



**IBM**

## **International Technical Support Centers**

**Workstation LAN File Services/VM  
LAN Resource Extension and Services/VM  
AS/400 PC Support  
in CID Environment**

**Workstation LAN File Services/VM  
LAN Resource Extension and Services/VM  
AS/400 PC Support  
in CID Environment**

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International Technical Support Center  
Boca Raton

**Take Note!**

Before using this information and the product it supports, be sure to read the general information under "Special Notices" on page xv.

**First Edition (July 1993)**

This edition applies to Workstation LAN File Services/VM Version 1 Release 1.1, Product Number 5684-120, LAN Resource Extension and Services/VM, Product Number 5684-124, IBM Software Licence Monitor Release 1.0, Program Number 5648-038, IBM LAN Server 3.0, Program Number 52G8222, Operating System/2 Version 2.0, Program Numbers 84F758G, 10G2991, Network Transport Services/2, Program Number 52G8217, Novell NetWare 3.11 and related products.

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## Abstract

This document describes the installation and usage of Workstation LAN File Services, LAN Resource Extension and Services for VM, and the PC Support/ 400 for AS/400 processor in order to make the host DASD storage space available for the LAN connected workstation using services of the IBM LAN Server 3.0 and Novell NetWare server 3.11.

This document also describes the preparation of the CID code server used for the automated installation of CID enabled products using Network Transport Services/2's CID utilities. The method utilizes the architected distribution specified by CID (**Configuration Installation Distribution**) strategy. This strategy consists of three elements: LAN redirection, response files and the architected return codes.

This document is intended for workstation specialists and system technical personnel responsible for mass distribution of OS/2 V2.0. A knowledge of LANs, OS/2 V2.x and VM host operating system is assumed.

Personal Systems-CID, Miscellaneous

(146 pages)



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# Contents

<b>Abstract</b> .....	iii
<b>Special Notices</b> .....	xv
<b>Preface</b> .....	xvii
How This Document is Organized .....	xvii
Related Publications .....	xvii
International Technical Support Center Publications .....	xix
The ITSC Redbooks about Automated Installation and Maintenance .....	xix
<b>Acknowledgments</b> .....	xxi
<b>Chapter 1. Introduction</b> .....	1
1.1 The ITSC Redbooks about Automated Installation and Maintenance .....	1
<b>Chapter 2. Automated System Installation Overview</b> .....	3
2.1 Introduction to CID .....	3
2.2 Introduction to Redirected Input/Output .....	4
2.2.1 Connections .....	5
2.2.2 The Server Workstation .....	5
2.2.3 Network Transport Services/2 .....	5
2.2.4 The Boot Diskettes .....	6
2.3 Introduction to Response Files .....	6
2.3.1 Why the Response File? .....	6
2.3.2 Response File Basics .....	7
2.3.3 Response File Processing .....	7
2.4 Introduction to Installation Methods .....	7
2.4.1 Standard Installation .....	8
2.4.2 Attended Redirected Installation .....	9
2.4.3 Lightly Attended Redirected Installation .....	11
<b>Chapter 3. Host Client/Server CID Installation Possibilities</b> .....	13
3.1 Workstation LAN File Services/VM .....	13
3.2 LAN Resource Extension and Services/VM .....	14
3.3 IBM PC Support/400 .....	17
3.3.1 Connectivity Alternatives .....	18
<b>Chapter 4. Workstation LAN File Services</b> .....	19
4.1 Documentation .....	20
4.2 Hardware and Software Requirements .....	21
4.3 Installing the WLFS/VM Host Software .....	23
4.3.1 Customization of the Software License Monitor/VM .....	30
4.4 Installing the WLFS PS/2 Software .....	31
4.4.1 Installing the MMC Adapter .....	32
4.4.2 Installing the LAN Server 3.0 Advanced .....	32
4.4.3 Installing the Front End Processor .....	32
4.4.4 Changes and Updates to the Vital Files .....	39
4.4.5 Test of FEP Connection .....	45
4.4.6 Setting up CID installation .....	46
4.5 Startup Procedure .....	47

<b>Chapter 5. LAN Resource Extension and Services/VM</b>	49
5.1 Documentation	49
5.2 Hardware and Software Requirements	50
5.3 LANRES/VM Host Software Installation	51
5.4 PS/2 Server Installation - Installing the MMC Adapter	62
5.4.1 Installing the NetWare Server Software	63
5.4.2 Customizing the NetWare Server Software	63
5.4.3 Setting up CID installation	71
<b>Chapter 6. AS/400 Client/Server Connection</b>	73
6.1 Hardware and Software Requirements	73
6.2 Installation Steps	74
6.2.1 Communications Manager Configuration	74
6.2.2 PC Support/400 Installation	83
6.2.3 CID Installation and Setup	89
6.2.4 Startup Procedure for the CID Code Server	89
<b>Chapter 7. CID Code Server Preparation</b>	91
7.1 Preparation of the CID Environment Using Host DASD	91
7.2 PC Hardware Requirements	91
7.3 The Directory Structure	91
7.4 Loading OS/2 V2.x CID Utilities to the CID Code Server	92
7.5 Loading the OS/2 V2.0 Diskette Images	93
7.6 Loading the OS/2 V2.0 Service Pak Diskette Images	93
7.7 Loading the Extended Services or Communications Manager/2	93
7.8 Loading the Database 2 /2 Diskette Images	94
7.9 Loading the NTS/2-LAPS Diskette Image	94
7.10 Loading the IBM LAN Server V3.0 Diskette Images	94
7.11 Loading the LAN CID Utility and SRVIFS Diskette Images	96
7.12 Enabling the CID Code Server	96
7.13 Install and Customize NTS/2-LAPS	96
7.14 Install and Customize the SRVIFS Server	97
7.15 Additional Necessary Files for the Code Server	98
7.16 Creating Boot Diskettes for the Client Workstations	99
7.17 Creating Product-Specific Client Response Files	102
7.18 The OS/2 V.2.x Response File	102
7.19 The OS/2 V.2.0 Service Pak Response File	104
7.20 The NTS/2-LAPS Response File	104
7.21 The Extended Services Response File	106
7.22 The LAN Server V.3.0 Requester Response File	107
7.23 Invoking The Remote Installation Using LCU	109
7.23.1 Create The General Setup File for LCU	109
7.23.2 Create The Installation-Dependent Setup File for LCU	111
7.23.3 Create The Client-Specific Command File with CASPREP	111
7.24 Sequence of Remote Installation via LCU	112
<b>Appendix A. Scenarios: A General View</b>	113
A.1 Concepts for WLFS	113
A.2 Sample WLFS Environment	113
A.3 WLFS Communications Options	115
A.4 Concepts for LANRES/VM	120
A.5 Sample LANRES/VM Environment	120
A.6 LANRES/VM Communications Options	123
<b>Appendix B. Software License Monitor</b>	127

B.1.1 Start the Server Virtual Machine (SLMSERV) . . . . .	128
B.1.2 Set up and Run an Admin User (SLMADMIN) . . . . .	129
B.1.3 Setting Up the Software License Monitor Production Environment . . . . .	129
<b>Appendix C. Extended Services 1.0 Response File . . . . .</b>	<b>131</b>
<b>Glossary . . . . .</b>	<b>141</b>
<b>Index . . . . .</b>	<b>145</b>



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## Figures

1.	OS/2 V2.0 Standard Installation Flow . . . . .	9
2.	OS/2 V2.0 Attended Redirected Installation Flow . . . . .	10
3.	OS/2 V2.0 Lightly Attended Redirected Installation Flow . . . . .	11
4.	CID Installation Using Host DASD . . . . .	13
5.	Services Provided by LANRES . . . . .	16
6.	A Basic Scenario for WLFS with CLAW Connection . . . . .	19
7.	WLFS CLAW Connection . . . . .	20
8.	DMKRIO ASSEMBLE File . . . . .	24
9.	WLFSEVM VM Directory Definition . . . . .	25
10.	WLFS CONFIG File . . . . .	28
11.	OS2LFS CONFIG File . . . . .	29
12.	PROFILE WLFS File . . . . .	30
13.	PROFILE EXEC File . . . . .	30
14.	Licensed Material Panel for WLFS . . . . .	33
15.	Main Installation Panel . . . . .	33
16.	OS/2 Version Selection Panel . . . . .	34
17.	Drive and Path of BFS Installation Panel . . . . .	34
18.	Create Path Option Panel . . . . .	34
19.	WLFS Connection Type Panel . . . . .	35
20.	Mainframe Connection Adapter Panel . . . . .	35
21.	Sub-channel Address Panel . . . . .	35
22.	Channel Speed Selection Panel . . . . .	36
23.	Front End Processor Naming Panel for Host Connection . . . . .	36
24.	OLSID Definition Panel of Host Resource . . . . .	36
25.	First Disk Installation Panel . . . . .	37
26.	IBMLAN.INI Drive/Path . . . . .	37
27.	CONFIG.SYS Drive . . . . .	37
28.	Cache Screen Selection Panel of Installation Routine . . . . .	38
29.	Selection Panel for Installing or Checking WLFS/VM . . . . .	38
30.	FEP Drivers Status Screen . . . . .	39
31.	CLAW Communications Driver Status Screen . . . . .	39
32.	Final Installation Screen . . . . .	39
33.	BFS.INI File . . . . .	40
34.	CONFIG.SYS File Statements (Partial View) . . . . .	40
35.	IBMLAN.INI File for LAN Server . . . . .	41
36.	Changes to PROTOCOL.INI File for BFS . . . . .	44
37.	FEP Logo . . . . .	45
38.	CODE SERVER.INI File . . . . .	46
39.	STRBFS.CMD File . . . . .	47
40.	FEP Screen . . . . .	47
41.	FEP Screen with Cache Monitor . . . . .	48
42.	A Basic Scenario for LANRES with Channel Connection . . . . .	49
43.	DMKRIO ASSEMBLE File . . . . .	53
44.	EWXCONFIG LINK File . . . . .	54
45.	EWXDISK VMPW File . . . . .	57
46.	EWXDISKX File for LANDISK . . . . .	58
47.	PROFILE EXEC for LANDISK User . . . . .	60
48.	PSCA1.CFG File in the SYS:\SYSTEM Directory . . . . .	65
49.	AUTOEXEC.NCF File with Statements for LANRES . . . . .	66
50.	EWXDISK.NPW file . . . . .	68
51.	EWXCOMM.INI File . . . . .	69

52.	A Basic Scenario for AS/400 PC Support/400 Environment	73
53.	Extended Services - Icon View	75
54.	Extended Services Basic Configuration Services	75
55.	Create Basic Configuration File	76
56.	Change Basic Configuration File Comments	76
57.	Basic Configuration Services Main Menu	77
58.	5250 Work Station Feature Defaults	77
59.	Select LAN Network Type	78
60.	Select LAN Address Type	78
61.	Local LAN Adapter Address	79
62.	5250 Work Station Feature LAN Defaults	79
63.	Configuration Network Defaults	80
64.	Basic Configuration Services Main Menu	80
65.	Create/Change and Verification of Configuration File	81
66.	Extended Services Basic Configuration Services Complete	81
67.	Communications Manager Has Been Successfully Installed	82
68.	Shutdown Your Workstation	82
69.	PC Support/400 Installation Screen	83
70.	PC Support/400 Installation	84
71.	PC Support/400 Installation (Startup Options)	84
72.	PC Support/400 Installation (Startup Options)	85
73.	PC to AS/400 Connection	85
74.	Copy Installation Files	86
75.	Files Are Being Copied	86
76.	PC Support/400 Installation (Completion)	87
77.	Exit Installation	87
78.	CONFIG.SYS File for PC Support	88
79.	AS400CID.INI File	89
80.	Example of a CID Code Server Directory Structure	92
81.	UNPACK Command	92
82.	UNPACK Command to Extract RSPINST.EXE	93
83.	UNPACK Command to Extract SEINST.EXE	93
84.	SEIMAGE Command	93
85.	XCOPY Command for Transferring OS/2 V.2.0 Service Pak	93
86.	ESAIMAGE Command	94
87.	CMIMAGE Command	94
88.	XCOPY Command for Transferring DB2/2 Diskettes	94
89.	LAPSDISK Command	94
90.	LANINST Command	94
91.	Installation Task Window within Advanced Server Installation/Configuration Window	95
92.	Copy Product Diskettes Window within Copy Product Diskettes for Remote Installation Window	95
93.	Transfer Commands for LCU and SRVIFS	96
94.	LAPS Install Command	96
95.	Responses for Installing LAPS on Your Workstation	97
96.	SERVICE.INI	98
97.	THINSRV Installation Command	98
98.	Copying Additional Necessary Files	99
99.	SEDISK Command	99
100.	THINLAPS Command	99
101.	THINIFS Commands	99
102.	CASINSTL Command	100
103.	CONFIG.SYS on the Second Boot Diskette	101
104.	STARTUP.CMD on the Second Boot Diskette	101

105.	OS/2 V2.x Response Sample Response File	103
106.	OS/2 V2.0 Service Pak's Response File	104
107.	LAPSRSP Command	104
108.	LAPS Response File	105
109.	ESARECD Command	107
110.	LANINST Command	107
111.	LAN Server V.3.0 Requester Response File	108
112.	The General Setup File	110
113.	The Installation Dependent Setup File	111
114.	A Basic Scenario for WLFS OS/2 Environment with CLAW Connection	113
115.	A Basic Scenario for WLFS OS/2 Environment with Token-Ring Connection	114
116.	A Basic Scenario for WLFS NFS Environment with Ethernet Connection	114
117.	Basic Scenarios for WLFS Using VM PWSCS	115
118.	A Basic Scenario for LANRES Using MMC	121
119.	A Basic Scenario for LANRES Using an SNA LU 6.2 Network	121
120.	A Basic Scenario for LANRES Using TCP/IP	122
121.	Basic Scenarios for LANRES Using VM PWSCS	123
122.	Software License Monitor APAR Requirements	127
123.	Response File for the Extended Services Installation	131



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## Tables

1.	Hardware and Software for the VM Processor . . . . .	21
2.	Hardware and Software for the Front End Processor . . . . .	22
3.	Hardware and Software for the Connectivity Equipment . . . . .	22
4.	Hardware and Software for the Client Workstation . . . . .	23
5.	Installation and Service Minidisks . . . . .	23
6.	Hardware Requirements for LANRES/VM . . . . .	50
7.	Hardware and Software Requirements for the Channel Connection . . . . .	51
8.	Installation and Service Minidisks . . . . .	51
9.	Hardware and Software for the AS/400 Processor . . . . .	74
10.	Hardware and Software for the Front End Processor . . . . .	74
11.	Hardware and Software for the VM Processor . . . . .	116
12.	Hardware and Software for the Front End Processor . . . . .	117
13.	Hardware and Software for the Connectivity Equipment . . . . .	118
14.	Hardware and Software for the Client Workstation . . . . .	119
15.	Hardware for the NFS Environment . . . . .	119
16.	Software for the NFS Environment . . . . .	120
17.	Hardware Requirements for the LANRES/VM . . . . .	124
18.	Hardware and Software Requirements for Channel Connection . . . . .	124
19.	Hardware and Software Requirements for the SNA LU6.2 Connection . . . . .	125
20.	Hardware and Software Requirements for the TCP/IP Connection . . . . .	125
21.	Hardware and Software Requirement for the VM PWSCS Connection . . . . .	126



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## Special Notices

This publication is intended to help the customer's technical personnel and IBM systems engineers to manage OS/2 V2.x mass installation and maintenance using the Workstation LAN File Services (WLFS), LAN Resource Extension and Services (LANRES) for VM systems, or PC Support/400 for the shared host DASD space in conjunction with Network Transport Services/2's LAN CID Utility lightly attended method. The information in this publication is not intended as the specification of any programming interfaces that are provided by the used products. See the PUBLICATIONS section of the IBM Programming Announcement for more information about what publications are considered to be product documentation.

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## Preface

This document intends to show how the host DASD space can be utilized as redirected drives for the LAN-connected workstations using Workstation LAN File Services, LAN Resource Extension and Services for VM system or PC Support/400 in the AS/400 environment in order to mass distribute the OS/2 V2.x and other CID enabled products.

This document is intended for IBM systems engineers and customers' technical personnel who deal with mass distribution and maintenance of OS/2 V2.x and related products.

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## How This Document is Organized

The document is organized as follows:

- Chapter 1, "Introduction"  
This chapter introduces the document for the reader.
- Chapter 2, "Automated System Installation Overview"  
This provides information about the basic principles common to CID automated installation process.
- Chapter 3, "Host Client/Server CID Installation Possibilities"  
This chapter introduces the host client/server products that enables the LAN connected workstations to access the redirected drive on the VM or AS/400 systems.
- Chapter 4, "Workstation LAN File Services"  
This chapter describes the installation and usage of Workstation LAN File Services (WLFS) on VM systems.
- Chapter 5, "LAN Resource Extension and Services/VM"  
This chapter describes the installation and usage of LAN Resource Extension and Services on VM systems.
- Chapter 6, "AS/400 Client/Server Connection"  
This chapter describes the installation and usage of PS Support/400 on AS/400 systems.
- Chapter 7, "CID Code Server Preparation"  
This chapter describes the CID code server preparation using the host DASD space.

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## Related Publications

The following publications are considered particularly suitable for a more detailed discussion of the topics covered in this document.

- *IBM Operating System/2 Version 2.0 Information and Planning Guide*, G326-0160
- *OS/2 2.1 Using the Operating System*, S61G-0905
- *IBM OS/2 Online Book Collection*, S53G-2166

- *Os/2 2.1 Technical Update*, GG24-3948-00
- *IBM Network Transport Services/2 LAN Adapter and Protocol Support Configuration Guide*, S96F-8489
- *IBM Network Transport Services/2 Redirected Installation and Configuration Guide*, S96F-8488
- *IBM Network Transport Services/2 Messages and Error Recovery Guide*, S96F-8490
- *IBM Extended Services 1.0 for OS/2 Communications Manager Configuration Guide*, S04G-1002
- *IBM Extended Services 1.0 for OS/2 Programmable Configuration Guide*, S04G-1003
- *IBM Extended Services 1.0 Guide to Database Manager*, S04G-1013
- *IBM Extended Services 1.0 CID Utility*, S96F-8378-00
- *DATABASE 2 OS/2 Installation Guide* , S62G-3664
- *Communications Manager/2 Version 1.0 New Features* , GG24-3958
- *IBM Communications Manager/2 Version 1.0 Network Administration and Subsystem Management Guide* , SC31-6168
- *IBM LAN Server V3.0 Network Administrator Reference Volume 1: Planning and Installation Guide*, S96F-8428
- *IBM LAN NetView START User's Guide*, S96F-8585
- *Novell NetWare Administrator's Guide*, 183-000296-001
- *Program Directory for Workstation LAN Services, Version 1, Release 1, Modification Level 1, Program Number 5684-120*
- *Workstation LAN File Services/VM, Guide and Reference, Version 1, Release 1.1, SH24-5247-01*
- *Workstation LAN File Services/VM, General Information, Version 1, Release 1.1, GH24-5246-02*
- *Program Directory for use with VM Personal Workstation Communication Facility, 5799-DDH, Release 1, Modification Level 1*
- *VM Personal Workstation Communication Services Operating Guide and Programming Reference Version 1.2, SC24-5645-00*
- *Program Directory for LAN Resource Extension and Services/VM, Release 2, Modification Level 0, Program Number 5684-142*
- *LAN Resource Extension and Services/VM, General Information, Release 2, GC24-5618-01*
- *LAN Resource Extension and Services/VM, Guide and Reference, Release 2, SC24-5622-00*
- *Program Directory for IBM Software Licence Monitor Release 1.0, Program Number 5648-038*
- *IBM Software Licence Monitor/VM and MVS Guide and Reference,SH24-5258*

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## **International Technical Support Center Publications**

A complete list of International Technical Support Center publications, with a brief description of each, may be found in:

- *Bibliography of International Technical Support Centers Technical Bulletins*, GG24-3070.

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## **The ITSC Redbooks about Automated Installation and Maintenance**

- *Automated Installation for CID Enabled Products in LAN Server V3.0 RIPL, TCP/IP and Novell NetWare 3.11 Environments*, GG24-3977-00
- *OS/2 V2.0 and V2.1 Remote Installation and Maintenance*, GG24-3780-02
- *Automated Installation for CID Enabled Extended Services, LAN Server V3.0 and Network Transport Services/2*, GG24-3781-01
- *Automated Installation of CID Enabled Products using NetView DM/2 V2.0 and NetView DM R4*, GG24-3782-00
- *Automated Installation for CID Enabled OS/2 V2.x*, GG24-3783-01

The entire set of CID related publications can be ordered by requesting GBOF-2224.



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## Chapter 1. Introduction

The number of programmable workstations installed in the business enterprises and connected to different LANs has grown steadily over the past years.

With new software technologies, which means operating systems, graphical user interfaces and application programs, software packages have become larger and more complex. It is not unusual that a software package, like a word processor, today needs 6-7 diskettes to be completely installed.

An area to consider is the tailoring of individual user needs, which of course depends on the specific workstation hardware configuration. This need will require a lot of parameter setting, setup information, additional files, and so on. Nobody can demand an end user with little or no experience in customizing software, to be able to succeed in these tasks with a reasonable amount of work and time spent. In order to minimize the time and manpower spent on installation and customization of programmable workstation platforms in the enterprise, the automated installations configured and controlled by especially appointed administrators is a possible solution.

This publication describes how to prepare the installation and maintenance of OS/2\* V2.x and its related products, using a redirected drive, which physically resides on the VM system or AS/400\* processor, without the need to feed sets of diskettes for products enabled for this kind of operations. The principles of these techniques are explained in Chapter 2, "Automated System Installation Overview" on page 3.

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### 1.1 The ITSC Redbooks about Automated Installation and Maintenance

*Workstation LAN File Services/VM, LAN Resource Extension and Services/VM, PC Support/400 in CID Environment (GG24-4073-00)* is one in a series of redbooks covering all aspects of CID installation and maintenance, in LAN and host environments. This book is concerned with preparation of the redirected drive using Workstation LAN File Services (WLFS) and LAN Resource Extension products for VM environments and PC Support/400 in the AS/400 enterprise.

The IBM effort to provide a generalized solution for installing OS/2 and its related products is aimed at the processes of **Configuration Installation** and **Distribution** (known as **CID**).

Although there are several aspects to CID, its primary objective is to provide for remote installation and maintenance of OS/2 and related products. CID enablement requires:

- Use of redirected I/O for installation and maintenance
- Use of response files rather than user dialogs
- Standardized return codes from installation and maintenance functions.

This book does not discuss CID in detail or cover the installation of CID enabled products.

For detailed information on CID and the installation and maintenance of CID enabled products you should refer to the other books in this series:

- *OS/2 V2.0 and V2.1 Remote Installation and Maintenance (GG24-3780-02)* describes basic installation and maintenance of OS/2 V2.x (only), for users using IBM\* LAN Server RIPL, TCP/IP, or Novell\*\* NetWare\*\* as a LAN transport system.
- *Automated Installation for CID Enabled Extended Services, LAN Server V3.0 and Network Transport Services/2 (GG24-3781)* describes CID installation of Extended Services\*, LAN Server 3.0, and NTS/2, using the LAN CID Utility of NTS/2.
- *Automated Installation of CID Enabled Products using NetView DM/2 V2.0 and NetView DM R4, (GG24-3782)* describes installation of CID enabled products using the NetView Distribution Manager products.
- *Automated Installation for CID Enabled OS/2 V2.x (GG24-3783-01)* describes installation of OS/2 V2.0 and related CID enabled products using the LAN CID Utility of NTS/2.
- *Automated Installation for CID Enabled Products in LAN Server V3.0 RIPL, TCP/IP, and Novell NetWare 3.11 Environments, (GG24-3977-01)* describes installation of OS/2 V2.0 and related CID products using the LAN CID Utility of IBM NTS/2; but using RIPL, TCP/IP, NetWare, or SRVIFS as the LAN transport system. This book is strongly recommended for those installations that require sophisticated installation of multiple products from RIPL, TCP/IP, or NetWare servers.

The entire set of CID related publications can be ordered by requesting GBOF-2224.

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## Chapter 2. Automated System Installation Overview

This chapter introduces some basic expressions used throughout this publication. It is strongly recommended that you refer to other available information on the subject as this short overview cannot cover everything.

---

### 2.1 Introduction to CID

The abbreviation **CID** stands for **C**onfiguration, **I**nstallation, **D**istribution.

The intention of **CID** is to provide an architected way to install OS/2 V2.0 with Extended Services, LAN Services and other products. The CID will also provide architected software customization, in accordance with the specifics for each workstation, under the automated remote installation process.

To reach this goal CID implements the following:

- **Redirected I/O** using the Network Transport Services/2 LAN CID Utility. For more information see 2.2, "Introduction to Redirected Input/Output" on page 4.
- **Response file** is a flat ASCII file storing the installation and configuration information. The response file techniques are explained in publications: *Automated Installation for CID Enabled OS/2 V2.x* and *Automated Installation for Extended Services, LAN Server V3.0 and Network Transport Services /2*.
- **Standard return codes** are utilized in all CID enabled products.
- **Master installation program** ties together the installation of OS/2 V2.0, Extended Services, LAN Services and other products. The master installation program is represented by LCU REXX command files. For details see *Automated Installation for CID Enabled OS/2 V2.x*.
- **Seed system** is the OS/2 V2.0 minimum operating system installed on the client workstation in a service subdirectory. The master installation program has the ability to boot the client workstation from there. For detailed information see *Automated Installation for CID Enabled OS/2 V2.x*.
- **Network Transport Services/2** is a IBM product that provides LAN adapter support and CID utilities. For details see *Automated Installation for CID Enabled OS/2 V2.x* and *Automated Installation for Extended Services, LAN Server V3.0 and Network Transport Services /2* publications.
- **LAN Configuration Installation and Distribution Utility (LCU)** is a part of CID utilities from Network Transport Services/2. The LCU includes redirection services and master installation program.
- **CID code server** is a workstation storing the product images, executables, response files, master installation program and so on. The CID code server is based on the LCU server facility.
- **CID redirector** is a client workstation executing LCU's redirection services in order to connect to CID code server. When the connection is established the CID redirector executes the master installation program.
- **System type**

There are two types of client workstation systems that are treated differently with regard to **CID**. Therefore we will define two system types that we will use throughout this publication:

- A client workstation, that is initially empty, without partitions on its hard disk, no operating system installed and no connection to a CID code server, or booted with a set of boot diskettes, is called a **diskette-initiated system**.
- A client workstation, that has a partitioned hard disk, operating system, connection to a CID code server and is booted from a hard disk is called a **hard disk-initiated system**.

This publication will cover both diskette-initiated and hard disk-initiated type systems connected to a CID code server system via a token-ring LAN.

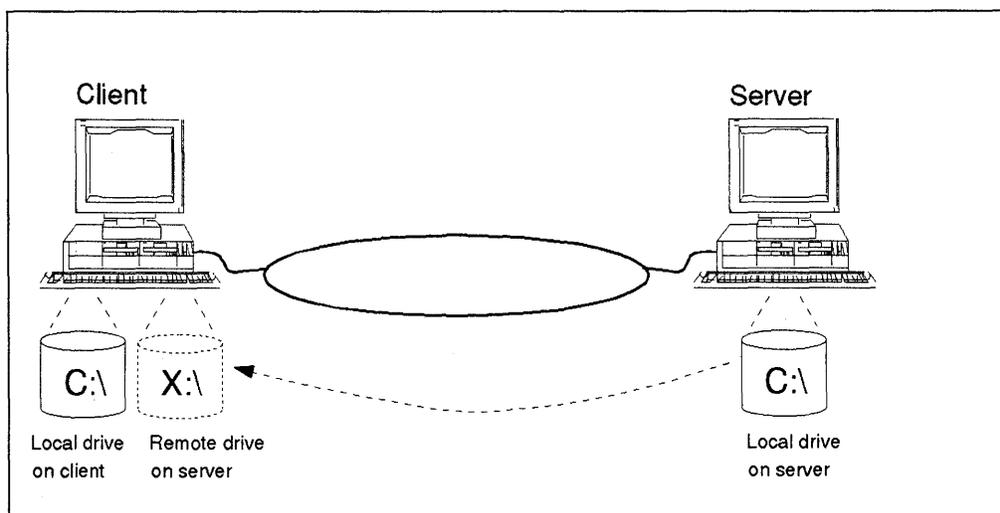
- **Installation methods** as described in 2.4, "Introduction to Installation Methods" on page 7.
- A **CID enabled product** conforms to CID by means of redirected I/O usage for the installation process. That means the product's diskettes can be stored and accessed on the CID code server along with the product's response file. The response file can be interpreted and the vital configuration files will be updated automatically during the installation process. The product's installation application returns standard codes to the master installation program.

The use of a master installation program is not only limited to CID enabled products. For each application execution, OS/2 generates a return code. If this return code is good the LAN CID utility master installation program considers it good and converges that code with a standard CID return code. Each execution of a .CMD file can generate standard CID return code. For details see *Automated Installation for CID Enabled OS/2 V2x*.

---

## 2.2 Introduction to Redirected Input/Output

Redirected input/output defines the capability of OS/2 V2.0 to use drive letters which are not connected to local drives but connected to drives, directories or subdirectories on a remote workstation.



Throughout this book the workstation that uses a remote (redirected) drive will be known as the **client or redirector** and the workstation that provides a remote (redirected) drive will be known as the **server or code server**.

## 2.2.1 Connections

The client can be connected to the server via several different ways, as for example:

- IBM LAN Server for Remote Initial Program Load (RIPL)
- TCP/IP
- Novell\*\* NetWare\*\*

The RIPL, TCP/IP and Novell connections are described in *OS/2 V2.0 Remote Installation and Maintenance, GG24-3780-02* and in document *Automated Installation for CID Enabled products in LAN Server 3.0 RIPL, TCP/IP and Novell NetWare 3.11 Environments (GG24-3977-00)*. The only connection used and described in this document is based on the LCU redirector/server. This connection type utilizes the NetBIOS interface and IBM Token-Ring.

## 2.2.2 The Server Workstation

A workstation or multiple workstations running OS/2 EE 1.3 or OS/2 V2.0 have to be assigned and installed as a server. In the case of the OS/2 V2.0-based server workstation the LAN Transport system must be installed and active.

The server has a subdirectory structure storing the OS/2 V2.0 images and code of other products used during the OS/2 V2.0 installation process.

Extended Services, LAN Services and other products are also stored in this subdirectory structure. For detailed descriptions of these two subsystem installations read *Automated Installation for CID Enabled Extended Services, LAN Server V3.0 and Network Transport Services/2*.

## 2.2.3 Network Transport Services/2

The IBM Network Transport Services/2 is a product which consists of three different parts. The **LAN Adapter and Protocol Support (LAPS)** provides the LAN transport facilities. The **Utilities** provides the redirector/server functions and the ability to tie together the installation of OS/2 V2.0, Extended Services and LAN Services. The **Additional Network Adapter Support** provides additional network adapter drivers for LAPS.

All three parts are delivered on separate diskettes.

### 2.2.3.1 LAPS Diskette

The LAPS diskette contains LAPS.EXE. This executable installs the complete LAN Transport subsystem on the workstation. If you are familiar with LAN adapter support for Extended Services or LAN Services you already know the "look and feel" of this product. The complete description of LAPS can be found either in *Automated Installation for CID Enabled Extended Services, LAN Server V3.0 and Network Transport Services/2* or in the product documentation.

### 2.2.3.2 Utilities Diskette

The Utilities diskette contains a set of CID utilities. A part of these utilities provide support for installation and maintenance of LCU redirector and code server.

Another part provides the LCU master installation program, which ties the automated installations together. LCU also carries out the redirected I/O functions by LCU redirector/server functions. The LCU agent program initializes the installation from the client workstation.

### 2.2.3.3 Additional Network Adapter Support Diskette

This diskette contains the additional network adapter drivers optionally used by LAPS. For detailed information refer to Network Transport Services/2 product publications.

## 2.2.4 The Boot Diskettes

In order to connect to the server workstation and perform the installation of OS/2 V2.0 the installation program requires OS/2 V2.0 to be activated. To bring up the OS/2 V2.0 minimum system the boot diskettes are used. There are two boot diskettes as follows:

- **OS/2 Installation diskette**
- **LAN Transport System diskette**

These diskettes are created by the administrator. The process is explained in publication *Automated Installation of CID Enabled OS/2 V2.x*. The diskettes contain OS/2 executables, CONFIG.SYS, and LAN Transport system files necessary for connection to the server workstation and the LCU redirector code enabling the redirected I/O operations.

There is another method available for booting the client workstation. The minimum of OS/2 V2.0 code, the LAN transport system and the LCU redirector files are installed as a pre-process to OS/2 V2.0 installation on the client workstation hard disk. After this step the client workstation is rebooted from the seed system and the OS/2 V2.0 installation process itself can start. This method is used and discussed in *Automated Installation of CID Enabled OS/2 V2.x*.

---

## 2.3 Introduction to Response Files

This section is an overview of response files and how these files provide the necessary configuration information required for the installation of different products.

### 2.3.1 Why the Response File?

The standard installation process requires inserting diskettes and answering screen prompts to provide configuration information. When response files are used, all information necessary for the installation is provided by these files. The response file interface effectively turns off the user interface. In some cases with the exception of progress indicators.

The response file enabled products such as OS/2 V2.0, Extended Services, LAN Services, Network Transport Services/2, Remote Multiple Printer Installation application, and certainly many others in the future, can utilize the redirected I/O and remote way of installation without user intervention.

## 2.3.2 Response File Basics

The response files are ASCII flat files, which contain the necessary information for the installation. The response file consists of many different keywords.

Each response file enabled product also has to have an application interpreting the response file and updating the vital configuration files.

The administrator can create either a default response file used by all client workstations or client specific response files.

## 2.3.3 Response File Processing

The response files will only reside on the CID code server workstations. When a response file is found, it uses the configuration information as input for the OS/2 V2.0 installation process.

Once the response file is processed, the initial full screen portion of OS/2 System Installation will continue to copy all diskette images from the server machine.

Any erroneous keywords in response files are ignored by the installation process. The entire installation will be recorded in a log file.

---

## 2.4 Introduction to Installation Methods

There are different methods of installing the CID enabled products. In our case we will describe the installation method for OS/2 V2.0.

- **Standard Installation**

This is the usual way of installing. The installation requires manual diskette insertion and is dialog-driven. This method is logically used on a **diskette-initiated system**. Read more about this in 2.4.1, "Standard Installation" on page 8.

- **Redirected Installation**

This installation is via a redirected drive. This method can be divided into three different types, depending on how you respond to the installation process.

- **Attended Redirected Installation**

This method uses the same dialog-driven response as the standard installation procedure. The difference is that the diskette images are stored on the server system and the client workstation has to connect to that server system in order to access the source. This method can be used on a **diskette-initiated system** or a **hard disk-initiated system**. Read more about this in 2.4.2, "Attended Redirected Installation" on page 9.

- **Lightly Attended Redirected Installation**

By use of this CID method, the input for the OS/2 V2.0 installation program is provided via a response file. The diskette images are stored and accessed on the CID code server. This method will always be referred to as a lightly attended installation, due to physical user interaction with the system, namely, the boot sequence that establishes a connection to the CID server. These boot sequences are:

- **With two boot diskettes**

- **With one "SEED" diskette**
- **Disketteless**

The lightly attended method can be utilized on a **diskette-initiated system** or a **hard disk-initiated system**. This document describes the details of this type of installation.

– **Unattended Redirected Installation**

This method is similar to the lightly attended method, but no manual interaction and no boot diskettes are required on the client side. All preparation, initialization and installation steps will be done on the server's initiative. This true CID client/server environment will be enabled in the future CID implementation. This type of installation method is not a subject of this document.

## 2.4.1 Standard Installation

A regular OS/2 V2.0 diskette installation is started by booting the workstation from diskette drive A: with the **OS/2 V2.0 Installation diskette** inserted. The boot sequence continues on **OS/2 V2.0 Diskette 1**. After **OS/2 V2.0 Diskette 1** has been processed the installation procedure requires input to displayed entries on the screen. The first part of an OS/2 V2.0 installation is a full screen application. The manual process of inserting diskettes continues to **OS/2 V2.0 Diskette 5**; there the installation process demands a reboot, in order to activate the second part of the OS/2 V2.0 installation. This second part is PM dialog-driven. After all required diskettes have been fed into drive A: the installation process asks for a final reboot.

The standard installation program, SYSINST2.EXE, reads from drive A: by default and examines the diskette labels. The following CONFIG.SYS statement from the **OS/2 V2.0 Diskette 1** enables that:

```
set os2_shell=sysinst2.exe
```

The following diagram, graphically shows the steps of a standard installation of OS/2 V2.0.

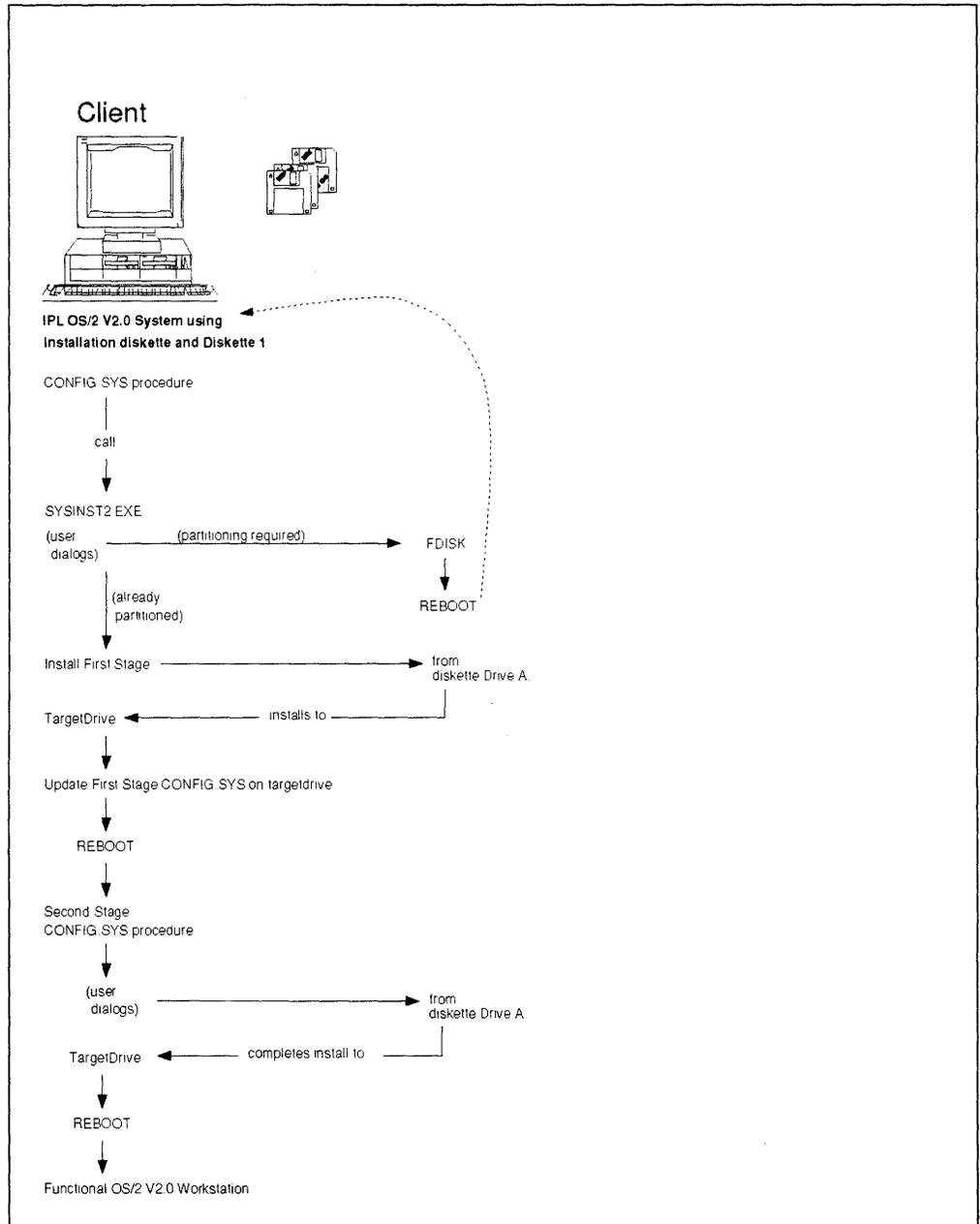


Figure 1. OS/2 V2.0 Standard Installation Flow

## 2.4.2 Attended Redirected Installation

The concept of standard installation is kept, but the source drive is redirected to the server. The manual diskette insertion disappears after the boot and reboot are performed on the client workstation. This is described in the document *OS/2 V2.0 Remote Installation and Maintenance*.

In order to connect to the server a pair of boot diskettes is used, the **OS/2 V2.0 Installation diskette** and **LAN transport (LT)** diskette. The LT diskette contains the necessary LAN transport mechanism and the specific redirector code.

The LT diskette CONFIG.SYS file contains the following statements:

```

set os2_shell=sysinst2.exe X:\
set sourcepath=X:\

```

These statements indicate that the source for the installation process is on the redirected drive. All OS/2 V2.0 diskette images have to be copied to the specified drive. A special subdirectory structure, recognized by the installation program SYSINST2.EXE, has to be created. Basically, each diskette is copied to a subdirectory with the diskette's label name. For more details see the document *OS/2 V2.0 Remote Installation and Maintenance*.

The following diagram graphically shows the steps of an attended redirected installation of OS/2 V2.0.

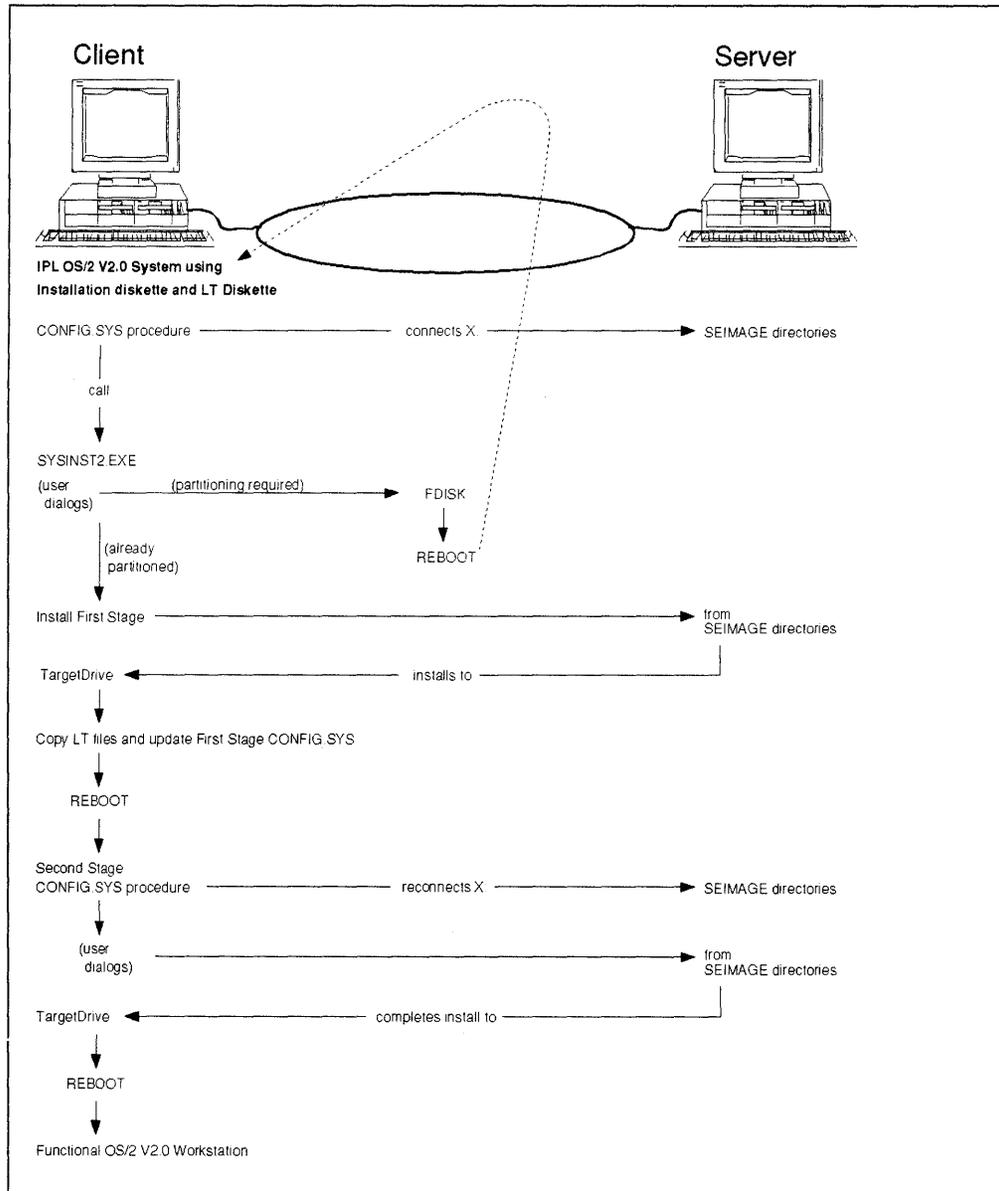


Figure 2. OS/2 V2.0 Attended Redirected Installation Flow

### 2.4.3 Lightly Attended Redirected Installation

This installation method is the first step in the implementation of CID strategy for mass-distribution of OS/2 V2.0. The **lightly** attended installation means that the only user interaction required for a successful installation process is the startup sequence. All of the following sequences are described in the document *Automated Installation for CID Enabled OS/2 V2.x*. There are three different startup sequences:

- **Two boot diskettes sequence**

As in attended redirected installation there are two diskettes used. The **OS/2 V2.0 Installation diskette** and **LAN Transport System (LTS)** diskette. The LTS diskette contains the necessary LAN transport mechanism to connect to the code server and the redirector code.

In this first CID implementation the LCU redirector and server are used.

The responses are defined in a response file, which is interpreted by the RSPINST.EXE application. As with previous installation methods the subdirectory structure has to be created for the OS/2 V2.0 images.

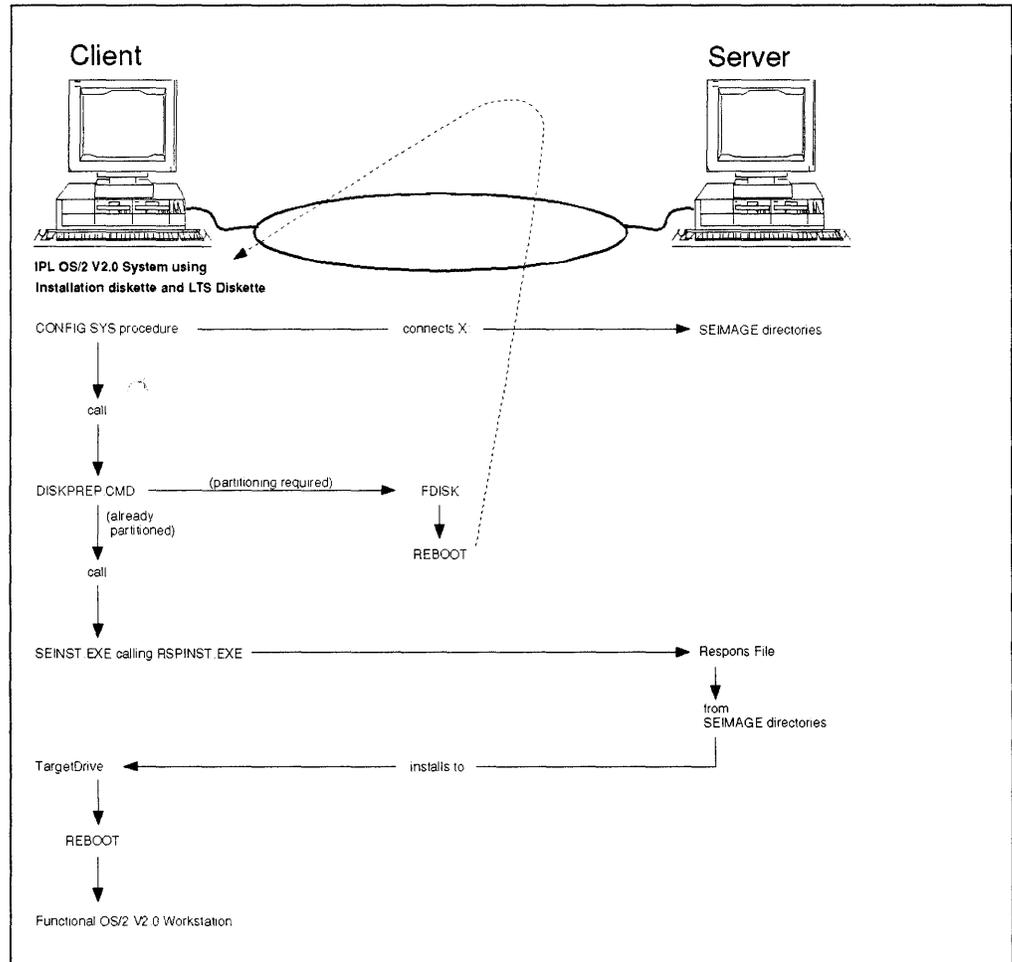


Figure 3. OS/2 V2.0 Lightly Attended Redirected Installation Flow

- **One diskette sequence**

The **"SEED" diskette** contains LAN transport system and redirector code that will be transferred and installed on the workstation hard disk. The workstation will be booted from its hard disk and get access to the code server.

- **Disketteless sequence**

**A previously CID installed** OS/2 V2.0 system that already has the LAN transport system and redirector code on its hard disk can, by a prepared command, install that code. The workstation will be booted from its hard disk and get access to the code server.

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## Chapter 3. Host Client/Server CID Installation Possibilities

This chapter will describe the use of CID with three products/scenarios: Workstation LAN File Services/VM, LAN Resource Extension and Services/VM, and IBM PC Support/400. The figure below shows a descriptive view of the CID installation using host DASD.

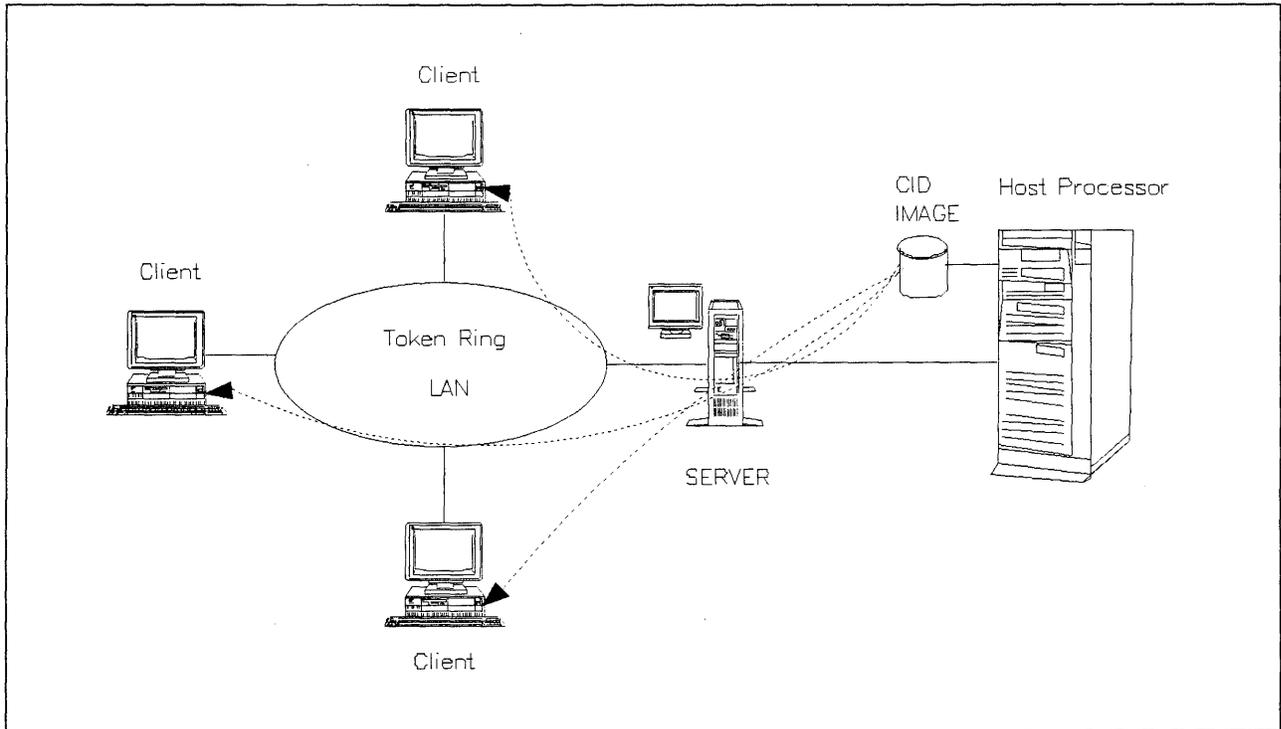


Figure 4. CID Installation Using Host DASD

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### 3.1 Workstation LAN File Services/VM

Workstation LAN File Services/VM (WLFS/VM) brings together computing environments that were previously separate entities.

Historically, Local Area Network (LAN) data and VM data have been stored as separate entities. LAN data has been saved on PC-based LAN servers or on users' local disk drives, while VM data resided on large capacity System/370\* or System/390\* DASD. Interaction between the two environments consisted of occasional uploads and downloads of files to and from the VM system, but even with this, separate copies of data were still maintained.

With WLFS/VM, many of the barriers between the VM host environment and the LAN are removed and the strengths of each environment complement those of the other. As a result, new function and capacity are added to each of these environments.

Workstation LAN File Services/VM:

- Uses VM DASD to provide file sharing services through LAN servers to workstation users.

- Allows file sharing across multiple LANs.
- Provides its services transparently.
- Allows sharing between OS/2 LAN server requesters and Network File System (NFS) clients.

Some of the fundamental ideas in setting up and administering a WLFS/VM system:

- In an OS/2 LAN environment, WLFS/VM acts as an extension of the OS/2 LAN server.
- WLFS/VM uses configuration files. Some of the files reside on the VM system and some reside on each OS/2 LAN Server system that acts as a front end processor for WLFS/VM. These files are read once each time WLFS/VM is started. Every time WLFS/VM is started it uses the current values in the configuration files.
- Temporary changes can be made via administrative commands to WLFS/VM while WLFS/VM is running. It is not always necessary to stop WLFS/VM to make important changes.
- Almost all of the administration of WLFS/VM is done from an administration virtual machine other than the server virtual machine.

WLFS/VM in a OS/2 environment has three parts:

1. An administration user ID on the VM system
2. A Server Message Block (SMB) protocol server on the VM system OS/2 LAN Server environments use the Microsoft Server Message Block (SMB) server protocols over lower-layer NetBIOS communications protocols.
3. A corresponding client in a PS/2\* OS/2 running LAN Server that acts as a "front end processor" to the VM system.

In an OS/2 environment, WLFS/VM can use two different connectivity methods:

1. CLAW (Common Link Access to Workstations)
2. VM PWSCS (Programmable Workstations Communications Services)

LAN topologies supported in the OS/2 environment include token-ring and Ethernet.

**Note**

On June 15, 1993, IBM announced LAN File Services /ESA (LFS/ESA) which is the successor product to WLFS/VM. LFS/ESA provides the above features with the addition of MVS as a host server platform option.

## 3.2 LAN Resource Extension and Services/VM

The LAN Resource Extension and Services/VM (LANRES), Program Number 5684-142, is an IBM product that provides services to NetWare clients by using virtual machine (VM) resources.

LANRES gives NetWare clients more disk storage space by making S/390\* and S/370\* direct access storage devices (DASD) accessible to the NetWare servers. It also puts VM system printers at the NetWare client's disposal.

LANRES/VM extends the NetWare environment to include the S/390 and S/370 host. Because it does this transparently, NetWare clients are unaware of the LAN-host interaction. They retain all the advantages of working in a LAN environment but receive use of VM large-capacity DASD and high-speed printers.

LANRES/VM also provides a data distribution service to help with change management. Authorized VM users can send data to, and retrieve data from, the NetWare server. They can list server files and directories, and create and delete server files.

Besides making VM resources available to NetWare servers and clients, LANRES/VM makes LAN printer resources available to VM users. For example, VM users can now send PostScript\*\* files to a PostScript printer on the LAN.

In addition to disk and print serving, LANRES/VM lets you move your LAN administration to VM, where tasks can be automated and where multiple LANS can be centrally administered from the host.

REXX programs provided with the product or written by users can be combined to perform new functions for LANRES/VM.

In summary, these are the services that LANRES/VM provides:

- Disk serving
- Data distribution
- Print serving
  - LAN-to-host printing
  - Host-to-LAN printing
- LAN administration

The intent of LANRES/VM is to retain the advantages of LANs for workstation responsiveness, availability, and inter-workstation communication, while bringing to the LAN such System/390 and System/370 resources as large capacity DASD, high speed printers, and wide area networking. LANRES/VM also makes LAN printer resources available to VM users.

In addition, LANRES/VM provides facilities for LAN administration and data distribution. With LANRES/VM, VM users can handle administration problems and changes, as well as manage NetWare server files and directories, from a central location. By requiring a NetWare server logon and password, LANRES/VM limits the range of these users' activities to those defined by their NetWare security privileges.

LANRES/VM services complement existing NetWare functions. Your installation can decide which LANRES/VM services to use; they can be used in any combination. NetWare servers and clients can still use local disks and printers. You can use the NetWare SYSCON utility for administration in conjunction with LANRES/VM administration functions.

One VM system can provide concurrent services for multiple NetWare servers. To do this you need to have multiple VM service machines: one or more for LAN-to-host printing, one or more for disk serving, and one for host-to-LAN printing for each NetWare server that is attached to VM. The VM system can also provide services to NetWare servers that are not directly connected to it if they are accessible to a NetWare server that is directly connected. Each VM user doing administration, data distribution, or host-to-LAN printing works with one server at a time and can switch easily from server to server.

The LANRES/VM data distribution, LAN administration, and host-to-LAN printing services are conversational monitor system (CMS) programs. They consist of line-oriented commands, so they can be used in REXX programs to automate procedures. They can also be used from any VM-supported terminal. And they can be used from terminals connected through the VM/Pass-Through Facility or the Virtual Telecommunications Access Method; this feature lets administrators control LANS connected to other VM systems in a wide area network.

The LANRES/VM disk serving and LAN-to-host printing functions are transparent to NetWare clients. Clients use the same commands as always, and if the disk or printer they specify happens to be a host resource, LANRES/VM provides the function needed to use that resource.

All LANRES/VM services are available to any supported NetWare clients. This includes full support for DOS, Microsoft Windows\*\*, OS/2, Macintosh \*\*, and UNIX\*\* clients. The figure below shows a descriptive view of the services provided by LANRES.

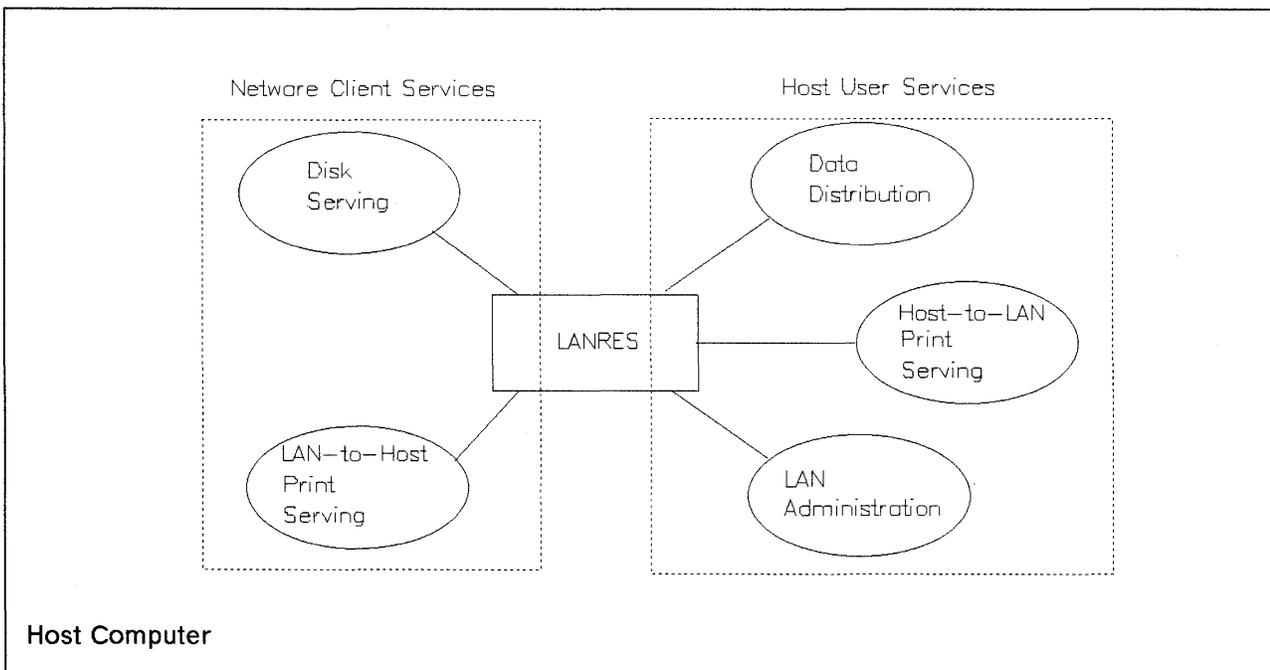


Figure 5. Services Provided by LANRES

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### 3.3 IBM PC Support/400

PC Support/400 is the premier client/server offering for the AS/400 system and the premier cooperative processing application enabler for the AS/400 system.

PC Support provides similar client/server functions (such as file serving and resource sharing) as do other client/server products (OS/2 LAN Server, Novell NetWare, etc). However, the AS/400 system and PC Support are best promoted as a "High Function Server" to customers who have requirements that cannot be satisfied by commodity PC servers. Some of the strengths of the AS/400 system as a High Function Server are its powerful, built-in database, comprehensive security, advanced networking LAN/WAN transparency, and strong management of local and remote computing environments. PC Support has been designed to bring this power of the AS/400 system to the desktop. Customers using this combination can:

- Take advantage of any of the thousands of available PC applications and centralize and share their data TRANSPARENTLY on an AS/400 system, and at the same time capitalize on the increased power and sophistication available in an OS/400 host environment.
- Select any of the thousands of available AS/400 applications that might be right for their business and use programmable as well as non-programmable workstations.

One of PC Support's many additional strengths is its PC Software Update capability. By combining the Systems Management capabilities of the OS/400 with the PC Support function, customers can update software on all the PCs in their network from one single location, transparently to end users.

The AS/400 system is positioned as a "Cooperative Applications Server". The PC Support enables the cooperative application development. The customers can now develop cooperative applications to the AS/400 system fully within a Windows 3.0 environment. These exciting new application enhancements should be conveyed to both AS/400 programmers as well as PC programmers as there are many new enablers being provided for both kinds of developers.

PC Support/400 provides a flexible set of cooperative processing functions for customers who need to take advantage of AS/400 data, programs, and resources from OS/2, Windows or DOS workstations. PC Support/400 integrates the strengths of the AS/400 environment with the power and ease-of-use of the programmable workstation by providing:

- A comprehensive set of Application Programming Interfaces
- Database access via SQL
- File Transfer
- File Serving
- Print Serving
- An integrated access to both AS/400 applications and PC applications

- Automatic update of programmable workstation software
- Centralized systems administration

### 3.3.1 Connectivity Alternatives

PC Support/400 provides the following connections for DOS and Windows based systems to the AS/400 system:

- IBM Token-Ring Network (direct and 5494 Remote Controller)
- Twinaxial (local, 5394 and 5494 Remote Controllers)
- Asynchronous (via direct attach through IBM or ROLM\*\* CBX and remote dialup)
- SDLC
- Ethernet (Native or 8209 Bridge).
- 3174 Establishment Controller APPN\*, Peer Communication LIC, and Configuration Support-C

Only twinaxial, token-ring, Ethernet, and SDLC connections are available for DBCS.

The IBM OS/2 Communications Manager provides the following APPC connections to the AS/400 system:

- IBM Token-Ring Network (direct and 5494 Remote Controller)
- Twinaxial (local, 5394 and 5494 Remote Controllers)
- X.25
- SDLC
- Ethernet (Native or 8209 Bridge)

## Chapter 4. Workstation LAN File Services

The purpose of this chapter is to describe the WLFS/VM product in the CID environment. We were interested in seeing how client workstations within a LAN could access the VM host DASD and execute the CID installation process from there.

### Note

On June 15, 1993, IBM announced LAN File Services /ESA (LFS/ESA) which is the successor product to WLFS/VM. LFS/ESA provides the above features with the addition of MVS as a host server platform option.

Our testing environment consisted of a 9370 VM Processor and a workstation Front End Processor running on OS/2 LAN Server Version 3.0/ Advanced with OS/2 Version 2.0. The connectivity option that we chose was the OS/2 Common Link Access to Workstations (CLAW) method. CLAW uses software that is shipped with WLFS. The OS/2 CLAW device driver provides a direct channel connection with the WLFS host server using the IBM PS/2 Micro Channel\* to Mainframe Connection (MMC) card. The figure below shows a descriptive view of WLFS with CLAW connection.

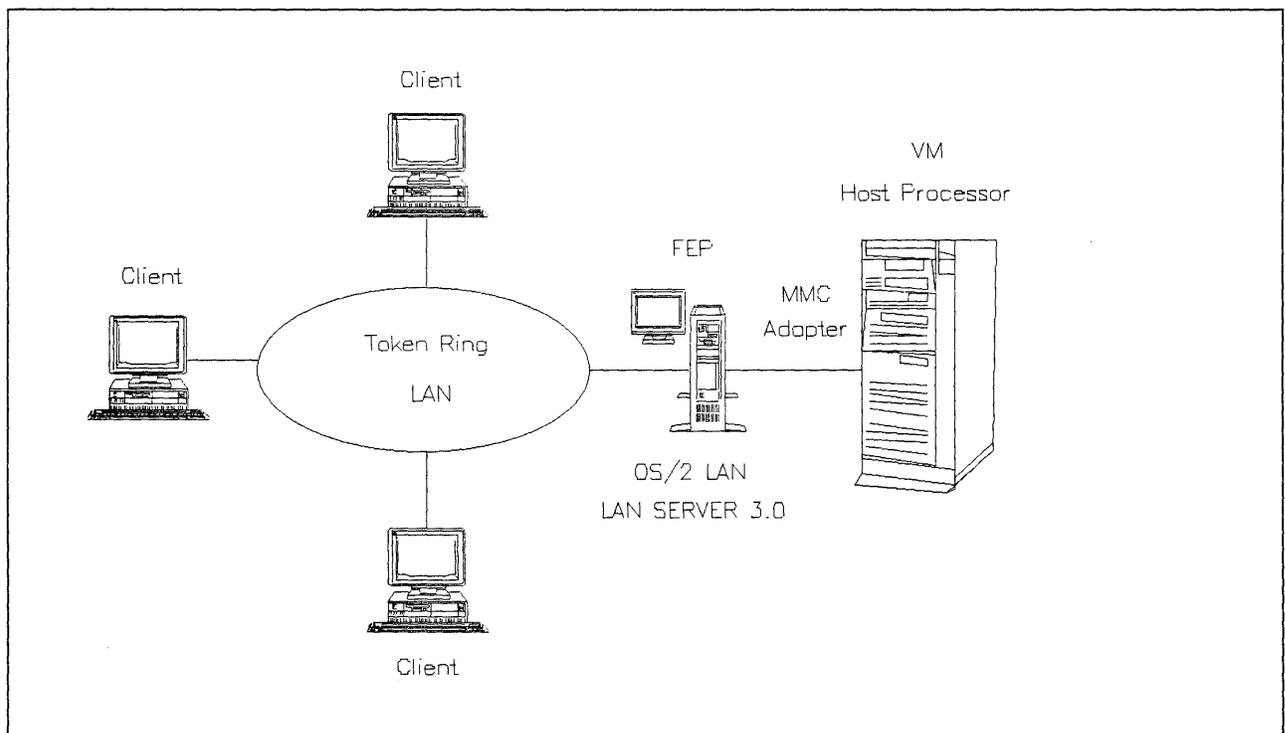


Figure 6. A Basic Scenario for WLFS with CLAW Connection

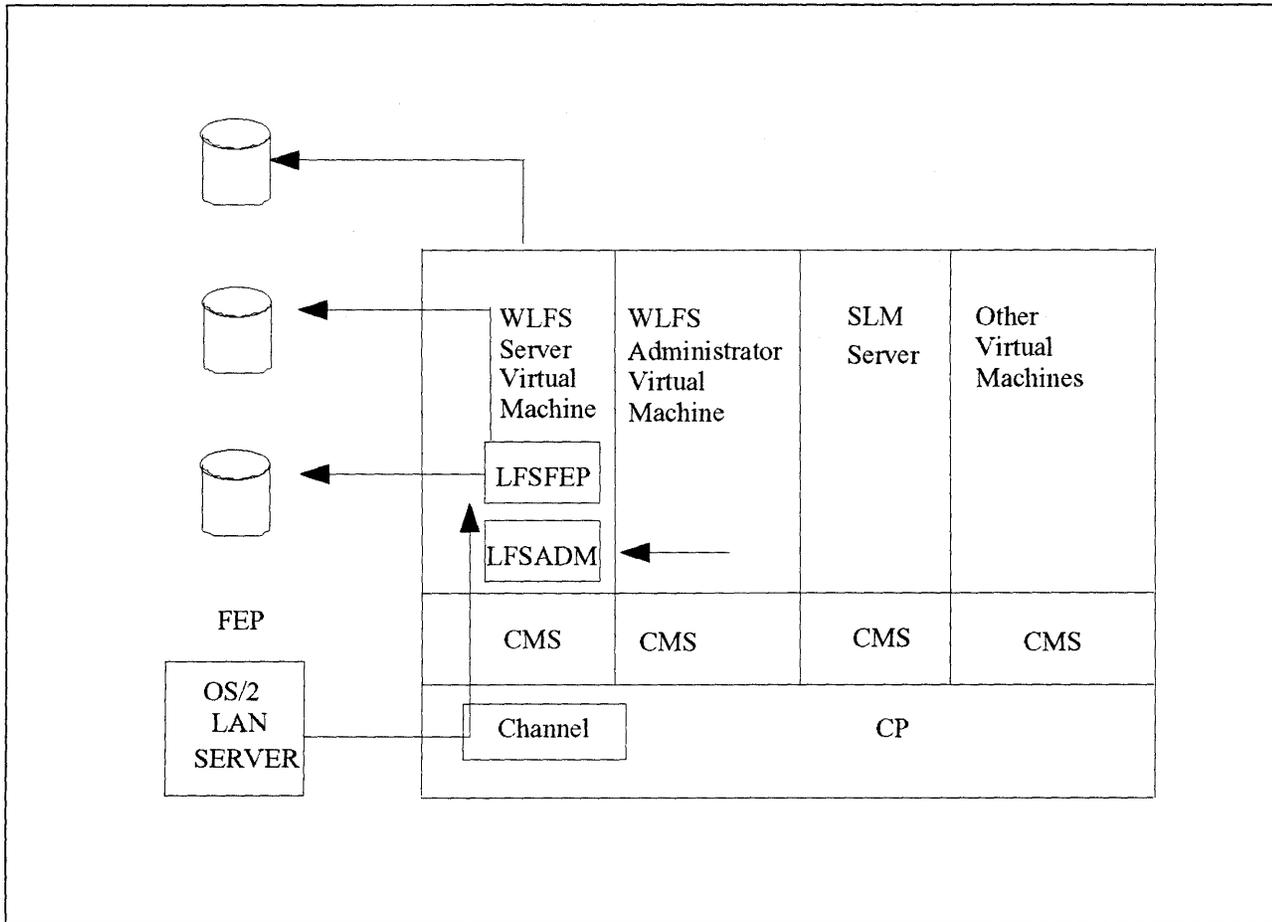


Figure 7. WLFS CLAW Connection

Figure 7 shows the relationship between FEP and WLFS in the VM system. The FEP acts as an intermediary between the user workstations and the WLFS server virtual machine. The FEP not only routes requests to and from VM, but it also maintains a cache of recently accessed WLFS data to provide fast response to user requests.

## 4.1 Documentation

The following publications are available.

### WLFS Publications

- Program Directory - Workstation LAN File Services
- *Workstation LAN File Services General Information*, GH24-5246
- *Workstation LAN File Services Guide and Reference*, SH24-5247
- *Workstation LAN File Services Licensed Program Specification*, GH24-5246

### Software Licence Monitor (SLM) Publications

- Program Directory for Software License Monitor
- *IBM Software License Monitor/MVS and VM Guide and Reference*, SH24-5258

### VM Publications

- *VM/SP Planning Guide and Reference*, SC19-6201
- *VM/ESA CP Planning and Administration for S/370*, SC24-5430
- *VM/ESA: Planning and Administration*, SC24-5521

LAN Server 3.0

- *IBM LAN Server V3.0 Network Administrator Reference Volume 1: Planning and Installation Guide*, S96F-8428

## 4.2 Hardware and Software Requirements

This table describes the hardware and software used with WLFS/VM for our test. For more information please review the preceding documentation section.

<i>Table 1. Hardware and Software for the VM Processor</i>	
<b>Hardware/Software</b>	<b>Comments</b>
<b>VM Processor</b>	VM processors supported by WLFS are any System/370 or System/390. For our tests we actually used: <ul style="list-style-type: none"> <li>• 937x (Model 12 and higher)</li> </ul>
<b>VM Operating System Software used for our test</b>	1. For CLAW connections, WLFS requires the following: <ul style="list-style-type: none"> <li>• VM/SP Release 6</li> </ul> Additional requirements for our test were: <ul style="list-style-type: none"> <li>• The IBM C/370 Library Version 2, program number 5688-188</li> <li>• The IBM Software License Monitor Release 1, program number 5648-038</li> </ul>

**Note**

The following APARS must be installed for Software License Monitor (SLM):

- APAR VM54782 for VM/SP
- APAR VM54780 for VM/ESA

A front end processor is a LAN server workstation running WLFS, through which LAN workstation users can access files stored on a VM system. Please note that the WLFS/VM front end processor programs are memory intensive. Performance may vary depending on the number of other applications on the front end processor. For more information regarding the front end processors please review the documentation section. The table below lists the hardware and software requirements needed for the front end processor.

<i>Table 2. Hardware and Software for the Front End Processor</i>	
<b>Hardware/Software</b>	<b>Comments</b>
<b>Front End Processor (FEP)</b>	<p>The workstation acting as a front end processor (FEP) to WLFS for our test consisted of the following:</p> <ul style="list-style-type: none"> <li>• Model 95 PS/2</li> <li>• 16 MB of main memory</li> <li>• 386 HPFS support</li> <li>• Channel connections via either of the following adapters are supported: (must have reference diskette V 1.31). <ul style="list-style-type: none"> <li>– MMC (OS/2 or NetWare)</li> <li>– S/370 Channel Emulator Adapter/A to 3088 (OS/2 only)</li> </ul> </li> </ul>
<b>OS/2 LAN Server</b>	<p>WLFS requires a front end processor consisting of a workstation running the following for our test:</p> <ul style="list-style-type: none"> <li>• OS/2 LAN Server Version 3.0/Advanced with OS/2 Version 2.0 with the following features installed: <ul style="list-style-type: none"> <li>– REXX support for OS/2</li> <li>– 386 HPFS support</li> </ul> </li> </ul>

**Note**

The channel adapter requires the **most current** version of the reference diskette for the PS/2 workstation.

**note**

You **NEED** to install 386HPFS feature of LAN Server 3.0 Advanced. The WLFS workstation feature utilizes only the 386HPFS device driver. That means the LAN Server 3.0 hard disk's partitions are not necessarily formatted with HPFS file system.

The table below describes the hardware and software requirements used for the Connectivity Equipment during our test. We used the CLAW connection between the VM system and our front end processor. Each front end processor can communicate with only one VM system at a time.

<i>Table 3. Hardware and Software for the Connectivity Equipment</i>	
<b>Hardware/Software</b>	<b>Comments</b>
<b>Connectivity Equipment</b>	<p>Connections between the VM processor and the front end processor for our test purposes were made by:</p> <ul style="list-style-type: none"> <li>• A standard channel interface using an IBM PS/2 Micro Channel to Mainframe Connection (MMC) card (Part No. 95F1436). The MMC card was used with the CLAW device driver.</li> </ul>

This table describes the hardware and software requirements of the client workstation. A client is a functional unit that receives shared services from a server. For more information regarding client workstations please review the documentation section.

Hardware/Software	Comments
<b>LAN Media/Workstations</b>	The token-ring LAN was used for client workstations during our test. The workstations had to be capable of running LAN requester programs.

### 4.3 Installing the WLFS/VM Host Software

Depending on the host software you are currently running, the host part of WLFS/VM can be installed in two different ways.

- CMS disk installation - our choice for test purposes
- Discontinuous Shared Segments (DCSS).

Please refer to the Program Directory for Workstation LAN File Services/ VM for more details.

You must also define a minidisk where the CID environments will be placed. The **minimum recommended size is 100MB**. You may want to increase this size.

After the installation you should have the following minidisks defined as shown in the table below:

Minidisk Address	Minidisk Usage
<b>2B2</b>	Base system code disk
<b>2C2</b>	Sample/local disk
<b>36F</b>	Production build disk
<b>29D</b>	Help files
<b>2DF</b>	Softcopy publications
<b>2D2</b>	Delta service disk
<b>37F</b>	Test build disk
<b>2A6</b>	Alternate apply disk
<b>2A2</b>	Production apply disk
<b>201,202</b>	HOST PWS disk
<b>203</b>	HOST PWS disk (used for CID images)

You have to define the host channel that will be used for the WLFS CLAW connection.

Make the necessary changes to your system so it reflects the highlighted entries in the DMKRIO ASSEMBLE file shown in the figure below. We used channel 6.

```

RIO      TITLE '9370 FOR RESIDENCY VM-05/2'
DMKRIO  CSECT
        PRINT NOGEN
        COPY  OPTIONS
        COPY  LOCAL

*=====*
*                C H A N N E L   Z E R O                *
*=====*
        RDEVICE ADDRESS=(000,32),DEVTYPE=3279,MODEL=3
        EJECT
                .
                .
                .
*=====*
*                C H A N N E L   S I X                    *
*=====*
        RDEVICE ADDRESS=(600,32),DEVTYPE=3279,MODEL=3
TAP3430 RDEVICE ADDRESS=(680,08),DEVTYPE=3430,FEATURE=DUALDENS
CTC3088 RDEVICE ADDRESS=(6C0,32),DEVTYPE=3088
        EJECT
                .
                .
                .
*=====*
*                C O N T R O L   U N I T S                *
*=====*
RCTLU0  RCTLUNIT ADDRESS=000,CUTYPE=3274,FEATURE=32-DEVICE
                .
                .
                .
RCTLU6  RCTLUNIT ADDRESS=680,CUTYPE=3430
RCTLUC RCTLUNIT ADDRESS=6C0,CUTYPE=3088,FEATURE=32-DEVICE
RCTLUB  RCTLUNIT ADDRESS=B40,CUTYPE=ICA,FEATURE=16-DEVICE
RCTLUC  RCTLUNIT ADDRESS=C00,CUTYPE=3880,FEATURE=16-DEVICE
RCTLUD  RCTLUNIT ADDRESS=D00,CUTYPE=3880,FEATURE=16-DEVICE
        EJECT
*=====*
*                C H A N N E L S                          *
*=====*
        RCHANNEL ADDRESS=0,CHTYPE=BLKMPXR
                .
                .
                .
RCHANNEL ADDRESS=6,CHTYPE=BLKMPXR
        RCHANNEL ADDRESS=7,CHTYPE=BLKMPXR
                .
                .
                .
        EJECT
*=====*
*                C O N S O L E   D E F I N I T I O N      *
*=====*
        SPACE
        RIOGEN  CONS=200,ALTCONS=(000)
        END

```

Figure 8. DMKRIO ASSEMBLE File

After the necessary changes are done to the DMKRIO ASSEMBLE file following commands have to be executed in order to build new CP nucleus:

- VMFSETUP
- VMFASM
- VMFBLD

For more information read the *VM/SP Installation Guide*.

The following virtual machines have to be defined to VM directory:

- WLFS server (WLFSSERV)
- WLFS administrator
- Software Licence Monitor (SLM) server

The Figure 9 displays the directory entry for WLFSSERV.

```
USER WLFSSERV VM6 16M 16M G
ACCOUNT 101 P684120A
IUCV ANY
IUCV ALLOW
IUCV *IDENT RESANY GLOBAL
OPTION ACCT DIAG98 ECMODE BMX MAXCONN 1024
IPL CMS
CONSOLE 009 3215
SPOOL 00C 2540 READER *
SPOOL 00D 2540 PUNCH A
SPOOL 00E 1403 A
MDISK 191 FB-512 451800 6600 MSRESV MR READ
***** WLFS WORKSTATION REPOSITORY *****
MDISK 201 FB-512 398800 26500 MSRESV MW
MDISK 202 FB-512 425300 26500 MSRESV MW
MDISK 203 FB-512 284568 350000 VMSRES MW
***** END OF WORKSTATION REPOSITORY *****
LINK P684120A 36F 36F RR
LINK P684120A 2C2 2C2 RR
LINK P684120A 29D 29D RR
LINK MAINT 190 190 RR
LINK MAINT 19D 19D RR
LINK MAINT 19E 19E RR
*** THE FOLLOWING LINK STATEMENT LINKS THE C/370 RUNTIME LIBRARY DISK
LINK MAINT 41F 120 RR
*** THE FOLLOWING DEDICATE STATEMENTS SHOW HOW TO DEFINE CLAW DEVICES
DEDICATE 6C4 6C4
DEDICATE 6C5 6C5
```

Figure 9. WLFSSERV VM Directory Definition

The size of the virtual machine depends on the type of installation. In our case, for test purposes, we selected the CMS disk installation. The successful execution of the WLFS server depends drastically on the size of the virtual machine. For production environment is the Discontinuous Shared Segments (DCSS) installation recommended. For more information see the Program Directory for WLFS.

## Step 1

At the VM system, you must do the following: **logon WLFSSERV**

## Step 2

Access the sample disk

```
acc 2c2 d
D (2C2) R/0
Ready; T=0.03/0.06 14:33:00
```

## Step 3

Copy the sample configuration files from the sample disk

```
copy wlfso1s config d w1fs = a
Ready; T=0.03/0.06 14:33:38
copy profile w1fs d = w1fs a
Ready; T=0.02/0.03 14:34:04
```

```
copy profile execsamp d = exec a
Ready; T=0.02/0.03 14:34:50
```

## Step 4

Access the production disk

```
acc 36f e
E (36F) R/0
Ready; T=0.02/0.03 14:37:34
```

## Step 5

Copy the access control file

```
copy w1fs accsct1 e w1fs = a
Ready; T=0.01/0.02 14:38:39
```

### Note 1

The access control file can **ONLY** be changed by using the administration command **LFSCMD OLSACCS**.

## Step 6

Format your repository minidisks. These minidisks will contain your CID environment.

```
format 203 z (BLKSIZE 4k
DMSFOR603R FORMAT will erase all files on disk Z(005). Do you wish to continue?
Enter 1 (YES) or 0 (NO).
1
DMSFOR605R Enter disk label:
cid203
Formatting disk Z
xxx FB-512 blocks formatted on Z(005)
Ready; T=0.04/0.10 14:41:56
```

The minidisks which will be used for data must be formatted once.

**Note**

The minidisk should be formatted in 4KB blocks for better performance.

**Step 7**

Edit the WLFS CONFIG file so that it reflects the highlighted changes as shown in the figure below:

```

*****
*
*      WLF5 General Configuration for OLS only environment      *
*
*****
* National Language is American English
*****
* Link for CLAW
*****
*      ccu  Front End Processor name
*          |      |
*          v      v
LINK 06C4 LFSUSER CLAW
*
LANG      AMENG
*
* Use VMDUMP format
*
DUMP      VMDUMP
*
* Enable OS/2 LAN Server feature, along with its global resource
* identifier.
*
OLS        ON
OLSID     LFSFEP
*
* Specify the global resource identifier of this server's
* administrative feature.
*
ADMINID   LFSUSER
*
* Support a maximum of 128 concurrent end users
*
MAXUSERS  128
*
* The following disks will be written in PWS format
*
* disk format  Owner of the minidisk
*          |      |
*          v      v
LFSDISK PWS WLFSSERV 201 MW
LFSDISK PWS WLFSSERV 202 MW
LFSDISK PWS WLFSSERV 203 MW *
*
* The following disks will be written in CMS format
*
* REMOVE THE WLF5 191 DEFINITION AFTER INSTALLATION IS VERIFIED!
*LFSDISK CMS WLFSSERV 191 RR

```

Figure 10. WLF5 CONFIG File

**Note**

The PWS disk format in the WLFS CONFIG file means that the subdirectory structure and extended attributes are supported. This format is not accessible via CMS command on the host.

On the other side the CMS disk format means that neither the subdirectory structure or extended attributes are supported. This file behaves as a regular CMS file.

**LFSFEP** is the front end processor name.

The LINK statement must be updated for use with CLAW.

**Step 8**

The OS2LFS CONFIG file has to be customized so that it includes the the disk definitions for access by FEPs.

Edit the file OS2LFS CONFIG so that it reflects the highlighted changes as shown in the figure below:

```

/*****/
/*
/*          OS/2 LAN Serving Configuration Information          */
/*
/*
/*****/
ACCOUNT OFF
BUFFSZ 4096
FEP ALLOWANY
FEP GLOBAL
  SHARE TRY201 WLFSSERV:0201 REMARK PWS Minidisk
  SHARE TRY202 WLFSSERV:0202 REMARK PWS Minidisk
FEP LFSUSER
  SHARE CID WLFSSERV:0203 REMARK PWS Minidisk for CID
/*****/
/*
/* REMOVE THE TRYWLFS DEFINITION AFTER INSTALLATION IS VERIFIED! */
/*
/*****/
  SHARE TRYWLFS WLFSSERV:0191 REMARK Minidisk to Verify Installation

```

Figure 11. OS2LFS CONFIG File

**Step 9**

The file PROFILE WLFS has to be customized so that it includes the FILEDEFS that are needed for accessing the Software Licence Monitor (SLM) control files. For more information about the SLM customization see 4.3.1, "Customization of the Software License Monitor/VM" on page 30.

Edit the file PROFILE WLFS so that it reflects the highlighted changes as shown in the figure below:

```

*****
*                               Sample PROFILE WLFS file                               *
*****
* Ensure that all WLFS-owned repository minidisks (both PWS
* and CMS format) are detached as WLFS begins executing.
*
CP DETACH 201
CP DETACH 202
CP DETACH 203
CMS FILEDEF BFLFCNF DISK BFLFCNF FILE *
CMS FILEDEF BFLFXREP DISK BFLFXREP GEN *
CMS FILEDEF BFLFPMSG DISK BFLFPMSG LOG A1
START LFSUSER
* TRACE SYS PRT ON                               * These statements can be used
* TRACE OLSU                                     * for debug.

```

Figure 12. PROFILE WLFS File

### Step 10

Edit the file PROFILE EXEC so that it links to the SLM disk. If you are running a S/370 mode virtual machine you must change "RUNWLFS" to "RUNWLFS WLFS370" as shown in the figure below:

```

/*****/
/*                               */
/*       Sample PROFILE EXEC for a WLFS virtual machine       */
/*                               */
/*****/
'CP SET EMSG ON'                /* Make sure EMSG is on      */
'ACCESS 36F D'                  /* Access WLFS system disk   */
'ACCESS 120 E'                 /* Access C/370 disk         */

'CP LINK P648038 36F 5FF RR'    /* Access SLM disk          */
'ACC 5FF I'

'EXEC RUNWLFS WLFS370'         /* Start WLFS for 370 mode   */

/* 'EXEC RUNWLFS ' */          /* Start WLFS                */

'CP SET PF12 RETRIEVE'
exit

```

Figure 13. PROFILE EXEC File

### 4.3.1 Customization of the Software License Monitor/VM

Use the program directory to set up the Software License Monitor for use with Workstation LAN File Services.

WLFS/VM must use Software License Monitor/VM to monitor the licenses of its OS/2 front end processors (FEPS). The following sections will cover

customization steps of Software License Monitor for WLFS/VM and the Software License Monitor commands that must be issued to enable the Software License Monitor functions. These customization instructions assume that Software License Monitor is installed and running. From the Software License Monitor administrator, follow the steps below to define WLFS/VM to Software License Monitor:

Step 1 Log on to the Software License Monitor administrator:

**logon slm\_admin**

Step 2 Check that the slm\_admin is a valid administrator:

**slmadmin query admin**

Step 3 Enroll the WLFS/VM product:

**slmadmin add product lfs class server notify n limit x**

n is the notification threshold.

x is the paid licenses for OS/2 front end processors for WLFS/VM.

Step 4 Enroll the names of all the WLFS/VM licensed FEPs (clients):

**slmadmin add client fepname product lfs class server**

Where fepname is the name of the front end processor that is being registered as a licensed client. The fepname should be defined on the FEP record of the OS2LFS CONFIG file.

Clients are defined as the OS/2 front end processors (FEPS).

**Step 5** WLFS/VM server machine must have authority to communicate with the SLM server:

**slmadmin add authority WLFS servername product lfs**

Now you are ready to install the front end processor (FEP).

---

## 4.4 Installing the WLFS PS/2 Software

Prior the WLFS workstation feature installation following products has to be installed on the PWS front end processor (FEP) workstation:

- MMC adapter
- OS/2 V2.0 and LAN Server 3.0 Advanced with 386HPFS feature.

#### 4.4.1 Installing the MMC Adapter

Install the IBM Personal System/2 MicroChannel to Mainframe Connection Adapter.

See the IBM Personal System/2 MicroChannel to Mainframe Installation Instruction, G571-0244, for more information.

**Note**

Your IBM service representative must attach the MMC card to the host channel. The host processor must be stopped or isolated by a channel switch before connecting the MMC card to the channel I/O interface.

#### 4.4.2 Installing the LAN Server 3.0 Advanced

Follow the documentation for the LAN Server 3.0 installation. The 386HPFS feature has to be installed. The front end processor uses the 386HPFS device driver. The file system on the LAN Server 3.0 hard disk's partition is not necessarily formatted to HPFS.

#### 4.4.3 Installing the Front End Processor

The following is a detailed list of all the panels shown when installing WLFS on your front end processor (FEP). We installed the CLAW feature of WLFS. The following information is needed and should be furnished by your HOST installation team.

- Channel and subchannel address on your VM system
- Channel speed of your Host System
- Name of the WLFS/VM host resource which is connected to the front end processor.

You also need the following information:

- Slot number of the MMC adapter installed on your PS/2.
- Front end processor name.

Install the front end processor software using the command below.

```
[C:\]a:bfsinst
```

The screen below informs you of the product and release you are installing. Press any key when you are ready to continue.

Workstation LAN File Services/VM Release 1.1 FEP Installation

Licensed Materials - Property of IBM

5684-120 (C) Copyright IBM Corporation 1992, 1993. All rights reserved.  
U.S. Government Users Restricted Rights - Use, duplication or disclosure  
restricted by GSA ADP Schedule Contract with IBM Corporation.

Press any key when ready . . .

*Figure 14. Licensed Material Panel for WLFS*

Select 1 for first time installation as shown in the figure below. This panel gives you many options which may be used at a later date.

Workstation LAN File Services/VM Release 1.1 FEP Installation

Welcome to Workstation LAN File Services/VM Release 1.1 (WLFS/VM 1.1)!  
This procedure will install the WLFS/VM 1.1 Front End Processor (FEP)  
drivers. Please choose an option:

Enter:

- |             |  |
|-------------|--|
| 1 - INSTALL | Install WLFS/VM 1.1 FEP Drivers for the first time |
| 2 - REINST  | Update WLFS/VM 1.1 FEP Drivers                     |
| 3 - DEINST  | Remove WLFS/VM 1.1 FEP Drivers                     |
| 4 - MIGRATE | Migrate WLFS/VM 1.0 FEP Drivers to Release 1.1     |
| 5 - STATUS  | Show status of WLFS/VM 1.1 FEP Drivers             |
| 6 - HELP    | Show help on this procedure                        |
| 7 - EXIT    | Exit this procedure                                |

1

*Figure 15. Main Installation Panel*

Presently, two versions of OS/2, 1.3 and 2.0, are supported. We tested OS/2 2.0, as shown in the figure below.

```
Workstation LAN File Services/VM Release 1.1 FEP Installation

The Workstation LAN File Services/VM Release 1.1 FEP Drivers can be installed
on either an OS/2 2.0 system running OS/2 LAN Server 3.0 Advanced, or on an
OS/2 1.3 system running OS/2 LAN Server 2.0 Advanced.

This system is currently running OS/2 version 2.00. Please enter the OS/2
version that WLFS/VM should be installed for:

Enter:

    1 - OS/2 Version 2.0
    2 - OS/2 Version 1.3
    3 - Exit Installation Procedure

1
```

Figure 16. OS/2 Version Selection Panel

Enter the drive and path which you intend to use for your environment, as shown in the figure below.

```
Workstation LAN File Services/VM Release 1.1 FEP Installation

The Workstation LAN File Services/VM Release 1.1 FEP Drivers can be installed
in any valid path on this system. Please enter the path to install these
drivers on, using the format: drive\path, for example C:\BFS.

C:\BFS
```

Figure 17. Drive and Path of BFS Installation Panel

The figure below describes the option which is used to create the path and directory if you have not already done this. Select **1**.

```
Workstation LAN File Services/VM Release 1.1 FEP Installation

C:\BFS does not currently exist.

Would you like this path to be created?

Enter:

    1 - Yes, create the path C:\BFS
    2 - No, exit installation.

1
```

Figure 18. Create Path Option Panel

We selected the CLAW method of connection to the host server, as shown in the figure below. We did not test the PWSCS option.

```

Workstation LAN File Services/VM Release 1.1 FEP Installation

Please specify which connection mechanism the WLFS/VM FEP will use to
communicate with the WLFS/VM host server.

Enter:

    1 - VM PWSCS    Use VM Programmable Workstation Communication Services
    2 - CLAW        Use MMC adapter and CLAW protocol drivers
    3 - EXIT        Exit installation driver

2

```

*Figure 19. WLFS Connection Type Panel*

Enter the slot number in which you inserted the MMC card on your system, as shown in the figure below.

```

Workstation LAN File Services/VM Release 1.1 FEP Installation

A new installation for a CLAW (direct channel connect) connection
has been chosen. This installation driver assumes that a MicroChannel
to Mainframe Connection (MMC) adapter has already been installed, and
the slot number that it is installed in is known.

This installation driver assumes that there will only be one MMC adapter
installed on this system.

Please enter the slot number that the MMC card is (or will be) installed
in: (for example, 2)

3

```

*Figure 20. Mainframe Connection Adapter Panel*

Enter the subchannel number from the VM host system, as shown in the figure below.

```

Workstation LAN File Services/VM Release 1.1 FEP Installation

The CLAW communications driver utilizes a host subchannel pair to
communicate between the WLFS/VM FEP and host server.

Please enter the EVEN address of the subchannel pair that the MMC adapter
will use for communications with the WLFS/VM host server virtual machine.

This address must be a 2-character value. The CLAW communications
driver will use this subchannel address and the next consecutive odd
address. For example, if C4 is specified as the EVEN address, then
subchannels C4 and C5 will be used for communications.

Please enter the EVEN address (hit ENTER for default value C4):

C4

```

*Figure 21. Sub-channel Address Panel*

Enter the channel speed of your system. We used 3.0 Mbps, as shown in the figure below.

```

Workstation LAN File Services/VM Release 1.1 FEP Installation

Please enter the channel speed corresponding to the mainframe channel that
will be used for communications.

Enter:

1 - 1.9 Mb/sec.
2 - 3.0 Mb/sec.
3 - 3.4 Mb/sec.
4 - 4.5 Mb/sec.

2
Installing WLFS/VM Release 1.1 Drivers and Related Files...

```

Figure 22. Channel Speed Selection Panel

This figure shows the machine name of the front end processor. You should use the default name, LSFUSER, as shown in the figure below.

```

Workstation LAN File Services/VM Release 1.1 FEP Installation

Please enter the FEP name of this Front End Processor. This name will be
used to identify this machine with the WLFS/VM host server virtual machine,
and must correspond to the name given in a FEP record in OS2LFS CONFIG on
the WLFS/VM host server virtual machine.

This string can be 1 to 8 characters, which will be uppercased. Legal
characters include 0-9, A-Z, #, $ and @.

Please enter the FEP name (hit ENTER for default string LFSUSER):

LFSUSER

```

Figure 23. Front End Processor Naming Panel for Host Connection

Press Enter to use the default host resource name, which is LFSFEP as shown in the figure below.

```

Workstation LAN File Services/VM Release 1.1 FEP Installation

Please enter the WLFS/VM host resource that this Front End Processor will
connect to. This value must correspond to an OLSID value given in WLFS
CONFIG on the WLFS/VM host server virtual machine.

This string can be 1 to 8 characters, and characters must be in accordance
with SNA standards.

Please enter the host resource name (hit ENTER for default value LFSFEP):

LFSFEP

Please Insert WLFS/VM FEP Installation Disk 2 into Drive A:
Press any key when ready . . .

Installing CLAW Device Driver and Related Files...

```

Figure 24. OLSID Definition Panel of Host Resource

Insert Disk 1 as you are told to do, as shown in the figure below.

```
Workstation LAN File Services/VM Release 1.1 FEP Installation

Please Insert WLFS/VM FEP Installation Disk 1 into Drive A:
Press any key when ready . . .
```

*Figure 25. First Disk Installation Panel*

Enter drive/path for LAN Server, as shown in the figure below.

```
Workstation LAN File Services/VM Release 1.1 FEP Installation

This installation procedure updates the OS/2 LAN Server configuration file
IBMLAN.INI to load a Workstation LAN File Services/VM Release 1.1 network
service. Please enter the path that this file is located, using the format:
drive\path, for example C:\IBMLAN. This path is the OS/2 LAN Server home
directory.

C:\IBMLAN
```

*Figure 26. IBMLAN.INI Drive/Path*

Enter the drive letter of where you are going to update your CONFIG.SYS file, as shown in the figure below.

```
Workstation LAN File Services/VM Release 1.1 FEP Installation

This installation procedure also updates CONFIG.SYS to load the Workstation
LAN File Services/VM Release 1.1 Drivers. Please enter the path that this
file is located by specifying the correct drive, for example C:

C:
```

*Figure 27. CONFIG.SYS Drive*

Enter the amount of cache you wish to use. It should be between 256KB and 4096KB, as shown in the figure below.

Workstation LAN File Services/VM Release 1.1 FEP Installation

The Workstation LAN File Services/VM Release 1.1 Front End Processor Drivers utilize memory cacheing to improve performance. Please specify the size of cache that you would like to allocate for use by the FEP for this cacheing (e.g. 256 = 256KB). Note that specifying larger cache sizes will lead to less memory being available for other applications on the FEP system. The minimum (and default) size is 256KB, and the maximum this install program will allow is 4096KB.

Please enter the cache size to be used by the FEP (e.g. 256):

256

Installation Complete

Press any key when ready . . .

Figure 28. Cache Screen Selection Panel of Installation Routine

**NOTE**

Read panel instructions carefully. This could affect the performance of your machine.

Installation is now complete.

Enter 5 to check the status of FEP drivers, as shown in the figure below. The screens that follow verify if the drivers are properly installed.

Workstation LAN File Services/VM Release 1.1 FEP Installation

Welcome to Workstation LAN File Services/VM Release 1.1 (WLFS/VM 1.1)!  
This procedure will install the WLFS/VM 1.1 Front End Processor (FEP) drivers. Please choose an option:

Enter:

- |             |  |
|-------------|--|
| 1 - INSTALL | Install WLFS/VM 1.1 FEP Drivers for the first time |
| 2 - REINST  | Update WLFS/VM 1.1 FEP Drivers                     |
| 3 - DEINST  | Remove WLFS/VM 1.1 FEP Drivers                     |
| 4 - MIGRATE | Migrate WLFS/VM 1.0 FEP Drivers to Release 1.1     |
| 5 - STATUS  | Show status of WLFS/VM 1.1 FEP Drivers             |
| 6 - HELP    | Show help on this procedure                        |
| 7 - EXIT    | Exit this procedure                                |

5

Figure 29. Selection Panel for Installing or Checking WLFS/VM

This screen shows the status of the FEP drivers currently installed.

```
Workstation LAN File Services/VM Release 1.1 FEP Installation

*** CURRENT INSTALLATION STATUS:

The WLFS/VM FEP Drivers Are Currently Installed.

Press any key when ready . . .
```

Figure 30. FEP Drivers Status Screen

This screen shows the status of the CLAW driver currently installed.

```
Workstation LAN File Services/VM Release 1.1 FEP Installation

*** CURRENT INSTALLATION STATUS:

The WLFS/VM FEP CLAW Communication Drivers Are Currently Installed.

Press any key when ready . . .
```

Figure 31. CLAW Communications Driver Status Screen

Your installation is complete at this time. You may select 7 and exit.

```
Workstation LAN File Services/VM Release 1.1 FEP Installation

Welcome to Workstation LAN File Services/VM Release 1.1 (WLFS/VM 1.1)!
This procedure will install the WLFS/VM 1.1 Front End Processor (FEP)
drivers. Please choose an option:

Enter:

    1 - INSTALL      Install WLFS/VM 1.1 FEP Drivers for the first time
    2 - REINST      Update WLFS/VM 1.1 FEP Drivers
    3 - DEINST      Remove WLFS/VM 1.1 FEP Drivers
    4 - MIGRATE     Migrate WLFS/VM 1.0 FEP Drivers to Release 1.1
    5 - STATUS      Show status of WLFS/VM 1.1 FEP Drivers
    6 - HELP        Show help on this procedure
    7 - EXIT        Exit this procedure

7
```

Figure 32. Final Installation Screen

### 4.4.4 Changes and Updates to the Vital Files

The WLFS FEP installation process created or updated following PS/2 OS/2 system vital files:

- The FEP configuration file BFS.INI was created
- The CONFIG.SYS was updated with FEP statements
- The IBMLAN.INI file was updated with FEP statements
- The LAN Server PROTOCOL.INI file.



## MAXSHARES

The value of this parameter may have to be increased, if the number of additional WLFS host disk resources added to the existing OS/2 LAN Server resources results in a number greater than the MAXSHARES number.

```
[networks]

net1 = NETBEUI$,0,LM10,32,50,14
; This information is read by the redirector at device initialization time.

[requester]

COMPUTERNAME = srvname
DOMAIN = ITSCWLFS
; The following parameters generally do not need to be
; changed by the user.
charcount = 16
chartime = 250
charwait = 3600
keepconn = 600
keepsearch = 600
maxcmds = 32          < === Change from 16 > 32
maxerrorlog = 100
maxthreads = 10
maxwrkcache = 64
numalerts = 12
numcharbuf = 10
numservices = 16
numworkbuf = 30       < === Change from 15 > 30
numdgrambuf = 14
othdomains =
printbuftime = 90
sesstimeout = 600    < === Change to 600
sizcharbuf = 512
sizerror = 1024
sizworkbuf = 4096
; The next lines help you to locate bits in the wrkheuristics entry.
;
;           1           2           3
;           0123456789012345678901234567890123
wrkheuristics = 1111111121311111110001011120111221
WRKSERVICES = LSCLIENT,MESSSENGER,NETPOPOP
wrknets = NET1

[messenger]

logfile = messages.log
sizmessbuf = 4096

[lsclient]

multilogon = no
timesync = yes
logonverification = domain
logonwarningmsgs = all
```

Figure 35 (Part 1 of 3). IBMLAN.INI File for LAN Server

[netlogon]

```
SCRIPTS = D:\IBMLAN\REPL\IMPORT\SCRIPTS
pulse = 60
update = yes
```

[replicator]

```
replicate = IMPORT
IMPORTPATH = D:\IBMLAN\REPL\IMPORT
tryuser = yes
password =
interval = 5
guardtime = 2
pulse = 3
random = 60
```

[dcdbrpl]

```
tryuser = yes
password =
interval = 5
guardtime = 2
pulse = 3
random = 60
```

[server]

```
alertnames =
auditing = no
autodisconnect = 120
maxusers = 32
; The following parameters generally do not need to be
; changed by the user. NOTE: srvnets= is represented in
; the server info struct as a 16-bit lan mask. Srvnet names
; are converted to indexes within networks" for the named nets.
guestacct = guest
accessalert = 5
alertsched = 5
diskalert = 5000
erroralert = 5
logonalert = 5
maxauditlog = 100
maxchdevjob = 6
maxchdevq = 2
maxchdevs = 2
maxconnections = 128
maxlocks = 64
maxopens = 250
maxsearches = 50
maxsessopens = 80
maxsessreqs = 50
maxsessvcs = 1
maxshares = 32
netioalert = 5
numbigbuf = 12
numfiletasks = 1
numreqbuf = 150
```

< === Change from 36

Figure 35 (Part 2 of 3). IBMLAN.INI File for LAN Server

```

sizereqbuf = 4096
srvanndelta = 3000
srvanannounce = 60
; The next lines help you to locate bits in the srvheuristics entry.
;
;           1
;           01234567890123456789
;
;   srvheuristics = 11110141111311091331< Bit 15 Change from 0 > 9
SRVSERVICES = NETLOGON,LSSERVER,BFSLINK      <==== UPDATED
srvnets = NET1

[alerter]

    sizalertbuf = 3072

[netrun]

    maxruns = 3
    runpath = D:\

[lsserver]

    cleanup = yes
    srvpipes = 3

[services]

; Correlates name of service to pathname of service program.
; The pathname must be either
;   1) an absolute path (including the drive specification)
;   OR
;   2) a path relative to the IBMLAN root
alerter = services\alerter.exe
dcdbrepl = services\dcdbrepl.exe
dldrinst = services\dldrinst.exe
genalert = services\genalert.exe
lsclient = services\lsclient.exe
lsserver = services\lsserver.exe
messenger = services\msrvinit.exe
netlogon = services\netlogon.exe
netpopup = services\netpopup.exe
netrun = services\runservr.exe
remoteboot = services\rplservr.exe
replicator = services\replicat.exe
requester = services\wksta.exe
server = services\netsvini.exe
timesource = services\timesrc.exe
ups = services\ups.exe
bfslink=D:\BFS\bfslink.exe      <==== NEW

[bfslink]      <==== NEW

    msg_file=D:\BFS\dfs.msg      <==== NEW
    log=D:\BFS\bfslink.log      <==== NEW

```

Figure 35 (Part 3 of 3). IBMLAN.INI File for LAN Server

The following file shows our suggested change of the RECVBUFS parameter in the PROTOCOL.INI file of the LAN Server.

```

[PROT_MAN]
DriverName = PROTMAN$

[IBMLXCFG]
IBMTOK_nif = IBMTOK.NIF
LANDD_nif = LANDD.NIF
NETBEUI_nif = NETBEUI.nif

;*-----*
;*----- PROTOCOL SECTION -----*
;*-----*

[LANDD_nif]
DriverName = LANDD$
Bindings = IBMTOK_nif
NETADDRESS = "T400000001683"
ETHERAND_TYPE = "I"
SYSTEM_KEY = 0x0
OPEN_OPTIONS = 0x2000
TRACE = 0x0
LINKS = 41
MAX_SAPS = 4
MAX_G_SAPS = 0
USERS = 4
T1_TICK_G1 = 255
T1_TICK_G1 = 15
T2_TICK_G1 = 3
T1_TICK_G2 = 255
T1_TICK_G2 = 25
T2_TICK_G2 = 10
IPACKETS = 250
UIPACKETS = 100
MAXTRANSMITS = 6
MINTRANSMITS = 2
TCBS = 64
GDTS = 30
ELEMENTS = 800

[NETBEUI_nif]
DriverName = netbeui$
Bindings = IBMTOK_nif
ETHERAND_TYPE = "I"
USEADDRREV = "YES"
SESSIONS = 40
NCBS = 95
NAMES = 21
SELECTORS = 5
USEMAXDATAGRAM = "NO"
ADAPTRATE = 1000
WINDOWERRORS = 0
T1 = 30000
T1 = 500
T2 = 200
MAXIN = 1
MAXOUT = 1
NETBIOS_TIMEOUT = 500
NETBIOSRETRIES = 8
NAMECACHE = 0
PIGGYBACKPACKETS = 1
DATAGRAMPACKETS = 2
PACKETS = 350
PIPELINE = 5
MAXTRANSMITS = 6
MINTRANSMITS = 2
DLCRETRIES = 5

;*-----*
;*----- MAC SECTION -----*
;*-----*

[IBMTOK_nif]
DriverName = IBMTOK$
MAXTRANSMITS = 12
RECVBUFS = :hp2.30 < === Change from 2 > 30:ehp2.
RECVBUFSIZE = 256
XMITBUFS = 1

```

Figure 36. Changes to PROTOCOL.INI File for BFS

#### 4.4.5 Test of FEP Connection

You may now test your FEP to the host connection by performing the following steps:

- Start your WLFSSERV server on the hHost
- Perform a shutdown on your FEP LAN Server system and reboot in order to activate the changes made to your CONFIG.SYS file.
- Start the LAN Server (NET START SERVER)
- C: (or the drive you specified in your installation)
- CD BFS
- Start the FEP (START BFSSERV); switch to the OS/2 desktop and press enter at the IBM logo window)
- cd\  
• Logon to the LAN Server (LOGON user ID /p:password)
- Issue NET USE command in order to share the allias defined the

```
net use h: \\wlfssrv\cid
```

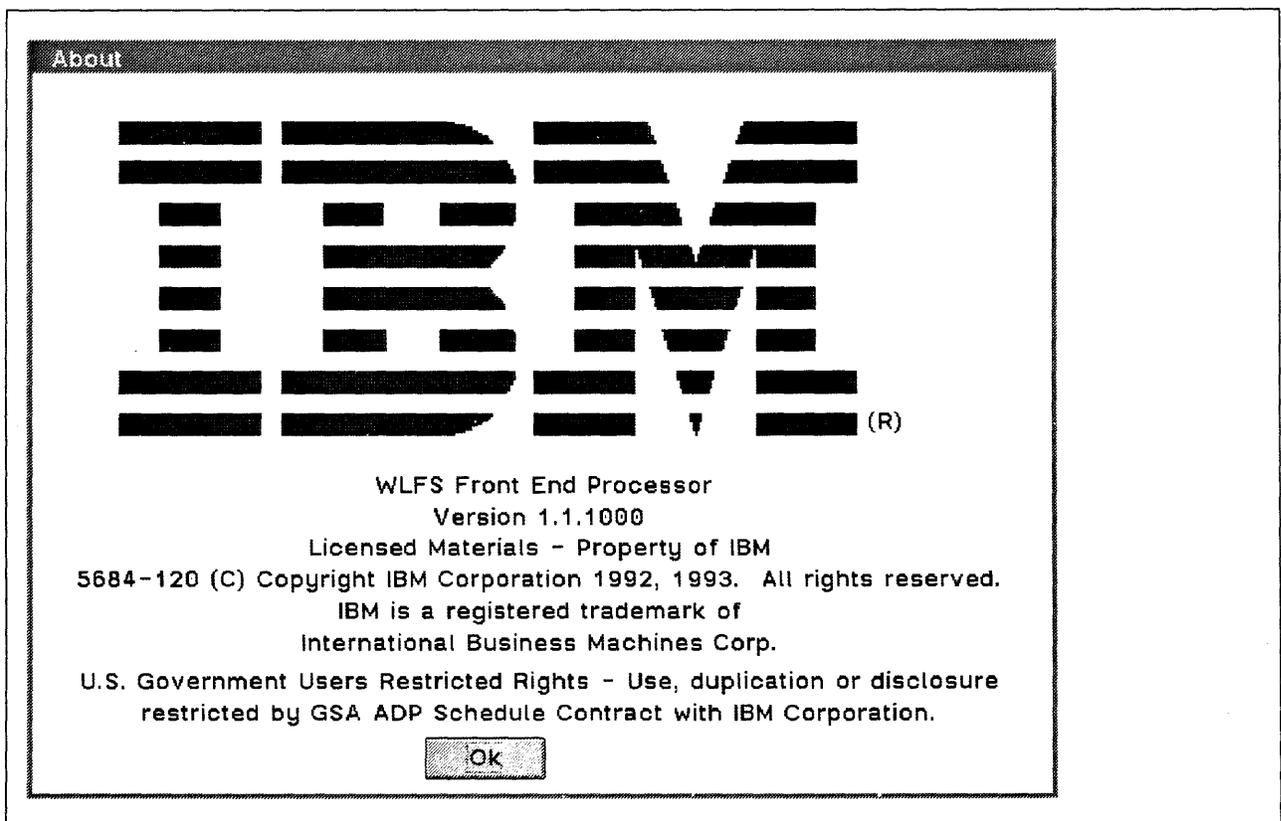


Figure 37. FEP Logo

### Note

To suppress the logo follow the instructions below:

The following procedure will stop the appearance of the IBM LOGO which is required if you wish to start the procedure automatically.

- Click on **OS/2 System** icon on OS/2 Desktop first.
- Click on **System Setup** icon on OS/2 System folder.
- Click on **System** icon on System Setup folder.
- Click on **LOGO** on System - Settings panel.
- Click on **None** button.

## 4.4.6 Setting up CID installation

Now you are ready to install your CID environments. Please refer to Chapter 7, "CID Code Server Preparation" on page 91 on how to prepare the CID server.

Figure 38 shows the CIDWLFS.INI file we used. This screen contains statements which were added or changed during WLFS installation.

```
;
!  
@  
#  
Adapter = 0  
MaxClients=8  
MaxFiles = 9998  
Name=CIDWLFS  
Groupname=No  
ClientWorkers=12  
;Authlist = dynamic,cidwlfs.cmd  
;  
; Path,PerClient,PermitWrite keywords are for compatibility only  
; and are still REQUIRED  
; Please use the new Alias Support instead  
; These keywords apply to the INTERNAL Alias named 'Default'  
;  
Path=h:\lancid  
PerClient=No  
PermitWrite = No  
;  
Alias= readwrite,single,log,h:\lancid\log  
Alias= readonly,PerClient,prtrsp,h:\lancid\rsp\rmpi
```

Figure 38. CODE SERVER.INI File

## 4.5 Startup Procedure

This file contains the procedure to start WLFS workstation feature the Front End Processor. This file is not furnished but you may create it with any text editor.

```
/* Sample Startup procedure command file */  
net start server  
c:  
cd bfs  
start bfsserv  
cd\  
logon userid /p:password  
net use h: \\wlfssrv\cid  
H:  
cd \lancid\server  
start SERVICE.EXE /INI=CIDWLFS  
cd\  
c:
```

Figure 39. STRBFS.CMD File

Figure 40 and Figure 41 on page 48 show the active screens on the FEP when the FEP is running.

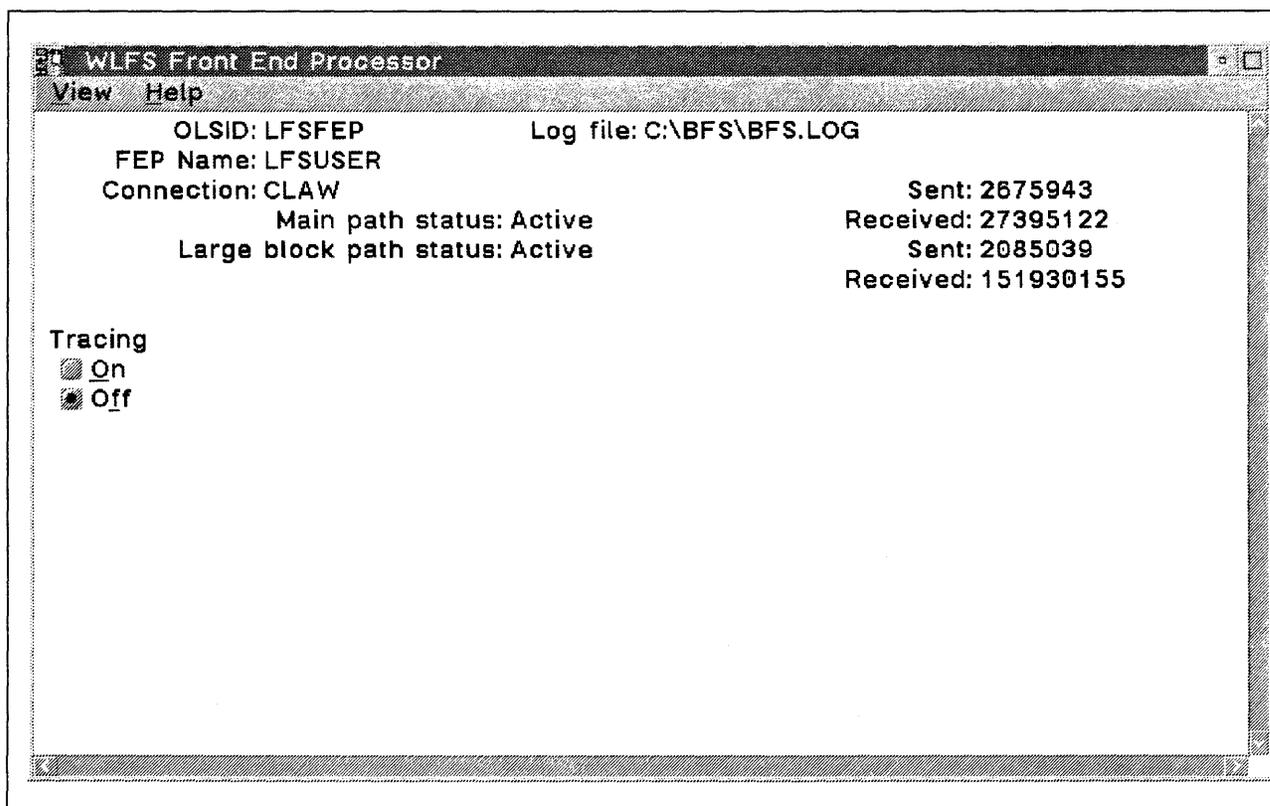


Figure 40. FEP Screen

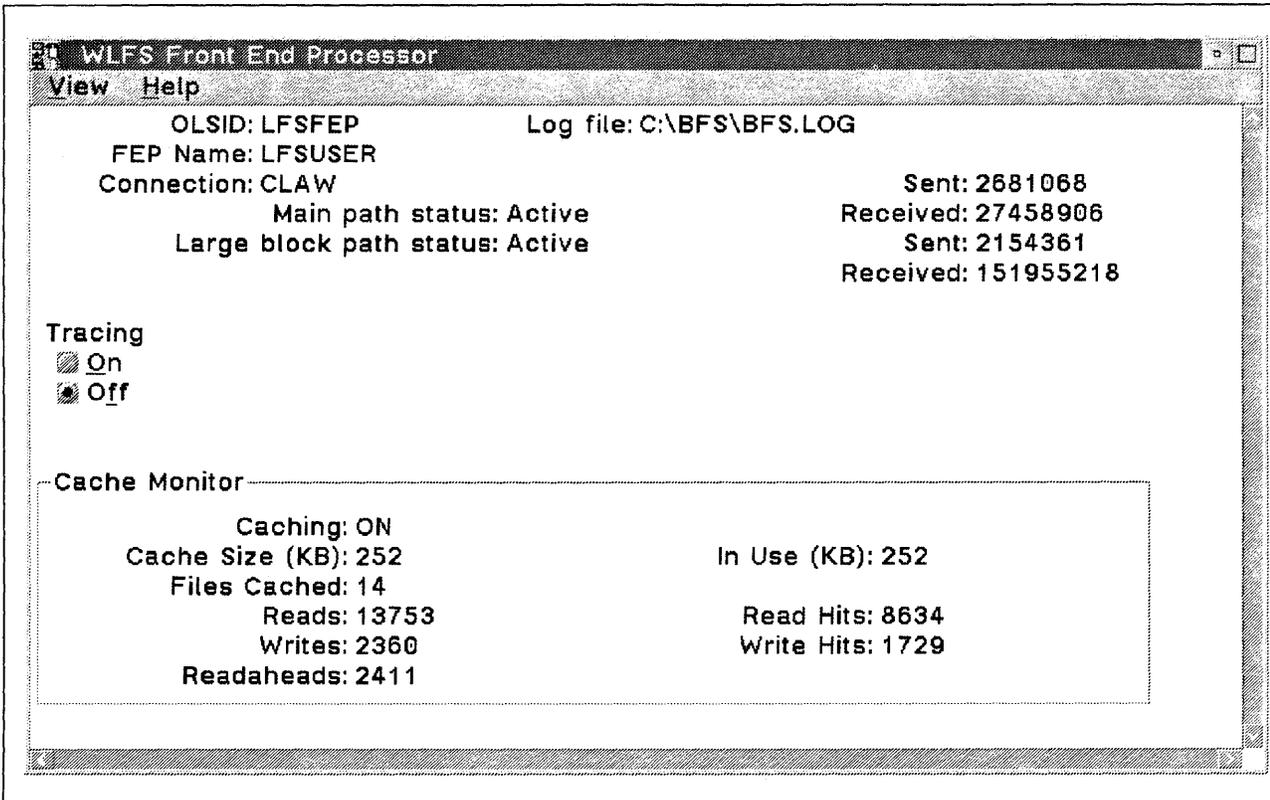


Figure 41. FEP Screen with Cache Monitor

---

## Chapter 5. LAN Resource Extension and Services/VM

The purpose of this chapter is to describe the LANRES/VM product in the CID environment. We were interested in seeing how clients within a LAN could have access the VM host DASD and use this storage for CID installation process in the Novell NetWare environment.

Our testing environment consisted of a 9370 VM Processor and a workstation Front End Processor running on Novell NetWare V3.11. We used a Micro Channel to Mainframe Connection (MMC) card to have a direct channel connection with the host server.

The figure below shows a descriptive view of a basic scenario for LANRES with channel connection.

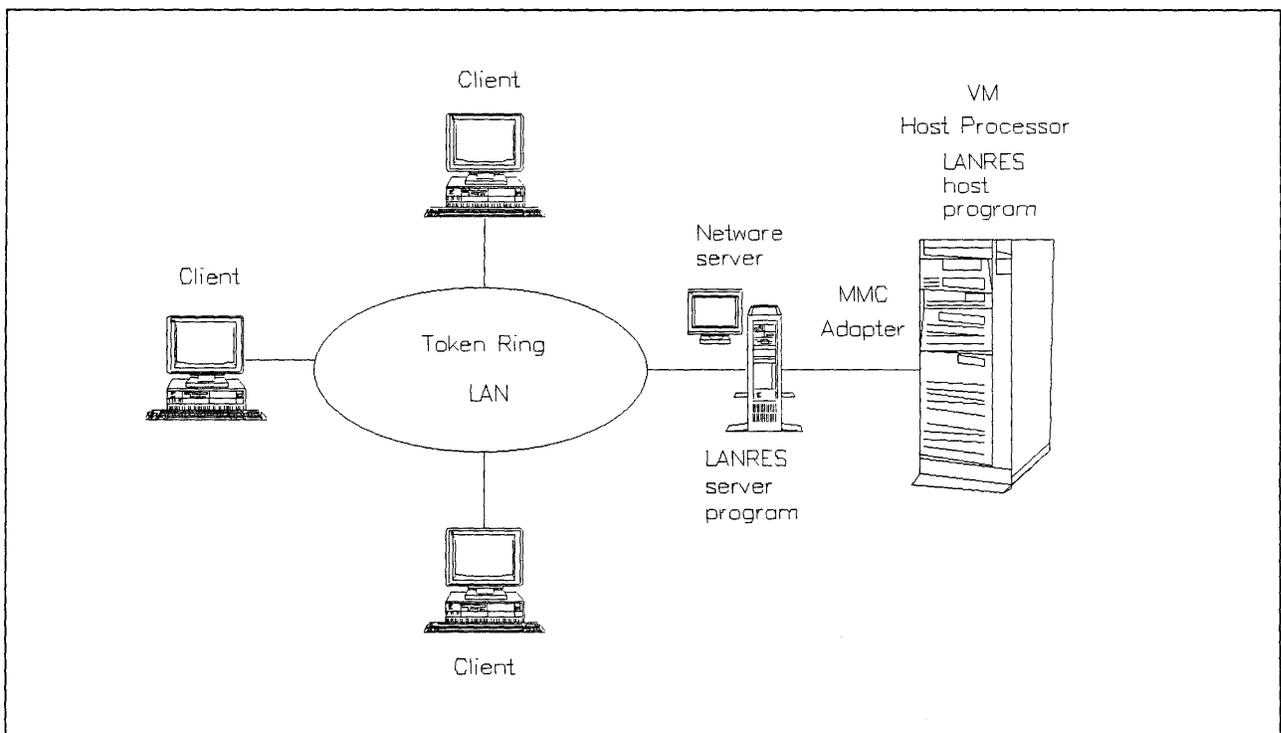


Figure 42. A Basic Scenario for LANRES with Channel Connection

---

### 5.1 Documentation

The following publications are necessary.

#### LANRES Publications

- *Program Directory - LAN Resource Extension and Services/VM*
- *LAN Resource Extension and Services/VM Guide and Reference, SC24-5622*
- *LAN Resource Extension and Services/VM General Information, GC24-5618*

#### Software Licence Monitor (SLM) Publications

- *Program Directory for Software License Monitor*

- ;cit.IBM Software License Monitor/MVS and VM Guide and Reference, SH24-5258

VM Publications

- *VM/SP Planning Guide and Reference*, SC19-6201
- *VM/ESA CP Planning and Administration for S/370*, SC24-5430
- *VM/ESA: Planning and Administration*, SC24-5521

NetWare 3.11

- NetWare Installation Version 3.11

## 5.2 Hardware and Software Requirements

Your Novell NetWare 3.11 system can be connected to VM host using several methods in order to interact with LANRES/VM. The following tables describe the hardware and software requirements for the channel connection via the PS/2 channel attachment card. For the information about the other connection types see Appendix A, "Scenarios: A General View" on page 113, section A.5, "Sample LANRES/VM Environment" on page 120 in this document.

Table 6 describes the minimum hardware requirements for the VM Processor and NetWare Server when using LANRES/VM.

<i>Table 6. Hardware Requirements for LANRES/VM</i>	
<b>Hardware</b>	<b>Comments</b>
<b>VM Processor</b>	<ul style="list-style-type: none"> <li>• An IBM System/370 or System/390 host processor (or equivalent) that the VM operating system runs on (except 9371).</li> </ul> <p><b>Note:</b> IBM Micro Channel 370 Models 110, 112 and 114 are not supported.</p> <ul style="list-style-type: none"> <li>• One of the following tape drives (for installing LANRES/VM):               <ul style="list-style-type: none"> <li>– A 9-track/1600 bpi magnetic tape drive</li> <li>– A 9-track/6250 bpi magnetic tape drive</li> <li>– A 18-track/38KB 3480 cartridge tape drive</li> </ul> </li> </ul>
<b>NetWare Server</b>	<p>An IBM Micro Channel PS/2 or equivalent, capable of running NetWare Version 3.11 with:</p> <ul style="list-style-type: none"> <li>• At least 100MB hard disk space.</li> <li>• At least 8MB of RAM (16MB is recommend, more memory gives you more room for caching and thus better performance for clients).</li> <li>• A 3.5-inch 1.44MB diskette drive.</li> </ul>

Table 7 on page 51 lists the requirements for LANRES/VM with channel connection.

Table 7. Hardware and Software Requirements for the Channel Connection	
Hardware/Software	Comments
<b>VM Host</b>	LANRES/VM requires one of the following: <ul style="list-style-type: none"> <li>• VM/ESA Release 1.1 (5684-112), or later</li> <li>• VM/ESA, ESA Feature, Release 1 (5684-112)</li> <li>• VM/ESA, 370 Feature, Release 1 (5684-112)</li> <li>• VM/SP Release 5 or 6 (5664-167), with or without:               <ul style="list-style-type: none"> <li>– VM/SP HPO Release 5 or 6 (5664-173)</li> </ul> </li> <li>• VM/XA SP Release 2.1 (5664-308)</li> </ul>
<b>NetWare Server</b>	You must install one of the following on the NetWare Server: <ul style="list-style-type: none"> <li>• NetWare V3.11 from IBM</li> <li>• Novell NetWare V3.11</li> </ul>
<b>Connectivity Equipment</b>	<ul style="list-style-type: none"> <li>• An IBM PS/2 Micro Channel to Mainframe Connection.</li> </ul> <b>Note:</b> <ul style="list-style-type: none"> <li>• The PS/2 (or equivalent) must be supported by the MMC.</li> <li>• The IBM PS/2 S/370 Channel Adapter (RPQ 8P1456) is also supported.</li> </ul> For more information about the channel adapter and cables, see the <i>IBM Personal System/2 MicroChannel to Mainframe Connection Installation Instructions, G571-0244</i> .

**Note**

This communication method requires that the NetWare server running LANRES/VM is channel attached to the host with an MMC.

**Note**

An APAR, number PW00115, is required for LANRES/VM when running a MMC channel connection on a VM/SP R6 system (without HPO).

### 5.3 LANRES/VM Host Software Installation

There are different ways to install the host part of LANRES/VM as it depends on the host software you are currently running. Please refer to the Program Directory for LAN Resource Extension and Services/VM.

You must define a minidisk where the CID image files will be placed. The **minimum recommended size is 100MB**. You may want to increase this size depending on the products you will have and if you will be storing response files and log files.

After the installation, you should have the following minidisks.

Table 8 (Page 1 of 2). Installation and Service Minidisks	
Minidisk Address	Minidisk Usage
<b>2B2</b>	Base system code disk

<i>Table 8 (Page 2 of 2). Installation and Service Minidisks</i>	
<b>Minidisk Address</b>	<b>Minidisk Usage</b>
<b>2C2</b>	Sample/local disk
<b>36F</b>	Production build disk
<b>29D</b>	Help files
<b>2DF</b>	Softcopy publications
<b>2D2</b>	Delta service disk
<b>37F</b>	Test build disk
<b>2A6</b>	Service apply disk
<b>2A2</b>	Service apply disk
<b>100</b>	HOST minidisk

You have to define the host channel that will be used for host connection.

Make the necessary changes to your system so that it reflects the highlighted entries in the DMKRIO ASSEMBLE file shown below in the following figure. We used channel 6.

```

RIO      TITLE '9370 FOR RESIDENCY VM-0S/2'
DMKRIO  CSECT
        PRINT NOGEN
        COPY  OPTIONS
        COPY  LOCAL

*=====*
*                C H A N N E L   Z E R O                *
*=====*
        RDEVICE ADDRESS=(000,32),DEVTYPE=3279,MODEL=3
        EJECT
                .
                .
                .
*=====*
*                C H A N N E L   S I X                  *
*=====*
        RDEVICE ADDRESS=(600,32),DEVTYPE=3279,MODEL=3
TAP3430 RDEVICE ADDRESS=(680,08),DEVTYPE=3430,FEATURE=DUALDENS
CTC3088 RDEVICE ADDRESS=(6C0,32),DEVTYPE=3088
        EJECT
                .
                .
                .
*=====*
*                C O N T R O L   U N I T S              *
*=====*
RCTLU0  RCTLUNIT ADDRESS=000,CUTYPE=3274,FEATURE=32-DEVICE
                .
                .
                .
RCTLU6  RCTLUNIT ADDRESS=680,CUTYPE=3430
RCTLUC  RCTLUNIT ADDRESS=6C0,CUTYPE=3088,FEATURE=32-DEVICE
RCTLUB  RCTLUNIT ADDRESS=B40,CUTYPE=ICA,FEATURE=16-DEVICE
RCTLUC  RCTLUNIT ADDRESS=C00,CUTYPE=3880,FEATURE=16-DEVICE
RCTLUD  RCTLUNIT ADDRESS=D00,CUTYPE=3880,FEATURE=16-DEVICE
        EJECT
*=====*
*                C H A N N E L S                        *
*=====*
        RCHANNEL ADDRESS=0,CHTYPE=BLKMPXR
                .
                .
                .
RCHANNEL ADDRESS=6,CHTYPE=BLKMPXR
        RCHANNEL ADDRESS=7,CHTYPE=BLKMPXR
                .
                .
                .
        EJECT
*=====*
*                C O N S O L E   D E F I N I T I O N    *
*=====*
        SPACE
        RIOGEN  CONS=200,ALTCONS=(000)
        END

```

Figure 43. DMKRIO ASSEMBLE File

After the necessary changes are done to the DMKRIO ASSEMBLE file following commands have to be executed in order to build new CP nucleus:

- VMFSETUP
- VMFASM
- VMFBLD

For more information read the *VM/SP Installation Guide*.

Prior the LANRES/VM installation on the host, the specified virtual machines have to be created. Follow the product's Program Directory.

## Step 1

Logon to P684142B Virtual Machine.

**access 2c2 b**

Ready; T=0.01/0.03 16:21:28

**access 37f c**

Ready; T=0.01/0.03 16:22:19

**copy ewxconfg sample b = link c**

Ready; T=0.06/0.10 16:23:14

## Step 2

Customize the EWXCONFG LINK file to reflect the highlighted changes shown in the figure below:

- Change the channel address in the DISK statement. See Figure 44 in part 2 of 3 and delete the unnecessary lines.

```
*****
* LAN Resource Extension and Services/VM (LANRES/VM) *
* COPYRIGHT - *
* THIS MODULE IS "RESTRICTED MATERIALS OF IBM" *
* 5684-142 (C) COPYRIGHT IBM CORP. - 1993 *
* LICENSED MATERIALS - PROPERTY OF IBM *
* SEE COPYRIGHT INSTRUCTIONS, G120-2083 *
* ALL RIGHTS RESERVED. *
* Sample EWXCONFG LINK File *
*****
```

Figure 44 (Part 1 of 3). EWXCONFG LINK File

```

*****
* There are two configuration files for the LANRES LINK command: *
* o EWXCONFIG LINK *
* This is the system configuration file, which should *
* be customized during LANRES/VM installation. *
* For security reasons, NetWare user IDs and their *
* passwords should not be added to this file because *
* all LANRES/VM users will have access to this file. *
* o EWXCONFIG LINKUSER *
* This is the user configuration file, which should be *
* customized with each user's preferences. You may *
* add you NetWare user IDs and passwords to your own *
* copy of this file. *
* When these files are used, they are treated as one file, with *
* EWXCONFIG LINK appended to the end of EWXCONFIG LINKUSER. *
*****
*****
* Both EWXCONFIG LINK and EWXCONFIG LINKUSER use the same format: *
* o Comment lines, which must start with '*', '/', *
* or ';' in the first column, are ignored. *
* Blank lines are also ignored. *
* o Each line can have a maximum of 500 characters. *
* o Characters may be in mixed case. *
* o Any line that is not a comment line or a blank line *
* is an information line, which contains information on *
* how to connect to the NetWare server. See the LANRES *
* Guide and Reference book for details on allowable *
* formats for information lines. *
*****
* The EWXCONFIG LINK and EWXCONFIG LINKUSER files provide two *
* main functions for the LANRES LINK command: *
* 1) As a shortcut: *
* o You can specify just a function or a nickname in *
* the LANRES LINK command and the LANRES EXEC will use *
* these files to provide the missing information, such *
* as server name, user ID, password, protocol, and *
* target. (User IDs and passwords should be added to *
* the EWXCONFIG LINKUSER file, not the EWXCONFIG LINK *
* file.) *
* o The following are some examples: *
DISK * MMC 6C4

```

Figure 44 (Part 2 of 3). EWXCONFIG LINK File

```

* 2) As a list of paths:
*   o You can use these files to avoid needing to
*     memorize all the available protocols and targets.
*     For example, you can just issue the command
*       "lanres link admin server1/user1 pw1" or
*       "lanres link dist server1/user1 pw1" or
*       "lanres link disk"
*     and allow the LANRES EXEC to pick the path to the
*     server.
*   o The following are some examples:
*     ADMIN      */* *                MMC 6C4
*     DISK                MMC 6C4
* LANRES EXEC will continue reading down the file if a
* particular connection fails. In the above example:
*
*     lanres link admin server1/user1 pw1
*
* LANRES EXEC will try to connect to the administration
* function, in the following order, through TCIP, APPC,
* and MMC.
*****
* The EWXCONFIG LINK and EWXCONFIG LINKUSER files can also be
* used to provide other functions for the LANRES LINK
* command. They include:
* 1) Always using a specific protocol and target for users
*    logging in to a specific server.
* 2) Allowing users to specify the protocol and letting the
*    LANRES EXEC choose the target.
* Please see the LANRES Guide and Reference book for details.

```

Figure 44 (Part 3 of 3). EWXCONFIG LINK File

### Step 3

Now we must copy the password files.

```

copy ewxdisk sample b = vmpw c
Ready; T=0.04/0.06 16:29:49

```

We are using the default passwords as shown in Figure 45 on page 57.

```

*****
* LAN Resource Extension and Services/VM (LANRES/VM) *
* *
* COPYRIGHT - *
* THIS MODULE IS "RESTRICTED MATERIALS OF IBM" *
* 5684-142 (C) COPYRIGHT IBM CORP. - 1993 *
* LICENSED MATERIALS - PROPERTY OF IBM *
* SEE COPYRIGHT INSTRUCTIONS, G120-2083 *
* ALL RIGHTS RESERVED. *
* *
* Sample EWXDISK VMPW File *
*****
* This is the sample component password file for the *
* LANRES/VM disk serving function. It should be *
* renamed to EWXDISK VMPW. *
*****
* VM component password files use the following format:
* o Comment lines, which must start with '*', '/',
* or ';' in the first column, are ignored.
* Blank lines are also ignored.
* o Each line can have a maximum of 128 characters.
* o Any line that is not a comment line or a blank line
* is a password line. The first word of the first
* password line is the component password expected
* from the LANRES/VM NLM. The first word of the
* second password line is the component password
* expected by the LANRES/VM NLM.
* o Each component password must be an alphanumeric
* string (a to z, A to Z, or 0 to 9) between 1 and 8
* characters long. It is not case sensitive.
* o See the LANRES Guide and Reference book for more
* details.
*****
*****
* The following is the password expected from the NetWare
* server's EWXDISK.DSK (modify password for your own
* installation):
*****
UP
*****
* The following is the password expected by the NetWare
* server's EWXDISK.DSK (modify password for your own
* installation):
*****
DOWN

```

Figure 45. EWXDISK VMPW File

#### Step 4

Customize the disk serving component.

```
copy ewxdiskx execsamp b = exec c
```

```
Ready; T=0.04/0.07 16:33:26
```

In the EWXDISKX file, you can change the operator message or replace the operator ID for another ID which will receive messages from the server when the server has established connection and the connection failed.

```

/*****/
/* COPYRIGHT - */
/* THIS MODULE IS "RESTRICTED MATERIALS OF IBM" */
/* 5684-142 (C) COPYRIGHT IBM CORP. - 1991, 1993 */
/* LICENSED MATERIALS - PROPERTY OF IBM */
/* SEE COPYRIGHT INSTRUCTIONS, G120-2083 */
/* ALL RIGHTS RESERVED. */
/*****/
/*
EWXDISKX is the user exit for the LANDISK machine. It is called with
one argument: UP or DOWN. EWXDISK calls the exec when it determines
a change in the server state. The purpose of the user exit is to
notify someone of the change in server status. No CMS commands that
change disk status (access, link, detach, release, etc.) or manipulate
LANDISK files should be invoked.
This sample exec notifies the operator. Customize it for your
own installation.
If the message text being displayed by this exec is to be changed,
then remove the XMITMSG sections and insert CP MSGNOH statements
with the new messages. Other commands may also be substituted into
these sections.
*/
/* Uncomment the following line with the 'EXIT' command to disable */
/* this user exit. This user exit will perform no instruction */
/* other than to exit immediately. */
/* Exit 0 */

Address 'COMMAND'
Arg x
/* An 'UP' argument is passed when the server is connected to VM. */
/* A 'DOWN' argument is passed when the connection between the */
/* server and VM is lost. */
If x = 'UP'
Then Do
/* XMITMSG section - message 'Server reconnected'. */
'XMITMSG 1520 (APPLID EWX CALLER DSK VAR HEADER NOCOMP'
If rc = 0
Then
Do index = 1 To message.0
'CP MSGNOH OPERATOR' message.index
End
End
Else Do
/* XMITMSG section - message 'Connection to server lost'. */
'XMITMSG 1506 (APPLID EWX CALLER DSK VAR HEADER NOCOMP'
If rc = 0
Then
Do index = 1 To message.0
'CP MSGNOH OPERATOR' message.index
End
End
Exit 0

```

Figure 46. EWXDISKX File for LANDISK

Log on to the LANDISK ID which is the owner of the disks. In the following steps, we will create the disk server host disk images.

#### Step 5

```
format 100 g (blk 4096
DMSFOR603R FORMAT will erase all files on disk G(100).
Do you wish to continue? Enter 1 (YES) or 0 (NO).
1
DMSFOR605R Enter disk label:
disk1
Formatting disk G
XXXXXX FB-512 blocks formatted on G(100)
Ready; T=0.05/0.13 16:50:12
```

#### Note

You must create the minidisk with 5% more than the desired amount as NetWare requires a 5% volume overhead.

For our test purposes, we allocated 135MB of host disk space.

```
ewxldini cid101 landisk g 135m
Ready; T=0.33/0.73 16:54:12
```

#### Step 6

Customize the user LANDISK PROFILE EXEC.

```
link p684142b 2c2 2c2 rw
Ready; T=0.01/0.02 16:55:31
```

```
access 2c2 b
B (2C2) R/O
Ready; T=0.02/0.04 16:56:56
```

#### Step 7

Copy the sample PROFILE EXEC from the 2C2 disk to your LANDISK Server A disk.

```
copy profile landisk b = exec A
Ready; T=0.01/0.02 16:58:39
```

Make the following changes to the PROFILE EXEC:

- Add your NetWare server name to the end of the following command:  
"EXEC LANRES LINK DISK **NWCIDSRV**"
- Add your link statements and access commands to access your minidisks.
- Add the disk names as parameters to the EWXDISK command. For example:  
EWXDISK **hostdisk1 hostdisk2 ...**

The Figure 47 on page 60 shows the changes to the PROFILE EXEC discussed above.

```

/*****/
/*  COPYRIGHT - */
/*  THIS MODULE IS "RESTRICTED MATERIALS OF IBM" */
/*  5684-142 (C) COPYRIGHT IBM CORP. - 1991, 1993 */
/*  LICENSED MATERIALS - PROPERTY OF IBM */
/*  SEE COPYRIGHT INSTRUCTIONS, G120-2083 */
/*  ALL RIGHTS RESERVED. */
/*****/
/* LANDISK PROFILE EXEC */
/* Copy this file to the 191 disk of the DISK service machine */
/* as PROFILE EXEC, and tailor to your installation. */
/*****/
Address Command
'CP SET PF12 RET'
/*****/
/* Link and access the shared disks containing the LANRES/VM */
/* code and help files. */
/* The 36F disk contains the code and the 29D contains the */
/* help files. This example assumes that the code was */
/* installed on the P684142B userid. */
/* If the following link statements were not included */
/* in the user profile, then uncomment the CP LINK lines. */
/*****/
'CP LINK P684142B 37F 37F RR';
'CP LINK P684142B 29D 29D RR';
'ACCESS 37F B';
'ACCESS 29D E';
/*****/
/* If LANRES/VM was installed to the Shared File System, use */
/* the following lines and comment out the ACCESS lines above.*/
/*****/
/* 'ACCESS VMSYS:P684142B.LANRESVM.BUILD. B' */
/* 'ACCESS VMSYS:P684142B.LANRESVM.BUILD3. E' */
/*****/
/* LANRES LINK connects this host disk server */
/* virtual machine with the EWXDISK.DSK program on */
/* the NetWare server. Replace SERVER1 with the */
/* server name which is to run the EWXDISK.NLM and */
/* configure the EWXCONFIG LINK and/or EWXCONFIG */
/* LINKUSER file to contain the additional */
/* information required by the LANRES LINK command. */
/* For example, if SERVER1 is the name of the */
/* NetWare server, the protocol to use is MMC (using */
/* the MMC product), and the suchannels x'034' and */
/* x'035' will be used, the following entry should be */
/* included in the EWXCONFIG file: */
/* DISK SERVER1 MMC 034 */
/*****/
'EXEC LANRES LINK DISK NWCIDSRV'
If rc/=0 then Exit rc;

```

Figure 47 (Part 1 of 3). PROFILE EXEC for LANDISK User

```

/*****/
/* Insert CP LINK and CMS ACCESS commands here to access */
/* the CMS minidisks that contain disk image files used */
/* by the EWXDISK command. */
/* */
/* IMPORTANT: */
/* LANRES/VM now supports the sharing of host disk */
/* image files between 2 or more host disk server */
/* virtual machines as long as each host disk server */
/* virtual machine, which is participating in the */
/* sharing, is started with the host disk image file */
/* residing on a CMS minidisk that is CMS accessed in */
/* read only (R/O) mode. In other words, LANRES/VM */
/* now supports the R/O sharing of host disk image */
/* files. */
/* */
/* As a result, each minidisk CP linked and CMS */
/* accessed below, in R/W mode, must not be CP linked */
/* to by any other virtual machine when the EWXDISK */
/* command is invoked. In addition, each minidisk CP */
/* linked and CMS accessed below, in R/O mode, must */
/* not be CP linked, in R/W mode, by any other */
/* virtual machine when the EWXDISK command is */
/* invoked. */
/* */
/* If on a VM level equal to VM/ESA R1.1 or later, */
/* use a CP LINK mode of SR on minidisks that contain */
/* disk image files that are to be brought up in */
/* Read/Only mode and use a CP LINK mode of SW on */
/* minidisks that contain disk image files that are to */
/* be brought up in Read/Write mode. The use of the */
/* SR and SW CP LINK modes is controlled by the */
/* LNKSTABL and LNKEXCLU options for the OPTION */
/* directory control statement for the virtual machine */
/* that is issuing the CP LINK command. See the */
/* "VM/ESA Planning and Administration" manual for */
/* more details. */
/* */
/* If on a VM level prior to VM/ESA R1.1, use a CP */
/* LINK mode of R on minidisks that contain disk image */
/* files that are to be brought up in Read/Only mode */
/* and use a CP LINK mode of W on minidisks that */
/* contain disk image files that are to be brought up */
/* in Read/Write mode. */
/*****/
'CP LINK *      100 100 w'
'ACCESS 100 C'

```

Figure 47 (Part 2 of 3). PROFILE EXEC for LANDISK User

```

/* Enable timeout call of user exit EWXDISK */
'CP SET TIMER REAL';
/*****
/* NUCXLOAD EWXXDISK to avoid problems with CMS levels */
/* that do not support relocatable modules. */
*****/
'NUCXLOAD EWXXDISK'
If rc><0 & rc><1
then do
/*****
/* A problem occurred with the NUCXLOAD command since */
/* the rc does not equal 0 (no error) or 1 (nucleus */
/* extension already exists). */
*****/
command = 'NUCXLOAD EWXXDISK'
"XMITMSG 0004 command rc (APPLID EWX CALLER DSK HEADER COMP"
Exit '8'
end /* then */
/*****
/* The parameters following the EWXDISK command should */
/* reflect YOUR disk image names. */
*****/
'EXEC EWXDISK CID100'

```

Figure 47 (Part 3 of 3). PROFILE EXEC for LANDISK User

**Note**

Later, you may want to autolog your machine by adding the autolog command to your host system startup procedure.

For example:

**autolog landisk psw**

Now the host installation is completed and you are ready to start the installation of the Novell NetWare server.

## 5.4 PS/2 Server Installation - Installing the MMC Adapter

Install the IBM Personal System/2 MicroChannel to Mainframe Connection Adapter.

See the *IBM Personal System/2 MicroChannel to Mainframe Installation Instruction*, G571-0244, for more information.

**Note**

Your IBM Service Representative must attach the MMC card to the host channel. The host processor must be stopped or isolated by a channel switch before connecting the MMC card to the channel I/O interface.

## 5.4.1 Installing the NetWare Server Software

To install the software on the NetWare server, follow these steps:

1. Install NetWare V3.11 on your server, if you have not done so.
2. Start the server with the LANRES diskette in drive A:

### SERVER

3. You also need to load the NetWare CLIB (C library)

```
load clib
load a:ewxinst
```

#### Note

If you are reinstalling LANRES, use **load a:ewxinst /R**

## 5.4.2 Customizing the NetWare Server Software

First you have to customize the channel adapter configuration file. A sample is supplied with LANRES/VM.

### Step 1

From a NetWare client, login to the server with an administrator user such as the SUPERVISOR ID.

```
login supervisor
```

### Step 2

Copy the sample file PSCA1.SAM from the SYS:\EwxNLM to the SYS:\SYSTEM directory. PSCA1.SAM is used for the first adapter and PSCA2.SAM for the second. Rename the PSCA1.SAM file you copied to PSCA1.CFG. This file will contain the information necessary for your adapter to operate.

#### Note

In an MMC connection all files should be put in the LANRES/VM directory EwxNLM except PSCAn.CFG files, where n = 1 or 2. These files should be in the SYS:\SYSTEM directory.

### Step 3

Configure your PSCA1.CFG file with the following statements:

- **DSPD**

This statement defines the channel speed and mode. It can run either in DC interlock or in data streaming mode.

- 0 This indicates DC interlock mode
- 1 This indicates streaming at 1.9 MBytes/second
- 2 This indicates streaming at 2.7 MBytes/second
- 3 This indicates streaming at 3.4 MBytes/second
- 4 This indicates streaming at 4.5 MBytes/second

If the speed of your channel is not the same as one of the above values, you must use the value which is just **below** the channel speed.

- **XLEN,RLEN,XNUM and RNUM**

These parameters should always be 0.

- **ADDR**

The ADDR statement indicates the subchannel address to be used by the adapter. One statement for each subchannel must be defined. They also have to be defined in pairs.

The statement has three parameters:

- Subchannel address
- First command-decode table-identifier number
- Second command-decode table-identifier number

A typical entry would be:

**ADDR=C4 1 2**

- **TABL**

This statement defines a command-decode table which is to be loaded into the adapter.

This statement has two parameters:

- Table reference number (should always start with 1)
- File specification of the file containing the decode table.

The following statements show how the tables should be defined for LANRES/VM:

**TABL=1 SYS:\EWXNLM\CU3088B.STD**

**TABL=2 SYS:\EWXNLM\CU3088E.STD**

For more information concerning the ADDR and TABL statements, please refer to pages 54 and 55 of the *LANRES/VM Program Directory*.

```

(*****
(*   COPYRIGHT -                                     *
(*   THIS MODULE IS "RESTRICTED MATERIALS OF IBM"   *
(*   5684-142 or 5695-123 (C) COPYRIGHT IBM CORP. - 1991, 1993 *
(*   LICENSED MATERIALS - PROPERTY OF IBM          *
(*   SEE COPYRIGHT INSTRUCTIONS, G120-2083        *
(*   ALL RIGHTS RESERVED                           *
(*****
DSPD=2
XLEN=0
RLEN=0
XNUM=0
RNUM=0
ADDR=C4 1 2
ADDR=C5 1 2
TABL=1 SYS:\Ewxnlm\CU3088B.STD
TABL=2 SYS:\Ewxnlm\CU3088E.STD

```

Figure 48. PSCA1.CFG File in the SYS:\SYSTEM Directory

#### 5.4.2.1 Setting up AUTOEXEC.NCF

Edit and add the load commands to your AUTOEXEC.NCF file.

- You can do this on the server console.
  - Enter: **load install**
  - Select System Options
  - Select Edit AUTOEXEC.NCF
- Or on a NetWare client workstation edit the SYS:\SYSTEM\AUTOEXEC.NCF file. This method may be easier because with a more powerful editor you can merge the sample AUTOEXEC.NCF file which comes with LANRES/VM. This sample file is in SYS:\Ewxnlm\ directory.

After editing, you should have a file similar to Figure 49 on page 66.

```

#-----
# LAN Resource Extension and Services
#
# COPYRIGHT -
#
#   THIS MODULE IS "RESTRICTED MATERIALS OF IBM"
#   5684-142 or 5695-123 (C) COPYRIGHT IBM CORP. - 1993
#   LICENSED MATERIALS - PROPERTY OF IBM
#   SEE COPYRIGHT INSTRUCTIONS, G120-2083
#   ALL RIGHTS RESERVED
#
# This programming example is to be used as a sample program only.
# Although this program may have been reviewed by IBM
# for accuracy in a specific environment, there is no
# guarantee that the same or similar results will be obtained
# elsewhere. The code is being provided on an 'As is' basis
# without any warranty expressed or implied.
#
#-----
# Sample AUTOEXEC.NCF File
# Lines here are typical of a NetWare Server
#-----
file server name NWCIDSRV
ipx internal net FF
load token
bind ipx to token net=F0
mount all
set allow unencrypted passwords=on
#Load route
search add sys:\ewxn1m
load streams
load clib
load mathlib
load tli
load ipxs
load spxs

```

Figure 49 (Part 1 of 2). AUTOEXEC.NCF File with Statements for LANRES

```

#-----
# Begin of LANRES statements
#
# Load MMC Driver
#
load sys:\ewxnlm\acpwpca m=psca.abs c1=sys:\system\psca1.cfg
#
# Load Communications NLM
#
load sys:\ewxnlm\ewxcomm
#
# Load Administration NLM
#
#load sys:\ewxnlm\ewxadmin
#
# Load Distribution NLM
#
#load sys:\ewxnlm\ewxdist
#
# Load Lan to Host Print NLM
#
#load sys:\ewxnlm\ewxlhprt
#
# Load Host to Lan Print NLM
#
#load sys:\ewxnlm\ewxhlprt
#
# Load Disk Driver
#
load sys:\ewxnlm\ewxdisk
#
# end of lanres statements
#
mount all

```

Figure 49 (Part 2 of 2). AUTOEXEC.NCF File with Statements for LANRES

**Note**

Only the necessary load commands for disk serving have been left. If you need other functions, you may have to add other load statements.

These can be seen in Figure 50 on page 68.

### 5.4.2.2 Customizing Server Password Files

We will use the default sample passwords.

Copy the EWXDISK.SAM to EWXDISK.NPW in the SYS:\EWXNLM\ directory. This must be done from a client workstation.

**Note**

There are other password files for functions other than disk serving.

```

*****
*       LAN Resource Extension and Services  5684-142 or 5695-123       *
*                                                                 *
*                               Sample EWXDISK.NPW File                *
*****
* This is a sample component password file for the LANRES           *
* Disk Server function.  It should be renamed to EWXDISK.NPW.      *
*****
* NetWare component password files use the following format:
*   o Comment lines, which are ignored, must start with '*', '/',
*     or ';' in the first column.  Blank lines are also ignored.
*   o Maximum length for a line is 128 characters.
*   o Any line that is not a comment line or a blank line is a
*     password line.  The first word of the first password line
*     is the component password expected from the LANRES host
*     function.  The first word of the second password line is
*     the component password expected by the LANRES host function.
*   o A component password must be an alphanumeric string (a to z,
*     A to Z, or 0 to 9) between 1 and 8 characters long.
*     It is not case sensitive.
*   o See the LANRES Guide and Reference book for more details.
*****

* The following is the password expected from the host
*   Disk Server function:
DOWN

* The following is the password expected by the host
*   Disk Server function:
UP

```

Figure 50. EWXDISK.NPW file

Customize the EWXCOMM.INI file. In this file, you must define the subchannel address for each adapter. You must have one statement for each MMC adapter. The statement syntax is:

SUBCHANNEL = even\_address,adapter;even\_address,adapter,...

The sample EWXCOMM.INI is shown in Figure 51 on page 69.

```

*****
* LAN Resource Extension and Services (LANRES) *
* COPYRIGHT - *
* THIS MODULE IS "RESTRICTED MATERIALS OF IBM" *
* 5684-142 or 5695-123 (C) COPYRIGHT IBM CORP. - 1993 *
* LICENSED MATERIALS - PROPERTY OF IBM *
* SEE COPYRIGHT INSTRUCTIONS, G120-2083 *
* ALL RIGHTS RESERVED. *
* *
* Sample EWXCOMM.INI File *
*****
*****
* This is a sample LANRES initialization file. *
* It should be renamed to EWXCOMM.INI and stored *
* in the directory where EWXCOMM.NLM is installed. *
*****
*****
* The LANRES initialization file uses the following format:
* o Comment lines, which start with '*', '/', or ';' in the
* first column, are ignored. Blank lines are also ignored.
* o Maximum length for a line is 275 characters.
* o Information records in this file should be in one of two
* formats:
* KEYWORD
* or
* KEYWORD = VALUE
* The keyword does not have to begin in column 1, and one or
* more spaces can separate keyword, equal sign, and value.
* Keyword and value are not case sensitive.
* o See the LANRES Guide and Reference book for more details
* on the format and contents of the LANRES initialization file.
*****

```

Figure 51 (Part 1 of 2). EWXCOMM.INI File

```

*****
* The following are some of the keywords that can be specified in
* this file.
*****
****
* The "SESSIONS =" value is the maximum number of concurrently
* active LANRES sessions allowed at one time. Each active host
* connection uses up one session, so you should specify a large
* enough SESSIONS number to satisfy all your host connection
* requirements. Please keep in mind that the EWXDISK disk driver
* can handle multiple host connections and, therefore, can have
* multiple sessions.
****
SESSIONS = 16
****
* The "SUBCHANNEL =" value specifies what subchannels addresses
* are to be used by LANRES. Even subchannel addresses of
* available subchannel pairs should be listed. The format for
* the subchannel address list is:
*   SUBCHANNEL = even_address,adapter;even_address,adapter,...
* The default adapter number is 1 so the adapter number may
* be omitted.
* Multiple SUBCHANNEL lines are allowed.
* These subchannel addresses and the corresponding odd subchannel
* address should also be listed in the files PSCA1.CFG
* (for adapter 1) or PSCA2.CFG (for adapter 2).
****
SUBCHANNEL = C4,1
****
* The "LOG_START =" value specifies whether a log file should be
* started or not. If a log file is started, messages issued by
* LANRES NLMs will be recorded in this log file. Specify YES
* to start the log file and NO to not start the log file.
****
LOG_START = YES

```

Figure 51 (Part 2 of 2). EWXCOMM.INI File

**5.4.2.3 Testing the Connection**

Bring your server down and start it again so that the changes take place. You may type the following commands at the NetWare console to do this:

- DOWN
- EXIT
- Start your disk server LANDISK on the host.
- SERVER

**5.4.2.4 Creating Volumes and Partitions**

After installing your software on the Novell NetWare server, you must create the NetWare volume for the disk you created on the host.

This is done by the installation module of NetWare.

On the NetWare server console type:

## LOAD INSTALL

From the installation panels select following:

- Select **Disk Options**
- **Partition Tables**
- Select the **device you created on your Host**
- You will get a message:

**Note**

No Partition Table exists on this Drive < Press ESCAPE to continue >

- Select **Yes** to create **New Partition Table**. The available size will be displayed in this panel.
- Select **Create NetWare Partition**
- Press **<ESCAPE>** to accept
- Select **YES** to create the partition

Now return to Installations Options Menu (to get there press **<ESCAPE>** 3 times).

Now we have to create a NetWare volume

- On the Installations Options Menu select **Volume Options**. and press insert to create a new volume.
- Enter the volume name, for example: CIDVOLUME
- Press **<ESCAPE>**
- Select **YES** to create the volume

Now you are ready to enable your volume by using the MOUNT command. On the NetWare server console type:

```
MOUNT ALL
```

### 5.4.3 Setting up CID installation

Start the server and establish the connection to the host. There is not a special startup procedure for this action.

Now you are ready to install your CID environment. You have to utilize a Novell NetWare requester; most probably the same workstation used as a SYSCON terminal. Map the host volume to the SYSCON terminal and start SRVSETUP in order to create the CID environment. For detailed description refer to GG24-3977-00, GG24-3783-00 and also to the Chapter 7, "CID Code Server Preparation" on page 91 for more the information how to create and handle the response and LCU command files.



---

## Chapter 6. AS/400 Client/Server Connection

This chapter describes how to use the automated installation process for CID enabled products in an AS/400 environment.

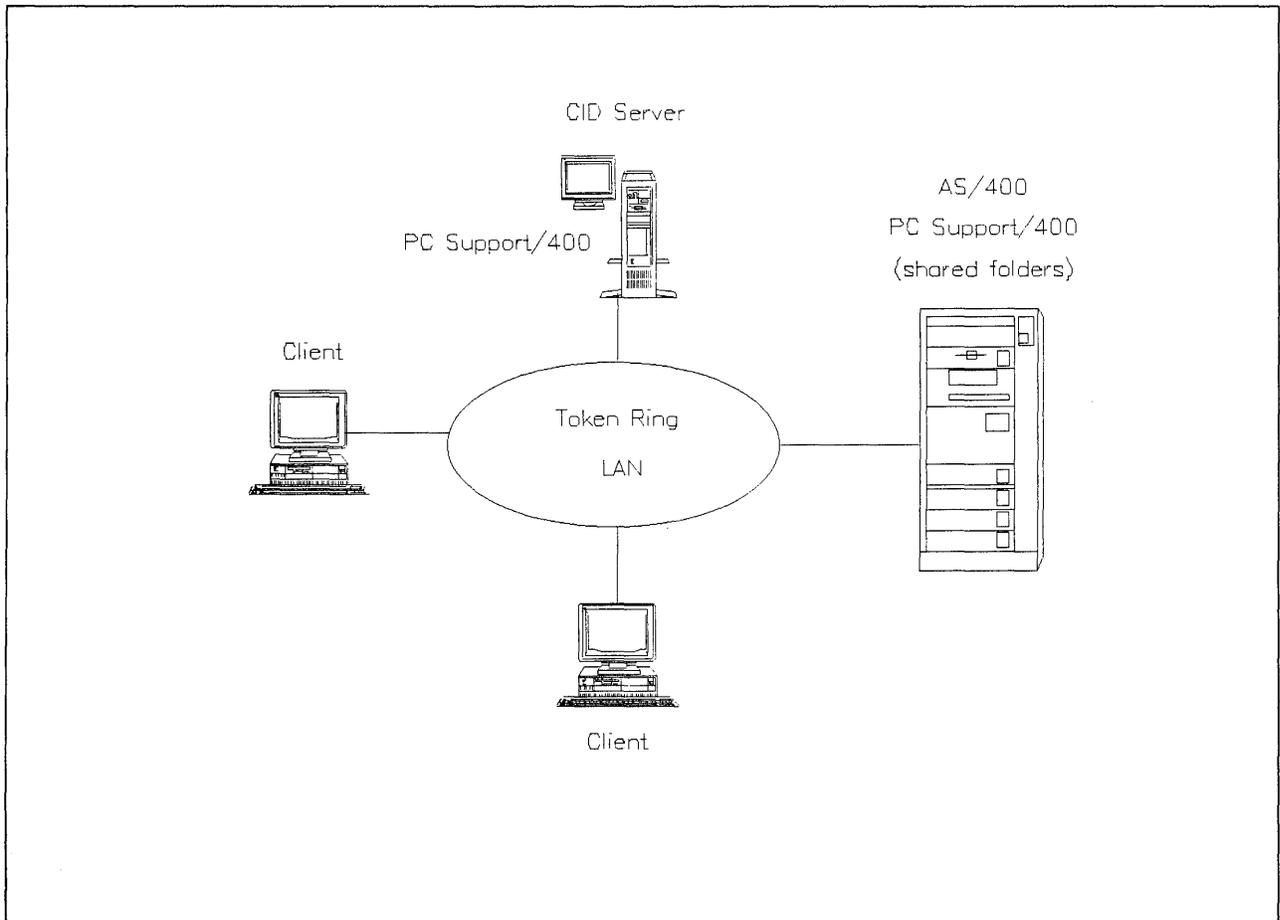


Figure 52. A Basic Scenario for AS/400 PC Support/400 Environment

Figure 52 illustrates a basic scenario taken from an AS/400 enterprise. The clients have to execute the PC Support/400 that establishes an access to a shared folder on the AS/400 processor. This folder is represented as a logical redirected drive on the client workstations.

---

### 6.1 Hardware and Software Requirements

The following table shows the hardware and software requirements for the AS/400 processor.

<i>Table 9. Hardware and Software for the AS/400 Processor</i>	
<b>Hardware/Software</b>	<b>Comments</b>
<b>AS/400 Processor</b>	Any AS/400 processor with enough DASD space available for the product images installed by CID techniques and a token-ring adapter: <ul style="list-style-type: none"> <li>• 9402</li> <li>• 9404</li> <li>• 9406</li> </ul>
<b>AS/400 Operating System Software</b>	<ul style="list-style-type: none"> <li>• OS/400 Operating System V2 R2 (5738-SS1)</li> <li>• IBM PC Support/400 Version 2 Release 2 (5738-PC1)</li> </ul>

The table below defines the requirements for the front end processor workstation.

<i>Table 10. Hardware and Software for the Front End Processor</i>	
<b>Hardware/Software</b>	<b>Comments</b>
<b>Front End Processor (FEP)</b>	The workstation acting as a front end processor (FEP) to WLFS for our test consisted of the following: <ul style="list-style-type: none"> <li>• Model 95 PS/2</li> <li>• 16 megabytes (MB) of main memory</li> <li>• 386 HPFS</li> </ul>
<b>OS/2 V2.X</b>	IBM PC Support/400 for OS/2 V2 R2

---

## 6.2 Installation Steps

The following list represents the items that must be processed prior to the automated installation of CID enabled products in the AS/400 environment:

- Communications Manager configuration
- PC Support/400 installation
- CID Installation and Setup
- Startup procedures
- CID Code server startup.

### 6.2.1 Communications Manager Configuration

This section will explain how to set up Communications Manager in order to establish communication sessions to an AS/400 processor through a token-ring network.

1. In the Extended Services - Icon View, you must select *Basic Configuration and Installation* icon.

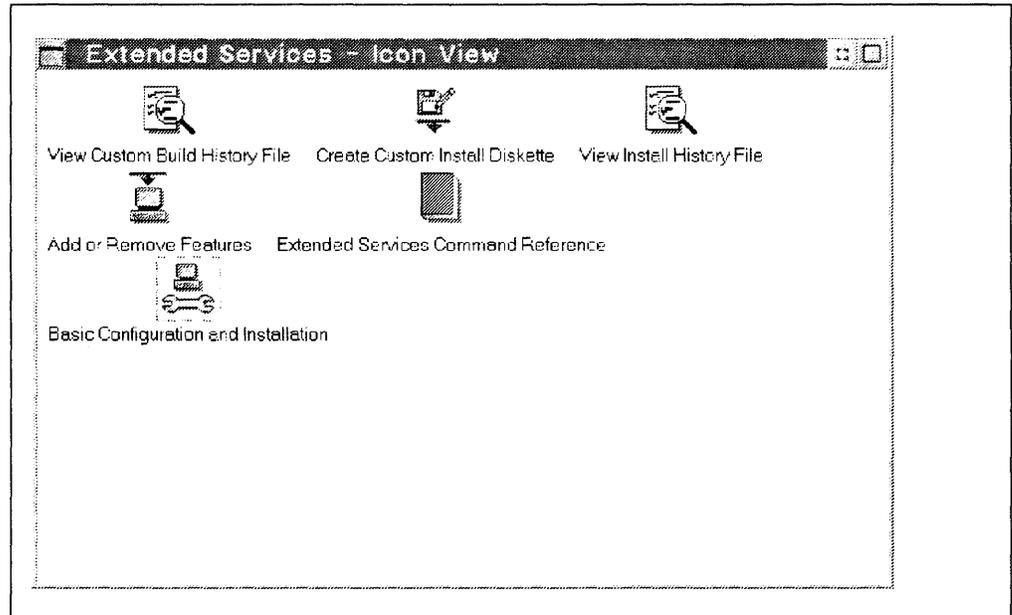


Figure 53. Extended Services - Icon View

2. Select *Create* for creating a new configuration file.

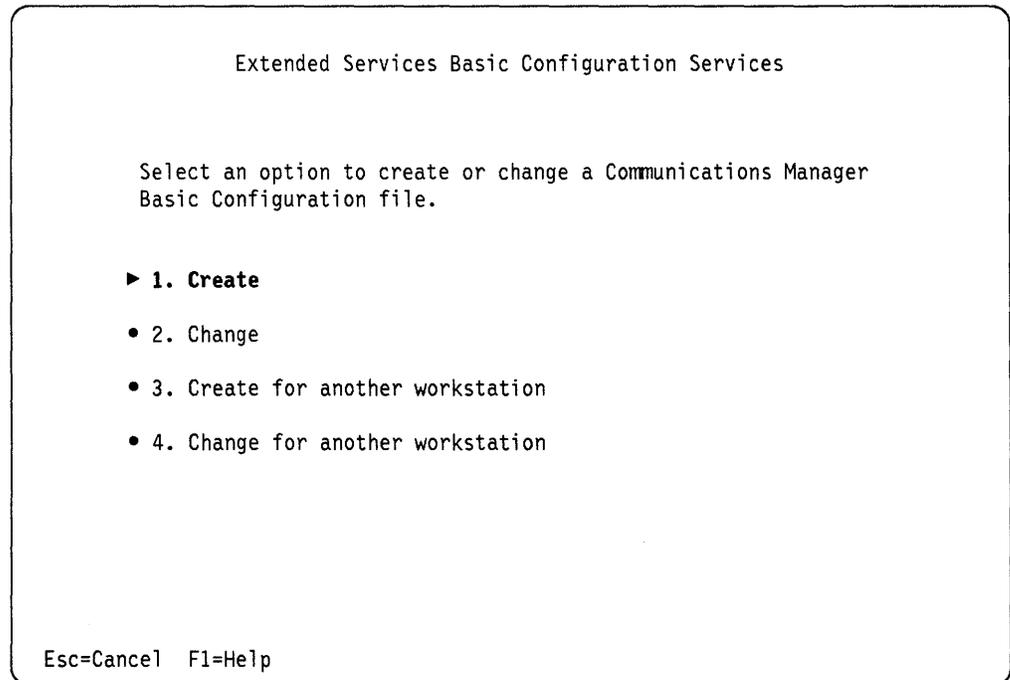


Figure 54. Extended Services Basic Configuration Services

3. Enter a configuration file name.

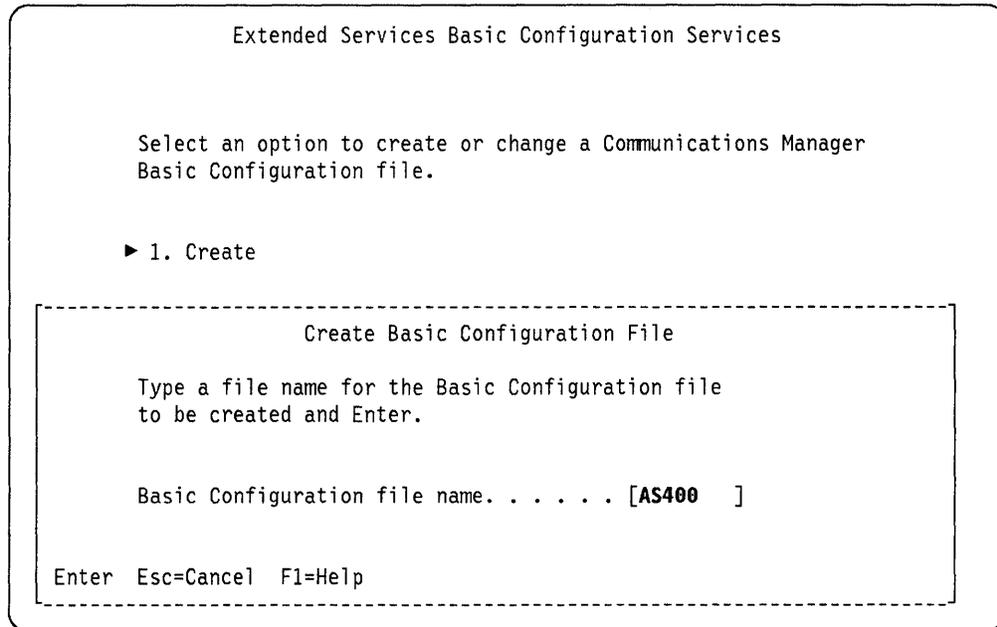


Figure 55. Create Basic Configuration File

4. Enter a description of your configuration file.

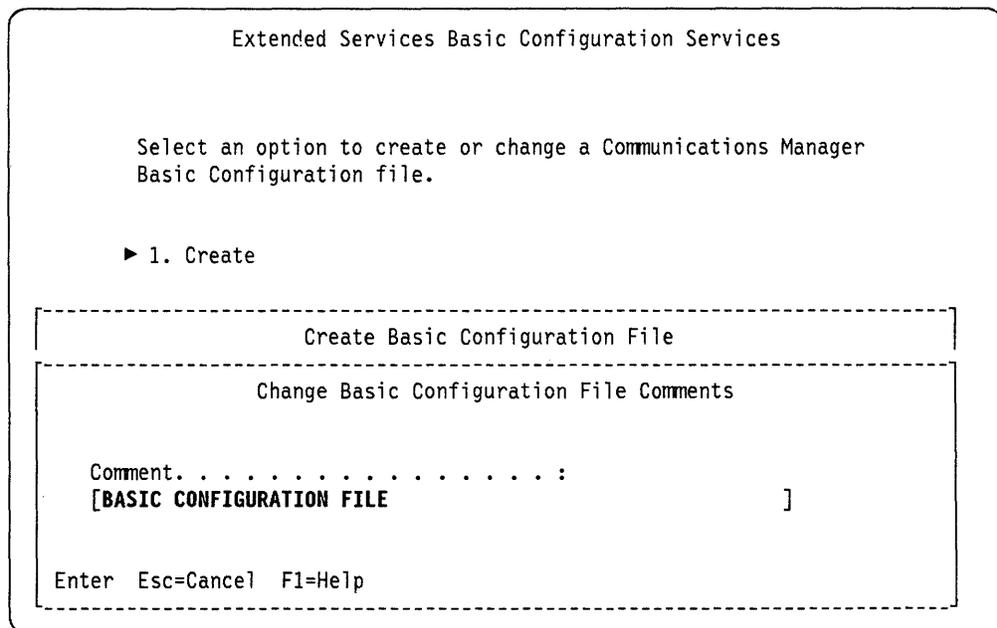


Figure 56. Change Basic Configuration File Comments

5. Select *5250 Work Station Feature* for AS/400 configuration.

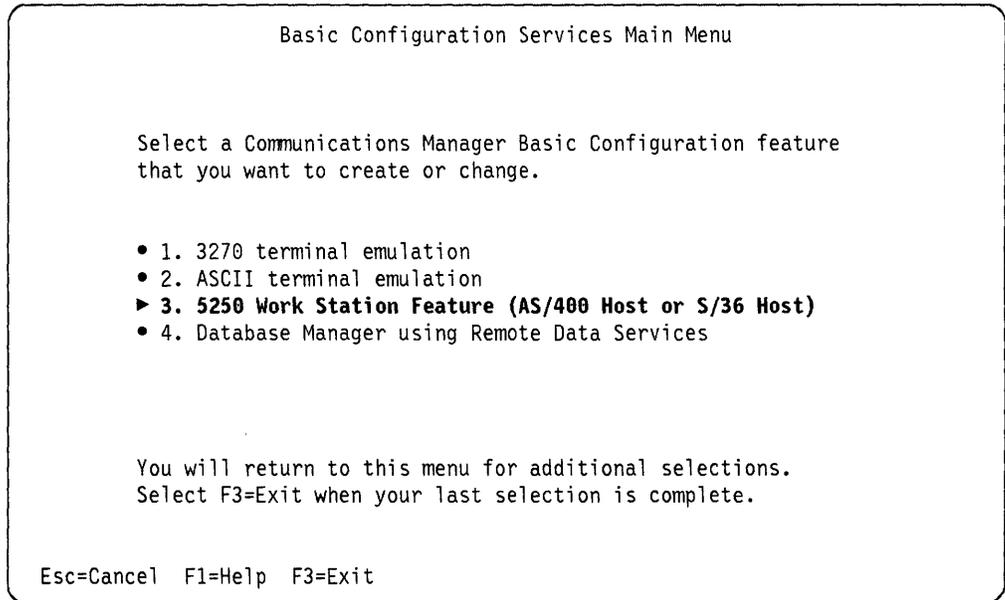


Figure 57. Basic Configuration Services Main Menu

6. Select the number of 5250 emulation sessions you will create. Make a selection to start all sessions automatically, and select the connection type. In our case, we used LAN (token-ring). Press the **Enter** key when finished.

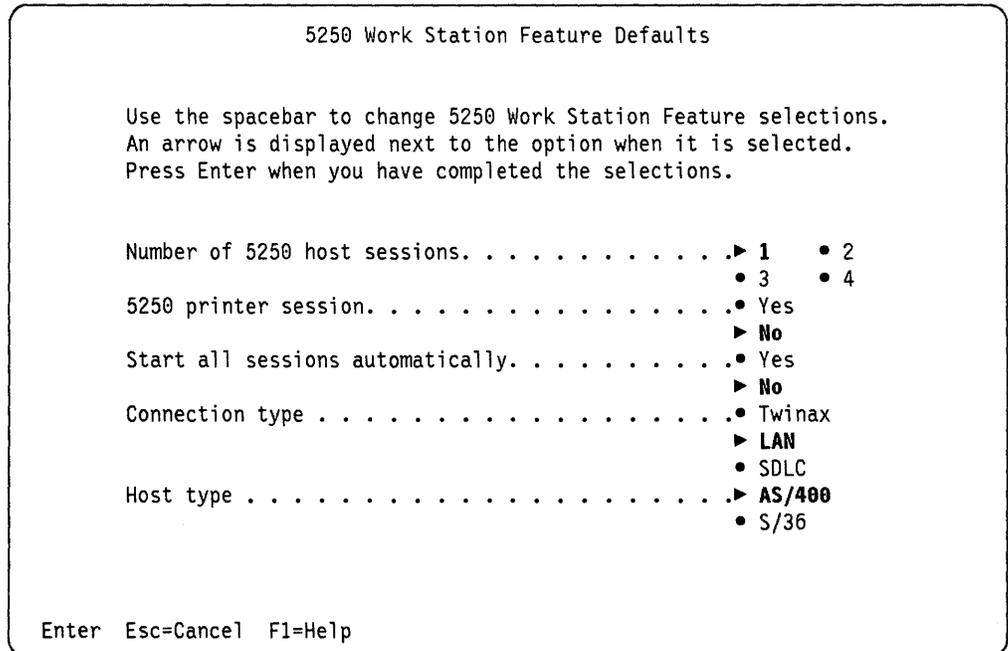


Figure 58. 5250 Work Station Feature Defaults

7. Select the network type.

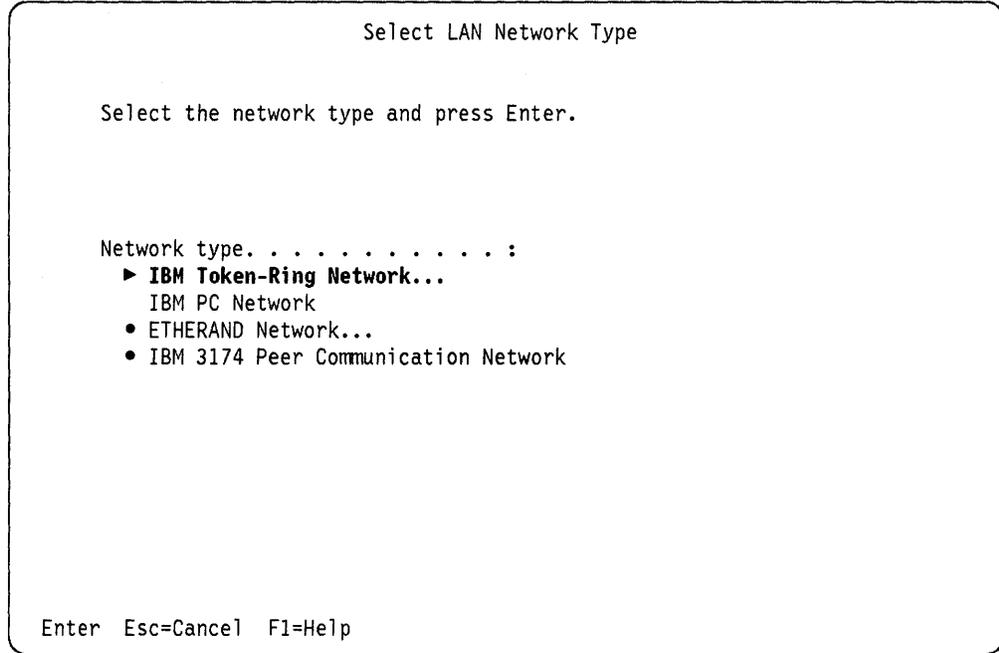


Figure 59. Select LAN Network Type

8. In the following panel, you should specify the type of token-ring address used. If you select **Use universal address**, you will skip the screen in Figure 61 on page 79.

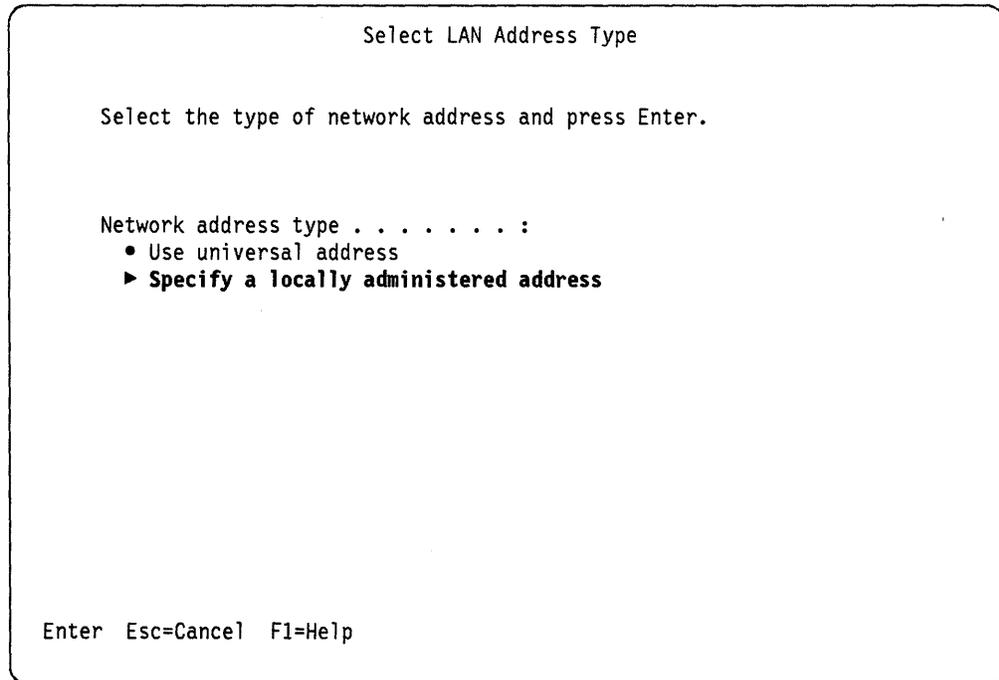


Figure 60. Select LAN Address Type

9. Fill in your local token-ring adapter address.

```

                                Select LAN Address Type

                                Select the type of network address and press Enter.

                                -----
                                Local LAN Adapter Address

                                The Local LAN adapter address must be unique for each
                                workstation on the LAN.

                                Type the correct Local LAN adapter address for your
                                workstation and Enter.

                                Local LAN adapter address . . . . . [40000AAA400]

                                Enter  Esc=Cancel  F1=Help
                                -----

```

Figure 61. Local LAN Adapter Address

10. Fill in the APPC definitions:

- 5250 Local LU name - your workstation name (can be any valid name)
- 5250 Partner LU name - This must match your AS/400 LCLCPNAME (Local control point name)
- 5250 Mode name - use QPCSUPP
- LAN destination address - This must match your AS/400 token ring address.

```

                                5250 Work Station Feature LAN Defaults

                                Type your specific information for the 5250 Work Station Feature
                                and Enter.

                                5250 Local LU name . . . . . [CID400 ]
                                5250 Partner LU name . . . . . [CIM400 ]
                                5250 Mode name . . . . . [QPCSUPP ]

                                LAN destination address . . . . . [400000009999]

                                Note: The ETHERAND address format may need to be reversed.
                                Press F1 for more information.

                                Enter  Esc=Cancel  F1=Help

```

Figure 62. 5250 Work Station Feature LAN Defaults

11. Enter your specific configuration network information as shown below:

- Local node name - any valid name
- Network ID - your network IDentification
- Local node ID use **00000**.

```
Configuration Network Defaults

Enter to use the configuration defaults displayed below
or type your specific information and Enter.

Local node name. . . . . [CID400 ]
Network ID . . . . . [APPN ]
Local node ID (in hex) . . . . . [00000]

Enter Esc=Cancel F1=Help
```

Figure 63. Configuration Network Defaults

12. Press the **F3** key to exit.

```
Basic Configuration Services Main Menu

Select a Communications Manager Basic Configuration feature
that you want to create or change.

• 1. 3270 terminal emulation
• 2. ASCII terminal emulation
▶ 3. 5250 Work Station Feature (AS/400 host or S/36 Host)
• 4. Database Manager using Remote Data Services

You will return to this menu for
Select F3=Exit when your last sel

5250 Work Station Feature
configuration has successfully
completed. Select another
feature or select F3=Exit.

Esc=Cancel F1=Help F3=Exit
```

Figure 64. Basic Configuration Services Main Menu

The following screen will appear while the configuration is in progress.

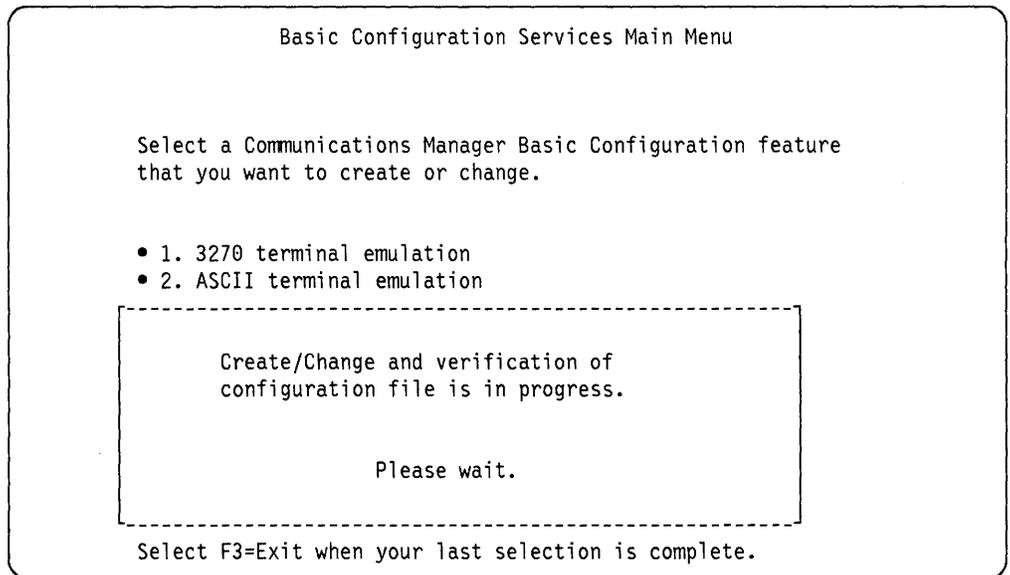


Figure 65. Create/Change and Verification of Configuration File

13. Select option 1 to set up your configuration from the following Communications Manager panel.

**Note**

You may be asked for Extended Services 1.0 diskettes.

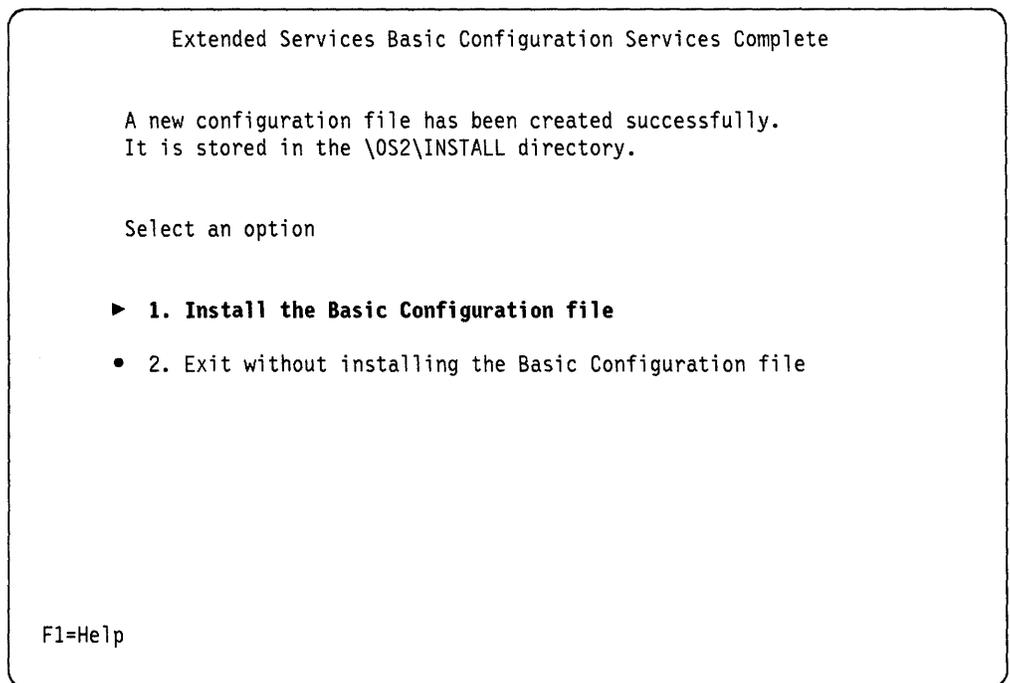


Figure 66. Extended Services Basic Configuration Services Complete

14. Press the **F3** key to exit.

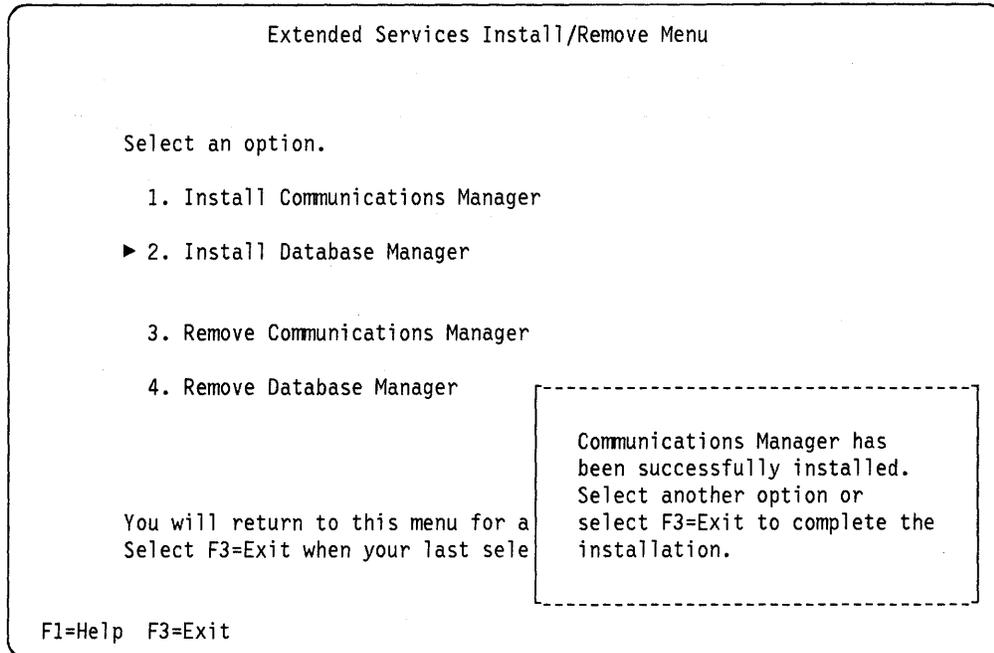


Figure 67. Communications Manager Has Been Successfully Installed

15. Shutdown your workstation.

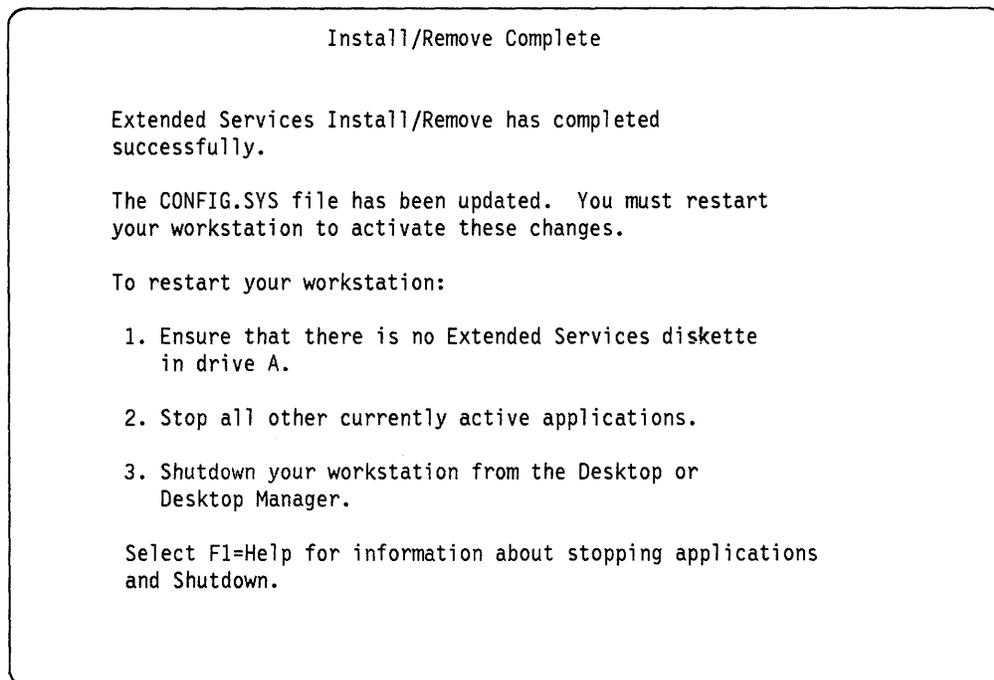


Figure 68. Shutdown Your Workstation

## 6.2.2 PC Support/400 Installation

In order to install the PC Support/400, you must have the product diskette available. Issue the following installation command at the command prompt:

**[C:\]a:install**

The following steps will guide you through the installation process:

1. At the PC Support/400 Installation screen, press the **Enter** key.

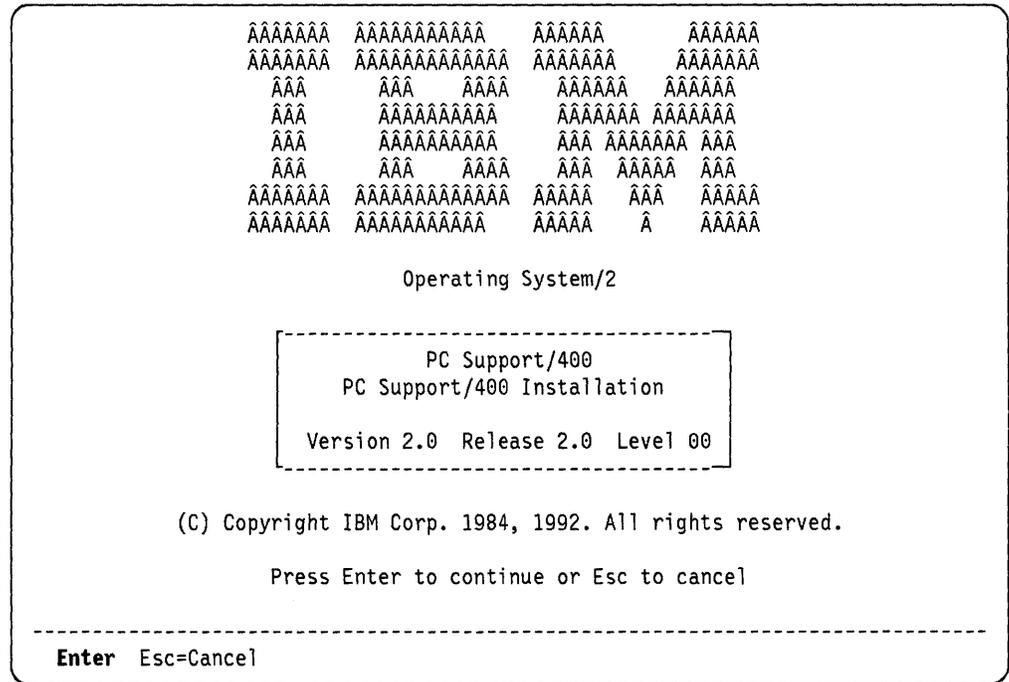


Figure 69. PC Support/400 Installation Screen



The following screen will appear only if you have not selected to automatically start any PC Support/400 functions.

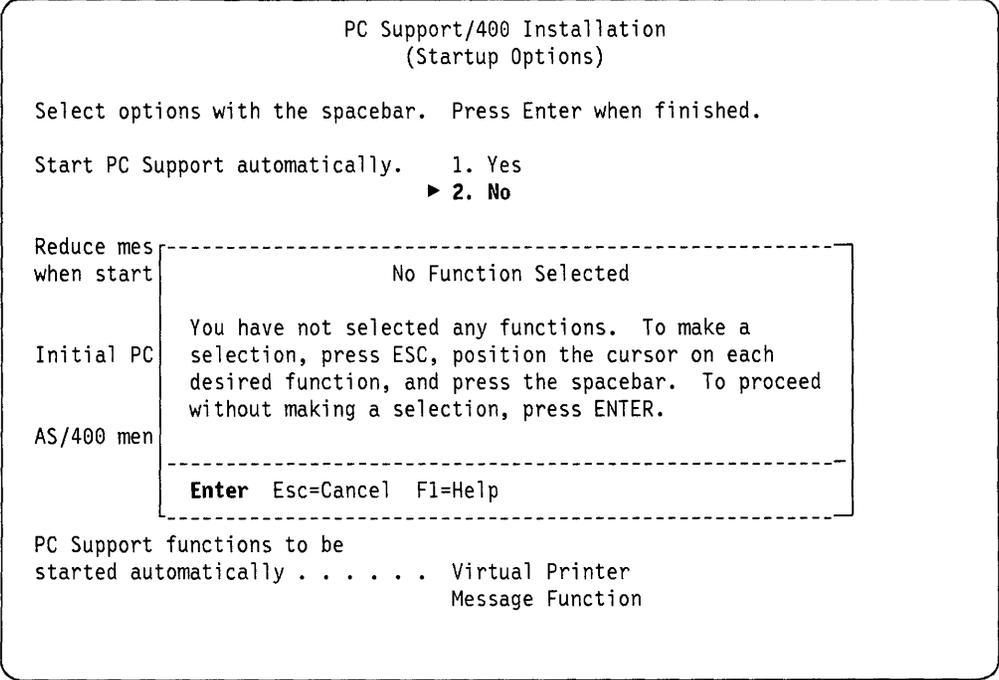


Figure 72. PC Support/400 Installation (Startup Options)

4. Accept the default Local and Partner LU.

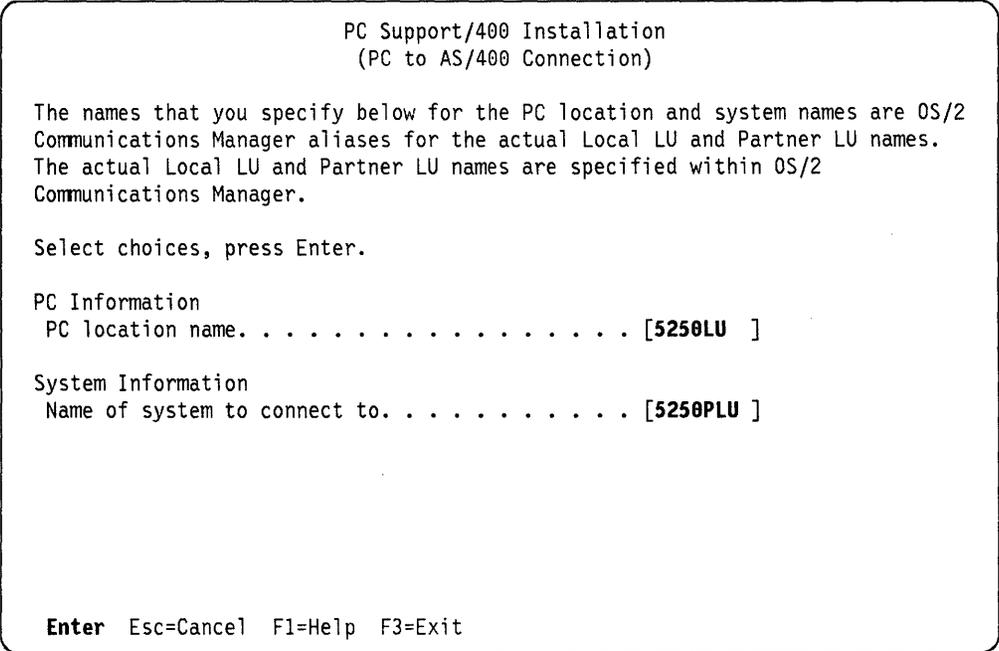


Figure 73. PC to AS/400 Connection

5. Press the **Enter** key to begin copying the PC Support/400 files.

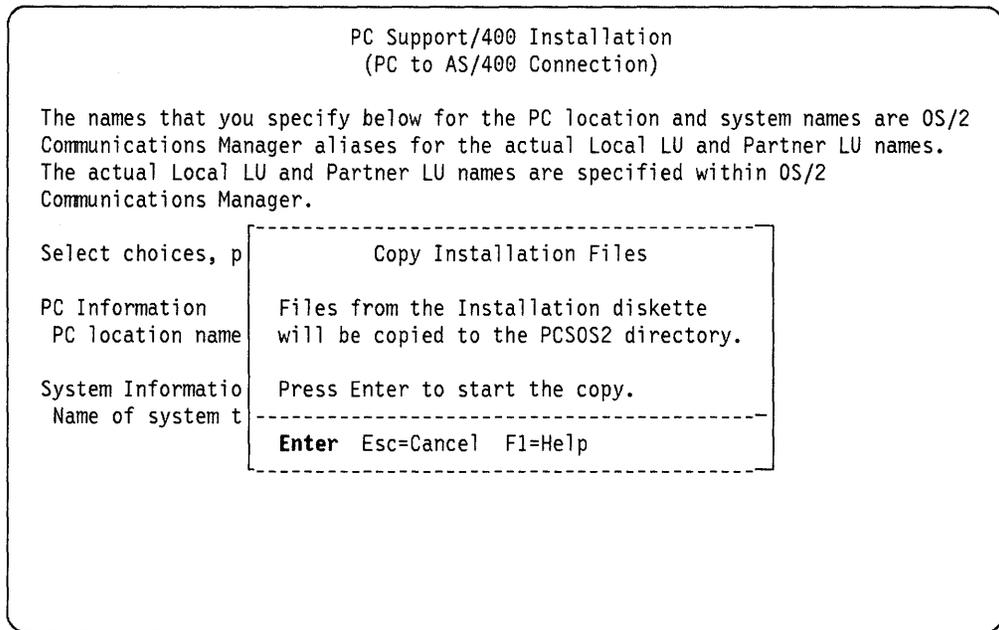


Figure 74. Copy Installation Files

Figure 75 is displayed while the files are being copied.

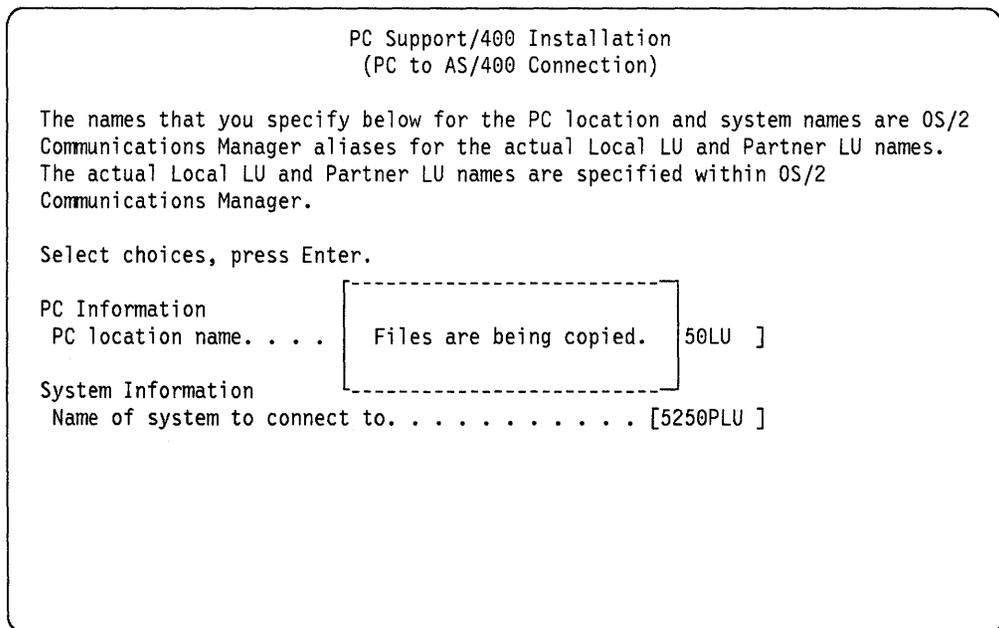


Figure 75. Files Are Being Copied

6. The installation is complete after all of the files are copied. Press the **Enter** key.

```
PC Support/400 Installation
(Completion)

PC Support installation has completed successfully.

PC Support files have been created and placed into the PCSOS2 directory
on the C drive.

To use the PC Support functions, you must restart your personal computer.

After restarting your personal computer, start the communications manager
program. Then either type STARTPCS at the command prompt or select
"PC Support/400" from the desktop group/folder and then select
"Start PC Support."

To modify your PC Support setup, use the configuration program (CFGPCS).

-----
Enter Esc=Cancel F1=Help F3=Exit
```

Figure 76. PC Support/400 Installation (Completion)

7. Exit the installation.

```
PC Support/400 Installation
(Completion)

PC Support installation has completed successfully.

PC Support files have been created and placed into the PCSOS2 directory
on the D drive.

To use the PC Support functions, you must restart your personal computer.

PC Support will be sta ► 1. Exit installation
                       2. Resume installation
Verify that the commun ----- started before you
enter your User ID for Enter Esc=Cancel F1=Help

To modify your PC Support setup, use the configuration program (CFGPCS).
```

Figure 77. Exit Installation

8. Remove your PC Support/400 diskette. Shutdown and reboot your system so that the changes in the CONFIG.SYS file on the client machine are activated.

Figure 78 shows changes made by the PC Support/400 product's installation to the CONFIG.SYS file of the client workstation.

```
SET VIO_XGA=DEVICE(BVHVGA,BVHXGA)
SET VIDEO_DEVICES=VIO_XGA
IFS=C:\OS2\HPFS.IFS /CACHE:64 /CRECL:4
PROTSHELL=C:\OS2\PMSHELL.EXE
SET USER_INI=C:\OS2\OS2.INI
SET SYSTEM_INI=C:\OS2\OS2SYS.INI
SET OS2_SHELL=C:\OS2\CMD.EXE
SET AUTOSTART=PROGRAMS,TASKLIST,FOLDERS
SET RUNWORKPLACE=C:\OS2\PMSHELL.EXE
SET COMSPEC=C:\OS2\CMD.EXE
LIBPATH=C:\IBMCOM\DLL;C:\IBMLAN\NETLIB;C:\MUGLIB\DLL;. ;C:\OS2\DLL;
C:\SQLLIB\DLL;C:\OS2\MDOS;C:\CMLIB\DLL;C:\;C:\OS2\APPS\DLL;
D:\PCSOS2;
SET
PATH=C:\IBMLAN\NETPROG;C:\OS2;C:\MUGLIB;C:\SQLLIB;C:\OS2\SYSTEM;
C:\OS2\MDOS\WINOS2;C:\OS2\INSTALL;C:\;C:\OS2\MDOS;C:\OS2\APPS;
C:\SRVIFSRQ;C:\CMLIB;C:\CMLIB\APPN;D:\PCSOS2;
SET
DPATH=C:\IBMCOM;C:\IBMLAN\NETPROG;C:\IBMLAN;C:\SRVIFSRQ;C:\OS2;C:\MU
GLIB\DLL;C:\SQLLIB;C:\CMLIB;C:\CMLIB\APPN;C:\OS2\SYSTEM;C:\OS2\MDO
S\WINOS2;C:\OS2\INSTALL;C:\;C:\OS2\BITMAP;C:\OS2\MDOS;C:\OS2\A
PPS;
SET PROMPT=$I[$P]
.
.
.
RUN=C:\IBMCOM\LANMSGEX.EXE
DEVICE=C:\CMLIB\ASYNCDDE.SYS NETBIOSD
DEVICE=C:\CMLIB\APPN\CMKFMDE.SYS
SET EHNL=2924
SET EHNP=D:\PCSOS2
IFS=D:\PCSOS2\EHNSFLO.DLL
RUN=D:\PCSOS2\UPDATEP2.EXE
```

Figure 78. CONFIG.SYS File for PC Support

9. After rebooting your system, start PC Support/400. This is accomplished by entering the following command:

**D:\PCSOS2\STARTPCS**

**Note**

You must use a user ID and password which are currently defined in the AS/400 directory.

The first time you start PC Support your files will be updated to the same level as your AS/400. This will also happen when you update your code on your AS/400. (For example, PTFs or a new version/release).

### 6.2.3 CID Installation and Setup

Now you are ready to prepare the CID code server. Please refer to Chapter 7, "CID Code Server Preparation" on page 91 for the detailed information.

Figure 79 shows the CID code server definition file named AS400CID.INI.

```
;
!  
@  
#  
Adapter = 0  
MaxClients=5  
MaxFiles = 102  
Name=AS400CID  
Groupname=No  
ClientWorkers=8  
;Authlist = dynamic,testlog.cmd  
;  
;  
; Path,PerClient,PermitWrite keywords are for compatibility only  
; and are still REQUIRED  
;  
; Please use the new Alias Support instead  
;  
; These keywords apply to the INTERNAL Alias named 'Default'  
;  
Path=I:\lancid  
PerClient=No  
PermitWrite = No  
;  
Alias= readwrite,single,log,D:\lancid\log  
Alias= readonly,PerClient,prtrsp,I:\lancid\rsp\rmpi
```

Figure 79. AS400CID.INI File

### 6.2.4 Startup Procedure for the CID Code Server

The following steps show the startup procedure:

- Boot the OS/2 operating system on the CID code server workstation
- Start Communications Manager
- Start PC Support/400
- Issue the following command to activate the CID code server:

```
SERVICE /INI=AS400CID
```



---

## Chapter 7. CID Code Server Preparation

---

### 7.1 Preparation of the CID Environment Using Host DASD

This chapter will describe the preparation of the CID code server using the manual step-by-step procedure. The manual preparation of the CID Code Server will also be explained so that you will get a better feeling of how CID really works for problem determination. For more information read the documents from the *GBOF-2224* series. These documents specifically the *Automated Installation for CID Enabled OS/2 V2.x* gives you even more details about the manual preparation.

The recommended way how to install the CID code server environment is the **automated** method using the **CASSETUP** of NTS/2 or the **SRVSETUP** of the sample code diskettes which accompany the *GG24-3783-01* and *GG24-3977-00* documents; specifically for the creation of CID environment for the LAN Server 3.0, TCP/IP and Novell NetWare server is recommended to use the SRVSETUP utility.

This chapter does not describe the manual preparation of the CID code server running in the TCP/IP and Novell NetWare environments. See the *GG24-3977* document for the detailed information.

In order to create the response file and the LCU command files use the LAN NetView Start product for the automated creation of these files.

---

### 7.2 PC Hardware Requirements

The DASD space requirement is dependent on the number of products you will be installing on the client workstations. Our recommendation is approximately 100MB.

The product images require the most of the DASD space. Don't forget that you also preparing the LCU command files and CID enabled products' response files.

Special attention is required for the creation of the CID enabled products log files. The recommendation is to create them at the local LAN Server 3.0 or Novell NetWare server DASD. The reason for this action is the nature of the connection establish between the FEP and the host. If this link is or the host itself is down, you as an administrator has no access to the log files.

---

### 7.3 The Directory Structure

In any CID environment, care should be taken in designing the directory structure. The recommended directory structure can be used for both host DASD or the local disk storage space. It is recommended to create the following directory structure which is shown in Figure 80 on page 92:

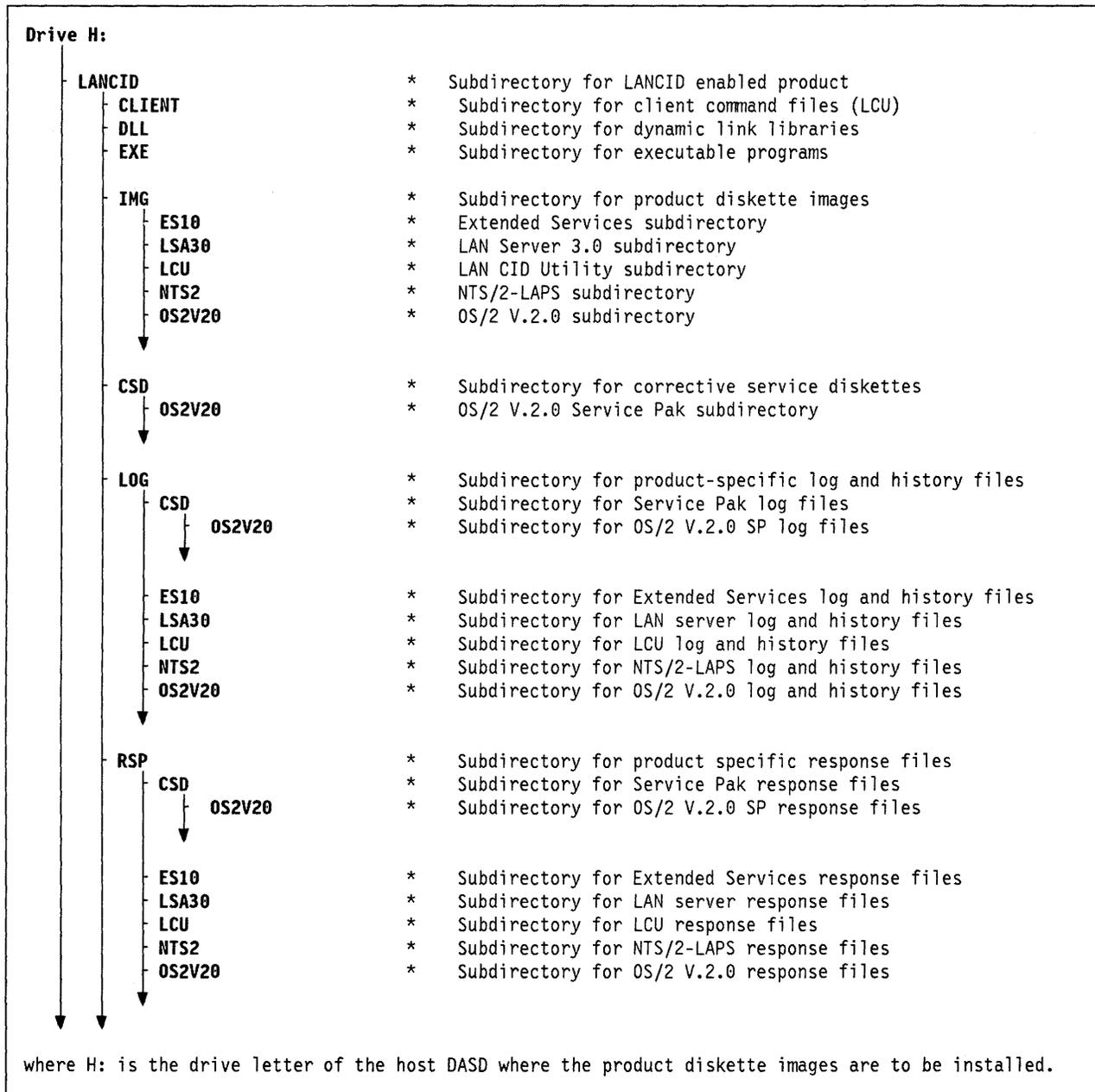


Figure 80. Example of a CID Code Server Directory Structure

## 7.4 Loading OS/2 V2.x CID Utilities to the CID Code Server

Unpack the CID File which resides on **Diskette 7** of OS/2 V2.x into the code server subdirectory \CID\EXE.

```
UNPACK A:\LANCID H:\LANCID\EXE
```

Figure 81. UNPACK Command

In order to extract the executable files SEMAINT, SEINST, SEDISK and SEIMAGE repeat the UNPACK command with the syntax showed above.

Pay the attention in case of OS/2 V2.0 for the usage of the latest version of RSPINST and SEINST utilities. That is the reason why the Service Pak diskettes are mentioned. The OS/2 V2.1 operating system has already the appropriate level of these utilities.

Extract the file RSPINST.EXE from OS/2 V.2.0 **Service Pak Diskette 6** into the CID server subdirectory \LANCID\EXE.

```
UNPACK A:\FIX\OS2\RSPINST* H:\LANCID\EXE.
```

Figure 82. UNPACK Command to Extract RSPINST.EXE

Extract the file SEINST.EXE from OS/2 V.2.0 **Service Pak Diskette 11** into the CID server subdirectory \LANCID\EXE.

```
UNPACK A:\FIX\OS2\SEINST* H:\LANCID\EXE
```

Figure 83. UNPACK Command to Extract SEINST.EXE

---

## 7.5 Loading the OS/2 V2.0 Diskette Images

In order to transfer the OS/2 V2.x product diskette images onto the CID server DASD invoke the following command:

```
H:\LANCID\EXE\SEIMAGE /S:A: /T:H:\LANCID\IMG\OS2V20
```

Figure 84. SEIMAGE Command

Insert the product diskettes as prompted.

---

## 7.6 Loading the OS/2 V2.0 Service Pak Diskette Images

In order to transfer OS/2 V.2.0 Service Pak diskettes into the CID server execute the XCOPY command as many times as there are Service Pak diskettes.

```
CD \LANCID\CSD\OS2V20  
XCOPY A: H: /s /e
```

Figure 85. XCOPY Command for Transferring OS/2 V.2.0 Service Pak

Copy all service diskettes invoking the XCOPY command diskette by diskette.

---

## 7.7 Loading the Extended Services or Communications Manager/2

Diskette Images

In order to transfer the Extended Services product diskette images into the CID server, you must use the **ES CID Utility Diskette**. The ESCID diskette can be ordered under the publication number S96F-8378-00. Insert this diskette in drive A: and invoke:

```
A:\ESAIMAGE H:\LANCID\IMG\ES10
```

Figure 86. ESAIMAGE Command

;p.The Communications Manager/2 diskette can be loaded by using the CMIMAGE utility which resides on the product diskettes.

```
A:\CMIMAGE H:\LANCID\IMG\ES10
```

Figure 87. CMIMAGE Command

Insert the product diskettes as prompted.

---

## 7.8 Loading the Database 2 /2 Diskette Images

In order to transfer DB2/2 diskettes into the CID server execute the XCOPY command as many times as there are DB2/2 diskettes.

```
CD \LANCID\IMG\DB22  
XCOPY A: H: /s /e
```

Figure 88. XCOPY Command for Transferring DB2/2 Diskettes

Copy all DB2/2 diskettes invoking the XCOPY command diskette by diskette.

---

## 7.9 Loading the NTS/2-LAPS Diskette Image

In order to transfer the NTS/2-LAPS product diskette image into the CID server, insert the **first** NTS/2 diskette in drive A: and invoke the following command:

```
A:\LAPSDISK A: H:\LANCID\IMG\NTS2
```

Figure 89. LAPSDISK Command

---

## 7.10 Loading the IBM LAN Server V3.0 Diskette Images

In order to transfer the IBM LAN Server V3.0 product diskette images into the CID server, insert the first product's server diskette in drive A: and invoke the following command:

```
A:\LANINST
```

Figure 90. LANINST Command

Continue as follows:

1. When the IBM logo is displayed, select **OK**.
2. Select Advanced on the "Basic or Advanced Installation/Configuration" window. The Installation Task window is displayed (Figure 91 on page 95).

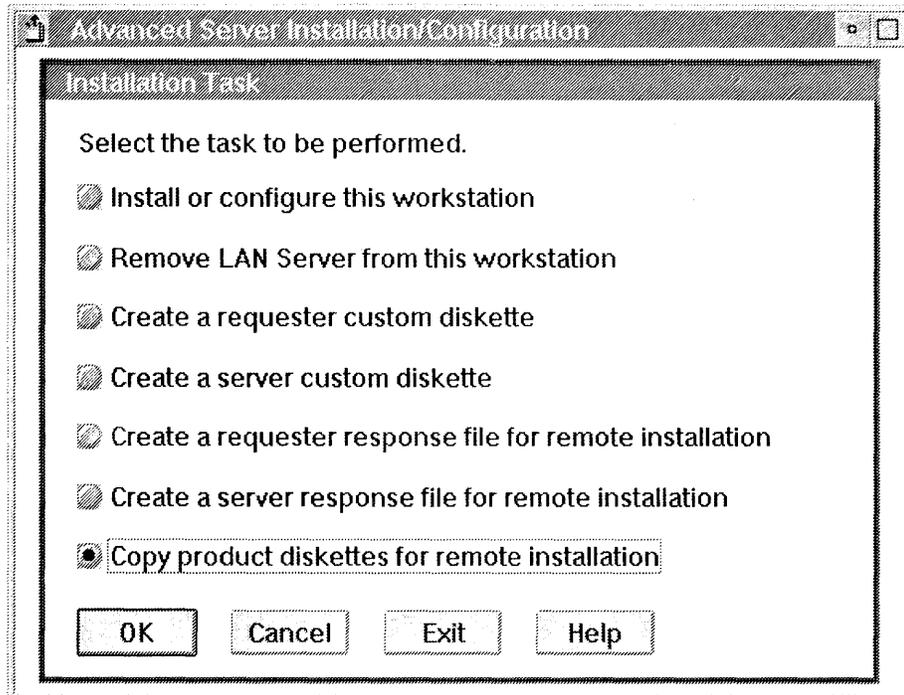


Figure 91. Installation Task Window within Advanced Server Installation/Configuration Window

3. Select **Copy product diskettes for remote installation** in order to copy the product diskettes into the CID server. Select **OK**. The Copy Product Diskettes window is displayed (Figure 92).



Figure 92. Copy Product Diskettes Window within Copy Product Diskettes for Remote Installation Window

4. Select LAN Services or LAN Services and DOS. DOS would be selected if the CID installation process will distribute a LAN Server supporting DOS remote IPL. Select **OK**.
5. If DOS was selected in the previous step, the following versions of IBM DOS are supported:
  - IBM DOS Version 5.0 and 3.3

**Note:** If you select to install DOS 5.0, you will have to create an DOS 5.0 Startup Diskette prior to this step. A DOS 5.0 Startup Diskette can be created simply by installing DOS 5.0 onto a diskette.

6. Enter the path H:\LANCID\IMG\LSA30 on the Remote Install Subdirectory window where the LAN Server V3.0 product diskette images are being copied. Select **OK** to start the copying process.
7. Insert product diskettes as prompted.

---

## 7.11 Loading the LAN CID Utility and SRVIFS Diskette Images

In order to transfer the LAN CID Utility and SRVIFS product diskette images into CID server insert the **second** diskette of Network Transport Services/2 in drive A: and execute:

```
COPY A:\LCU\*.* H:\LANCID\IMG\LCU
COPY A:\APPLETS\CAS*.* H:\LANCID\IMG\LCU
COPY A:\SRVIFS\*.* H:\LANCID\IMG\LCU
COPY A:\SAMPLE\SERVPK.COM H:\LANCID\IMG\LCU\CASSKEL.COM
```

Figure 93. Transfer Commands for LCU and SRVIFS

---

## 7.12 Enabling the CID Code Server

Using the workstation as a CID code server you have to enable it by installing the following:

1. LAN Adapter Protocol Support
2. SRVIFS Redirection Utility

---

## 7.13 Install and Customize NTS/2-LAPS

In order to install LAPS on your workstation invoke the following command:

```
H:\LANCID\IMG\NTS2\LAPS
```

Figure 94. LAPS Install Command

Respond to the LAPS customization panels as follows:

Select **Install** at the LAN Adapter and Protocol Support window  
Enter **Target drive** at the Target Drive window  
Select **OK** at the Target Drive window  
Select **OK** at the Installation Complete window  
Select **Configure** at the LAN Adapter and Protocol Support window  
Select **Configure LAN transports** at the Configuration window  
Select **Continue...** at the Configuration window

**Note**

If an earlier version of LAPS is installed, you are prompted to upgrade it. In this case select, **Yes** at the confirmation pop-up window.

The Configure Workstation window is displayed.  
Select the **IBM Token-Ring Network Adapters** or the adapter you are actually using at the Network Adapters window  
Select **Add** (it will appear in the Current Configuration window)  
Select **IBM IEEE-802.2** at the Protocols window column  
Select **Add** (it will appear in Current Configuration window)  
Select **IBM OS/2 NetBIOS** at the Protocols window column  
Select **Add** (it will appear in the Current Configuration window)

**Note**

If you are using a locally administered addressing scheme, then select **IBM Token-Ring Network Adapter** at the current Configuration window Select **Edit**  
Enter the locally administered address in the **Network adapter address** field  
Select **OK**

Select **OK**  
Select **Exit** at the LAN Adapter and Protocol Support window  
Choose drive C to update at the CONFIG.SYS Updates window  
Select **Continue...** at the CONFIG.SYS Updates window  
Select **OK** after CONFIG.SYS has been updated  
Select **Exit** at the Exiting LAPS window and follow the shutdown instructions

Figure 95. Responses for Installing LAPS on Your Workstation

---

## 7.14 Install and Customize the SRVIFS Server

Now we have to define the SERVICE.INI a file there the SRFIFS server environment is defined. Use any ASCII editor to create and customize the SRVIFS .INI file. Store the file on C:\SRVIFS drive. This is the drive used to install SRVIFS. The host-defined drive is H:. (You can adapt this to your environment).

```
NAME=svname
GROUPNAME=NO
ADAPTER=0
MAXCLIENTS=5
MAXFILES=200
CLIENTWORKERS=10
PATH=H:\
PERMITWRITE=NO
PERCLIENT=NO
ALIAS=READONLY,SINGLE,IMAGES,H:\LANCID
ALIAS=READWRITE,SINGLE,LOGFILES,H:\LANCID\LOG
```

Figure 96. SERVICE.INI

The first file alias named IMAGES points to the subdirectory where all CID dependent files are stored giving read only access. The second file alias named LOGFILES points to the log file subdirectory giving read and write access. All other files need read only permission. In this example H:\ is the drive of the host DASD. This drive ID can be adapted to your systems requirements.

The next step is to install SRVIFS by invoking following command:

```
H:\LANCID\IMG\LCU\THINSRV /R:C:\SRVIFS\SERVICE.INI
                          /T:C:\SRVIFS
                          /S:H:\LANCID\IMG\LCU
                          /TU:C:\
```

Figure 97. THINSRV Installation Command

---

## 7.15 Additional Necessary Files for the Code Server

Various products require additional executable and DLL type files. The following commands will install these files to your CID code server. These files need to be copied to predefined subdirectories.

REXX is required on the code server to run the LCU command files which are written in the procedure language REXX.

Remember that the files you use for installing OS/2 should only be used from the directory set up on the host DASD. The operating system that you are using doesn't have to be the same as the one you are trying to install. The REXX modules on the host DASD Images are the ones you must use.

Invoke the following commands:

```

H:\LANCID\IMG\LCU\GETREXX H:\LANCID\IMG\OS2V20 H:\LANCID\DLL
H:\LANCID\IMG\LCU\GETBOOT H:\LANCID\IMG\OS2V20 H:\LANCID\EXE

COPY H:\LANCID\IMG\LCU\SRVREXX.EXE H:\LANCID\EXE

COPY H:\LANCID\IMG\OS2V20\DISK_1\FDISK.COM H:\LANCID\EXE
COPY H:\LANCID\IMG\OS2V20\DISK_2\FORMAT.COM H:\LANCID\EXE
COPY H:\LANCID\IMG\OS2V20\DISK_2\CHKDSK.COM H:\LANCID\EXE

COPY H:\LANCID\IMG\NTS2\PKUNZIP2.EXE H:\LANCID\EXE

COPY H:\LANCID\IMG\LCU\CASAGENT.DLL H:\LANCID\DLL
COPY H:\LANCID\IMG\LCU\CASAGENT.EXE H:\LANCID\EXE

COPY H:\LANCID\IMG\OS2V20\DISK_0\UHPFS.DLL H:\LANCID\DLL

```

Figure 98. Copying Additional Necessary Files

The CID code server preparation is now complete.

## 7.16 Creating Boot Diskettes for the Client Workstations

We need to build client boot diskettes for diskette-initiated workstations. You will need two 1.44MB formatted diskettes to do this. First, insert one diskette in the diskette drive A: and invoke the following command:

```
H:\LANCID\EXE\SEDISK /S:H:\LANCID\IMG\OS2V20 /T:A:
```

Figure 99. SEDISK Command

Leave the second diskette in the diskette drive and invoke:

```
H:\LANCID\IMG\NTS2\THINLAPS H:\LANCID\IMG\NTS2 A: IBMTOK.NIF
```

Figure 100. THINLAPS Command

Continue installing the SRVIFS requester utility by invoking:

```

H:\LANCID\IMG\LCU\THINIFS /S:H:\LANCID\IMG\LCU
                        /T:A:
                        /REQ:*P
                        /D:X
                        /SRV:\\srvname\IMAGES

H:\LANCID\IMG\LCU\THINIFS /S:H:\LANCID\IMG\LCU
                        /T:A:
                        /REQ:*P
                        /D:Y
                        /SRV:\\srvname\LOGFILES

```

Figure 101. THINIFS Commands

**Remarks:**

- THINIFS is executed twice because of the two redirected drives X: and Y: which point to the host DASD aliases IMAGES and LOGFILES.
- The parameter /REQ:\*P prompts the user to enter the client name when IPLing with these prepared boot diskettes.

Now change to the host DASD's drive and change to the subdirectory H:\LANCID\IMG\LCU and enter the CASINSTL command:

```
CASINSTL /TU:A:\ /CMD:X:\CLIENT /D
        /PL:X:\DLL;X:\IMG\LCU;
        /PA:X:\EXE
        /0
        /L2:Y:\LCU\SRVIFS_REQ.LOG
```

*Figure 102. CASINSTL Command*

If you followed all the steps described above, your CONFIG.SYS on the **second** boot diskette should look like as exposed in Figure 103 on page 101:

```

buffers=32
iop1=yes
memman=noswap
protshell=sysinst1.exe
set os2_shell=cmd.exe /K A:\STARTUP.CMD
diskcache=64,LW
protectonly=yes
libpath=.;\;X:\DLL;X:\IMG\LCU;
ifs=hpfs.ifs /c:64 /AUTOCHECK:C
pauseonerror=no
codepage=437
country=001,country.sys
devinfo=kbd,us,keyboard.dcp
devinfo=scr,ega,vtbl850.dcp
device=\dos.sys
set path=\;\os2;\os2\system;\os2\install;a;;
set dpath=a;\;\os2;\os2\system;\os2\install;X:\DLL;X:\IMG\LCU;
set keys=on
basedev=print01.sys
basedev=ibm1flpy.add
basedev=ibm1s506.add
basedev=ibm2flpy.add
basedev=ibm2adsk.add
basedev=ibm2scsi.add
basedev=ibmint13.i13
basedev=os2dasd.dmd
device=\testcfg.sys
rem *** Start of ThinLAPS additions ***
device = lanmsgdd.os2
device = protman.os2
device = netbeui.os2
device = netbios.os2
device = IBMTOK.OS2
run = netbind.exe
run = lanmsgex.exe
CALL=a:\SRVATTCH.EXE X: srvname
DEVICE=a:\SRVIFS.SYS
IFS=a:\SRVIFSC.IFS *P /T /NS:2
CALL=a:\SRVATTCH.EXE Y: \\srvname\LOG
RUN=X:\EXE\SRVREXX.EXE

```

Figure 103. CONFIG.SYS on the Second Boot Diskette

The STARTUP.CMD is also updated by the execution of CASINSTL command. See the Figure 104.

```

H:\EXE\CASAGENT.EXE /CMD:H:\CLIENT /D /L1:Y:\LCU\SRVIFS_REQ.LOG
CMD
EXIT

```

Figure 104. STARTUP.CMD on the Second Boot Diskette

Now you are ready to create client-dependable product-specific response files.

---

## 7.17 Creating Product-Specific Client Response Files

This section describes how to create product-specific client response files. There are different ways for creating the response files. One way is the manual editing of a template response file, another and the recommended way is to use LAN NetView Start product. For detailed information study specifically the GG24-3781, GG24-3783 and GG24-3977 documents from the GBOF-2224 series about the automated installation for the CID enabled products.

The response file general basics:

- A response file is a flat ASCII file which can be edited.
- Comments are indicated with an asterisk. Any line beginning with this character will be ignored including blank lines.
- Response files contain keyword=value pairs that define the entries for the installation programs.
- Statements do not have to start in the first column.
- Response file statements are not case sensitive.
- Naming conventions for the response files:
  - The client workstation name followed by the .RSP extension
  - DEFAULT.RSP
  - Another unrelated name

The LAN CID Utility has an internal mechanism which first looks for the client workstation name .RSP. If this file name is not found the DEFAULT.RSP will be used. Generally the recommendation is to use the client specific names to enable the target workstation's unique customization.

Always follow this rule through every product specific response file. Response files are stored in their product specific subdirectories on the code server. See Figure 80 on page 92.

---

## 7.18 The OS/2 V.2.x Response File

Copy the file SAMPLE.RSP from an already installed OS/2 V.2.x workstation into the code server's subdirectory H:\LANCID\RSP\OS2V2x. Rename the file, for example to WLFSCLI.RSP.

**Note**

You can find the file SAMPLE.RSP in the C:\OS2\INSTALL subdirectory of the already installed OS/2 V2.x workstation.

This sample response file should be customized in order to reflect the target workstation's unique customization.

A typical response file for installation of a OS/2 2.x base operating system looks as follows in the figure below:

```

AlternateAdapter=0
BaseFileSystem=2
CDROM=0
CountryCode=001
CountryKeyboard=US
DefaultPrinter=85
DiagnosticAids=1
DisplayAdapter=0
Documentation=1
DoseEnvironment=1
DPMI=1
ExitOnError=1
Fonts=1
FormatPartition=1
MigrateConfigFiles=0
MoreBitmaps=1
Mouse=1
MousePort=0
OptionalFileSystem=1
OptionalSystemUtilities=1
PrimaryCodePage=1
PrinterPort=1
ProcessEnvironment=1
ProgressIndication=1
RebootRequired=0
REXX=1
SerialDeviceSupport=1
SourcePath=x:\img\os2v20
TargetDrive=C:
ToolsAndGames=1
UserExit=X:\EXE\FORM.COMD

```

Figure 105. OS/2 V2.x Response Sample Response File

Carefully consider the highlighted keyword value pairs:

- **BaseFileSystem = 1** (Default = 1)  
If the disk is to be formatted with High Performance File System then BaseFileSystem = 1 must be specified. Otherwise the disk will be formatted with File Allocation Table file system.
- **DefaultPrinter = 85** (Default = 0)  
If you wish to install a default printer driver please edit the file \CID\IMG\OS2V20\PMDD\_1\PRDESC.LST on the code server. The line itself is the printer's number. If the multiple printers should be installed use the RMP1 application explained in the GG24-3783-01 document and delivered on the Sample Code diskette in the same document.
- **DiagnosticAids = 1** (Default = 1)  
If LAN Server V.3.0 is to be installed with FFST/2 then the Diagnostic Aids must be installed.
- **ExitOnError = 1** (Default = 0)  
LCU requires this setting to get control after the installation is complete.
- **Fonts = 1** (Default = 1)  
Extended Services require that the Outline fonts are installed.
- **FormatPartition = 1** (Default = 0)  
To install a pristine system set FormatPartition = 1; that means format the disk. Otherwise set the keyword equal to 0, for example if migration is wanted. The automated creation of multiple partitions is handle by DISKPRP utility delivered on the Sample Code Diskette in the document mentioned above.
- **RebootRequired = 0** (Default = 0)  
LCU requires this setting to be able to do the reboot instead of the SEINST installation program.
- **REXX = 1** (Default = 1)

REXX procedural language will installed on the target workstation's **local** disk.

---

## 7.19 The OS/2 V.2.0 Service Pak Response File

The OS/2 V.2.0 Service Pak response file may be unique for all target workstations being serviced. Using an ASCII editor, you create the file **H:\LANCID\RSP\CSD\OS2V20\WLFSCLI.RSP** and append the following lines:

```
* Next statement indicates service
:SERVICE
:DIRLIST
* No syslevel specifiers on :DIRLIST, use all eligible files
<DEFAULT>
* use default directories to update
:ENDDIRLIST
:FLAGS REPLACE_PROTECTED
```

*Figure 106. OS/2 V2.0 Service Pak's Response File*

The selective service process can be achieved by specifying the subdirectories in the response file's :DIRLIST statement.

The default response file can be found on the first OS/2 V2.0 Service Pak's diskette.

---

## 7.20 The NTS/2-LAPS Response File

In order to get a complete response file for LAN Adapter and Protocol Support, you should use the **LAPSRSP** command which resides on the first NTS/2 diskette. You can either specify your own prepared PROTOCOL.INI file, if the network configuration requires that. Otherwise the default PROTOCOL.INI file will be used. In the sample bellow the already existing PROTOCOL.INI file will be used. Pay attention to the unique local administrated addresses. The LAPS response files have to customized to reflect this. In our sample the WLFSCLI.RSP will be created.

```
A:\LAPSRSP C:\IBMCOM\PROTOCOL.INI H:\LANCID\RSP\NTS2\WLFSCLI.RSP
/T:C: /I:PRODUCT /U:NEW
```

*Figure 107. LAPSRSP Command*

The WLFSCLI.RSP response file is exposed below.

```

INST_SECTION = (
  INSTALL = product
)

PROTOCOL = (
  [PROT_MAN]

  DRIVERNAME = PROTMAN$

  [IBMLXCFG]

  LANDD_nif = LANDD.NIF
  IBMTOK_nif = IBMTOK.nif
  NETBEUI_nif = NETBEUI.nif

  [LANDD_nif]
  drivername = landd$
  bindings = ibmtok_nif
  maxtransmits = 10
  max_g_saps = 50
  NETADDRESS = "t400000c11344"

  [NETBEUI_nif]

  DriverName = netbeui$
  Bindings = IBMTOK_nif
  ETHERAND_TYPE = "I"
  netaddress = "400000c11344"
  USEADDRREV = "YES"
  SESSIONS = 40
  NCBS = 95
  NAMES = 21
  SELECTORS = 5
  USEMAXDATAGRAM = "NO"
  ADAPTRATE = 1000
  WINDOWERRORS = 0
  T1 = 30000
  T1 = 500
  T2 = 200
  MAXIN = 1
  MAXOUT = 1
  NETBIOS_TIMEOUT = 10000
  NETBIOSRETRIES = 8
  NAMECACHE = 0
  PIGGYBACKACKS = 1
  DATAGRAMPACKETS = 2
  PACKETS = 350
  PIPELINE = 5
  MAXTRANSMITS = 6
  MINTRANSMITS = 2
  DLCRETRIES = 5

  [IBMTOK_nif]

  DriverName = IBMTOK$
  PRIMARY
  netaddress = "400000c11344"
  MAXTRANSMITS = 6
  RECVBUFS = 2
  RECVBUFSIZE = 256
  XMITBUFS = 1

)

```

Figure 108. LAPS Response File

- **NETADDRESS = t400000000000** (Default = 1)  
Enter the token-ring address which you will use for your site definitions. This parameter, if specified, must be changed in three locations in this response file which are as follows: [LANDD\_nif] [NETBEUI\_nif] [IBMTOK\_nif]
- **NETBIOS\_TIMEOUT** (Default = 500)

### Note

The **NETBIOSTIMEOUT** parameter is crucial for the CID environment extended to the host DASD using the WLFS and PC Support/400 products. The value has to be balanced in the clients PROTOCOL.INI files. In our case, without the value increased to the limit of the parameter's range, the target workstation lost intermittently the NetBIOS sessions with the CID code server. In our test environment the time-out was given the value of 10000 milliseconds.

## 7.21 The Extended Services Response File

In order to create a response file for Extended Services 1.0, you may use the ESARECD utility which resides on the ESCID Utility diskette. This method is appropriate for defining DFT or non-DFT 3270 host sessions.

ESARECD extracts information from the `cfgname.CFG` file, which is in the `\CMLIB` subdirectory, and from the `cfgname.NDF` and `cfgname.CF2` files, which are stored in the `\CMLIB\APPN` subdirectory of the workstation where Extended Services is installed and working well.

The Extended Services Utilities must be installed in order to use the ESARECD utility.

If you have not installed the ES utilities, please install these utilities by invoking the REINST command from a windowed command prompt. Then continue as follows:

1. Select "Install Communications Manager" and press Enter
2. Select "Additional Features" and press Enter
3. Select "Utilities" and press Enter
4. Press PF3 and follow the instructions being displayed on the screen

**Important notice:** If your base operating system is not US- or UK-English you should edit the ESAINSTS.CMD file and change lines 1267 and 1268 from:

```
ADDRESS CMD "@echo y ' erase" bkpdir"\"*.*)" ec.redir;  
ADDRESS CMD "@echo y ' erase" bkpappn"\"*.*)" ec.redir;
```

to:

```
ADDRESS CMD "@erase" bkpdir"\"*.*/N" ec.redir;  
ADDRESS CMD "@erase" bkpappn"\"*.*/N" ec.redir;
```

Otherwise temporarily stored files would not be deleted when they were not being used anymore.

Insert the ES10 CID Utility diskette in drive A: of the workstation already installed and change to the subdirectory where Extended Services is installed (for example `C:\CMLIB`). Invoke the following command:

```
A:\ESARECD > H:\LANCID\RSP\ES10\WLFSCLI.RSP
```

Figure 109. ESARECD Command

The response file created by ESARECD unfortunately is not complete. Depending on the desired remote installation of Extended Services, you will have to add the following keyword-value pairs manually by using an ASCII editor. The response file should start with:

```
CMUpdateType=1
DBUpdateType=1
CMModelCFG=X:\RSP\ES10\ACSCFG.CFG
CMUserCFG=WLFSCLI
```

Type = 1 means "New Installation", Type = 2 would mean "Migration from a previous release".

**Note:** You will have to copy the ACFCFG.CFG file from the current workstation's subdirectory \CMLIB to the code server's subdirectory H:\LANCID\RSP\ES10. This file is needed when using different keyboard profiles from the US or UK.

The sample ES 1.0 response file is exposed in Appendix C, "Extended Services 1.0 Response File" on page 131.

If you wish to remotely install more than just 3270 host sessions, for example SRPI profiles and APPC definitions etc., the easiest method to use is the remote installation program, ESAINST. Do this to use Communications Manager configuration files created by OS/2 Extended Edition V.1.3. These .CFG files can be easily used as the model configuration file instead of ACSCFG.CFG. The program ESAINST will automatically migrate the Communications Manager configuration file.

The ES 1.0 response files can be used and migrated by the CMSETUP command during the Communications Manager's/2 CID installation. The command line parameter **/MG** has to be specified in that case.

---

## 7.22 The LAN Server V.3.0 Requester Response File

Every preparation task that has to do with LAN Server 3.0 must be invoked by the LANINST command from the **first** LAN Server/Install Diskette:

```
A:\LANINST
```

Figure 110. LANINST Command

Continue as follows:

1. When the IBM logo is displayed, select **OK**.
2. Select Advanced on the "Basic or Advanced Installation/Configuration" window. The Installation Task window is displayed (see Figure 91 on page 95).

3. Select "Create a requester response file for remote installation" and go through all panels as you would do when installing the workstation itself.
4. If you want the target workstation to be migrated from a previous release, you will have to select: "Use target settings".

A typical LAN Server V.3.0 Requester response file is shown below.

```

DELETEIBMLAN = Networks<
  net2 =
  net3 =
  net4 =
  net1b =
>
UPDATEIBMLAN = Networks<
  net1 = NETBEUI$,*,LM10,*,*,*
>
DELETEIBMLAN = Peer<
  srvnets = NETLB,NET2,NET3,NET4
>
UPDATEIBMLAN = Peer<
  security = Migrate
  srvnets = NET1
>
DELETEIBMLAN = Requester<
  wrknets = NETLB,NET2,NET3,NET4
>
UPDATEIBMLAN = Requester<
  Computername = WLFSLI
  Domain = ITSCBOCA
  wrknets = NET1
>
ADDIBMLAN = Requester<
  wrkservices = LSCLIENT,MESSSENGER,NETPOPUP
>
  ConfigApp1DumpPath = C:\OS2\SYSTEM
  ConfigApp1MaxDumps = 32
  ConfigAutoStartFFST = No
  ConfigAutoStartLS = No
  ConfigDisplayMSG = OFF
  ConfigMsgLogName = C:\OS2\SYSTEM\OS2MLOG.DAT
  ConfigSourceDrive = None
  ConfigSystemDumpPath = C:\OS2\SYSTEM
  ConfigSystemMaxDumps = 32
  ConfigTargetDrive = C
  ConfigWsId = WLFSLI
  ConfigWsSerial1 = 55
  ConfigWsSerial2 = 00FCNK3
  ConfigWsType1 = 8580
  ConfigWStype2 = A31
  InstallAPI = INSTALLIFREQUIRED
  InstallDosLanApi = INSTALLIFREQUIRED
  InstallFullScreenInterface = INSTALL
  InstallFFST = INSTALLIFREQUIRED
  InstallGlossary = INSTALL
  InstallInstallProgram = INSTALLIFREQUIRED
  InstallOS2CmdRef = INSTALL
  InstallOS2OnlineRef = INSTALL
  InstallPeerService = INSTALLIFREQUIRED
  InstallRemoteFaultTolerance = INSTALLIFREQUIRED
  InstallRequester = INSTALL
  InstallUPM = INSTALL

```

Figure 111. LAN Server V.3.0 Requester Response File

Now you are ready to create the client-specific LCU command file.

---

## 7.23 Invoking The Remote Installation Using LCU

This section will describe the preparation of the client-specific LCU command files. LCU is a software distribution manager and stands for "LAN CID Utility" or "LAN Configuration/Installation/Distribution Utility".

In the examples shown below, we used the **CASPREP** utility for creation of the LCU command file. Here are some of the advantages:

The recommended way for creation of LCU command file is the automated process used by LAN NetView Start.

- You do not have to have knowledge of the REXX programming language.
- You are very flexible in preparing different installation or migration scenarios.
- You do not have to do "trial and error" to initiate remote installations.
- This utility easily generates client-specific LCU command files.

You may also use another method which is to copy and edit the **CASSKEL.CMD** for each single workstation. The **CASSKEL.CMD** is a skeleton command file written in REXX.

### 7.23.1 Create The General Setup File for LCU

Use an ASCII editor and type in the following lines:

**Note:** We know the creation of the general setup file is time consuming. However, you will see that you will save a lot of effort later as only minor changes need to be made to create client-specific LCU command files. The method of how to create client-specific LCU command files is described on the following page. The Figure 112 on page 110 shows the GENERAL.FIL stored in the following path:

**H:\LANCID\CLIENT\GENERAL.FIL**

```

/*
Summary of variables referenced:
-----
maintdir : path from where maintenance started
bootdrive: drive to boot from upon first reboot
exeppath : path to the code server's subdirectory containing executable programs
wname    : reference to the workstation's name
*/

:Prog SEINST
Name = SEINST
Invoke = X:\EXE\SEINST /B:"bootdrive" /S:X:\IMG\OS2V20 /T:"maintdir"
/L1:Y:\OS2V20\client".LOG /R:
Rspdir = X:\RSP\OS2V20
Default = PS"wname".RSP
:EndProg

:Prog LAPS
Name = LAPS
Invoke = X:\IMG\NTS2\LAPS /E:MAINT /S:X:\IMG\NTS2 /G:X:\RSP\NTS2
/T:"bootdrive" /L1:Y:\NTS2\client".LOG /R:
Rspdir = X:\RSP\NTS2
default = PS"wname".RSP
:EndProg

:Prog LAPSPROD
Name = LAPSPROD
Invoke = X:\IMG\NTS2\LAPS /E:PROD /S:X:\IMG\NTS2 /G:X:\RSP\NTS2
/T:"bootdrive" /L1:Y:\NTS2\client".LOG /R:
Rspdir = X:\RSP\NTS2
default = PS"wname".RSP
:EndProg

:Prog ESAINST
Name = ESAINST
Invoke = X:\IMG\ES10\ESAINST /S:X:\IMG\ES10 /L1:Y:\ES10\client".L1
/L2:Y:\ES10\client".L2 /L3:Y:\ES10\client".L3 /L4:Y:\ES10\client".L4
/R:
Rspdir = X:\RSP\ES10
default = PS"wname".RSP
:EndProg

:Prog LANINSTR
Name = LANINSTR
Invoke = X:\IMG\LSA30\LANINSTR /REQ /G:X:\RSP\LSA30 /L1:Y:\LSA30\client".L1
/L2:Y:\LSA30\client".L2 /R:
Rspdir = X:\RSP\LSA30
Default = PS"wname".RSP
:EndProg

:Utility THINIFS01
Name = SRVIFS REQUESTER 01
Invoke = X:\IMG\LCU\THINIFS /S:X:\IMG\LCU /T:C:\SRVIFS /TU:"bootdrive"
/L1:Y:\LCU\client".L1 /REQ:"client" /SRV:\srvname\IMAGES /D:x
:EndUtility
:Utility THINIFS02
Name = SRVIFS REQUESTER 02
Invoke = X:\IMG\LCU\THINIFS /S:X:\IMG\LCU /T:C:\SRVIFS /TU:"bootdrive"
/L1:Y:\LCU\client".L2 /REQ:"client" /SRV:\srvname\LOGFILES /D:y
:EndUtility

:Utility CASINSTL
Name = CASTLE
Invoke = X:\IMG\LCU\CASINSTL /CMD:X:\CLIENT /TU:"bootdrive" /PA:X:\IMG\LCU
/PL:X:\DLL;X:\IMG\LCU; /L1:Y:\LCU\client".L1
/L2:Y:\LCU\client".L2 /D
:EndUtility

:Utility IFSDEL
Name = IFSDEL
Invoke = X:\IMG\LCU\IFSDEL /T:C:\SRVIFS /TU:"bootdrive"
:EndUtility

:Utility CASDELET
Name = CASDELET
Invoke = X:\IMG\LCU\CASDELET /PL:X:\DLL;X:\IMG\LCU; /TU:"bootdrive"
:EndUtility

:Prog FSERVICE
Name = FSERVICE
Invoke = x:\csd\os2v20\fservice /S:x:\csd\os2v20
/L1:Y:\GSD\OS2V20\client".L1 /R:
Rspdir = x:\rsp\csd\os2v20
Default = PS"wname".RSP
:EndProg

```

Figure 112. The General Setup File

### 7.23.2 Create The Installation-Dependent Setup File for LCU

If you wish to remotely install the OS/2 V.2.x, NTS/2, ES10 and LS components, you will have to create the file ALLCOMP.FIL by using an ASCII editor. This file is stored in the following path: Named H:\LANCID\CLIENT\ALLCOMP.FIL. Type in the following lines:

```
:Vars
maintdir = A:\
bootdrive = C:
exepath  = X:\EXE
wname    = wname
:EndVars

:Install Keywords
SEINST+LAPS+THINIFS01+THINIFS02+CASINSTL+FSERVICE
ESAINST
LANINSTR
IFSDEL+CASDELET
:EndInstall
```

Figure 113. The Installation Dependent Setup File

**Note:** If all components are not going to be installed remotely, just delete the statement for the component installation which is not desired.

### 7.23.3 Create The Client-Specific Command File with CASPREP

If you wish to create the client specific command file by using the GENERAL.FIL and ALLCOMP.FIL files, you will have to use the **CASPREP** utility. In the following example, we created the client command file WLFSCLI.CMD. Issue following commands:

```
cd \LANCID\CLIENT
copy ALLCOMP.FIL + GENERAL.FIL TEMP.FIL

cd \LANCID\IMG\LCU
CASPREP \LANCID\CLIENT\TEMP.FIL \LANCID\CLIENT\WLFSCLI.CMD CASBASE.FIL

cd \LANCID\CLIENT
erase TEMP.FIL
```

Now you are ready to start the remote installation process.

**Note:** The name of the client command file is equal to the netBIOS client name entered at the prompt during the boot process. Notice again that the file names of response files and client command files should have the same name. For Example, the workstation's name is WLFSCLI, each product-specific client response file as well as the client command file should have the filename WLFSCLI, too. The LCU utility using the same recognition process for LCU command files as for the response files.

---

## 7.24 Sequence of Remote Installation via LCU

In this section, you will get to know the sequence of a remote installation using LCU as the software distribution manager.

How do you initiate remote installation?

1. Have your code server running.
2. Go to the workstation being remotely installed.
3. Your disks should be partitioned on the target workstation. The size of the C: drive should be at least 70MB (67 cylinders) when all products are to be installed. It is also possible to let LCU partition the hard disk (see document number *GG24-3781* or *GG24-3783* for more detailed information about how to partition a hard disk remotely).
4. First, insert the CID boot diskette and restart or power on your workstation. Second, insert the CID boot diskette when prompted.
5. You will be prompted to enter a workstation name. This name must be the name of the client-specific LCU command file which is to be used for the remote installation. Type in the name and press Enter.
6. When the redirected drives x: and y: are established, the LCU command file invokes one installation command after another. The sequence is:
  - Remote installation of **OS/2 V.2.0**
  - Remote installation of LAN Adapter and Protocol Support (**LAPS**).
  - Remote installation of the requester part of **SRVIFS**.
  - Remote installation of LAN CID Utility (LCU)
  - Remote installation of OS/2 V.2.0 **Service Pak** XR<sub>x</sub>6055.
  - The user is prompted to remove the CID boot diskette.

### warm start

**Note:** No user action will be necessary from now on.

- Generating the OS/2 V.2.0. Workplace Shell.

### warm start

- Remote installation of **Extended Services**.

### warm start

- Remote installation of **LAN Services** (LAN Requester or LAN Server).

### warm start

- Remote removal of requester part of SRVIFS.
- Remote removal of LAN CID Utility (LCU).

### warm start

7. The installation is finished. See log files on the code server and check if all remote installations finished successfully.

---

## Appendix A. Scenarios: A General View

---

### A.1 Concepts for WLFS

Workstation users accustomed to working with file servers do not need to learn new interfaces to use WLFS.

- In an OS/2 environment, WLFS is an extension of the OS/2 LAN Server. Workstation users access the WLFS disk storage on the VM system as if it were disk storage on the OS/2 LAN Server.
- In a TCP/IP environment, WLFS is a standard Network File System (NFS) Version 2 server.

In general, a workstation user can access files on the VM system as if the files were stored on the local LAN server.

---

### A.2 Sample WLFS Environment

Figure 114 shows a CLAW connection between FEP and the host.

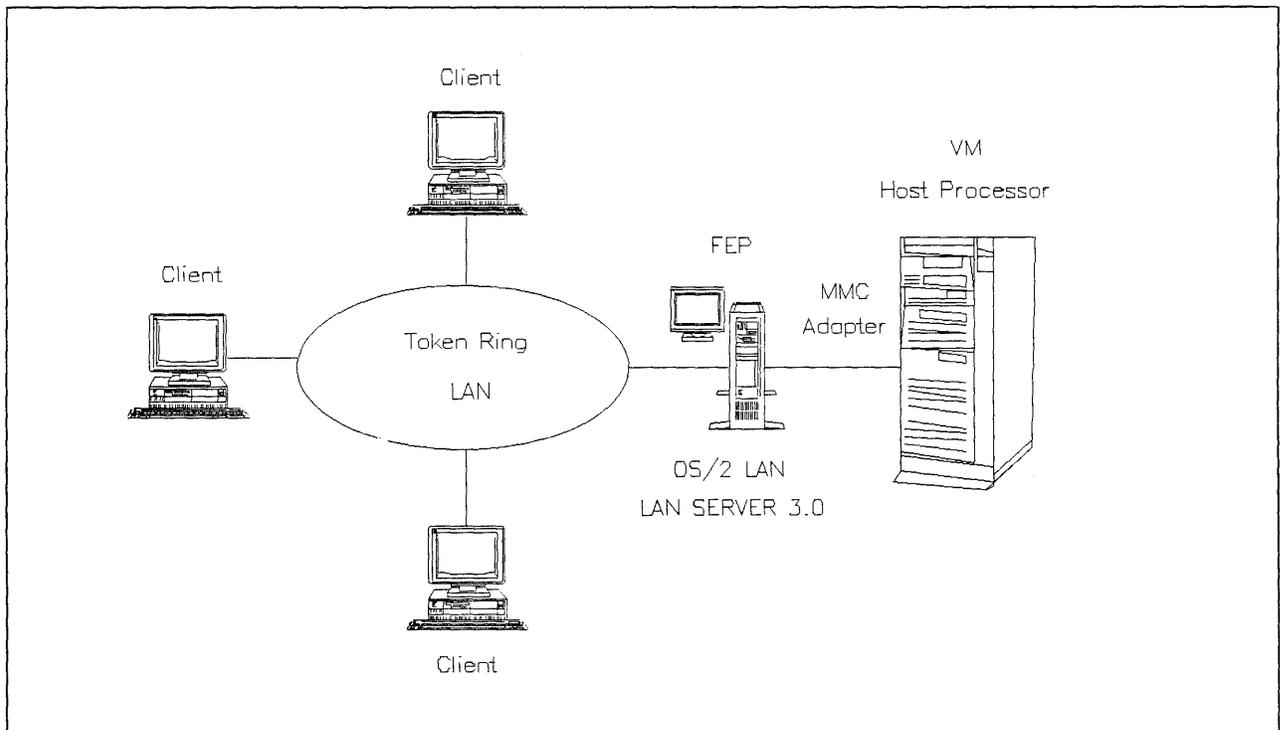


Figure 114. A Basic Scenario for WLFS OS/2 Environment with CLAW Connection

Figure 115 on page 114 shows WLFS with a token-ring LAN connection.

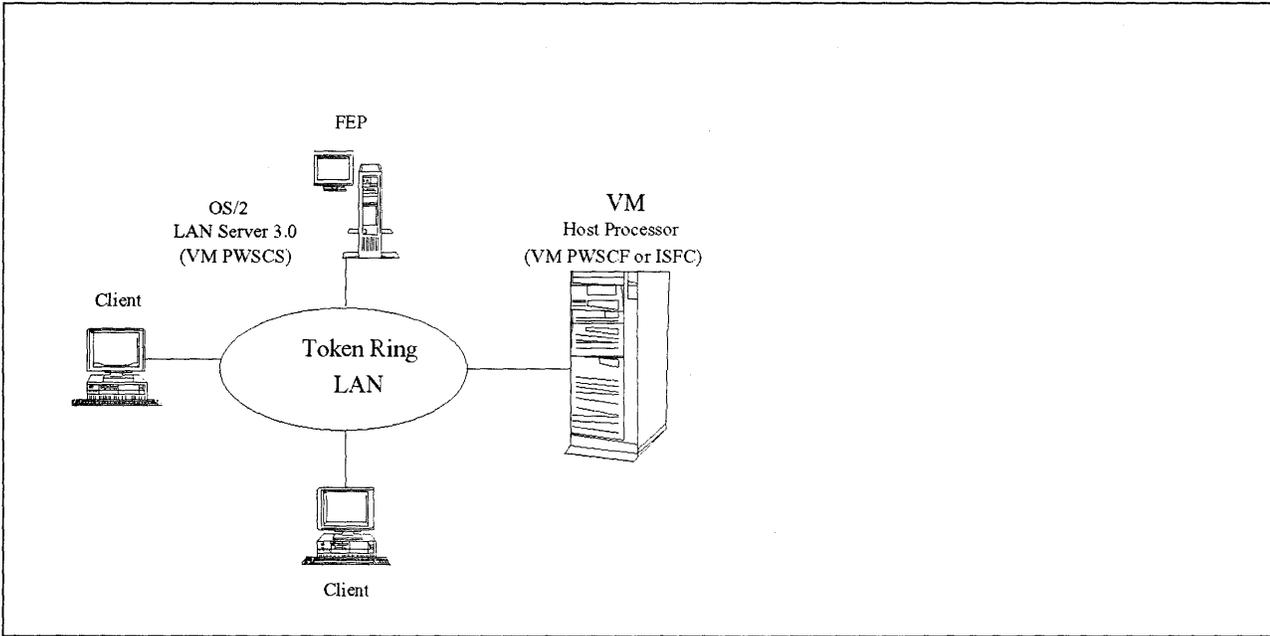


Figure 115. A Basic Scenario for WLFS OS/2 Environment with Token-Ring Connection

Figure 116 shows WLFS with an Ethernet LAN connection.

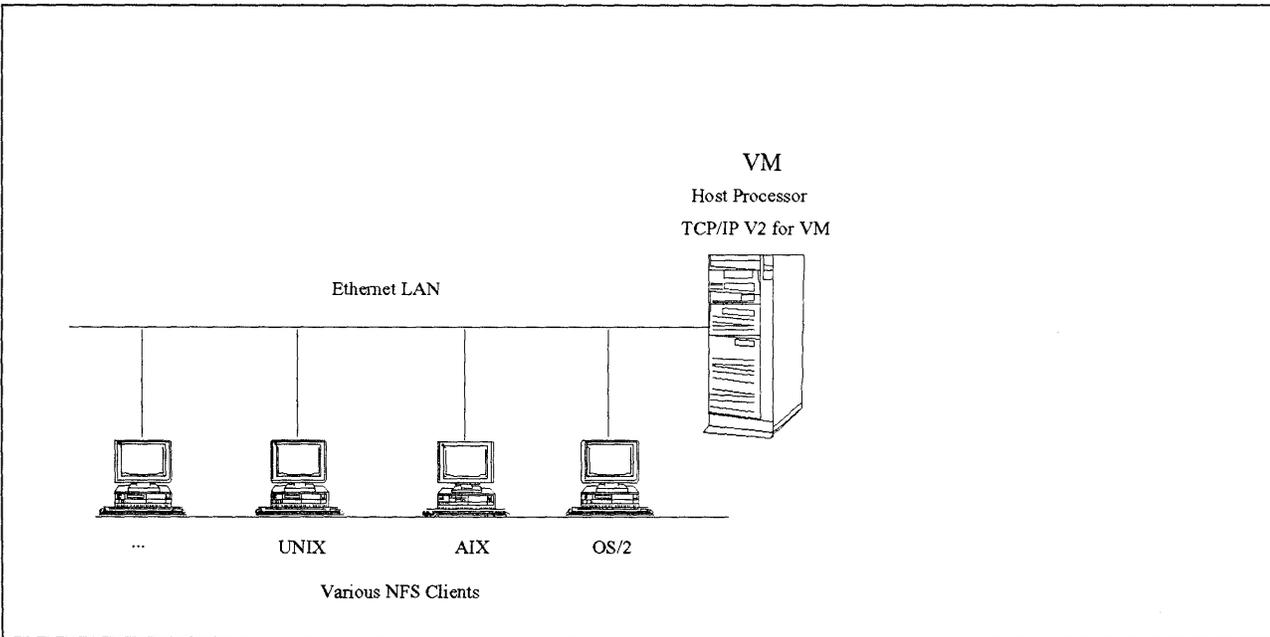


Figure 116. A Basic Scenario for WLFS NFS Environment with Ethernet Connection

Figure 117 on page 115 shows the three different connections between host and OS/2 LAN Server.

The OS/2 Domain Controller is special setup of VM PWSCS. This configuration acts as a gateway for the OS/2 LAN Servers accessing the host either through the channel adapters or the SNA LU 6.2 communication.

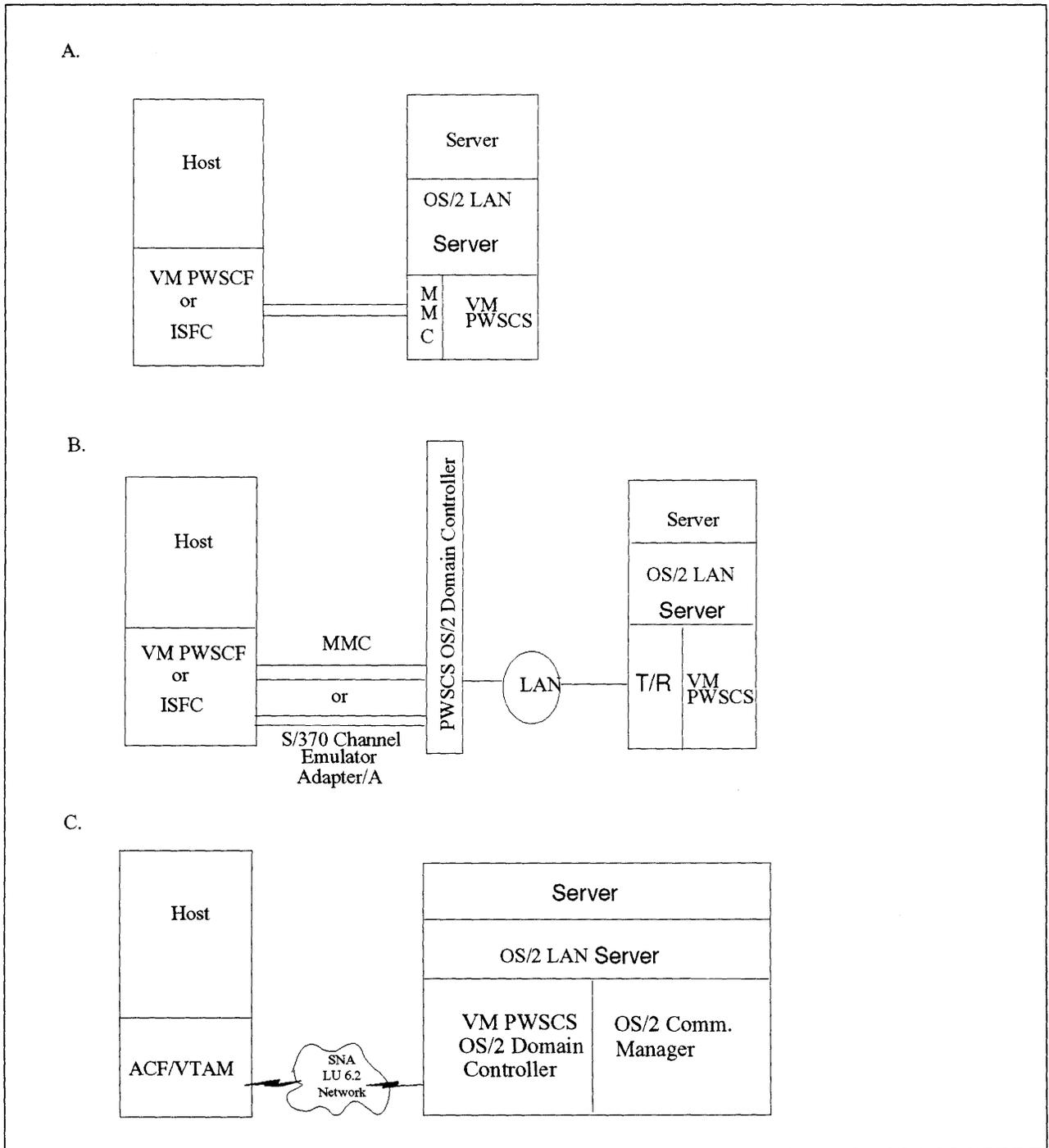


Figure 117. Basic Scenarios for WLFS Using VM PWSCS

### A.3 WLFS Communications Options

Various software and hardware products can be used for communications between WLFS servers and network environments.

Table 11 on page 116 and Table 12 on page 117 list workable pairings.

Table 11. Hardware and Software for the VM Processor

Hardware/Software	Comments
<b>VM Processor</b>	<p>VM processors supported by WLFS are any System/370 or System/390 architecture machines that support a channel, an integrated Channel-to-Channel adapter, or an integrated token-ring adapter. Examples include the following IBM machines:</p> <ul style="list-style-type: none"> <li>• 937x (Model 12 and higher)</li> <li>• 4381-2x and 4381-9xE</li> <li>• 3090-xxx</li> <li>• ES/9000</li> </ul>
<b>VM Operating System Software</b>	<ol style="list-style-type: none"> <li>1. For CLAW connections, WLFS requires one of the following: <ul style="list-style-type: none"> <li>• VM/ESA Release 1.1, or higher (ESA or 370 mode)</li> <li>• VM/ESA Release 1.0 (ESA Feature or 370 Feature)</li> <li>• VM/SP Release 6</li> </ul> </li> <li>2. For VM PWSCS connections, WLFS requires one of the following: <ul style="list-style-type: none"> <li>• VM/ESA Release 1.1, or higher (370 mode) <ul style="list-style-type: none"> <li>– Channel connections via either of the following adapters are supported: <ul style="list-style-type: none"> <li>- MMC (OS/2 or NetWare)</li> <li>- S/370 Channel Emulator Adapter/A to 3088 (OS/2 only)</li> </ul> </li> </ul> </li> <li>• VM/ESA Release 1.0 (370 Feature) or VM/SP Release 6, supplemented with the VM PWSCF PRPQ P81056 Release 1.2</li> <li>• The following channel connections are supported: <ul style="list-style-type: none"> <li>– Direct token ring connections with a host having the integrated token ring adapter.</li> <li>– Channel connections from a domain controller with either of the following adapters installed: <ul style="list-style-type: none"> <li>- MMC (OS/2 or NetWare)</li> <li>- S/370 Channel Emulator Adapter/A to 3088 (OS/2 only)</li> </ul> </li> <li>– Data Exchange Adapter (OS/2 and AIX PS/2 only). Found only on 9371-114.</li> </ul> </li> </ul> <p>Additional requirements are:</p> <ul style="list-style-type: none"> <li>• The IBM C/370 Library Version 2, program number 5688-188</li> <li>• The IBM Software License Monitor Release 1, program number 5648-038 <ul style="list-style-type: none"> <li>– The following APARS will be required for installation of SLM: <ul style="list-style-type: none"> <li>– For VM/SP APAR VM54782</li> <li>– For VM/ESA APAR VM54780</li> </ul> </li> </ul> </li> </ul> </li> </ol>

This table describes the hardware and software recommended for the VM processor for use with WLFS/VM. For more information please refer to the following manuals:

1. *VM/SP Planning Guide and Reference*
2. *VM/ESA CP Planning and Administration for S/370*
3. *VM/ESA: Planning and Administration*
4. *WLFS/VM Guide and Reference*

<i>Table 12. Hardware and Software for the Front End Processor</i>	
<b>Hardware/Software</b>	<b>Comments</b>
<b>Front End Processor (FEP)</b>	<p>A workstation acting as a front end processor (FEP) to WLFS must have:</p> <ul style="list-style-type: none"> <li>• At least 10MB of main memory (16 MB or more is recommended for better performance)</li> <li>• A hard disk of at least 60MB for OS/2, OS/2 LAN Server, and WLFS. The WLFS portion is about 2MB.</li> <li>• A 80386 or later microprocessor.</li> </ul>
<b>OS/2 LAN Server</b>	<p>WLFS requires a front end processor consisting of a workstation running one of the following:</p> <ul style="list-style-type: none"> <li>• OS/2 LAN Server Version 3.0/Advanced with OS/2 Version 2.0. The optional REXX support for OS/2 must also be installed.</li> <li>• OS/2 LAN Server Version J3.0/Advanced with OS/2 Version J2.0, for DBCS support. The optional REXX support for OS/2 must also be installed.</li> <li>• The following LAN Servers are supported. However, they do not support the improved caching and multimedia functionality that is available when running on OS/2 LAN Server Version 3.0/Advanced. <ul style="list-style-type: none"> <li>– OS/2 LAN Server Version 2.0/Advanced with OS/2 Version 1.3.2</li> <li>– OS/2 LAN Server Version J2.0/Advanced with OS/2 Version J1.33</li> </ul> </li> </ul>

This table lists the hardware and software requirements available for the front end processor. A front end processor is a LAN server workstation running WLFS, through which LAN workstation users can access files stored on a VM system. Please note that the WLFS/VM front end processor programs are memory intensive. Performance may vary depending on the number of other applications on the front end processor. For more information regarding the front end processors please refer to the following manual:

- *WLFS/VM Guide and Reference*

<i>Table 13. Hardware and Software for the Connectivity Equipment</i>	
<b>Hardware/Software</b>	<b>Comments</b>
<b>Connectivity Equipment</b>	<p>Connections between the VM processor and the front end processor can be made by:</p> <ul style="list-style-type: none"> <li>• A standard channel interface using an IBM PS/2 Micro Channel to Mainframe Connection (MMC) card (Part No. 95F1436). The MMC card can be used either with the CLAW device driver or with VM PWSCS Version 1.2.</li> <li>• Any device supported by the VM PWSCS OS/2 gateway to SNA resources</li> <li>• Any device supported by the VM PWSCF and VM PWSCS, such as: <ul style="list-style-type: none"> <li>– 9370 Model 14 data exchange adapter</li> <li>– 9370 Integrated Token-Ring LAN adapter</li> <li>– IBM System/370 Channel Emulator/A card to an IBM 3088 Multisystem Channel Communication Unit</li> <li>– IBM System/370 Channel Emulator/A card to an integrated Channel-to-Channel adapter on an IBM 4381 processor</li> </ul> </li> </ul>
<b>OS/2 LAN Server (continued)</b>	<p>One of the following connectivity options is also required:</p> <ul style="list-style-type: none"> <li>• VM PWSCS Version 1.1 (or higher)</li> </ul> <p>VM PWSCS Version 1.2 is required for PWSCS communications using the IBM PS/2 Micro Channel to Mainframe Connection card.</p> <ul style="list-style-type: none"> <li>• OS/2 CLAW device driver which uses a proprietary channel protocol for communications.</li> </ul>

This table describes the hardware and software requirements available for the Connectivity Equipment. WLFS can use either a VM PWSCS or CLAW connection between the VM system and a front end processor. When more than one front end processor is connected to a server virtual machine, the connections may be any combination of PWSCS and CLAW. Each front end processor can communicate with only one VM system at a time. For more information please refer to the following manual:

- *WLFS/VM Guide and Reference*

Hardware/Software	Comments
<b>LAN Media/Workstations</b>	<p>Token-ring LANs or Ethernet LANs may be used for workstations; however, Ethernet LANs are not supported as a front end processor to VM connection.</p> <p>Workstations supporting requester programs include:</p> <ul style="list-style-type: none"> <li>• IBM Personal Computer XT</li> <li>• IBM Personal Computer AT</li> <li>• IBM Personal System/2</li> <li>• IBM Personal System/55</li> </ul> <p>The workstations must be capable of running LAN requester programs.</p>
<b>Workstation Operating Systems and Requesters</b>	<p>Workstations may use any of these operating systems with the requesters indicated:</p> <ul style="list-style-type: none"> <li>• OS/2 Version 2.0 with OS/2 LAN Server Version 2.0 or 3.0 LAN Requester</li> <li>• OS/2 Extended Edition (includes OS/2 LAN Requester)</li> <li>• DOS Version 3.3 or later, with DOS LAN Requester 2.0 or 3.0 (part of OS/2 LAN Server Version 2.0 or 3.0)</li> <li>• DOS Version 3.3 or later, with PC LAN Program (PCLP)</li> </ul> <p>Workstations may use any LAN requester capable of interoperating with OS/2 LAN Server Version 3.0.</p>

This table describes the hardware and software requirements of the client workstation. A client is a functional unit that receives shared services from a server. For more information regarding client workstations please refer to the following manual:

- *WLFS/VM Guide and Reference*

Hardware	Comments
<b>VM Processor</b>	VM processors supported by the WLFS are any System/370 or System/390 architecture machines that are supported by IBM TCP/IP Version 2 for VM.
<b>Connectivity Equipment</b>	The only connectivity supported by the NFS portion of WLFS is through the TCP/IP virtual machine provided by TCP/IP Version 2 for VM. WLFS uses UDP sockets over an IUCV connection to the TCP/IP machine to communicate with its NFS clients.
<b>Workstations</b>	Any programmable workstation capable of running a standard NFS Version 2 client.

<i>Table 16. Software for the NFS Environment</i>	
<b>Software</b>	<b>Comments</b>
<b>VM Operating System</b>	WLFS requires one of the following: <ul style="list-style-type: none"> <li>• VM/ESA Release 1.1, or higher (370 mode)</li> <li>• VM/ESA Release 1.0 (ESA or 370 mode)</li> <li>• VM/SP Release 6</li> </ul> TCP/IP Version 2 for VM and the IBM C/370 Library Version 2 are also needed.
<b>Workstation Operating Systems and Requesters</b>	Workstations may use any operating system capable of running a standard NFS Version 2 client.

This table describes the hardware and software requirements recommended for use when running WLFS in an NFS environment. For more information please refer to the following manual:

- *WLFS/VM Guide and Reference*

---

## **A.4 Concepts for LANRES/VM**

The LAN Resource Extension and Services/VM (LANRES/VM) is an IBM product that provides services to NetWare clients by using virtual machine (VM) resources. It gives NetWare clients more disk storage space by making S/390 and S/370 direct access DASD accessible to the NetWare servers.

In effect, LANRES/VM extends the NetWare environment to include the S/390 and S/370 host. NetWare clients are unaware of LAN-host interaction because they do this transparently.

These are the communication methods that work with LANRES/VM and VM:

- Channel attachment
- System Network Architecture Logical Unit 6.2 (SNA LU 6.2)
- Transmission Control Protocol/Internet Protocol (TCP/IP)
- VM Programmable Workstation Communication Services (VM PWSCS).

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## **A.5 Sample LANRES/VM Environment**

Figure 118 on page 121 shows an MMC connection between host and NetWare server.

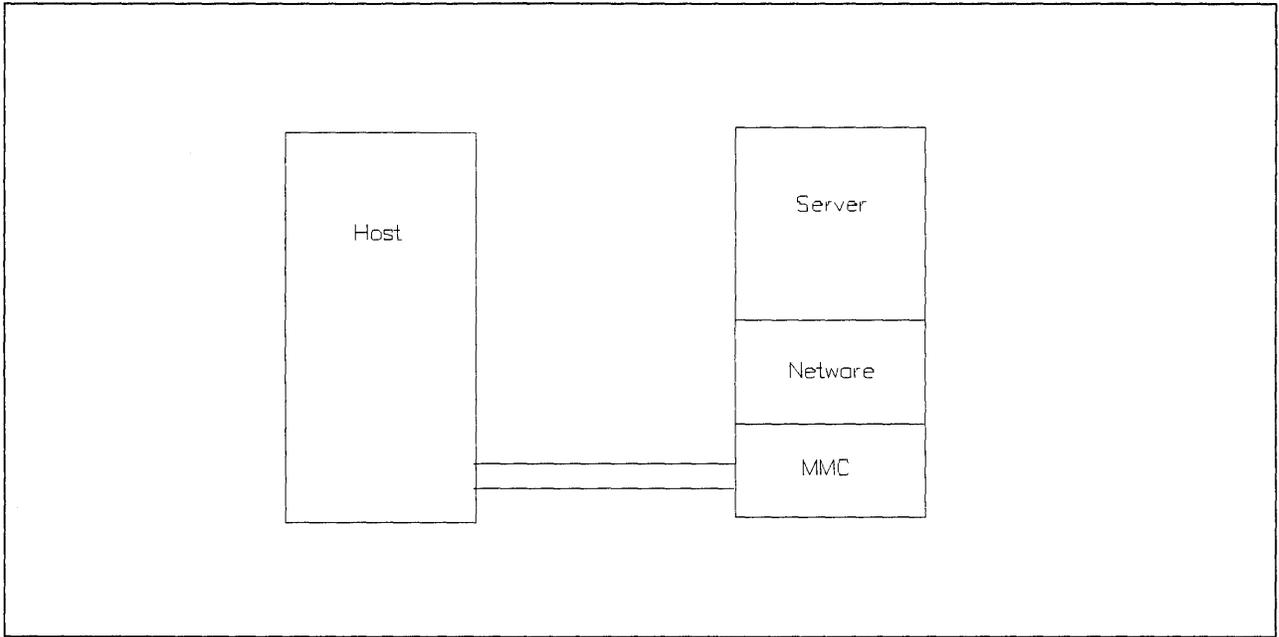


Figure 118. A Basic Scenario for LANRES Using MMC

Figure 119 shows a SNA LU 6.2 connection between host and NetWare server.

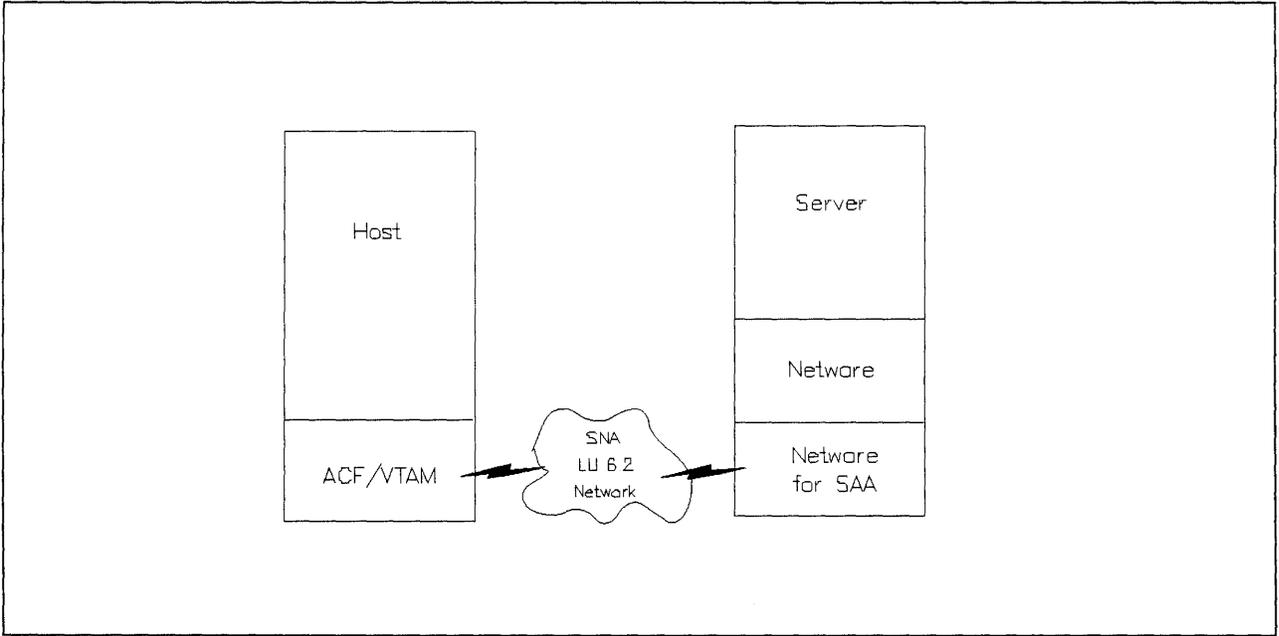


Figure 119. A Basic Scenario for LANRES Using an SNA LU 6.2 Network

Figure 120 on page 122 shows a TCP/IP connection between host and NetWare server.

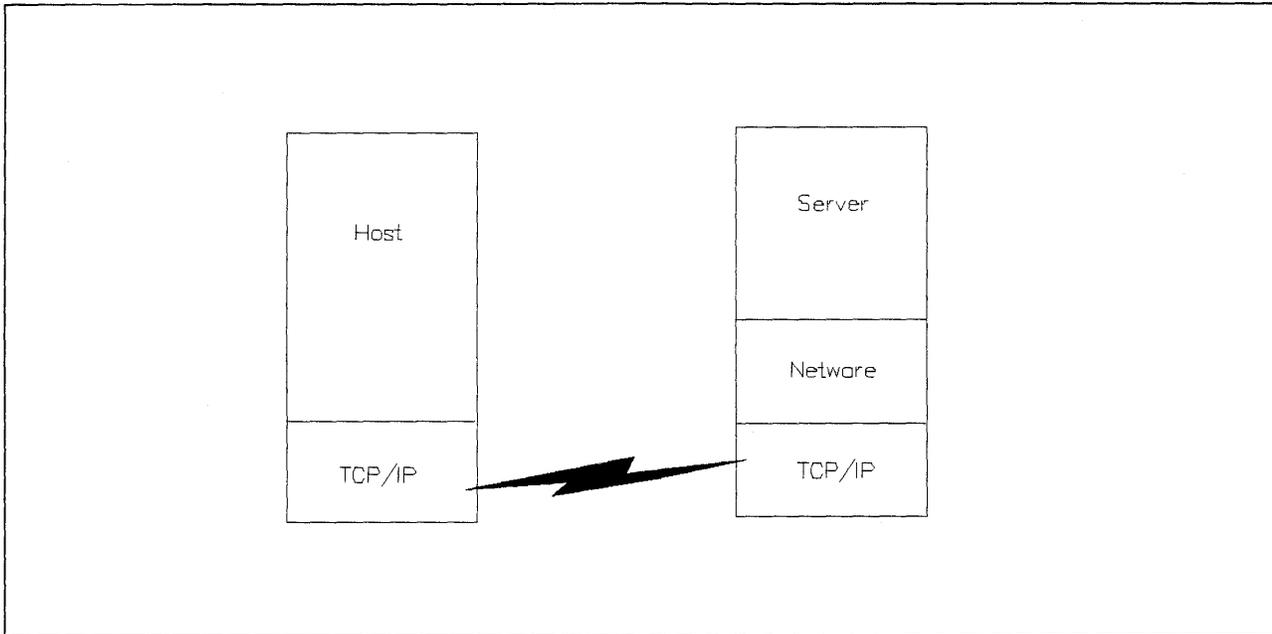


Figure 120. A Basic Scenario for LANRES Using TCP/IP

Figure 121 on page 123 shows the three different connections between host and NetWare server using VM PWSCS.

The OS/2 Domain Controller is special setup of VM PWSCS. This configuration acts as a gateway for the Novell NetWare servers accessing the host either through the channel adapters or the SNA LU 6.2 communication.

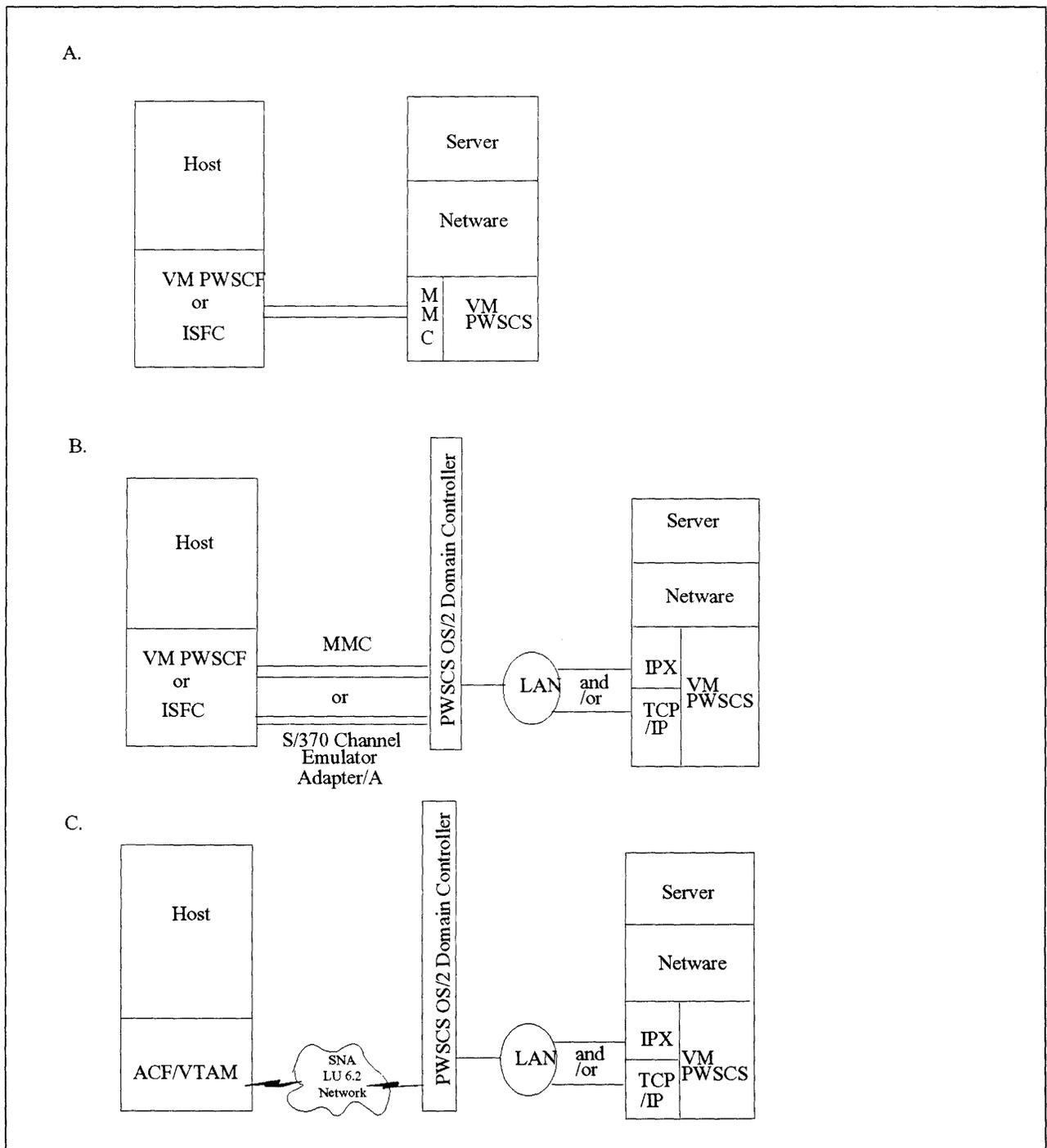


Figure 121. Basic Scenarios for LANRES Using VM PWSCS

## A.6 LANRES/VM Communications Options

To use LANRES/VM, your NetWare operating system must be connected to VM. You can do this several ways. The following tables describe the hardware and software needed for each of the different communications methods.

Table 6 on page 50 describes the minimum hardware requirements for the VM processor and NetWare server when using with LANRES/VM.

Hardware	Comments
<b>VM Processor</b>	<ul style="list-style-type: none"> <li>An IBM System/370 or System/390 host processor (or equivalent) that the VM operating system runs on (except 9371).</li> </ul> <p><b>Note:</b> IBM Micro Channel 370 Models 110, 112 and 114 are not supported.</p> <ul style="list-style-type: none"> <li>One of the following tape drives (for installing LANRES/VM): <ul style="list-style-type: none"> <li>A 9-track/1600 bpi magnetic tape drive</li> <li>A 9-track/6250 bpi magnetic tape drive</li> <li>A 18-track/38K 3480 cartridge tape drive</li> </ul> </li> </ul>
<b>NetWare Server</b>	<p>An IBM Micro Channel PS/2 or equivalent, capable of running NetWare Version 3.11 with:</p> <ul style="list-style-type: none"> <li>At least 70MB hard disk space.</li> <li>At least 8MB of RAM (16MB is recommend, more memory gives you more room for caching and thus better performance for clients).</li> <li>A 3.5-inch 1.44MB diskette drive.</li> </ul>

Table 18 lists hardware and software requirements for channel connection.

Hardware/Software	Comments
<b>VM Host</b>	<p>LANRES/VM requires one of the following:</p> <ul style="list-style-type: none"> <li>VM/ESA Release 1.1 (5684-112), or later</li> <li>VM/ESA, ESA Feature, Release 1 (5684-112)</li> <li>VM/ESA, 370 Feature, Release 1 (5684-112)</li> <li>VM/SP Release 5 or 6 (5664-167), with or without: <ul style="list-style-type: none"> <li>VM/SP HPO Release 5 or 6 (5664-173)</li> </ul> </li> <li>VM/XA SP Release 2.1 (5664-308)</li> </ul>
<b>NetWare server</b>	<p>On the NetWare server, requires one of the following:</p> <ul style="list-style-type: none"> <li>NetWare V3.11 from IBM</li> <li>Novell NetWare V3.11</li> </ul>
<b>Connectivity Equipment</b>	<ul style="list-style-type: none"> <li>An IBM PS/2 Micro Channel to Mainframe Connection.</li> </ul> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>The PS/2 (or equivalent) must be supported by the MMC.</li> <li>The IBM PS/2 S/370 Channel Adapter (RPQ 8P1456) is also supported.</li> </ul> <p>For more information about the channel adapter and cables, see the <i>IBM Personal System/2 MicroChannel to Mainframe Connection Installation Instructions G571-0244</i>.</p>

Table 19 on page 125 lists requirements for SNA LU6.2 connection

<i>Table 19. Hardware and Software Requirements for the SNA LU6.2 Connection</i>	
<b>Hardware/Software</b>	<b>Comments</b>
<b>VM Host</b>	<p>LANRES/VM requires one of the following:</p> <ul style="list-style-type: none"> <li>• VM/ESA Release 1.1 (5684-112), or later</li> <li>• VM/ESA, ESA Feature, Release 1 (5684-112)</li> <li>• VM/ESA, 370 Feature, Release 1 (5684-112)</li> <li>• VM/SP Release 6 (5664-167), with or without: <ul style="list-style-type: none"> <li>– VM/SP HPO Release 6 (5664-173)</li> </ul> </li> <li>• ACF/VTAM 3.3 for VM/SP (5664-280), or later</li> <li>• ACF/VTAM 3.3 for VM/ESA (5684-095), or later</li> </ul>
<b>NetWare server</b>	<p>On the NetWare server, requires one of the following:</p> <ul style="list-style-type: none"> <li>• NetWare V3.11 from IBM</li> <li>• Novell NetWare V3.11</li> </ul> <p>And additional software:</p> <ul style="list-style-type: none"> <li>• NetWare for SAA Version 1.2 or NetWare for SAA from IBM Version 1.2 (product numbers vary based on number of sessions).</li> </ul>
<b>Connectivity Equipment</b>	<ul style="list-style-type: none"> <li>• Hardware to support the SNA LU 6.2 connection.</li> </ul> <p>See the NetWare for SAA Version 1.2 Administration Guide for more information.</p>

Table 20 lists requirements for TCP/IP connection.

<i>Table 20. Hardware and Software Requirements for the TCP/IP Connection</i>	
<b>Hardware/Software</b>	<b>Comments</b>
<b>VM Host</b>	<p>LANRES/VM requires one of the following:</p> <ul style="list-style-type: none"> <li>• TCP/IP for VM (5735-FAL) Version 2 Release 1 or Version 2 Release 2</li> <li>• IBM C/370 Library (5688-188) Version 2</li> </ul>
<b>NetWare server</b>	<p>On the NetWare server, requires one of the following:</p> <ul style="list-style-type: none"> <li>• NetWare V3.11 from IBM</li> <li>• Novell NetWare V3.11</li> </ul>
<b>Connectivity Equipment</b>	<ul style="list-style-type: none"> <li>• Hardware to support the connection using TCP/IP protocols.</li> </ul> <p>See the NetWare Version 3.11 TCP/IP Transport Supervisor's Guide and the appropriate TCP/IP Version 2 for VM License Program Specifications for more information.</p>

Table 21 on page 126 lists requirements for VM PWSCS connection

<i>Table 21. Hardware and Software Requirement for the VM PWSCS Connection</i>	
<b>Hardware/Software</b>	<b>Comments</b>
<b>VM Host</b>	LANRES/VM requires one of the following: <ul style="list-style-type: none"> <li>• VM/ESA Release 1.1 or Release 2 (5684-112)</li> <li>• VM/ESA Release 1 (370 Feature) (5684-112) with APARs VM42789, VM42843 and the VM PWSCF PRPQ P81056.</li> <li>• VM/SP Release 6 (5664-167) with APARs VM40152, VM40500, VM41269 and the VM PWSCF PRPQ P81056.</li> </ul>
<b>NetWare server</b>	On the NetWare server, requires one of the following: <ul style="list-style-type: none"> <li>• NetWare V3.11 from IBM</li> <li>• Novell NetWare V3.11</li> </ul> And additional software: <ul style="list-style-type: none"> <li>• VM PWSCS (5684-138) Version 1.2</li> </ul>
<b>Connectivity Equipment</b>	<ul style="list-style-type: none"> <li>• Hardware to support the connection between the VM host and NetWare server.</li> </ul> See the VM PWSCS Licensed Program Specifications for more information.

**Note:** This communications method requires that the NetWare server running LANRES/VM be channel attached to the host with an MMC, or with an additional OS/2 domain controller which is attached to VM with one of the supported connectivities (and is on the same LAN as the NetWare server).

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## Appendix B. Software License Monitor

The following APARS will be required for installation of Software License Monitor (SLM) on VM systems:

### APARS

- For VM/SP APAR VM54782
- For VM/XA 2.1 APAR VM54781
- For VM/ESA APAR VM54780

Figure 122. Software License Monitor APAR Requirements

The Software License Monitor consists of three parts:

1. The Server
2. The Admin client
3. The API client

Set up the Installer Virtual Machine (P648038). During our test we have assumed the following correspondence between disk address or Shared File System directories and file modes:

- Disk address 191 as A
- Disk address 2C2 or directory VMSYS:P648038.SAMPLES is E.
- Disk address 37F or directory VMSYS:P648038.BUILD1 is I.
- Disk address 2B2 or directory VMSYS:P648038.PRODUCT is J.

For detailed information see the product's Program Directory.

### Steps

1. Log on the P648038 installer's user ID.
2. The following files must be available on the P648038 logon ID:
  - On the 37F disk:
    - SLMSEVR EXEC
    - BFLFDEF EXEC
    - BFLSERVR MODULE
    - DEFADMIN EXEC
    - BFLPAPI MODULE
    - BFLPSLM TEXT
    - BFLPSLM2 TEXT
    - SLMADMIN EXEC
    - BFLADMIN MODULE
    - BFLFXREP GEN
  - On the 2C2 disk:
    - BFLFCNF SAMPLE

- On the 2B2 disk:
    - BFLFPROD SAMPLE
    - BFLFAUTH SAMPLE
    - BFLFCLNT SAMPLE
3. Configure the 37F I-disk for the server shared files.

This disk will contain any files that are shared by the server with the admin client and the API client.

- A. Copy the configuration file to the 37F I disk.

**COPYFILE BFLFCONF SAMPLE E = FILE I**

- B. Tailor the configuration file (BFLFCONF FILE)

**SLM\_SERVER\_NAME** Set to server's user ID (if not default is SLMSEVR)

**VM\_NOTIFY\_ID** Set to virtual machine user ID to receive a CP MSG.

4. Log off the P648038 installers user ID.

### B.1.1 Start the Server Virtual Machine (SLMSERV)

1. Log on to the SLMSEVR user ID.
2. Set up a 191 A-disk for the SLMSEVR logon ID.

This disk contains files that are unique to the server.

- a. This disk is readable and writable by the server only.
- b. LINK and ACCESS the 37F Test and Build disk.
- c. Use DEFADMIN EXEC to define the initial administrator.

This prompts you for the VM user ID of an administrator and creates the following required file on your 191 A disk:

**BFLFADM FILE** (Administrator list)

The server will not start unless this file exists and contains an entry.

- d. LINK and ACCESS the P648038 2B2 disk as J.
- e. Put the three required server files on the A-disk.

**COPYFILE BFLFPROD SAMPLE J = FILE A** (Product List)

**COPYFILE BFLFAUTH SAMPLE J = FILE A** (Authorized user list)

**COPYFILE BFLFCLNT SAMPLE J = FILE A** (Client List)

The server will not start unless these files exist.

3. Create an appropriate PROFILE EXEC.

Add the following information to your PROFILE EXEC to automatically run the server

**'ACC 36F K'**  
**'EXEC SLMSEVR'**

Add all links, accesses and globals to use the C/370 library to the PROFILE EXEC.

4. The following modules must be on your 190 disk and be linked and accessed:
  - **DMSSVM5 module**
  - **DMSSVM5C module**
5. Issue: **SLMSERV**

6. If the server fails to come up check the following for diagnostic information:
  - The reason code on message BFL1123
  - The BFLSMMSG LOG
  - The last entry (event 70) in BFLFACT LOG

### **B.1.2 Set up and Run an Admin User (SLMADMIN)**

1. Log on to the SLMADMIN user ID.
2. Set up to use the C/370 runtime library. You will want to include the LINK and ACCESS for this library in the PROFILE EXEC for the SLMADMIN user ID.
3. The following modules must be on your 190 disk and be linked and accessed:
  - **DMSSVM5 module**
  - **DMSSVM5C module**
4. Link and access the P648038 37F disk containing the common files.
5. Issue SLMADMIN requests. You probably want to use:

**SLMADMIN ADD ADMIN** to define other admin users  
**SLMADMIN ADD PRODUCT** to define the product class  
**SLMADMIN ADD AUTH** to define the authorized user for the product  
**SLMADMIN ADD CLIENT** to define the enrolled clients

6. BFLAMSG LOG will be created on this user's A-disk

### **B.1.3 Setting Up the Software License Monitor Production Environment**

Copy the Software License Monitor code from P648038s 37F disk to the 36F disk when you are ready to put Software License Monitor code into production using the CMS COPYFILE command:

```
ACCESS 37F I  
ACCESS 36F K
```

Or if using Shared File System directories:

```
ACCESS VMSYS:P648038.BUILD1 I  
ACCESS VMSYS:P648038.BUILD K
```

```
COPYFILE * * I = = K (OLDDATE REPLACE
```



## Appendix C. Extended Services 1.0 Response File

The following pages show the sample ES 1.0 response file. This response file contains definitions for:

- Four 3270 Non-DFT sessions
- Token-ring DLC
- APPN definitions.

```
CMUpdateType=1
DBUpdateType=1
CMModelCFG=X:\RSP\ES\ACSCFG.CFG
CMUserCFG=WLFSCLI
*-----
      WKST = (
          COMMENT = Workstation Profile WLFSCLI
          MACHINE_TYPE = 8570
          MODEL_NUM = 121
          PLANT_MFG = 55
          SERIAL_NUM = 00FCNK3
          TRANS_TABLE = ACSGTAB.DAT
          LOG_FNAME = ERROR.DAT
          LOG_SIZE = 16
          LOG_OVFLOW = 1
          MEDIA_NAME = MESSAGE.DAT
          MEDIA_SIZE = 500
          MEDIA_OVFL = 1
          DISP_MSG_POPUP = Y
          QUICK_START = Y
          START_3270_DFT = N
          START_ALL_DFT_SESS = Y
          START_DFT_SESS_1 =
          START_DFT_SESS_2 =
          START_DFT_SESS_3 =
          START_DFT_SESS_4 =
          START_DFT_SESS_5 =
          START_3270_APPC = Y
          START_ALL_NDFT_SESS = Y
          START_NDFT_SESS_1 =
          START_NDFT_SESS_2 =
          START_NDFT_SESS_3 =
          START_NDFT_SESS_4 =
          START_NDFT_SESS_5 =
          START_ASYNC_TRM = N
          START_5250_WSF = N
          START_ALL_5250_SESS = Y
          START_5250_SESS_1 =
          START_5250_SESS_2 =
          START_5250_SESS_3 =
          START_5250_SESS_4 =
          START_5250_SESS_5 =
          FIRST_SCREEN = 3
          1ST_SCREEN_SESS = X7089802
          LOAD_SERVICES = 1
          LOAD_SNA_APPC = Y
          LOAD_SRPI = Y
          LOAD_X25_API = Y
          LOAD_ACDI = Y
      )
*-----
```

Figure 123 (Part 1 of 10). Response File for the Extended Services Installation

```

SNACConnect = (
    DLC_TYPE = 2
    ADAPT_NUM = 0
    DEST_ADDR = 400010299001
    X25_DIR =
)
-----*-----
SNASession = (
    name = 1
    SESN_ID = X7089802
    TYPE = 1
    COMMENT = Host session 1 non-DFT
    SHORT_ID = A
    AT_KEYBOARD = ACS3ATGR
    ENH_KEYBOARD = ACS3ENGR
    SPACE_SIZE = 1
    PSS_ROW = 25
    PSS_COL = 80
    XFER_SIZE = 0
    UNSUP_CC = 1
    APS_PRINT = Y
    DBCS_NUML = 1
    DBCS_LANG = 1
    PRT_BUFF = 1920
    F_NORMAL_UNPRO = 3
    F_INTENSE_UNPRO = 5
    F_NORMAL_PRO = 4
    F_INTENSE_PRO = 8
    F_BLUE = 4
    F_GREEN = 3
    F_PINK = 14
    F_RED = 5
    F_TURQUOISE = 12
    F_WHITE = 8
    F_YELLOW = 15
    F_BLINK = 1
    F_DEFLT_HILITE = 8
    F_DEFLT_NOHILT = 3
    F_OIA = 1
    B_NORMAL_UNPRO = 1
    B_INTENSE_UNPRO = 1
    B_NORMAL_PRO = 1
    B_INTENSE_PRO = 1
    B_BLUE = 1
    B_GREEN = 1
    B_PINK = 1
    B_RED = 1
    B_TURQUOISE = 1
    B_WHITE = 1
    B_YELLOW = 1
    B_BLINK = 8
    B_DEFLT_HILITE = 1
    B_DEFLT_NOHILT = 1
    B_OIA = 3
    HOST_ALARM = 1
    PF_ALARM = 1
    SU_ALARM = 1
    NAU = 02
)

```

Figure 123 (Part 2 of 10). Response File for the Extended Services Installation

```

SNASession = (
  name = 2
  SESN_ID = X7089803
  TYPE = 1
  COMMENT = Host session 2 non-DFT
  SHORT_ID = 8
  AT_KEYBOARD = ACS3ATGR
  ENH_KEYBOARD = ACS3ENGR
  SPACE_SIZE = 1
  PSS_ROW = 25
  PSS_COL = 80
  XFER_SIZE = 0
  UNSUP_CC = 1
  APS_PRINT = Y
  DBCS_NUML = 1
  DBCS_LANG = 1
  PRT_BUFF = 1920
  F_NORMAL_UNPRO = 3
  F_INTENSE_UNPRO = 5
  F_NORMAL_PRO = 4
  F_INTENSE_PRO = 8
  F_BLUE = 4
  F_GREEN = 3
  F_PINK = 14
  F_RED = 5
  F_TURQUOISE = 12
  F_WHITE = 8
  F_YELLOW = 15
  F_BLINK = 1
  F_DEFLT_HILITE = 8
  F_DEFLT_NOHILT = 3
  F_OIA = 1
  B_NORMAL_UNPRO = 1
  B_INTENSE_UNPRO = 1
  B_NORMAL_PRO = 1
  B_INTENSE_PRO = 1
  B_BLUE = 1
  B_GREEN = 1
  B_PINK = 1
  B_RED = 1
  B_TURQUOISE = 1
  B_WHITE = 1
  B_YELLOW = 1
  B_BLINK = 8
  B_DEFLT_HILITE = 1
  B_DEFLT_NOHILT = 1
  B_OIA = 3
  HOST_ALARM = 1
  PF_ALARM = 1
  SU_ALARM = 1
  NAU = 03
)

```

Figure 123 (Part 3 of 10). Response File for the Extended Services Installation

```

SNASession = (
  name = 3
  SESN_ID = X7089804
  TYPE = 1
  COMMENT = Host session 3 non-DFT
  SHORT_ID = C
  AT_KEYBOARD = ACS3ATGR
  ENH_KEYBOARD = ACS3ENGR
  SPACE_SIZE = 2
  PSS_ROW = 25
  PSS_COL = 80
  XFER_SIZE = 0
  UNSUP_CC = 1
  APS_PRINT = Y
  DBCS_NUML = 1
  DBCS_LANG = 1
  PRT_BUFF = 1920
  F_NORMAL_UNPRO = 3
  F_INTENSE_UNPRO = 5
  F_NORMAL_PRO = 4
  F_INTENSE_PRO = 8
  F_BLUE = 4
  F_GREEN = 3
  F_PINK = 14
  F_RED = 5
  F_TURQUOISE = 12
  F_WHITE = 8
  F_YELLOW = 15
  F_BLINK = 1
  F_DEFLT_HILITE = 8
  F_DEFLT_NOHILT = 3
  F_OIA = 1
  B_NORMAL_UNPRO = 1
  B_INTENSE_UNPRO = 1
  B_NORMAL_PRO = 1
  B_INTENSE_PRO = 1
  B_BLUE = 1
  B_GREEN = 1
  B_PINK = 1
  B_RED = 1
  B_TURQUOISE = 1
  B_WHITE = 1
  B_YELLOW = 1
  B_BLINK = 8
  B_DEFLT_HILITE = 1
  B_DEFLT_NOHILT = 1
  B_OIA = 3
  HOST_ALARM = 1
  PF_ALARM = 1
  SU_ALARM = 1
  NAU = 04
)

```

Figure 123 (Part 4 of 10). Response File for the Extended Services Installation

```

SNASession = (
    name = 4
    SESN_ID = X7089805
    TYPE = 1
    COMMENT = Host session 4 non-DFT
    SHORT_ID = 0
    AT_KEYBOARD = ACS3ATGR
    ENH_KEYBOARD = ACS3ENGR
    SPACE_SIZE = 2
    PSS_ROW = 25
    PSS_COL = 80
    XFER_SIZE = 0
    UNSUP_CC = 1
    APS_PRINT = Y
    DBCS_NUML = 1
    DBCS_LANG = 1
    PRT_BUFF = 1920
    F_NORMAL_UNPRO = 3
    F_INTENSE_UNPRO = 5
    F_NORMAL_PRO = 4
    F_INTENSE_PRO = 8
    F_BLUE = 4
    F_GREEN = 3
    F_PINK = 14
    F_RED = 5
    F_TURQUOISE = 12
    F_WHITE = 8
    F_YELLOW = 15
    F_BLINK = 1
    F_DEFLT_HILITE = 8
    F_DEFLT_NOHILT = 3
    F_OIA = 1
    B_NORMAL_UNPRO = 1
    B_INTENSE_UNPRO = 1
    B_NORMAL_PRO = 1
    B_INTENSE_PRO = 1
    B_BLUE = 1
    B_GREEN = 1
    B_PINK = 1
    B_RED = 1
    B_TURQUOISE = 1
    B_WHITE = 1
    B_YELLOW = 1
    B_BLINK = 8
    B_DEFLT_HILITE = 1
    B_DEFLT_NOHILT = 1
    B_OIA = 3
    HOST_ALARM = 1
    PF_ALARM = 1
    SU_ALARM = 1
    NAU = 05
)

```

Figure 123 (Part 5 of 10). Response File for the Extended Services Installation

```

LDLC = (
    name = 0
    ADAPT_TYPE = 2
    LOAD = Y
    MAX_LINK_STA = 6
    PER_N_CALLS = 0
    FREE_LINK = N
    PER_CONGEST = 100
    MAX_RU_SIZE = 1920
    SEND_COUNT = 2
    REC_COUNT = 1
    CASM_LAN_ID = WLFSCLI
    SEND_ALERT = N
)

*-----
Define_Local_CP = (
    name = DEIBMD1.X708980A
    CP_ALIAS = 5250LU
    HOST_FP_LINK_NAME =
    HOST_FP_SUPPORT = Y
    NAU_ADDRESS = 0
    NODE_ID = 08098
    NODE_TYPE = 3
    DESCRIPTION = Merkmale des lokalen Knotens
)

*-----
Define_Logical_Link = (
    name = LINK0001
    DLC_NAME = IBMTRNET
    ACTIVATE_AT_STARTUP = N
    CP_CP_SESSION_SUPPORT = N
    ADAPTER_NUMBER = 0
    ADJACENT_NODE_TYPE = 1
    PREFERRED_NN_SERVER = N
    DESTINATION_ADDRESS = 4000700D807C
    X25_DIRECTORY_ENTRY =
    FQ_ADJACENT_CP_NAME = DEIBMD1.STU38EB2
    EFFECTIVE_CAPACITY = -1
    COST_PER_BYTE = -1
    COST_PER_CONNECT_TIME = -1
    PROPAGATION_DELAY = -1
    SECURITY = -1
    USER_DEFINED_1 = -1
    USER_DEFINED_2 = -1
    USER_DEFINED_3 = -1
    LIMITED_RESOURCE = N
    LINK_STATION_ROLE = -1
    SOLICIT_SSCP_SESSION = N
    DESCRIPTION = Peer-Knoten AS/400
)

*-----
Define_Local_LU = (
    name = LU2
    LU_ALIAS = LU2
    NAU_ADDRESS = 0
    DESCRIPTION = Lokale LU
)

*-----

```

Figure 123 (Part 6 of 10). Response File for the Extended Services Installation

```

Define_Partner_LU = (
    name = DEIBMD1.STU38EB2
    PARTNER_LU_ALIAS = STU38EB2
    PARTNER_LU_UNINTERPRETED_NAME =
    CONV_SECURITY_VERIFICATION = N
    MAX_MC_LL_SEND_SIZE = 32767
    PARALLEL_SESSION_SUPPORT = Y
    DESCRIPTION = Partner LU AS/400 Zfu
)

*-----
Define_Partner_LU_Location = (
    name = DEIBMD1.STU38EB2
    WILDCARD_ENTRY = 0
    FQ_OWNING_CP_NAME = DEIBMD1.STU38EB2
    FQ_SERVING_NN_CP_NAME =
    LOCAL_NODE_NN_SERVER = Y
    DESCRIPTION = Prepared by CID
)

*-----
Define_COS = ( no changes here necessary
    name = #BATCH
)
Define_COS = ( no changes here necessary
    name = #BATCHSC
)
Define_COS = ( no changes here necessary
    name = #CONNECT
)
Define_COS = ( no changes here necessary
    name = #INTER
)
Define_COS = ( no changes here necessary
    name = #INTERSC
)
Define_COS = ( no changes here necessary
    name = #CPSVCMG
)
Define_COS = ( no changes here necessary
    name = #SNASVCMG
)

*-----
Define_Mode = (
    name =
    MAX_RU_SIZE_UPPER_BOUND = 2048
    COS_NAME = #CONNECT
    DEFAULT_RU_SIZE = Y
    MAX_NEGOTIABLE_SESSION_LIMIT = 8
    MIN_CONWINNERS_SOURCE = 4
    PLU_MODE_SESSION_LIMIT = 8
    RECEIVE_PACING_WINDOW = 3
    DESCRIPTION =
)
Define_Mode = (
    name = #BATCH
    MAX_RU_SIZE_UPPER_BOUND = 2048
    COS_NAME = #BATCH
    DEFAULT_RU_SIZE = Y
    MAX_NEGOTIABLE_SESSION_LIMIT = 8
    MIN_CONWINNERS_SOURCE = 4
    PLU_MODE_SESSION_LIMIT = 8
    RECEIVE_PACING_WINDOW = 3
    DESCRIPTION =
)

```

Figure 123 (Part 7 of 10). Response File for the Extended Services Installation

```

Define_Mode = (
    name = #BATCHSC
    MAX_RU_SIZE_UPPER_BOUND = 2048
    COS_NAME = #BATCHSC
    DEFAULT_RU_SIZE = Y
    MAX_NEGOTIABLE_SESSION_LIMIT = 8
    MIN_CONWINNERS_SOURCE = 4
    PLU_MODE_SESSION_LIMIT = 8
    RECEIVE_PACING_WINDOW = 3
    DESCRIPTION =
)
Define_Mode = (
    name = #INTER
    MAX_RU_SIZE_UPPER_BOUND = 2048
    COS_NAME = #INTER
    DEFAULT_RU_SIZE = Y
    MAX_NEGOTIABLE_SESSION_LIMIT = 8
    MIN_CONWINNERS_SOURCE = 4
    PLU_MODE_SESSION_LIMIT = 8
    RECEIVE_PACING_WINDOW = 7
    DESCRIPTION =
)
Define_Mode = (
    name = #INTERSC
    MAX_RU_SIZE_UPPER_BOUND = 2048
    COS_NAME = #INTERSC
    DEFAULT_RU_SIZE = Y
    MAX_NEGOTIABLE_SESSION_LIMIT = 8
    MIN_CONWINNERS_SOURCE = 4
    PLU_MODE_SESSION_LIMIT = 8
    RECEIVE_PACING_WINDOW = 7
    DESCRIPTION =
)
Define_Mode = (
    name = CPSVCMG
    MAX_RU_SIZE_UPPER_BOUND = 512
    COS_NAME = CPSVCMG
    DEFAULT_RU_SIZE = N
    MAX_NEGOTIABLE_SESSION_LIMIT = 2
    MIN_CONWINNERS_SOURCE = 1
    PLU_MODE_SESSION_LIMIT = 2
    RECEIVE_PACING_WINDOW = 1
    DESCRIPTION =
)
Define_Mode = (
    name = QPCSUPP
    MAX_RU_SIZE_UPPER_BOUND = 1920
    COS_NAME = #CONNECT
    DEFAULT_RU_SIZE = N
    MAX_NEGOTIABLE_SESSION_LIMIT = 32767
    MIN_CONWINNERS_SOURCE = 32
    PLU_MODE_SESSION_LIMIT = 64
    RECEIVE_PACING_WINDOW = 7
    DESCRIPTION = 5250 Modusdefinition
)

```

Figure 123 (Part 8 of 10). Response File for the Extended Services Installation

```

Define_Mode = (
    name = SNASVCMG
    MAX_RU_SIZE_UPPER_BOUND = 512
    COS_NAME = SNASVCMG
    DEFAULT_RU_SIZE = N
    MAX_NEGOTIABLE_SESSION_LIMIT = 2
    MIN_CONWINNERS_SOURCE = 1
    PLU_MODE_SESSION_LIMIT = 2
    RECEIVE_PACING_WINDOW = 1
    DESCRIPTION =
)

*-----
Define_Defaults = (
    name =
    DEFAULT_TP_CONV_SECURITY_RQD = N
    DEFAULT_TP_OPERATION = 2
    DEFAULT_TP_PROGRAM_TYPE = 0
    DIRECTORY_FOR_INBOUND_ATTACHES = *
    IMPLICIT_INBOUND_PLU_SUPPORT = Y
    DEFAULT_MODE_NAME =
    DEFAULT_LOCAL_LU_ALIAS =
    MAX_HELD_ALERTS = 10
    MAX_MC_LL_SEND_SIZE = 32767
    DESCRIPTION =
)

*-----
Define_TP = (
    name = X'07',6DB
    FILESPEC = C:\SQLLIB\SQLCIAA.EXE
    ICON_FILESPEC =
    PARM_STRING =
    CONV_SECURITY_RQD = Y
    CONVERSATION_TYPE = 2
    INCOMING_ALLOCATE_QUEUE_DEPTH = 255
    INCOMING_ALLOCATE_TIMEOUT = -1
    PROGRAM_TYPE = 0
    RECEIVE_ALLOCATE_TIMEOUT = -1
    SYNC_LEVEL = 2
    TP_OPERATION = 2
    DESCRIPTION = Transaktionsprogramm
)

Define_TP = (
    name = X'07',6SN
    FILESPEC = C:\SQLLIB\SQLLCNSM.EXE
    ICON_FILESPEC =
    PARM_STRING =
    CONV_SECURITY_RQD = Y
    CONVERSATION_TYPE = 2
    INCOMING_ALLOCATE_QUEUE_DEPTH = 255
    INCOMING_ALLOCATE_TIMEOUT = -1
    PROGRAM_TYPE = 0
    RECEIVE_ALLOCATE_TIMEOUT = -1
    SYNC_LEVEL = 2
    TP_OPERATION = 2
    DESCRIPTION = Transaktionsprogramm
)

```

Figure 123 (Part 9 of 10). Response File for the Extended Services Installation

```

CNOS_FQ_PLU_Name = (
    name = 5250LU,DEIBMD1.STU38EB2,QPCSUPP
    SET_NEGOTIABLE = N
    AUTO_ACTIVATE = 0
    PLU_MODE_SESSION_LIMIT = 64
    MIN_CONWINNERS_SOURCE = 64
    MIN_CONWINNERS_TARGET = 0
    RESPONSIBLE = 0
    DRAIN_SOURCE = N
    DRAIN_TARGET = N
)

*-----
GWW = (
    name = M6
    COMMENT = Modell Gateway-Datenstations-LU-Profil (nur Modell)
    CP_NAME =
    LU_TYPE = 1
    LU_POOL_CLASS = 1
    AUTOLOGOFF = N
    ADDR_HOST =
    ADDR_WS =
    DLC_TYPE = 2
    ADAPTER = 0
    DEST_ADDR =
    X25_DIR =
)

*-----
Start_Attach_Manager = 1
CMInstallACDI = 0
CMInstallAPI = 1
CMInstallConfigServices = 1
CMInstallKeyBdRemap = 1
CMInstallUtilities = 1
CMInstallACDIRedir = 1
CMTarget = C:
CMNetBiosName =
*****
DBMaxActiveDB = 3
DBRequesterBlockSize = 4096
DBServerBlockSize = 0
DBCommunicationType = 3
DBMaxSharedSegments = 25
DBMaxCommoHeapSize = 2
DBMaxRDSHeapSize = 2
DBMaxRemoteConnections = 3
DBBasesOnWorkStation =
DBWorkstationName = WLFSCLI
DBInstallQueryManager = 1
DBInstallDosReqSuppt = 0
DBInstallDataBaseServices = 1
DBInstallDataBaseTools = 1
DBInstallWINReqSuppt = 0
DBTarget = C:

```

Figure 123 (Part 10 of 10). Response File for the Extended Services Installation

---

## Glossary

**ANSI.** American National Standards Institute; U.S.-based organization which defines standards for computing devices, protocols, programming languages etc.

**Alias name.** A redirected drive cannot be accessed directly. An Alias statement on the server points to the server directory or drive, which should be made accessible. Each Alias statement has a name, which must be referred to from a client workstation, when it wants access to this server directory or drive.

**API.** Application Programming Interface; term used to describe the set of functions by which an application may gain access to operating system services.

**Bit.** A binary digit, which may be either zero or one. Bits are represented within a computing device by the presence or absence of an electrical or magnetic pulse at a particular point, indicating a one or a zero respectively.

**Boot Manager.** Boot Manager; feature of OS/2 V2.0 which allows multiple partitions to exist on fixed disks in the same machine, with a separate operating system on each partition. At boot time, the user may select the desired operating system with which to start the machine.

**Byte.** A logical data unit composed of eight binary digits (bits).

**CD-ROM.** Compact Disk Read-Only Memory; technology where data is stored on an optical disk for reading by a computer system equipped with an appropriate reading device. CD-ROM storage media may not be updated by the computer system, although certain implementations allow the media to be erased and re-written.

**CID.** Configuration Installation and Distribution. The IBM architected way of automated installation and customization for OS/2 V2.0 and other products.

**CID code server.** LCU server workstation storing images, response files and log information.

**CID enabled.** CID enabled product can access its product images on the code server. The configuration and installation is done via response file. The product's installation program, which interprets the response file, leaves CID standard return codes.

**CID standard return codes.** The standard return codes are used to identify the product's installation program behavior under the master installation program execution. These codes identify, for example, the boot and call-back requests.

**CSD.** see Corrective Service Diskette

**Corrective Service Diskette.** To maintain OS/2 operating systems, CSDs are supplied, which can be installed using the OS/2 V2.0 Corrective System Facility.

**DDE.** Dynamic Data Exchange; interprocess communication protocol used by applications to define dynamic links. Information updated in one application is automatically reflected in other applications linked to the first application via DDE.

**Debugging.** The process of removing "bugs" or errors from application code.

**Device Driver.** Code which handles the translation of generic device commands into specific commands for the required physical device and vice versa, allowing operating system interaction with physical devices attached to the system.

**DLL.** Dynamic Link Library; application module containing routines and/or resources, which is dynamically linked with its parent application at load time or runtime rather than during the linkage editing process. The use of DLLs enables decoupling of application routines and resources from the parent program, enhancing code independence, facilitating maintenance and reducing resident memory consumption.

**DMA.** Direct Memory Addressing; technique by which transfers to and from system memory are made by an independent control chip rather than by the system's main processor, thereby resulting in improved overall performance.

**DOS.** Disk Operating System; generally used in reference to IBM DOS, the single-tasking 16-bit real-mode operating system designed for Intel 8086 processors, and developed by Microsoft Corporation as MS DOS in the early 1980s. IBM subsequently licensed MS DOS for use on IBM Personal Computer and Personal System/2 machines, and has since undertaken joint development of later versions of the operating system in conjunction with Microsoft.

**DOS settings..** Function provided by the Multiple Virtual DOS Machine component of OS/2 V2.0 which allows a user to customize the behavior of a virtual DOS machine to suit the application running in that VDM. Settings may be configured once by the user and saved, or applications may provide their own configuration information which is used by the VDM upon startup.

**DPMI.** DOS Protected Mode Interface.

**EMS.** Expanded Memory Specification; term used to describe the standard developed by Lotus, Intel and Microsoft for access to expanded memory by real mode 80x86 applications.

**Expanded Memory.** Memory in 80x86 processors, typically on special hardware adapters, which is accessed by real mode 8086 applications using the LIM EMS specification. Up to 32 MB of expanded memory are supported by EMS Version 4.0.

**Extended Attributes.** Under OS/2 V2.0 extended attributes are used to provide additional information on files, programs and drivers. Under HPFS the extended attributes are stored together with the file. For file systems, not supporting extended attributes, the EAUTIL program can be used to extract the extended attributes from and storing them in a separate file, as well as reconstructing the original file with extended attributes.

**Extended Memory.** Memory in 80286, 80386, and 80486-based machines which is located above the 1MB address boundary and accessed using the LIMA XMS specification.

**FAT.** File Allocation Table; term used to describe the file system implemented by DOS and also supported by OS/2. This file system uses a file allocation table to contain the physical sector addresses of all files on the disk. The FAT file system is supported by OS/2 V2.0, along with the newer HPFS and other installable file systems.

**GB.** Gigabyte; 1024 Megabytes, or 1024 x 1024 x 1024 bytes.

**HIMEM.SYS.** The Extended Memory Manager in general use for DOS.

**HPFS.** High Performance File System; file system first implemented under OS/2 Version 1.2, offering enhanced performance over the original FAT file system implemented in DOS and prior versions of OS/2. HPFS is an optional installation item under OS/2 V2.0; the FAT system may also be used to retain compatibility with DOS.

**Included response file.** The keyword Include of the response file makes it possible to include another response file in a response file, thereby overriding keywords, previously defined before the include statement.

**I/O.** Input/Output; term used to collectively describe the techniques and devices through which a computer system interfaces with storage devices, external systems and the user.

**KB.** Kilobyte; 1024 bytes.

**LAN.** Local Area Network: term used to define a group of devices (typically programmable

workstations but also including midrange and host systems) known as nodes, which are located in close geographical proximity to one another (typically within a single property boundary), and which are connected in order to share and exchange information. Typical local area networks include the IBM token-ring network.

**LANRES/VM.** Local Area Network Resource Extension and Services/VM is an IBM product that provides services to NetWare clients by using Virtual Machine (VM) resources.

**LCU.** LAN Configuration Installation and Distribution Utility (LCU) is a part of Network Transport Services/2 and includes the server/redirector facilities and master installation program.

**LDU.** LAN Download Utility: a NETBIOS utility for distribution of software across a LAN.

**LTS.** The LAN transport system is used to establish a NetBIOS communication, basic vehicles are needed. The package of programs required to start a successful NetBIOS communication are called LTS.

**Master installation program.** Ties together the automated installation and customization of OS/2 V2.0 and other products. The master installation program is a part of LCU.

**MB.** Megabyte; 1024 Kilobytes, or 1024 x 1024 bytes.

**Multiple Virtual DOS Machine.** Feature of OS/2 V2.0 which enables multiple DOS applications to execute concurrently in full screen or windowed mode under OS/2 V2.0, in conjunction with other 16-bit or 32-bit applications, with full pre-emptive multitasking and memory protection between tasks. See also virtual DOS machine.

**NDM/2.** NetView Distribution Manager/2: workstation product which interact with NetView DM on the host to provide change management functions.

**NetBIOS.** NetBIOS stands for Network Basic Input/Output System for LAN. It is an Application Programming Interface (API) that allows high level communication programming on a LAN.

**Network Transport Services/2.** Network Transport Services/2 consists of two parts. The LAN Adapter and Protocol Support and LCU.

**Page.** Granular unit for memory management using the 80386 and 80486 processors. A page is a 4 KB contiguous unit of memory, which the processor manipulates as a single entity for the purpose of memory manipulation and swapping.

**PC Support/400.** PC Support/400 is the premier client/server offering for the AS/400 system and the

premier cooperative processing application enabler for the AS/400 system.

**Physical Device Driver.** Protected mode device driver used by the OS/2 V2.0 operating system and protected mode processes to access hardware devices. DOS applications running in VDMs do not directly access physical device drivers; virtual device drivers are utilized by these applications, and the virtual device driver in turn communicates with the physical device driver.

**POST.** Power-On Self-Test; code typically stored on ROM (although the IBM PS/2 Model 90 and 95 allow POST code to be stored on fixed disk) which is invoked when a machine is powered on, in order to test the hardware.

**Protected Mode.** Mode of operation for the Intel 80286 and 80386/80486 processors, whereby the address space is expanded to 16 MB (80286) or 4 GB (80386/80486), and memory references are translated via segment selector and offset, enabling full memory protection between processes executing in the system. With the 80386/80486, paging is available in protected mode.

**RAM.** Random Access Memory; term used to describe memory which may be dynamically read and written by a processor or other device during system operations. RAM is typically used to store program instructions and data which not being operated upon by the processor at the current moment in time, but which are required for the logical unit of work currently being carried out.

**RAS.** Reliability, Availability and Serviceability of the OS/2 operating system.

**Real Mode.** Default mode of operation for the Intel 80286 and 80386/80486 processors, and the only mode of operation for the 8086 processor. In real mode, the processor acts as a 16-bit device, its physical memory address space is limited to 1MB, and memory references translate directly to physical addresses. With the 80386 and 80486, paging is not supported in real mode.

**Redirected drive.** A drive letter, which is not pointing to a local logical or virtual drive, but to a drive or directory on a server. This feature is used by LAN and SRVIFS to gain access to directories on the server.

**Response File.** The response file is a man-readable ASCII file, prepared in advance, to answer all questions asked during the installation or maintenance of an OS/2 operating system by means of keywords. This file is used during the remote installation or maintenance process.

**REXX.** Restructured Extended Executor: procedural language originally developed for VM/CMS, which conforms to the SAA standards for procedural languages as defined by SAA *Common Programming Interface Procedures Language Reference*, SC26-4358.

**ROM.** Read-Only Memory; term used to describe memory which may be read, but not written to, during system operations. ROM is typically used to store basic hardware initialization instructions, BIOS or self-testing code, which is required to be available prior to accessing the disk subsystem.

**SAA.** System Application Architecture: set of defined rules, guidelines, interfaces and protocols for application and system design, intended to facilitate cross-system consistency and application portability.

**Seed system.** The minimum OS/2 V2.0 operating system booted in order to upgrade the existing operating system on the client workstation.

**Service.INI file.** This readable ASCII file is needed to start a LCU code server. Keywords are used to prepare all information required. \*

**OS/2 V2.0 Corrective System Facility.** A mechanism of servicing the OS/2 product line.

**VDM.** See Virtual DOS Machine

**Virtual DOS Machine.** A protected mode process under OS/2 V2.0 which emulates a DOS operating system environment, such that DOS applications executing within the virtual machine operate exactly as if they were running under DOS. DOS virtual machines support both text and graphics applications. VDMs make use of the virtual 8086 mode of the 80386 and 80486 processors.

**Virtual 8086 Mode.** Mode of operation of the Intel 80386 and 80486 processors, which allows the processor to execute multiple concurrent tasks with each regarding the processor as its own distinct 8086 processor. This mode of operation provides full pre-emptive multitasking and full memory protection between the virtual 8086 tasks. Also known as V86 mode.

**WLFS/VM.** Workstation LAN File Services/VM uses VM DASD to provide file sharing services through LAN servers to workstation users.

**80386.** Intel 80386 microprocessor; the 32-bit processor upon which the OS/2 V2.0 operating system is based.

**80486.** Intel 80486 microprocessor; a 32-bit processor which implements a superset of the 80386 processor instruction set.



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## Index

### A

APARS for Software License Monitor 127  
Attended redirected installation 9

### B

BFS.INI file 40  
Boot diskettes 6  
BOOT disks creation 99

### C

CASINSTL command 100  
CASPREP utility 111  
CID  
    Attended redirected installation 7  
    CID code server 3, 5  
    CID definition 3  
    CID Enabled product 4  
    CID redirector 3  
    Diskette initiated 3  
    Disketteless sequence 12  
    Hard disk initiated 3  
    Installation methods 4  
    LCU 3  
    Lightly attended redirected installation 7  
    Master installation program 3  
    One diskette sequence 12  
    Redirected I/O 3  
    Redirected installation 7  
    Response file 3, 6  
    Seed system 3  
    Standard installation 7  
    Standard return codes 3  
    System type 3  
    Two boot diskette sequence 11  
    Unattended redirected installation 8  
CID Code server enabling 96  
CID installation steps AS/400 74  
CID utilities 92  
CLAW connection figure 19  
Client specific response file 101  
Client workstation - WLFS hardware and software requirements 22  
CMIMAGE command 94  
Code SERVER.INI file 46  
Communications Manager configuration 74  
CONFIG.SYS file 100  
CONFIG.SYS file statements 40  
Connectivity equipment - WLFS hardware and software requirements 22  
Creating volumes and partitions for NetWare 70  
Customizing server password files 67

Customizing the NetWare server software 63

### D

Directory structure 91  
DMKRIO ASSEMBLE file 23  
DMKRIO ASSEMBLE file for LANRES/VM 52

### E

ES 1.0 response file 131  
ESAIMAGE command 93  
EWXCONFIG LINK file for LANRES/VM 54  
EWXDISK VMPW file for LANRES/VM 56  
EWXDISKX file for LANDISK 58  
Extended Services 1.0 and CM/2 response files 106

### F

FEP screen 47  
Front end processor - WLFS hardware and software requirements 21

### H

Hardware requirements 91  
Hardware/software requirements 73

### I

IBMLAN.INI file 41  
Images on host DASD 91  
Installing the NetWare server software 62

### L

LANINST command 94, 107  
LANRES 14  
LANRES documentation 49  
LANRES/VM figure 49  
LANRES/VM hardware and software requirements 50  
LANRES/VM host software installation 51  
LAPS response file 104  
LAPSDISK command 94  
LAPSRSP command 104  
LCU general setup file 109  
LCU step sequence 111  
Lightly attended redirected installation 10

### N

Network connections 5  
NTS/2  
    Network Transport Services/2 5  
NTS/2-LAPS install 96

NTS/2-LAPS response file 104

## O

OS/2 2.0 response file 102

OS/2 V2.x response file 102

OS2LFS CONFIG file 29

## P

PC Support/400 17

PROFILE EXEC file 30

PROFILE EXEC for LANDISK user 59

PROFILE WLFS file 29

PROTOCOL.INI file 43

PS/2 server installation - installing the MMC

Adapter 62

## R

Redirected I/O 4

## S

SEDISK command 99

SEIMAGE command 93

Service PAK response file 104

SERVICE.INI file 97

Setting up AUTOEXEC.NCF 65

Setup file for LCU 110

Software License Monitor 127

Software License Monitor/VM customization 30

SRVIFS disk images 96

SRVIFS server install 97

Standard Installation 8

STARTUP.CMD file 101

STRBFS.CMD file 47

## T

THINIFS command 99

THINLAPS command 99

THINSRV install command 98

## U

UNPACK command 92

## V

VM Processor - WLFS hardware and software requirements 21

## W

WLFS concepts 113

WLFS CONFIG file 27

WLFS documentation 20

WLFS PS/2 software installation 31

WLFS/VM 13

WLFS/VM host software installation 23

WLFS/VM host software installation steps 25

## X

XCOPY files to CID code server 98



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LAN Resource Extension and Services/VM  
AS/400 PC Support  
in CID Environment**

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