'D484ED27'
Alert type	X'01'	Permanent
Alert description	X'3320'	X.25 error
Probable causes	X'2050' X'2008' X'2006' X'2200'	Packet layer control X.25 communication X.25 network Remote node
User causes	(none)	
Install causes	(none)	
Failure causes	X'20C1' X'82' SF X'82' SF X'2006' X'2200'	X.25 communication error - The following indication packet was received (Packet type and cause code) (Diagnostic code) X.25 communication error Remote node
Actions	X'3302' X'3107' X'32D0' X'82' SF X'82' SF X'82' SF X'3123'	If the problem occurs repeatedly contact X.25 network information service Report the following (DTE address called) (DTE address calling) (Local DTE address) Contact remote DTE's operator
Additional SVs	X'05' SV X'10' SF	Hierarchy or resource list Hierarchy name list First resource below sender Name = (Workstation group ID) Type = X'81' (Service point) Second resource below sender Name = LANDP Type = X'18' (Transaction program) Third resource below sender Name = (Workstation ID) Type = X'84' (Programmable workstation) Fourth resource below sender Name = X'E7F2F5C4D3C34040' (X25DLC in EBCDIC) Type = X'82' (Communication Controller)

X3—Reset indication packet sent by the DTE

This alert occurs when, because of an abnormal situation, the X25DLC server resets a virtual circuit and some information is lost in the DTE.

Alert ID number		X'6A837F72'
Alert type	X'02'	Temporary
Alert description	X'3320'	X.25 error
Probable causes	X'2050' X'2008' X'2200' X'2006'	Packet layer control X.25 communication Remote node X.25 network
User causes	(none)	
Install causes	(none)	
Failure causes	X'20C2' X'82' SF X'82' SF X'2200' X'2006'	X.25 communication error - DTE sent the following request packet to the network (Packet type and cause code) (Diagnostic code) Remote node X.25 communication error
Actions	X'3302' X'3107' X'32D0' X'82' SF X'82' SF X'82' SF X'3123'	If the problem occurs repeatedly contact X.25 network information service Report the following (DTE address called) (DTE address calling) (Local DTE address) Contact remote DTE's operator
Additional SVs	X'05' SV X'10' SF	Hierarchy or resource list Hierarchy name list First resource below sender Name = (Workstation group ID) Type = X'81' (Service point) Second resource below sender Name = LANDP Type = X'18' (Transaction program) Third resource below sender Name = (Workstation ID) Type = X'84' (Programmable workstation) Fourth resource below sender Name = X'E7F2F5C4D3C34040' (X25DLC in EBCDIC) Type = X'82' (Communication Controller)

X4—Clear request packet sent by the DTE

This alert occurs when the DTE sends a CLEAR_REQUEST packet containing a DTE-originated cause code and a diagnostic code.

Alert ID number		X'056A9521'
Alert type	X'01'	Temporary
Alert description	X'3320'	X.25 error
Probable causes	X'2050' X'2008'	Packet layer control X.25 communication
User causes	(none)	
Install causes	(none)	
Failure causes	X'20C2' X'82' SF X'82' SF	X.25 communication error - The DTE sent the following request packet: (Packet type and cause code) (Diagnostic code)
Actions	X'3302' X'3107' X'32D0' X'82' SF X'82' SF X'82' SF	If the problem occurs repeatedly contact X.25 network information service Report the following (DTE address called) (DTE address calling) (Local DTE address)
Additional SVs	X'05' SV X'10' SF	Hierarchy or resource list Hierarchy name list First resource below sender Name = (Workstation group ID) Type = X'81' (Service point) Second resource below sender Name = LANDP Type = X'18' (Transaction program) Third resource below sender Name = (Workstation ID) Type = X'84' (Programmable workstation) Fourth resource below sender Name = X'E7F2F5C4D3C34040' (X25DLC in EBCDIC) Type = X'82' (Communication Controller)

Chapter 9. 3270 emulator operator information area

The 3270 emulator uses the last line of the screen, the operator information area, to provide status information. The format of the operator information area depends on whether you use the emulator in SBCS mode or in DBCS mode.

Deriving the status indicator codes

The LANDP 3270 emulator provides status information by placing a three-digit Status Indicator Code in the Operator Information Area (OIA) . The codes fall into the following ranges:

- 3xx - Cryptography errors
- 4xx - Host data stream errors
- 6xx - Release errors
- 7xx - Connect errors
- 8xx - Read Host errors
- 9xx - Send Host errors

Cryptography errors

Codes in the 3xx range indicate cryptography errors. These are:

394 A hardware or software error occurred while generating the encryption key or initial value.

395 A hardware or software error occurred while sending the initial encryption value to the host.

396 A hardware or software error occurred while verifying the encryption data sent from the host.

397 A hardware or software error occurred while sending the encryption verification response to the host.

398 A hardware or software error occurred while decrypting data sent from the host.

399 A hardware or software error occurred while encrypting data to be sent to the host.

Host data stream errors

Codes in the 4xx range indicate host data stream errors. These are:

401 The host data stream contained an invalid command code, an invalid data stream order sequence, or an invalid structured field.

402 The host data stream contained an invalid address in a Set Buffer Address Erase Unprotected to Address or Repeat to Address data stream order sequence.

403 The host data stream contained a Read Modified, Read Modified All, Read Buffer, or Erase All Unprotected command which was followed by subsequent data.

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498 An unexpected negative response was received from the host. This probably indicates a host protocol or communications error.

To further diagnose the exact reason for the failure, examine the contents of the host data stream to determine the cause of the error.

Other error codes

Codes of 6xx and above are generated when a SNA function ends with a return code which indicates that an error has occurred. The first digit indicates the SNA function which failed (6=Release, 7=Connect, 8=Read Host, and 9=Send Host), and the last two digits are derived from the last three bits of each character of the LANDP return code received from the SNA server, the LANDP workgroup server, or the router.

For example, a timeout on a Send Host command causes an L8 return code to be returned. 'L8' in ASCII is hex '4C38', and so the OIA error code is 940, which is derived as follows:

```
9 - means 'Send'
4 - from 'L'. In ASCII this is hex 4C, binary 0100 1100;
              The last three bits are 100, which is decimal 4.
0 - from '8'. In ASCII this is hex 38, binary 0011 1000;
              The last three bits are 000, which is decimal 0.
```

Each digit of the xx can therefore only be in the range 0-7 and can be derived from several alternative return code characters:

OIA digit	x'30'- x'37'	x'38'- x'3F'	x'40'- x'47'	x'48'- x'4F'	x'50'- x'57'	x'58'- x'5F'
0	0	8		H	P	X
1	1	9	A	I	Q	Y
2	2		B	J	R	Z
3	3		C	K	S	
4	4		D	L	T	
5	5		E	M	U	
6	6		F	N	V	
7	7		G	O	W	

In practise, only certain codes are used. This table gives the OIA error codes for return codes in the ranges I1-I4, L0-LM, P0-PF, PZ and U1-U9.

OIA code	LANDP return codes
x00	P0, P8
x01	P1, P9, PA
x02	P2, PB, PZ
x03	P3, PC
x04	P4, PD
x05	P5, PE
x06	P6, PF
x07	P7
x11	I1
x12	I2

```
x13  :  I3
x14  :  I4
x40  :  L0, L8, LH
x41  :  L1, L9, LA, LI
x42  :  L2, LB, LJ
x43  :  L3, LC, LK
x44  :  L4, LD, LL
x45  :  L5, LE, LM
x46  :  L6, LF
x47  :  L7, LG
x50  :  U8
x51  :  U1, U9
x52  :  U2
x53  :  U3
x54  :  U4
x55  :  U5
x56  :  U6
x57  :  U7
```

To further diagnose the exact reason for the failure, examine the LANDP function trace to determine the failing SNA function and its return code.

Status indicator codes

If there is an error condition, the operator information area includes a status indicator code. The following tables list the common reasons for some of the status indicator codes that might be generated.

Status indicator codes

701	LUA definition error • DOS: SNA.CFG and LAN.CFG mismatch • OS/2: Communications Server LUA definitions mismatch • Windows: Communications Server or SNA server LUA definitions mismatch
703	No communication buffers. Configuration error.
705	LANDP internal error. For example, (OS/2) server-managed cryptography has been requested, but the Communications Server exits are missing or invalid.
712	Modem powered off, or communication adapter or cabling hardware problem.
713	No X.25 circuit available.
740	LAN timeout.
741	Hardware failure or configuration error (LAN.CFG or COM.CFG).
742	The gateway is not accessible for one of the following reasons: • Configuration error • The gateway is powered off • LANDP not loaded at the gateway
743	Session not defined, configuration error.
744	Irrecoverable gateway error.
745	Server not loaded. Configuration error.
746	Irrecoverable workstation error.
747	LAN adapter not present, or support software not loaded.

Status indicator codes

750
- DOS: No DLC loaded, configuration problem
- OS/2: Communications Server not started, or link not started
- Windows: Communications Server or SNA Server not started, or link not started

751 Pending contact. Communications error.

754 Communication adapter hardware error.

756 Communication adapter software microcode error.

801 LUA definition error or LANDP internal error
- DOS: SNA.CFG and LAN.CFG mismatch
- OS/2: Communications Server LUA definitions mismatch
- Windows: Communications Server or SNA server LUA definitions mismatch

803 An attempt has been made to read a message from the host when there were no pending messages, or to send a message to the host when the host was not ready to receive messages.

If a program is running that uses either the LANDP 3270 emulator API or the LANDP 3270 emulator high-level language API (HLLAPI) to communicate with the host, check the logic of this program to ensure it is not trying to communicate with the host at the wrong time.

811 No session with the host.

812 Modem powered off, or communication adapter or cabling hardware problem.

840 LAN timeout.

841 Hardware failure or configuration error (LAN.CFG or COM.CFG).

842 The gateway is not accessible due to one of the following reasons:
- Configuration error
- The gateway is powered off
- LANDP not loaded at the gateway

843 Session not defined, configuration error.

844 Irrecoverable gateway error.

845 Server not loaded. Configuration error.

846 Irrecoverable workstation error.

847 LAN adapter not present or support software not loaded.

850
- DOS: No DLC loaded, configuration problem
- OS/2: Communications Server not started or link not started
- Windows: Communications Server or SNA Server not started, or link not started

851 Pending contact. Communications error.

854 Communication adapter hardware error.

856 Communication adapter software microcode error.

901 LUA definition error
- DOS: SNA.CFG and LAN.CFG mismatch
- OS/2: Communications Server LUA definitions mismatch
- Windows: Communications Server or SNA server LUA definitions mismatch

903 No communication buffers. Configuration error.

907 Communication server protocol error.

911 No session.

912 Modem powered off, or communication adapter or cabling hardware problem.

940 LAN timeout.

941 Hardware failure or configuration error (LAN.CFG or COM.CFG).

Status indicator codes

942 The gateway is not accessible because:
- There is a configuration error
- The gateway is powered off
- LANDP is not loaded at the gateway

943 Session not defined, configuration error.

944 Irrecoverable gateway error.

945 Server not loaded.

946 Irrecoverable workstation error.

947 LAN adapter not present, or support software not loaded.

950
- DOS: No DLC loaded, configuration problem
- OS/2: Communications Server not started, or link not started
- Windows: Communications Server or SNA Server not started, or link not started

951 Pending contact.

954 Communication adapter hardware error.

956 Communication adapter software microcode error.

SBCS operator information layout

Table 50. SBCS operator information

Column	SBCS operator information	
1	4	System available
2	B	Secondary LU: B SNA protocol
3		Primary LU:
	⍟	System operator
	?	Unowned
	□	My job
10	X	Inhibited keyboard
12	M	Machine check
	☼	Terminal wait
	?	Retry
	S	System wait
	f	Minus function
	⍟	Operation action not valid
	#	Numeric field
	√	Communication check
	P	Program check
	D	Device not working
	O	Operator communication check
14 – 16	SIC	Status indicator code (see “Status indicator codes” on page 259)
20	√	Communication check reminder
21 – 24		X.25 cause and diagnostic (CLEAR/RESET packet)
26	#	Cursor in numeric field
35	↑	Shift key pressed
36	C	Ctrl key pressed
37	A	Alt key pressed
39	⇕	Caps locked
41	N	Numeric pad locked
43	â	Insert on
49 – 50		Workstation ID
52		Session short name
54 – 61		Session long name (8 characters)
70 – 71		Cursor row
72	/	Separator
73 – 74		Cursor column (80 column screen)
73 – 75		Cursor column (132 column screen)

DBCS operator information layout

Table 51. DBCS operator information

Column	DBCS operator information	
1	4	System available
2	B	Secondary LU: B SNA protocol
3		Primary LU:
	X	System operator
	?	Unowned
	□	My job
5 – 8		Keyboard status, defined by DOS/V FEP
9	↑	In shift status
10 – 13		Keyboard status, defined by DOS/V FEP
17		DBCS translation mode, defined by DOS/V FEP
20	X	Inhibited keyboard
22	M	Machine check
	☼	Terminal wait
	?	Retry
	S	System wait
	f	Minus function
	X	Operation action not valid
	#	Numeric field
	X	Communication check
	P	Program check
	D	Device not working
	O	Operator communication check
24 – 26	SIC	Status indicator code (see “Status indicator codes” on page 259)
30	X	Communication check reminder
31 – 34		X.25 cause and diagnostic (CLEAR/RESET packet)
36	#	Cursor in numeric field
55	C	Ctrl key pressed
56	A	Alt key pressed
57	⇕	Caps locked
58	N	Numeric lock
59	^	Insert on
61 – 62		Workstation ID
64		Session short name
66 – 73		Session long name
75 – 76		Cursor row
77	/	Separator
78 – 79		Cursor column (80 column screen)

Table 51. DBCS operator information (continued)

Column	DBCS operator information
78 – 80	Cursor column (132 column screen)

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A

abend. Abnormal end of task.

Abnormal end of task. Termination of a task before its completion because of an error condition that cannot be resolved by recovery facilities while the task is executing.

abstract class. A class that provides common information for subclasses, and that therefore cannot be instantiated. Abstract classes provide at least one abstract method.

abstract method. A method with a signature, but no implementation. You provide the implementation of the method in the subclass of the abstract class that contains the abstract method.

account. In the AIX operating system, the log-in directory and other information that gives a user access to the system.

ACF. Advanced Communications Function

ACF/NCP. Advanced Communications Function for the Network Control Program.

activate logical unit request (ACTLU). A request, sent by the host to the LANDP SNA server, to establish a logical session.

activate physical unit request (ACTPU). A request, sent by the host to the LANDP SNA server, to establish a physical session.

active. In an XLR environment, the server (and by implication, the workstation) that handles client requests and sends logging data to the backup.

ACTLU. Activate logical unit request.

ACTPU. Activate physical unit request.

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adapter. A part that electrically or physically connects a device to a computer or to another device. A printed circuit board that modifies the system unit to allow it to operate in a particular way.

address. The unique code assigned to each device or workstation connected to a network. A standard Internet address is a 32-bit address field. This field can be broken into two parts. The first part contains the network address; the second part contains the host number.

Advanced Communications Function (ACF). A group of IBM licensed programs, principally VTAM programs, TCAM, NCP, and SSP, that use the concepts of Systems Network Architecture (SNA), including distribution of function and resource sharing. See also Network Control Program (NCP).

Advanced Communications Function for the Network Control Program (ACF/NCP). An IBM program product that provides communication controller support for single-domain, multiple-domain, and interconnected network capability. See also Advanced Communications Function (ACF) and Network Control Program (NCP).

advanced program-to-program communication (APPC). The general facility characterizing the LU 6.2 architecture and its various implementations in products.

AID. Attention identifier.

AIX (Advanced Interactive Executive). IBM's licensed version of the UNIX operating system.

alert. A message sent to a management services focal point in a network to identify a problem or an impending problem. In the NetView program, a high-priority event that warrants immediate attention. A database record is generated for certain event types that are defined by user-constructed filters.

alert condition. A problem or impending problem for which information is collected and possibly forwarded for problem determination, diagnosis, or resolution.

alert description. Information in an alert table that defines the contents of a Systems Network Architecture (SNA) alert for a particular message ID.

alert focal point. The system in a network that receives and processes (logs, displays, and optionally forwards) alerts. An alert focal point is a subset of a problem management focal point.

alert ID number. A value created from specific fields in the alert using a cyclic redundancy check. A focal point uses this value to refer to a particular alert, for example, to filter out duplicate alerts.

alert type. A value in an alert that indicates the problem being reported.

American National Standards Institute (ANSI). An organization consisting of producers, consumers, and general interest groups, that establishes the procedures by which accredited organizations create and maintain voluntary industry standards in the United States. (A)

ANSI. American National Standards Institute.

APAR. Authorized program analysis report.

API. Application program interface.

APPC. Advanced program-to-program communication.

applet. A Java program designed to run within a Web browser. Contrast with application.

application. In LANDP, a program using IBM LANDP for DOS, IBM LANDP for OS/2, IBM LANDP for Windows, IBM LANDP for Linux, IBM FBSS/2, IBM PC/Integrator, or IBM PC Integrator/2, tailored to the needs of the workstation user. The use to which an information processing system is put; for example, a payroll application, an airline reservation application, a network application. A collection of software components used to perform specific types of user-oriented work on a computer. In Java programming, a self-contained, stand-alone Java program that includes a static main method. It does not require an applet viewer. Contrast with applet.

application program. A program that is specific to the solution of an application problem. Synonymous with application software. (T) A program written for or by a user that applies to the user's work, such as a program that does inventory control or payroll. A program used to connect and communicate with stations in a network, enabling users to perform application-oriented activities.

application program interface (API). In LANDP, the common interface by which server functions are requested. Requests are expressed by issuing a call to the supervisor. A functional interface supplied by the operating system or by a separately orderable licensed program that allows an application program written in a high-level language to use specific data or functions of the operating system or the licensed program. The interface through which an application program interacts with an access method.

application software. Software that is specific to the solution of an application problem. (T) Synonymous with application program. Software coded by or for an end user that performs a service or relates to the user's work. Software products such as games, spreadsheets, and word processing programs designed for use on a personal computer.

argument. An independent variable. (I) (A) Any value of an independent variable; for example, a search key; a number identifying the location of an item in a table. (I) (A) A parameter passed between a calling program and a called program.

arrival sequence. An order in which records are retrieved that is based on the order in which records are stored in a physical file.

AS/400®. IBM Application System/400®.

ASCII (American National Standard Code for Information Interchange). The standard code, using a coded character set consisting of 7-bit coded characters (8-bits including parity check), used for information interchange among data processing systems, data communication systems, and associated equipment. The ASCII set consists of control characters and graphic characters. (A)

Note: IBM has defined an extension to ASCII code (characters 128-255).

ASCIIZ format. A string of ASCII characters ending with a null character (X'00').

ASYNC. Asynchronous.

asynchronous (ASYNC). Pertaining to two or more processes that do not depend upon the occurrence of specific events such as common timing signals. (T) Without regular time relationship; unexpected or unpredictable with respect to the execution of program instructions.

attention identifier (AID). A code in the inbound 3270 data stream that identifies the source or type of data that follow. A character in a data stream indicating that the user has pressed a key, such as the Enter key, that requests an action by the system.

authorization. In computer security, the right granted to a user to communicate with or make use of a computer system. (T) An access right. The process of granting a user either complete or restricted access to an object, resource, or function.

authorized program analysis report (APAR). A report of a problem caused by a suspected defect in a current unaltered release of a program.

B

back-out. To restore a file to a previous condition by removing changes in the inverse chronological order from which the changes were originally made.

backup. In an XLR environment, the server (and, by implication, the workstation) that accepts logging data from the active and maintains a mirror set of databases (at a transaction level).

BASIC. Beginner's all-purpose symbolic instruction code. A procedural algebraic language originally designed for ease of learning with a small instruction repertoire. (A) A high-level programming language with a small number of statements and a simple syntax that is designed

to be easily learned and used and that is widely used for interactive applications on microcomputers.

Basic Input/Output System (BIOS). Code that controls basic hardware operations, such as interactions with diskette drives, hard disk drives, and the keyboard. See also NetBIOS.

BAT, bat. A DOS batch file extension (.BAT). A batch file that contains a series of commands to be processed sequentially.

BB. Begin bracket.

begin bracket (BB). An SNA bracket protocol term issued by the LANDP SNA server when bracket protocol is requested in the bind session. Contrast with end bracket.

BID. In SNA, a request to start a bracket.

bind. To associate a variable with an absolute address, identifier, or virtual address, or with a symbolic address or label in a program.

BIND. In SNA, a request to start a session between two logical units. Contrast with UNBIND.

binding. In programming, an association between a variable and a value for that variable that holds within a defined scope. The scope may be that of a rule, a function call, or a procedure invocation. (T) In the AIX operating system, a temporary association between a client and both an object and a server that exports an interface to the object. A binding is meaningful only to the program that sets it and is represented by a bound handle.

BIOS. Basic Input/Output System.

block. The smallest complete unit of data that can be transmitted between units in a communication network. The maximum size of a block depends on the characteristics of the sending or receiving unit. A group of contiguous characters recorded as a unit. See also connectivity programming request block, program control block.

browser. An Internet-based tool that lets users browse web sites.

buffer. A routine or storage used to compensate for a difference in rate of flow of data, or time of occurrence of events, when transferring data from one device to another. (A) A portion of storage used to hold input or output data temporarily.

C

C language. A language used to develop software applications in compact, efficient code that can be run on different types of computers with minimal change.

call. In LANDP, the invocation of one of the LANDP API routines, RMTREQ, GETRPLY and RMTAREQ (client calls) and GETREQ, RMTRPLY, and SRVINIT (server calls). A LANDP client uses the RMTREQ call to request a LANDP function. Calls use the connectivity programming request block (CPRB) to pass and receive information. The syntax of a call varies with the programming language. The following examples are for COBOL and C respectively

```
CALL "RMTREQ" USING BY REFERENCE EHC-CPRB
                    BY VALUE     EHC-RESERVED

retcode = GETREQ(&mycprb, EHC_RESERVED);
```

CCITT. Comité Consultatif International Télégraphique et Téléphonique. The International Telegraph and Telephone Consultative Committee.

CD. Compact disc.

CD-ROM. Compact disc-read-only memory.

CICS®. Customer Information Control System.

CID. Configuration, Installation, and Distribution. An IBM standard methodology for installing and distributing products under DOS, OS/2, and Windows 3.1.

ciphertext. In computer security, text produced by encryption. Synonym for enciphered data.

cleartext. Nonencrypted data. Synonym for plaintext.

class. An encapsulated collection of data and methods to operate on data. A class can be instantiated to produce an object that is an instance of the class.

CLASSPATH. In your deployment environment, the environment variable keyword that specifies the directories in which to look for class and record files.

client. A functional unit that receives shared services from a server. (T) A user. See also client/server, client workstation, server, and user.

client workstation. In IBM LANDP for DOS, IBM LANDP for OS/2, IBM LANDP for Linux, IBM LANDP for Windows, IBM FBSS/2, IBM PC/Integrator, and IBM PC Integrator/2, a workstation in a LAN that uses a service. See also client, client/server, server, and user.

client/server. In communications, the model of interaction in distributed data processing in which a program at one site sends a request to a program at another site and awaits a response. The requesting program is called a client; the answering program is called a server. See also client, client workstation, server, and user.

CLIST, clist. Command list.

close. A LANDP family function used to release a server. To end the processing of a file. A data manipulation function that ends the connection between a file and a program. Contrast with open.

COBOL. Common business-oriented language. A high-level programming language, based on English, that is used primarily for business applications.

code page. An assignment of graphic characters and control function meanings to all code points; for example, assignment of characters and meanings to 256 code points for an 8-bit code, assignment of characters and meanings to 128 code points for a 7-bit code.

collating sequence. A specified arrangement used in sequencing. (I) (A)

COM, com. A DOS file with the file extension .COM.

command. Loosely, a mathematical or logic operator. (A) A request from a terminal for performance of an operation or processing of a program. A character string from a source external to a system that represents a request for system action.

command list (CLIST, clist). A list of commands and statements designed to perform a specific function for the user.

Common User Access™ architecture. Guidelines for the dialog between a human and a workstation or terminal. One of the three SAA architectural areas.

communication configuration. In LANDP, the process of selecting and describing to the LANDP programs the particular arrangement of communication functions about a particular user.

communication controller. A device that directs the transmission of data over the data links of a network; its operation may be controlled by a program executed in a processor to which the controller is connected or it may be controlled by a program executed within the device. (T) A type of communication control unit whose operations are controlled by one or more programs stored and executed in the unit. It manages the details of line control and the routing of data through a network.

communication server. A server that communicates with a remote computer for various workstations in a local area network.

Communications Server. An IBM licensed program that supports the development and use of OS/2 applications involving two or more connected systems or workstations. IBM SecureWay Communications Server for OS/2 Warp provides multiple concurrent connectivities using different protocols for IBM 3270 and 5250 emulation sessions, printer sessions, and file transfers. It supports a range of application programming interfaces (API), which may be called concurrently and are designed for a variety of applications. IBM

SecureWay Communications Server for OS/2 Warp includes the necessary interfaces for network management.

compact disc (CD). A disc, usually 4.75 inches in diameter, from which data is read optically by means of a laser. A disc with information stored in the form of pits along a spiral track. The information is decoded by a compact-disc player and interpreted as digital audio data, which most computers can process.

compact disc-read-only memory (CD-ROM). A 4.75-inch optical memory storage medium, capable of storing about 550 megabytes of data. The standards for CD-ROM storage are known as the “Yellow Book.”

compaction. Any method for encoding data to reduce the storage it requires. In SNA, the transformation of data by packing two characters in a byte so as to take advantage of the fact that only a subset of the allowable 256 characters is used; the most frequently sent characters are compacted. See also compression and encode.

compression. The process of eliminating gaps, empty fields, redundancies, and unnecessary data to shorten the length of records or blocks. In SNA, the replacement of a string of up to 64 repeated characters by an encoded control byte to reduce the length of the data stream sent to the LU-LU session partner. The encoded control byte is followed by the character that was repeated (unless that character is the prime compression character). Contrast with decompression.

config.sys. A file created during the customization process that holds the details about the system configuration. The CONFIG.SYS file is used during system operation.

configuration. The manner in which the hardware and software of an information processing system are organized and interconnected. (T) The physical and logical arrangement of devices and programs that make up a data processing system. The devices and programs that make up a system, subsystem, or network.

connection. An association established between functional units for conveying information. The path between two protocol modules that provide reliable stream delivery service. On the Internet, a connection extends from a TCP module on one machine to a TCP module on the other.

connectivity. The capability to attach a variety of functional units without modifying them.

connectivity programming request block (CPRB). The control block used for communication between a server and a client. This control block contains the information that is exchanged between clients and servers, and the information required for routing the requests and replies.

constructor. A method called to set up a new instance of a class.

control program. A computer program designed to schedule and supervise the execution of programs of a computer system. (I) (A)

coprocessor. A supplementary processor that performs operations in conjunction with another processor. In personal computers, a microprocessor on an expansion board that extends the address range of the processor in the system unit or adds specialized instructions to handle a particular category of operations; for example, an I/O coprocessor, math coprocessor, or networking coprocessor.

corrective service diskette. A diskette provided by IBM to registered service coordinators for resolving user-identified problems with previously installed software. This diskette includes program updates designed to resolve problems.

CPRB. Connectivity programming request block.

CRC. The cyclic redundancy check character. (A)

critical error handler. A routine that the operating system calls automatically if an error occurs in an operating system function call. There is a standard error handler or the user can provide one for special functions.

CRV. Cryptography verification request.

cryptography. The transformation of data to conceal its meaning. In computer security, the principles, means, and methods for encrypting plaintext and decrypting ciphertext.

cryptography key. A parameter that determines cryptographic transformations between plaintext and ciphertext.

cryptography verification (CRV) request. A request unit sent by the primary logical unit (PLU) to the secondary logical unit (SLU) as part of cryptographic session establishment, to allow the SLU to verify that the PLU is using the correct session cryptography key and initialization vector (IV).

CTS. Clear to Send.

CUA™ architecture. Common User Access™ architecture.

cursor. A movable, visible mark used to show a position of interest on a display surface. (A) In SAA Common User Access architecture, a visual cue that shows a user where keyboard input will appear on the screen.

Customer Information Control System (CICS®). An IBM licensed program that allows transactions entered at remote terminals to be processed concurrently by user-written application programs. It includes facilities for building, using, and maintaining databases.

Customer Information Control System for Virtual Storage (CICS/VS). An IBM licensed program used in a communications network.

customization. The process of designing a data processing installation or network to meet the requirements of particular users.

customization workstation. A workstation on which LANDP is installed, and which is used to customize a LANDP workgroup.

cyclic redundancy check character (CRC). A character used in a modified cyclic code for error detection and correction. (A)

D

DASD. Direct access storage device.

data circuit-terminating equipment (DCE). In a data station, the equipment that provides the signal conversion and coding between the data terminal equipment (DTE) and the line. (I)

Notes:

1. The DCE may be separate equipment or a part of the DTE or an integral part of the DTE or of the intermediate equipment.
2. A DCE may perform other functions that are usually performed at the network end of the line.

Data Encryption Standard (DES). In computer security, the National Institute of Standards and Technology (NIST) Data Encryption Standard, adopted by the U.S. government as Federal Information Processing Standard (FIPS) Publication 46, which allows only hardware implementations of the data encryption algorithm.

data flow control (DFC). In SNA, a request/response unit (RU) category used for requests and responses exchanged between the data flow control layer in one half-session and the data flow control layer in the session partner. Half duplex, flip-flop is the only LANDP-supported data flow control for both send and receive.

data link control (DLC). In SNA, the layer that consists of the link stations that schedule data transfer over a link between two nodes and perform error control for the link. Examples of data link control are SDLC for serial-by-bit link connection and data link control for the System/370™ channel. See also Systems Network Architecture (SNA). In SNA, a set of rules used by two nodes on a data link to accomplish an orderly exchange of information.

data set. The major unit of data storage and retrieval, consisting of a collection of data in one of several prescribed arrangements and described by control information to which the system has access. Sometimes called a file.

data terminal equipment (DTE). The part of a data station that serves as a data source, data sink, or both. (I) (A)

database description (DBD). In LANDP, the shared-file server descriptor. In IMS/VS, the collection of macro-parameter statements that describes an IMS/VS database. These statements describe the hierarchical structure, IMS/VS organization, device type, segment length, sequence fields, and alternate search fields. The statements are assembled to produce database description blocks.

datagram. The basic unit of information that is passed across the Internet. It consists of one or more data packets.

DBCS. Double-byte character set.

DBD. Database description.

DBM. Database manager.

DCA. Direct communication adapter.

DCE. Data circuit-terminating equipment. Distributed Computing Environment.

DDE. Dynamic data exchange.

DDT. Diagnostic and debugging tool.

decipher. To convert enciphered data in order to restore the original data. (T) In computer security, to convert ciphertext into plaintext by means of a cipher system. To convert enciphered data into clear data. Synonymous with decrypt. Contrast with encipher.

decompression. A function that expands data to the length that preceded data compression. Contrast with compression.

decrypt. In computer security, to decipher or decode. Synonymous with decipher. (T)

default. A value, attribute or option that is assumed when none is explicitly specified.

delimiter. A character used to show the beginning and end of a character string. (T) A character that groups or separates words or values in a line of

deprecation. An obsolete component that may be deleted from a future release of a product.

DES. Data Encryption Standard.

development workstation. A workstation which is part of a LANDP workgroup, and which is customized via a customization workstation.

device driver. In Advanced DOS, a file that contains the code needed to attach and use a device.

DFC. Data flow control.

DIN. Deutsches Institut für Normung.

direct access. The capability to obtain data from a storage device, or to enter data into a storage device, in a sequence independent from their relative position, by means of addresses indicating the physical position of the data. (T) Contract with sequential access.

direct access storage device (DASD). A device where access time is effectively independent of the location of the data.

directory. A table of identifiers and references to the corresponding items of data. (I) (A) A type of file containing the names and controlling information for other files or other directories. An index that is used by a control program to locate one or more blocks of data that are stored in separate areas of a data set in direct access storage. A listing of the files stored on a diskette.

directory service (DS). An application service element that translates the symbolic names used by application processes into the complete network addresses used in an OSI environment. (T)

disk. A round, flat data medium that is rotated to read or write data. (T) Loosely, a magnetic disk unit.

disk operating system. An operating system for computer systems that use disks and diskettes for auxiliary storage of programs and data.

diskette. A thin, flexible magnetic disk and a semi-rigid protective jacket, where the disk is permanently enclosed. Contrast with hard disk.

Distributed Computing Environment (DCE). The Open Software Foundation (OSF) specification (or a product derived from this specification) that assists in networking. DCE provides such functions as authentication, directory service (DS), and remote procedure call (RPC).

distributed system. A data processing system where processing, storage, and control functions, and also input and output operations, are distributed among remote locations.

distribution diskette. A diskette on which IBM sends programs and documentation to a customer.

DLC. Data link control.

DLL. Dynamic link library.

DMA. Direct memory access.

domain. The part of a computer network where the data processing resources are under common control. (T) In a database, all the possible values of an attribute or a data element. In SNA, a system services control point (SSCP) and the physical units (PUs), logical units (LUs), links, link stations, and all associated resources that the SSCP could control with activation requests and deactivation requests.

DOS. Disk Operating System.

double-byte character set (DBCS). A set of characters in which each character is represented by 2 bytes. Languages such as Japanese, Chinese, and Korean, which contain more symbols than can be represented by 256 code points, require double-byte character sets. Because each character requires 2 bytes, the typing, display, and printing of DBCS characters requires hardware and programs that support DBCS. Contrast with single-byte character set (SBCS).

DS. Directory service.

DSR. Data Set Ready.

DTE. Data terminal equipment. (A)

DTE/DCE interface. The physical interface and link access procedures between a data terminal equipment (DTE) and a data circuit-terminating equipment (DCE).

dynamic data exchange (DDE). The exchange of data between programs or between a program and a data-file object. Any change made to information in one program or session is applied to the identical data created by the other program.

dynamic link library (DLL). A file containing executable code and data bound to a program at load time or run time, rather than during linking. The code and data in a dynamic link library can be shared by several applications simultaneously.

E

EB. End bracket.

EBCDIC. Extended binary-coded decimal interchange code.

EGA. Enhanced graphics adapter.

EID. End-of-message (EOM) identification.

EMM. Expanded memory manager.

emulation. The use of a data processing system to imitate another data processing system, so that the imitating system accepts the same data, executes the same programs, and achieves the same results as the imitated system. Emulation is usually achieved with hardware or firmware. (T)

encipher. To scramble data or to convert data to a secret code that masks the meaning of the data to any unauthorized recipient. Synonymous with encrypt. (T) In computer security, to convert plaintext into an unintelligible form by means of a

cipher system. Synonymous with cipher. Contrast with decipher. See also encode.

enciphered data. Data whose meaning is concealed from unauthorized users or observers. Synonymous with encode.

encode. To convert data by the use of a code in such a manner that reconversion to the original form is possible. (T) In computer security, to convert plaintext into an unintelligible form by means of a code system. See also plaintext.

encrypt. In computer security, to encode or encipher. Synonym for encipher. (T)

end bracket (EB). An SNA bracket protocol term used when the bind session specifies the end bracket call. If specified in the bind session, the personal computer may send both begin bracket and end bracket calls (not-response mode protocol). Contrast with begin bracket.

end-of-message (EOM). The character or sequence of characters that shows the end of a message or record.

enhanced graphics adapter (EGA). An adapter, such as the IBM Enhanced Graphics Adapter, that provides high-resolution graphics, allowing the use of a color display for text processing and also graphics applications.

environment. A named collection of logical and physical resources used to support the performance of a function.

EOM. End-of-message.

erase. To remove data from a data medium. Erasing is usually accomplished by overwriting the data or deleting the references. (T)

error log. A data set or file in a product or system where error information is stored for later access. A record of machine checks, device errors, and volume statistical data.

error message. An indication that an error has been detected. (A)

ERRORLEVEL. A parameter of the IF command used by batch files. It is used in testing for failure of recently loaded programs.

event. An occurrence or happening. An occurrence of significance to a task; for example, the completion of an asynchronous operation, such as an input/output operation. A data link control command and response passed between adjacent nodes that allows the two nodes to exchange identification and other information necessary for operation over the data link. In the NetView program, a record indicating irregularities of operation in physical elements of a network.

exception. An object that has caused some new condition, such as an error. In Java, throwing an error means passing that object to an interested party. A signal indicates what condition has occurred. Catching the condition means receiving the sent object. Handling this exception means dealing with the problem after receiving the object (though it might mean doing nothing, which is bad programming practice).

exchange identification (XID). The ID that is exchanged with the remote physical unit when an attachment is first established.

EXE, exe. An executable file with the file extension .EXE.

extended ASCII. A set of ASCII codes that uses the eighth (most significant) bit to define 127 additional codes. Standard ASCII uses 7 bits and defines 128 codes.

extended binary-coded decimal interchange code (EBCDIC). A coded character set of 256 8-bit characters.

external logging replicator (XLR). Shared-file mode of operation in which fault-tolerant data replication is achieved by logging database updates to an external server.

F

facility. An operational capability, or the means for providing such a capability. (T) A service

provided by an operating system for a particular purpose; for example, the checkpoint/restart facility.

FBSI. Financial Branch Systems Integrator.

FBSS (DOS). IBM Financial Branch Systems Service (DOS). The predecessor to LANDP.

FBSS/2. Financial Branch Systems Service/2.

FCB. File control block.

FIC. First-in-chain.

file. A named set of records stored or processed as a unit. (T) A collection of information treated as a unit. A collection of data that is stored and retrieved by an assigned name.

file control block (FCB). A record that contains all of the information about a file, such as its structure, length, and name.

file index table (FIT). A table used by WorkSpace On-Demand to redirect file access requests from a client workstation's boot drive to the appropriate location on the boot server.

file server. A high-capacity disk storage device or a computer that each computer on a network can use to access and retrieve files that can be shared among the attached computers.

file transfer. In remote communications, the transfer of one or more files from one system to another over a communications link.

first-in-chain (FIC). A request unit (RU) whose request header (RH) begin chain indicator is on and whose RH end chain indicator is off.

FIT. file index table

fixed disk. Synonym for hard disk.

flag. A variable indicating that a certain condition holds. (T) Any of various types of indicators used for identification; for example, a word mark. (A) A character that signals the occurrence of some condition, such as the end of a word. (A)

FMH. Function management header.

format identification (FID) field. In SNA, a field in each transmission header (TH) that shows the format of the transmission header; that is, the presence or absence of certain fields.

forward recovery. The process of reconstructing a file from a particular point by restoring a saved version of the file and then applying changes to that file in the same order in which they were originally made.

function. In IBM LANDP for DOS, IBM LANDP for OS/2, IBM LANDP for Windows NT, IBM FBSS (DOS), IBM FBSS/2, IBM PC/Integrator, and IBM PC Integrator/2 a function is the specification of an activity to be performed by a server. In computer programming, synonym for procedure.

function management header (FMH). A special record or part of a record that contains control information for the data that follow. In SNA, one or more headers optionally present in the leading request units (RUs) of an RU chain that allow a half-session in an LU-LU session to: (a) select a destination as session partner and control way where end-user data it sends are handled at the destination, (b) change destination or characteristics of data during session, and (c) send between session partners status or user information about destination; for example, whether it is a program or device.

G

gateway. In LANDP, the workstation that connects the LANDP workgroup to a host computer with the necessary LANDP software and the respective physical attachment. A functional unit that interconnects two computer networks with different network architectures. A gateway connects networks or systems of different architectures. A bridge interconnects networks or systems with the same or similar architectures. (T) A network that connects hosts. Contrast with router.

generic alert. A product-independent method of encoding alert data by means of both (a) code points indexing short units of stored text and (b) textual data.

H

hard disk. A rigid magnetic disk such as the internal disks used in the system units of IBM personal computers and in external hard disk drives. Synonym for fixed disk. Contrast with diskette.

HDLC. High-level data link control.

hexadecimal. Describing a numbering system with base of sixteen; valid numbers use the digits 0 through 9 and characters A through F, where A represents 10 and F represents 15.

high-level data link control (HDLC). In data communication, the use of a specified series of bits to control data links under the International Standards for HDLC: ISO 3309 Frame Structure and ISO 4335 Elements of Procedures.

host, host computer, host processor, or host system. The primary or controlling computer in a multiple computer installation. A computer used to prepare programs for use on another computer or on another data processing system; for example, a computer used to compile, link edit, and test programs to be used on another system.

hot-key. The key combination used to change from one session to another on the workstation.

Hypertext Transfer Protocol (HTTP). The Internet protocol, based on TCP/IP, that is used to fetch hypertext objects from remote hosts.

I

I/O. Input/output.

IBM Operating System/2® (OS/2). Pertaining to the IBM licensed program that can be used as the operating system for personal computers. The OS/2 licensed program can perform multiple tasks at the same time.

ICV. Initial chaining value.

ID. Identifier. Identification.

identification. In computer security, the process that allows a system to recognize an entity with personal, equipment, or organizational characteristics or codes.

identifier. One or more characters used to identify or name a data element or possibly to show certain properties of that data element. (A)

IEEE. Institute of Electrical and Electronics Engineers.

IMS/VS. Information Management System/Virtual Storage.

indexed access. Pertaining to the organization and accessing of the records of a storage structure through a separate index to the locations of the stored records. (A)

indexed sequential access. Pertaining to the organization and accessing of records through an index of the keys that are stored in arbitrarily partitioned sequential files. (A)

initial chaining value (ICV). An 8-byte pseudo-random number used to verify that both ends of a session with cryptography have the same session cryptography key. The initial chaining value is also used as input to Data Encryption Standard (DES) algorithm to encipher or decipher data in a session with cryptography.

initial program load (IPL). The initialization procedure that causes an operating system to begin operation. The process by which a configuration image is loaded into storage at the beginning of a work day or after a system malfunction. The process of loading system programs and preparing a system to run jobs.

initialization. The operations required for setting a device to a starting state, before the use of a data medium, or before implementation of a process. (T) Preparation of a system, device, or program for operation.

initiate self. An SNA command issued by the LANDP SNA server to initiate a host application. The SNA command is issued in response to the receipt of an Open command from the personal computer.

INITSELF. Initiate self.

input/output (I/O). Describing a device whose parts can perform an input process and an output process at the same time. (I) Describing a functional unit or channel involved in an input process, output process, or both, concurrently or not, and to the data involved in such a process.

Instruction Pointer (IP). In System 38, a pointer that provides addressability for a machine interface instruction in a program.

interface. A shared boundary between two functional units, defined by functional characteristics, signal characteristics, or other characteristics, as appropriate. The concept includes the specification of the connection of two devices having different functions. (T)

International Organization for Standardization (ISO). An organization of national standards bodies from various countries established to promote development of standards to simplify international exchange of goods and services, and develop cooperation in intellectual, scientific, technological, and economic activity.

Internet Protocol (IP). A protocol used to route data from its source to its destination in an Internet environment.

interoperability. The capability to communicate, execute programs, or transfer data among various functional units in a way that requires the user to have little or no knowledge of the unique characteristics of those units. (T) In SAA usage, the ability to link SAA and non-SAA environments and use the combination for distributed processing.

IP. Instruction Pointer. Internet Protocol.

IPL. Initial program load.

ISAM. Indexed sequential access method.

ISO. International Organization for Standardization.

J

Jar file format. Java Archive, a platform-independent file format that aggregates many files into one. Multiple Java applets and their requisite components (.class files, images, sounds, and other resource files) can be bundled in a JAR file and subsequently downloaded to a browser in a single HTTP transaction.

Java. An object-oriented programming language for portable, interpretive code that supports interaction among remote objects. Java was specified and developed by Sun Microsystems, Incorporated. The Java environment consists of the JavaOS, the Virtual Machines for various platforms, the object-oriented Java programming language, and several class libraries.

Java Development Kit (JDK). A set of Java technologies made available to licensed developers by Sun Microsystems. Each release of JDK consists of the Java compiler, Java virtual machine, Java class libraries, Java applet viewer, Java debugger, and other tools.

JavaDoc. Sun Microsystems tool for generating HTML documentation of classes by extracting comments from the Java source code files.

Java eXtensions for Financial Services (J/XFS). J/XFS is a proposed standard, developed jointly by IBM, Siemens Nixdorf, NCR, DeLaRue and Sun Microsystems, for a standardised interface to all common financial devices that can be used by applications and applets within the Java programming language. The J/XFS standard defines APIs for accessing financial devices, and a control mechanism that enables any number of applications to access these devices. The following LANDP servers are supported through the J/XFS API:

- Financial Printer Server (4722 document printer, 9068 multipurpose passbook printer)
- Magnetic Stripe Reader/Encoder (MSR/E) Server (4717, 4777)
- Personal Identification Number (PIN) Pad Server (4778 including MSD support)

Java Remote Method Invocation (RMI). Method invocation between peers, or between client and server, when applications at both ends of the invocation are written in Java. Java RMI is included in JDK 1.1, or later.

Java Runtime Environment (JRE). A subset of the Java Development Kit (JDK) that contains the core executables and files that constitute the standard Java platform. The JRE includes the Java Virtual Machine, core classes and supporting files.

Java Virtual Machine. A software implementation of a central processing unit (CPU) that runs compiled Java code (applets and applications).

journal. A chronological record of changes made in a set of data; the record may be used to reconstruct a previous version of the set. (T) A special-purpose data set that provides an audit trail of operator and system actions, or as a means of recovering superseded data.

JRE. Java Runtime Environment.

JVM. Java Virtual Machine.

J/XFS. Java/eXtensions for Financial Services.

K

KB. Kilobyte; 1024 bytes.

key. An identifier within a set of data elements. (T) One or more characters used to identify the record and establish the order of the record within an indexed file.

keystroke. Actuation of a key on a keyboard to perform or release a machine function. (T)

keyword. A name or symbol that identifies a parameter or an ordered set of parameters.

L

LAN. Local area network.

LAN configuration. The process by which the details about the structure of the LAN for a particular user are provided to the LANDP family programs. This includes details about the workstations forming the LAN, the services provided by each workstation, and the workstations that receive the services.

LAN trace. A LANDP family trace facility that informs about the LANDP-related LAN and displays the status of the local area network.

LAN Distributed Platform. The former name for the LANDP family of products.

last-in-chain (LIC). A request unit (RU) whose request header (RH) end chain indicator is on and whose RH begin chain indicator is off.

LDA. Logical device address.

LED. Light-emitting diode.

LIC. Last-in-chain.

light-emitting diode (LED). A semiconductor chip that gives off visible or infrared light when operated.

link connection. In SNA, the physical equipment providing two-way communication between one link station and one or more other link stations; for example, a telecommunication line and data circuit-terminating equipment (DCE).

LIP. LAN Internet Protocol.

LLAP. Logical link access path.

loader. A routine, commonly a computer program, that reads data into main storage. (A)

local area network (LAN). A computer network located on a user's premises within a limited geographical area. Communication within a local area network is not subject to external regulations; however, communication across the LAN boundary may be subject to some form of regulation. (T)

local host. In the Internet, the computer to which a user's terminal is directly connected without using the Internet.

logging. The recording of data about specific events.

logical device address (LDA). A number used to represent a terminal or terminal component within a workstation. See also physical device address.

logical link access path (LLAP). In a multi-system environment, the path between any two systems. One or more logical link paths must be defined for each logical link.

logical unit (LU). In SNA, a port through which an end user accesses the SNA network to communicate with another end user and through which the end user accesses the functions provided by the system services control points (SSCPs). An LU can support at least two sessions, one with an SSCP and one with another LU, and may be capable of supporting many sessions with other logical units. A type of network addressable unit that allows end users to communicate with each other and gain access to network resources.

longitudinal parity check. A parity check of a row of binary digits that are members of a set forming a matrix; for example, a parity check of the bits of a track in a block on a magnetic stripe. (T)

longitudinal redundancy check (LRC). Synonym for longitudinal parity check.

LRC. Longitudinal redundancy check.

LU. Logical unit.

LU—LU session type 0. In SNA, a type of session between two LU—LU half-sessions using SNA-defined protocols for transmission control and data flow control, but using end-user or product-defined protocols to augment or replace FMD services protocols.

LU—LU session type 1. In SNA, a type of session between an application program and single- or multiple-device data processing terminals in an interactive, batch data transfer, or distributed processing environment.

LU—LU session type 2. In SNA, a type of session between an application program and a single display terminal in an interactive environment, using the SNA 3270 data stream.

LUSTAT. An SNA command used to send logical unit status information.

M

MAC. Message authentication code.

mapper. A device, such as a piece of code, which performs a mapping function.

mapping. A list, usually in a profile, that establishes a correspondence between items in two groups; for example, a keyboard mapping can establish what character is displayed when a certain key is pressed. In a database, the establishing of correspondences between a given logical structure and a given physical structure. (T)

MB. Megabyte; 1 048 576 bytes.

memory. All of the addressable storage space in a processing unit and other internal storages that is used to execute instructions. (T)

message. An assembly of characters and sometimes control codes that is transferred as an entity from an originator to one or more recipients. A message consists of two parts: envelope and content. (T) A communication sent from a person or program to another person or program. A unit of data sent over a telecommunication line. One or more message segments transmitted among terminals, application programs, and systems. In SAA Common User Access architecture, information not requested by a user but displayed by an application in response to an unexpected event, or when something undesirable could occur.

message authentication code (MAC). In computer security, a value, part of, or accompanying a message, used to determine that the contents, origin, author, or other attributes of all or part of the message are as they appear to be. In cryptography: (a) a number or value derived by processing data with an authentication

algorithm, (b) the cryptographic result of block cipher operations on text or data using a cipher block chain (CBC) mode of operation, (c) a digital signature code.

method. A fragment of Java code within a class that can be invoked and passed a set of parameters to perform a specific task.

MIC. Middle-in-chain.

MICR. Magnetic ink character recognition.

microcode. One or more microinstructions. A code, representing the instructions of an instruction set, that is done in a part of storage that is not program-addressable. To design, write, and also to test one or more microinstructions.

middle-in-chain (MIC). A request unit (RU) whose request header (RH) begin chain indicator and RH end chain indicator are both off.

mnemonic. A symbol chosen to help the user remember the significance of the symbol.

mode. A method of operation.

mode switching. Operator switching between a concurrently running personal computer application and 3270 emulation or other internal application.

MSR, MSR/E. Magnetic stripe reader; Magnetic stripe reader/encoder.

multi-tasking. A mode of operation that provides for concurrent performance, or interleaved execution of two or more tasks. (I) (A)

N

name server. The server that stores resource records about hosts. In the AIX operating system, a host that provides name resolution for a network. Name servers translate symbolic names assigned to networks and hosts into the Internet addresses used by machines. In TCP/IP, synonym for domain name server.

NAU. Network addressable unit.

NCP. Network Control Program.

NDIS. Network Driver Interface Specification

NetBIOS. Network Basic Input/Output System. A standard interface to networks, IBM personal computers (PCs), and compatible PCs, that is used on LANs to provide message, print-server, and file-server functions. Application programs that use NetBIOS do not need to handle the details of LAN data link control (DLC) protocols. See also BIOS.

NetView program. An IBM licensed program used to monitor and manage a network and to diagnose network problems.

network. An arrangement of nodes and connecting branches. (T) A configuration of data processing devices and software connected for information interchange.

network addressable unit (NAU). In SNA, a logical unit, a physical unit, or a system services control point. The NAU is the origin or the destination of information transmitted by the path control network. See also logical unit, physical unit, system services control point (SSCP).

Network Control Program (NCP). An IBM licensed program that provides communication controller support for single-domain, multiple-domain, and interconnected network capability. See also Advanced Communications Function (ACF).

network management vector transport (NMVT). A management services request/response unit (RU) that flows over an active session between physical unit management services and control point management services (SSCP-PU session).

network resource. In ACF/VTAM®, a network component such as a local network control program, an SDLC data link, or a peripheral node.

network services procedure error (NSPE). A request unit that is sent by a system services control point (SSCP) to a logical unit (LU) when a procedure requested by that LU has failed.

NLS. National language support.

NMVT. Network management vector transport.

node. In a network, a point at which one or more functional units connect channels or data circuits. (I) In network topology, the point at an end of a branch. (T)

NPSI. X.25 NCP Packet Switching Interface.

NSPE. Network services procedure error.

O

object. The principal building block of object-oriented programs. Objects are software programming modules. Each object is a programming unit consisting of related data and methods.

object-oriented programming (OOP). A programming approach based on the concepts of data abstraction and inheritance. Unlike procedural programming techniques, object-oriented programming concentrates on the data objects that constitute the problem and how they are manipulated, not on how something is accomplished.

ODBC. Open Database Connectivity is a standardized set of API function calls that can be used to access data stored in both relational and non-relational DBMSs.

OIA. Operator information area.

OIC. Only-in-chain.

only-in-chain (OIC). A request unit (RU) for which the request header (RH) begin chain indicator and RH end chain indicator are both on.

OOP. object-oriented programming

open. The function that connects a file to a program for processing. Contrast with close.

open system. A system with specified standards, and that therefore can be readily connected to other systems that comply with the same standards.

operating system. Software that controls the execution of programs and that may provide services such as resource allocation, scheduling, input/output control, and data management. Although operating systems are predominantly software, partial hardware implementations are possible. (T)

operator information area (OIA). In the 3270 Information Display System, the area near the bottom of the display area where terminal or system status information is displayed.

option. A specification in a statement that may be used to influence the processing of the statement.

OS/2 operating system. IBM Operating System/2.

P

pacing. A technique by which a receiving station controls the rate of transmission of a sending station to prevent overrun.

package. A program element that contains classes and interfaces.

packet. A sequence of binary digits, including data and control signals, that is transmitted and switched as a composite entity.

panel. A formatted display of information that appears on a display screen.

parallel port. On a personal computer system, a port used to attach devices such as dot matrix printers and input/output units; it transmits data one byte at a time. See also serial port.

parameter. A variable that is given a constant value for a specified application and that may denote the application. (I) (A) An item in a menu for which the user specifies a value or for which the system provides a value when the menu is interpreted. Data passed between programs or procedures.

Pascal. A high-level, general purpose programming language, related to ALGOL.

Programs written in Pascal are block structured, consisting of independent routines. They can run on different computers with little or no modification.

path. In a personal computer system, the logical relationship between directories.

PBM. Personal banking machine.

PC. Personal computer.

PC-ID. Workstation identifier.

PCB. Program control block.

PC/TCP. FTP Software's implementation of TCP/IP for systems running DOS and Windows. Now called PC/TCP Network Software version 5.0 and available from NetManage Inc..

PDA. Physical device address.

PDP. Problem determination procedure.

personal computer system. IBM Personal System/2 and also the various IBM Personal Computer system units, unless otherwise described.

Personal Identification Number (PIN) pad. A pad with twelve keys in a specific arrangement that display alphabetic and numeric characters that may be entered onto a financial transaction terminal. (T) (A)

physical device address (PDA). An address or set of addresses that identifies a particular device.

physical unit (PU). In SNA, the component that manages and monitors the resources, such as attached links and adjacent link stations, associated with a node, as requested by an SSCP via an SSCP-PU session. An SSCP starts a session with the physical unit to indirectly manage, through the PU, resources of the node such as attached links. This term applies to type 2.0, type 4, and type 5 nodes only.

PIN. Personal identification number.

plaintext. Nonencrypted data. Synonymous with cleartext. Synonym for clear data.

PLU. Primary logical unit.

PM. Presentation Manager® (in OS/2).

pointing device port. The IBM PS/2 port that allows attachment of various devices including pointing devices.

port. An access point for data entry or exit. A connector on a device to which cables for other devices such as display stations and printers are attached. A specific communications end point within a host. A port is identified by a port number.

Post Telephone and Telegraph Administration (PTT). An organization, usually a government department, that provides communication common carrier services in countries other than the USA and Canada. Examples of PTTs are the Bundespost in Germany, and the Nippon Telephone and Telegraph Public Corporation in Japan.

PPC. Program to program communications.

Presentation Manager. A component of OS/2 that provides a complete graphics-based user interface, with pull-down windows, action bars, and layered menus.

primary logical unit (PLU). In SNA, the logical unit (LU) that contains the primary half-session for a particular LU—LU session. Contrast with secondary logical unit (SLU). See also logical unit (LU).

problem determination procedure (PDP). A prescribed sequence of steps taken to identify the source of a problem.

process. A unique, finite course of events defined by its purpose or by its effect, achieved under defined conditions. Any operation or combination of operations on data. A function being performed or waiting to be performed. A program in operation.

processor. In a computer, a functional unit that interprets and executes instructions. A processor consists of at least an instruction control unit and an arithmetic and logic unit. (T) The functional unit that interprets and processes instructions.

profile. In computer security, a description of the characteristics of an entity to which access is controlled. Data that describes the significant characteristics of a user, a group of users, or one or more computer resources.

program. A sequence of instructions suitable for processing by a computer. Processing may include the use of an assembler, a compiler, an interpreter, or a translator to prepare the program for execution, and also to execute it. (I)

program control block (PCB). LANDP family shared-file server pointer related to a specific DBD.

Program temporary fix (PTF). A temporary solution or bypass of a problem diagnosed by IBM as resulting from a defect in a current unaltered release of the program.

protocol. In SNA, the meanings of and the sequencing rules for requests and responses used for managing the network, transferring data, and synchronizing the states of network components.

PS/2. Personal System/2.

PTF. Program temporary fix.

PTT. Post Telephone and Telegraph Administration.

PU. Physical unit.

Q

QLLC. Qualified logical link control.

qualified logical link control (QLLC). An X.25 protocol that allows the transfer of data link control information between two adjoining systems network architecture (SNA) nodes that are connected through an X.25 packet-switching data network. The QLLC provides the qualifier “Q” bit in X.25 data packets to identify packets that carry logical link protocol information.

query. A request for information from a file relying on specific conditions. In the AS/400 system, the query management object that is used to define queries against relational data.

quiescing. The process of bringing a device or a system to a stop by rejection of new requests for work. (A)

R

RAM. Random access memory. (A)

random access memory (RAM). A storage device where data can be written and read.

RC. Return code.

RCMS. Remote change management services.

RDBMS. Relational database management system. A generic name for any relational database system such as DB2.

re-synchronization. Restarting the transmission of a function at the point where it was interrupted.

read-only memory (ROM). A storage device where data, under normal conditions, can only be read. (T) See also read-only storage (ROS).

read-only storage (ROS). A storage device whose contents cannot be modified, except by a particular user, or when operating under particular conditions. See also read-only memory (ROM).

record. In programming languages, an aggregate that consists of data objects, possibly with different attributes, that usually have identifiers attached to them. In some programming languages, records are called structures. (I) A set of data treated as a unit. (T) A set of one or more related data items grouped for processing.

remote attachment. A method of connecting two devices over a telecommunication line.

remote initial program load (remote IPL). A feature that permits a computer to receive its initial program from another computer, rather than from its own internal disk or diskette storage.

remote method invocation. A specific instance of the more general term RPC (remote procedure call). Remote method invocation (RMI) allows objects to be distributed over a network, that is, a Java program running on one computer can call

the methods of an object running on another computer. RMI and java.net are the only 100% pure Java APIs for controlling Java objects in remote systems.

remote procedure call (RPC). A facility that a client uses to request the execution of a procedure call from a server. This facility includes a library of procedures and an external data representation.

REMS. Reader/encoder magnetic stripe.

request/response header (RH). In systems network architecture (SNA), control information preceding a request/response unit (RU) that specifies the type of RU and contains control information associated with the RU.

request/response unit (RU). In systems network architecture (SNA), a generic term for a request unit or a response unit.

resource. Any of the data processing system elements needed to perform required operations, including storage, input/output units, one or more processing units, data, files, and programs. (T) See also network resource.

retry. To resend data a prescribed number of times or until the data is received correctly.

return code (RC). A code used to influence the execution of succeeding instructions. (A) A value returned to a program to indicate the results of an operation requested by that program.

RH. Request/response header.

roll back. To remove changes that were made to database files under commitment control since the last commitment boundary.

RMI. Remote Method Invocation.

rollback. A programmed return to a prior checkpoint. (A) The process of restoring data changed by an application program or user to the state of its last commitment boundary. In SQL, the process of restoring data changed by an application program or user to the state of its last commit point.

ROM. Read-only memory. (A)

ROS. Read-only storage.

router. A computer that determines the path of network traffic flow. The path selection is made from several paths based on information obtained from specific protocols, algorithms that attempt to identify the shortest or best path, and other criteria such as metrics or protocol-specific destination addresses. An attaching device that connects two LAN segments, which use similar or different architectures, at the reference model network layer. Contrast with bridge, gateway. In OSI terminology, a function that determines a path by which an entity can be reached.

RPC. Remote procedure call.

RTR. Ready to Receive.

RU. Request/response unit.

S

SAM. Service availability manager.

SAP. Service access point.

SBC. Server Based Computing.

SBCS. Single-byte character set.

scan code. A code generated by a keyboard.

SCS. Systems network architecture character string.

SDLC. Synchronous data link control.

secondary logical unit (SLU). In systems network architecture (SNA), the logical unit (LU) that contains the secondary half-session for a particular LU-LU session. Contrast with primary logical unit (PLU). See also logical unit (LU).

SEQ. Sequential file.

sequential access. The capability to enter data into a storage device or a data medium in the same sequence as the data is ordered, or to obtain data in the same order as it has been

entered. (T) An access method in which records are read from, written to, or removed from a file based on the logical order of the records in the file. Contrast with direct access.

serial port. On personal computer systems, a port used to attach devices such as display devices, letter-quality printers, modems, plotters, and pointing devices such as light pens and mice; it transmits data one bit at a time. See also parallel port.

serialization. Turning an object into a stream and back again.

server. A functional unit that provides shared services to workstations over a network; for example, a file server, a print server, a mail server. (T) In LANDP, a functional area that provides functions to LANDP workstations in a LANDP workgroup. The computer that hosts the Web page that contains an applet. The .class files that make up the applet, and the HTML files that reference the applet reside on the server. When someone on the Internet connects to a web page that contains an applet, the server delivers the .class files over the Internet to the client that made the request. The server is also known as the originating host. See also client, client workstation, and user. In LANDP, a function provided by a server.

server based computing (SBC). This is a generic term that is used to describe network computer systems such as WorkSpace on Demand and Windows Terminal Server.

service access point (SAP). A logical point made available by a token-ring adapter where information can be received and transmitted.

service availability manager (SAM). Facility used by the shared-file server to provide fault-tolerant data access in an XLR environment.

servlet. Server-side program that executes on and adds function to a Web server. Java servlets allow for the creation of complicated, high-performance, cross-platform Web applications. They are highly extensible and flexible, making it easy to expand from client or single-server applications to multi-tier applications.

session. In systems network architecture (SNA), a logical connection between two network addressable units (NAU) that can be started, tailored to provide various protocols, and deactivated, as requested. The time during which programs or devices can communicate with each other.

single-byte character set (SBCS). A character set in which each character is represented by a one-byte code. Contrast with double-byte character set (DBCS).

SLU. Secondary logical unit.

SNA. Systems network architecture.

SNUF. Systems network architecture up-line facility.

socket. An endpoint for communication between processes or applications. A pair consisting of TCP port and IP address.

SOM. Start-of-message code.

SPC, spc. Specification file.

specification file (SPC, spc). In LANDP, a file with the file extension .SPC. This file can be edited. It contains information for customization purposes.

SQL. Structured query language.

SSCP. System services control point.

start-of-message code (SOM). A character or group of characters transmitted by the polled terminal and indicating to other stations on the line that what follows are addresses of stations to receive the answering message.

storage. A functional unit into which data can be placed, where it can be retained, and from which it can be retrieved. (T)

stream. A continuous sequence of data elements being transmitted, or intended for transmission, in character or binary-digit form, using a defined format.

structured query language (SQL). An established set of statements used to manage information stored in a database. By using these statements, users can add, delete, or update information in a table, request information through a query, and display the results in a report.

subdirectory. A directory contained within another directory in a file system hierarchy.

synchronous. About two or more processes that depend on the occurrence of a specific event such as common signal timing. Occurring with a regular or predictable time relationship. See also asynchronous.

synchronous data link control (SDLC). A discipline conforming to subsets of the Advanced Data Communication Control Procedures (ADCCP) of the American National Standards Institute (ANSI) and High-level Data Link Control (HDLC) of the International Organization for Standardization, for managing synchronous, code-transparent, serial-by-bit information transfer over a link connection. Transmission exchanges may be duplex or half-duplex over switched or not-switched links. The configuration of the link connection may be point-to-point, multi-point, or loop. (I)

system diskette. The diskette, either real or virtual, that contains your control program. In personal computer systems, the diskette on which you have the operating system.

system distribution manager. A system that contains the files and programs required for product installation, and initiates or manages the installation process.

system services control point (SSCP). In systems network architecture (SNA), the focal point within an SNA network for managing the configuration, coordinating network operator and problem determination requests, and providing directory support and other session services for end users of the network.

systems network architecture (SNA). The description of the logical structure, formats, protocols, and operational sequences for transmitting information units through and controlling the configuration and operation of networks.

systems network architecture character string (SCS). In systems network architecture (SNA), a character string composed of EBCDIC controls, optionally intermixed with end-user data, that is carried within a request/response unit (RU).

systems network architecture network (SNA network). In systems network architecture (SNA), the part of an application program network that conforms to the formats and protocols of SNA. It allows reliable transfer of data among end users and provides protocols for controlling the resources of various network configurations. The SNA network consists of network addressable units (NAU), boundary function components, and the path control network.

systems network architecture up-line facility (SNUF). The communications support that allows an AS/400 system to communicate with CICS/VS and IMS/VS application programs on a host computer.

T

takeover. In an XLR environment, the process by which a backup server assumes the role of the (failed) active. This involves backing out incomplete transactions, rebuilding indexes, and informing SAM of the new active workstation.

TCP/IP. Transmission Control Protocol/Internet Protocol.

terminal status line. Synonym for operator information area (OIA).

TH. Transmission header.

thin client. A client workstation that loads its operating system environment and applications

across a network from a server. The degree of local processing power in a thin client can vary considerably depending on the implementation of the thin client concept.

The term thin client usually refers to a system that runs on a resource-constrained machine or that runs on a small operating system. This clients do not require local system administration, and they execute Java applications delivered over the network.

Time Sharing Option (TSO). An operating system option; for the System/370 system, the option provides interactive time sharing from remote terminals.

token-ring network. A ring network that allows unidirectional data transmission between data stations by a token passing procedure, so that the transmitted data returns to the transmitting station. (T) A network that uses a ring topology, where tokens are passed in a circuit from node to node. A node that is ready to send can capture the token and insert data for transmission.

trace. A record of the execution of a computer program. It exhibits the sequences in which the instructions were executed. (A) The process of recording the sequence in which the statements in a program are executed and, optionally, the values of the program variables used in the statements. To record a series of events as they occur. For data links, a record of the frames and bytes transmitted or received.

trace file. A file that contains a record of events that occur in a system.

trace function. A function used for problem determination.

trace log. A file in which trace events are recorded.

trace program. A computer program that performs a check on another computer program by exhibiting the sequence in which the instructions are executed and, usually, the results of executing the instructions. (I) (A)

trace routine. A routine that provides an historical record of specified events in the execution of a computer program. (A)

transaction. An exchange between a workstation and another device that accomplishes a particular action or result.

translation. Conversion of a code or codes to another code or codes according to a set of specifications.

transmission. The sending of data from one place for reception elsewhere. (A)

Notes:

1. Transmission implies only the sending of data; the data may or may not be received.
2. The term transmit is used to describe the sending of data in telecommunication operations. The terms move and transfer are used to describe movement of data in data processing operations.

transmission control (TC) layer. The layer within a half-session or session connector that synchronizes and paces session-level data traffic, checks session sequence numbers of requests, and enciphers and deciphers end-user data.

Transmission Control Protocol (TCP). A communications protocol used in the Internet and in any network that follows the US Department of Defense standards for inter-network protocol. TCP provides a reliable host-to-host protocol between hosts in packet-switched communications networks and in interconnected systems of such networks. It assumes that the Internet protocol is the underlying protocol.

Transmission Control Protocol/Internet Protocol (TCP/IP). A set of communication protocols that support peer-to-peer connectivity functions for both local and wide area networks.

transmission header (TH). In systems network architecture (SNA), control information, optionally followed by a basic information unit (BIU) or a BIU segment, that is created and used by path control to route message units and to control their flow within the network.

transmission services (TS) profile. In systems network architecture (SNA), a specification in a session activation request (and, optionally in the responses) of transmission control (TC) protocols, such as session-level pacing and the usage of session-level requests, to be supported by a particular session. Each defined TS profile is identified by a number.

trap. An unprogrammed conditional jump to a specified address that is automatically activated by hardware. A recording is made of the location from which the jump occurred.

TRDLC. Token-ring data link control.

TS. Transmission services.

TSO. Time Sharing Option.

U

UDP. User Datagram Protocol.

UNBIND. In systems network architecture (SNA), a request to deactivate a session between two logical units (LU). Contrast with BIND.

user. A function that uses the services provided by a server. A host can be a user and a server at the same time. Any person or any thing that may issue or receive commands and messages to or from the information processing system. (T) Any person who requires the services of a computing system. See also client, client/server, client workstation, and server.

User Datagram Protocol (UDP). In TCP/IP, a packet-level protocol built directly on the Internet protocol layer. UDP is used for application-to-application programs between TCP/IP host systems.

user profile. In computer security, a description of a user that includes such information as user identification (ID), user name, password, access authority, and other attributes obtained at log-on.

user-written server. In LANDP, a server not supplied with a LANDP program, but developed by the customer.

utility program. A computer program which supports computer processes; for example, a sort program. (T) A program designed to perform an everyday task such as copying data from one storage device to another. (A)

V

validation. The checking of data for correctness, or compliance with applicable standards, rules, and conventions. (A)

VDM. Virtual DOS machine.

vector. A set of `keyword=parameter` statements that define configuration items. These items can correspond to both model and real configurations.

verify. To determine whether a transcription of data or other operation has been accomplished accurately. (A)

VFS. Virtual file system.

virtual DOS machine (VDM). A functional simulation of a machine running under DOS.

virtual file system (VFS). A remote file system that has been mounted so that it is accessible to the local user.

virtual machine (VM). A virtual data processing system that seems to be at the exclusive disposal of a particular user, but whose functions are accomplished by sharing the resources of a real data processing system. (T)

Virtual Telecommunications Access Method (VTAM). A set of programs that maintain control of the communication between terminals and application programs running under Disk Operating System/Virtual Storage (DOS/VS), OS/VS1, and OS/VS2 operating systems.

VisualGen®. A high-level object-oriented programming language.

VM/CMS. Virtual machine/conversational monitor system.

VTAM. Virtual Telecommunications Access Method.

W

WAN. Wide area network.

wide area network (WAN). A network that provides communication services to a geographical area larger than that served by a local area network.

WebSphere™. A comprehensive solution to build, deploy, and manage e-business Web sites. WebSphere is the cornerstone of IBM's overall Web strategy The Websphere product line provides companies with an open, standards-based, Web server deployment platform, together with Web site development and management and management tools to help accelerate the process of moving to e-business.

window. A division of a screen where one of several programs being run concurrently can display information.

workgroup. In LANDP, the logical connection of LANDP for DOS, LANDP for OS/2, LANDP for Windows NT, and LANDP for AIX workstations through the LANDP client/server mechanism, which is available with each LANDP program.

Workspace On-Demand. A set of management utilities that enables OS/2 Warp Server to remotely load a thin client operating system, known as Workspace On-Demand client, into a client workstation across a LAN. The client workstation component of Workspace On-Demand, which is loaded into a client workstation from a server machine running OS/2 Warp Server and Workspace On-Demand Server.

Workspace On-Demand Server. A server, running OS/2 Warp Server and Workspace On-Demand, that is used to boot client workstations.

workstation. A functional unit at which a user works. In LANDP, personal computer system in a local area network (LAN).

wrapper. A language binding.

X

X.25. A CCITT recommendation that defines the physical level (physical layer), link level (data link layer), and packet level (network layer) of the open systems inter-connection (OSI) reference model. An X.25 network is an interface between data terminal equipment (DTE) and data circuit-terminating equipment (DCE) operating in the packet mode, and connected to public data networks by dedicated circuits. X.25 networks use the connection-mode network service.

X.25 NCP Packet Switching Interface. An IBM-licensed program that allows systems network architecture (SNA) users to communicate over packet switched data networks that have interfaces complying with Recommendation X.25 (Geneva 1980) of the International Telegraph and Telephone Consultative Committee (CCITT). It allows SNA programs to communicate with SNA equipment or with non-SNA equipment over such networks.

XID. Exchange identification.

XLR. External logging replicator.

XOR. Logical operation exclusive-or.

Numerics

4700 Processor. IBM Finance Communication System 4701 Controller Model 3 and IBM 4702 Branch Automation Processor, unless otherwise described.

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Index

Special Characters

(I) intervention errors, description of 6
(P) programming errors, description of 6
(U) device errors, description of 6

Numerics

3270 books 296
3270 emulator
  alerts 236
3270 send/receive facility messages 223
4718 PIN pad devices
  alerts 239

A

abbreviations 269
adapter trace (coprocessor), LANDP for DOS X.25 19
adapter trace, LANDP for DOS X.25 20
administrators (system), description of vii
Alert
  EJ1, unsuccessful call to shared-file server 233
alerts
  3270 emulator 236
  4717, 4777 MSR devices 237
  4718 PIN pad devices 239
  description of 7
  EM1—Data stream error 236
  FF1, unsuccessful call to server 235
  financial printer server 234
  forwarding server 235
  generic architecture 7
  LANDP 231
  MSR/E (magnetic stripe reader/encoder) server 237
  MSR1, hardware error 237
  MSR2 alert, device not connected 238
  NetView program 7
  PIN1, hardware error 239
  PIN2, device not connected 240
  printers (4712, 4722) 234
  PS1, hardware error 234
  RC1, file operation error 241
  RCMS (remote change management services) 241
  S1, unexpected SNRM command received 247
  S2—Invalid or unsupported frame received 248
  S3—Frame exceeding allowable length received 249
  S4—Timer expired without being polled 250
  S5—Modem power off 251
  SDLC (synchronous data link control) 247
  SF1, error by disk read 244
  SF2, file full 245
  SFF1, unsuccessful call to shared-file server 246
  SH1, error by disk read or write 242
alerts *(continued)*
  SH2, file full 243
  shared IBM DOS directory server 242
  shared-file server 244
  SN1—SNA protocol error 252
  SNA server 252
  store-for-forwarding server 246
  X.25 data link control (DLC) 252
  X2—DCE-Originated clear indication received 254
  X3—Reset indication packet sent by the DTE 255
Alerts
  electronic journal server 233
alerts functions
  notification and messages 7
alerts, LANDP 231
APAR
  programs for managing 5
application programmers, description of vii
APPLYFIX program 64
APPLYFIX utility, description 5
architecture, generic alert 7
ASCII characters, return code values 6
ASCII-EBCDIC server
  return codes 127
ASCII-EBCDIC translation server
  return codes 127
assistance (IBM support), requesting 53
audience for this book vii

B

BACKUP utility program
  return codes 204
banking interactive workstation program xi
banking printer program xi
banking self-service books 295
bibliography 295
books for LANDP ix
buffer pool, specifying LANDP for DOS supervisor 32

C

checking program version level 59
checking program version level, Linux 61
CICS interface server
  return codes 128
class, return code 6
clear packets
  Native X.25 server 171
common vectors xi
communication
  books 296
communication and internal traces, EHCLIP program 49

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communication server problems 70, 77
communication traces
SDLC 15
communication traces, LANDP for DOS
DCA DCL information 26
DCA DLC 24
EHCLIP trace 35
native X.25 23
SNA 22
start X.25 adapter 20
stop X.25 adapter 21
token-ring DLC 27
X.25 adapter 20
X.25 adapter (coprocessor) 19
X.25 network errors 18
Communications Server
books 299
compression server
return codes 130
compression server, LANDP for DOS SNA 130
configuration vectors xi
conventions, in this book viii
coprocessor, LANDP for DOS X.25 adapter trace 19
critical errors, LANDP for DOS
shared-file servers 200
critical errors, LANDP for Linux
shared-file servers 201
critical errors, LANDP for OS/2
shared-file servers 201
critical errors, LANDP for Windows
shared-file servers 201
cryptographic interface
return codes 131
cryptography
books 298

D

data compression (CM function) 130
data required when reporting problems 54
database server problems 69, 76
DB2 for OS/2 viii
DB2 Universal Database viii
DCA DLC
DCA DLC information, LANDP for DOS 26
DCA DLC trace, LANDP for DOS 24
DDE access server
return codes 133
decipher (cryptographic interface return codes) 131
decompression (UC function) 130
decryption (cryptographic interface return codes) 131
decryption and encryption books 298
defect, reporting program 53
definitions of terms 269
diagnostic and debugging tool
description of 9
diagnostic and debugging tool server
using 11
diagnostic tools, overview 3
display program, general description of trace tool 4
display routines trace active or inactive, LANDP for DOS 37
displaying trace files
LANDP for DOS 14
displaying trace files and records
LANDP for OS/2 44
LANDP for Windows 44
documentation, LANDP viii

E

EHCLIP
description of, LANDP for DOS 35
error codes, LANDP for DOS 36
loading parameters 49
statistics codes, LANDP for DOS 36
TCP/IP tools, using with 36
EHCLIP program
return codes 155
EHCPDT program, using 44
EHCSQL ##
return codes 184
EHCTRACF program, using 49
EHCTRACW
loading 40
EHCTRACW server 40
EHCTRALL program, using 14
EHCVAL program, loading messages 221
EJ1 alert, unsuccessful call to shared-file server
LANDP 233
electronic journal server
return codes 136
Electronic journal server
alerts 233
EJ1 alert, unsuccessful call to shared-file server 233
EJ1—Unsuccessful call to shared-file server 233
EM1—Data stream error
alerts 236
encipher (cryptographic interface return codes) 131
encryption (cryptographic interface return codes) 131
encryption and decryption
books 298
entries, LANDP for OS/2 error log 41
error codes
LANDP for DOS 36, 123
LANDP for Linux 123
LANDP for OS/2 123
LANDP for Windows 123
error log entries, LANDP for OS/2 41
error logging
MQSeries Link Server 51

error logging, LANDP for Linux 40
error logging, LANDP for OS/2 40
error logging, LANDP for Windows 40
errors, external communication, TCP/IP and LIP
  LANDP for DOS 36
  LANDP for OS/2 50
event tracing, LANDP for Linux 41
event tracing, LANDP for OS/2 41
event tracing, LANDP for Windows 41
external communication errors, TCP/IP and LIP
  LANDP for DOS 36
  LANDP for OS/2 50

F

family messages, list of LANDP 221, 231
FBSS
  books 295
FF1 alert, unsuccessful call to server 235
file error subcodes
  VARDAT 122
file status setting, LANDP for Linux trace tool 41
file status setting, LANDP for OS/2 trace tool 41
file status setting, LANDP for Windows trace tool 41
file transfer facility messages 223
files, by name
  .LGD 40
  .TRP 40
  TR$*xxx*A*n*.DAT 13
  TR$*xxxx*n.DAT 12
financial I/O servers problems 68, 75
financial printer server
  alerts 234
  PS1 alert, hardware error 234
  return codes 141
flowcharts, problem determination 64, 78
  load time problems
    communication server 70
    database server 69
    financial I/O servers 68
  run time problems
    communication server 77
    database server 76
    financial I/O servers 75
format error subcodes
  VARDAT 119
forwarding server
  alerts 235
functions trace pages, number of LANDP for DOS supervisor 32
functions trace, LANDP for DOS supervisor 31
functions trace, on-request/on-completion values, LANDP for DOS supervisor 32

G

generic alert architecture 7
getting assistance (IBM support) 53
GETTRACE program, using 14
glossary 269
guidelines for reporting problems 53

H

hardware errors, alerts
  PS1 234
hexadecimal codes 81, 123
high-level language API (HLLAPI) messages 226
highlighting, in this book viii
HLLAPI messages 226
host program error, alert 236

I

I/O books 297
I/O error subcodes
  VARDAT 118
IBM 4717 Magnetic Stripe Reader
  return codes 163
IBM 4717 Magnetic Stripe Reader/Encoder
  return codes 163
IBM 4718 PIN Key Pad
  return codes 177
IBM 4748 printer server
  return codes 145
IBM 4770 printer server
  return codes 148
IBM 4777 Magnetic Stripe Reader
  return codes 163
IBM 4777 Magnetic Stripe Reader/Encoder
  return codes 163
IBM 4778 PIN Pad Magnetic Stripe Reader
  return codes 177
IBM support, requesting 53
information about IBM products 295
information area (3270 emulator) 257
information required by IBM 54
information required when reporting problems 54
information, LANDP viii
installing xi
internal and communication traces, EHCLIP program 49
introduction, diagnostic tools 3

J

Java websites and redbooks 299

K

knowledge, prerequisite vii

L

LAN books 296

LANDP
  alerts 231
LANDP family books ix
LANDP for DOS
  trace tools 9, 37
LANDP for Linux
  trace tools 39
LANDP for OS/2
  trace tools 39
LANDP for Windows
  trace tools 39
LANDP global return codes 150
LANDP Internet Protocol
  return codes 155
LANDP link server
  return codes 158
LANDP return codes 123
LANDP servers
  return codes 125
LGD files 40
library, books in LANDP viii
Linux system log 56
LIP programs
  EHCLIP 49
  EHCLIP, LANDP for DOS 35
  error codes, LANDP for DOS 36
  statistics codes, LANDP for DOS 36
  TCP/IP tools, using with 36
LOADER program and trace tools 4
loading error return subcodes
  NEWCFG 117
  VARPARM 116
loading return codes 82
loading statements (DOS) xi
loading statements (OS/2) xi
Local resource management server
  return codes 160
log entries, LANDP for OS/2 error 41
log file contents
  MQSeries Link Server 51
log file naming
  MQSeries Link Server 51
logging errors, LANDP for Linux 40
logging errors, LANDP for OS/2 40
logging errors, LANDP for Windows 40
logical device address 7 program xi

M

Magnetic stripe reader/encoder server
  return codes 163
MAIL program messages 228
maintenance level (Linux), checking 61
maintenance level, checking 59
maintenance strategy, example 64
manuals, LANDP viii
memory status setting, LANDP for Linux trace tool 41
memory status setting, LANDP for OS/2 trace tool 41
memory status setting, LANDP for Windows trace tool 41
messages to NetView operators 7
messages, LANDP family 221, 231
  description of 7
MQSeries Link Server
  log file contents 51
  log file naming 51
  logging 51
  return codes 166
MSR/E (magnetic stripe reader/encoder) server
  alerts 237
MSR/E server xi
  return codes 163
MSR1, hardware error
  alerts 237
MSR2 alert, device not connected
  alerts 238

N

native X.25 communication
  trace, LANDP for DOS 23
Native X.25 server
  clear packets 171
  reset packets 171
Native X.25 Server
  return codes 169
NetView books 297
NetView program, and alerts 7
NEWCFG
  loading error return subcodes 117
notification, alert 7

O

Object post box server
  return codes 173
ODBC query server
  return codes 175
on-request/on-completion values, LANDP for DOS supervisor functions trace 32
operator information area (3270 emulator) 257
organization of this book viii
overview, diagnostic tools 3

P

pages, number of LANDP for DOS SNA trace 22
pages, number of LANDP for DOS supervisor functions trace 32
PDPACK utility 57
PDPACK utility, description 5
performance xi
Personal Communications books 299
personal computer books 295
PIN pad server xi

PIN pad server *(continued)*
return codes 177, 181
PIN1 alert, hardware error
LANDP for DOS 239
PIN1, hardware error
alerts 239
PIN2 alert, device not connected 240
PIN2, device not connected
alerts 240
PINP47##
return codes 177
pool, specifying LANDP for DOS supervisor buffer 32
PPC server
return codes 181
PR47X2##.EXE, printer server 56
prerequisite knowledge vii
primary I/O errors
shared-file servers 202
printer errors
PS1, hardware error 234
Printer manager server
return codes 180
problem determination
APPLYFIX program 64
corrective service diskette (CSD) 54
data required when reporting problems 54
flowcharts 64, 78
communication server 70, 77
database server 69, 76
financial I/O servers 68, 75
load time problems 66, 72
IBM support 53, 78
VERSION utility 59
problem determination tools, overview 3
program
version level (Linux), checking 61
program defect, reporting 53
program version level 59
program version level, checking 59
Program-to-program communications server
return codes 181
programs
EHCTRALL 14
GETTRACE 14
programs, by name
DDT 9
EHCLIP 49
EHCLIP, description of LANDP for DOS 35
EHCTRACF 49
EHCTRACW 40
PS1 alert, hardware error 234
publications, LANDP viii

Q

query server xi
Query server
return codes 184
Query server utility programs
return codes 188

R

RC1 alert, file operation error 241
RC1, file operation error
alerts 241
RCMS
return codes 189
RCMS (remote change management services)
alerts 241
readers of this book vii
related information viii
remote change management services xi
Remote change management services
return codes 189
remote requests included or excluded, LANDP for DOS 37
requesting assistance, guidelines 53
reset packets
Native X.25 server 171
resolution notification 7
RESTORE utility program
return codes 204
return code classes 6
return codes
ASCII-EBCDIC server 127
ASCII-EBCDIC translation server 127
BACKUP utility program 204
CICS interface server 128
compression server 130
cryptographic interface 131
DDE access server 133
description of 5
EHCLIP program 155
EHCSQL ## 184
electronic journal server 136
financial printer server 141
IBM 4717 Magnetic Stripe Reader 163
IBM 4717 Magnetic Stripe Reader/Encoder 163
IBM 4718 PIN Key Pad 177
IBM 4748 printer server 145
IBM 4770 printer server 148
IBM 4777 Magnetic Stripe Reader 163
IBM 4777 Magnetic Stripe Reader/Encoder 163
IBM 4778 PIN Pad Magnetic Stripe Reader 177
LANDP for DOS 123
LANDP for Linux 123
LANDP for OS/2 123
LANDP for Windows 123
LANDP Internet Protocol 155
LANDP link server 158
LANDP servers 125

return codes *(continued)*
Local resource management server 160
Magnetic stripe reader/encoder server 163
MQSeries Link Server 166
MSR/E server 163
Native X.25 Server 169
Object post box server 173
ODBC query server 175
PIN pad server 177, 181
PINP47## 177
PPC server 181
Printer manager server 180
printer servers
IBM 4009 Universal Banking Printer 141
IBM 4712 Transaction Printer 141
IBM 4722 Document Printer 141
IBM 4748 Document Printer 145
IBM 4772 Ink Jet Transaction Printer 141
IBM 9055-001 Multi–purpose Passbook Printer 145
IBM 9055-002 Document Printer 141
IBM 9068-A01 Multi–purpose Passbook Printer 141
IBM 9068-A03 Multi–purpose Passbook Printer 141
IBM 9068-D01 Multi–purpose Passbook Printer 145
IBM 9068-S01 Multi–purpose Passbook Printer 141
Program-to-program communications server 181
Query server 184
Query server utility programs 188
RCMS 189
Remote change management services 189
RESTORE utility program 204
shared-file servers 200, 201
Shared-file servers 193
shared-file utility programs 204
SHFILE ## 193
SNA ## 205
SNA server 205
store-for-forwarding server 136
Supervisor local functions 210
System manager server 212
TCP/IP wide area communications server 218
VisualAge Generator support functions 220
return codes,
LOADER and LOADERE programs 82
return codes, LANDP for DOS 123
return codes, loading 81
REXX messages (for LANDP for OS/2) 229
router return codes, description of 6
routines trace, LANDP for DOS supervisor 34
run time problems 72

S

S1 alert, unexpected SNRM command received 247
S1, unexpected SNRM command received
alerts 247
S2 alert, invalid or unsupported frame received 248
S2—Invalid or unsupported frame received
alerts 248
S3 alert, frame exceeding allowable length received 249
S3—Frame exceeding allowable length received
alerts 249
S4 alert, timer expired without being polled 250
S4—Timer expired without being polled
alerts 250
S5 alert, modem power off 251
S5—Modem power off
alerts 251
screens, levels and names of LANDP for DOS trace tool 11
SDLC xi
trace, LANDP for DOS 15
SDLC (synchronous data link control)
alerts 247
server return codes, description of 6
service marks 266
service, requesting IBM 53
setting status of LANDP for Linux trace tool 41
setting status of LANDP for OS/2 trace tool 41
setting status of LANDP for Windows trace tool 41
SF1 alert, error by disk read 244
SF1, error by disk read
alerts 244
SF2 alert, file full
LANDP for DOS 245
SF2, file full
alerts 245
SFF1 alert, unsuccessful call to shared-file server 246
SFF1, unsuccessful call to shared-file server
alerts 246
SH1 alert, error by disk read or write 242
SH1, error by disk read or write
alerts 242
SH2 alert, file full 243
SH2, file full
alerts 243
shared IBM DOS directory server
alerts 242
shared-file server
alerts 244
shared-file servers
critical errors, LANDP for DOS 200
critical errors, LANDP for Linux 201
critical errors, LANDP for OS/2 201
critical errors, LANDP for Windows 201
primary I/O errors 202

Shared-file servers
return codes 193
shared-file utility programs
return codes 204
SHFILE ##
return codes 193
SN1 alert, protocol error 252
SN1—SNA protocol error
alerts 252
SNA compression server, LANDP for DOS 130
SNA server
alerts 252
return codes 205
SNA trace pages, number of LANDP for DOS 22
SNA trace, LANDP for DOS 22
SNA##
return codes 205
SNRM, unexpected command received alert 247
software error, alert 236
start tracing, LANDP for DOS 37
start X.25 adapter trace, LANDP for DOS 20
statistics codes
LANDP for DOS 36
status indicator codes (3270 emulator) 259
status settings, LANDP for Linux trace tool 41
status settings, LANDP for OS/2 trace tool 41
status settings, LANDP for Windows trace tool 41
stop tracing, LANDP for DOS 37
stop X.25 adapter trace, LANDP for DOS 21
store-for-forwarding server
alerts 246
FF1, unsuccessful call to server 235
return codes 136
structure of this book viii
supervisor buffer pool, specifying LANDP for DOS 32
Supervisor local functions
return codes 210
supervisor traces, LANDP for DOS
display routines active or inactive 37
EHCLIP program 35
functions 31
remote requests included or excluded 37
routines 34
start 37
stop 37
support, requesting IBM 53
system administrators, description of vii
System log, Linux 56
system manager server
access to LANDP for DOS trace tools 10
alerts functions 7
System manager server
return codes 212
system programmers, description of vii

T

TCP/IP
wide area communications server
return codes 218
TCP/IP tools and LIP programs
LANDP for DOS 36
LANDP for OS/2 50
terms, definitions of 269
token-ring DLC trace, LANDP for DOS 27
TR$*xxx*A*n*.DAT file 13
TR$*xxxx*n.DAT file 12
trace pages, number of LANDP for DOS SNA 22
trace pages, number of LANDP for DOS supervisor functions 32
trace tool display program, general description of 4
trace tool server, general description of 4
trace tools
description of 4
display program, description of 4
EHCLIP program, description of 49
EHCTRACF program, using 49
formatting trace files in ASCII 49
LANDP for DOS, using 9, 37
LANDP for Linux, using 39
LANDP for OS/2, using 39
LANDP for Windows, using 39
loading 4
trace files, formatting in ASCII 49
trace server, general description of 4
trace tools, LANDP for DOS 9
buffer pool, specifying supervisor 32
DCA DLC information 26
DCA DLC trace 24
display routines trace active or inactive 37
displaying trace files 14
EHCLIP error codes 36
EHCLIP statistics codes 36
EHCLIP, description of 35
EHCTRALL program, using 14
GETTRACE program, using 14
loading parameters 22, 32
native X.25 trace 23
on-request/on-completion values, functions trace 32
panels (screens) 11
remote requests included or excluded 37
routines trace 34
screen contents, saving 12
screens, levels and names of 11
SDLC trace 15
SNA trace 22
SNA trace pages, number of 22
start 37
start X.25 adapter trace 20
stop 37
stop X.25 adapter trace 21

trace tools, LANDP for DOS *(continued)*
supervisor buffer pool, specifying 32
supervisor functions trace 31
supervisor functions trace pages, number of 32
token-ring DLC trace 27
trace buffer contents, saving 13
trace files, displaying 14
X.25 adapter trace 20
X.25 adapter trace (coprocessor) 19
X.25 network errors 18
trace tools, LANDP for Linux 39
EHCTRACW server, using 40
error logging 40
event tracing 40, 41
file status setting 41
loading parameters 42
logging errors 40
memory status setting 41
status settings 41
stop event tracing 41
trace tools, LANDP for OS/2 39
displaying trace files 44
EHCPDT program, using 44
EHCTRACW server, using 40
error logging 40
event tracing 40, 41
file status setting 41
loading parameters 42
log entries 41
logging errors 40
memory status setting 41
return codes 40
status settings 41
stop event tracing 41
trace files, displaying 44
trace tools, LANDP for Windows 39
displaying trace files 44
EHCPDT program, using 44
EHCTRACW server, using 40
error logging 40
event tracing 40, 41
file status setting 41
loading parameters 42
logging errors 40
memory status setting 41
status settings 41
stop event tracing 41
trace files, displaying 44
trace, on-request/on-completion values, LANDP for DOS supervisor functions 32
tracing, LANDP for Linux event 41
tracing, LANDP for OS/2 event 41
tracing, LANDP for Windows event 41
trademarks 266
trap errors 40
TRDLC xi
TRP files 40
tuning the performance xi
types, return code 6

U

uncompress (UC function) 130
users of this book vii

V

validation program (EHCVAL), loading messages 221
values, return code 6
VARDAT
file error subcodes 122
format I/O error subcodes 119
I/O error subcodes 118
VARPARM
loading error return subcodes 116
verifying program version level 59
VERSION utility program
description of 5
VERSION.TXT file 59
VisualAge C++ web site 298
VisualAge Generator books 298
VisualAge Generator support functions
return codes 220
VisualAge Smalltalk web site 299

W

wide area communication
books 296

X

X (hexadecimal codes)
ALU 219
CL1 through CL2 159
CN1 through CN4 159
CN1 through CN8 219
CNP 219
CNW 219
GH1 159, 219
IF1 through IF3 219
IN1 through IN7 159, 219
INa through INe 159, 219
INC 219
INL 219
INM 219
INN 219
INP 159, 219
MX1 159, 219
MX2 219
RD1 through RD2 219
RD1 through RD3 159
SD1 159, 219
TE1 through TE2 219
X'00A00004' 131

X (hexadecimal codes) *(continued)*
X'00A00008' 131
X'00A0000A' 131
X'00A0000B' 131
X'00A0000C' 131
X'00A00033' 131
X'00A00034' 131
X'00A00035' 131
X'00A00036' 131
X'00A00050' 131
X'00A00061' 131
X'00A05000' 131
X'00A05001' 131
X'00A05002' 131
X'00A05004' 131
X'00A05005' 131
X'00A05006' 131
X'00A05007' 131
X'00A05008' 131
X'00A0504C' 133
X'00A051AC' 133
X'00A05345' 133
X'00A05441' 133
X'00A05445' 133
X'00A06000' 131
X'00A06001' 131
X'00A06002' 131
X'00A06003' 131
X'00A07001' 131
X'00A07002' 131
X'00A07003' 131
X'00A07004' 131
X'0100414E' 133
X'01004253' (BS) 127
X'01004345' 133
X'01004346' 133
X'0100434C' 133
X'0100434F' 133
X'01004454' 133
X'0100454F' 133
X'01004844' (HD) 127
X'01004943' 133
X'01004946' 133
X'0100494D' 133
X'01004950' 133
X'01004950' (IP) 127
X'01004954' 133
X'01004E41' 133
X'01004E44' 133
X'01004E46' 133
X'01004E4C' 133
X'01004E4D' 133
X'01004E52' 133
X'01004E53' (NS) 127
X'01004F45' 133

X (hexadecimal codes) *(continued)*
X'01005030' (P0) 128
X'01005031' (P1) 128
X'01005032' (P2) 130
X'01005032'(P2) 128
X'01005033'(P3) 128
X'01005034' (P4) 130
X'01005037'(P7) 130
X'01005038'(P8) 128
X'01005059'(PY) 128
X'0100505A'(PZ) 128
X'01005539'(U9) 128
X (hexadecimal) codes
01004144 (AD) 200
0100424C (BL) 200
01004345 (CE) 200
0100434F (CO) 200
01004441 (DA) 200
01004442 (DB) 200
01004448 (DH) 200
0100444A (DJ) 200
0100444F (DO) 200
01004531 (E1) 200
01004532 (E2) 200
01004550 (EP) 200
01004644 (FD) 200
01004742 (GB) 200
01004745 (GE) 200
01004945 (IE) 200
01004949 (II) 200
01004C49 (LI) 200
01004D49 (MI) 200
01004E41 (NA) 200
01004E42 (NB) 200
01004E43 (NC) 200
01004E4F (NO) 200
01004E50 (NP) 200
01004E53 (NS) 200
01004E54 (NT) 200
01004F50 (OP) 200
01005049 (PI) 200
0100505A (PZ) 200
0100524C (RL) 200
0100544C (TL) 200
0100544F (TO) 200
01005941 (YA) 200
01005942 (YB) 200
0100594F (YO) 200
01005950 (YP) 200
082FF001 192
082FF004 192
0833F001 192
328A0108 192
32B00001 192
32B00002 192

X (hexadecimal) codes *(continued)*
32B00202 192
32B10001 192
32B10002 192
32B10101 192
32B20001 192
32B20002 192
32B20104 192
32B40204 192
32B50001 192
32B50002 192
32B50003 192
32B50201 192
32B60001 192
32B60002 192
32B60105 192
32B60201 192
32B70001 192
32B70002 192
32B70003 192
32B70004 192
32B70005 192
32B70007 192
32B80001 192
32B80002 192
32B80003 192
32B80004 192
32B90001 192
32B90002 192
32B90003 192
32BA0001 192
32BA0002 192
32BA0003 192
32BA0004 192
32BA0005 192
32BA0006 192
32BA0007 192
32BA0008 192
32BB0001 192
32E90002 192
32E90201 192
32E90202 192
32E90203 192
32E90204 192
32E90205 192
32E90206 192
X.25 data link control (DLC)
alerts 252
X.25 data link control server xi
X.25 network
adapter trace (coprocessor), LANDP for DOS 19
adapter trace, LANDP for DOS 20
errors trace, LANDP for DOS 18
X1 alert, invalid or unsupported command received 253
X2 alert, DCE-originated clear indication received 254
X2—DCE-Originated clear indication received
alerts 254
X3 alert, reset indication packet sent by the DTE 255
X3—Reset indication packet sent by the DTE
alerts 255
X4 alert, clear request packet sent by the DTE 256

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