IBM S/390® Integrated Server 3006

IBM

User's Guide and Reference

Model B01

IBM S/390® Integrated Server 3006
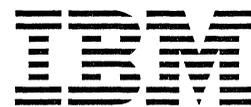
User's Guide and Reference

Model B01

Note!

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

First Edition (November 1998)

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Preface

This book describes how to install, generate, and modify S/390 operating systems on the IBM S/390 Integrated Server Model B01. This includes information on:

- The IBM S/390 Integrated Server, its hardware and software components, and connectivity options

- Installing IBM S/390 Integrated Server programs and S/390 operating systems

- How to operate and configure the system to create and maintain S/390 operating systems

- How to use tools provided by the IBM S/390 Integrated Server to solve problems

- How to improve the operation and performance of the IBM S/390 Integrated Server, by using commands and utilities provided with the product

Who This Book Is For

This book is intended for a system programmer responsible for installing and maintaining S/390 operating systems on the IBM S/390 Integrated Server. A general understanding of System/390® data processing and teleprocessing techniques is assumed. In particular, you must have a good understanding of the S/390 operating system, and a general knowledge of a S/390 Server. You should also have a good understanding of the OS/2® operating system.

How This Book Is Organized

This book contains the following chapters and appendixes:

- Chapter 1, "Introduction to the IBM S/390 Integrated Server" on page 1 tells about the benefits of the IBM S/390 Integrated Server and provides an overview of its hardware and software components.

- Chapter 2, "P/390 I/O Subsystem" on page 15 provides information to help you decide which options you want to use when installing and configuring the system.

- Chapter 3, "Installing P/390 Hardware and Software" on page 29 contains procedures to help you customize the IBM S/390 Integrated Server for the S/390 environment.

- Chapter 4, "Installing a Non-Preconfigured Operating System" on page 31 provides guidance when installing the S/390 operating system and associated products.

- Chapter 5, "Operating the P/390" on page 47 describes how to use the tools for operating the IBM S/390 Integrated Server.

- Chapter 6, "Configurator Overview" on page 59 contains an overview of the Configurator which you will use to configure the IBM S/390 Integrated Server.

- Chapter 7, "Configurator Tasks" on page 93 gives step-by-step instructions on how to use the Configurator to complete certain tasks.

- Chapter 8, "Configuring the 3172 SDLC Gateway" on page 147 tells how to configure the IBM S/390 Integrated Server for the 3172 SDLC Gateway (MVS/ESA and OS/390 only) function.

- Chapter 9, "Using the P/390 Manual Operations Session" on page 167 describes the S/390 manual operations session, including editing registers, editing main storage, and generating hardware requests.

- Chapter 10, "Exploiting the S/390 Integrated Server with VSE/ESA" on page 175, Chapter 11, "Exploiting the S/390 Integrated Server with MVS/ESA and OS/390" on page 183, and Chapter 12, "Exploiting the S/390 Integrated Server with VM/ESA" on page 191 give suggestions on using S/390 operating systems and IBM S/390 Integrated Server combination.

- Chapter 13, "CMS Commands" on page 199 describes the CMS commands that are shipped with the IBM S/390 Integrated Server.

- Chapter 14, "OS/2 Utilities" on page 221 describes the OS/2 utilities that come with the IBM S/390 Integrated Server.

- Chapter 15, "Modifying CP and CMS (VM/ESA Only)" on page 239 describes information you should consider before you modify CP for use on the S/390 Integrated Server.

- Chapter 16, "Performance Hints and Tips" on page 251 contains performance and tuning hints that were gathered during laboratory experiences.

- Chapter 17, "How the P/390 Supports the S/370 and S/390 Architecture" on page 255 identifies S/370™ and ESA/390™ facilities that are supported and unsupported by the P/390.

- Appendix A, "Documentation and Related IBM Manuals" on page 261 lists additional publications that describe the IBM S/390 Integrated Server and the operating systems supported on the IBM S/390 Integrated Server.

Chapter 1. Introduction to the IBM S/390 Integrated Server

The IBM S/390 Integrated Server Model B01 brings together two powerful technologies:

- Compact, high-performance, low-cost peripheral component interconnect (PCI) servers with their broad range of user-friendly interfaces and applications, and

- Enterprise System Architecture/390®-based operating systems with their rich tradition of applications and functions supporting interactive and commercial processing.

P/390 Solutions

The S/390 Integrated Server offers unique and cost-effective computing solutions with the latest technology to customers who require ESA/390 architecture on a workstation or on a server in a Local Area Network (LAN) environment. The software provided with the S/390 Integrated Server offers new solutions to customers, for example:

- A development workbench
- A distributed server
- An entry System/390 server

The following section describes sample environments in which the S/390 Integrated Server can support your business or enterprise. The scenarios are only intended to outline the possibilities. They should not be used as a guide to establish a specific environment.

Development Workbench

Using the S/390 Integrated Server as a development workbench, it can serve as a dedicated platform for developing, testing, and maintaining mainframe applications, using the same tools as the host. Therefore, the availability of the host production system is increased, dependencies on the host are eliminated, and risks to the production system are reduced, resulting in higher productivity. Figure 1 on page 2 shows an enterprise organized this way.

Application and system development performed on a S/390 Integrated Server on the LAN increases the availability of the host system. Developers can continue to move applications, data, and system changes between the mainframe and the S/390 Integrated Server on the LAN. Commands and utilities supplied with the S/390 Integrated Server software can aid in using the S/390 Integrated Server facilities.

As applications are developed, client workstations that access the host across the LAN for production applications can access this end-user test machine to validate the applications before they are moved to the mainframe. These applications are uploaded to the host system through the connectivity facilities provided by the S/390 Integrated Server and the S/390 operating systems that run on it.

With the host mainframe connected to the LAN with devices such as the 3172 controller or an integrated mainframe LAN adapter, full SNA connectivity is available between the mainframe and the LAN-attached devices to support these

types of environments. S/390 Integrated Servers can communicate peer-to-peer across the LAN with the mainframe and with each other. Workstations can communicate with S/390 Integrated Servers on the LAN, with the mainframe, or both.
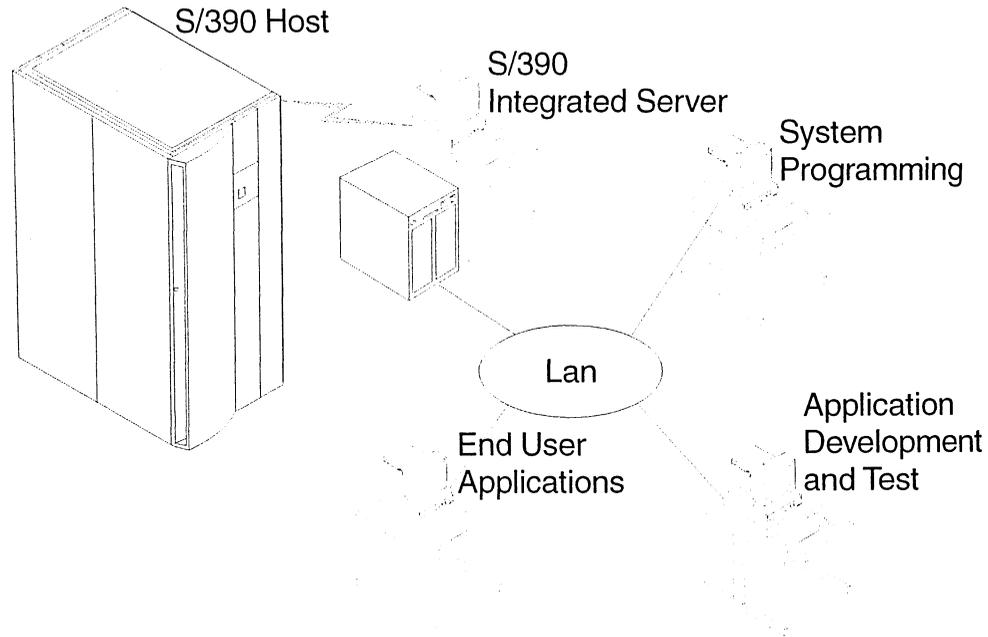
Figure 1. S/390 Integrated Server as a Development Workbench

Distributed Server

The S/390 Integrated Server can participate in multiple local and remote enterprises. Figure 2 on page 3 shows an example of this.

Remote Server: If you have a business or enterprise that needs total systems management of multiple remote systems, the S/390 Integrated Server provides a distributed platform that is capable of running ESA/390 applications. Remote locations can run their businesses autonomously while receiving consistent services, such as business applications, regional and corporate data, system skills, and transparent systems management, from the host. Cost savings are achieved by consolidating skills at the host, by eliminating administrative skills at the remote sites, and by reducing telecommunications costs.
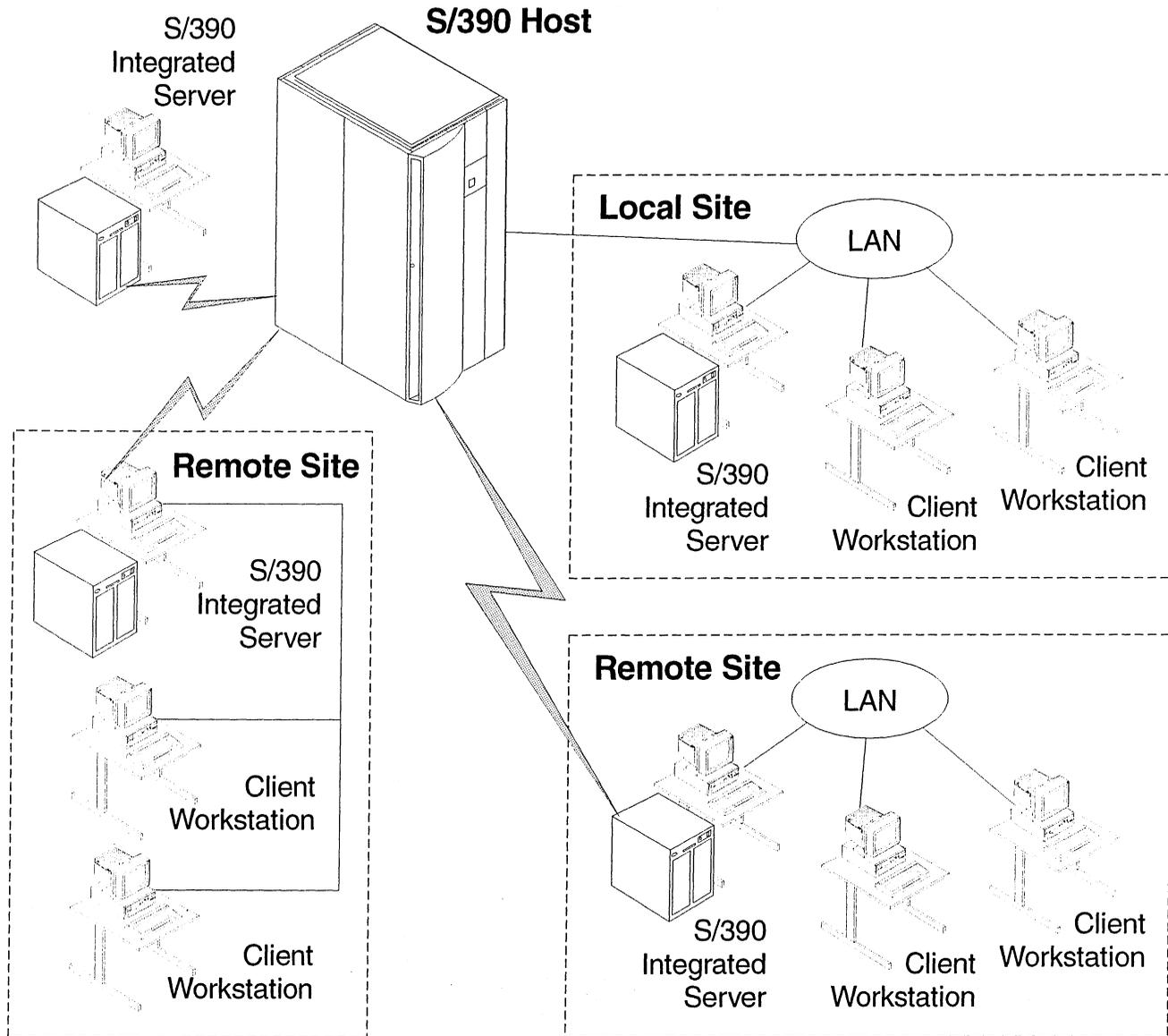
Figure 2. S/390 Integrated Server in Distributed Environments

Entry S/390 Server

The S/390 Integrated Server can run as an entry System/390 server, replacing S/370 mainframe systems that are outdated. Figure 3 on page 4 shows an example of how this would be done. Substantial savings can be demonstrated in lower maintenance costs on both the processor and DASD, lower energy costs, lower connectivity costs, and environmental savings. You have the flexibility of configuring the S/390 Integrated Server as a stand-alone system or integrating it into a LAN environment. You can also attach selected tape drives, printers, and communication controllers to the S/390 Integrated Server by using the S/390 Parallel Channel adapter, or utilize the ESCON® feature of the S/390 Serial Channel adapter to connect to new devices and to those you were unable to connect to in the past.

By replacing existing S/370 and S/390 operating systems with the S/390 Integrated Server, you can use the latest technology, including S/390 ESA software, and retain the same skills. The S/390 software provides complete year 2000 support.
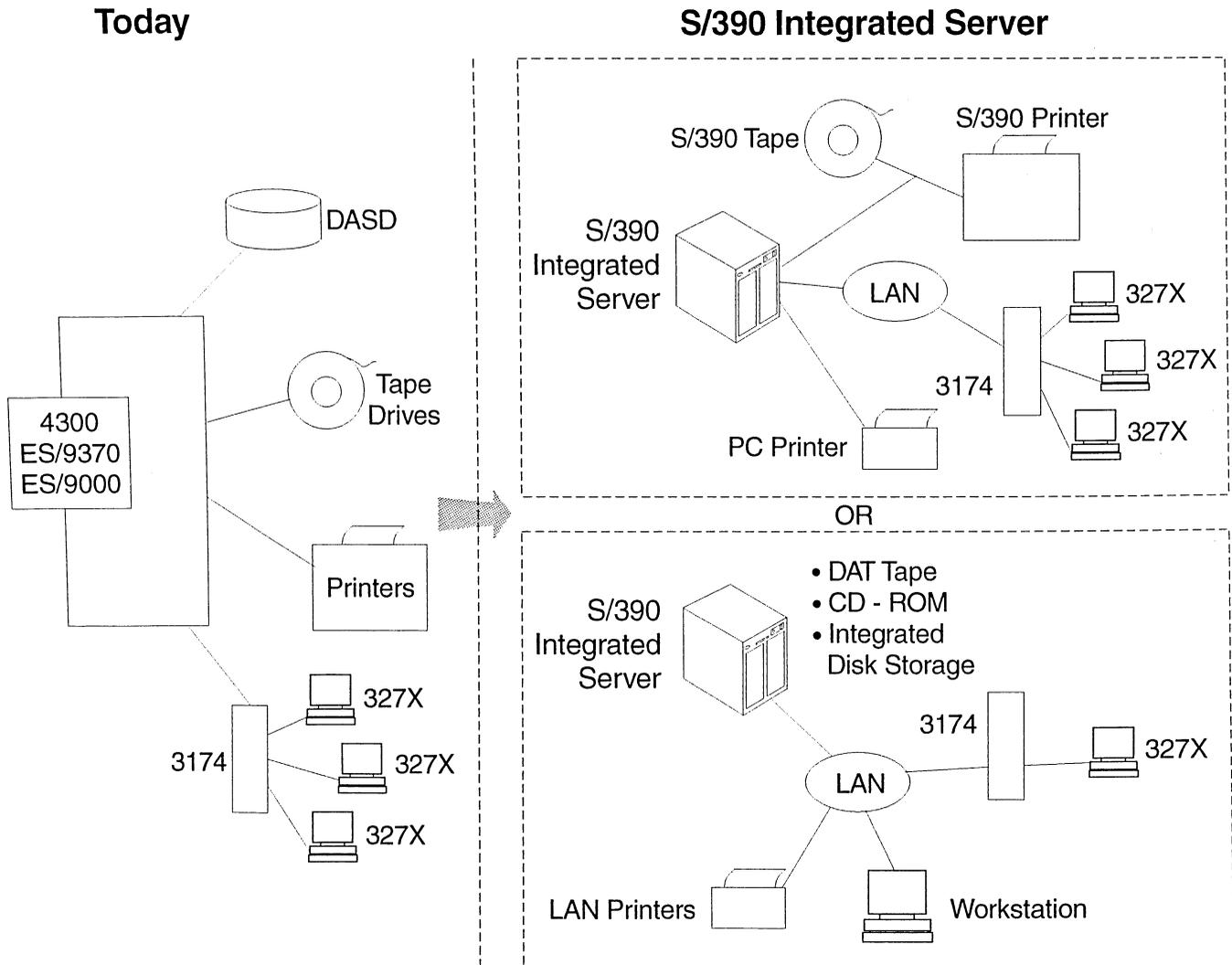
Figure 3. S/390 Integrated Server as an Entry Server

System Overview

The S/390 Integrated Server is a dual-processor system with a high-performance Pentium® II processor as part of the I/O and Service Processor (IOSP). This IOSP provides an execution environment for the programs that provide the S/390 I/O emulation. An enhanced S/390 Microprocessor Complex (P/390) provides the S/390 ESA instruction set and runs the VM/ESA®, VSE/ESA™, and OS/390® operating systems unmodified. Most S/390 applications run unmodified on the S/390 Integrated Server. (Throughout this book, the System/390 Microprocessor Complex will be referred to as the P/390.)

Figure 4 on page 5 illustrates the basic structure of the S/390 Integrated Server.
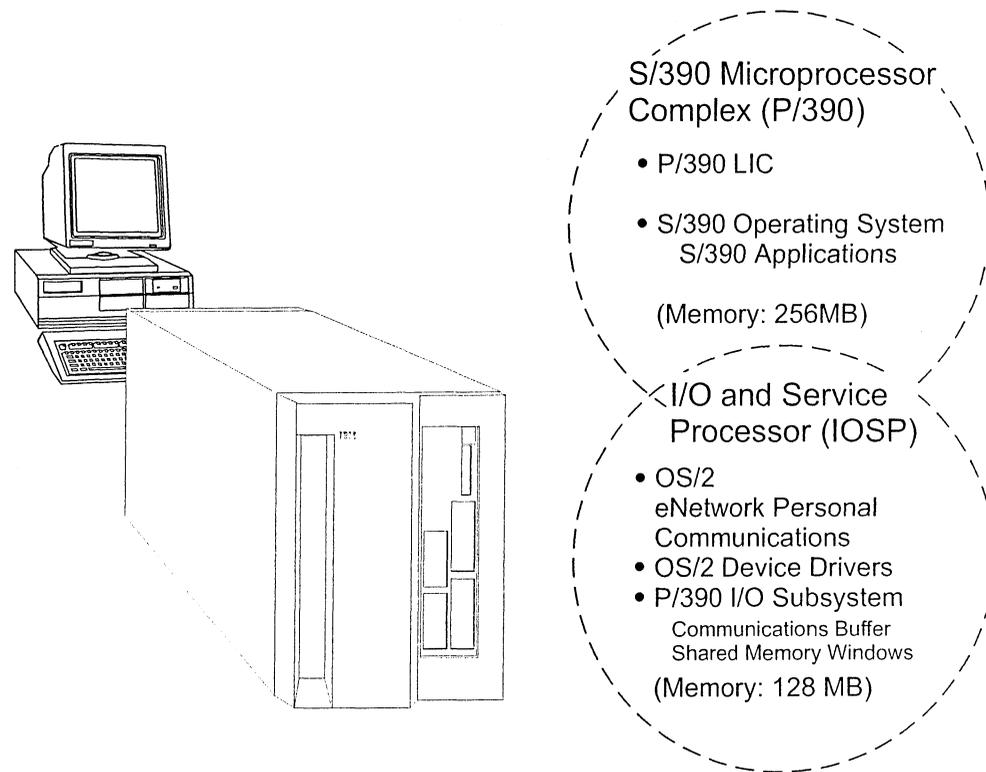
Figure 4. S/390 Integrated Server System Overview

S/390 Integrated Server Hardware Structure

There are two processor parts in the S/390 Integrated Server system:

- The System/390 Microprocessor Complex or P/390 card
- The I/O and Service Processor (IOSP)

This section describes these main components.

The System/390 Microprocessor Complex

The S/390 Microprocessor Complex or P/390 card, is presently supported in the S/390 Integrated Server Model B01. It has the following features:

- S/390 microprocessor
- 256MB ECC memory
- 64-bit internal data flow
- Integrated floating point unit
- Support for S/390 ESA architecture
- Sends I/O requests to the IOSP
- Uses one PCI slot

The P/390 provides the functions of an S/390 processor and is best understood when you look at its main parts.

- **The P/390 licensed internal code** is responsible for processor communication with the IOSP and for implementation of the ESA/390 architecture on the S/390 Integrated Server. This code is supplied with the S/390 Integrated Server Program and is installed on the integrated server's hard disk. It is loaded from the hard disk when an IPL command is executed.

- **The P/390**, with the aid of the licensed internal code, can run the VM/ESA, VSE/ESA, and OS/390 operating systems along with their applications. The System/390 Microprocessor Complex is implemented via a single 300,000 gate CMOS VLSI module. The P/390 supports the standard ESA/390 instruction set and facilities described in the *ESA/390 Principles of Operations*. In addition, the S/390 Integrated Server can operate in S/370 mode. In S/370 mode, the standard S/370 instruction set and facilities, as described in the *IBM System/370™ Principles of Operation*, are supported. Additional facilities provided by the S/390 Integrated Server are described in Appendix A, "Documentation and Related IBM Manuals" on page 261.

  The P/390 takes advantage of the I/O capabilities of the IOSP to support S/390 I/O operations rather than having its own separate I/O capabilities. It works in tandem with the I/O and Service Processor (IOSP) to provide a base for running the device managers, which in turn provide the S/390 device emulation.

- **Real memory** for the P/390 consists of 256MB ECC memory. This memory is part of the P/390 and is completely separate from the IOSP memory that comes with the S/390 Integrated Server. It is dedicated to the P/390, and it is only used to support execution of the S/390 operating system and its programs.

The I/O and Service Processor (IOSP)

The I/O and Service Processor (IOSP) is available in the S/390 Integrated Server Model B01. The P/390 takes advantage of the I/O capabilities of the IOSP to support S/390 I/O operations rather than having its own separate I/O capabilities. It utilizes an S/390 I/O subsystem implemented through device emulation software, device drivers, and S/390 Integrated Server devices controlled by the IOSP to service its I/O requests.

The following features are standard on the S/390 Integrated Server Model B01:

- Single Board Computer (SBC) with an on-board high performance 333MHz Intel Pentium II processor-L1 cache 32KB and L2 cache 512KB
- IBM System/390 Microprocessor Complex (P/390) with 256MB ECC memory
- S/390 Parallel Channel and ESCON Channel adapters
- Internal Serial Storage Architecture (SSA) RAID-5 DASD controller
- Sixteen hot-swap DASD bays
- Expansion slots:
  - sixteen Peripheral Component Interconnect (PCI) I/O slots, and
  - three Industry Standard Architecture (ISA) slots
- Accelerated Graphics Port (AGP) On Board Video with 2 MB memory
- Integrated 10/100Mbps PCI Ethernet controller
- 4mm DDS/3 digital audio tape (DAT) provided for S/390 software installation and service
- Two high-speed serial ports and one parallel port
- Enhanced 101-keyboard
- IBM PS/2 mouse
- 1.44MB diskette drive
- CD-ROM drive

S/390 Integrated Server Software Structure

Figure 4 on page 5 shows the major software components that run on the processor:

- S/390 operating system
- OS/2 operating system, for S/390 Integrated Server support
- P/390 I/O subsystem

You should already be familiar with the software structure of an S/390 processor running VM/ESA, VSE/ESA, MVS/ESA™, or OS/390. If not, see the manuals listed in Appendix A, "Documentation and Related IBM Manuals" on page 261. The new piece in the picture for a system running S/390 software is the I/O and Service Processor (IOSP) and the programs running on it. A description of each of these software components follows.

S/390 Operating Systems

Here are the S/390 operating systems that are supported on the S/390 Integrated Server:

- VM/ESA (currently marketed releases)
- VSE/ESA (currently marketed releases)
- MVS/ESA (currently marketed releases)
- OS/390 (currently marketed releases)

The S/390 operating systems are distributed on any currently supported tape, including the 4mm digital audio tape (DAT). In addition, the S/390 preconfigured systems are distributed on CD-ROMs. The installation of the preconfigured system has been simplified; and it will be preinstalled so that the S/390 Integrated Server is ready to run when it arrives. Additional CD-ROMs also contain VM/ESA, VSE/ESA, MVS/ESA, and OS/390 publications in softcopy format for use with BookManager® Read licensed products or library readers supplied on the CD-ROM.

To find out the current release level for the operating system that is supported, contact your IBM marketing representative, or IBM authorized dealer, or call 800-IBM-CALL in the U.S. and Canada. In some situations, you may be able to migrate older releases of S/370 or S/390 operating systems to a later release.

OS/2 Operating System

The following programs are required and come preloaded on the S/390 Integrated Server:

- IBM OS/2 Warp Server

- IBM eNetwork™ Personal Communications for OS/2

The S/390 Integrated Server uses OS/2 facilities to control parts of the IOSP system, including standard I/O devices, such as the display, keyboard, mouse, disks, and printer. The multitasking capabilities of OS/2 allow concurrent execution of OS/2 applications and the device managers and programs that support the P/390. Installation and operation of the S/390 environment are also integrated into the OS/2 environment.

OS/2 must be properly installed on the S/390 Integrated Server before the P/390 programs can be installed, because the installation steps use standard OS/2 commands to copy the P/390 support programs to OS/2 formatted disks. This use of unaltered BIOS and OS/2 is an advantage for installation, backup, recovery, and

debugging. No special tools are required to manipulate the S/390 Server disks, which contain standard OS/2 files representing both the P/390 programs and the S/390 disk volumes.

IBM Multi-Protocol Transport Services (MPTS) is required on the S/390 Integrated Server for MPTS connections. MPTS function is provided by OS/2 Warp. These and other S/390 Integrated Server connectivity options are described further in Chapter 2, "P/390 I/O Subsystem" on page 15.

3270 emulation sessions are used on the S/390 Integrated Server to access the ESA/390 operating system. These sessions are displayed in OS/2 windows, as are other functions related to the S/390 environment, such as the S/390 CPU activity window shown in Figure 15 on page 49. Some of the S/390 Integrated Server programs use the Presentation Manager® interface to display screens that support the S/390 environment. Online help is also available.

P/390 icons are provided for easy access to the functions that are used to operate and support the S/390 environment. Figure 14 on page 47 shows the icon folder that is displayed when the P/390 icon is selected from the OS/2 desktop.

The IPL P/390 icon can be included in the OS/2 startup folder to automate the startup of the S/390 operating system when the S/390 Integrated Server is turned on.

OS/2 Problems

The S/390 Integrated Server I/O subsystem is based on a customized OS/2. If any programs are added to the OS/2 that are not part of the Integrated Server product, these applications can affect both the performance and reliability of your S/390 I/O.

If you have added new applications and then experience *any* problems, first stop running the applications while the P/390 is IPLed, to see if the problems cease. If the problems persist, then try uninstalling the applications. If you still have problems, then contact your IBM Business Partner; your C: drive may have to be formatted and reloaded.

Note: The following programs are *not* part of the S/390 Integrated Server product and should *never* be loaded or run:

- Netfinity
- OS/2 LAN Server
- HPFS386

P/390 I/O Subsystem

The S/390 Integrated Server IOSP provides the I/O support for the P/390 in place of System/390 channel hardware. All of the standard S/370 and S/390 I/O devices are emulated by device drivers, device managers, and utilities that come with the P/390 programs and by S/390 Integrated Server devices that are standard features of the system or are added through installation of additional device adapters. The P/390 I/O subsystem consists of:

- P/390 device driver
- I/O control blocks (IOCBs)
- S/390 channel emulator
- Device manager emulators for S/390 I/O devices
- Device map (DEVMAP) for mapping emulated S/390 hardware devices to OS/2 devices

These components are described in detail in Chapter 2, "P/390 I/O Subsystem" on page 15.

Connectivity

There are many ways to provide connectivity to the S/390 operating systems running on the S/390 Integrated Server. With appropriate software installed, the S/390 Integrated Server can operate using IBM Systems Network Architecture (SNA), IBM non-SNA networks and some non-IBM networks. The device managers identified in this section are described in detail in Chapter 2, "P/390 I/O Subsystem" on page 15.

S/390 Integrated Server

S/390 Host
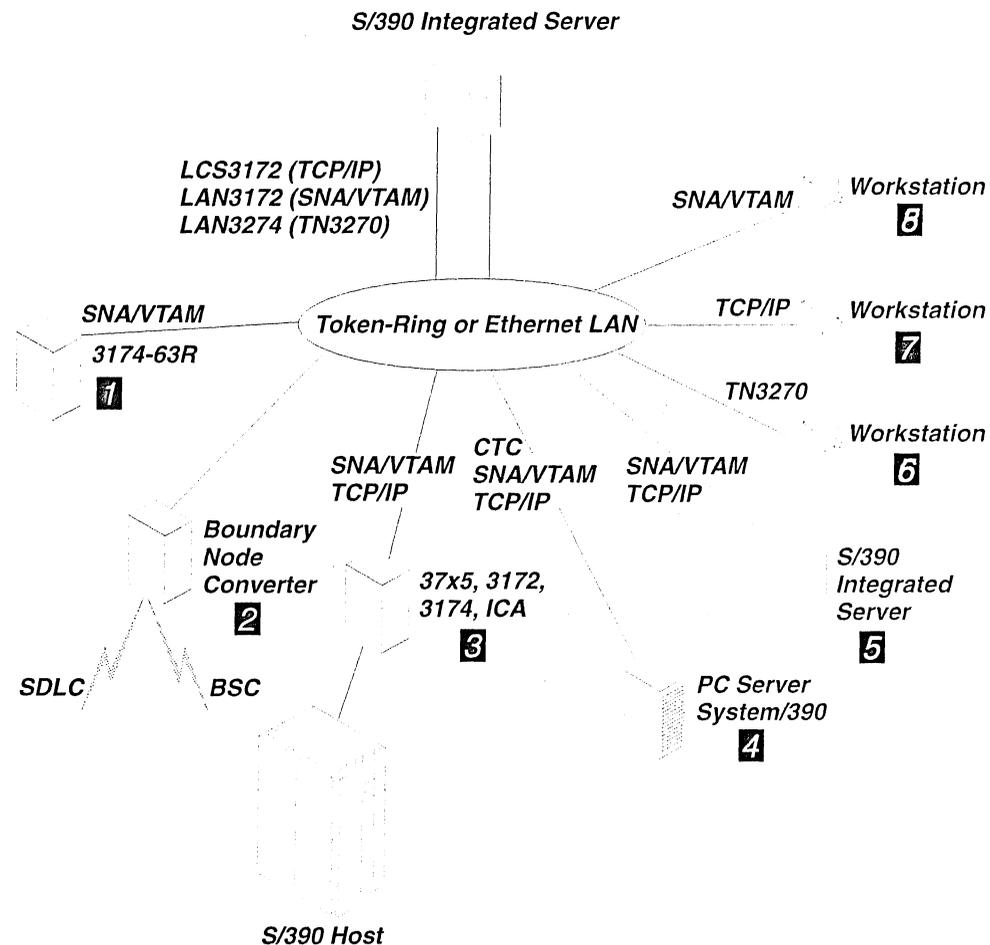
Figure 5. The S/390 Integrated Server in a Local Area Network

Figure 5 shows the possibilities of using a token-ring or an Ethernet LAN using P/390-provided device managers LCS3172, LAN3172, and LAN3274.

- 3270-type terminals and printers can gain connectivity through a LAN-attached 3174 display controller **1** using SNA/VTAM®.

- A LAN-attached boundary node converter **2** using SNA/VTAM can be used to provide connectivity for SDLC- and BSC-attached devices.

- LAN-attached S/390 host mainframes **3** can establish connectivity to the S/390 operating systems using either SNA/VTAM or TCP/IP. A S/390 host

connection to the LAN would be through a 37X5, 3172, 3174 controller or an integrated communication adapter (ICA).

- The S/390 operating system on the S/390 Integrated Server can communicate across **4** the LAN peer-to-peer to a PC Server System/390 or **5** another S/390 Integrated Server as if they were connected using a 3172-001 controller. Either SNA/VTAM or TCP/IP can be used.

- Workstations using the TN3270 protocol **6** for transmitting 3270 data streams over TCP/IP Telnet can communicate with the S/390 operating system using non-SNA DFT 3270 emulation sessions.

- TCP/IP clients **7** connected to the LAN can access the S/390 operating system running on the S/390 Integrated Server.

- OS/2, Windows®, and DOS client workstations **8** on the LAN can communicate with S/390 Integrated Server from 3270 emulation sessions using SNA 3270 protocol.
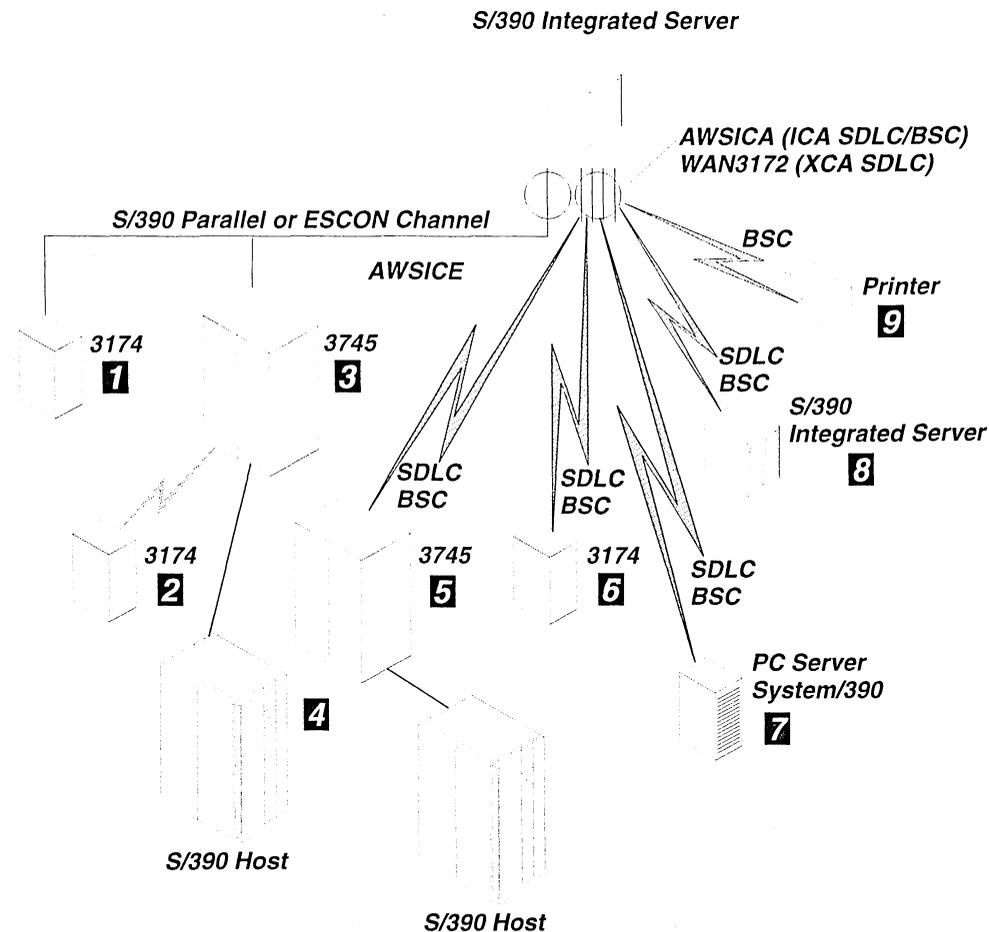
Figure 6. The S/390 Integrated Server with Communication Lines

Figure 6 describes additional connectivity options using conventional communication lines and P/390 device managers AWSICA and WAN3172. Also provided is an attachment capability using the S/390 Parallel Channel (with the S/370 OEMI interface specification) and/or ESCON Channel. The AWSICE device manager supports this capability.

- 3174 display controllers ▮ can be connected to a S/390 Parallel Channel or ESCON Channel through an ESCON director, thus providing local attachment for 3270-type terminals and printers.

- Applications requiring an expanded communication capability can attach a 3745 communication controller ▮ to a S/390 Parallel Channel or ESCON Channel through an ESCON director. The 3745 can provide alternate connections to the S/390 host ▮ or 3174 display controller ▮ as well as increased communication capabilities.

- Remote 3270-type terminals and printers can be attached using a 3174 display control unit ▮ with a directly-connected communication link.

- A remote peer-to-peer PC Server System/390 ▮ or S/390 Integrated Server connection ▮ can be established using a directly connected communication link and either SDLC or BSC protocols.

- Remote printers ▮ can be attached using BSC protocols.

Commands and Utilities

Commands

Several commands and utility programs are used with the S/390 Integrated Server in addition to those provided by the OS/2 and S/390 operating systems. These are useful when operating P/390 functions on the S/390 Integrated Server.

CMS commands that come with the S/390 Integrated Server complement those provided by the VM/ESA operating system. CMS users can invoke these commands from VM sessions running on the S/390 Integrated Server to access host VM data and OS/2 files and to interact with the OS/2 environment. These are included with the VM/ESA preconfigured system.

Figure 7 lists the commands and their functions:

Figure 7. Commands and their functions	
Command	**Function**
MOUNT	Associate an OS/2 file specification with an S/390 Integrated Server emulated tape drive
NEWDIR	Import the current VM user directory from OS/2 and make it active in VM
OS2	Execute an OS/2 command from a S/390 Integrated Server virtual machine
PCOPY	Copy (import/export) files between OS/2 and VM
PIPE OS2	Use the OS2FILE stage command in a pipeline running under CMS to read or write an OS/2 file
PIPE OS2FILE	Read or write OS/2 files from CMS pipelines

Utilities

Several OS/2 and P/390 utilities are supplied with the P/390 programs to help control and operate the S/390 Integrated Server. The interactive functions invoked by the P/390 icons use some of these utilities to perform their tasks. Because the utilities are OS/2 programs, they can be invoked from an OS/2 command prompt to accomplish these and other tasks without using one of the S/390 Integrated Server interactive interfaces.

See Chapter 14, "OS/2 Utilities" on page 221 for additional information about these utilities.

Figure 8 lists the utilities and their functions:

Figure 8. Utilities and their functions	
Utility	**Function**
ALC.EXE CKDALC.EXE	Allocates files as DASD, display volume information, and change volume labels
AWSCFG.CMD	Invokes the P/390 Configurator
AWSEND.CMD	Stops the P/390 I/O subsystem
AWSMOUNT.EXE	Changes the FBA DASD or emulated tape configuration dynamically
AWSPROF.EXE	Records the name and location of the DEVMAP to use as the default for the Configurator and IPL
AWSSTART.EXE	Starts P/390 device managers
AWSSTAT.EXE	Displays or changes the status of the P/390 I/O subsystem and device managers
DEV2NAME.CMD	Creates an ASCII file from a DEVMAP file
ICEDEV	Stand-alone scan of the S/390 Parallel Channel and/or ESCON Channel for devices
ICEINIT	Initializes and loads the ARTIC960, S/390 Parallel Channel, and/or ESCON Channel
ICEMAP	Displays the devices claimed by AWSICE and their settings
ICETRACE	Gets an internal S/390 Parallel Channel and/or ESCON Channel trace dump
IPL.CMD	Starts the P/390 I/O subsystem and IPL the P/390
LTRENAME.EXE	Renames the title bar of a Personal Communications 3270 session
RDEVMAP.CMD	Reconfigures directory and pathnames in a DEVMAP
SENDLOG.CMD	Transmits logs and traces to IBM via the Internet for problem analysis

VSE/ESA Utilities

Samples of two utilities are provided on an as-is basis in the latest releases of VSE/ESA in ICCF Library 59.

TMOUNT Runs in a VSE/ESA batch partition. Allows the same functions as AWSMOUNT. This function can be included in a job stream instead of using the OS/2 AWSMOUNT command. It is supplied on the

preconfigured CD-ROM. The source of this program is contained in
VSE/ESA ICCF Library 59 (TMOUNT). See "Using the TMOUNT
Command in VSE/ESA" on page 178 for more information on using
this function.

PCOPY   Is a sample program to allow file transfers between OS/2 and
VSE/ESA. The source for the sample program can be found in
VSE/ESA ICCF Library 59 (PCOP*).

Chapter 2. P/390 I/O Subsystem

Before installing the S/390 operating system, you need to understand the P/390 I/O subsystem and its options. This section will help you decide in advance which options you want to choose. This will make the actual installation go faster and more smoothly.

Overview

The S/390 Integrated Server is a combination of the System/390 and I/O and Service Processor (IOSP) architectures that provide access and use of both in a single package. While the S/390 instructions execute natively on a dedicated CMOS chip on the P/390, as shown in Figure 9, the execution of the S/390's I/O is handled by device managers, device drivers, and S/390 channel emulation. The S/390 design in the S/390 Integrated Server is unique when compared to other S/390 processors. In this implementation, S/390 devices are either channel-attached (via the ESCON or S/390 Parallel Channels), or emulated on OS/2 devices in a manner that is transparent to the S/390. DASD devices can be attached via the S/390 Serial Channel Adapter or emulated using 18GB HDDs in a manner that is transparent to the S/390 operating system or application.
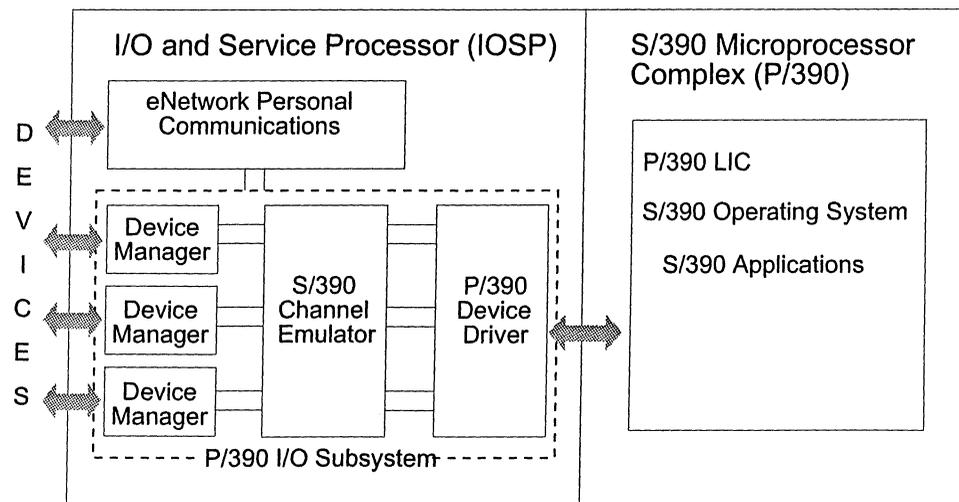
Figure 9. S/390 I/O handled by OS/2 Device Managers/Drivers

P/390 Device Driver

This device driver provides the interface between the P/390 and the OS/2 application programs that perform channel and device emulation.

Some of the functions it performs include:

- Starting and stopping the P/390
- Initial program load (IPL) of the P/390
- Handling of interrupts from the P/390
- Issuing interrupts to the P/390
- Loading the P/390 licensed internal code from an OS/2 file.

It is written as a standard OS/2 device driver.

IOCBs

An I/O Control Block (IOCB) is created for each emulated device at initialization time. It contains all the status needed to describe the state of the device from the channel's point of view. The IOCB includes:

- CCW (channel command word)
- I/O count
- A pointer to the I/O buffer for the current operation
- Status and internal control indicators

The IOCB is the basis for all I/O activity to and from a device.

S/390 Channel Emulator

This program is supplied as an OS/2 application. It performs the S/390 channel emulation and interfaces between the device manager emulators and the P/390 device driver. It is invoked by the device driver when an I/O request is issued by the S/390 processor and passes control to the appropriate OS/2 device managers to perform the I/O operation. It is given control by the device manager when the S/390 I/O request completes, and passes control to the device driver to issue an I/O interrupt to the P/390 to signal completion and provide status.

A communications buffer and shared memory windows are used for communication between the P/390 and the IOSP. The communications buffer resides in the OS/2 physical address space. It provides a communication area between the P/390 and the software running on the IOSP. It is used to pass control information between the two systems for I/O operations and for other S/390 control functions such as start, stop, and IPL of the P/390.

There are 31 shared memory windows, each 128KB in size. One window is always reserved for control functions such as the communications buffer. The 31 shared windows are allocated in 4MB of OS/2 address space above the 16MB line. The shared memory windows are used mainly to transfer data between the P/390 and the IOSP for I/O operations.

I/O Device Mapping

The S/390 Integrated Server can emulate S/390 I/O because it maps S/390 hardware devices to OS/2 resources. Device mapping is the process of relating S/390 device addresses to the OS/2 device managers that will emulate it. For example, an S/390 DASD address is mapped to an OS/2 file.

The P/390 I/O subsystem uses resources available on your S/390 Integrated Server to emulate the devices available on larger S/390 systems. The following table shows some of the device mapping that is used to achieve this emulation:

Host System/390 Device	S/390 Server Equivalent Device
3270 Information Display	Personal Communications emulated sessions
FBA, CKD, ECKD™-capable DASD	OS/2 file
3215	OS/2 Presentation Manager session

Host System/390 Device	S/390 Server Equivalent Device
2540 card reader	OS/2 file
1403 printer	OS/2 print spooler
3422 Tape Drive	OS/2 file
Special (VM)	Import/export PC data
ICA	SDLC/BSC connection
3172	LAN VTAM connection
3172	LAN TCP/IP connection
3420/3480 Tape Drive	DAT (digital audio tape)

Device mapping is performed by a supplied utility program called the *P/390 Configurator*. The Configurator is menu-driven. Changes to system configuration are easily made by changing the values in data menus. The Configurator also provides menus to simplify creation and maintenance of VM user IDs and minidisks.

I/O Data Flow Example

The following example of reading a 3380 DASD device summarizes how the S/390 I/O subsystem emulates I/O operations on the S/390 Integrated Server:

1. The S/390 operating system does an SSCH (start subchannel) to real device 120.

2. The P/390 licensed internal code passes all I/O instructions to the P/390 I/O subsystem running on the IOSP.

3. The S/390 channel emulator executes the S/390 channel program and passes the request to the device manager that has claimed that range of devices in DEVMAP. In this example, it would be a CKD device manager.

4. The CKD device manager gets the request for device 120. It looks in the DEVMAP entry for device 120 to find out the OS/2 file name for the 3380 device 120. The device map points to an OS/2 file that emulates the S/390 disk drive; for example, D:\OS390\OS390R.120 for an OS/390 system.

5. A request is issued to OS/2 to read data from the OS/2 file named OS390R.120 in the \OS390 directory of disk drive D:.

6. OS/2 issues the request for the data to the S/390 Server device containing disk drive D:.

7. The data is passed back up the line until it is presented to the requesting operating program.

Device Managers

These programs are also OS/2 applications. They act as control units and emulate S/390 devices using IOSP hardware, OS/2 software, or both. Disk, tape, printer, unit record, and communication devices are emulated.

Each device manager is identified by name on the P/390 Configurator screen that is used to perform device mapping. Figure 10 on page 18 summarizes S/390 device types emulated by the P/390 device managers. It is followed by a detailed description of each manager.

Device Type Codes Summary

Figure 10. Device Managers Available on S/390 Operating Systems			
Device Manager	Function	DEVTYPE	S/390 Operating Systems Supported
AWSCKD	Count-key-data (CKD or ECKD-capable) DASD emulator	3330, 3350, 3375, 3380, 3390, 9345	VSE, MVS, OS/390, VM
AWSFBA	Fixed-block-architecture (FBA) DASD emulator	FB-512, 0671, 3310, 3370, 9332, 9335, 9336	VSE, VM
AWSICA	Integrated communication adapter (ICA) support for SDLC and BSC protocols	SDLC ICA BSC ICA	VSE, VM
AWSICE	S/390 Parallel Channel and ESCON Channel adapter device manager	See "AWSICE" on page 19.	VSE, MVS, OS/390, VM
AWSOMA	Optical media attach	3422, 3423	VSE, MVS, OS/390, VM
AWSPCSRV	Accesses OS/2 files	VSE/ESA, VM/ESA	
AWSTAPE	9-track tape emulator	3422 (3803 control unit)	VSE, MVS, OS/390, VM
AWS2540	2540 Card Reader emulator	2540	VSE, MVS, OS/390, VM
AWS2821	Printer manager	1403 (2821 control unit)	VSE, MVS, OS/390, VM
AWS3215	Typewriter keyboard emulator	3215	VM, VSE
AWS3274	3274 control unit emulator (non-SNA)	3277, 3278, 3279, 3287	VSE, MVS, OS/390, VM
LAN3172	3172 LAN Gateway (SNA)	3088	VSE, MVS, OS/390, VM
LAN3274	LAN 3270 sessions (non-SNA)	3277, 3278, 3279, 3287	VSE, MVS, OS/390, VM
LCS3172	3172 LAN channel station for TCP/IP	3088 (even/odd address pair)	VSE, MVS, OS/390, VM
MGR3172	NetView function	3088	VSE, MVS, OS/390, VM
SCSI3420 AWS3420	SCSI-attached 4mm DAT tape drive emulating a 9-track tape unit	3422	VSE, MVS, OS/390, VM
SCSI3480 AWS3480	SCSI-attached 18- or 36-track tape unit	3480, 3490	VSE, MVS, OS/390, VM
WAN3172	3172 LAN Gateway (SDLC/VTAM)	3088	VSE, MVS, OS/390, VM

The following section summarizes the capabilities and limitations of the device managers. The online help provided with the P/390 Configurator should always be used to obtain the most current information about a device manager and any new ones that may be added to the system.

AWSCKD: CKD/ECKD-Capable DASD Emulator

AWSCKD is designed to emulate 3330, 3350, 3375, 3380, 3390, and 9345 DASD. OS/2 files representing these volumes must be preallocated using the P/390 Configurator program or the CKDALC.EXE utility program before the S/390 Integrated Server can use them. The files can be located on either FAT or HPFS volumes and can reside on either the S/390 Integrated Server or a LAN server.

AWSCKD supports ECKD commands and 3390 devices. 3380 devices are handled as ECKD-capable.

AWSFBA: FBA DASD Emulator
AWSFBA emulates FBA DASD by mapping a complete CP, CMS, or VSE volume to a single OS/2 file. OS/2 files representing these volumes must be preallocated using the P/390 Configurator program or the ALC.EXE utility program before the S/390 Integrated Server can use them. The files can be located on either FAT or HPFS volumes and can reside on either the S/390 Integrated Server or on a LAN server.

AWSICA: Integrated Communication Adapter (WAC Adapter) Support
AWSICA provides Synchronous Data Link Control (SDLC) or Binary Synchronous Communication (BSC) Integrated Communication Adapter (ICA) support using the Wide Area Connector (WAC) adapters. MVS/ESA does not support ICAs.

Up to three WAC adapters are supported. Each can have up to two line interfaces installed. The maximum supported configuration is six 9221-type SDLC/BSC ICA devices. Switched and non-switched RS-232 and V.35 lines and non-switched X.21 lines are supported (depending on the WAC electrical interface board installed), with a maximum data rate of 500 Kbps (V.35). This is the highest speed tested. For more information about the 9221 SDLC/BSC ICA, see *ES/9000 Telecommunications Subsystem Description and Reference,* SA24-4198. This adapter does support V.25 bis.

If connecting to a NCP, an ICA does not support two-way simultaneous SDLC (DATMODE=FULL) or more than 7 outstanding SDLC frames (MAXOUT=7).

Because the AWSICA emulates a 9221 SDLC ICA, PU T2.1 support is supported.

Restrictions and known deviations from the 9221 ICA: Multidropped configurations have undergone limited testing to date. Link Problem Determination Aid-level 2 (LPDA®-2) protocol support is not provided. The WAC X.21 interface is only supported for leased lines (no switched line support).

AWSICE: S/390 Parallel Channel and ESCON Channel Adapter Device Manager
The AWSICE manager allows real S/370 and S/390 I/O control units to be attached to a S/390 Integrated Server system using the ARTIC960 PCI Co-Processor Platform with S/390 Parallel Channel and/or ESCON Channel application interface board (AIB) attached. Some typical attachments are:

- Line and page printers, such as the IBM 3800 Model 1 and the IBM 4248
- Tape drives such as the IBM 3420, 3480, and 3490
- Communication controllers, such as the IBM 3720 and 3745
- Display controllers, such as the 3174

For information on ESCON and Parallel channel performance, see "I/O Channel Performance" on page 27.

Restrictions:

- Only specific IBM devices have been tested. Because of timing considerations, non-IBM implementations of these devices may not function.

- DASD attachment is only supported on ESCON Serial Channel adapters.

- 3274, 5088, 3725, and 6098 controllers are not supported.

- A maximum of four adapters are supported.

- For best performance, connect a maximum of four control units to an adapter.

- A dedicated S/390 Parallel Channel adapter is required. It cannot be shared with any other OS/2 applications.

- Only DCI, 3 MB/Sec and 4.5 MB/Sec are supported on the P/390 Parallel Channel; 2 MB/Sec is **NOT** supported.

- A maximum of 16 active channel programs per card is supported.

- Multi-path is not supported (two channels to the same device controller).

- Only ESCON Channel functions are supported. ESCON to Parallel converter and CTC function is not supported; however, an S/390 ESCON Channel adapter can connect to another S/390 system where the CTC "load" is in that system's channel.

- Connection to ESCON Directors is supported.

AWSOMA: Optical Media Emulator

AWSOMA reads a CD-ROM in optical media format. IBM uses this format to ship program products, fixes, publications, and so on. AWSOMA reads a tape descriptor file (TDF) which describes the format and location of files on the CD-ROM and the logical organization of the files on the tape. This device manager is useful for allowing S/390 applications to have direct access to LAN files. See Chapter 10, "Exploiting the S/390 Integrated Server with VSE/ESA" on page 175, Chapter 11, "Exploiting the S/390 Integrated Server with MVS/ESA and OS/390" on page 183, or Chapter 12, "Exploiting the S/390 Integrated Server with VM/ESA" on page 191 for information on using this device manager.

AWSPCSRV: Support for Communication with OS/2

AWSPCSRV allows the P/390 to directly communicate with the OS/2 environment. This device manager supports commands such as, PCOPY, OS2, PIPE OS2 and PIPE OS2FILE for VM/ESA and PCOPY for VSE/ESA.

AWSTAPE: 9-Track Tape Emulator

AWSTAPE emulates one or more 3803/3422 tape drives using OS/2 files. The file can reside on either a hard disk, diskettes, or CD-ROM. Unlike S/390 Integrated Server DASD files, the configurator does not preallocate tape files. The AWSTAPE device manager automatically creates them when the S/390 operating system writes data to the device. Read, write, and repositioning commands are supported.

AWS2540: Card Reader Emulator

AWS2540 emulates a 2540 card reader using OS/2 files. Only one 2540 card reader device is supported. The emulator watches for files to appear in a specified OS/2 subdirectory. Files copied into that subdirectory appear to the emulated 2540 as card decks placed into a stacker. ASCII to EBCDIC translation is supported. The card reader emulator makes it easy for LAN clients to submit jobs to an S/390 Integrated Server VM/ESA, VSE/ESA, and MVS/ESA system.

AWS2821: Printer Manager

AWS2821 emulates 1403 printers on the S/390 Integrated Server. Printed output can be directed to either a printer port (LPTn) or an OS/2 file. The device manager, AWS2821 can also include the use of a control file. The control file is an OS/2 ASCII file that contains basic control lines and is created with any OS/2 editor. It provides the user with the ability to send control characters to the PC printer, before printing any output. This allows the printer to receive controls, such as rotating output, selecting the character set, and printing in duplex mode. For further information, see AWS2821.DOC file in the P390 sub-directory. If you are using the MVS/ESA operating system, see *Printing with MVS on the PC Server System/390*.

AWS3215: Typewriter Keyboard Emulator

The 3215 sessions are typewriter/keyboard sessions. These sessions are best suited for virtual machines that need a console to monitor them, for example, the VM/ESA 370 Feature operator console, and stand-alone utilities such as DDR and DSF. 3215 sessions are more suited to this activity than 3270 sessions are because 3215 sessions automatically scroll off old data and do not require you to press the CLEAR key at the "MORE..." or "HOLDING" indicators that 3270 sessions do. VM/ESA ESA Feature does not support 3215 except as a virtual device. These 3215 sessions can also be used for the VSE console. However, VSE's console support is better suited for use on a 3270 emulation session.

AWS3274: 3274 Control Unit Emulator

AWS3274 allows the S/390 Integrated Server to emulate a 3274 non-SNA control unit in support of 3270 devices, such as 3277s, 3278s, and 3279s.

AWS3274 uses eNetwork Personal Communications to emulate local 3270 devices. AWS3274 supports non-SNA DFT protocol and uses the PCOMM TCP/IP 3270 Emulator.

LAN3172: 3172 LAN Gateway

LAN3172 implements 3172 Interconnect Controller function serving as a LAN SNA gateway. This device manager provides support for OS/2, Windows, and DOS client workstations on the LAN to communicate with the S/390 operating system on the S/390 Integrated Server using SNA 3270 protocols. It also provides peer-to-peer support across the LAN between S/390 Integrated Servers and host mainframe systems connected to the LAN.

Personal Communications and MPTS are required on the S/390 Integrated Server and the OS/2 workstations for definition of LAN resources (IEEE 802.2). LAN Support for DOS and a 3270 emulator, such as eNetwork Personal Communications, are required on Windows and DOS workstations. A LAN adapter card is required for the S/390 Integrated Server and the workstations. Multiple LAN adapters are supported using a single S/390 address for the 3172.

ACF/VTAM® External Channel Adapter (XCA) major node definitions and switched major node definitions are used in the S/390 operating system to support connections using this device manager.

LAN3274: LAN 3270 Sessions

The LAN3274 device manager allows other users to log on to the S/390 operating system on the S/390 Integrated Server from remote workstations using TCP/IP TN3270 or TN3270E protocols. The device manager emulates a 3274 non-SNA control unit.

Any client workstation capable of supporting a TCP/IP 3270 session can be used to connect to the S/390 Integrated Server, for example, OS/2, AIX®, VM, Windows (3.1, NT, 95, 98), DOS, MAC, Sun, etc. OS/2 TCP/IP must be installed on the S/390 Integrated Server, and a separate LAN adapter from that used for the LCS3172 manager is required.

LCS3172: 3172 LAN Channel Station for TCP/IP support

The LCS3172 emulator lets TCP/IP running under VM/ESA, VSE/ESA, or MVS/ESA on the S/390 Integrated Server think it is communicating with a real 3172 LAN Channel Station. This support only requires TCP/IP support in VM/ESA, VSE/ESA, or MVS/ESA and does not require TCP/IP support on OS/2. Since LCS3172 must use the direct interface for the LAN adapter, and because MPTS only allows one application at a time to use this interface, the LAN adapter used by LCS3172 cannot be simultaneously shared with other applications such as OS/2 TCP/IP and Token Ring Monitor (TRMON) that use the direct interface. It is acceptable to install multiple LAN adapters in the S/390 Integrated Server if there are conflicts with the direct interface. Any adapter that is supported by MPTS can be used, that is, Token Ring, Ethernet, or any other NDIS-supported adapter.

MGR3172: Support for NetView

MGR3172 provides a network manager function for the P/390. This feature allows the P/390 to send network management information to NetView. Manager 3172 transports SDLC alerts, LAN alerts, alerts due to equipment failures, and responds to Vital Product requests.

SCSI3420 and AWS3420: SCSI/Tape Support

This device manager provides 3420 tape support. It can emulate a 3420 or 3422 tape on an IBM 4mm DAT tape drive. See the SCSI3420.DOC file for additional information on which tape drives have been tested.

SCSI3480 and AWS3480: SCSI/Tape Support

This device manager provides 3480 tape support in two formats. It can emulate a 3480 tape on an IBM 4mm DAT tape drive, or it can drive a SCSI-attached 3480 or 3490 (cartridge) tape drive.

Most IBM programs available in standard 3480 cartridge format are now also available in 4mm DAT format, which means you can order and load most IBM software using the 4mm DAT drive included in the S/390 Integrated Server. See the SCSI3480.DOC file for additional information on which tape drives have been tested.

WAN3172: SDLC Support for VTAM

WAN3172 provides transparent SDLC protocol conversion from a VTAM XCA Token Ring Major Node to either Wide Area Connector (WAC) or ARTIC MultiPort Model 2 (MM2) adapters.

Up to two WAC adapters are supported. Each WAC can have one or two line interfaces installed giving a maximum WAC configuration of four SDLC lines. Switched and NonSwitched RS-232 or V.35 lines are supported, with a maximum data rate of 56Kbps.

Up to two MultiPort Model 2 adapters are supported. Each can support 8 lines, for a maximum configuration of 16 SDLC lines. Only Switched and NonSwitched RS-232 lines are supported. The maximum data rate is a function of the number and speed of the SDLC lines. Each MultiPort Model 2 adapter has the capacity to support simultaneous use of all 8 lines at 9600bps.

WAN3172 supports true full duplex operation if the other end of the connection is also configured to operate in full duplex (a SDLC line on an IBM 3245 running NCP is one example of such a full duplex facility).

The principle WAN3172 restrictions are:

1. Switched SDLC operation is ONLY DIAL-IN to WAN3172 since WAN3172 is not able to obtain a dial number from VTAM via the XCA Major Mode definition.

2. SubArea (PUTYPE4 and PUTYPE5) SDLC connections are ONLY NonSwitched (Leased) because XCA SubArea XID negotiation follows just the VTAM NonSwitched XID protocol.

3. Half duplex modems that bracket receive data by modulating CD (or RLSD) are not supported.

DASD/Disk Storage

The S/390 Integrated Server comes with a base of 36GB of usable SAA RAID-5 DASD, which can be expanded to a total of 255GB of RAID-5 storage. The 16 DASD bays hot-swappable hard disk drives in a RAID 5 configuration allow for the replacement of the failing drive without shutting down the system. The unique cooling design promotes maximum airflow over system components and all disk drives for system cooling and reliability. By reducing the hardware complexity and points of failure, and by providing hot-swappable disk drives, the S/390 Integrated Server is designed for superior system availability.

RAID

The S/390 Integrated Server supports RAID 5. RAID 5 provides ease of configuration since data is spread across every disk. The RAID drives, therefore, appear to be one or a small number of large disk drives, rather than many small drives, making the configuration easier to manage.

If you plan to install any additional drives beyond the minimum required for RAID 5, do so at the initial installation, if possible. In this way, you can add them to the array without having to back up and restore the data to a redefined array. If additional drives are added to an existing array that contains data, the data must be backed up and restored because reconfiguring an array destroys all existing data in that array. You can, however, configure added drives into an additional array without affecting an existing array.

Capacities for Emulated DASD

Using OS/2 files, the S/390 Integrated Server device managers emulate the following DASD:

- IBM 0671, 3310, 3370, 9332, 9335, 9336, and FB-512 DASD FBA DASD
- IBM 3330, 3350, and 3375 CKD DASD
- IBM 3380, 3390, and 9345 ECKD-capable DASD

Multiple emulated DASD types can be used concurrently by S/390 operating system, if desired.

Figure 11 and Figure 12 on page 25 show the capacities of various emulated DASD and the size in MB of the OS/2 files used to emulate them. These sizes are for full volume emulation; it is possible to specify a size less than the full volume. When less than a full volume is used, the S/390 operating system sees a DASD of the defined type, but with fewer FBA blocks or CKD cylinders.

VM/ESA Users

On P/390, you will almost always specify a size that is less than a full volume. The space required for the OS/2 file depends on the size you specify. A general convention that is encouraged is to allocate every user minidisk as a separate DASD volume that is exactly the desired size. CP areas are also allocated on separate DASD volumes. For example, the CP nucleus is contained in a different OS/2 file from the CP paging area. Because each separate DASD volume is an individual OS/2 file, the back-up and propagation of the VM/ESA system, users, and program products is easier.

For systems with a large number of defined VM user IDs[1] (in the hundreds), using the convention of having only one minidisk per DASD volume can become unmanageable. It is perfectly acceptable to define DASD volumes of any size (up to the device maximums listed in tables 1 and 2) and use VM/ESA's conventional minidisk support to divide the DASD volume into minidisks as you would on a real mainframe.

If you have no compelling reason to select a specific DASD type to emulate, we recommend that you choose 9336 FBA DASD, because you can install the preconfigured system on this DASD type, and it should perform better in most cases than any CKD DASD type.

---

[1] P/390 supports a maximum of 250 devices in the DEVMAP

Figure 11. Emulated CKD and ECKD-capable S/390 DASD Storage Capacities		
Type	**Cylinders per DASD**	**OS/2 File Size (MB)[2]**
3330	808	195
3350	555	309
3375	959	393
3380	885 1770 2655	603 1206 1809
3390	1113 2226 3339	905 1810 2715
9345	1440 2156	960 1437

Figure 12. Emulated FBA S/390 DASD Storage Capacities		
Type	**Number of Blocks**	**OS/2 File Size (MB)[2]**
0671	513,072 574,119 624,456	250 281 305
3310	126,016	62
3370	558,000 712,752	273 348
9332	360,036 554,816	176 271
9335	804,714	393
9336-10	920,115	449
9336-20	1,672,881	817

Here are some factors to consider when making your DASD emulation choice:

- 3330, 3350 and 3375 CKD DASD

  - These are common DASD types for older S/370 mainframe systems. Existing file definitions and library allocations can be used without change.

  - VM/ESA cannot be installed on this DASD type, because no standard layouts are defined.

  - Performance is generally worse than FBA emulation.

- 3380 CKD DASD

  - This is a common DASD type on older S/370 mainframe systems, so existing file definitions and library allocations can be used without change.

---

[2] 1,048,576 bytes or 1024KB

- 3380 devices are handled as ECKD-capable devices.

- Performance is generally worse than FBA emulation.

- 3390 CKD DASD

  This EDKD-capable DASD is most common for new S/390 systems.

- 9345 CKD DASD

  This is a common DASD type for newer small systems.

Real S/390 DASD can only be attached to the S/390 Integrated Server using the S/390 ESCON Channel adapter.

Performance Considerations

The S/390 Integrated Server is designed to meet the performance, availability, and reliability requirements of servers with a small to medium number of S/390 users in a work group. However, there are performance factors similar to the host mainframe environment and some unique to the S/390 Integrated Server environment that need to be considered when running S/390 operating systems on the P/390, namely:

- Processor performance
- I/O performance

Processor Performance

As described earlier in "System Overview" on page 4, the S/390 Integrated Server has two completely separate processors, a P/390 and an IOSP. The two processors run in parallel, that is, activity in the P/390 overlaps activity in the IOSP. The P/390 executes S/390 instructions at the same time the IOSP handling I/O operations for both P/390 and OS/2 applications.

I/O Performance

Because the IOSP handles all I/O requests for the P/390, the S/390 I/O performance will be affected by:

- IOSP activity
- P/390 I/O activity

IOSP Activity

The P/390 I/O subsystem executes as OS/2 applications in the IOSP. Any other OS/2 applications that are running will contend for the IOSP and affect P/390 I/O activity. I/O activity from other OS/2 applications may also affect the amount of IOSP resource available for P/390 I/O activity. For more information, see the *IBM S/390 Integrated Server Service Guide*.

P/390 I/O Activity

OS/2 activity affecting S/390 I/O operations: Depending on usage, the P/390 I/O subsystem can consume all of the IOSP resources. Therefore, you should not run other applications, such as file servers or databases on the IOSP.

I/O activity from S/390 applications will be affected by I/O activity from OS/2 applications because S/390 I/O operations may be emulated on the same IOSP devices that the OS/2 applications use. You can minimize contention for hard disks

by proper placement of files to reduce seek times and by spreading OS/2 files for S/390 emulated devices across multiple addresses. The RAID technology can also improve DASD performance because of its technique of striping data across multiple hard disks.

Additional IOSP memory can also improve system performance and S/390 I/O throughput. Memory can be used for disk caching to reduce activity to I/O devices and adapters. An OS/2 virtual disk can be used for emulated S/390 disk drives containing selected READ-only S/390 operating system files.

For additional information on performance considerations, see Chapter 16, "Performance Hints and Tips" on page 251.

LAN Performance

The S/390 Integrated Server can have up to four LAN adapters installed (a mixture of Token Ring and Ethernet adapters). The reason you would put multiple LAN adapters in the system is for connectivity reasons *only*; such as, to allocate one adapter to OS/2 and another to OS/390, or to attach the system to multiple LAN segments. The LAN performance will **not** increase as more and more adapters are installed, for example, four adapters will not yield four times the performance of one LAN adapter.

I/O Channel Performance

The main purpose for attaching ESCON or Parallel channel devices to the S/390 Integrated Server is for connectivity. The performance of integrated I/O devices will probably be better, in most cases, than ESCON or Parallel attached devices. Because of the bus structure of the PCI bus in the IOSP, S/390 Integrated Server ESCON or Parallel channel performance will not match that of traditional mainframe ESCON or Parallel channels.

Chapter 3. Installing P/390 Hardware and Software

Detailed information on installing the P/390 hardware and software can be found in the *IBM S/390 Integrated Server Service Guide.*

This chapter provides procedures to help you install your preconfigured S/390 operating system.

Installing the Preconfigured S/390 Operating System

Installation of the preconfigured system requires copying and unpacking files from the CD-ROM to the S/390 Integrated Server hard disk drive. The files to be copied are disk images of an S/390 operating system. There may be additional information on files on the CD-ROM. See the README file on the CD-ROM for details and file names. Here is the procedure for installing from the preconfigured CD-ROM:

1. If you have not already done so, shut down and restart OS/2.

2. Make all Personal Communications sessions inactive.

3. Insert the CD-ROM for the S/390 operating system into the CD-ROM drive.

4. To start the install from the CD-ROM, type the following at the OS/2 command prompt:

   x:install

   where *x* is the drive letter assigned to the CD-ROM drive. You will be guided through the process by instructions that appear on your display screen. (As the program progresses, you may need to scroll the window to see the prompts.)

You should receive a message that the installation of the S/390 operating system is complete. If you do not receive this message, the preconfigured system has not been successfully installed. You must correct the situation that caused the error (such as not enough disk space, or a CD-ROM is missing or damaged) and then run the INSTALL procedure again. Also, remember to install the latest RSU (Recommended Service Upgrade). See Appendix A, "Documentation and Related IBM Manuals" on page 261 for service publications that are explain how to install these upgrades.

IPLing the S/390 Preconfigured System

The S/390 preconfigured operating system that you installed is a fully functional system. You can IPL this system to test for correct installation.

1. Ensure the Personal Communications 3270 sessions are running.

2. Double-click on the **P/390** folder icon. This displays the P/390 Main Menu.

3. Double-click on the **IPL P/390** icon.

4. Double-click on the **System Operator** icon (or select it from the task list).

5. Respond to the system messages as you would to the standard S/390 operating system.

Completing the Installation

You can now operate the P/390, modify the configuration, install an S/390 operating system that is not preconfigured, or further customize the S/390 operating system.

- To further customize your S/390 system, see "Customizing the S/390 Operating Systems."

- To operate the P/390, see Chapter 5, "Operating the P/390" on page 47.

- To configure the P/390, see Chapter 6, "Configurator Overview" on page 59. (A DEVMAP containing a sample configuration was installed when you installed the S/390 operating system from the CD-ROM. Refer to this section for information on how to display and modify this DEVMAP.)

- To install a non-preconfigured S/390 operating system, see Chapter 4, "Installing a Non-Preconfigured Operating System" on page 31.

Customizing the S/390 Operating Systems

The operating system you installed on the S/390 Integrated Server is now ready for further tailoring. You can add terminals and other devices to the system, define terminal transactions, programs, and files; define users; and make any network definitions you need to communicate with other systems. If you installed VSE/ESA, you should use the VSE/ESA Interactive Interface for this tailoring as it makes most of the definition work easier. Using the Interactive Interface to tailor the VSE/ESA system is described in *VSE/ESA Administration*.

Installing Optional Program Products

Any product supported in the S/390 operating environment on the S/390 Integrated Server platform can be installed. Review the documentation that came with your order to determine which offerings you want to install and how to install them.

Chapter 4. Installing a Non-Preconfigured Operating System

Several methods can be used to install an S/390 operating system and associated products and applications onto the S/390 Integrated Server. This chapter describes these choices and offers guidance about using these methods.

1. **Use the preconfigured CD-ROM**. Most S/390 Integrated Servers are delivered with one of the following preconfigured CD-ROM systems preloaded: OS/390, MVS/ESA, VM/ESA, or VSE/ESA.

   Therefore, the S/390 Integrated Server can be IPLed with an S/390 operating system that is fully functional. This system can then be used as a starting point for further customization. In addition, a sample DEVMAP and stand-alone utilities are installed with the preconfigured CD-ROM. If you plan to use the preloaded system, you can skip this chapter. (If your machine has not been preloaded, see "Installing the Preconfigured S/390 Operating System" on page 29 to install the preconfigured CD-ROM.)

2. **Migrate existing systems**. If you plan to run your existing operating system and applications that are currently resident on your existing hardware or production system, a migration method is required. You can dump all of the volumes to 3480 tape, and use a SCSI-connected 3480 compatible drive or a channel-connected 3480 to restore volumes on the S/390 Integrated Server. Then, you can allocate, initialize, and restore the volumes onto the S/390 Integrated Server. You need to ensure appropriate DASD is available on the S/390 Integrated Server to accommodate the volumes being migrated. To install by migrating an S/390 operating system from another system, see "Method 1: Migrating an S/390 Operating System from Another System" on page 32.

3. **Use IBM software deliverables**. When your S/390 Integrated Server was ordered, you may have requested that all of the licensed programs that were ordered be licensed for the S/390 Integrated Server.   Most individual licensed program and offerings are orderable on OMA-formatted CD-ROMs, 4mm DAT tapes, or on 3480 cartridge. The standard software manufacturing deliverables available to you on ES/9000® systems are available for the S/390 Integrated Server. Installation of these offerings or individual product tapes require system programming skills. Additionally, fee offerings such as SIE or SystemPac can be ordered and installed on the S/390 Integrated Server.

   If you use this method, you can either:

   - Use the preconfigured system as a base and add the products received on 4mm DAT tape and follow the procedures that came with the product,

     or

   - Use the preconfigured system as a driving system to install the S/390 operating system received on 4mm DAT or in optical-media-attach (OMA) format.

   To install using this method, see "Method 2: Installing Using IBM Software Deliverables" on page 33.

4. **Copy another S/390 Integrated Server system or IBM RISC/System and System/390 Server-on-Board (R/390) System**. If you have an existing S/390 Integrated Server or R/390 system, you can replicate this system onto the new

S/390 Integrated Server system. The emulated DASD volumes can be copied or moved using OS/2 commands or backup utilities.

To install using this method, see "Method 3: Copying from Another S/390 Integrated Server, PC Server System/390, or R/390" on page 45.

After the base S/390 operating system is installed, certain products need additional product customization and setup to be usable.

Method 1: Migrating an S/390 Operating System from Another System

┌── **Important** ──┐

This section tells how to copy the S/390 operating system from other S/390 hardware. This should be done only in compliance with IBM licensing agreements.

└───┘

In some situations, it is desirable to replicate the S/390 operating system that is currently running on existing S/390 hardware onto the S/390 Integrated Server. To do this, you can attach a 3480 or 3490 tape drive to a S/390 Integrated Server with an S/390 Parallel Channel or ESCON Channel adapter, or you can attach a 3490E tape drive to a S/390 Integrated Server with a SCSI adapter.

1. Dump the volumes on the existing S/390 system to 3480 cartridge using utility programs on the operating system. For MVS/ESA and OS/390, you can use DFDSS, which is provided on the preconfigured CD-ROM as SADSS.IPL. For VM/ESA, you can use DDR, which is provided on the preconfigured CD-ROM as DDRXA.IPL. For VSE/ESA, you can use FASTCOPY, which is part of VSE/ESA.

2. Ensure that all steps in the "Installing P/390 Hardware and Software" section of the *IBM S/390 Integrated Server Service Guide* are complete.

3. On the target S/390 Integrated Server, stop the S/390 operating system so that the system releases ownership of the files you will be copying. Double-click on END P/390.

4. Use the device map that was installed with the preconfigured CD-ROM as a starting point. If you have already installed the preconfigured CD-ROM, the device map file is already installed. If you have not installed the preconfigured CD-ROM, you can copy it from the CD-ROM.

5. Using the P/390 Configurator, use the **Update System Environment** menu to modify the DEVMAP to represent the proposed S/390 operating system.

   Enter the appropriate DASD volumes, names, addresses, and sizes. Delete any of the volumes from the preconfigured CD-ROM system that you will not be using on the new system. Each initialization will take 15–30 minutes to complete, depending on size of the volume. The device map must contain a 3278 device for the stand-alone utilities console. This entry supports the console for utilities such as ICKDSF, DFDSS, or DDR. The device map must also contain an address for the tape drive that you will be using. To update the device map using the P/390 Configurator, see "Allocating New Devices" on page 122.

6. Invoke the P/390 Configurator and select **Update System Environment** menu to set the appropriate IPL address.

7. Now you are ready to follow the standard procedures for your utility to initialize DASD[3]. On the S/390 Integrated Server Main Menu, click on the **IPL P/390** icon. IPL of the stand-alone utilities is complete when the System/390 Activity window displays a waiting state and FFFF in the PSW. To give the initial 3270 console interrupt, go to the first local Personal Communications session. Make this session the active session, and press the right mouse button. Select **ATTN** from the pop-up menu.

8. After you have initialized your simulated DASD, you can restore the DASD from the media. IPL of the stand-alone utilities is complete when the System/390 Activity window displays a waiting state and FFFF in the PSW.

9. After the volumes are restored, the S/390 operating system is available for further customization, software installation, and production use.

Method 2: Installing Using IBM Software Deliverables

Installing an S/390 operating system using this method involves a complete, step-by-step installation, as it would be done on an ES/9000. Before installing the product, some preparation is necessary.

You can prepare for installing an S/390 operating system by following these steps:

1. Ensure that all steps in the "Installing P/390 Hardware and Software" section of the *IBM S/390 Integrated Server Service Guide* are complete.

2. If the S/390 Integrated Server system is IPLed, stop the S/390 operating system.

3. Use the device map that was installed with the preconfigured CD-ROM as a starting point.

4. Using the P/390 Configurator, select the **Update System Environment** menu to modify the DEVMAP to represent the proposed S/390 operating system. The device map must contain a 3278 or 3215 device for the stand-alone utilities console. This entry supports the console for utilities such as ICKDSF[3], DFDSS, or DDR. The device map must also contain an address for the tape drive that you will be using.

5. Follow the procedures for the operating system you are installing. Use the manuals that came with the operating system, and refer to the information in one of the following sections as appropriate:

   - "Installing OS/390 and MVS/ESA"
   - "Installing VSE/ESA" on page 37
   - "Installing VM/ESA" on page 40

Installing OS/390 and MVS/ESA

Installation of OS/390 and MVS/ESA using this method involves a complete, step-by-step installation, as it would be done on an ES/9000. Before installing the product, some preparation is necessary.

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[3] ICKDSF 16.0A or higher is required. It is provided on the S/390 preconfigured system CD-ROM as ICKDSF.IPL, which is an AWSTAPE emulated file. See the README for instructions on running this utility.

To perform an initial installation of OS/390 or MVS/ESA, you must first install a driving system on the S/390 Integrated Server. You can use either the preconfigured CD-ROM system as the driving system or a driving system such as MVS CBIPO or the Customized Offerings (program number 5665-343). It is recommended that you use the preconfigured CD-ROM system, because it is already installed on the S/390 Integrated Server. If you use the preconfigured CD-ROM system as the driving system, see "Using the Preconfigured System as the Driving System." If you use either the CBIPO or the customized offerings as a driving system, see "Using Another Driving System."

Using the Preconfigured System as the Driving System

This section assumes that you have installed the preconfigured CD-ROM or you have done steps in "Using Another Driving System" to install a driving system.

1. Install OS/390 or MVS/ESA in the same way as you would on S/390 systems. For MVS/ESA, supported installation methods include stand-alone product installs, CBIPO, CBPDO, and SystemPac. For OS/390, supported installation methods include CBPDO, ServerPac, and SystemPac. Refer to the manuals that come with your MVS/ESA or OS/390 order for instructions on system installation and customization.

   Note: Because SystemPac orders are load-and-go systems, they can be installed in the same manner as the driving systems. See "Using Another Driving System."

2. Install optional products for OS/390 or MVS/ESA. Any product supported in an OS/390 or MVS/ESA environment on the S/390 Integrated Server platform can be installed. Use SMP/E to install products and any related service. Review the documentation that came with your order to determine which offerings you want to install.

3. Customize OS/390 or MVS/ESA. After the OS/390 or MVS/ESA system is installed, the system is now ready for further tailoring. You can add terminals and other devices to the system; define terminal transactions, programs, and files; define users; and make any network definitions you need to communicate with other systems.

   If you plan to install TCP/IP, you should do so now. See LCS3172.DOC for additional information.

Using Another Driving System

This section assumes that you decided not to use the preconfigured CD-ROM system as a driving system, and you want to install a driving system using stand-alone utilities. Follow these procedures and refer to the *MVS CBIPO Driver Memo to Users and Installation Guide* or *OS/390 Customized Offerings Memo to Users* for detailed instructions on installing and IPLing the driver.

Note: These procedures can be followed for restoring any OS/390 or MVS system that was dumped to tape using DFDSS.

1. Ensure that all steps in the "Installing P/390 Hardware and Software" section of the *IBM S/390 Integrated Server Service Guide* have been completed.

2. Ensure that the S/390 Integrated Server has the P/390 software installed and any changes to the CONFIG.SYS file are in operation. See the "Installing P/390 Hardware and Software" section of the *IBM S/390 Integrated Server Service Guide*. For the following support to be active, the CONFIG.SYS file must contain the indicated text:

- For SCSI devices to emulate S/390 hardware:

  ```
  BASEDEV=OS2SCSI.DMD
  ```

- If the 4mm tape drive will be used as a 3480:

  ```
  DEVICE=drive:\directory\SCSI3480.SYS id,ai
  ```

  where *id* is the SCSI ID of the actual 4mm device and *ai* is the adapter index that the 4mm drive is connected to. A typical example would be `DEVICE=C:\P390\SCSI3480.SYS 00,00`. The respective command for 3420 tape drive emulation would be `DEVICE=C:\P390\SCSI3420.SYS 00,00`.

3. Modify the device map by doing the following:

   a. Acquire or create a DEVMAP. We recommend using the DEVMAP that was provided on the preconfigured CD-ROM system as a starting point.

   b. Open the S/390 Integrated Server Main Menu, click on the **P/390 Configurator**, and update the device map to represent the proposed MVS/ESA or OS/390 operating system.

   c. This configuration must contain an address space for the stand-alone utilities console. To define this console in the device map, enter the following values in the **UPDATE SYSTEM DEVICES** menu:

Addr	700
Device	3278
Mgr	AWS3274

      These entries will support the console for utilities such as ICKDSF and DFDSS.

   d. Ensure that any 3380 or 3390 DASD you require is represented in the device map. You must address system requirements that have resulted from your specific order. Refer to "Allocating New Devices" on page 122 for details on how to do this.

   e. Ensure that the device map has an active entry for emulated AWSTAPE used with ICKDSF.

4. Initialize the DASD using ICKDSF stand-alone utilities [3].

   a. IPL the tape address of ICKDSF.IPL.

   b. If the IPL of ICKDSF is successful, 10–15 seconds later, the System/390 Activity window displays PSW wait code FFFF.

   c. To give the initial 3270 console interrupt, go to the first local Personal Communications session. Make this session the active session, and press the right mouse button. Select **ATTN** from the pop-up menu. The following message is displayed:

      ```
      ICK005E DEFINE INPUT DEVICE, REPLY 'DDDD,CUU' OR 'CONSOLE'
      ENTER INPUT/COMMAND
      ```

   d. Type:

      ```
      console
      ```

      Press **Enter**. The following message is displayed:

      ```
      ICK006E DEFINE OUTPUT DEVICE, REPLY 'DDDD,CUU' OR 'CONSOLE'
      ENTER INPUT/COMMAND
      ```

   e. Type:

```
console
```

Press **Enter**. The following message is displayed:

```
ICKDSF - SA/XA/ESA DEVICE SUPPORT FACILITIES  16.0A
ENTER INPUT/COMMAND
```

   f. Type:[4]

```
init unit(120) nocheck novalidate vtoc(10,0,1) volid(mvsv5r) noverify
```

Press **Enter**. The following messages are displayed:

```
ICK00700I DEVICE INFORMATION FOR 0120 IS CURRENTLY AS FOLLOWS
          PHYSICAL DEVICE = 3380
          STORAGE CONTROLLER = 3880
          STORAGE CONTROL DESCRIPTOR = 03
          DEVICE DESCRIPTOR = 02
          ADDITIONAL DEVICE INFORMATION = 0000FFFF
ICK00703I DEVICE IS OPERATED AS A MINIDISK
ICK003D REPLY U TO ALTER VOLUME 0120 CONTENTS, ELSE T
ENTER INPUT/COMMAND
```

   g. Type:

```
u
```

Press **Enter**.

The following messages are displayed:

```
ICK31061I 0120 VTOC INDEX CREATION SUCCESSFUL. VOLUME IN INDEX FORMAT
ICK061I   0120 VTOC INDEX CREATION SUCCESSFUL. VOLUME IN INDEX FORMAT
ICK01313I VOLUME CONTAINS 0 ALTERNATE TRACTS - 0 AVAILABLE
ICK01314I VTOC IS LOCATED AT CCHH = '0000 0001' AND IS 14 TRACKS
ICK00001I FUNCTION COMPLETED.  HIGHEST CONDITION CODE WAS 0.
ENTER INPUT/COMMAND
```

Repeat these steps for each simulated DASD device.

5. Restore the tapes to the DASD using DFDSS stand-alone utilities.

   a. Insert the DFDSS stand-alone tape into the available tape drive and IPL the tape address.

   b. If the IPL of DFDSS is successful, 10–15 seconds later, the System/390 Activity window displays a PSW wait code FFFF.

   c. To give the initial 3270 console interrupt, go to the first local Personal Communications session. Make this session the active session, and press the right mouse button. Select **ATTN** from the pop-up menu. The following message is displayed:

```
display =
ADR505A DEFINE INPUT DEVICE.
```

   d. Type

```
input=cnsl
```

Press **Enter**. The following message is displayed:

---

4 where VTOC (10,0,1) may be used when initializing a volume you plan to restore over. The VTOC will become that of the restored volume. If you are initializing a volume for another purpose, we suggest that you use at least 30 tracks. The *DSF Users' Guide and Reference*, GC35-0033, provides information for calculating the VTOC size. 3330, 3350, and 3375 DASD require a mimic (mini(cyl)) parameter. See *DSF Users' Guide and Reference*.

```
ADR507A ENTER CONTROL CARD STATEMENT
```

Note: Note the leading blank in some of the following responses.

e. Type the following after a leading blank:

```
job
```

Press **Enter**. The following message is displayed:

```
ADR507A ENTER CONTROL CARD STATEMENT
```

f. Type:

```
msg todev=cnsl
```

Press **Enter**.

The following message is displayed:

```
display =
ADR507A ENTER CONTROL CARD STATEMENT
```

g. Type the following after a leading blank:

```
restore fromdev=3480,fromaddr=560,todev=3380,toaddr=120,
volid=MVSV5R
```

Press **Enter**.

The following message is displayed:

```
ADR507A ENTER CONTROL CARD STATEMENT
```

h. Type the following after a leading blank:

```
end
```

Press **Enter**.

Repeat these steps from the IPL for each simulated DASD device. Restoring each 3380 DASD from tape takes about twenty minutes.

6. Open the S/390 Integrated Server Main Menu, enter the Configurator, and enter the MVS/ESA or OS/390 driver volume in the **UPDATE SYSTEM ENVIRONMENT** menu. Then, IPL the MVS/ESA or OS/390 driving system.

Installing VSE/ESA

Installation of VSE/ESA using this method involves a complete, step-by-step installation, very much like it would be done on an ES/9000. Be sure to use the procedures in this publication to IPL the P/390.

1. Open a window and bring up the S/390 Integrated Server Main Menu.

2. Click on the **P/390 Configuration** icon to start the Configurator. Define, delete, or change I/O device definitions as needed. For VSE/ESA to be installed, the I/O configuration must include at least two emulated DASD volumes. These DASD volumes *must* be allocated by the Configurator. See "Allocating New Devices" on page 122 for procedures on allocating new devices.

The IPL address must be set through the Configurator function **Update System Environment (F4)** to the address of your DOSRES volume. You must also have at least two local 3270 sessions defined, one for the VSE/ESA console, in most cases address 01F, and one for a CICS® terminal. In addition, you need a tape drive from which you want to install VSE/ESA.

3. Ensure Personal Communications and your two 3270 sessions are active.

4. In the OS/2 window, type the following command:

   `ipl cuu clear`

   where *cuu* is the address of the tape drive where the VSE/ESA base tape is located.

   If you are installing VSE/ESA 2.x.x., go to step 11.

5. This IPLs ICKDSF[3] (see footnote on page 33) and takes several minutes. It is complete when the **S/390 Activity** window indicates a WAITING state.

   a. Switch to the first 3270 session designated as LOCAL on the Logical Terminal Option screen (PF7 on the Configurator menu).

   b. Press the right mouse button to display the pop-up keypad.

   c. Select **ATTN**.

6. Clear the screen and follow the instructions in the *VSE/ESA Installation and Service* manual on initializing the emulated DASD (DOSRES and SYSWK1) using ICKDSF.

7. Perform a second IPL to the installation tape by:

   - Typing the following in an OS/2 window:

     `ipl cuu clear`

     where *cuu* is the address of tape drive where the VSE/ESA base tape is located.

8. This loads the stand-alone utilities from the tape.

   a. Switch to the first 3270 session designated as LOCAL on the Logical Terminal Option screen (PF7 in the configurator menu).

   b. Press the right mouse button to display the pop-up keypad.

   c. Select **ATTN**.

9. Follow the instructions in the *VSE/ESA Installation and Service* manual to restore IJSYSRS.SYSLIB. Be sure to use the correct library allocation values for the DASD type you are emulating.

10. You are now asked to IPL the restored VSE/ESA system from DOSRES.

    a. In the OS/2 window, type the following command:

       `ipl cuu clear`

       where *cuu* is the address of the DOSRES device

    b. Switch to the first 3270 session.

    c. Press the right mouse button to display the pop-up keypad.

    d. Select **ATTN**. Skip to step 18 on page 39.

11. If you are installing, VSE/ESA 2.x.x, do the following:

    a. Switch to the first 3270 session.

    b. Press the right mouse button to display the pop-up keypad.

    c. Select **ATTN**.

12. When the VSE console comes up and displays the following message:

    `BG 0000 SI01D DO YOU WANT TO DO AN AUTOMATIC INSTALLATION (YES/NO)`

reply, 0 YES.

13. When the following message is displayed:

    BG 0000 SA02 IF YOU WANT A LISTING, SPECIFY CUU OF PRINTER, ELSE (ENTER

    reply, 0 cuu or 0 if you do not want a list.

14. When the following message is displayed:

    BG 0000 SI02D ENTER CUU of DOSRES

    reply, 0 cuu where, *cuu* is the address of the DASD that should be used as DOSRES.

15. When the following message is displayed:

    BG 0000 SI03D ENTER CUU OF SYSWK1

    reply, 0 cuu where *cuu* is the address of the DASD that should be used as SYSWK1.

16. You will receive some informational messages followed by:

    BG 0000 SI10D START WITH AUTOMATIC INSTALLATION (YES/NO)

    reply, 0 YES

17. Job processing starts, initializes the two volumes, restores the base system from tape to DASD, and performs an automatic software initiated IPL from the DOSRES device.

18. Follow the instructions in *VSE/ESA Installation and Service* to complete the installation of the VSE/ESA system.

VSE/ESA is now available for further customization, software installation, and production use.

Before doing this, you should shutdown and re-IPL your VSE/ESA system. Do this by entering the following commands at the VSE/ESA system console:

```
MSG F2
2 CEMT P SHUT
Z NET,QUICK
PEND
```

When VSE/ESA shutdown is complete, also stop the P/390 by typing AWSEND in an OS/2 window. See "AWSEND.CMD OS/2 Utility" on page 224 on how to use this command. To restart, you can either select an OS/2 window, change to the \P390 subdirectory, and type the following command:

```
ipl cuu clear
```

where *cuu* is the address of the DOSRES device or you can just double-click on the IPL icon on the P/390 main menu.

Installing Optional Products for VSE/ESA

Several software offerings are shipped on magnetic tape with VSE/ESA. Each offering is a combination of software that you can install on your VSE/ESA system and begin using immediately. Review the documentation that came with the tape to determine which specific offerings you might want to install. In addition, refer to the *VSE/ESA Administration* book included on the *VSE/ESA Collection* CD-ROM that comes with S/390 Integrated Server.

Configuring VSE/ESA

The VSE/ESA system is now ready for further tailoring. You can add terminals and other devices to the system; define CICS/VSE transactions, programs, and files; define users; and make any network definitions you need to communicate with other systems. We recommend you use the VSE/ESA Interactive Interface for this tailoring, as it will make most of the definition work easier. Using the Interactive Interface to tailor the VSE/ESA system is described in *VSE/ESA Administration.*

Installing VM/ESA

Follow the instructions in the "Installing P/390 Hardware and Software" section of the *IBM S/390 Integrated Server Service Guide* to install and set up the S/390 Integrated Server. This will install a device map file and VM utility programs that you can use as a starting point. Then do the following:

1. Use the P/390 Configurator to change the DEVMAP. At the S/390 Integrated Server Main Menu, click on the **P/390 Configuration** icon.

2. On the **CONFIGURATOR PASSWORD** screen, either use the default password of SYSTEM or press **Enter**. The **Configurator Filenames** field should contain DEVMAP.1VM, which is the default name of the DEVMAP file delivered on the preconfigured CD-ROM.

3. From the **FUNCTIONS** main menu screen, select **F4** to bring up the **UPDATE SYSTEM ENVIRONMENT** menu. Enter your desired NetID, GMT Offset, and CPUID. System MODE should be ESA. For our standard configuration, use an IPL Address of 123. Press **F10** to save this information and to return to the **FUNCTIONS** main menu.

4. From the **FUNCTIONS** screen, press **F2** to bring up the **UPDATE SYSTEM DEVICES** menu. You need to update the devices defined on this screen to look similar to the configuration in Figure 13. You need to define all needed devices except for the emulated DASD volumes. These emulated volumes will be defined in step 5 on page 41.

```
     Addr Device  Label  Atype  Size   Mgr*  FN/P


     123  9336    E22RES                1     D:\VMESA\E22RES.123
     124  9336    E22W01                1     D:\VMESA\E22W01.124
     200  3278           DSPY           3     Local 1
     201  3278           DSPY           3     Local 2
     202  3278           DSPY           3     Local 3
     203  3278           DSPY           3     Local 4
     580  3422                          B     D:\Tape.580
     581  3422                          H
     590  3480                          C
```

Figure 13. Sample device map

* The device manager codes depend on the configuration of your system. The device manager codes in Figure 13 represent the following device managers:

Mgr	Manager Name
3	AWS3274 device manager that allows 3270 sessions on this system to appear as local coax attached terminals on a 3274 control unit
B	AWSTAPE device manager that emulates a 3422 tape as an OS/2 file
H	AWSOMA device manager that makes an optical media-attach formatted CD-ROM look like a 3422 tape drive
C	SCSI3480 device manager to make the 4mm DAT tape appear to the VM/ESA system as a 3480 tape drive

5. Allocate the emulated VM/ESA volumes. For this procedure, we assume you are installing the FBA DDR VM/ESA install CD-ROM or a 4mm tape and that you want to emulate 9336-20 volumes. (9336-20 volumes are convenient because VM/ESA can be installed on two such volumes with relatively little unused space.)

   a. Define a device with the following characteristics:

Addr	123	The device number of the IPL or SYSRES volume.
Device	9336	
Label	E22RES	This will be the SYSRES volume.
Atype	VSE	Prevents the CP allocation area from being allocated.
Mgr	1	The AWSFBA device manager that emulates FBA DASD devices using OS/2 files.
FN/P	D:\VMESA\E22RES.123	The name and path of the OS/2 file to be created for the emulation of this device.

   b. Press **ENTER**. The Configurator will create this file and initialize it. This takes about 20 minutes.

   c. After it completes, define another volume that looks the same, except:

Addr	124	Device number of the second volume created.
Label	E22W01	This is the VOLID of the second volume.
FN/P	D:\VMESA\E22W01.124.	The suggested name for this file.

   The P/390 Configurator will create and initialize this file. Now you are ready to IPL the VM/ESA CD-ROM. To IPL from CD-ROM, go to step 6; to IPL from tape, go to step 14 on page 42.

6. Select the VM/ESA installation CD-ROM in OMA format that corresponds to the DASD volume type that you allocated in step 5, for example FBA. Read the writing on the platter to find what the VOLID is for the tape. The VOLID should be in the form of UAAnnn where nnn is a number.

7. Open an OS/2 window session. From the OS/2 command prompt, issue the following command:

```
DIR x:\TAPES\*.TDF
```

This confirms that the Tape Descriptor File (TDF) is there and confirms its name.

8. Return to the **UPDATE SYSTEM DEVICES** panel in the P/390 Configurator by selecting **F2** from the **FUNCTIONS** main menu.

9. Type in the full name and path of the TDF into the FN/P field of the OMA tape address you will be using, for example, x:\TAPES\UAA199.TDF for device 581.

   Note: After you finish with the installation of VM/ESA from CD-ROM, you will blank out the name you typed here. You would normally use the CMS MOUNT command or OS/2 AWSMOUNT command to associate the TDF with the device. However, this procedure of specifying the TDF in the DEVMAP is only needed at installation.

10. Press **F10** to return to the **FUNCTIONS** main menu.

11. Press **F6** to save the updates that you made and to exit the Configurator.

   Note: None of the changes that you have specified are saved until you exit from the Configurator.

12. Start Personal Communications 3270 sessions.

13. You are now ready to IPL the CD and load ICKDSF[3] from the OMA formatted CD. From an OS/2 window, issue the command:

```
IPL 581 CLEAR /MODE ESA
```

   where 581 is the address of the OMA emulated tape drive. The CD should spin while the ICKDSF stand-alone program is being read. Go to step 15.

14. Load the VM/ESA system from the 4mm tape.

   You are now ready to IPL the 4mm tape and load ICKDSF. From an OS/2 window, issue the command:

```
IPL 590 CLEAR /MODE ESA
```

   where 590 is the address of the 4mm tape drive defined as a 3480 device. The light on the tape drive should come on while the ICKDSF stand-alone program is being read. Go to step 15.

15. Continue with the standard VM/ESA installation procedure. Immediately after the initial IPL, you should refer to the VM/ESA System DDR installation procedures in the *VM/ESA Installation Guide*. Select the procedure for installing a system that is not currently running a VM system or one that is running a VM system that will be shutdown. Follow the procedure with these *exceptions*:

   - You should use the first local 3270 session as the system console or operator's console. Note that the first local session defaults to address 200.

   - When you need to create an interrupt on the terminal:

     a. Place the cursor over the terminal session window you want to interrupt.

     b. Click the right mouse button; a pop-up window will appear.

     c. Click the left mouse button on the **Attn** button to cause an attention interrupt.

- You do not need to label or initialize your volumes, so you can skip any steps directing you to do so. However, you do need to CPVOL FORMAT the volumes.

- Now you will re-IPL the CD-ROM or 4mm tape to bring up the DDR program Use the OS/2 IPL command:

  ```
  IPL 590 CLEAR /MODE ESA /PARM 200
  ```

- When you are ready to IPL the VM/ESA Initial Installation System, issue the following command:

  ```
  IPL 123 CLEAR /MODE ESA /PARM 200
  ```

- Follow the directions for installing from CD-ROM or 4mm tape. Your CD-ROM drive is defined at address 581. Your 4mm tape drive is defined as a 3480 on device address 590.

16. Consider the SYSTEM CONFIG file. Certain P/390 emulated devices require RDEVICE statements in the SYSTEM CONFIG file, which is located on the VM/ESA IPL PARM disk. Therefore, you must add the following statements to your SYSTEM CONFIG file:

```
Rdevice 000E  Type IMPACT  Class A  Form *
Rdevice 000C  Type RDR  Class A
Rdevice 0460-0463  Type Unsupported  Devclass 3270_Display
```

000E   The default address for the emulated 1403 line printer, device manager AWS2821, which uses a S/390 Server parallel port printer.

000C   The default address for the emulated 2540R card reader, device manager AWS2540, which uses a OS/2 subdirectory for a LAN-accessible card deck reader.

0460-0463 Default addresses for the special P/390 PCSERVER devices, device manager AWSPCSRV, that are used by the PCOPY and OS/2 CMS utilities. See "Rdevice" on page 244 for details.

Other emulated devices may need statements. For the current list of such devices, see the SYSTEM CONFIG file that is shipped on the VM/ESA CD-ROM. A copy of this file is available in OS/2 as:

```
x:\VMESA\SYSTEM.CFG
```

. where *x* is your CD-ROM drive letter.

The VM/ESA system is now installed and the initial customization is complete. You can now install other licensed program or applications or customize the system.

Installing P/390 CMS Utilities

If you installed VM/ESA using the OMA formatted CD-ROM instead of the preconfigured system, then you will probably want to install the tools such as PCOPY, OS2CMD, and TFA. These programs are shipped on a minidisk on the VM/ESA preconfigured CD-ROM. If you did not use the preconfigured CD-ROM, you must copy the OS/2 file that contains the CMS minidisk from the preconfigured system to your hard drive, and then add it to your DEVMAP so that your VM system can use the minidisk for installation of the programs.

The steps for making the minidisk accessible are:

1. Insert the VM/ESA preconfigured CD-ROM into the CD-ROM drive.

2. Copy the SDISKADD.370 from the CD to your hard drive.

   `COPY x:\VMESA\SDISKADD.370 d:\VMESA`

   where *x:* is your CD-ROM drive letter and *d:* is your hard drive. The \VMESA subdirectory is assumed to be where you would want this file.

3. Add an entry to your DEVMAP using the **UPDATE SYSTEM DEVICES** menu in the P/390 Configurator. Specify an unused real address (for example, 120), device type (9336), and OS/2 file name:

   `d:\VMESA\SDISKADD.370`

4. Press **ENTER**. The device is added to the DEVMAP and the configurator fills in the DASD volume label that it read from the file. The volume label should be P370S.

5. Press **F10** to return to the **FUNCTIONS** main menu.

6. Press **F6** to save the updates that you made.

7. To make this change take effect in the DEVMAP:

   a. Enter `SHUTDOWN` on the VM OPERATOR console.
   b. Click on **End P/390** icon.
   c. Click on the **IPL P/390** icon.

   After you re-IPL VM/ESA ESA, the system will dynamically sense the DASD volume and allow you to bring it online. You can then attach the DASD volume to the system, and define a minidisk for the MAINT user ID so that the CMS programs and files on the minidisk can be installed on you system.

8. Log on to the MAINT user ID on the P/390 and enter the following command:

   `CP ATTACH nnnn SYSTEM`

   where *nnnn* is the real address of the volume in the DEVMAP; for example, 120.

9. Add the following MDISK card to your CP directory source (USER DIRECT) for the MAINT user ID:

   `MDISK 370 FB-512 016 END P370S RR`

10. Use DIRECTXA to put the changed directory online.

11. Link to the new minidisk.

    `CP LINK MAINT 370 370 RR`

12. Access the new minidisk so that you can see the files and install them.

    `ACCESS 370 R`

To enhance your ability to use CMS on the P/390, use the P/390 CMS utilities that come with the P/390. Copy them now to the CMS system disk.

1. Enter the following:

   `ACCESS 190 Z`
   `COPY * * R2 = = Z2 (OLDDATE REPLACE`

2. To avoid increased paging on your system and to reduce the amount of virtual storage available to users of CMS, you want all users of the NSS to use a shared copy of the S disk directory (SSTAT). Enter the following commands to resave the CMS Named Saved System:

```
ACCESS 193 Z
SAMPNSS CMS
IPL 190 CLEAR PARM SAVESYS CMS
```

Method 3: Copying from Another S/390 Integrated Server, PC Server System/390, or R/390

> **Important**
>
> This section tells how to copy the S/390 operating system from another S/390 Integrated Server or from an IBM RISC System/6000® and System/390 Server-on-Board (R/390). This should be done only in compliance with IBM licensing agreements.

You can use OS/2 or system utilities (such as PCOPY) to copy the S/390 operating system

- From one S/390 Integrated Server to another S/390 Integrated Server
- From an R/390 to another S/390 Integrated Server
- To duplicate the operating system on the same hardware on one S/390 Integrated Server

OS/2 utilities can handle entire CKD-defined areas as files. Therefore, you can duplicate DASD volumes by using OS/2 commands or other backup utilities.

Here are some things to remember during the migration:

- On the source and target S/390 Integrated Server, stop the S/390 operating system so that the system releases ownership of the files you are copying.

- Before copying the files, ensure that you have followed the procedures in the "Installing P/390 Hardware and Software" section of the *IBM S/390 Integrated Server Service Guide* on the target system.

- Personal Communications sessions on the target machine should be configured exactly like the ones on the source machine. If this is not the case, the P/390 configuration may need updating.

- Copy all the files from the S/390 directory on the source machine.

- Ensure that you copy the device map to the target system. If you are copying from an R/390, you should copy the OS/2 device map that is provided on the preconfigured CD-ROM. (There are numerous differences between the S/390 Integrated Server and the AIX device map files.)

- Set the name of the DEVMAP that is to be used on the target system. See "AWSPROF.EXE OS/2 Utility" on page 226.

- Modify the device map if the actual hardware configuration on the target S/390 Integrated Server is not identical to the source or if the directory and file names are different on the target machine.

When the migration is complete, the S/390 Integrated Server is available for further customization, software installation, and production use. The target system should perform exactly like the source machine.

Chapter 5. Operating the P/390

You access the P/390 from the OS/2 desktop by double-clicking on the P/390 folder. The P/390 Icon View window appears:
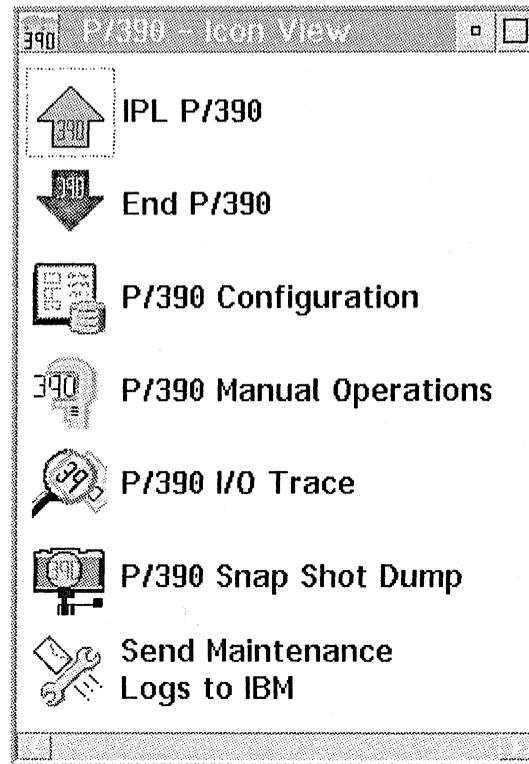
Figure 14. P/390 Icon View Window

From this window, you can select one of the following six functions:

IPL P/390   Use this selection to start the P/390 and its I/O subsystem and to perform an IPL of the operating system from DASD or tape.

End P/390   Use this selection to stop the P/390 and unload its I/O subsystem.

P/390 Configuration
Use this selection to configure P/390 users and devices.
Chapter 6, "Configurator Overview" on page 59 tells how to use the P/390 Configurator.

P/390 Manual Operations
Use this selection to invoke the P/390 Manual Operations session.
The P/390 Manual Operations session is a general-purpose debug facility. It is similar in function to the maintenance console found on many mainframes, and provides the ability to modify the P/390's memory and control registers. For this reason, it should be used with extreme care. Chapter 9 presents instructions for using the P/390 Manual Operations session.

P/390 I/O Trace
Use this selection to view the contents of the I/O trace buffer and create an I/O trace file.

The information contained in the I/O trace file is created for use by experienced S/390 system programmers and personnel in the P/390 Support Center. Because the trace table wraps, and irrelevant data could overlay the beginning of the true problem, it is important to limit the scope of the I/0 trace. See the *IBM S/390 Integrated Server Service Guide* for information about how to set up an I/O trace.

P/390 Snap Shot Dump

Use this selection to create a dump file.

Note: The P/390 Snap Shot Dump facility creates a dump of the P/390 I/0 subsystem, including control blocks and device manager data. This information is created for use by personnel in the P/390 Support Center during problem determination. Use this selection only when directed to do so by P/390 Support Center personnel.

Send Maintenance Logs to IBM

Use this selection when instructed by the IBM Support Center to send logs and traces to IBM via the Internet for problem analysis.

Starting and Stopping the P/390

You start and stop the P/390 by making selections from the P/390 Icon View window.

Starting the P/390

To start the P/390, double-click on the IPL P/390 icon. As the IPL of the P/390 progresses, the following icons and indicators are displayed on the OS/2 desktop:

S/390 Activity
Displays the status of the P/390 processor and the PSW. The S/390 Activity indicator, which is shown in the upper right corner of Figure 15 on page 49, can display the following status of the P/390 processor:

Red   Supervisor state

Green Problem state

Blue   S/390 I/O wait state

Pink   Waiting for I/O initial status

Yellow SIOs (start I/Os per second)

To adjust the activity display, see the AWSSAD.DOC file.

System Operator Console
The System Operator session, which is displayed at the bottom of Figure 15 on page 49, is active as the operator console for your P/390. It is used for communication between the S/390 operator and the system, primarily to control system devices and to monitor system operation.

Access the System Operator session by double-clicking on the icon. All system-related messages, such as printer messages, appear in this session.
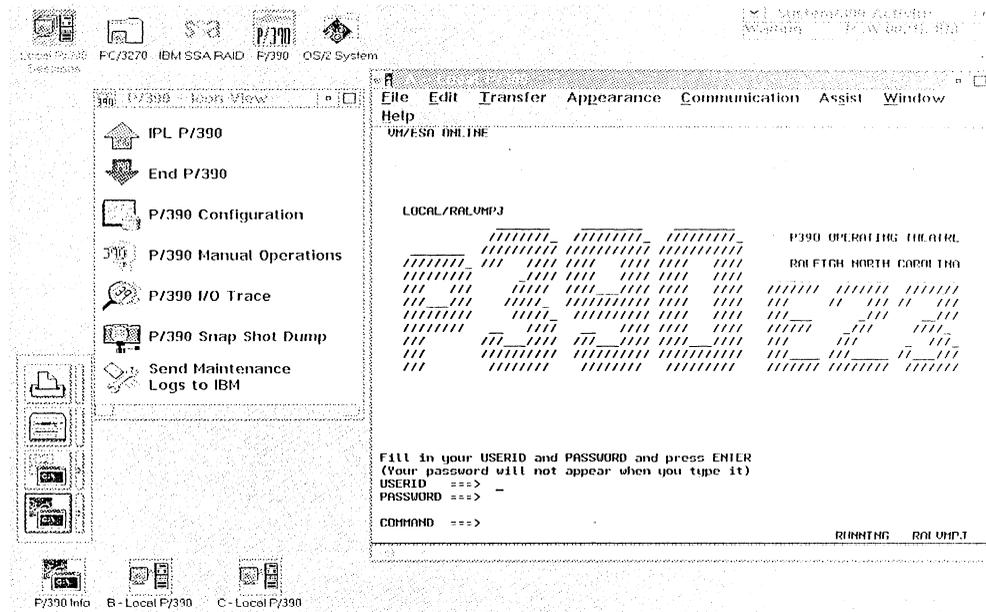
Figure 15. OS/2 Desktop Displaying P/390 Icons

P/390 Info   This window displays information about the level of the P/390 kernel and device driver. This window is for information only. You do not need to use it during normal operation of the P/390. However, if you report a problem to the P/390 Support Center, you may be asked to supply the information displayed in the P/390 Info window.

Note: Do not close this window. Closing the P/390 Info window ends the P/390 and is the same as selecting the End P/390 icon.

Local and Remote Sessions

During IPL of the P/390, icons for local and remote 3270 sessions are displayed on the desktop if PC/3270 has been started.

Local   A local session is a 3270 emulator session that allows you to log on to an S/390 session running in the P/390. You may find it useful to have more than one local session so that you can be logged on to multiple S/390 sessions simultaneously.

Local sessions are defined and named using the UPDATE SYSTEM DEVICES (F2) Configurator screen.

To log on to a local session, double-click on one of the icons for a local session. You will see the logo screen for the S/390 operating system. You can log on as usual.

Remote

A remote session is a 3270 emulator TCP/IP session that allows you to log on to the operating system running on a remote computer. To log on to a remote session, double-click on an appropriate icon. The

remote system's logo is displayed, and you can log on as usual.

Shutting Down the P/390

There are times when you need to shut down the P/390; for example, many changes made in the P/390 Configurator *require* that you do an END P/390, and then an IPL P/390 before updates can take effect. Or, you may want to shut down the P/390 for maintenance.

You should *always* make sure that the S/390 operating system has been properly shut down before terminating the P/390 I/O subsystem with the END P/390 icon.

Here are some sample procedures for shutting down various S/390 operating systems. Additional steps may be necessary for your configuration. You should follow your local procedures.

Shutting Down VM/ESA
When you want to shut off your S/390 Integrated Server, follow this procedure:

1. Log off from any host sessions.

2. Log off from any local sessions.

3. Make the System Operator console the active window.

4. At the System Operator console, type:

   SHUTDOWN

5. Wait until the *System Shutdown Complete* message appears.

6. Click on END P/390.

7. Follow your usual procedures for shutting down OS/2.

8. When the OS/2 shutdown is complete, turn off the power on the S/390 Integrated Server.

Shutting Down VSE/ESA
When you want to shut off your S/390 Integrated Server, follow this procedure:

1. Make the VSE system console the active window.

2. At the VSE system console, type:

   MSG F2
   2 CEMT P SHUT I
   Z NET,QUICK
   PEND

3. Wait until VSE shutdown completes.

4. Click on END P/390.

5. Follow your usual procedures for shutting down OS/2.

6. When the OS/2 shutdown is complete, turn off the power on the S/390 Integrated Server.

Shutting Down MVS/ESA or OS/390

When you want to shut off your S/390 Integrated Server, follow this procedure:

1. Make the MVS system console the active window.

2. At the MVS system console, type:

```
P TCAS
Z NET,QUICK
$PJES2
Z EOD
```

These commands will end TSO, VTAM, JES, and MVS, respectively. Additional commands may be required to shut down IMS™, DB2®, CICS, and any other subsystem running under MVS/ESA.

3. Wait until the MVS/ESA or OS/390 shutdown completes.

4. Click on END P/390.

5. Follow your usual procedures for shutting down OS/2.

6. When the OS/2 shutdown is complete, turn off the power on the S/390 Integrated Server.

Operating the 3172 SNA Communications Monitor

The 3172 SNA Communications Monitor provides a dynamic display of resource status and traffic throughput in a Presentation Manager-based window. This section describes how to monitor the status of your network using this status window. It provides this information only if you have configured the LAN3172, MGR3172, or WAN3172 device managers.

Understanding the Status Monitor

This section describes the general characteristics of the status monitor.

* Navigating through the monitor
* Using traces

Navigating through the Status Monitor

The status monitor presents information from general to more specific. The main window contains general information on all resources in the S/390 Server. Double-clicking on a field within a window displays another window that shows more detailed information. For example, you can double-click on a resource in the main window to see detailed information concerning that resource. Figure 16 illustrates the hierarchical nature of the status monitor.

```
                              Main
                                │
          ┌─────────────────────┼─────────────────────┐
          ▼                     │                     ▼
     SDLC line                  │                LAN adapter
          │                     │                     │
          ▼                     ▼                     ▼
  SDLC link station        Subchannel          LAN link station
```
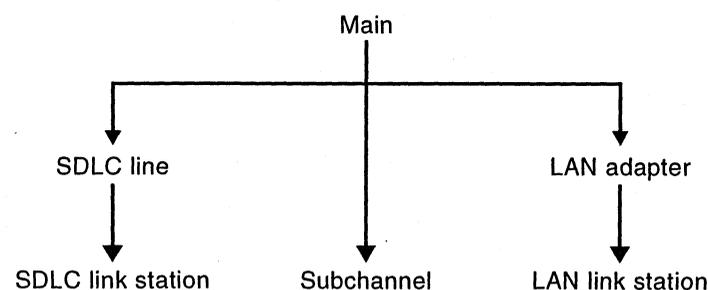
Figure 16. Status Monitor Navigation

Using Traces, Dumps, and Diagnostic Information

The status monitor provides functions for collecting trace data, writing the trace data to a file, and collecting diagnostic information.

Collecting Trace Data

Each entity (LAN adapter, SDLC line, link station, subchannel) supports trace functions. The detail display of the entity shows which events are currently selected for tracing on that entity and allows you to select and deselect these events.

You can perform the following trace functions:

- From the LAN adapter or SDLC line detail window:

  - Enable adapter/line trace
  - Disable adapter/line trace
  - Enable trace on all link stations
  - Disable trace on all link stations

- From the link station detail window:

  - Enable link trace
  - Disable link trace

- From the subchannel detail window:

  - Enable subchannel trace
  - Disable subchannel trace

On the main window, you can start and stop tracing as a whole. To start tracing or to resume a suspended trace, select **Start/resume trace** from the Control pull-down menu. To stop all tracing, select **Suspend trace** from the Control pull-down menu.

You also can write all trace data to a file by selecting **Write trace** from the Control pull-down menu. To erase all data from the trace buffer, select **Clear trace**.

Collecting Diagnostic Information

You might need to collect trace data, dump data, and your configuration files to send to someone for problem analysis. You do this by creating a zip file as follows:

1. At the OS/2 command prompt, enter **cd\snacom**

2. Enter **ZIPDIAG** *d:\path\filename*

   where

   d   is the letter designating the drive you want diagnostic information written to.

   path   is the directory path on the destination drive where the diagnostic zip file is to go.

   filename   is the name to use for the diagnostic zip file (does not require a three-letter extension because a default extension of *.zip* is used).

   If you choose to write the file to drive A, insert a diskette in the drive before you run the ZIPDIAG procedure; the procedure does not prompt you to insert the diskette.

3. Give the diagnostic zip file to your IBM service representative for delivery to the Support Center.

If possible, include soft copies (that is, files on a diskette) of relevant VTAM Switched-Net (SWNET) and External Communications Adapter (XCA) node definitions.

For efficient problem resolution, include a copy of any relevant VTAM console output.

Viewing Overall Network Status

To start the status monitor, enter **CD\SNACOM** at the OS/2 command prompt. Then enter **LSAMON**.

The main window of the status monitor contains the following information for each resource in the S/390 Server:

- ID
- Status
- The corresponding subchannel ID (for SDLC lines)

Figure 17 shows an example of the main window of the status monitor.
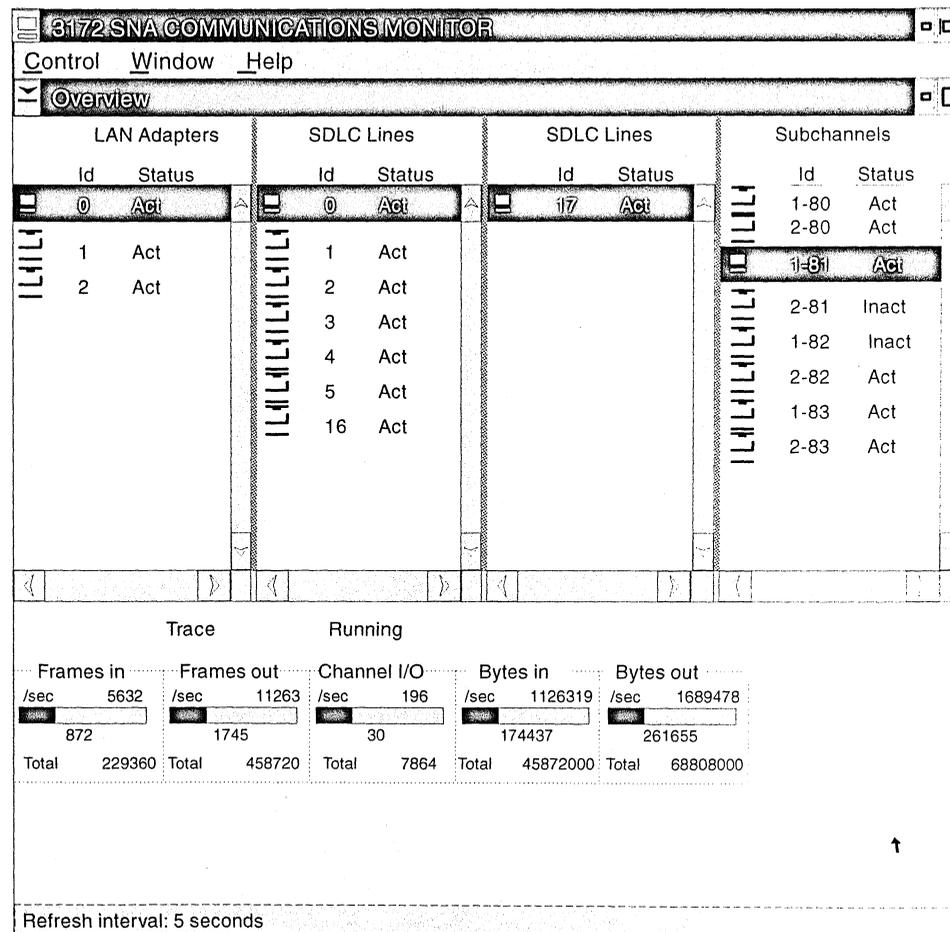
Figure 17. Status Monitor Main Window

The resource information in the main window has the following format:

icon [+] *nn status*

where:

icon   is an icon representing the resource. If the corresponding resource detail window is open, the icon is on a hatched background.

+   is the trace enabled indicator.

nn   is the LAN adapter, SDLC line, or subchannel number.

status   is the status value (active or inactive).

Viewing Detailed LAN Adapter and SDLC Line Data

To view detailed data about a particular LAN adapter or SDLC line, double-click on the icon of that resource. The resource detail window appears and lists information about the link stations for that resource. The window also shows utilization data for the resource.

Figure 18 shows an example of an SDLC line detail window.
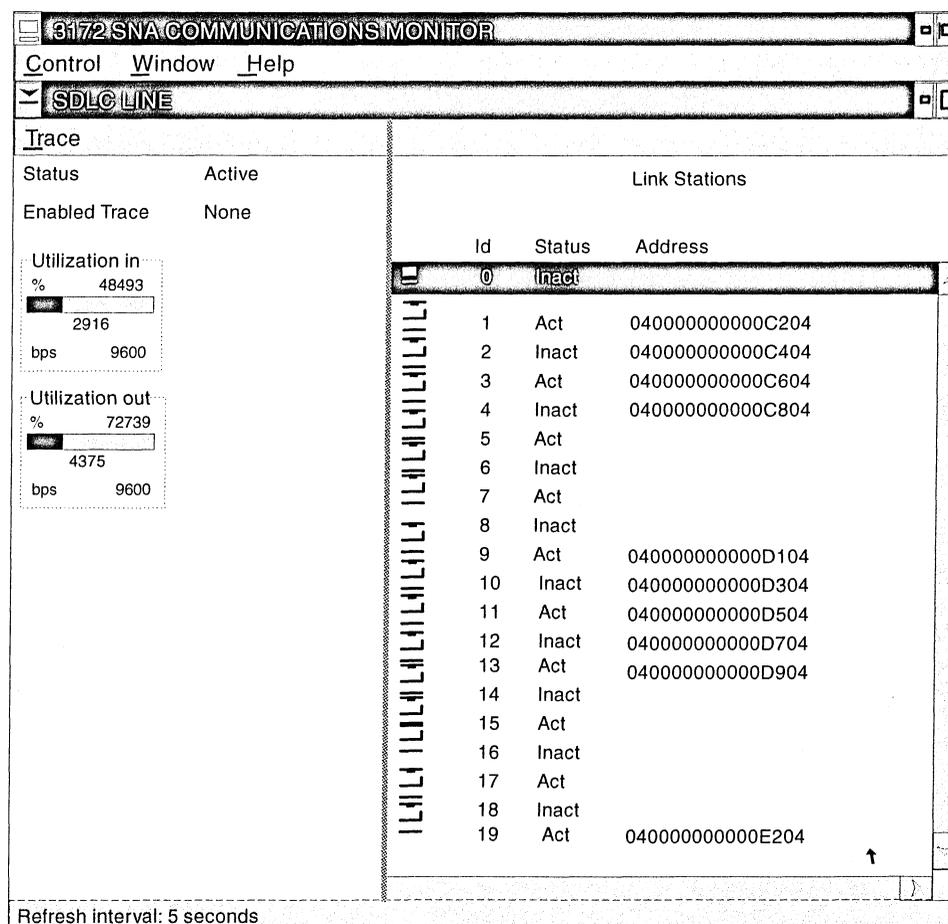
Figure 18. Adapter Detail Window

The resource detail window lists up to 255 link stations. The stations are placed top-to-bottom in the order of creation. Once placed, a station is not moved (even if the detail window is closed and reopened).

The window lists the following data for each link station:

- Link station ID

- Status

- Link station address

  - Local SAP address
  - Remote MAC address
  - Remote SAP address

  These values are defined for link stations as a means of identification at the host.

To view detailed data about a particular link station, double-click on the link station ID. A window appears and lists details for that link station.

Viewing Link Station Details (LAN and SDLC)

Figure 19 shows an example of a link detail window.


```
3172 SNA COMMUNICATIONS MONITOR

Control   Window   Help

SDLC Link 4:5

Trace

Status          Active
Enabled Trace   Events + Data
Local SAP       04
Remote MAC      00000000000C6
Remote SAP      04
Subchannel      0182

Frames in          Bytes in           Time RNRing
/sec       325     /sec      64977     %          33
        10               2183               1
Total    22300    Total  4460000    Total secs  22300

Frames out         Bytes out          Time RNRd
/sec       650     /sec      97465     %          65
        21               3275               2
Total    44600    Total  6690000    Total secs  44600


Refresh interval: 5 seconds
```

Figure 19. Link Station Detail Window

The status monitor displays the following information for the link station you selected on the Adapter Detail window:

- Status
- Enabled Trace
- Local SAP address
- Remote MAC address
- Remote SAP address
- Subchannel ID
- Number of frames in and out
- Number of bytes in and out
- Percent of time blocked by receive not ready (RNR)

Viewing Subchannel Details

You can display detailed data about a particular subchannel from the main window. To display detailed data for a subchannel, double-click on the subchannel ID.

Figure 20 shows an example of a subchannel detail window.
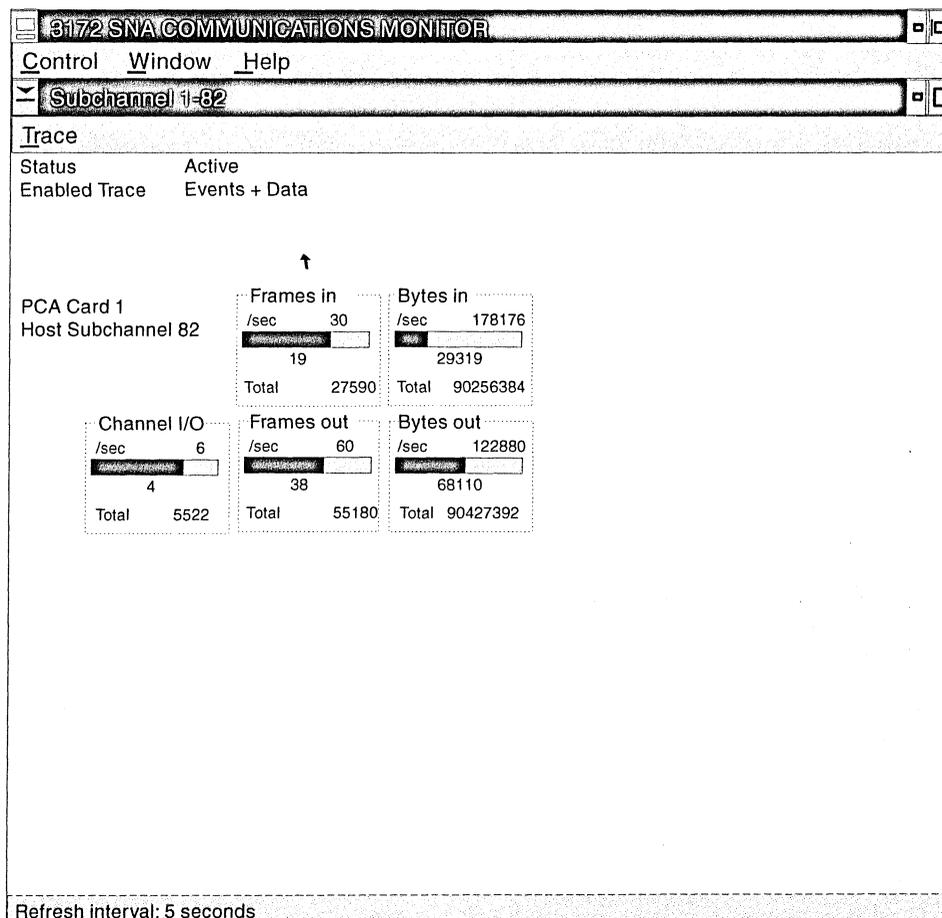
Figure 20. Subchannel Detail Window

The status monitor displays the following information for a subchannel:

- Status
- Enabled Trace

- Channel I/O
- Number of frames in and out
- Number of bytes in and out

Setting the Refresh Rate

The status monitor collects data from shared memory for display at fixed intervals. You can set this refresh interval to best meet your needs.

To set the refresh interval, select **Control** from the action bar. Then select **Set Refresh Interval** from the pull-down menu. A pop-up window appears that allows you to set the refresh interval.

Chapter 6. Configurator Overview

The P/390 Configurator is the tool that you use to perform system programmer tasks on your P/390.

The Configurator performs three main functions:

- It allows you to describe the mapping between the I/O devices available on the S/390 Server and the System/390 I/O devices they emulate.

- It provides an easy way for you to create and maintain new VM user IDs for P/390 users, and the minidisks associated with those user IDs.

- It allows you to customize P/390 system parameters and to allocate S/390 Server 3270 terminal sessions.

The P/390 Configurator is menu-driven, and changes to system configuration are easily made by changing the values in data menus.

The P/390 Configurator supports all System/370 and System/390 operating systems.

This chapter provides an overview of the P/390 Configurator:

- System files needed by the Configurator
- Menu field and function key conventions
- Menu tree structure
- How to start the Configurator
- Description of Configurator menus

System Files Needed to Run the P/390 Configurator

Before you can run the Configurator, certain system files must be available on your S/390 Server. If you are using the Configurator for VM/ESA 1.2.1 or above, or any non-VM operating system, then either one or two files are needed:

- Device map
- VM User Directory (optional)

  You do not need this file if you are maintaining VM user IDs through a program such as DIRMAINT, or if you prefer not to have VM user IDs accessible through OS/2 and the LAN.

If you are using the Configurator for a 370 version of VM, such as VM/ESA (370 Feature) or VM/SP, an additional file is needed:

- DMKRIO.ASM

The VM User Directory file must be available only if you want to add, delete, move, or change user IDs, passwords, links, or minidisks using the Configurator.

A description of each of these files follows:

- **Device map:** The S/390 Integrated Server is able to emulate host System/390 I/O because it maps S/390 hardware devices to S/390 Server devices. Two device maps are shipped with the operating system software:

  - **DEVMAP.1VM** provides a configuration that supports installation of VM/ESA and VSE/ESA as guests on VM/ESA.

- **DEVMAP.VSE** provides a configuration tailored for installation of VSE/ESA only.

- **DEVMAP.MVS** provides a configuration tailored for installation of MVS/ESA and OS/390.

You can modify the supplied device map files to change the S/390 and S/390 Integrated Server I/O device configuration or create additional device map files to designate different device configurations. DEVMAP.1VM and DEVMAP.VSE are examples of using different device map files for different device configurations, that is, one for a VM/ESA or combined VM/ESA and VSE/ESA system and another for a VSE/ESA only system.

You can determine which DEVMAP file is used by the S/390 Integrated Server Configurator and programs by using the AWSPROF command to set or change the default. The DEVMAP file can only be edited using the Configurator. You can create a new DEVMAP by using the AWSCFG command. See "AWSCFG.CMD OS/2 Utility" on page 223.

The P/390 I/O subsystem uses resources available on your S/390 Server to emulate the devices available on larger System/390s. The following table shows the mapping that is used to achieve this emulation:

Host System/390 Device	S/390 Server Equivalent Device
3270 Information Display	Personal Communications emulated session
FBA, CKD, ECKD-capable DASD	OS/2 file
3215	OS/2 Presentation Manager session
2540 card reader	OS/2 file
1403 printer	OS/2 print spooler
3422 Tape Drive	OS/2 file
Special (VM)	Import/export PC data
ICA synchronous	SDLC/BSC connection
3172	LAN VTAM connection
3172	LAN TCP/IP connection
3420/3480 Tape Drive	DAT (digital audio tape)

It is possible to operate your P/390 with different versions of the DEVMAP file to designate different device configurations. You can determine which DEVMAP file is used by the P/390 program by changing the specification of the DEVMAP file with the AWSPROF command. See "AWSPROF.EXE OS/2 Utility" on page 226. For example, you may have one configuration specifying that some DASD should be emulated on an optical disk while another configuration calls for DASD emulation on a S/390 Server fixed disk. Or, if you have both a VM and VSE operating system installed on the same S/390 Server, use AWSPROF to switch between DEVMAP.1VM and DEVMAP.VSE.

The following files apply only to VM:

- **VM User Directory** (optional)

The directory contains information that defines the user IDs, passwords, minidisks, links, and environment for all your VM sessions on the P/390.

This file is edited through the Configurator, but does not have to be present for the Configurator to run. However, if you do not specify this file, you will not be able to use the Configurator functions that use this file—specifically, those under the *Update User Data* heading on the **FUNCTIONS** main menu. It is assumed, in this case, that you are using some other means of VM User Directory maintenance, such as the DIRMAINT program product.

A sample USER.DIR file is supplied with the VM/ESA preconfigured system.

Although the directory can be read and edited, it is strongly recommended that you use the Configurator to make directory modifications. When the Configurator makes changes to the directory, it applies your modifications to the DEVMAP file. In most instances, the editing features of the Configurator are sufficient to make the necessary changes to the directory.

Attention: Failure to comply with these recommendations may result in serious errors.

If you are using the P/390 Configurator to maintain the VM User Directory, note the following important points:

–   If you want the changes you made to USER.DIR with the P/390 Configurator to be applied to your VM system upon startup, the EXEC NEWDIR command *must* remain in the Operator's PROFILE EXEC. For information on this command, see "NEWDIR CMS Command" on page 203.

–   If you make changes to the USER DIRECT file, you should export (using PCOPY) a current copy of the directory out to OS/2 as d:\VM\USER.DIR.

–   *Do not* define an "AUTOLOG1" user ID to autolog P/390 VM user IDs at system IPL time. This causes some users to be logged on *before* the directory has been uploaded and applied by the system OPERATOR. Put all your AUTOLOG statements in the Operator's AUTOLG EXEC.

–   These updates will not take effect until after the next IPL of the P/390.

The following file applies only to (VM/ESA 370 Feature) or VM/SP:

* **DMKRIO.ASM file**

This file is called *real I/O*. It is a CP system control file and, along with the directory, is used to define the VM/ESA system that is generated at the P/390 It consists of macros describing I/O devices, control units, and channels attached to the real processor. VM/ESA uses this information to schedule I/O operations and allocate resources.

The Configurator uses this file to verify I/O device types and addresses as you add new devices to your system. The Configurator only reads this file; it does not modify it in any way.

DMKRIO.ASM file is part of your VM system that was built by your system programmer. It is a readable ASCII file. Do *not* edit this file unless you are an experienced system programmer.

Configurator Conventions

Throughout the Configurator, these conventions are observed:

- Only the information in unprotected fields can be changed. The information in these fields is red. If you cannot write in a field, you are not required to supply that information.

- You move from unprotected field to unprotected field on a Configurator menu by using **Tab**. You can also use the arrow keys to move anywhere on the menu, but you can type only in an unprotected field.

- Most of the messages produced by the Configurator pop up in the middle of the screen. Some messages appear in the message area of the menu, which is either just below the menu title or at the very bottom of the menu. Messages always appear in yellow.

- Each menu has a name printed in the lower right corner. This helps to identify the menu both in this book and in discussions with system support people.

- The following key assignments are consistent from menu to menu:

  F1   Online help information.

  F7 or PageUp   Move all or part of a menu backward.

  F8 or PageDown   Move all or part of a menu forward.

  F9   Delete entry.

  F10   Return to the **FUNCTIONS** main menu.

  ESC   Return to the previous menu in the hierarchy, discarding any changes unless **ENTER** or a scroll key were pressed.

  F11   Special allocation functions.

  Insert and **Delete**   These keys operate in all data entry fields.

  ENTER   Accept data that has been typed in. **ESC** will *not* discard this data after you have pressed **ENTER** or a scroll key.

- When the name of a function key appears twice on a menu, the set of names on the left represents choices; the set of names on the right describes these choices. More help is always available by pressing **F1**.

Starting the Configurator

This section describes how to start the Configurator and enter data on its password menu. After performing the steps that follow, you should be able to do useful work with the Configurator from its **FUNCTIONS** main menu.

1. To start the Configurator, select the P/390 configuration icon from the P/390 folder. Depending on how your system is set up, you first see either the Configurator's logo or the **CONFIGURATOR PASSWORD** menu:

```
┌─────────────────────────────────────────────────────────────────┐
│                   ┌───────────────────────────────┐               │
│                   │ C O N F I G U R A T O R   P A S S W O R D │    │
│                   └───────────────────────────────┘               │
│   The configurator system                                         │
│   is password protected.    ┌──────────────────────────────────┐ │
│   Please type the password  │      Configurator Filenames      │ │
│   and press ENTER.          │ -------------------------------- │ │
│                             │ Device map > D:\VMESA\DEVMAP.1VM  │ │
│                             │ DMKRIO.ASM >                     │ │
│   ┌──────────────────┐      │                                  │ │
│   │ PASSWORD>>       │      │ Directory  > D:\VMESA\USER.DIR    │ │
│   └──────────────────┘      └──────────────────────────────────┘ │
│                                                                   │
│                             ┌──────────────────────────────────┐ │
│                             │        HELP INFORMATION          │ │
│                             │                                  │ │
│                             │ The password is provided for your protection. │
│                             │ If your P/390 system will have multiple users │
│   ┌────────────────────┐    │ defined, the password provides a level of │
│   │   FUNCTION KEYS    │    │ security. If you have never changed your │
│   │ F1  - Help         │    │ password, the default password is SYSTEM. │
│   │ F10 - Exit configurator │ └──────────────────────────────────┘ │
│   └────────────────────┘                                          │
│                                                                   │
│                                                      conpaswi     │
│                                                                   │
└─────────────────────────────────────────────────────────────────┘
```

2. Notice the menu name **conpaswi** in the lower right corner of the menu. Each menu used by the Configurator is identified by a unique menu name appearing in this location.

3. Two kinds of information are displayed on the menu:

   - The location and names of the P/390 system files:
     - Device map
     - Directory
   - The Configurator password

   The names of the P/390 system files should appear in the box at the upper right.

4. If you want to change the location (drive or pathname) of any of these files, or provide alternative file names, move the cursor to the file name you want to change and type over the existing name.

   If this is a *non-VM* DEVMAP, only the device map field is filled in. For VM/ESA 1.2.1 and above, the DMKRIO.ASM file is not used. The Directory file is optional and is only required if you are using the Configurator to maintain your VM User Directory.

   Note: The only file name you cannot change on this screen is the DEVMAP name. This name was taken as a parameter when you started the Configurator (or default is assumed).[5]   It is provided only for information.

5. If you have not changed the Configurator password previously, the default password is *SYSTEM*. Press **ENTER** to use the default password and begin your Configurator session.

6. If you have defined a password, you must supply that password and press **ENTER**. The letters of your password do *NOT* appear as you type them in,

---

[5] You can determine which DEVMAP file is used by the P/390 Configurator and the IPL program by using the AWSPROF command to set or change the default.

even if the default is used. If you want to change the password, see "Changing the P/390 Configurator Password" on page 96.

7. If the Configurator cannot find one of the files listed in the file name box, a message similar to the following appears, where xxxxxx.xxx is the name of the missing file:

```
The xxxxxx.xxx file could not be found.
The program needs this file in order to run.
Correct the pathname at the cursor position.
                    Press any key to continue...
```

Structure of the P/390 Configurator

Figure 21 shows the menu relationship of the menus in the P/390 Configurator.
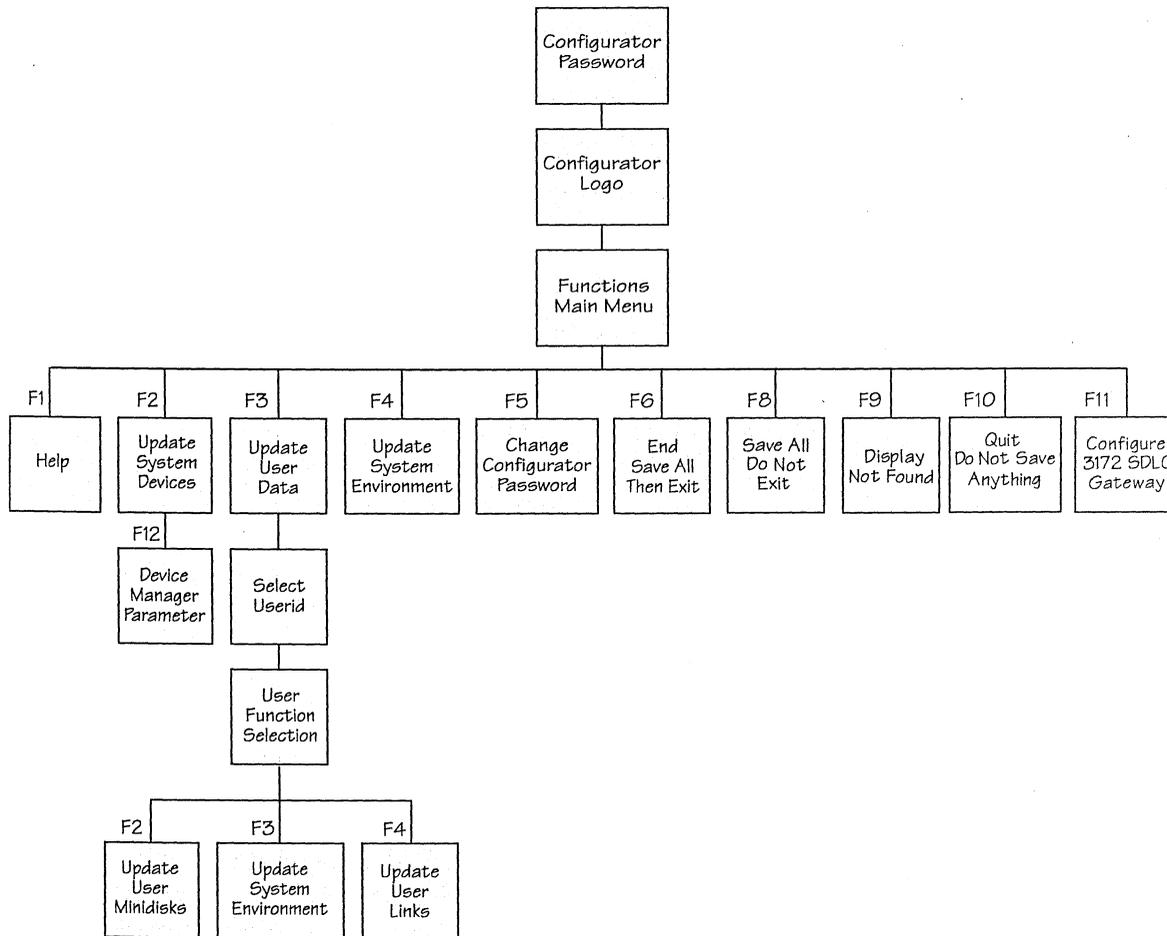
Figure 21. The Structure of the Configurator Menus

Notice that you select all Configurator operations from the **FUNCTIONS** main menu, which looks like this:

```
┌──────────────────────────────────────────────────────────────────────┐
│                                                                        │
│                          ┌─────────────────────┐                       │
│                          │  F U N C T I O N S  │                       │
│                          └─────────────────────┘                       │
│                                                                        │
│                   Current P/390 Program Level is x.x.x                 │
│            Press the FUNCTION KEY for the activity you want.           │
│                                                                        │
│   ┌──────────────────────────────────┐  ┌──────────────────────────────┐ │
│   │       Major Functions            │  │  Description of Major Functions: │ │
│   │  F1   Help                       │  │  F2 Allocate new files, delete data │ │
│   │  F2   Update System Devices      │  │     from the system, modify addresses. │ │
│   │  F3   Update User Data           │  │     Update all DEVMAP information. │ │
│   │  F4   Update System Environment  │  │                              │ │
│   │  F5   Change Configurator Password│  │  F3 Add/Delete/Change USERIDs, mini │ │
│   │  F6   END  - SAVE ALL, then EXIT │  │     disks and user links.    │ │
│   │  F8   SAVE - SAVE ALL, DO NOT EXIT│  │                              │ │
│   │  F9   Display Files Not Found    │  │  F4 Change CPUID, GMT Offset, Cache │ │
│   │  F10  QUIT - DO NOT SAVE ANYTHING│  │     buffer size, etc.        │ │
│   │  F11  Configure 3172 SDLC Gateway│  │                              │ │
│   └──────────────────────────────────┘  └──────────────────────────────┘ │
│                                                                        │
│                                                              cnfuns     │
│                                                                        │
└──────────────────────────────────────────────────────────────────────┘
```

The following is a brief explanation of what tasks you can perform from each of these menus:

F2, UPDATE SYSTEM DEVICES (all modes)
> This menu allows you to update the mapping between S/390 I/O devices and S/390 Server devices. This information is kept in the DEVMAP file. This menu is essentially a complete display of the contents of the DEVMAP file, with limited editing capabilities. It allows experienced users to maintain the real I/O device configuration of their P/390. From this menu, you can also display system startup parameters for device managers.

F3, UPDATE USER DATA (VM only)
> This is the first menu involved with editing the USER.DIR file. If you are not using the Configurator to maintain the VM User Directory, then this string of menus will be disabled. The user IDs listed in the main display area of this menu are those that are in your directory. There are three types of user IDs on this list:

> • General user IDs, displayed in yellow

> • User IDs reserved for system functions, displayed in dark blue

> • System directory profiles, displayed in light blue at the bottom of the list

> You use this menu to select a user ID to modify or delete. You also use this menu to add a new user ID to the system.

USER FUNCTION SELECTION (VM only)
> From this menu, you can select one of the three main groups of directory statements you can modify:

> • User Environment

- User Minidisks
- User Links

UPDATE USER ENVIRONMENT (VM only)

This menu allows you to edit all the statements in the directory *EXCEPT* the MDISK and user LINK statements. You edit these statements on their own menus.

UPDATE USER MINIDISKS (VM only)

This menu allows you to manipulate minidisks for a particular user. Changes made on this menu affect the MDISK statements in the USER.DIR file. You can allocate, change, or delete minidisks from this menu.

UPDATE USER LINKS (VM only)

This menu allows you to add, delete, or change the LINK statements in the directory for this user ID. The data entered in this menu is used to produce the LINK statements when the new directory is written.

F4, UPDATE SYSTEM ENVIRONMENT (all modes)

This menu allows you to update the system environment data that controls the P/390. The system data items that can be changed are:

- Local area network ID (NetID)
- System IPL address
- System Load parameter
- System mode
- System GMT offset
- System CPUID
- Cache size
- Expanded storage
- Character font name

F5, CHANGE CONFIGURATOR PASSWORD (all modes)

This menu allows you to change the Configurator password. The password can consist of any combination of normal numbers and letters.

F11, 3172 SDLC Gateway

This is a set of screens that allows you to allocate SDLC ports. For information on how to configure this function, see Chapter 8, "Configuring the 3172 SDLC Gateway" on page 147.

For a complete description of the Configurator menus and the meaning of their entry fields, see "P/390 Configurator Menus" on page 68.

P/390 Configurator Menus

This section describes the following P/390 Configurator menus:

- Update System Devices, page 69
- Select Userid, page 75
- User Function Selection, page 78
- Update User Environment, page 80
- Update User Minidisks, page 83
- Update User Links, page page 87
- Update System Environment, page 89

Update System Devices Menu (All Modes)

Using the Configurator, you can define the particular S/390-device to S/390 Server-device mapping you require and create a DEVMAP file based on this mapping. This function is performed by the **UPDATE SYSTEM DEVICES** menu of the Configurator. An example of this menu is shown below:

```
                    U P D A T E   S Y S T E M   D E V I C E S



 ┌─ Active Devices:87 ──────────── Available disk space in Mbytes: 500.123 ──┐
 │Addr Device  Label  Atype  Size     Mgr  FN/P        PATH:>D:\VMESA        <│
 │---------------------------------------------------------------------------│
 │>    >      >      >      >        >   >                                    │
 │000C  2540                          7   D:\RDR\*.*                          │
 │000E  1403          PRTR            6   D:\PRINT.00E                        │
 │0038  ICA                           C                                      │
 │0100  3370   USER03 PERM   1400K    1   D:\VMESA\SAMPLE.191                 │
 │0101  3370   NEW191 PERM   4096K    1   D:\VMESA\NEWUSER.191                │
 │0200  3278          DSPY            3   /R=OP                               │
 │0201  3278          DSPY            3   Local 3270 Session                  │
 │0202  3278          DSPY            4   LAN 3270 Session                    │
 │0203  3278          DSPY            4   LAN 3270 Session                    │
 └───────────────────────────────────────────────────────────────────────────┘

 Mgr Codes:  1=AWSFBA    2=AWSCKD    3=AWS3274  4=LAN3274  5=AWS3215  6=AWS2821
 7=AWS2540  8=LAN3172  9=LCS3172  A=MGR3172  B=WAN3172  C=AWSICA   D=AWSTAPE
 E=SCSI3480 F=SCSI3420 G=AWS3480  H=AWS3420  I=AWSOMA   J=AWSPCSRV K=AWSICE

 ┌────────────────────────────────────────────────────────────────────────┐
 │ F1 Help   ALT+F1 Function Key Definitions   F10 Main Menu  ESC Cancel Input │
 └──────────────────────────────────────────────────────────────cnsysdev─┘
```

The **UPDATE SYSTEM DEVICES** menu is essentially a full-screen editor for the DEVMAP file. It was created to allow experienced users to maintain the device configuration of their P/390 in a straightforward manner. This menu also provides DASD allocation/deletion capabilities on a S/390 real device address basis. This differs from the "user minidisk" method, which is the underlying principle of the panels that constitute the **UPDATE USER DATA** section of the Configurator. You can use this menu to:

- Add devices at particular S/390 addresses
- Allocate DASD volumes
- Change OS/2 file names assigned to DASD devices
- Change 3270 or 3215 session titles
- Delete devices from DEVMAP
- Temporarily exclude devices from DEVMAP
- Specify parameters for device managers

Menu Elements
This menu has five main areas:

1. The title area at the top of the menu.

   On the far right of this line is a field that indicates which *System Mode* is currently specified in the F4, **UPDATE SYSTEM ENVIRONMENT** menu.

2. The message area immediately below the title. All error or warning messages produced by the Configurator appear here.

3. The main parameter input/data display area in the center of the screen.

This area is composed of a file path field, an active devices field, an available disk space field, a new data input line (with the input fields denoted by ">" signs), and a display area for the existing DEVMAP entries.

The *Path >* field allows you to specify the default pathname for all new DASD volumes that you enter on this panel. You can type over the displayed information if you want to change the default pathname. The initial default pathname is the location of the DEVMAP file.

The *Active devices* field specifies the number of active device addresses in DEVMAP. This informs you how close you are to the limit of 255 devices.

The *Available disk space* field specifies the number of bytes available on the S/390 Server drive indicated in the *Path* field. To view the amount of free space available on other drives, change the drive specified in the *Path* field, and press **ENTER**.

The new data input fields allow you to specify all the information required to add new devices. The list of existing device statements contains protected fields, which are indicated in blue. You can delete or change the data in the unprotected fields (red) by typing over the existing data and pressing **ENTER**.

The display area for existing DEVMAP entries has the following fields:

- *Addr* is the 3-digit or 4-digit S/390 real address for the device. This is a required data entry field.

- *Device* is the S/390 device type for the device. If a DMKRIO.ASM file was specified when starting the Configurator, this is automatically taken from that file. For VM/ESA and non-VM operating systems this is an data entry field that *must* be filled in.

- *Label* is the 6-character volume label. It is required only for DASD.

- *Atype* is the 4-character allocation type. It is required only for VM FBA DASD. Non-VM DASD and unformatted VM DASD volumes will display as **VSE** and all Count Key Data DASD as **CKD**.

- *Size* is the size of the volume in megabytes, kilobytes, 512-byte blocks, cylinders, or fullpack. It is required only for DASD.

- *Mgr* is the P/390 manager code that identifies which P/390 manager controls that device. It is a required data entry field, although if left blank, the manager code is defaulted based on entries in the AWSCTYPE.MGR file.

- *FN/P* (filename / parameters)

  - For DASD, it is the OS/2 file name associated with this device.

  - For 3215 terminals, it is the title that will be placed on the terminal session.

  - For all other device types, this field may contain optional parameters. To see if any parameters are accepted by a device manager, place the cursor under the device line and press **F1**.

4. The P/390 device manager codes display area near the bottom of the screen.

The manager names are taken from the file AWSCTYPE.MGR or, if a DEVMAP contains a manager name that is not in this file, that manager is added to the end of the list.

5. The bottom line of the menu, which lists some of the valid function keys.

   Pressing **ALT+F1** will display a pop-up box of all valid function keys.

Function Keys

F1
Online help information. Placing the cursor under a particular device address or manager name and then pressing this key will display the help for that device manager. If the cursor is anywhere else on the screen when **F1** is pressed, general help for this menu is displayed.

F5
Locate. Lets you search for a particular device address by typing it into the "Addr" entry field and then pressing this key. You can also search for a particular DASD "Label".

F7 or PageUp
Scroll Back. Lets you scroll the data in the display area backward.

F8 or PageDown
Scroll Forward. Lets you scroll the data in the display area forward.

F9
Delete. Deletes the DEVMAP entry at the cursor position. If the entry points to a DASD volume and the OS/2 file exists, you also have the opportunity to delete the file.

F10
Returns you to the **FUNCTIONS** main menu. All changes are accepted.

ESC
Returns you to the **FUNCTIONS** main menu. Any changes you made without pressing **ENTER** or a scroll key are discarded.

F11
Allocate. For DASD, specifies that the entry or corresponding file at the current cursor location is to be allocated.

F12
Displays a screen that shows startup parameters for each device manager. You can edit this screen to change startup parameters for any device manager. See "Device Manager Parameter Menu (All Modes)" on page 73 for information on this screen.

Alt+B
Causes the *Size* fields in the main display area to show the DASD volume size in number of 512-byte blocks. Pressing this key again restores the normal file size representations. Non-VM-type files are always displayed in 512-byte blocks.

Alt+R
Marks the DASD volume as R/O. A lowercase r is displayed in front of the OS/2 file name. Pressing this key again marks the volume R/W.

Alt+F2
Allows you to change the volume label of a DASD. The cursor must be under the label field you want to change when this key is pressed.

Alt+F3
Turns off (excludes) a range of devices. Excluded devices are displayed in dark blue.

Alt+F5
Turns on a previously excluded range of devices.

ENTER
Accept data that has been typed in. **ESC** does *not* discard this data after you have pressed **ENTER** or a scroll key.

Ctl+Up Arrow   Retrieve previously entered data in the input line.

Ctl+Down Arrow   Retrieve previously entered data in the input line.

Device Manager Parameter Menu (All Modes)

This menu is used to display and modify the startup parameters for each of the P/390 device managers that are listed at the bottom of the **UPDATE SYSTEM DEVICES** menu.

```
┌─────────────────────────────────────────────────────────────────────────┐
│                                                                          │
│         ┌───────────────────────────────────────────────────────┐        │
│         │     Start Device Manager Parameter Input/Display       │        │
│         └───────────────────────────────────────────────────────┘        │
│                                                                          │
│  ┌─────────────────────────────────────────────────────────────────┐     │
│  │1    AWSFBA    >                                     .            │     │
│  │2    AWSCKD    >/PN                                               │     │
│  │3    AWS3274   >                                                 │     │
│  │4    LAN3274   >/PORT=7490                                       │     │
│  │5    AWS3215   >                                                 │     │
│  │6    AWS2821   >                                                 │     │
│  │7    AWS2540   >                                                 │     │
│  │8    LAN3172   >                                                 │     │
│  │9    LCS3172   >                                                 │     │
│  │A    MGR3172   >                                                 │     │
│  │B    WAN3172   >/id=07400000 /sn=7490                            │     │
│  │C    AWSICA    >                                                 │     │
│  │D    AWSTAPE   >                                                 │     │
│  │E    SCSI3480  >                                                 │     │
│  │F    SCSI3420  >                                                 │     │
│  └─────────────────────────────────────────────────────────────────┘     │
│                                                                          │
│  ┌─────────────────────────────────────────────────────────────────┐     │
│  │ F1 Help  F7=Up  F8=Down  F10=Accept/Return  ENTER=Accept data  ESC=Cancel │ │
│  └─────────────────────────────────────────────────────────────────┘     │
│                                                                          │
└─────────────────────────────────────────────────────────────────────────┘
```

The **Device Manager Parameter** menu displays the parameters that are passed to each P/390 device manager when it is started from IPL.CMD. You should not modify IPL.CMD, but instead use this menu.

Menu Elements

Each line on the menu has three parts:

1. The Device Manager Code

   On the far left of the line is the device manager code that is used on the **UPDATE SYSTEM DEVICES** menu.

2. The Device Manager Name.

   Note that the color of the name means the same thing as on the **UPDATE SYSTEM DEVICES** menu:

   - Yellow — manager has devices assigned to it.

   - Cyan (light blue) — manager has no devices assigned to it.

   - Dark Blue — all devices are temporarily excluded for the manager.

3. The main parameter input/data display area

   This entry field is 54 characters long and begins with the > sign. The format of the parameters is manager dependent and is described in the *.DOC files for each manager. To view a particular manager's DOC file, move the cursor onto the manager's line and press F1.

The defaults are taken from the file AWSCPARM.MGR. If a manager has no parameters, then the field will be blank. If you want to revert back to the default parameters for any manager, blank out the line and press **ENTER**. If a manager has default parameters, but you want to pass *no* parameters, type in the word none. This will cause IPL.CMD to pass blanks to the device manager.

After modifying any of the manager parameters, press **ENTER** to make them accepted. They are saved in the DEVMAP file when you select *END – SAVE ALL, then EXIT* from the Configurator main menu.

You can have different device manager parameters in different DEVMAPs, for example, for multiple operating systems or different I/O configurations.

Function Keys

F1
Online help information. Placing the cursor on the line for a particular manager and then pressing this key will display the help for that device manager. If the cursor is anywhere else on the screen when **F1** is pressed, general help for this menu is displayed.

F7 or PageUp
Scroll Back. Lets you scroll the data in the display area backward.

F8 or PageDown
Scroll Forward. Lets you scroll the data in the display area forward.

F10
Accept/Return. Returns you to the **UPDATE SYSTEM DEVICES** menu. All changes are accepted.

ESC
Cancel. Returns you to the **UPDATE SYSTEM DEVICES** menu. Any changes you made without pressing **ENTER** or a scroll key are discarded.

ENTER
Accept data that has been typed in. **ESC** does *not* discard this data after you have pressed **ENTER** or a scroll key.

Select Userid Menu (VM only)

The **SELECT USERID** menu lets you add or delete VM user IDs on the P/390 and to set or change the environment, minidisks, and links for the user IDs. You can reach the **SELECT USERID** menu by pressing **F3** *Update User Data* function, on the FUNCTIONS main menu.

The Configurator allows you to use this menu (and the others under it in the hierarchy) only if you specified a user directory in the *Directory* field of the **CONFIGURATOR PASSWORD** menu. Thus, this menu is only available in VM mode.

```
┌─────────────────────────────────────────────────────────────────────────┐
│                                                                           │
│                          ┌───────────────────────┐                        │
│                          │  S E L E C T   U S E R I D │                    │
│                          └───────────────────────┘                        │
│      USERIDs 1 to 39                                                       │
│                                                                           │
│  ┌──────────────────────────────────────────┐  ┌──────────────────────┐  │
│  │ Place cursor under USERID, then use ENTER │  │     HELP INFORMATION │  │
│  │ or PF3 to modify. Use PF9 to delete.      │  │ Use this screen to add a│ │
│  │ ----------------------------------------- │  │ new user or to select a│ │
│  │ MAINT                                     │  │ user for modification or│ │
│  │ NEWUSER                                   │  │ deletion. PF1 = more HELP.│ │
│  │ OPERATOR                                  │  └──────────────────────┘  │
│  │ SAMPLE                                    │                            │
│  │ $ALLOC$                                   │  ┌──────────────────────┐  │
│  │ $DIRECT$                                  │  │ F3/ENTER  Select user │  │
│  │ $CPNUC$                                   │  │ F5        Un-Delete   │  │
│  │ USERPROF                                  │  │ F7/PgUp   Scroll Back │  │
│  │ SYSPROF                                   │  │ F8/PgDwn  Scroll Forward│ │
│  │                                           │  │ F9        Delete user │  │
│  │                                           │  │ F10/ESC   Main menu   │  │
│  │                                           │  │ F11       Copy Entry  │  │
│  │                                           │  │ F12       Create Profile│ │
│  │                                           │  └──────────────────────┘  │
│  └──────────────────────────────────────────┘                            │
│                                                                           │
│  ┌──────────────────────────────────────────┐                            │
│  │ NEW USERID >>>                            │                            │
│  └──────────────────────────────────────────┘                            │
│                                                          cnusers          │
└─────────────────────────────────────────────────────────────────────────┘
```

Menu Elements

This menu has 5 areas:

- The title box at the top of the menu
- Brief help information at the box in the upper right of the menu
- The function key box at the middle right
- The user ID list in the box on the left
- The new user ID input field on the lower left

The User ID List: This list, located on the left side of the menu, usually shows three types of user ID entries:

1. **General User IDs**

   These user IDs are all available to you to log onto under VM on the P/390. They include the system user IDs OPERATOR and MAINT, as well as other user IDs you create with the Configurator.

> ┌── **Important** ───
> │
> │ Do not delete the OPERATOR or MAINT user IDs from your system. You
> │ are not able to IPL and maintain your VM system if you do.
> │

These entries always appear in yellow.

2. **User IDs Reserved for System Functions**

These user IDs were created by your system programmer to help you maintain
your copy of VM/ESA. They do not represent virtual machines; therefore, you
cannot log on to them. Instead, they indicate areas of the physical DASD
volumes that are reserved for system functions.

These user IDs always have names beginning and ending in a $ sign, as in
$ALLOC$ in the menu above. They appear in dark blue.

> ┌── **Note** ───
> │
> │ Because these user IDs are reserved for system functions, you should *not*
> │ delete or modify them.
> │

3. **System Directory Profiles**

Profiles represent a standard set of user environment statements that you can
specify for several users without repeating all the statements for each user.
The profiles USERPROF and SYSPROF are provided with the VM/ESA
preconfigured system. Your system programmer may have added others.

System Directory Profiles always appear in light blue.

> ┌── **Note** ───
> │
> │ You should not delete System Directory Profiles, because errors in your
> │ user ID definitions result.
> │

As you add new user IDs to your system, they are placed alphabetically in the user
ID list. The list itself expands to 3 columns with 13 user IDs per column. The
maximum number of user IDs allowed is 312.

Press **Tab** or **Shift-Tab** to move between the user IDs in the list and to get to the
New Userid input field on the lower left.

Function Keys

F1   Online help information.

F3 or ENTER   Select the user ID indicated by moving the cursor under one
                        of the user IDs from the list in the left box.

F5   Withdraw a delete request for a user ID (undelete).

F7 or PageUp   Scroll the menu of user IDs backward.

F8 or PageDown   Scroll the menu of user IDs forward.

F9   Delete the user ID indicated by moving the cursor under one
                        of the user IDs from the list in the left box. The user ID is
                        highlighted to indicate that it has been deleted from the
                        system.

F10 or **ESC**   Return to the **FUNCTIONS** main menu.

F11   Copy an existing user ID to a new user ID.

F12   Create a Directory Profile entry.

User Function Selection Menu (VM only)

You use this menu to select which aspect of a user ID (either new or existing) you want to create or change. You can reach the **USER FUNCTION SELECTION** menu by pressing **F3** or **ENTER** with the cursor placed under a particular user ID on the **SELECT USERID menu.**

```
               ┌──────────────────────────────────────────┐
               │  USER FUNCTION SELECTION FOR NEWUSER      │
               └──────────────────────────────────────────┘

  Press the FUNCTION key for the activity you want.


  ┌───────────────────────────────┐   ┌──────────────────────────────────────┐
  │ To ADD/MODIFY/DELETE:         │   │        (F1) HELP INFORMATION         │
  │ ----------------------------- │   │                                      │
  │      F2  User Environment     │   │ F2  User Environment includes such items
  │                               │   │     as USERID, password, virtual storage
  │      F3  User Minidisks       │   │     size, and auto IPL.              │
  │                               │   │                                      │
  │      F4  User Links           │   │ F3  MINIDISKS include virtual device │
  │                               │   │     address, PC drive ID, read/write │
  └───────────────────────────────┘   │     share passwords, and mode.       │
                                       │                                      │
  ┌───────────────────────────────┐   │ F4  USER LINKS include disk owner's  │
  │ To Change Users or Return:    │   │     USERID, virtual address, and link │
  │ ----------------------------- │   │     access mode.                     │
  │ ESC      - User select menu.  │   │                                      │
  │ F7/PgDn  - scroll Back 1 User.│   └──────────────────────────────────────┘
  │ F8/PgUp  - Scroll Fwd  1 User.│
  │ F10      - Main Menu.         │
  └───────────────────────────────┘

                                                               cnuserfu
```

Menu Elements

This menu has four areas:

- The title box
- The menu box "To ADD/MODIFY/DELETE:" on the upper left
- The function key box on the lower left
- Brief help information in the box on the right side of the menu

This menu and the menus below it in the hierarchy allow you to edit the various statements that define a user ID in the system directory. From the **USER FUNCTION SELECTION** menu, you can choose which of the three main groups of directory statements you would like to modify:

- *User Environment.* Refer to "Update User Environment Menu (VM only)" on page 80 for more information.

- *User Minidisks.* Refer to "Update User Minidisks Menu (VM only)" on page 83 for more information.

- *User Links.* Refer to "Update User Links Menu (VM only)" on page 87 for more information.

Function Keys

<u>F1</u>	Online help information.
<u>F2</u>	Go to the **UPDATE USER ENVIRONMENT** menu.
<u>F3</u>	Go to the **UPDATE USER MINIDISKS** menu.
<u>F4</u>	Go to the **UPDATE USER LINKS** menu.
<u>F7</u>	Scroll backward one user.
<u>F8</u>	Scroll forward one user.
<u>F10</u>	Return to the **FUNCTIONS** main menu.
<u>ESC</u>	Go to the **SELECT USERID** menu.

Update User Environment Menu (VM only)

This menu is used to define the user's environment. On this menu you can edit all aspects of a user ID, except minidisks and links, which have their own menus. You can reach the **UPDATE USER ENVIRONMENT** menu by pressing **F2** while on either the **USER FUNCTION SELECTION, UPDATE USER MINIDISKS,** or **UPDATE USER LINKS** menus.

```
┌──────────────────────────────────────────────────────────────────────────────┐
│                                                                              │
│                      ┌──────────────────────────────────────┐                │
│                      │  UPDATE USER ENVIRONMENT FOR NEWUSER  │                │
│                      └──────────────────────────────────────┘                │
│    Make all changes, then press ENTER to KEEP new data.                      │
│   ┌──────────────────────────────────────────────────────────────────────┐  │
│   │ Logon               Logon          Maximum          User             │  │
│   │ password>SECRET     storage>4M      storage>8M      class>G           │  │
│   │ -----------------------------------------------------------------------│  │
│   │ * Configurator generated USERID   Tue Sep 14 13:18:58 1993            │  │
│   │ INCLUDE USERPROF                                                       │  │
│   │                                                                        │  │
│   │                                                                        │  │
│   │                                                                        │  │
│   │                                                                        │  │
│   │                                                                        │  │
│   │                                                                        │  │
│   └────────────────────────────────────────────────────────────────────────┘│
│                                                                              │
│   ┌──────────────────────────────────────────────────────────────────────┐  │
│   │ F1 Help   F2 User Functions   F3 Disks   F4 Links   F6 Insert   F7 Back│  │
│   │ F8 Forward   F9 Delete   F10 Main Menu   F12 UserID menu   ESC No changes│ │
│   └──────────────────────────────────────────────────────────cnuseren────┘  │
│                                                                              │
└──────────────────────────────────────────────────────────────────────────────┘
```

Menu Elements
This menu has three main areas:

- The title area, which displays the user ID you are working on. You can *rename* the user ID name by typing in this area.

- The top line of the large display area, which has fields describing information contained in the USER directory statements.

- The large editing area, where any other directory statements can be entered or modified.

```
┌─ Note ──────────────────────────────────────────────────────────────────────┐
│                                                                              │
│  No syntax checking is done for any of the information entered on this menu.  │
│  Errors are detected when the information is applied to the system with the   │
│  DIRECT command in the OPERATOR's PROFILE EXEC. See the VM/ESA               │
│  Planning and Administration Guide for more information about VM directory    │
│  statement syntax.                                                           │
│                                                                              │
└──────────────────────────────────────────────────────────────────────────────┘
```

Here is an explanation of the data fields you can modify on this menu. You must press **ENTER** for the Configurator to accept any of the changes you make to these fields.

- *Logon Password*, just as in your host system, consists of up to 8 alphanumeric characters. If you are adding a new user ID, the *Logon password* field is filled with asterisks.

- *Logon Storage* is the default logon virtual storage size. A typical entry in this field is in the form:

    nnnnnX

    where **nnnnn** is an decimal integer, and **X** is either "K" for kilobytes or "M" for megabytes (1M = 1024K). Virtual machine storage size is assignable in 64K increments below 16MB, and in 1MB increments above 16MB.

- *Maximum Storage* specifies the maximum virtual storage that this user ID can request while logged on. The format of this entry is the same as it is for Logon Storage.

- *User Class* field must contain at least one of the IBM-defined classes (A through G) or locally defined classes (H through Z, 0 through 9) that indicate which system privileges this user ID will have under VM/ESA. If more than one class is specified, there should be no spaces between the class letters.

    For VM/ESA (370 Feature) the CP dispatch priority can be entered on the same line after the class.

    Here is a brief explanation of the different user classes:

IBM-Defined Class	Function	Function, Primary User, and Use
A	Primary system operation	The system assigns class A to the Operator session during IPL. The class A user is responsible for VM's availability and its communication lines and resources.
B	System resource operator	This class of user ID can issue commands that control allocation and deallocation of real resources of VM, except those that the primary system operator and the spooling operator control.
C	System programmer	This class of user ID can issue commands to update functions of the VM system and change real storage in the real machine.
D	Spooling operator	The commands available to this class user ID control spool data files and specific functions of the system's emulated unit record control unit.
E	System analyst	This user ID class can execute commands to examine and save certain data in the VM storage area.
F	Service representative	This user ID class allows the execution of commands to retrieve and examine data about input and output devices attached to the VM system.

IBM-Defined Class	Function	Function, Primary User, and Use
G	General users	The commands available to this user class control functions to run user's virtual machines.

Although any of these privilege classes are valid, typical users usually have either class G alone, or both class B and G. Note that, when your ID is defined as user privilege class B, the traditional CP commands, which you as a class G user might issue, take on different meanings. For example, the QUERY DASD command for a G class user queries the virtual storage for the user ID from which the query is issued; the same command for a B class user queries the virtual storage for the entire system.

The Main Editing Display Area is provided for you to enter any directory statements that are not LINK or MDISK cards. You can add or change statements by typing over them and pressing **ENTER**. You can add new statements in between existing lines by pressing **F6**. If no data was found in the directory, an asterisk is displayed on the first line as a place holder.

Typically, you specify the name of a directory profile in this area by typing in:

```
INCLUDE profile_name
```

where profile_name is the name of a system directory profile that appears on the **SELECT USERID** menu. For example, USERPROF.

Function Keys

F1   Online help information.

F2   Return to the **USER FUNCTION SELECTION** menu for this user ID.

F3   Go to the **UPDATE USER MINIDISKS** menu for this user ID.

F4   Go to the **UPDATE USER LINKS** menu for this user ID.

F6   Add a line to the display area of the menu just below the line where the cursor is placed.

F7   Scroll the data in the display area backward.

F8   Scroll the data in the display area forward.

F9   Delete the line at the current cursor position. There is no provision for "undeleting" the line.

F10   Return to the **FUNCTIONS** main menu.

F12   Return to the **SELECT USERID** menu.

ESC   Return to the **USER FUNCTION SELECTION** menu, discarding all changes only if **ENTER** or a scroll key has *not* been pressed.

ENTER   Accept data that has been typed in. **ESC** does *not* discard this data after you have pressed **ENTER** or a scroll key.

Update User Minidisks Menu (VM only)

This menu is used to define or update minidisks for your VM user IDs on your P/390.[6] Using this menu, you can add, change, or delete the user minidisk entries. The actual directory statements affected are the MDISK statements. Refer to the *VM/ESA CP Planning and Administration Guide* for more information about MDISK statements.

When you specify a new minidisk on this menu, the results are:

- A new MDISK statement, which is added to your directory entry for the user ID you are working on

- A new file on the S/390 Server fixed disk in the specified subdirectory of the size you typed in

- A new entry in DEVMAP with the real address of the minidisk volume automatically computed

The allocation type of the volume generated is always PERM. You must format the minidisk under CMS once you bring up the VM operating system on the P/390 For information about formatting a new minidisk, see "Logging On to a New P/390 VM User ID" on page 101.

An example of the **UPDATE USER MINIDISKS** menu follows:

```
                    UPDATE USER MINIDISKS FOR NEWUSER



                         ──────── Available disk space in bytes:  19,130,368──────┐
 Virt    DASD      VOL   ACC   File      File          Path >G:\VM              <
 Addr    Type     Label  Mode  Size      Name
 ---------------------------------------------------------------------------------
 >       >        >      >     >         >
 191     FB-512   NEW191 MR    4096K     G:\VM\NEWUSER.191





 MDISK 191    FB-512 16       8192       NEW191     MR ALL
```

```
 F1 Help    ALT+F1 Key Definitions    F10 Main Menu    ESC No Changes
                                                          ──cnuserud┘
```

---

[6] When you use the Configurator menus to maintain your VM User Directory, each user minidisk is allocated as a separate OS/2 file and each appears as a separate DASD volume to VM. If you choose to maintain your VM User Directory using more traditional mainframe tools, such as the DIRMAINT program product, then you can allocate (using the Configurator F2, Update System Devices menu) larger DASD volumes and use conventional minidisk subdivision. Note that the Configurator does not provide any support for multiple minidisk extents per single OS/2 file.

Menu Elements

This menu has five main areas:

1. The title area displays the menu title and the user ID you are currently working on.

2. The message area lies just below the menu title. All error or warning messages produced by the Configurator appear here.

3. The main parameter input/data display area in the center of the screen.

   This area is composed of a file path field, an available disk space field, a new data input line (with input fields denoted by ">" signs), and a display area for the existing minidisk statements.

   The *Path >* field allows you to specify the default pathname for all new minidisks that you enter on this panel. You can type over the displayed information if you want to change the default pathname. The initial default pathname is the location of the DEVMAP file.

   The *Available disk space* field specifies the number of bytes available on the S/390 Server drive indicated in the *Path* field. To view the amount of free space available on other drives, change the drive specified in the *Path* field, and press **ENTER**

   The new data input fields allow you to specify all the information required to add new minidisks. The list of existing minidisk statements contains protected fields, which are indicated in blue. You can delete or change the data in the unprotected fields (red) by typing over the existing data and pressing **ENTER**.

4. A display of the actual MDISK statement as contained in USER.DIR.

   This box, above the function key definitions, contains the MDISK statement for each entry as the cursor is moved down under each minidisk's virtual address. Parts of this statement can be directly edited by pressing **Alt-F5**.

5. The box at the bottom of the menu, which list some of the valid function keys.

   Pressing **ALT+F1** displays a pop-up box of all valid function keys.

The display area for existing minidisk entries has the following fields:

Virtual Address   A 3- or 4-digit hexadecimal address. This is the virtual address you want the minidisk to have under VM for this user ID. In the example menu above, the minidisk entry defines a disk that will be NEWUSER's virtual 191 disk. You *must* supply a virtual address when specifying a new minidisk. Duplicate addresses are not allowed.

DASD Type   This is the device type of the DASD that the minidisk is emulating. The default is FB-512, which is what VM calls all Fixed Block Architecture (FBA) DASD, including 3370, 9336, and 0671.[7]

---

[7] Also supported are 3350, 3375, 3380, and 3390, which are Count Key Data (CKD) DASD types. CKD DASD should *not* be used for user minidisks unless you have a special need for a particular DASD type. CKD DASD requires several more steps in preparing it for use (using the ICKDSF facility). FBA DASD (the default) requires only a CMS FORMAT before it is ready to contain your data.

CP Volume Label	The 6-character label for the volume. This label identifies the physical volume to CP. For the P/390, volume labels must not begin with the character *?*
	If you are creating a new minidisk, you *must* supply a *unique* volume label. The Configurator does not allow you to create the minidisk if the volume label is a duplicate of another label that is already specified to the system. If you are creating a new minidisk entry for an existing minidisk file, you can leave the volume label field blank. The label found on the minidisk is displayed in the *Vol Label* field.
	If the volume label found on an existing minidisk is a duplicate of one already specified to the system, you are prompted to change the volume label in the actual minidisk file.
Access Mode	A 1- or 2-character access mode. The first letter specifies the primary access mode (**R** is read-only, **W** is write, and **M** is multiple). The optional second letter indicates the alternate access mode (**R** is read-only and **W** is write access) desired if primary access is not available. The default access mode is MR.
File Size	The size of the minidisk. You are required to specify a size for new minidisks. The size can be expressed as a number followed by one of these units:

- **K** (Kilobytes)
- **M** (Megabytes = 1024K)
- **B** (512-byte blocks–for FBA DASD only)
- **C** (Cylinders– for CKD DASD only)

	If you are specifying an existing minidisk, leave the *File Size* field blank. The Configurator determines the correct file size when it reads the OS/2 file from your S/390 Server disk.
File name	The name of the OS/2 file to be allocated as a minidisk. If you enter a file name without a path, the path shown in the *Path>* field is appended to the front of the file name. You can also type the full OS/2 path and file name.
	Filenames *must* have both a name and file extension (that is, *name.ext*). The convention for P/390 user minidisk OS/2 file names is:

```
userid.vaddr
```

For example, NEWUSER.191.

If you are specifying an existing OS/2 file as a minidisk and the file name follows this convention, the Configurator searches the current *Path* for a file by that name when you press **ENTER**. Thus, for existing files, the minimum data that must be entered is the *Virtual Address*.

Care must be taken not to enter a file name that conflicts with the names of other minidisks or files defined in your system.

A special type of minidisk entry can be defined that does not allocate a permanent disk file. These temporary disks are allocated from a pool of TDSK space that is owned by the VM Control Program. To define one of these minidisks, enter T-DISK in the *File name* field, along with the virtual address and file size.

Function Keys

F1	Online help information.
F2	Go to the **UPDATE USER ENVIRONMENT** menu for this user ID.
F3	Return to the **USER FUNCTION SELECTION** menu for this user ID.
F4	Go to the **UPDATE USER LINKS** menu for this user ID.
F7	Scroll the data in the display area up one line.
F8	Scroll the data in the display area down one line.
PageUp	Scroll the data in the display area up one page.
PageDown	Scroll the data in the display area down one page.
Ctl+Home	Scrolls to the first screen entry in the display area.
Ctl+End	Scrolls to the last screen entry in the display area.
F9	Delete the minidisk entry at the cursor position. If the minidisk file exists, you have the opportunity to delete the file.
F10	Return to the **FUNCTIONS** main menu.
F11	Allocate an OS/2 file for this minidisk.
F12	Return to the **SELECT USERID** menu.
ESC	Return to the **USER FUNCTION SELECTION** menu, discarding all changes only if **ENTER** or a scroll key has *not* been pressed.
ALT+F5	Change Start, Extent, or Password fields on MDISK statement.
ALT+F11	Search for existing OS/2 files in current *Path* that match all unallocated minidisk entries for this user.
ENTER	Accept data that has been typed in. **ESC** does not discard this data after you have pressed **ENTER** or a scroll key

Update User Links Menu (VM only)

This menu allows you to add, delete, or change the automatic links that apply to the designated user ID.

CP ensures that access to a minidisk is limited to the minidisk owner, or to other virtual machines given access authorization by the owner. It is possible to specify several automatic links to other users' minidisks that take effect each time you log on to the current user ID. This is accomplished through the LINK directory statements.

An example of the **UPDATE USER LINKS** menu follows:

```
                      ┌────────────────────────────────┐
                      │  UPDATE USER LINKS FOR NEWUSER  │
                      └────────────────────────────────┘
        Use TAB or ARROW keys to position cursor.
         To MODIFY a LINK, type over the data.

                                              ┌──────────────────────────┐
                                              │      HELP INFORMATION     │
         ┌──────────────────────────────────┐ │  Use this menu to modify, │
         │  USERID  │ VIRTAD1 │ VIRTAD2 │ MODE│ │  add, or delete a LINK    │
         │──────────────────────────────────│ │  entry.                   │
         │                                  │ └──────────────────────────┘
         │  SAMPLE    191       491      RR │
         │                                  │ ┌──────────────────────────┐
         │                                  │ │       FUNCTION  KEYS      │
         │                                  │ │  F1   More Help           │
         │                                  │ │  F2   User Environment    │
         │                                  │ │  F3   User Minidisks      │
         │                                  │ │  F4   User Functions      │
         │                                  │ │  F6   Insert              │
         │                                  │ │  F7   Scroll Back         │
         │                                  │ │  F8   Scroll Forward      │
         │                                  │ │  F9   Delete              │
         │                                  │ │  F10  Main Menu           │
         │                                  │ │  F12  Userid Menu         │
         │                                  │ │  ESC  No Changes          │
         └──────────────────────────────────┘ └──────────────────────────┘
                                                             cnuserlk
```

Menu Elements
This menu has four main areas:

- The title area (containing the current user ID) and the instructions.

- The large box on the left contains link information. Space is provided for 15 display lines of 4 fields each. The data entered in these fields is used to produce the LINK statements when the new directory is created.

- The upper right box contains brief help information. Detailed help information is available by pressing **F1**.

- The lower right box contains the valid function keys.

These fields are defined in the link list:

Userid   The user ID whose disk you want to link. Refer to the list on the **SELECT USERID** menu (described under "Select Userid Menu (VM only)" on page 75) for a complete list of the user IDs defined for your system.

VirtAd1	Virtual Address 1: The virtual address of the disk you would like to link to as it is defined for the user ID described above. In the preceding example menu, a link to SAMPLE's 191 disk is specified.
VirtAd2	Virtual Address 2: The virtual address you would like to use to link to the disk from the current user ID. In the preceding example, a link to SAMPLE's 191 disk as NEWUSER's 491 disk is specified.
Acc Mode	A 1- or 2-character access mode for the linked disk. The first letter specifies the primary access mode (**R** is read-only, **W** is write, and **M** is multiple). The optional second letter indicates the alternate access mode (**R** is read-only and **W** is write access) desired if primary access is not available. In most cases, the access mode should be RR (Read only).

Function Keys

F1	Online help information.
F2	Go to the **UPDATE USER ENVIRONMENT** menu for this user ID.
F3	Go to the **UPDATE USER MINIDISKS** menu for this user ID.
F4	Return to the **USER FUNCTION SELECTION** menu.
F6	Add a line to the display area of the menu just below the line where the cursor is placed.
F7	Scroll the data in the display area backward.
F8	Scroll the data in the display area forward.
F9	Delete the line containing the cursor from the display area of the menu. There is no provision for "undeleting" the line.
F10	Return to the **FUNCTIONS** main menu.
F12	Return to the **SELECT USERID** menu.
ESC	Return to the **USER FUNCTION SELECTION** menu, discarding all changes only if **ENTER** or a scroll key has *not* been pressed.
ENTER	Accept data that has been typed in. **ESC** does *not* discard this data after you have pressed **ENTER** or a scroll key

Update System Environment Menu

The **UPDATE SYSTEM ENVIRONMENT** menu allows you to specify various parameters that control the working environment of your P/390 system.

The following is an example of the **UPDATE SYSTEM ENVIRONMENT** menu:

```
                    ┌─────────────────────────────────────┐
                    │ U P D A T E   S Y S T E M   E N V I R O N M E N T │
                    └─────────────────────────────────────┘

        Use TAB or ARROW keys to move cursor. Press ENTER to make changes.

        ┌──────────────────────────────────────────────────────────────┐
        │      Customer Name       >ABC Company: Our Town, N.Y.          │
        │      Local Area NetID     >MYSYSTEM     (Char)                 │
        │      System IPL Address   >300          (Hex)                  │
        │      System Load Parm     >             (Char)                 │
        │      System MODE          >ESA          (370/ESA)             │
        │      System GMT Offset    >05:00>W      (HH:MM West/East)      │
        │      System CPUID         >123456       (Hex)                  │
        │      Cache Size           >0            (Max Megabytes)        │
        │      Expanded Store Size >0   >         (Max MB) / A=Adapter,P=PC │
        │      Character Font Name >                                     │
        │                                                                │
        │                                                                │
        └──────────────────────────────────────────────────────────────┘


        ┌──────────────────────────────────────────────────────────────┐
        │  F1=Help  F8=Save  F10=OK, goto Main Menu   ENTER=OK  ESC=No Changes │
        │                                                  ─cnsysenv─    │
        └──────────────────────────────────────────────────────────────┘
```

Menu Elements

This menu has three main areas:

- The title area
- The large parameter input area in the center of the menu
- The box at the bottom of the menu, which lists the valid function keys

Here is a description of each of the fields in the parameter input area:

- *Customer Name* appears in dumps and traces to help identify the owner of the dump or trace, and can be up to 40 characters.

- *Local Area NetID* specifies the Local Area Network (LAN) name identification for your S/390 Integrated Server. This is the NetBIOS node name that is used by other S/390 Integrated Servers and clients to connect to your S/390 Integrated Server. It must be a *unique* name. We strongly suggest making this name match the system node ID that you select for your S/390 Integrated Server. In VM/ESA 1.2.1 and above, this name is specified in two VM files: SYSTEM CONFIG (on the IPL PARM disk) and SYSTEM NETID (on the system S-disk). In VM/ESA (370 Feature), this name is specified in: SYSPARM OVERRIDE (on the OPERATOR's 191 disk) and SYSTEM NETID (on the system S-disk).

- *System IPL Address* specifies the real address of the system IPL volume. This address must be three or four hexadecimal digits. The default system IPL volume address is 300. Your system programmer may have changed this, however.

- *System Load Parm* is a 1- to 8-character load parameter. If fewer than 8 characters are specified, the load parameter is left justified and padded with blanks. The load parameter may be retrieved by the operating system during its IPL sequence. Its use is determined by the operating system, such as indicating the nucleus to be loaded.

- *System Mode* specifies the architectural mode, either 370 or ESA.

- *System GMT Offset* specifies the offset from Greenwich Mean Time (GMT) that should be used to set the system clock on your P/390. The format of the GMT offset is:

```
          HH:MM W
HH      is the 2 digit hour offset
MM      is the 2 digit minute offset
W or E is West or East
```

Leading zeros must be included for both *HH* and *MM*. W is the default.

Here are a two examples:

  - If you are running your P/390 in a time zone that is 2 hours and 15 minutes west of GMT, specify a GMT offset of 02:15 W.

  - If your time zone is 11 hours and 2 minutes east of GMT, specify an offset of 11:02 E.

In VM/ESA 1.2.1 and above, the GMT offset must also be specified in the Timezone_Definition statement in the SYSTEM CONFIG file on the IPL PARM disk. In VM/ESA (370 Feature) the GMT offset must also be specified in the file SYSPARM OVERRIDE (on the OPERATOR's 191 disk).

- *The System CPUID* field specifies the CPU Identification code for your P/390. The contents of this field are used to create the response to the QUERY CPUID CP command. It must be six hexadecimal digits.

  The CPUID should be set to uniquely identify your system. Your system programmer may have specified an ID for you to use. If not, enter the first six characters of your P/390 serial number.

  In VM, the CPUID is used in the file SYSPARM OVERRIDE.

- *Cache Size* (370 versions of VM only) specifies the amount of processor main memory to use for the CMS minidisk cache. If nonzero, it decreases the S/390 processor's real storage by that amount. It must be a single decimal digit from 0 to 8. For VM/ESA (ESA mode) and non-VM operating systems, you should specify a cache size of 0.

- *Expanded Store Size (ESA mode only)* reserves part of either S/390 storage or PC memory for paging and caching. Specify the size in megabytes and the source:

  - Specify **A** for the P/390 adapter's memory

  - Specify **P** for the PC's memory (not supported on Micro channel PCs)

To use the P option, you must also specify the /X=nn parameter on AWS370DD.SYS in CONFIG.SYS. See AWS370DD.DOC for details on this option.

Set this parameter to 0 unless your operating system specifically needs additional storage. Specifying a nonzero number will decrease either your S/390 main memory (**A** option) or OS/2 memory (**P** option) by that amount. Refer to the functional characteristics of your operating system.

- *Character Font Name* specifies the name of the font used for all 3215 sessions (for example, the Operator's console). The following fonts are available on most S/390 Servers:

  - 12.System Monospaced
  - 10.System Monospaced
  - 12.Courier
  - 10.Courier
  - 8.Courier

To use the default standard font, enter spaces into this field.

Function Keys

F1   Online help information.

F8   Save DEVMAP changes.

F10   Accept changes and then return to the **FUNCTIONS** main menu.

ESC   Discard changes (if **ENTER** was not pressed) and then return to the **FUNCTIONS** main menu.

ENTER   Accept data that has been typed in. **ESC** does *not* discard this data after you have pressed **ENTER.**

Chapter 7. Configurator Tasks

The following table lists these tasks:

Figure 22. S/390 Integrated Server Configurator Tasks Roadmap		
To Perform this Configurator Task	**See This Section**	**Page**
General Tasks (all modes)		
Starting the Configurator	Starting the Configurator	94
Setting a new password	Changing the P/390 Configurator Password	96
Updating IPL and system parameters	Customizing P/390 System Parameters	96
Updating User Data*(VM only)*		
Adding a new user ID	Creating VM User IDs on Your P/390 System	98
Duplicating a user ID	Copying User IDs	102
Adding a directory profile	Adding System Directory Profiles	104
Renaming a user ID	Changing the Name of a P/390 User ID	105
Removing a user ID	Deleting P/390 User IDs	106
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Adding a new minidisk	Creating New P/390 Minidisks	108
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Moving minidisk files in OS/2	Moving a P/390 Minidisk	116
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Allocating CP System volumes *(VM only)*	Allocating CP System Volumes in VM Mode	139
Creating multiple minidisk volumes *(VM only)*	Creating Multiple Minidisk Volumes	143

Starting the Configurator

This section shows you how to start the Configurator in various modes, depending on what file names are filled in on the Configurator password menu. The mode selected determines which menus of the Configurator are active. Your chosen mode is saved in the DEVMAP file and is automatically selected the next time you start the Configurator. The mode can, however, be changed on the **CONFIGURATOR PASSWORD** menu.

1. To start the Configurator, select the P/390 Configuration icon from the P/390 folder. Depending on how your system is set up, you will first see either the Configurator's logo or the **CONFIGURATOR PASSWORD** menu:

```
┌─────────────────────────────────────────────────────────────────────┐
│                                                                       │
│              ┌─────────────────────────────────────┐                  │
│              │  C O N F I G U R A T O R   P A S S W O R D │            │
│              └─────────────────────────────────────┘                  │
│  The Configurator system                                              │
│  is password protected.     ┌──────────────────────────────────────┐  │
│  Please type the password   │          Configurator Filenames       │  │
│  and press ENTER.           │  ----------------------------------   │  │
│                             │  Device map > D:\VMESA\DEVMAP.1VM      │  │
│                             │  DMKRIO.ASM >                          │  │
│  ┌──────────────────┐       │                                       │  │
│  │  PASSWORD>>       │       │  Directory  > D:\VMESA\USER.DIR        │  │
│  └──────────────────┘       └──────────────────────────────────────┘  │
│                                                                       │
│                             ┌──────────────────────────────────────┐  │
│                             │          HELP INFORMATION             │  │
│                             │                                       │  │
│                             │  The password is provided for your protection. │
│                             │  If your P/390 system will have multiple users │
│  ┌──────────────────┐       │  defined, the password provides a level of │  │
│  │  FUNCTION KEYS    │       │  security. If you have never changed your │  │
│  │  F1  - Help       │       │  password, the default password is SYSTEM. │  │
│  │  F10 - Exit Configurator │└──────────────────────────────────────┘  │
│  └──────────────────┘                                                 │
│                                                          conpaswi      │
│                                                                       │
└─────────────────────────────────────────────────────────────────────┘
```

2. If you see the password menu "flash by" and go directly to the **FUNCTIONS** main menu, it is because your system is set with the Configurator starting parameter to skip both the logo and password menus.

   To change this, you must edit the *P/390 Configuration - Settings* under the icon you use to start the Configurator. Change the *Parameters* field from S=2 to S=1. This causes the logo screen to be skipped and leaves the password menu up.

3. The presence or absence of the *DMKRIO.ASM* Configurator file name determines whether the Configurator is in VM/370 mode or normal mode (used for VM/ESA 1.2.1 and above, and all non-VM operating systems).

   - Normally, the field DMKRIO.ASM field is *blank*.

   - For *VM/370 mode*, type in a valid DMKRIO.ASM file name into this field.

4. If you are using the P/390 Configurator to maintain your VM User Directory, then you must supply the OS/2 file name for the directory file. A sample USER.DIR file is provided with the VM/ESA Starter System. If you are using a traditional mainframe tool, such as the DIRMAINT program product, to maintain your VM User Directory, then leave the Directory field *blank*.

5. Supply a password and press **ENTER** to start the Configurator. If the Configurator has never been changed from the default of SYSTEM, you do not have to type in the password; press **ENTER** instead.

6. The **FUNCTIONS** main menu is displayed.

   If you did *not* supply the name of a VM User Directory, then the menu selection for function key F3 says **F3 Disabled** and is displayed in yellow. This is because either you are running a non-VM operating system (such as VSE/ESA), or you have chosen another method of maintaining your VM User Directory.

7. Press **F2** to display the **UPDATE SYSTEM DEVICES** menu:

```
             U P D A T E   S Y S T E M   D E V I C E S        Mode = ESA


                              ─ Available disk space in bytes:20,570,112─
  Addr Device  Label  Atype  Size     Mgr   FN/P       Path:>G:\VM
  --------------------------------------------------------------------
         >     >      >      >        >  >
  00C  2540                          7   D:\RDR\*.*
  00E  1403           PRTR           6
  029  2703                          D   COM1:1200,N,7,2,OFF,DCD
  038  ICA                           E
  100  3370    USER03 PERM   1400K   1   G:\VM\SAMPLE.191
  101  FB-512  NEW191 PERM   4096K   1   G:\VM\NEWUSER.191
  200  3278           DSPY           3   System Operator
  201  3278           DSPY           3   Local 1
  202  3278           DSPY           3   Local 2
  203  3278           DSPY           4   LAN 1



  Mgr Codes:  1=AWSFBA   2=AWSCKD   3=AWS3274  4=LAN3274  5=AWS3215  6=AWS2821
  7=AWS2540  8=LAN3172  9=LCS3172  A=MGR3172  B=WAN3172  C=AWSICA   D=AWSTAPE
  E=SCSI3480 F=SCSI3420 G=AWS3480  H=AWS3420  I=AWSOMA   J=AWSPCSRV K=AWSICE



  F1 Help   ALT-F1 Function Key Definitions   F10 Main Menu  ESC No Changes
                                                            ─cnsysdev┘
```

The above menu shows the Configurator in normal mode, where a device type *must* be specified when a device address is added.

The following menu shows the Configurator in VM/370 mode:

```
             U P D A T E   S Y S T E M   D E V I C E S        Mode = 370


                              ─ Available disk space in bytes:20,570,112─
  Addr Device  Label  Atype  Size     Mgr   FN/P       Path:>G:\VM
  --------------------------------------------------------------------
     |   >     >      >              >  >
  00C  2540                          7   D:\RDR\*.*
  00E  1403           PRTR           6
  029  2703                          D   COM1:1200,N,7,2,OFF,DCD
  038  ICA                           E
  100  3370    USER03 PERM   1400K   1   G:\VM\SAMPLE.191
```

Note the *Device* entry field is not open for input, as indicated by the I symbol. In VM/370 mode, you cannot type into this field; the device type is extracted

from the DMKRIO.ASM file that you supplied on the Configurator password menu.

Changing the P/390 Configurator Password

This section describes how to change the access password for the Configurator.

1. Start at the P/390 Configurator **FUNCTIONS** main menu.

   See "Starting the Configurator" on page 62 for instructions on how to get to the Configurator's main menu (cnfuns).

2. Choose the option *Update Configurator Password* by pressing **F5**.

   The following **CHANGE CONFIGURATOR PASSWORD** menu appears:

```
┌─────────────────────────────────────────────────────────────────────────┐
│                                                                           │
│          ┌──────────────────────────────────────────────────┐            │
│          │  C H A N G E   C O N F I G U R A T O R   P A S S W O R D │     │
│          └──────────────────────────────────────────────────┘            │
│                                                                           │
│                                                                           │
│   Press ENTER to replace the old password.                                │
│                                                                           │
│                                                                           │
│          ┌──────────────────────────────────────────────────┐            │
│          │  OLD PASSWORD>> SYSTEM        NEW PASSWORD>>       │            │
│          └──────────────────────────────────────────────────┘            │
│                                                                           │
│                              ┌────────────────────────────────────────┐   │
│                              │            HELP INFORMATION             │   │
│                              │                                         │   │
│                              │ The password is provided for your protection. │
│                              │ If your P/390 system will have multiple users │
│          ┌──────────────┐    │ defined, the password provides a level of │  │
│          │ FUNCTION KEYS │    │ security. If you have never changed your │   │
│          │  F1    - Help │    │ password, the default password is SYSTEM. │  │
│          │ F10/ESC - Main Menu │ └────────────────────────────────────────┘  │
│          └──────────────┘                                                 │
│                                                                           │
│                                                    conpaswu               │
│                                                                           │
└─────────────────────────────────────────────────────────────────────────┘
```

Your old password is displayed in the *OLD PASSWORD* field. If you did not change the password previously, this field reads SYSTEM.

3. Type your new password (up to 8 characters) into the *NEW PASSWORD* field and press **ENTER**. This will return you to the **FUNCTIONS** main menu.

4. If you are finished using the Configurator, press **F6** to exit the Configurator and save all changes. Your new Configurator password does not take effect unless you save all changes.

Customizing P/390 System Parameters

This section describes how you can use the **UPDATE SYSTEM ENVIRONMENT** menu to specify the following information:

- Local area NetID
- System IPL volume real address
- System load parameter
- System mode
- System GMT offset
- System CPU ID

- CMS minidisk cache size (370 versions of VM only)[8]
- Expanded store size
- System character font name

1. Start at the P/390 Configurator **FUNCTIONS** main menu.

   See "Starting the Configurator" on page 62 for instructions on how to get to the Configurator's main menu (cnfuns).

2. Choose the option *Update System Environment* by pressing **F4**.

   An **UPDATE SYSTEM ENVIRONMENT** menu similar to the following appears:

```
┌────────────────────────────────────────────────────────────────────────┐
│                                                                          │
│            ┌──────────────────────────────────────────────┐             │
│            │  U P D A T E   S Y S T E M   E N V I R O N M E N T │        │
│            └──────────────────────────────────────────────┘             │
│                                                                          │
│      Use TAB or ARROW keys to move cursor. Press ENTER to make changes.  │
│                                                                          │
│     ┌──────────────────────────────────────────────────────────────┐    │
│     │    Local Area NetID      >MYSYSTEM     (Char)                 │    │
│     │    System IPL Address    >300          (Hex)                  │    │
│     │    System Load Parm      >             (Char)                 │    │
│     │    System MODE           >ESA          (370/ESA)              │    │
│     │    System GMT Offset     >05:00>W      (HH:MM West/East)      │    │
│     │    System CPUID          >123456       (Hex)                  │    │
│     │    Cache Size            >0            (Max Megabytes)        │    │
│     │    Expanded Store Size >0   >         (Max MB) / A=Adapter,P=PC│   │
│     │    Character Font Name >                                      │    │
│     │                                                              │    │
│     │                                                              │    │
│     └──────────────────────────────────────────────────────────────┘    │
│                                                                          │
│    ┌──────────────────────────────────────────────────────────────┐     │
│    │ F1=Help  F8=Save  F10=OK, goto Main Menu  ENTER=OK  ESC=No Changes │ │
│    │                                              ─cnsysenv─         │    │
│    └──────────────────────────────────────────────────────────────┘     │
│                                                                          │
└────────────────────────────────────────────────────────────────────────┘
```

3. Use the tab key to go to any field you want to specify or change. Type over the displayed data.

4. Press **ENTER** to validate and accept the changes.

   Note: If you want to *discard* any changes, you must press **ESC** to leave this menu *before* pressing **ENTER.**

5. Press **F10** to go back to the **FUNCTIONS** main menu.

6. Then press **F6** to save all changes and exit from the Configurator.

See "Update System Environment Menu" on page 89 for a complete explanation of the fields on this menu and the suggested defaults.

The Configurator stores information specified on this menu in the DEVMAP file that you specified on the **CONFIGURATOR PASSWORD** menu. This means that your system environment parameters may change if you change DEVMAP files and fail to update them in the new file.

---

[8] This is not used for VM/ESA MDC facility and should be specified as 0 for VM/ESA 1.2.1 and above, and all non-VM 370 operating systems.

Creating VM User IDs on Your P/390 System

This shows you how to create a new VM user ID on your P/390 system.
Instructions for logging on to the new user ID are also included.

1. Start at the P/390 Configurator **FUNCTIONS** main menu.

   See "Starting the Configurator" on page 62 for instructions on how to get to the
   Configurator's main menu (cnfuns).

2. Choose the option *Update User Data* by pressing **F3**.

   A **SELECT USERID** menu similar to the following appears:

```
┌──────────────────────────────────────────────────────────────────────┐
│                                                                        │
│                        ┌─────────────────────┐                         │
│                        │ S E L E C T   U S E R I D │                   │
│                        └─────────────────────┘                         │
│      USERIDs 1 to 39                                                    │
│                                                                         │
│   ┌──────────────────────────────────────┐   ┌──────────────────────┐ │
│   │ Place cursor under USERID, then use ENTER │   │     HELP INFORMATION │ │
│   │ or PF3 to modify. Use PF9 to delete. │   │ Use this screen to add a │ │
│   │ ------------------------------------ │   │ new user or to select a │ │
│   │ MAINT                                │   │ user for modification or │ │
│   │ OPERATOR                             │   │ deletion. PF1 = more HELP. │ │
│   │ SAMPLE                               │   └──────────────────────┘ │
│   │ $ALLOC$                              │                            │
│   │ $DIRECT$                             │   ┌──────────────────────┐ │
│   │ $CPNUC$                              │   │ F3/ENTER  Select user │ │
│   │ USERPROF                             │   │ F5        Un-Delete   │ │
│   │ SYSPROF                              │   │ F7/PgUp   Scroll Back │ │
│   │                                      │   │ F8/PgDwn  Scroll Forward │ │
│   │                                      │   │ F9        Delete user │ │
│   │                                      │   │ F10/ESC   Main menu   │ │
│   │                                      │   │ F11       Copy Entry  │ │
│   │                                      │   │ F12       Create Profile │ │
│   │                                      │   └──────────────────────┘ │
│   └──────────────────────────────────────┘                            │
│                                                                         │
│   ┌──────────────────────────────────────┐                            │
│   │ NEW USERID >>> newuser_              │                            │
│   └──────────────────────────────────────┘              cnusers       │
│                                                                         │
└──────────────────────────────────────────────────────────────────────┘
```
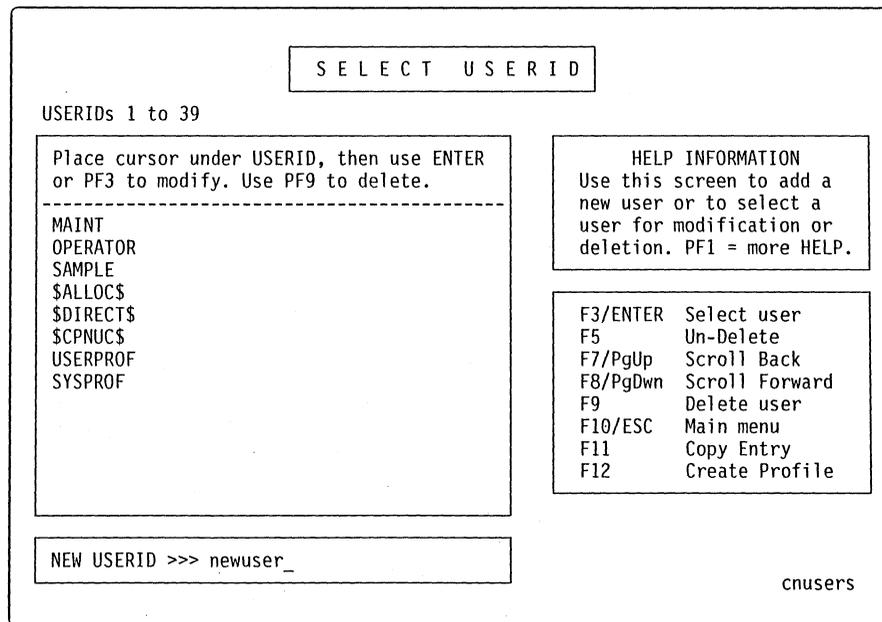
3. Move the cursor to the *NEW USERID* entry field in the lower left corner of the
   menu.

4. Type a new user ID of 8 characters or less (this example will use the user ID
   NEWUSER) and press **ENTER**.

5. The **UPDATE ENVIRONMENT** menu (cnuseren) appears:

```
                  ┌─────────────────────────────────────┐
                  │ UPDATE USER ENVIRONMENT FOR NEWUSER  │
                  └─────────────────────────────────────┘
    Make all changes, then press ENTER to KEEP new data.

    ┌─────────────────────────────────────────────────────────────────────┐
    │ Logon            Logon         Maximum        User                   │
    │ password>SECRET   storage>4M    storage>8M     class>G               │
    │ -------------------------------------------------------------------- │
    │ * Configurator generated USERID  Sun Mar  6 13:18:58 1994           │
    │ INCLUDE USERPROF                                                     │
    │                                                                     │
    │                                                                     │
    │                                                                     │
    │                                                                     │
    │                                                                     │
    │                                                                     │
    │                                                                     │
    │                                                                     │
    └─────────────────────────────────────────────────────────────────────┘

    ┌─────────────────────────────────────────────────────────────────────┐
    │ F1 Help  F2 User Functions  F3 Disks  F4 Links  F6 Insert  F7 Back   │
    │ F8 Forward  F9 Delete  F10 Main Menu  F12 UserID menu  ESC No changes │
    │                                                        └─cnuseren┘    │
    └─────────────────────────────────────────────────────────────────────┘
```

6. Fill in the user environment information as follows:

   The attributes of a user environment are its password, logon size, maximum storage, and user class. Fields for this data are located at the top of the menu. You can specify any other standard VM directory statements in the area provided in the middle of the menu. In the above example menu, the values have been entered as follows:

   a. *Logon Password* = SECRET

   b. *Logon Storage* = 4M (Where 4M = 4 megabytes).

      This is the size of the virtual machine when this user ID logs on.

      Note: Throughout the Configurator, the memory/disk storage specifications **M**=megabyte (MB) and **K**=kilobyte (KB) (where 1M = 1024K) can always be used.

   c. *Maximum Storage* = 8M

      This is the size of the largest virtual machine that this user ID is able to define under VM.

   d. *User Class* = G

      This class corresponds to a GENERAL user. For more information about other user class types, see "Update User Environment Menu (VM only)" on page 80.

   The lower portion of the UPDATE (User) ENVIRONMENT menu is a free-form entry area where you can enter other data that defines the VM environment for your new user ID. Any standard VM directory statements (except MDISK and LINK, which have their own menus) can be specified in this area. See the *VM/ESA Planning and Administration* manual for more information on VM directory statements.

   Several of the most common user environment specifications have been packaged into a single element called a *System Directory Profile*.

A sample system directory profile called USERPROF was provided with your P/390. This name should appear on the **SELECT USERID** menu. If you do not see it, ask your system programmer for the name of the user profile that applies to your system.

In the preceding menu, the specification INCLUDE USERPROF has been entered. If you have a directory profile, enter the word INCLUDE followed by the name of the profile.

Press **ENTER** to store the data on this menu.

7. Press **F3** to go to the **UPDATE USER MINIDISKS** menu (cnuserud):

```
                      UPDATE USER MINIDISKS FOR NEWUSER


─────────────────────────── Available disk space in bytes:  19,130,368───────
 Virt   DASD     VOL    ACC   File      File          Path >G:\VM
 Addr   Type    Label   Mode  Size      Name
─────────────────────────────────────────────────────────────────────────────
>191  >         >new191 >    >4m         >











┌─────────────────────────────────────────────────────────────────────────┐
│ F1 Help    ALT+F1 Key Definitions    F10 Main Menu    ESC No Changes      │
│                                                              ─cnuserud┘
└─────────────────────────────────────────────────────────────────────
```

8. Follow these steps to allocate minidisks for your new user ID:

   a. Move the cursor to the *Virt Addr* > field in the upper left corner of the menu.

   b. Type in the virtual address of the minidisk you want to create.

   c. In the *VOL Label* field, type in the desired CP volume label.

   d. In the *File Size* field, type in the desired size (in **M**egabytes, **K**ilobytes, or 512-byte **B**locks.).

   e. Leave the *DASD Type*, *ACC Mode*, and *File Name* fields blank; defaults are taken.

   f. After you type in the information for your new minidisk, press **ENTER** to allocate the minidisk.

The preceding menu shows sample data entered in these fields. In this example, a minidisk is added at:

   Virtual Address = 191
   Volume Label = NEW191
   File Size = 4M

The following defaults are taken for the blank entry fields:

   DASD Type = FB-512
   Access Mode = MR
   File Name = G:\VM\NEWUSER.191

Note: The Configurator allocates files in increments of 4KB. Any size specification you enter is automatically rounded up to the next 4KB boundary. The Configurator also adds an additional 8K to the file to hold the CP blocks associated with each minidisk. The "Filesize" shown on this menu *does not* include this additional 8K.

If there is enough space available, the new minidisk is allocated on the S/390 Server fixed disk. After the minidisk is allocated, the data that you entered on the first line of the menu, along with any defaults, is moved to the main display area (see the following example).

Note that the file size has been converted to kilobyte format (for example, 4M=4096K). If you move the cursor down under the 191, you can view the actual MDISK statement that was generated. It is displayed in the box immediately above the function key definitions.

```
                    UPDATE USER MINIDISKS FOR NEWUSER



─────────────────────────── Available disk space in bytes:  19,130,368─────────
  Virt   DASD     VOL    ACC   File       File            Path >G:\VM
  Addr   Type    Label   Mode  Size       Name
  ------------------------------------------------------------------------
>      >        >      >    >          >
  191    FB-512  NEW191  MR   4096K      G:\VM\NEWUSER.191




  MDISK 191    FB-512 16      8192       NEW191     MR ALL


  ┌────────────────────────────────────────────────────────────────────┐
  │ F1 Help    ALT+F1 Key Definitions    F10 Main Menu    ESC No Changes │
  └──────────────────────────────────────────────────────────cnuserud───┘
```

9. To save your work and exit from the Configurator, press **F10** to return to the **FUNCTIONS** main menu.

10. Press **F6** (*END – SAVE ALL, then EXIT* to save the updates you made.

   Note: None of the changes you have specified are saved until you exit the Configurator. However, user minidisks you allocate will still exist as OS/2 files on your S/390 Server fixed disk, even if you choose not to save the other changes you made.

You have now created a new user ID called NEWUSER for your P/390, and have allocated at least one minidisk for that user ID. The next step is to IPL your P/390 and log on to this new user ID with the password that you specified.

Logging On to a New P/390 VM User ID

When you log on to a new user ID, you receive a message similar to the one below:

```
DMSACP112S A(191) device error
Ready; T=n.nn/n.nn hh:mm:ss
```

This message informs you that, although CMS knows that your new minidisk exists (in this case, NEWUSER's 191 disk), an error occurred during an attempt to read the disk. You must format the 191 disk (and any other minidisks you may have allocated) so it can be used by CMS. The CMS command sequence shown below can be used to format a minidisk (enter the data shown in **BOLD** type):

format 191 a (blk 4k noerase

```
DMSFOR603R FORMAT will erase all files on disk A(191).
Do you wish to continue?
Enter 1 (YES) or 0 (NO).
```

1

```
DMSFOR605R Enter disk label:
```

new191

```
Formatting disk A
8192 FB-512 blocks formatted on A(191)
Ready; T=n.nn/n.nn hh:mm:ss
```

All new minidisks you allocate with the Configurator should be formatted with this procedure. For other minidisks, enter:

format *nnn m* (blk 4k noerase

where *nnn* = the virtual address of the disk and *m* = any disk mode, B through R and T through Z.

Note: Formatting a minidisk erases all the files on that disk. Be careful not to format a disk that you have been using. The *noerase* option considerably speeds up the formatting process for FB-512 devices, but the files are *still* erased!

Copying User IDs

You will sometimes find it easier to copy a user ID and make small changes to it than it is to create a new user ID from scratch. The P/390 Configurator provides this function and makes it simple to create new user IDs by copying and modifying existing user IDs.

To copy a P/390 user ID:

1. Start at the P/390 Configurator **FUNCTIONS** main menu.

   See "Starting the Configurator" on page 62 for instructions on how to get to the Configurator's main menu (cnfuns).

2. Choose the option *Update User Data* by pressing **F3**.

   A **SELECT USERID** menu similar to the following appears:

```
┌─────────────────────────────────────────────────────────────────────────┐
│                                                                           │
│                      ┌───────────────────────────┐                        │
│                      │  S E L E C T   U S E R I D │                        │
│                      └───────────────────────────┘                        │
│     USERIDs 1 to 39                                                        │
│                                                                           │
│  ┌──────────────────────────────────────────┐  ┌────────────────────────┐ │
│  │ Place cursor under USERID, then use ENTER │  │     HELP INFORMATION   │ │
│  │ or PF3 to modify. Use PF9 to delete.      │  │ Use this screen to add │ │
│  │ ------------------------------------------│  │ a new user or to select│ │
│  │ MAINT                                     │  │ a user for modification│ │
│  │ OPERATOR                                  │  │ or deletion. PF1 = more │ │
│  │ SAMPLE                                    │  │ HELP.                  │ │
│  │ $ALLOC$                                   │  └────────────────────────┘ │
│  │ $DIRECT$                                  │                            │
│  │ $CPNUC$                                   │  ┌────────────────────────┐ │
│  │ USERPROF                                  │  │ F3/ENTER  Select user  │ │
│  │ SYSPROF                                   │  │ F5        Un-Delete    │ │
│  │                                           │  │ F7/PgUp   Scroll Back  │ │
│  │                                           │  │ F8/PgDwn  Scroll Forward│ │
│  │                                           │  │ F9        Delete user  │ │
│  │                                           │  │ F10/ESC   Main menu    │ │
│  │                                           │  │ F11       Copy Entry   │ │
│  │                                           │  │ F12       Create Profile│ │
│  └──────────────────────────────────────────┘  └────────────────────────┘ │
│                                                                           │
│  ┌──────────────────────────────────────────┐                            │
│  │ NEW USERID >>> newuser                    │                            │
│  └──────────────────────────────────────────┘                            │
│                                                              cnusers      │
│                                                                           │
└─────────────────────────────────────────────────────────────────────────┘
```

3. Move the cursor under the user ID you want to copy, and press **F11**.

   The name of the user ID you are copying is displayed in red, and the cursor moves to the *NEW USERID* input area at the bottom left of the screen.

4. Type in the name of the new user ID you want to create, and press **ENTER**.

   The **USER FUNCTION SELECTION** menu is displayed:

```
┌─────────────────────────────────────────────────────────────────────────┐
│                                                                           │
│                ┌───────────────────────────────────────┐                  │
│                │ USER FUNCTION SELECTION FOR NEWUSER    │                  │
│                └───────────────────────────────────────┘                  │
│                                                                           │
│     Press the FUNCTION key for the activity you want.                      │
│                                                                           │
│  ┌──────────────────────────────┐  ┌────────────────────────────────────┐ │
│  │ To ADD/MODIFY/DELETE:        │  │       (F1) HELP INFORMATION         │ │
│  │ -----------------------------│  │                                    │ │
│  │     F2  User Environment     │  │ F2  User Environment includes such │ │
│  │                              │  │     items as USERID, password,     │ │
│  │     F3  User Minidisks       │  │     virtual storage size, and auto │ │
│  │                              │  │     IPL.                           │ │
│  │     F4  User Links           │  │                                    │ │
│  │                              │  │ F3  MINIDISKS include virtual      │ │
│  └──────────────────────────────┘  │     device address, PC drive ID,   │ │
│                                     │     read/write share passwords,    │ │
│  ┌──────────────────────────────┐  │     and mode.                      │ │
│  │ To Change Users or Return:   │  │                                    │ │
│  │ -----------------------------│  │ F4  USER LINKS include disk owner's│ │
│  │ ESC      - User select menu. │  │     USERID, virtual address, and   │ │
│  │ F7/PgDn - scroll Back 1 User.│  │     link access mode.              │ │
│  │ F8/PgUp - Scroll Fwd  1 User.│  │                                    │ │
│  │ F10     - Main Menu.         │  └────────────────────────────────────┘ │
│  └──────────────────────────────┘                                         │
│                                                              cnuserfu     │
│                                                                           │
└─────────────────────────────────────────────────────────────────────────┘
```

From this menu, you can modify entries for the user environment, user minidisks, and user links.

5. Press **F2** to update the user environment information, such as logon password and storage size.

6. Press **F3** to update the user minidisks.

The MDISK statements were copied, but no OS/2 files were allocated. Move the cursor under each *Virtual Address* and press **F11** to allocate each minidisk. The first three characters of each *VOL Label* were changed to *** ; you must substitute in valid letters for these. If you do not need as many minidisks for this new user ID, use **F9** to delete the extra entries.

7. To save your changes and exit from the Configurator, press **F10** to go back to the **FUNCTIONS** main menu.

8. Press **F6** (*END–SAVE ALL, then EXIT*) to save the updates you made.

9. Press **F4** to update the user links information.

Adding System Directory Profiles

To create a new System Directory Profile:

1. Go to the **SELECT USERID** menu.

2. Type in the profile name (for example, *xxxx*PROF) in the *NEW USERID* field.

3. Press **F12**, *Create Profile*.

   The **UPDATE USER ENVIRONMENT** menu appears. The profile should contain common statements such as:

```
 Logon              Logon        Maximum        User
 password>          storage>     storage>       class>
 ---------------------------------------------------------------------------
 MACH ESA
 IPL CMS
  CONSOLE 009 3215
  SPOOL 00C 2540 READER *
  SPOOL 00D 2540 PUNCH A
  SPOOL 00E 1403 A
```

   Do *not* put anything into the > fields at the top of the menu. These items must be specified for each user ID.

4. Press **F4**, *User Links*.

   The **UPDATE USER LINKS** menu appears. You should add entries for common system disks, such as:

```
  USERID    | VIRTAD1 | VIRTAD2 | MODE

  MAINT       190       190      RR
  MAINT       19D       19D      RR
  MAINT       19E       19E      RR
```

   Note: Do *not* put anything in the **F3** *User Minidisks* menu for a directory profile. Minidisk statements are invalid for directory profiles.

   The new profile name is displayed at the bottom of the **SELECT USERID** list.

Changing the Name of a P/390 User ID

Use this procedure to rename a P/390 user ID. In the following example, the user ID, NEWUSER, is changed to NEWNAME.

1. Start at the P/390 Configurator **FUNCTIONS** main menu.

   See "Starting the Configurator" on page 62 for instructions on how to get to the Configurator's main menu (cnfuns).

2. Choose the option *Update User Data* by pressing **F3**.

   A **SELECT USERID** menu similar to the following appears:

```
                        ┌─────────────────────┐
                        │  S E L E C T   U S E R I D │
                        └─────────────────────┘
USERIDs 1 to 39

 Place cursor under USERID, then use ENTER          HELP INFORMATION
 or PF3 to modify. Use PF9 to delete.           Use this screen to add a
 -------------------------------------------    new user or to select a
 MAINT                                          user for modification or
 NEWUSER                                        deletion. PF1 = more HELP.
 OPERATOR
 SAMPLE
 $ALLOC$                                        F3/ENTER  Select user
 $DIRECT$                                       F5        Un-Delete
 $CPNUC$                                        F7/PgUp   Scroll Back
 USERPROF                                       F8/PgDwn  Scroll Forward
 SYSPROF                                        F9        Delete user
                                                F10/ESC   Main menu
                                                F11       Copy Entry
                                                F12       Create Profile

 NEW USERID >>>
                                                            cnusers
```

3. Move the cursor under the user ID you want to rename, and press **ENTER**. (NEWUSER is selected in this example.)

4. When the **USER FUNCTION SELECTION** menu appears, press **F2** to go to the **UPDATE ENVIRONMENT** menu:

```
                  ┌──────────────────────────────┐
                  │ UPDATE ENVIRONMENT FOR NEWUSER │
                  └──────────────────────────────┘
 Make all changes, then press ENTER to KEEP new data.

 Logon            Logon         Maximum        User
 password>SECRET  storage>1M    storage>4M     class>G
 ----------------------------------------------------------------------
 * Configurator generated USERID  Tue Sep 14 13:18:58 1993
 INCLUDE USERPROF
```

5. Place the cursor at the beginning of the user ID in the title box at the top of the menu. Type over the user ID with the new user ID (for example, NEWNAME), and press **ENTER**.

```
┌─────────────────────────────────────────────────────────────────────────────┐
│                                                                               │
│                    ┌─────────────────────────────────┐                        │
│                    │ UPDATE ENVIRONMENT FOR newname_  │                        │
│                    └─────────────────────────────────┘                        │
│          Make all changes, then press ENTER to KEEP new data.                 │
│                                                                               │
│         ┌───────────────────────────────────────────────────────────────────┐│
│         │ Logon           Logon          Maximum          User               ││
│         │ password>SECRET  storage>1M     storage>4M       class>G            ││
│         │ ----------------------------------------------------------------    ││
│         │ * Configurator generated USERID  Tue Sep 14 13:18:58 1993           ││
│         │ INCLUDE USERPROF                                                    ││
│         │                                                                     ││
│         └───────────────────────────────────────────────────────────────────┘│
│                                                                               │
└─────────────────────────────────────────────────────────────────────────────┘
```

6. To verify the change, press **F12** and locate the renamed user ID in the list on the **SELECT USERID** menu.

7. To save your changes and exit the Configurator, press **F10** to return to the **FUNCTIONS** main menu.

8. Press **F6** (*END–SAVE ALL, then EXIT*) to save the updates you made.

Deleting P/390 User IDs

Use this procedure to delete a P/390 user ID from the system:

1. Start at the P/390 Configurator **FUNCTIONS** main menu.

   See "Starting the Configurator" on page 62 for instructions on how to get to the Configurator's main menu (cnfuns).

2. Choose the option *Update User Data* by pressing **F3**.

   A **SELECT USERID** menu similar to the following appears:

```
┌─────────────────────────────────────────────────────────────────────────────┐
│                                                                               │
│                        ┌───────────────────────────────┐                      │
│                        │ S E L E C T   U S E R I D      │                      │
│                        └───────────────────────────────┘                      │
│                                                                               │
│  USERIDs 1 to 39                                                              │
│                                                                               │
│  ┌─────────────────────────────────────────┐  ┌───────────────────────────┐  │
│  │ Place cursor under USERID, then use ENTER│  │     HELP INFORMATION      │  │
│  │ or PF3 to modify. Use PF9 to delete.     │  │ Use this screen to add a  │  │
│  │ ----------------------------------------- │  │ new user or to select a   │  │
│  │ MAINT                                    │  │ user for modification or  │  │
│  │ NEWUSER                                  │  │ deletion. PF1 = more HELP.│  │
│  │ OPERATOR                                 │  └───────────────────────────┘  │
│  │ SAMPLE                                   │                                 │
│  │ $ALLOC$                                  │  ┌───────────────────────────┐  │
│  │ $DIRECT$                                 │  │ F3/ENTER   Select user    │  │
│  │ $CPNUC$                                  │  │ F5         Un-Delete      │  │
│  │ USERPROF                                 │  │ F7/PgUp    Scroll Back    │  │
│  │ SYSPROF                                  │  │ F8/PgDwn   Scroll Forward │  │
│  │                                          │  │ F9         Delete user    │  │
│  │                                          │  │ F10/ESC    Main menu      │  │
│  │                                          │  │ F11        Copy Entry     │  │
│  │                                          │  │ F12        Create Profile │  │
│  │                                          │  └───────────────────────────┘  │
│  │                                          │                                 │
│  └─────────────────────────────────────────┘                                 │
│  ┌─────────────────────────────────────────┐                                 │
│  │ NEW USERID >>>                           │                                 │
│  └─────────────────────────────────────────┘                    cnusers      │
│                                                                               │
└─────────────────────────────────────────────────────────────────────────────┘
```

3. Move the cursor under the user ID you want to delete.

4. Press **F9**, *Delete User*, to delete this user ID. The user ID chosen for deletion is highlighted in reverse video.

5. User IDs that are marked for deletion cannot be modified. If you decide that you do not want the user ID deleted, press **F5** to *Un-Delete* the user ID.

6. To save your changes and exit the Configurator, press **F10** to go back to the **FUNCTIONS** main menu.

7. Press **F6** (*END – SAVE ALL, then EXIT*) to save the updates you made.

   The deletion does *not* take effect if you exit the Configurator using *F10 QUIT – DO NOT SAVE ANYTHING.*

Note: This procedure does not delete any of the minidisks associated with the deleted user ID. If you want to delete these minidisks, use the procedure for "Deleting a P/390 Minidisk" on page 114 *before* deleting the user ID. Alternately, the minidisks can be deleted from the Update System Devices menu (see "Deleting I/O Devices" on page 131) if the user ID has already been deleted.

Editing the P/390 User Environment

The statements on this menu take effect when the user ID first logs onto VM.

1. Start at the P/390 Configurator **FUNCTIONS** main menu.

   See "Starting the Configurator" on page 62 for instructions on how to get to the Configurator's main menu (cnfuns).

2. Choose the option *Update User Data* by pressing **F3**.

   The **SELECT USERID** menu is displayed.

3. Move the cursor under the user ID you want to edit, and press **ENTER**.

   The **USER FUNCTION SELECTION** menu is displayed.

4. Press **F2** to go to the **UPDATE ENVIRONMENT** menu:

```
                    ┌─────────────────────────────────┐
                    │  UPDATE ENVIRONMENT FOR NEWUSER  │
                    └─────────────────────────────────┘
         Make all changes, then press ENTER to KEEP new data.
         ┌──────────────────────────────────────────────────────────────────┐
         │  Logon           Logon        Maximum         User                │
         │  password>SECRET  storage>1M   storage>4M      class>G             │
         │  -------------------------------------------------------------------│
         │  * Configurator generated USERID  Tue Sep 14 13:18:58 1993          │
         │  INCLUDE USERPROF                                                   │
         │  ipl cms parm autocr                                               │
         │                                                                    │
         │                                                                    │
         │                                                                    │
         │                                                                    │
         │                                                                    │
         │                                                                    │
         └──────────────────────────────────────────────────────────────────┘

         ┌──────────────────────────────────────────────────────────────────┐
         │  F1 Help  F3 Disks  F4 Links  F6 Insert  F7 Scroll Back  F8 Scroll Forward│
         │  F9 Delete  F10 Main Menu  F12 User Select Menu  ESC Back One Menu │
         │                                                        ─cnuseren┘  │
         └──────────────────────────────────────────────────────────────────┘
```

Under "Creating VM User IDs on Your P/390 System" on page 98, you specified a password, logon storage, maximum storage, and user class for the NEWUSER user ID.

5. Make any modifications you want, and press **ENTER**.

Any of the data that is displayed in red on the menu can be changed by typing over it. New lines can be added after the "INCLUDE USERPROF" line.

6. To save your changes and exit the Configurator, press **F10** to go back to the **FUNCTIONS** main menu.

7. Press **F6** (*END – SAVE ALL, then EXIT*) to save the updates you made.

For more information about this menu, see "Update User Environment Menu (VM only)" on page 80.

Creating New P/390 Minidisks

This section shows you how to create additional minidisks for a user that already exists on the P/390. For information on new user IDs, see "Creating VM User IDs on Your P/390 System" on page 98. For information on how to suballocate a large DASD volume into smaller user minidisks, see "Creating Multiple Minidisk Volumes" on page 143.

In this case, there is no OS/2 file for the minidisk and there is no entry on the **UPDATE USER MINIDISKS** menu for this user.

- If the MDISK entry exists but the OS/2 file does not, see "Allocating Minidisk Files" on page 110.

- If the OS/2 minidisk file exists but there is no MDISK entry, see "Adding Minidisk Entries for Existing Files" on page 112.

- If *neither* exists, follow the steps below:

1. Start at the P/390 Configurator **FUNCTIONS** main menu.

   See "Starting the Configurator" on page 62 for instructions on how to get to the Configurator's main menu (cnfuns).

2. Choose the option *Update User Data* by pressing **F3**.

   The **SELECT USERID** menu is displayed.

3. Move the cursor under the user ID you want to edit, and press **ENTER**.

   The **USER FUNCTION SELECTION** menu is displayed.

4. Press **F3** to go to the **UPDATE USER MINIDISKS** menu:

```
┌──────────────────────────────────────────────────────────────────────────┐
│                                                                            │
│  ┌──────────────────────────────────────────────────────────────────────┐ │
│  │                 UPDATE USER MINIDISKS FOR NEWUSER                      │ │
│  │                                                                        │ │
│  │                                                                        │ │
│  │ ─────────────────────────── Available disk space in bytes: 19,130,368──│ │
│  │  Virt   DASD    VOL    ACC   File     File          Path >G:\VM        │ │
│  │  Addr   Type    Label  Mode  Size     Name                             │ │
│  │ ──────────────────────────────────────────────────────────────────────│ │
│  │  >      >       >      >     >         >                                │ │
│  │  191    FB-512  NEW191 MR    4096K      G:\VM\NEWUSER.191              │ │
│  │                                                                        │ │
│  │                                                                        │ │
│  │                                                                        │ │
│  │                                                                        │ │
│  │                                                                        │ │
│  │                                                                        │ │
│  │  ┌────────────────────────────────────────────────────────────────┐   │ │
│  │  │ F1 Help   ALT+F1 Key Definitions   F10 Main Menu   ESC No Changes│  │ │
│  │  └────────────────────────────────────────────────────────────────┘   │ │
│  │                                                       ─────cnuserud     │ │
│  └──────────────────────────────────────────────────────────────────────┘ │
│                                                                            │
└────────────────────────────────────────────────────────────────────────────┘
```
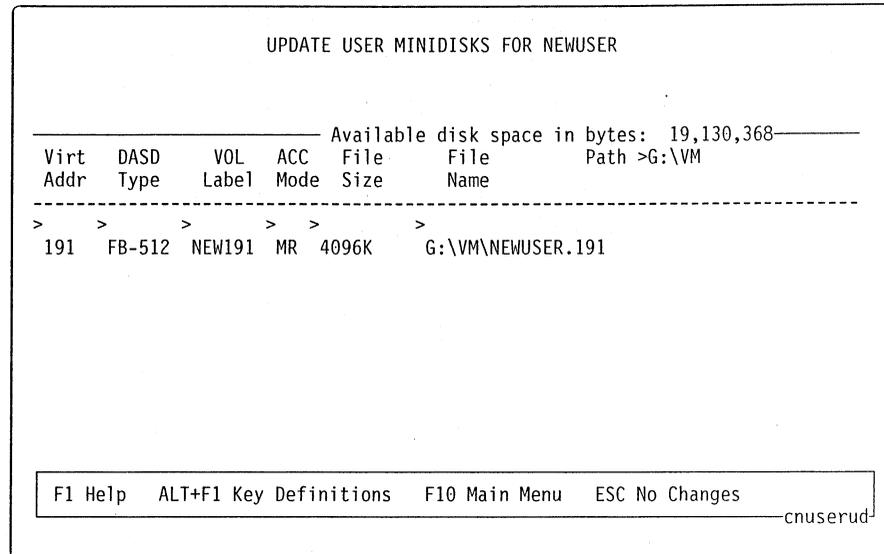
5. To add a new minidisk, type the information into the entry fields. For example:

Virt Addr	DASD Type	VOL Label	ACC Mode	File Size	File Name
>192	>FB-512	>NEW192	>MR	>12M	>G:\VM\NEWUSER.192

6. Press **ENTER** to allocate the new minidisk.

The new minidisk is allocated on the S/390 Server fixed disk if enough space is available. If anything goes wrong, an error message is displayed and you are given a chance to correct the information in the entry fields. After the minidisk is allocated, the entry for that minidisk is placed in the body of the menu.

You do not always have to type in all of the above data. The Configurator uses defaults and assumes a standard form for the file name. The minimum that you have to specify is:

- *Virtual Address*
- *Volume Label*
- *File Size*

The Configurator defaults to these values:

- *DASD Type* = **FB-512**
- *ACC Mode* = **MR**
- *File Name* = **d:\path\userid.vaddr**

  The **path** is taken from the *Path>* field located at the top of this menu. You can modify this field, and it is saved for next time.

If you cannot remember what fields are required, type in the new virtual address and press **ENTER.** The Configurator fills in all the defaults and prompts you for the missing information. You can change any of the defaults before hitting **ENTER** to allocate the new minidisk.

Note: The minidisk read password defaults to **ALL**. If you want to change the read password or add write or multiwrite passwords:

a. Move the cursor under the existing minidisk entry.

b. Press **ALT+F5**.

    c. Modify the MDISK card displayed at the bottom of the menu.

    d. Press **ENTER**.

7. To save your work and exit from the Configurator, press **F10** to return to the **FUNCTIONS** main menu.

8. Then press **F6** (*END – SAVE ALL, then EXIT*) to save the updates you made.

> **Note:** None of the changes you specified are saved until you exit from the Configurator. However, any OS/2 files allocated by the Configurator still exist on your S/390 Server fixed disk, even if you choose not to save the other changes you made.
>
> If the P/390 is currently running, new minidisks are not available until VM is shutdown and the P/390 stopped (use the End P/390 icon).

For more details about this menu, see "Update User Minidisks Menu (VM only)" on page 83.

Allocating Minidisk Files

This section shows you how to allocate OS/2 files for minidisk entries that exist but do not have a real file associated with them.

This situation can occur if your system programmer added several minidisk specifications in the USER.DIR file for a particular user ID before distributing the system software to you. You can use the Configurator to create the minidisks based on the information already contained in the MDISK entry in USER.DIR.

- If the OS/2 minidisk file exists but there is no MDISK entry, see "Adding Minidisk Entries for Existing Files" on page 112.

- If *neither* the MDISK entry nor the OS/2 file exists, see "Creating New P/390 Minidisks" on page 108.

If only the MDISK entry exists, continue with these steps:

1. Start at the P/390 Configurator **FUNCTIONS** main menu.

   See "Starting the Configurator" on page 62 for instructions on how to get to the Configurator's main menu (cnfuns).

2. Choose the option *Update User Data* by pressing **F3**.

   The **SELECT USERID** menu is displayed.

3. Move the cursor under the user ID you want to edit, and press **ENTER**.

   The **USER FUNCTION SELECTION** menu is displayed.

4. Press **F3** to go to the **UPDATE USER MINIDISKS** menu.

   The following **UPDATE USER MINIDISKS** menu shows the NEWUSER user ID with an incomplete minidisk entry for the 192 disk:

```
                    UPDATE USER MINIDISKS FOR NEWUSER



  ───────────────────────────── Available disk space in bytes: 23,324,672──────┐
  Virt    DASD     VOL   ACC   File       File          Path >G:\VM
  Addr    Type    Label  Mode  Size       Name
  ──────────────────────────────────────────────────────────────────────────────
  >       >        >     >     >          >
  191    FB-512   NEW191  MR   4M             G:\VM\NEWUSER.191
  192    FB-512   NEW192  MR
  193    FB-512   NEW193  MR   4M             G:\VM\NEWUSER.193
```

Notice that the *File Size* field is blank for the 192 minidisk entry.

5. To allocate a minidisk by using the partially complete minidisk entry, use the cursor keys to place the cursor under the minidisk entry, and press **F11** to allocate the minidisk. The selected minidisk entry moves up to the data entry line of the menu.

In the next example, the entry for NEWUSER's 192 disk was selected:

```
                    UPDATE USER MINIDISKS FOR NEWUSER



  ───────────────────────────── Available disk space in bytes: 23,324,672──────┐
  Virt    DASD     VOL   ACC   File       File          Path >G:\VM
  Addr    Type    Label  Mode  Size       Name
  ──────────────────────────────────────────────────────────────────────────────
  >192   >FB-512  >NEW191 >MR  >1024K      >
  191    FB-512   NEW191  MR   4096K          G:\VM\NEWUSER.191

  193    FB-512   NEW193  MR   4096K          G:\VM\NEWUSER.193




        MDISK 192   FB-512 16      2048       NEW192     MR ALL
```

When the entry for minidisk 192 is brought up to the entry line, the original entry in the body of the menu is blanked out to indicate that you are working on it.

The *File Size* field is filled in by the Configurator based on the values in the MDISK entry. In this example, an extent of 2048 blocks corresponds to a file size of 1 Megabyte (or 1024 Kilobytes). You can change the file size to suit your needs.

The *File Name* may or may not be filled in, based on whether there is a DEVMAP entry for this device. Even if it is filled in, you can change it if you wish. If you leave the file name blank, the Configurator assumes a default name of **userid.vaddr**, for example, NEWUSER.192.

6. After you have changed the entry fields to the values you want, press **ENTER** to allocate the minidisk file.

The new minidisk is allocated on the S/390 Server fixed disk if enough space is available. If anything goes wrong, an error message is displayed and you are given a chance to correct the information in the entry fields. After the minidisk is allocated, the entry for that minidisk returns to the body of the menu.

7. To save your work and exit from the Configurator, press **F10** return to the **FUNCTIONS** main menu.

8. Press **F6** (*END – SAVE ALL, then EXIT*) to save the updates you made.

> **Note:** None of the changes you have specified are saved until you exit from the Configurator. However, any OS/2 files that were allocated by the Configurator still exist on your S/390 Server fixed disk, even if you choose not to save the other changes you made.
>
> If the P/390 is currently running, new minidisks are not available until VM is shutdown and the P/390 stopped (use End P/390 icon).

For more details about this menu, see "Update User Minidisks Menu (VM only)" on page 83.

Adding Minidisk Entries for Existing Files

This section shows you how to add minidisk entries for files that already exist on your S/390 Server fixed disk. This can occur if you copied a new minidisk from another P/390. Before using this new minidisk, you must use the Configurator to describe the file to the system.

- If the MDISK entry exists but the OS/2 file does not, see "Allocating Minidisk Files" on page 110.

- If *neither* the MDISK entry nor the OS/2 file exists, see "Creating New P/390 Minidisks" on page 108.

If only the file exists, continue with these steps:

1. Start at the P/390 Configurator **FUNCTIONS** main menu.

   See "Starting the Configurator" on page 62 for instructions on how to get to the Configurator's main menu (cnfuns).

2. Choose the option *Update User Data* by pressing **F3**.

   The **SELECT USERID** menu will be displayed.

3. Move the cursor under the user ID you want to edit, and press **ENTER**.

   The **USER FUNCTION SELECTION** menu is displayed.

4. Press **F3** to go to the **UPDATE USER MINIDISKS** menu:

5. Type in the *Virtual Address* you want to use and the location and name of the minidisk file in the *File Name* field. For example, to add an OS/2 file named D:\DATA\NEWFILE.199 as NEWUSER's 192 disk, enter the following:

```
                        UPDATE USER MINIDISKS FOR NEWUSER



            ─────────────────────── Available disk space in bytes:  23,324,672──────┐
     Virt   DASD     VOL   ACC   File      File          Path >G:\VM
     Addr   Type    Label  Mode  Size      Name
    ------------------------------------------------------------------------------
    >192  >        >       >    >             >d:\data\newfile.199
     191   FB-512  NEW191  MR   4096K         G:\VM\NEWUSER.191
```

6. Press **ENTER**. If the file is found and it is a valid minidisk volume, the following information is displayed:

```
                      UPDATE USER MINIDISKS FOR NEWUSER
  The file name specified already exists. Cannot allocate as a new file. Press
  ENTER to update DEVMAP and the MDISK card for this entry or ESC to cancel
  this command.
  ─────────────────────────── Available disk space in bytes:  23,324,672───────
   Virt   DASD    VOL   ACC  File      File          Path >G:\VM
   Addr   Type    Label Mode Size      Name

   ────────────────────────────────────────────────────────────────────────────
   >192  >FB-512 >DATA99 >MR >10240K   >d:\data\newfile.199
    191   FB-512  NEW191  MR   4096K    G:\VM\NEWUSER.191
```

7. Press **ENTER** to add this minidisk to the system.

   The entry for the minidisk is placed in the body of the menu.

8. To save your work and exit from the Configurator, press **F10** to return to the **FUNCTIONS** main menu.

9. Press **F6** (*END–SAVE ALL, then EXIT*) to save the updates you made.

   Note: None of the changes you have specified are saved until you exit from the Configurator.

   If the P/390 is currently running, new minidisks are not available until VM is shutdown and the P/390 stopped (use the End P/390 icon).

For more details about this menu, see "Update User Minidisks Menu (VM only)" on page 83.

Automatic Search for Existing Minidisk Files

This procedure covers a special case where the minidisk file exists on your S/390 Server fixed disk, and the minidisk entry also exists in USER.DIR. This can occur if you are installing a VM program product or set of minidisks providing both the S/390 Server files and updates for the VM directory (MDISK statements).

If the minidisk file names obey the naming convention **userid.vaddr**, the search function can be used to cause the Configurator to add a DEVMAP entry for each minidisk file having a corresponding MDISK statement.

1. Start at the P/390 Configurator **FUNCTIONS** main menu.

   See "Starting the Configurator" on page 62 for instructions on how to get to the Configurator's main menu (cnfuns).

2. Choose the option *Update User Data* by pressing **F3**.

   The **SELECT USERID** menu is displayed.

3. Move the cursor under the user ID you want to edit, and press **ENTER**.

   The **USER FUNCTION SELECTION** menu is displayed.

4. Press **F3** to go to the **UPDATE USER MINIDISKS** menu.

5. Move the cursor to the *Path>* entry field located at the top right.

6. Type in the OS/2 path name (directory) containing the new minidisk files, and press **ENTER**.

   In this example, all the new minidisk files are located in E:\VMPP and are named ISPVM.vaddr:.

```
                        UPDATE USER MINIDISKS FOR ISPVM



  ─────────────────────────────── Available disk space in bytes:   524,288,000 ─┐
   Virt    DASD     VOL   ACC   File      File          Path >e:\vmpp
   Addr    Type    Label  Mode  Size      Name
  -----------------------------------------------------------------------------
  >      >       >      >    >           >
   191    FB-512  ISP191  MR
   192    FB-512  ISP192  MR
```

7. Press **ALT+F11**.

   The Configurator searches for the missing minidisks (indicated by a blank file
   size and blank file name), and if they are found, fills in the missing information.
   The following message is displayed during the search:

   MDISK file name search in progress....

   In this example, the Configurator searches for the files E:\VMPP\ISPVM.191 and
   E:\VMPP\ISPVM.192.

   Assuming both files were found, this is the resulting menu:

```
                        UPDATE USER MINIDISKS FOR ISPVM



  ─────────────────────────────── Available disk space in bytes:   524,288,000 ─┐
   Virt    DASD     VOL   ACC   File      File          Path >E:\VMPP
   Addr    Type    Label  Mode  Size      Name
  -----------------------------------------------------------------------------
  >      >       >      >    >           >
   191    FB-512  ISP191  MR   1024K      E:\VMPP\ISPVM.191
   192    FB-512  ISP192  MR   36864K     E:\VMPP\ISPVM.192
```

8. To save your work and to exit from the Configurator, press **F10** to return to the
   FUNCTIONS main menu.

9. Press **F6** (*END–SAVE ALL, then EXIT*) to save the updates you made.

   Note: None of the changes you have specified are saved until you exit from
   the Configurator.

   If the P/390 is currently running, new minidisks are not available until
   VM is shutdown and the P/390 stopped (use the End P/390 icon).

For more details about this menu, see "Update User Minidisks Menu (VM only)" on
page 83.

Deleting a P/390 Minidisk

The following instructions show you how to delete minidisks.

Important: ─────────────────────────────

Because all minidisks on your P/390 are OS/2 files, you can use the OS/
ERASE command to erase a minidisk permanently from your S/390 Server
fixed disk. This method, however, does not correct the minidisk specification in
your DEVMAP file. Your P/390 still attempts to locate the disk because it has
not been informed that the disk no longer exists.

We recommend that you *always* use the Configurator to delete minidisks from
your P/390.

---

1. Start at the P/390 Configurator **FUNCTIONS** main menu.

   See "Starting the Configurator" on page 62 for instructions on how to get to the
   Configurator's main menu (cnfuns).

2. Choose the option *Update User Data* by pressing **F3**.

   The **SELECT USERID** menu is displayed.

3. Move the cursor under the user ID you want to edit, and press **ENTER**.

   The **USER FUNCTION SELECTION** menu is displayed.

4. Press **F3** to go to the **UPDATE USER MINIDISKS** menu.

   This menu shows an example of user ID NEWUSER's minidisks:

   ```
                           UPDATE USER MINIDISKS FOR NEWUSER



                ─────────────── Available disk space in bytes:  23,324,672──────
        Virt    DASD     VOL    ACC   File      File         Path >G:\VM
        Addr    Type    Label  Mode  Size      Name
        ------------------------------------------------------------------------
        >       >       >       >    >         >
         191    FB-512  NEW191  MR   4096K     G:\VM\NEWUSER.191
         192    FB-512  NEW191  MR   12288K    G:\VM\NEWUSER.192
   ```

5. Delete the minidisk entry.

   Move the cursor to the minidisk entry you want to delete (in this example, disk
   192). Then press **F9**, *Delete*. The deleted minidisk entry is *highlighted*, and
   you will see the following message:

   ```
   Press F9 to confirm deletion of this entry or ESC to cancel.
   ```

   To complete the deletion of the minidisk entry, press **F9** a second time.

6. The Configurator gives the option to delete the OS/2 file that holds the minidisk
   on your S/390 Server fixed disk. The following message appears:

   ```
   The file G:\VM\NEWUSER.192 is associated with this entry.
   To DELETE the file, press F9 again or ESC to cancel.
   ```

   If you do not want to delete the OS/2 file that holds the minidisk, you can press
   ESC.

7. Delete the OS/2 file.

   To erase the minidisk from your S/390 Server fixed disk, press **F9** a third time.

If there are any other minidisk entries for any of your P/390 user IDs that also refer to this minidisk file, you will see the following message:

```
Attention: Other minidisk entries have been found referring
to the OS/2 file os2filename under the user ID userid
Press F9 again to delete the OS/2 file or ESC to cancel.
```

In the above message, *os2filename* is the name of the OS/2 file to be deleted and *userid* is the name of the first user ID located that also has a minidisk entry pointing to the file. This warning informs you that at least one other P/390 user ID is affected when you erase the minidisk.

If you still want to delete the OS/2 file after receiving this warning, press **F9** a fourth time to delete the file.

Note: If you have chosen to delete the OS/2 file, the Configurator deletes the file *immediately.* It does not wait for you to exit and save all changes. The deletion of the minidisk entry, however, is not permanent until you end the Configurator and save all changes (see next steps).

8. To save your work and to exit from the Configurator, press **F10** to return to the **FUNCTIONS** main menu.

9. Press **F6** (*END–SAVE ALL, then EXIT*) to save the updates you made.

For more details about this menu, see "Update User Minidisks Menu (VM only)" on page 83.

Moving a P/390 Minidisk

The following instructions show you how to move a minidisk to another fixed disk or subdirectory, and how to specify the new location of the minidisk to the Configurator.

Because all P/390 minidisks are OS/2 files, you must use a combination of OS/2 commands and Configurator functions to move a minidisk from one location to another on your S/390 Server. Moving a minidisk in a P/390 is a three-stage process:

- Stage 1: Use OS/2 commands to move or copy the minidisk file.
- Stage 2: Specify the new file location to the Configurator.
- Stage 3: Use OS/2 command to erase the old copy of file (optional).

The following procedure is used to move a minidisk:

1. To move the disk (stage 1), use the OS/2 **COPY** or **MOVE** command to copy or move an existing minidisk from one area of your S/390 Server fixed disk to another. In this example, the following command would copy NEWUSER's 191 disk from the G: drive to the D: drive.

   ```
   COPY G:\VM\NEWUSER.191   D:\NEWUSER.191
   ```

2. To notify the Configurator that the disk has moved (stage 2), go to the **UPDATE USER MINIDISKS** menu for the user ID that owns the minidisk. For example:

```
                    UPDATE USER MINIDISKS FOR NEWUSER


---------------------------- Available disk space in bytes:  24,373,248----------
 Virt   DASD     VOL   ACC   File     File          Path >G:\VM
 Addr   Type    Label  Mode  Size     Name
-----------------------------------------------------------------------------
 >     >       >      >     >         >
 191   FB-512  NEW191  MR   4096K      G:\VM\NEWUSER.191
```

If you used the OS/2 MOVE command, a copy of the file will not be at the old location, and the *File Size* field will be blank.

3. Move the cursor under the minidisk entry that you would like to modify, and press **F11**, *Allocate*. This moves the selected entry up to the top line of the input area:

```
                    UPDATE USER MINIDISKS FOR NEWUSER

 ve

---------------------------- Available disk space in bytes:  24,373,248----------
 Virt   DASD     VOL   ACC   File     File          Path >G:\VM
 Addr   Type    Label  Mode  Size     Name
-----------------------------------------------------------------------------
 >191   >FB-512 >NEW191 >MR >4096K     >G:\VM\NEWUSER.191
```

4. Modify the pathname of the file to indicate its new location.

   In this example, we would change G:\VM\NEWUSER.191 to D:\NEWUSER.191, the new location of the minidisk file.

   Note: Make sure you specify the correct new location of the OS/2 file before pressing **ENTER.** If you specify an incorrect but valid OS/2 drive and subdirectory and press **ENTER,** a completely *new* file is allocated!

5. Press **ENTER**.

   The Configurator warns you that the specified file name already exists:

```
                    UPDATE USER MINIDISKS FOR NEWUSER
  The file name specified already exists. Cannot allocate as a new file.
  Press ENTER to update DEVMAP and the MDISK card for this entry or
  ESC to cancel this command.
---------------------------- Available disk space in bytes:  24,373,248----------
 Virt   DASD     VOL   ACC   File     File          Path >G:\VM
 Addr   Type    Label  Mode  Size     Name
-----------------------------------------------------------------------------
 >191   >FB-512 >NEW191 >MR >4096K     >D:\NEWUSER.191
```

6. Press **ENTER** to continue with the update.

   You have now specified the new minidisk location to the Configurator. The entry for the minidisk moves back to the body of the menu. Your changes will take effect permanently when you exit from the Configurator and save all changes.

7. To save your work and exit from the Configurator, press **F10** to return to the **FUNCTIONS** main menu.

8. Press **F6** (*END – SAVE ALL, then EXIT*) to save the updates you made.

9. You can now optionally use the OS/2 **ERASE** command (stage 3) to reclaim the S/390 Server disk space used by the old copy of the minidisk file:

```
ERASE G:\VM\NEWUSER.191
```

For more details about this menu, see "Update User Minidisks Menu (VM only)" on page 83.

Changing the Size of P/390 Minidisks

The Configurator does not directly support modification of the size of an existing minidisk. There are, however, several procedures that you can use to change the size of an existing minidisk. These all involve four basic steps:

1. Rename the old minidisk.
2. Create a new minidisk of the desired size.
3. Copy the files from the old minidisk.
4. Delete the old disk or use it for some other purpose.

In the following example, SAMPLE's 191 disk will be replaced by a minidisk that has a larger size.

1. Before invoking the Configurator, rename the existing minidisk so it has a different file extension. You can use the OS/2 **RENAME** command to do this:

```
RENAME G:\VM\SAMPLE.191 G:\VM\SAMPLE.SAV
```

2. Start the Configurator, and go to the **UPDATE USER MINIDISKS** menu for the user ID in question:

```
                   UPDATE USER MINIDISKS FOR SAMPLE


                                 Available disk space in bytes:  19,130,368
    Virt   DASD     VOL   ACC   File     File          Path >G:\VM
    Addr   Type    Label  Mode  Size     Name
   ------------------------------------------------------------------------
   >    >        >      >   >            >
    191   FB-512  SAM191  MR              G:\VM\SAMPLE.191
```

The minidisk entry for SAMPLE's 191 disk does not have a file size associated with it because the file SAMPLE.191 was not found by the Configurator. (It was renamed to SAMPLE.SAV in step 1.)

3. Allocate a new minidisk of a different size by moving the cursor under the entry of the disk to be reallocated, and press **F11**, *Allocate*. This moves the selected entry up to the input line where you can specify a larger file size.

In the next example, an 8-megabyte file is allocated as SAMPLE's new 191 disk.

```
                         UPDATE USER MINIDISKS FOR SAMPLE




    ─────────────────────────── Available disk space in bytes:  19,130,368──────
    Virt   DASD     VOL    ACC   File     File          Path >G:\VM
    Addr   Type     Label  Mode  Size     Name
    ─────────────────────────────────────────────────────────────────────────
   >191   >FB-512 >SAM191 >MR  >8m          >G:\VM\SAMPLE.191
```

4. Press **ENTER** to allocate the new minidisk file.

5. You now need to make a minidisk entry for the original 191 disk that was renamed to SAMPLE.SAV in step 1 on page 118. Enter this file name on the new data entry line of the menu, as shown in the following example:

```
                         UPDATE USER MINIDISKS FOR SAMPLE




    ─────────────────────────── Available disk space in bytes:  19,130,368──────
    Virt   DASD     VOL    ACC   File     File          Path >G:\VM
    Addr   Type     Label  Mode  Size     Name
    ─────────────────────────────────────────────────────────────────────────
   >200   >        >      >    >           >g:\vm\sample.sav
    191    FB-512  SAM191  MR               G:\VM\SAMPLE.191
```

Any unique (for this user ID) virtual address can be specified. For this example, we chose address 200.

6. Press **ENTER**.

The Configurator displays a message saying that the file name specified already exists:

```
                         UPDATE USER MINIDISKS FOR NEWUSER
        The file name specified already exists. Cannot allocate as a new file.
        Press ENTER to update DEVMAP and the MDISK card for this entry or
        ESC to cancel this command.
    ─────────────────────────── Available disk space in bytes:  24,373,248──────
    Virt   DASD     VOL    ACC   File     File          Path >G:\VM
    Addr   Type     Label  Mode  Size     Name
    ─────────────────────────────────────────────────────────────────────────
   >200   >FB-512 >SAM191 >MR  >4096K      >G:\VM\SAMPLE.SAV
    191    FB-512  SAM191  MR   8192K        G:\VM\SAMPLE.191
```

7. Press **ENTER** to continue.

The Configurator displays a message indicating that the volume name found on the new disk is a duplicate of a volume label already in the system, as shown in the following example:

```
                    UPDATE USER MINIDISKS FOR NEWUSER
While trying to create a new DEVMAP entry for this existing file, a duplicate
VOLUME name was found. Change the file's volume name (at cursor position),
then press ENTER to continue or press ESC to cancel this command.
─────────────────────────── Available disk space in bytes:  24,373,248──────
 Virt   DASD    VOL   ACC  File      File          Path >G:\VM
 Addr   Type   Label  Mode Size      Name
-----------------------------------------------------------------------------
>200   >FB-512 >SAM191 >MR >4096K     >G:\VM\SAMPLE.SAV
 191    FB-512  SAM191  MR  8192K      G:\VM\SAMPLE.191
```

Now you have to change the volume label (SAM191) of the original minidisk.
Any unique (for the P/390 system) name can be used. For example, we chose
OLD191.

8. Type in a new volume label and press **ENTER** to change the label on the disk.

   In the following menu, the label on the original minidisk has been changed to
   OLD191.

```
                    UPDATE USER MINIDISKS FOR SAMPLE




─────────────────────────── Available disk space in bytes:  24,373,248──────
 Virt   DASD    VOL   ACC  File      File          Path >G:\VM
 Addr   Type   Label  Mode Size      Name
-----------------------------------------------------------------------------
>      >       >      >    >          >
 191    FB-512  SAM191  MR  8192K      G:\VM\SAMPLE.191
 200    FB-512  OLD191  MR  4096K      G:\VM\SAMPLE.SAV
```

9. To save your work and exit from the Configurator, press **F10** to return to the
   FUNCTIONS main menu.

10. Press **F6** (*END – SAVE ALL, then EXIT*) to save the updates you made.

    Note: If the P/390 is currently running, the new minidisk is not available until
    VM is shutdown and the P/390 stopped (use the End P/390).

11. Use the IPL P/390 icon to bring up VM.

12. Log on to the user ID that owns the minidisks.

    In our example, SAMPLE is now able to access both the new minidisk
    (SAMPLE's 191), and the original minidisk (SAMPLE's 200).

13. Use the CMS **FORMAT** command to format the new minidisk. (Enter the data
    shown in **bold** type):

    format 191 a (blk 4k noerase

    ```
    DMSFOR603R FORMAT will erase all files on disk A(191).
    Do you wish to continue?
    Enter 1 (YES) or 0 (NO).
    ```

    1

    ```
    DMSFOR605R Enter disk label:
    ```

    SAM191

```
Formatting disk A
8192 FB-512 blocks formatted on A(191)
Ready; T=n.nn/n.nn hh:mm:ss
```

14. Use CMS commands to copy the files from the old minidisk to the new minidisk:

    ```
    access 191 A
    access 200 B
    copyfile * * B = = A (OLDDATE
    ```

15. Verify that the 191 A disk contains the files you expect.

16. After shutting down VM, you can use the OS/2 **ERASE** command to erase SAMPLE.SAV.

Modifying P/390 User Minidisk Links

1. Start at the P/390 Configurator **FUNCTIONS** main menu.

   See "Starting the Configurator" on page 62 for instructions on how to get to the Configurator's main menu (cnfuns).

2. Choose the option *Update User Data* by pressing **F3**.

   The **SELECT USERID** menu is displayed.

3. Move the cursor under the user ID you want to edit, and press **ENTER**.

   The **USER FUNCTION SELECTION** menu is displayed.

4. Press **F4** to go to the **UPDATE USER LINKS** menu:

```
┌──────────────────────────────────────────────────────────────────────┐
│                                                                        │
│              ┌─────────────────────────────────────┐                   │
│              │ UPDATE USER LINKS FOR NEWUSER │                          │
│              └─────────────────────────────────────┘                   │
│   Use TAB or ARROW keys to position cursor.                            │
│    To MODIFY a LINK, type over the data.                               │
│                                                                        │
│                                          ┌──────────────────────────┐  │
│   ┌────────────────────────────────────┐ │      HELP INFORMATION    │  │
│   │ USERID   | VIRTAD1 | VIRTAD2 | MODE │ │  Use this screen to modify,│ │
│   │ ---------------------------------- │ │  add, or delete a LINK   │  │
│   │ SAMPLE     191      120     RR     │ │  entry.                  │  │
│   │                                    │ └──────────────────────────┘  │
│   │                                    │ ┌──────────────────────────┐  │
│   │                                    │ │     FUNCTION  KEYS       │  │
│   │                                    │ │  F1   More Help          │  │
│   │                                    │ │  F2   User Environment   │  │
│   │                                    │ │  F3   User Minidisks     │  │
│   │                                    │ │  F4   User Functions     │  │
│   │                                    │ │  F6   Insert             │  │
│   │                                    │ │  F7   Scroll Back        │  │
│   │                                    │ │  F8   Scroll Foward      │  │
│   │                                    │ │  F9   Delete             │  │
│   │                                    │ │  F10  Main Menu          │  │
│   │                                    │ │  F12  User Selection Menu│  │
│   │                                    │ │  ESC  Back 1 Menu        │  │
│   │                                    │ └──────────────────────────┘  │
│   └────────────────────────────────────┘                   cnuserlk   │
│                                                                        │
└──────────────────────────────────────────────────────────────────────┘
```

   You can use this menu to specify automatic links to minidisks owned by other P/390 user IDs. These minidisks are linked to your new user ID each time you log on to that user ID under any P/390 session. Note that, if you specified a directory profile for this user, some links may have already been included. They do not have to be specified here again.

5. For each link specification, you must provide:

> *USERID*   The name of the P/390 user ID that owns the minidisk.
>
> *VIRTAD1*   The virtual address of the minidisk as it is defined for that P/390 user ID.
>
> *VIRTAD2*   The virtual address the minidisk will have when it is linked to your user ID.
>
> *MODE*   The access mode you desire (default is RR, which means a Read/Only link).

6. Type in the required information using the **TAB** key to move the cursor between fields.

7. Press **ENTER** after completing each line.

   Any errors or conflicts with existing virtual addresses are flagged.

   You can modify existing lines by overtyping the data and pressing **ENTER**. Lines can be deleted using the F9 key. There is no undelete function.

   The link changes that you make are not permanent until you exit from the Configurator and save the changes.

8. To save your work and exit from the Configurator, press **F10** to return to the **FUNCTIONS** main menu.

9. Press **F6** (*END – SAVE ALL, then EXIT*) to save the updates you made.

For more details about this menu, see "Update User Minidisks Menu (VM only)" on page 83.

Allocating New Devices

The UPDATE SYSTEM DEVICES (F2) menu is used to add devices at specific real S/390 addresses or to specify parameters to the P/390 device manager that is handling the I/O for a device. In non-VM mode, this menu *must* be used to add all devices.

The following sections show you how to add various devices to your P/390 I/O configuration:

- "Adding Non-DASD Devices"

- "Adding Direct Access Storage Devices (DASD)" on page 125

- "Adding DASD Device Records Without Allocating a File" on page 128

- "Allocating an OS/2 File for an Existing DASD Entry" on page 130

Adding Non-DASD Devices

This section shows you how to allocate a new, non-DASD devices for use by the operating system running on your P/390. Non-DASD devices include 3270 terminal sessions, 3420 tape drives, communications lines, such as, 2703 or ICA, 1403 printers, and so on.[9]

---

9   The P/390 Configurator treats all non-DASD devices the same, that is, no special processing is performed. For DASD devices, for example, user or system minidisks on device types 3370, 0671, FB-512, 3380, 3390, 3375, 9345, and so on, the Configurator will allocate an OS/2 file for each volume. See "Adding Direct Access Storage Devices (DASD)" on page 125.

1. Start at the P/390 Configurator **FUNCTIONS** main menu.

   See "Starting the Configurator" on page 62 for instructions on how to get to the Configurator's main menu (cnfuns).

2. Choose the option *Update System Devices* by pressing **F2**.

   An **UPDATE SYSTEM DEVICES** menu similar to the following appears:

```
                  U P D A T E   S Y S T E M   D E V I C E S        Mode = ESA



      ┌──────────────────────────── Available disk space in bytes:20,570,112──────┐
      │ Addr Device  Label  Atype  Size    Mgr   FN/P        Path:>G:\VM           │
      │ ------------------------------------------------------------------------   │
      │ >    >      >      >      >        >   >                                    │
      │ 00C  2540                          7   D:\RDR\*.*                          │
      │ 00E  1403            PRTR          6                                       │
      │ 101  3370   USER03  PERM   1400K   1   G:\VM\SAMPLE.191                    │
      │ 200  3278            DSPY          3   System Operator                     │
      │ 201  3278            DSPY          3   Local Session 1                     │
      │                                                                            │
      │                                                                            │
      │                                                                            │
      └────────────────────────────────────────────────────────────────────────┘


      Mgr Codes: 1=AWSFBA    2=AWSCKD    3=AWS3274  4=LAN3274  5=AWS3215  6=AWS2821
      7=AWS2540  8=LAN3172   9=LCS3172   A=MGR3172  B=WAN3172  C=AWSICA   D=AWSTAPE
      E=SCSI3480 F=SCSI3420  G=AWS3480   H=AWS3420  I=AWSOMA   J=AWSPCSRV K=AWSICE


      ┌──────────────────────────────────────────────────────────────────────────┐
      │ F1 Help    ALT-F1 Function Key Definitions    F10 Main Menu   ESC No Changes│
      └──────────────────────────────────────────────────────────────cnsysdev─────┘
```

3. Move the cursor to the new entry line and fill in:

   a. *Addr* with the real device address.[10]

   You can specify any three- or four-digit real address that your operating system will support.

   b. *Device* with the S/390 device type.

   You can specify any device type that your operating system will support. Note that in VM/ESA 1.2.1 (and above) most devices are dynamically sensed at IPL time, so an HCPRIO file is not necessary. Those devices that are too old to support dynamic sensing must be defined in the SYSTEM CONFIG file on the IPL PARM disk.[11]

   c. *FN/P* with device parameters, if any.

   These parameters are optional. Parameters can also be added after the device is allocated. Move the cursor down to the desired device address, TAB over to the FN/P field, add or change parameters, as required, and press **ENTER**.

---

[10] In VM/370 mode, you must choose a real address that corresponds to the correct device type as defined in the VM DMKRIO.ASM (real I/O configuration) file. A current copy of this file must always be kept on the S/390 Server.

[11] In VM/370 mode, the proper device type will be extracted from DMKRIO.ASM.

4. Press **ENTER** to take the default device manager (*Mgr* column), or type the specific manager code (Mgr Code).

   The default Mgr code for each device type is listed in the file AWSCTYPE.MGR.[12]

Here are two examples.

EXAMPLE 1: Adding a 3278 device using default Mgr Code:

```
                                 ── Available disk space in bytes:20,570,112 ──┐
│Addr Device  Label  Atype  Size    Mgr   FN/P        Path:>G:\VM              │
│---------------------------------------------------------------------------- │
│>202 >       >      >      >        > >Local Session 2                        │
```

After pressing **ENTER**, the device is added to DEVMAP. Here is the resulting menu:

```
                                 ── Available disk space in bytes:20,570,112 ──┐
│Addr Device  Label  Atype  Size    Mgr   FN/P        Path:>G:\VM              │
│---------------------------------------------------------------------------- │
│>    >       >      >      > ·      > >                                       │
│00C  2540                           7   D:\RDR\*.*                            │
│00E  1403           PRTR            6                                         │
│101  3370    USER03 PERM   1400K    1   G:\VM\SAMPLE.191                      │
│200  3278           DSPY            3   System Operator                       │
│201  3278           DSPY            3   Local Session 1                       │
│202  3278           DSPY            3   Local Session 2                       │
```

EXAMPLE 2: Adding a 3278 device with a specific Mgr Code:

```
                                 ── Available disk space in bytes:20,570,112 ──┐
│Addr Device  Label  Atype  Size    Mgr   FN/P        Path:>G:\VM              │
│---------------------------------------------------------------------------- │
│>204 >       >      >      >        >4 >LAN Session 1                         │
```

After pressing **ENTER** the device is added to DEVMAP. Here is the resulting menu:

---

[12] This is also where you would add your own device manager name if you were writing a P/390 device manager. The name would appear in the **Mgr Codes** list at the bottom of the screen.

```
┌────────────────────────────────────────────────────────────────────────────┐
│                                                                              │
│  ┌──────────────────── Available disk space in bytes:20,570,112─────────┐    │
│  │ Addr Device  Label  Atype  Size   Mgr   FN/P        Path:>G:\VM       │    │
│  ├──────────────────────────────────────────────────────────────────────│    │
│  │ >      >      >      >      >       >  >                               │    │
│  │ 00C  2540                           7  D:\RDR\*.*                      │    │
│  │ 00E  1403            PRTR           6                                  │    │
│  │ 101  3370    USER03  PERM   1400K   1  G:\VM\SAMPLE.191                │    │
│  │ 200  3278            DSPY           3  System Operator                 │    │
│  │ 201  3278            DSPY           3  Local Session 1                 │    │
│  │ 202  3278            DSPY           3  Local Session 2                 │    │
│  │ 204  3278            DSPY           4  LAN Session 1                   │    │
│  │                                                                        │    │
│  │                                                                        │    │
│  └────────────────────────────────────────────────────────────────────── │    │
│                                                                              │
│  Mgr Codes: 1=AWSFBA    2=AWSCKD   3=AWS3274  4=LAN3274  5=AWS3215  6=AWS2821 │
│  7=AWS2540 8=LAN3172  9=LCS3172  A=MGR3172  B=WAN3172  C=AWSICA   D=AWSTAPE   │
│  E=SCSI3480 F=SCSI3420 G=AWS3480  H=AWS3420  I=AWSOMA    J=AWSPCSRV K=AWSICE  │
│                                                                              │
│  ┌──────────────────────────────────────────────────────────────────────┐   │
│  │ F1 Help    ALT-F1 Function Key Definitions    F10 Main Menu  ESC No Changes│
│  └─────────────────────────────────────────────────────────────cnsysdev──┘   │
└──────────────────────────────────────────────────────────────────────────────┘
```

In example 2, we specified device manager code 4 so that the 3278 device address would be managed by the LAN3274 manager instead of the default, AWS3274. If you move the cursor under address 204 and press **F1**, you can read an explanation of LAN3274 managed devices. The text in the FN/P field, LAN Session 1, is a comment reminding you about what this device is for.

5. To save your work and exit from the Configurator, press **F10** to return to the **FUNCTIONS** main menu.

6. Then press **F6** (*END - SAVE ALL, then EXIT*) to save the updates that you made.

   Note: None of the changes that you have specified are saved until you exit from the Configurator.

Adding Direct Access Storage Devices (DASD)

This section shows you how to allocate a new DASD volume to be used by the operating system running on your P/390. The Configurator creates both a new OS/2 file and the corresponding DEVMAP entry, which describes this DASD volume.

There are several reasons why you would use this procedure, rather than allocating the volume as a minidisk using the **F3 UPDATE USER MINIDISKS** menu:

- You are allocating a VM system volume (that is, not user minidisks).

  See "Allocating CP System Volumes in VM Mode" on page 139.

- You are allocating a volume that will contain *multiple* VM user minidisks in a single OS/2 file at a single S/390 device address.

  See "Creating Multiple Minidisk Volumes" on page 143.

- You are allocating a non-VM (for example, a VSE or MVS) DASD volume.

  Use the following procedure.

1. Start at the P/390 Configurator **FUNCTIONS** main menu.

   See "Starting the Configurator" on page 62 for instructions on how to get to the Configurator's main menu (cnfuns).

2. Choose the option *Update System Devices* by pressing **F2**.

   An **UPDATE SYSTEM DEVICES** menu similar to the following appears:

```
                    U P D A T E   S Y S T E M   D E V I C E S        Mode = ESA


              ┌─────────────────────────── Available disk space in bytes:20,570,112───────┐
              │ Addr Device  Label  Atype  Size    Mgr   FN/P       Path:>G:\VM            │
              │ ---------------------------------------------------------------------------│
              │ >    >      >      >     >          >   >                                   │
              │ 100  3370    USER03 PERM   1400K     1   G:\VM\SAMPLE.191                   │
              │ 101  FB-512 NEW191 PERM   4096K     1   G:\VM\NEWUSER.191                   │
              │                                                                             │
              │                                                                             │
              │                                                                             │
              │                                                                             │
              │                                                                             │
              └─────────────────────────────────────────────────────────────────────────┘


       Mgr Codes: 1=AWSFBA   2=AWSCKD   3=AWS3274  4=LAN3274  5=AWS3215  6=AWS2821
       7=AWS2540  8=LAN3172  9=LCS3172  A=MGR3172  B=WAN3172  C=AWSICA   D=AWSTAPE
       E=SCSI3480 F=SCSI3420 G=AWS3480  H=AWS3420  I=AWSOMA   J=AWSPCSRV K=AWSICE


       ┌─────────────────────────────────────────────────────────────────────────┐
       │ F1 Help   ALT-F1 Function Key Definitions   F10 Main Menu  ESC No Changes │
       └──────────────────────────────────────────────────────────────cnsysdev────┘
```

3. Move the cursor to the new entry line and fill in:

   a. *Addr* with the real device address.[13]

      You can specify any three- or four-digit real address that is supported by your operating system. Hint: put heavily used volumes at lower real addresses than other devices in DEVMAP.

   b. *Device* with the S/390 device type.

      The possible choices include 3370, 3310, 0671, 9332, 9335, 9336, or FB-512 (for FBA DASD) and 3380, 3390, 3375, 9345, 3330, or 3350 (for CKD or ECKD-capable DASD).

   c. *Label* with a unique 6-character volume label.

   d. *Atype* with the allocation type.

      For VM/ESA the possible choices are PERM, DRCT, TDSK, PAGE, SPOL, or PARM. These are currently valid for FBA DASD *only*.[14]

      For VSE/ESA, always specify VSE for VSE volumes. If you are using the Configurator to allocate a full-pack DASD volume that will later be formatted for VM/ESA using ICKDSF, then you can also specify VSE. This will result in an unformatted volume.

---

[13] In VM/370 mode, you must choose a real address that corresponds to the correct device type as defined in the VM DMKRIO.ASM (real I/O configuration) file. A current copy of this file must always be kept on the S/390 Server.

[14] For VM/370 the possible choices are PERM, DRCT, TDSK, PAGE, DUMP, or TEMP.

For CKD DASD, *always* specify `CKD` as the allocation type. CKD volumes are *not* formatted automatically by the Configurator as are FBA volumes. You **must** use the ICKDSF Device Support Facilities program to prepare CKD volumes for use by the operating system. The P/390 VM/ESA and VSE/ESA preconfigured systems provide a copy of ICKDSF, as emulated tape file IPLDSF.580.

e. *Size* with the desired file size in megabytes (**M**), kilobytes (**K**), 512-byte blocks (**B**), cylinders (**C**) or fullpack (**D**). DASD can be allocated by specifying *n*D, where *n* is the column header of a table in AWSCFULL.PAK. See the AWSCFULL.PAK file. The values in the table are position-dependent. You can use the values that are in the table, or edit the table to represent your own values.

f. *FN/P* with an OS/2 file name.

You can specify any valid OS/2 subdirectory and file name. If left blank, it defaults to *Path\label.addr.* where *path* is the drive letter and subdirectory name displayed in the *Path* field at the top of the menu, and *label* and *addr* are taken from the entry fields.

4. When you have completed all the entry fields, press **ENTER**.

Here are two examples.

EXAMPLE 1: Fixed Block Architecture (FBA) DASD:

```
                                    ─── Available disk space in bytes:20,570,112───────┐
   │Addr Device  Label  Atype  Size    Mgr   FN/P        Path:>G:\VM                   │
   │----------------------------------------------------------------------------------│
   │>102 >3370   >segisp >perm >3984b    >   >                                         │
```

After pressing **ENTER**, the file is allocated and the device record is inserted into the main display, sorted by real address. The *Mgr* field defaults to 1 (AWSFBA) based on the device type (3370). The file name defaults to the subdirectory in the *path:>* field, the label, and the real address (G:\VM\SEGISP.102). Here is the resulting menu:

```
                                    ─── Available disk space in bytes:18,522,112───────┐
   │Addr Device  Label  Atype  Size    Mgr   FN/P        Path:>G:\VM                   │
   │----------------------------------------------------------------------------------│
   >    >       >      >      >         >   >
   │100  3370   USER03  PERM  1400K      1   G:\VM\SAMPLE.191                          │
   │101  FB-512 NEW191  PERM  4096K      1   G:\VM\NEWUSER.191                         │
   │102  3370   SEGISP  PERM  1992K      1   G:\VM\SEGISP.102                          │
```

EXAMPLE 2: Count Key Data (CKD) DASD:

```
                                    ─── Available disk space in bytes:18,522,112───────┐
   │Addr Device  Label  Atype  Size    Mgr   FN/P        Path:>G:\VM                   │
   │----------------------------------------------------------------------------------│
   │>340 >3380   >sys001 >      >8m       >   >                                        │
```

After pressing **ENTER**, the file is allocated and the device record is inserted into the main display, sorted by real address. The *Mgr* field defaults to 2 (AWSCKD) based on the device type (3380). The file name defaults to the subdirectory in the *path:>*

field, the label, and the real address (G:\VM\SYS001.102). Notice that the file size has been converted from 8 megabytes to twelve 3380 cylinders. You also could have entered the size in cylinders, for example, 12c. Here is the resulting menu:

```
┌─────────────────────────────────────────────────────────────────────────────┐
│                                                                               │
│  ┌─────────────────────────── Available disk space in bytes: 9,936,896──────┐ │
│  │Addr Device  Label  Atype  Size    Mgr   FN/P        Path:>G:\VM           │ │
│  │--------------------------------------------------------------------------│ │
│  │ >    >       >      >      >       >  >                                   │ │
│  │100  3370    USER03  PERM   1400K    1   G:\VM\SAMPLE.191                  │ │
│  │101  FB-512  NEW191  PERM   4096K    1   G:\VM\NEWUSER.191                 │ │
│  │102  3370    SEGISP  PERM   1992K    1   G:\VM\SEGISP.102                  │ │
│  │340  3380    SYS001  CKD    12C      2   G:\VM\SYS001.340                  │ │
│  │                                                                          │ │
└──┴──────────────────────────────────────────────────────────────────────────┘
```

5. To save your work and exit from the Configurator, press **F10** to return to the **FUNCTIONS** main menu.

6. Press **F6** (*END – SAVE ALL, then EXIT*) to save the updates you made.

Note: None of the changes that you have specified are saved until you exit from the Configurator. However, DASD volumes that you allocate will still exist as OS/2 files on your S/390 Server fixed disk even if you choose not to save the other changes you made.

Adding DASD Device Records Without Allocating a File

This section shows you how to allocate a DASD device record for future use, for example, on another P/390 workstation. If you are configuring the P/390 and distributing it to other users in your organization, you may want to specify most of the minidisks that will be required by your users without actually allocating them on your P/390. Then, you can distribute a copy of your DEVMAP file and provide users with instructions on how to allocate the minidisks you have specified. See section "Allocating an OS/2 File for an Existing DASD Entry" on page 130.

These steps cause the Configurator to create a DEVMAP entry without allocating an OS/2 file.

1. Start at the P/390 Configurator **FUNCTIONS** main menu.

   See "Starting the Configurator" on page 62 for instructions on how to get to the Configurator's main menu (cnfuns).

2. Choose the option *Update System Devices* by pressing **F2**.

   An **UPDATE SYSTEM DEVICES** menu similar to the following appears:

```
                    U P D A T E   S Y S T E M   D E V I C E S        Mode = ESA



                                    ── Available disk space in bytes:20,570,112──
         Addr Device  Label  Atype  Size    Mgr   FN/P       Path:>G:\VM
         ─────────────────────────────────────────────────────────────────────
       >    >      >      >      >       >  >
        100  3370   USER03 PERM   1400K      1   G:\VM\SAMPLE.191
        101  FB-512 NEW191 PERM   4096K      1   G:\VM\NEWUSER.191






         Mgr Codes: 1=AWSFBA   2=AWSCKD   3=AWS3274  4=LAN3274  5=AWS3215  6=AWS2821
         7=AWS2540  8=LAN3172  9=LCS3172  A=MGR3172  B=WAN3172  C=AWSICA   D=AWSTAPE
         E=SCSI3480 F=SCSI3420 G=AWS3480  H=AWS3420  I=AWSOMA   J=AWSPCSRV K=AWSICE

         ┌──────────────────────────────────────────────────────────────────┐
         │ F1 Help   ALT-F1 Function Key Definitions   F10 Main Menu  ESC No Changes │
         └──────────────────────────────────────────────────────────────────┘
                                                                   ──cnsysdev
```

3. Move the cursor to the new entry line and fill in:

   a. *Addr* with the real device address.

   b. *Device* with the S/390 device type.

      The possible choices include 3370, 3310, 0671, 9332, 9335, 9336, or
      FB-512 (for FBA DASD) and 3380, 3390, 9345, 3375, 3330, or 3350 (for
      CKD or ECKD-capable DASD).

   c. *FN/P* with an OS/2 file name.

4. Press **ENTER**

   This message is displayed:

   ```
   Attention! No SIZE or ATYPE was filled in.
   This will result in a valid
   entry, but NO FILE will be allocated.
   Press ENTER to continue, ESC to
   cancel this command, or fill in more information and then press ENTER.
   ```

   This warning is necessary because most of the time you want to allocate a file.
   This procedure covers an extraordinary case.

5. Press **ENTER** to create the DEVMAP entry without allocating the OS/2 file. In
   the following menu, device 102 does not have an allocated file, as indicated by
   the blank *Size* field:

```
                                    ── Available disk space in bytes: 9,936,896──
         Addr Device  Label  Atype  Size    Mgr   FN/P       Path:>G:\VM
         ─────────────────────────────────────────────────────────────────────
       >    >      >      >      >       >  >
        100  3370   USER03 PERM   1400K      1   G:\VM\SAMPLE.191
        101  FB-512 NEW191 PERM   4096K      1   G:\VM\NEWUSER.191
        102  3370                            1   G:\VM\SEGISP.102
```

6. To save your work and exit from the Configurator, press **F10** to return to the
   FUNCTIONS main menu.

7. Press **F6** (*END – SAVE ALL, then EXIT*) to save the updates that you made.

   Note: None of the changes you have specified are saved until you exit from the Configurator.

Allocating an OS/2 File for an Existing DASD Entry

This section shows you how to allocate an OS/2 file when you already have a DASD device entry in DEVMAP. These entries are recognizable because they have a blank *Size* field.

1. Start at the P/390 Configurator **FUNCTIONS** main menu.

   See "Starting the Configurator" on page 62 for instructions on how to get to the Configurator's main menu (cnfuns).

2. Choose the option *Update System Devices* by pressing **F2**.

   An **UPDATE SYSTEM DEVICES** menu similar to the following appears:

```
                 U P D A T E   S Y S T E M   D E V I C E S        Mode = ESA


                               ─────── Available disk space in bytes:20,570,112──────┐
         Addr Device  Label  Atype  Size    Mgr   FN/P      Path:>G:\VM
         ────────────────────────────────────────────────────────────────────────
         >    >       >      >      >        >   >
         100  3370    USER03 PERM   1400K    1   G:\VM\SAMPLE.191
         101  FB-512  NEW191 PERM   4096K    1   G:\VM\NEWUSER.191
         102  FB-512                         1   G:\VM\SEGISP.102




                                                                                    │
         └──────────────────────────────────────────────────────────────────────────┘

         Mgr Codes: 1=AWSFBA    2=AWSCKD    3=AWS3274  4=LAN3274  5=AWS3215  6=AWS2821
         7=AWS2540  8=LAN3172  9=LCS3172  A=MGR3172  B=WAN3172  C=AWSICA   D=AWSTAPE
         E=SCSI3480 F=SCSI3420 G=AWS3480  H=AWS3420  I=AWSOMA   J=AWSPCSRV K=AWSICE

         ┌─────────────────────────────────────────────────────────────────────────┐
         │ F1 Help   ALT-F1 Function Key Definitions   F10 Main Menu  ESC No Changes │
         └────────────────────────────────────────────────────────────────cnsysdev──┘
```

   The DASD device at address 102 does not have a corresponding OS/2 file. This is indicated by the blank *Size* field.

   To allocate a file for this device, continue with these instructions.

3. Move the cursor down into the body of the menu under the desired address. In our example, this is address 102.

4. Press **F11** *Allocate*.

   This moves the entry up to the new entry lines so you can edit the fields.

   You *must* complete the following fields:

   a. *Label* with a unique 6-character volume label.

   b. *Atype* with the allocation type.

For VM/ESA the possible choices are `PERM, DRCT, TDSK, PAGE, SPOL,` or `PARM.` These are currently valid for FBA DASD *only.*[15]

For non-VM/ESA, always specify `VSE` for VSE volumes. For full-pack, unformatted VM volumes, you can also specify `VSE.`

For CKD DASD in either VM or VSE mode, *always* specify `CKD` as the allocation type.

Note: All new files of type `VSE` or `CKD` *must* be formatted using the ICKDSF Device Support Facilities program to prepare the volumes for use by the operating system. The P/390 VM/ESA and VSE/ESA Starter Systems provide a copy of ICKDSF, as emulated tape file IPLDSF.580.

   c. *Size* with the desired file size in megabytes (**M**), kilobytes (**K**), 512-byte blocks (**B**), or cylinders (**C**) or fullpack (**D**). DASD can be allocated by specifying *n*D, where *n* is the column header of a table in AWSCFULL.PAK. See the AWSCFULL.PAK file. The values in the table are position-dependent. You can use the values that are in the table, or edit the table to represent your own values.

   d. *FN/P.* You can keep the OS/2 subdirectory and file name, or change it at this time.

5. When you have completed all the entry fields, press **ENTER** to allocate the OS/2 file.

After the file is allocated, the menu looks like this:

```
┌────────────────────────────────────────────────────────────────────────┐
│                                                                          │
│  ┌───────────────────────── Available disk space in bytes:18,522,112─────┐
│  │Addr Device  Label  Atype  Size    Mgr  FN/P        Path:>G:\VM        │
│  │-------------------------------------------------------------------    │
│  │ >    >      >      >      >       >  >                                 │
│  │100  3370    USER03 PERM   1400K    1  G:\VM\SAMPLE.191                 │
│  │101  FB-512 NEW191  PERM   4096K    1  G:\VM\NEWUSER.191                │
│  │102  FB-512 SEGISP  PERM   1992K    1  G:\VM\SEGISP.102                 │
│  │                                                                       │
└──┴───────────────────────────────────────────────────────────────────────┘
```

6. To save your work and exit the from Configurator, press **F10** to return to the **FUNCTIONS** main menu.

7. Then press **F6** (*END - SAVE ALL, then EXIT*) to save the updates that you made.

   Note: None of the changes that you have specified are saved until you exit from the Configurator. However, DASD volumes that you allocate will still exist as OS/2 files on your S/390 Server fixed disk even if you choose not to save the other changes that you made.

Deleting I/O Devices

This section shows you how to delete P/390 I/O device entries from DEVMAP. If the device is a DASD that has an OS/2 file associated with the entry, you are also given the chance to delete the underlying OS/2 file.

1. Start at the P/390 Configurator **FUNCTIONS** main menu.

---

[15] For VM/370 the possible choices are `PERM, DRCT, TDSK, PAGE, DUMP,` or `TEMP.`

See "Starting the Configurator" on page 62 for instructions on how to get to the Configurator's main menu (cnfuns).

2. Choose the option *Update System Devices* by pressing **F2**.

   An **UPDATE SYSTEM DEVICES** menu similar to the following appears:

```
                    U P D A T E   S Y S T E M   D E V I C E S           Mode = ESA



        ┌──────────────────────── Available disk space in bytes:20,570,112──────┐
        │Addr Device  Label  Atype  Size    Mgr   FN/P        Path:>G:\VM         │
        │----------------------------------------------------------------------  │
        │ >    >     >      >      >         > >                                   │
        │00C  2540                          7  D:\RDR\*.*                         │
        │00A  3215                          5  A 3215 console                     │
        │100  FB-512 USER03 PERM   1400K     1  G:\VM\SAMPLE.191                   │
        │101  FB-512 NEW191 PERM   4096K     1  G:\VM\NEWUSER.191                  │
        │102  FB-512 SEGISP PERM   1992K     1  G:\VM\SEGISP.102                   │
        │                                                                         │
        │                                                                         │
        │                                                                         │
        └─────────────────────────────────────────────────────────────────────  ┘

        Mgr Codes: 1=AWSFBA    2=AWSCKD    3=AWS3274  4=LAN3274  5=AWS3215  6=AWS2821
        7=AWS2540  8=LAN3172   9=LCS3172   A=MGR3172  B=WAN3172  C=AWSICA   D=AWSTAPE
        E=SCSI3480 F=SCSI3420  G=AWS3480   H=AWS3420  I=AWSOMA   J=AWSPCSRV K=AWSICE

        ┌───────────────────────────────────────────────────────────────────┐
        │ F1 Help    ALT-F1 Function Key Definitions   F10 Main Menu  ESC No Changes │
        │                                                        ─────cnsysdev┘
```

3. Move the cursor down into the body of the menu under the address that you would like to delete and press **F9** *Delete*. If you choose address "00A", which is a 3215 console (non-DASD) device, the entire line for address 00A will be highlighted (reverse video) and the following message appears:

   ```
   Press F9 again to confirm deletion of this entry from DEVMAP
   or press ESC to cancel this command.
   ```

4. Press **F9** again to delete device 00A. (Or press **ESC** if you do not want to delete the device).

For non-DASD devices, the procedure is complete at this point. If this is a DASD device *and* there is an OS/2 file associated with this device entry, then you will be given the option of deleting the OS/2 file.

For example, if you are deleting address 102, which is an FB-512 DASD device, this additional message appears:

```
The file G:\VM\SEGISP.102 is associated with the deleted entry.
To also DELETE THE FILE, press F9 again or ESC NOT to delete the file.
```

5. Press **F9** a third time to delete the OS/2 file G:\VM\SEGISP.102. (Or press **ESC** if you do not want to delete the file).

   Note that the OS/2 file is deleted *immediately*, that is, it will not wait until you exit from the Configurator to delete the file. If you change your mind and use the F10 QUIT option to exit, the DEVMAP entry for the DASD device will still be there, but the OS/2 file will be gone.

6. To save your work and from exit the Configurator, press **F10** to go back to the **FUNCTIONS** main menu.

7. Then press **F6** (*END – SAVE ALL, then EXIT*) to save the updates that you made.

> **Note:** None of the changes that you have specified are saved until you exit from the Configurator. However, OS/2 DASD files that you delete will be gone from your S/390 Server fixed disk even if you choose not to save the other changes that you made.

Moving I/O Devices

This section describes how to move I/O devices on the **UPDATE SYSTEM DEVICES** (F2) menu.

There are several reasons you might want to "move" I/O devices:

- To change the real address of a device.

  This may be necessary to match the I/O configuration of your S/370 operating system.

- To change the device type.

  This procedure is described in "Changing the Real Address of a Non-DASD Device." If you are in VM mode, you must choose a different device address that corresponds to the type of device that you want. If you are in VSE mode, you can delete and add the device at the same address by specifying a different device type. You **CANNOT** change the device type of DASD!

- To change the OS/2 drive letter of a DASD device.

  This may be necessary if you reconfigure your S/390 Server disks and the drive letters of some of the OS/2 files change.

The following sections show you how to move P/390 device entries:

- "Changing the Real Address of a Non-DASD Device"
- "Changing the Real Address of a DASD Device" on page 134
- "Changing the OS/2 Drive Letter of a DASD File" on page 136

Changing the Real Address of a Non-DASD Device

This section shows you how to change the real address of an existing I/O device entry in DEVMAP. This procedure should be used only for non-DASD devices.

Suppose you want to move device 029 to address 020. First, add a new entry at address 020 that matches the current device entry at address 029, then delete the entry at address 029.

1. Start at the P/390 Configurator **FUNCTIONS** main menu.

   See "Starting the Configurator" on page 62 for instructions on how to get to the Configurator's main menu (cnfuns).

2. Choose the option *Update System Devices* by pressing **F2**.

   An **UPDATE SYSTEM DEVICES** menu similar to the following appears:

```
                  U P D A T E   S Y S T E M   D E V I C E S          Mode = ESA



                                  ───── Available disk space in bytes:20,570,112──────
       │ Addr Device  Label  Atype  Size    Mgr   FN/P       Path:>G:\VM              │
       │ ─────────────────────────────────────────────────────────────────────────── │
       │ >     >     >        >      >        >  >                                     │
       │ 00C  2540                             7  D:\RDR\*.*                           │
       │ 029  2703                             B  COM1:4800,E,7,1,OFF                  │
       │                                                                              │
       │                                                                              │
       │                                                                              │
       │                                                                              │
       │                                                                              │
       │                                                                              │


        Mgr Codes: 1=AWSFBA    2=AWSCKD    3=AWS3274  4=LAN3274  5=AWS3215  6=AWS2821
        7=AWS2540  8=LAN3172  9=LCS3172  A=MGR3172  B=WAN3172  C=AWSICA   D=AWSTAPE
        E=SCSI3480 F=SCSI3420 G=AWS3480  H=AWS3420  I=AWSOMA    J=AWSPCSRV K=AWSICE


       │ F1 Help    ALT-F1 Function Key Definitions    F10 Main Menu   ESC No Changes  │
       │                                                                ──cnsysdev┘
```

3. Follow the procedure in section "Adding Non-DASD Devices" on page 122 to add a new device of the same type at the new address. Make sure that you specify the same *Mgr* code and parameters (*FN/P*), if any.[16]

4. After the new entry has been added and you have verified that it has the same device type, device manager, and device parameters as the original, follow the procedure in "Deleting I/O Devices" on page 131 to delete the original device.

5. To save your work and from exit the Configurator, press **F10** to return to the **FUNCTIONS** main menu.

6. Press **F6** (*END - SAVE ALL, then EXIT*) to save the updates that you made.

   Note: None of the changes that you have specified are saved until you exit from the Configurator.

Changing the Real Address of a DASD Device

This section shows you how to change the real address of an existing DASD device entry in DEVMAP.

Suppose you want to move device 102 to address 322. The procedure is *not* the same as for non-DASD devices.

1. Start at the P/390 Configurator **FUNCTIONS** main menu.

   See "Starting the Configurator" on page 62 for instructions on how to get to the Configurator's main menu (cnfuns).

2. Choose the option *Update System Devices* by pressing **F2**.

   An **UPDATE SYSTEM DEVICES** menu similar to the following appears:

---

[16] In VM/370 mode, make sure the same device type appears in the *Device* field after you press ENTER. If not, then examine DMKRIO.ASM to find the correct address for the device type that you want.

```
                  U P D A T E   S Y S T E M   D E V I C E S            Mode = ESA


                                         ─ Available disk space in bytes:20,570,112─┐
        Addr Device  Label  Atype  Size    Mgr   FN/P        Path:>G:\VM
        ├─────────────────────────────────────────────────────────────────────────
        >    >      >       >      >       >  >
        │100  FB-512 USER03  PERM   1400K    1  G:\VM\SAMPLE.191
        │101  FB-512 NEW191  PERM   4096K    1  G:\VM\NEWUSER.191
        │102  FB-512 SEGISP  PERM   1992K    1  G:\VM\SEGISP.102




        Mgr Codes: 1=AWSFBA    2=AWSCKD    3=AWS3274  4=LAN3274  5=AWS3215  6=AWS2821
        7=AWS2540  8=LAN3172  9=LCS3172  A=MGR3172  B=WAN3172  C=AWSICA   D=AWSTAPE
        E=SCSI3480 F=SCSI3420 G=AWS3480  H=AWS3420  I=AWSOMA    J=AWSPCSRV K=AWSICE

        ┌─────────────────────────────────────────────────────────────────────────
        │ F1 Help    ALT-F1 Function Key Definitions    F10 Main Menu   ESC No Changes
        └─────────────────────────────────────────────────────────────cnsysdev─┘
```

3. Follow the procedure in "Adding Direct Access Storage Devices (DASD)" on page 125 to add a new device of the same type at the new address. Specify *only* two parameters on the new entry line:

   a. The new address in the *Addr* field.

   b. Exactly the same OS/2 file name as the existing DASD device in the *FN/P* field.

   You will see the following message displayed:

   ```
   Attention! The file name specified is a DUPLICATE.
   Press ENTER to keep the file name or type in a new name and
   then press ENTER to continue or ESC to cancel this command.
   ```

4. Press **ENTER** to keep the file name.

   You will see the following message displayed:

   ```
   Attention! This entry will create a DUPLICATE volume name in DEVMAP.
   You can keep this name, change it, or blank it out.
   Then press ENTER
   to continue or ESC to cancel.
   ```

5. Press **ENTER** to keep the volume name (*Label*).[17]

6. After the new entry has been added and you have verified that it is exactly the same as the original, except for the device address, you may now follow the procedure in section "Deleting I/O Devices" on page 131 to delete the original device. **Warning:** Do *not* delete the OS/2 file associated with either DASD entry. In other words, do *not* press **F9** three times!

7. To save your work and exit from the Configurator, press **F10** to go back to the **FUNCTIONS** main menu.

---

[17] In VM/370 mode, make sure the same device type appears in the *Device* field after you press ENTER. If not, then examine DMKRIO.ASM to find the correct address for the device type that you want.

8. Press **F6** (*END - SAVE ALL, then EXIT*) to save the updates you made.

   Note: None of the changes that you have specified are saved until you exit from the Configurator.

Changing the OS/2 Drive Letter of a DASD File

This section shows you how to change the OS/2 drive letter of an existing DASD device entry. Use this procedure if you have reconfigured or rearranged your S/390 Server disk drives such that the drive letters for the OS/2 files that represent P/390 DASD volumes have changed.

For example, you may have added another disk drive partition and caused all the files that were previously on disk D: to now be on E:. Or, you may have moved just a few files from the D: drive to the E: drive.

You can update the DEVMAP entries for these DASD volumes using either of these methods:

- To update one file at a time, use the **UPDATE SYSTEM DEVICES (F2)** menu on the Configurator. See "Changing OS/2 Drive Letters Using the Configurator."

- To update an entire group, use the RDEVMAP.CMD OS/2 command. See "Changing OS/2 Drive Letters with RDEVMAP.CMD" on page 137.

Changing OS/2 Drive Letters Using the Configurator

Use this method if you only have a few DASD files that need their drive letters updated.

1. Start at the P/390 Configurator **FUNCTIONS** main menu.

   See "Starting the Configurator" on page 62 for instructions on how to get to the Configurator's main menu (cnfuns).

   The first time the **FUNCTIONS** main menu is displayed, look at the bottom of the screen for the message:

   ```
   NOTE: DEVMAP references files not found on the system.
   Use F9 to list them.
   ```

2. Press **F9** *Display Files Not Found* to see which OS/2 files were not found by the Configurator.

   For example, you may see:

   ```
   The following files were called out by DEVMAP, but were not found:

   D:\VM\SAMPLE.191
                                                    press any key....
   ```

   Write down the names of the files you are missing.

3. Choose the option *Update System Devices* by pressing **F2**.

   An **UPDATE SYSTEM DEVICES** menu similar to the following appears:

```
                    U P D A T E   S Y S T E M   D E V I C E S        Mode = ESA



                                       ── Available disk space in bytes:20,570,112──┐
      │ Addr Device  Label  Atype  Size    Mgr   FN/P       Path:>G:\VM
      │ ----------------------------------------------------------------------------
      │ >    >      >       >      >        >  >
      │ 100  FB-512 USER03                  1   D:\VM\SAMPLE.191
      │ 101  FB-512 NEW191  PERM   4096K     1   G:\VM\NEWUSER.191
      │
```

In this screen, you can tell that DASD device 100 is not found because the device does not have a *Size* or *Atype*. In this example, we manually moved the file SAMPLE.191 from the D: drive to the E: drive using the OS/2 COPY or MOVE commands.

4. Move the cursor down to the OS/2 file name for device 100 (using the TAB and arrow keys) and overtype the **D:** with an **E:** and then press **ENTER**.

5. If the OS/2 file E:\VM\SAMPLE.191 is found, then the size and allocation type fields are filled in by the Configurator.

6. Repeat these steps for any other DASD files that you have moved.

7. To save your work and exit the from the Configurator, press **F10** to go back to the **FUNCTIONS** main menu.

8. Press **F6** (*END – SAVE ALL, then EXIT*) to save the updates that you made.

   Note: None of the changes that you have specified are saved until you exit from the Configurator.

Changing OS/2 Drive Letters with RDEVMAP.CMD

Use this method if you have many DASD files that need their drive letters updated. This method only works if *every* file in a given subdirectory has changed drive letters. For example, if *all* D:\VM files were changed to E:\VM, do the following:

1. Type in this command at an OS/2 prompt:

   RDEVMAP d=D:\VM\ E:\VM\

   This causes ALL occurrences of D:\VM to be changed to E:\VM in the current DEVMAP file.

2. For other RDEVMAP options, see "RDEVMAP.CMD OS/2 Utility" on page 236 or enter RDEVMAP ? from an OS/2 prompt.

Hiding I/O Devices

Sometimes you want to have a device address defined in DEVMAP, but want to temporarily hide the device from the operating system. Perhaps you do not currently have the piece of hardware attached to your S/390 Server, or you want to reserve an address for when this DEVMAP will be used on another P/390 system.

Hidden or *Excluded* devices are always displayed in **dark blue**.

To exclude a device or range of devices:

1. Start at the P/390 Configurator **FUNCTIONS** main menu.

See "Starting the Configurator" on page 62 for instructions on how to get to the Configurator's main menu (cnfuns).

2. Choose the option *Update System Devices* by pressing **F2**.

An **UPDATE SYSTEM DEVICES** menu similar to the following appears:

```
                 U P D A T E   S Y S T E M   D E V I C E S          Mode = ESA


                                    ─── Available disk space in bytes:20,570,112───┐
    │Addr Device  Label  Atype  Size    Mgr   FN/P        Path:>G:\VM
    │-----------------------------------------------------------------------------
    >     >     >       >     >        >  >
    │200  3278          DSPLY           3   System Operator
    │201  3278          DSPLY           3   Local 1
    │202  3278          DSPLY           3   Local 2
    │203  3278          DSPLY           4   LAN 1
    │204  3278          DSPLY           4   LAN 2
    │205  3278          DSPLY           4   LAN 3




    Mgr Codes:  1=AWSFBA   2=AWSCKD   3=AWS3274  4=LAN3274  5=AWS3215  6=AWS2821
    7=AWS2540  8=LAN3172  9=LCS3172  A=MGR3172  B=WAN3172  C=AWSICA   D=AWSTAPE
    E=SCSI3480 F=SCSI3420 G=AWS3480  H=AWS3420  I=AWSOMA   J=AWSPCSRV K=AWSICE

    ┌─────────────────────────────────────────────────────────────┐
    │ F1 Help   ALT-F1 Function Key Definitions   F10 Main Menu  ESC No Changes │
    └──────────────────────────────────────────────────────────────cnsysdev┘
```

3. Move the cursor down into the body of the menu under first address that you would like to exclude and press **Alt+F3** *Exclude*. If you choose address 204, which is a LAN3274 managed display device, the next *two* lines (both devices 204 and 205) will be changed to **dark blue**.

The effect of using **Alt+F3** always continues through the range of device addresses, starting with the cursor position, and ending when the control unit Mgr changes.

If you only wanted to exclude address 204, then move the cursor down under device 205 and press **Alt+F5** *Restore*.

Now the menu looks like:

```
                 U P D A T E   S Y S T E M   D E V I C E S          Mode = ESA


                                    ─── Available disk space in bytes:20,570,112───┐
    │Addr Device  Label  Atype  Size    Mgr   FN/P        Path:>G:\VM
    │-----------------------------------------------------------------------------
    >     >     >       >     >        >  >
    │200  3278          DSPLY           3   System Operator
    │201  3278          DSPLY           3   Local 1
    │202  3278          DSPLY           3   Local 2
    │203  3278          DSPLY           4   LAN 1
    │204  3278          DSPLY           0   LAN 2
    │205  3278          DSPLY           4   LAN 3
```

To restore a previously excluded device or range of devices:

- Move the cursor down into the body of the menu under first **dark blue** address that you would like to restore and press **Alt+F5** *Restore*. In the above example we chose address 205, which had been excluded along with device 204. All blue lines starting with the cursor and continuing to the end of that control unit Mgr range will be changed back to light blue.

Note: When ALL the devices that are managed by a particular Mgr code are excluded, then the Mgr name in the *Mgr Codes* list at the bottom of the menu is also changed to **dark blue**.

To hide a DASD volume:

Individual DASD volumes can be hidden from the operating system by placing an asterisk (*) in front of the entire file name in the *FN/P* field for that particular device address.

Allocating CP System Volumes in VM Mode

Typically, your system programmer will have predefined the various allocation parameters for your PAGING, SPOOLS, and TDISKS volumes and left these as partial entries in your DEVMAP file. When you installed the P/390 Program and all your CP volumes on your P/390, you must also allocate these volumes by using the **UPDATE SYSTEM DEVICES** menu.

1. Start at the P/390 Configurator **FUNCTIONS** main menu.

   See "Starting the Configurator" on page 62 for instructions on how to get to the Configurator's main menu (cnfuns).

2. Choose the option *Update System Devices* by pressing **F2**.

   An **UPDATE SYSTEM DEVICES** menu similar to the following appears:

```
                    U P D A T E   S Y S T E M   D E V I C E S        Mode = ESA


                               Available disk space in bytes:20,570,112
       Addr Device  Label  Atype  Size    Mgr   FN/P        Path:>G:\VMESA
       --------------------------------------------------------------------
     >    >      >      >      >       >  >
       300  FB-512 SYSRES  PARM   24000K   1  G:\VMESA\SYSRES.300
       301  FB-512 DIRECT  DRCT   312K     1  G:\VMESA\DIRECT.301
       302  FB-512 PAGING                  1  G:\VMESA\PAGING.302
       303  FB-512 TDISKS                  1  G:\VMESA\TDISKS.303
       304  FB-512 SPOOLS                  1  G:\VMESA\SPOOLS.304




       Mgr Codes: 1=AWSFBA   2=AWSCKD   3=AWS3274  4=LAN3274  5=AWS3215  6=AWS2821
       7=AWS2540  8=LAN3172  9=LCS3172  A=MGR3172  B=WAN3172  C=AWSICA   D=AWSTAPE
       E=SCSI3480 F=SCSI3420 G=AWS3480  H=AWS3420  I=AWSOMA   J=AWSPCSRV K=AWSICE

       F1 Help   ALT-F1 Function Key Definitions   F10 Main Menu   ESC No Changes
                                                                      cnsysdev
```

In the example menu shown, the PAGING, SPOOLS, and TDISKS volumes have been defined in DEVMAP, but they do not exist as OS/2 files on the S/390 Server fixed disk. The absence of entries in the *Atype* and *Size* columns indicates that the files do not exist. You will see entries like these if you are defining your PAGING, SPOOLS, and TDISKS volumes for the first time, or if you have deleted one or more of these volumes and are defining new versions.

The following procedures describe how to use the **UPDATE SYSTEM DEVICES** menu to allocate the PAGING, SPOOLS, and TDISKS volumes. Before you begin, however, you should determine the sizes required for each of these volumes. This depends on any instructions your system programmer may have provided, as well as on the amount of free space you have on your S/390 Server fixed disks. The examples shown in the steps that follow suggest standard sizes for each of these volumes.

The PAGING Volume

To allocate PAGING volumes:

1. Use **F7** and **F8** to scroll through the device listing until you find the device entry with the word PAGING in the *Label* column. Your P/390 was shipped with the definition of an FBA PAGING volume at real address 302 (this is the address shown in the example menu). Your system programmer may have changed the volume label, DASD type, and/or real address.[18]

2. Move the cursor under the address 302 and press **F11**, *Allocate*, for this entry. The entry will move up to the top line.

3. Enter the allocation type (*Atype*) of PAGE.

> ┌─ **IMPORTANT:** ─────────────────────────────────────
> │
> │ It is EXTREMELY important that you enter the correct *Atype* for this entry. Your P/390 will not function properly if you do not.

4. Enter the *Size* for the PAGING volume.

    A valid file size specification always has the form:

    nnnnX

    where nnnn is an integer and X is one of the following:

    - **K** for kilobytes (1K = 1024 bytes)
    - **M** for megabytes (1M = 1024K)
    - **B** for blocks (1B = 512 bytes)
    - **D** for full-pack (see the AWSFULL.PAK conversion file)

    The size specified for the PAGING volume in the following example menu is 10M.

5. Verify the minidisk file name.

    Because the entry for the PAGING volume was already in your DEVMAP file, a default file name was already provided. The previous example menu shows that the PAGING volume will be contained in the OS/2 file PAGING.302 that

---

[18] You may want to allocate a PAGING volume as a 3380 CKD device. 3380 volumes have shown better *paging* performance under VM/ESA 2.2. Note that all CKD volumes require an extra step to format and allocate them as PAGE using the ICKDSF facility in VM or independently.

will reside in the \VM\ directory of the G-drive of the S/390 Server. You can accept this default file name and path, or enter a new one.

6. Press **ENTER** again to allocate the PAGING file.

   The allocation is successful if there is enough space on your S/390 Server fixed disk. The completed DEVMAP entry is moved back into the main body of the display.

7. If you have completed allocating system volumes, see step 1 on page 142.

The TDISKS Volume

To allocate the TDISKS volume:

1. Move the cursor to the TDISKS device entry and press **F11**.

2. Enter the allocation type (*Atype*) of **TDSK**.

   ┌─── **IMPORTANT:** ──┐
   │   │
   │ It is EXTREMELY important that you enter the correct *Atype* for this entry. │
   │ Your P/390 will not function properly if you do not.   │
   │   │
   └───┘

3. Enter the *Size* of the TDISKS volume. The following example menu shows a TDISKS volume size of 10M.

4. Verify the file name.

5. Press **ENTER** again to allocate the file.

6. If you have completed allocating system volumes, see step 1 on page 142.

The SPOOLS Volume

The steps for allocating the SPOOLS volume is essentially the same as the steps for allocating the PAGING volume.

1. Move the cursor to the SPOOLS device entry and press **F11**.

2. Enter the allocation type (*Atype*) of **SPOL**.[19]

   ┌─── **IMPORTANT:** ──┐
   │   │
   │ It is EXTREMELY important that you enter the correct *Atype* for this entry. │
   │ Your P/390 will not function properly if you do not.   │
   │   │
   └───┘

3. Enter the *Size* of the SPOOLS volume. The next example menu shows a SPOOLS volume size of 15M.

4. Verify the file name.

5. Press **ENTER** again to allocate the file.

6. If you have completed allocating system volumes, see step 1 on page 142.

The following is an example of the **UPDATE SYSTEM DEVICES** menu with each of the PAGING, SPOOLS, and TDISKS volumes allocated.

---

[19] For VM/370 this allocation type is TEMP.

```
                    U P D A T E   S Y S T E M   D E V I C E S        Mode = ESA


    ┌─────────────────────── Available disk space in bytes:20,570,112─────────┐
    │Addr Device  Label  Atype  Size    Mgr   FN/P       Path:>G:\VMESA        │
    │------------------------------------------------------------------------- │
    │>    >       >      >      >        >   >                                  │
    │300  FB-512 SYSRES  PARM   24000K    1   G:\VMESA\SYSRES.300               │
    │301  FB-512 DIRECT  DRCT   312K      1   G:\VMESA\DIRECT.301               │
    │302  FB-512 PAGING  PAGE   10232K    1   G:\VMESA\PAGING.302               │
    │303  FB-512 TDISKS  TDSK   5112K     1   G:\VMESA\TDISKS.303               │
    │304  FB-512 SPOOLS  SPOL   20432K    1   G:\VMESA\SPOOLS.304               │
    │                                                                          │
    │                                                                          │
    │                                                                          │
    │                                                                          │
    │                                                                          │
    └──────────────────────────────────────────────────────────────────────── ┘

    Mgr Codes:  1=AWSFBA    2=AWSCKD    3=AWS3274  4=LAN3274  5=AWS3215  6=AWS2821
    7=AWS2540  8=LAN3172  9=LCS3172  A=MGR3172  B=WAN3172  C=AWSICA   D=AWSTAPE
    E=SCSI3480 F=SCSI3420 G=AWS3480  H=AWS3420  I=AWSOMA   J=AWSPCSRV K=AWSICE

    ┌──────────────────────────────────────────────────────────────────────┐
    │ F1 Help    ALT-F1 Function Key Definitions   F10 Main Menu  ESC No Changes│
    └─────────────────────────────────────────────────────────────────cnsysdev┘
```

1. To save your work and exit from the Configurator, press **F10** to return to the **FUNCTIONS** main menu.

2. Press **F6** (*END – SAVE ALL, then EXIT*) to save the updates that you made.

   Note: None of the changes that you have specified are saved until you exit from the Configurator. However, DASD volumes that you allocate will still exist as OS/2 files on your S/390 Server fixed disk even if you choose not to save the other changes that you made.

Creating Multiple Minidisk Volumes

This section shows you how to allocate multiple VM user minidisks on a single DASD volume. This task corresponds to the normal VM mainframe task of suballocating a real DASD device into many user minidisks. The P/390 configurator provides the **F3 UPDATE USER MINIDISKS** menu for general users to add new minidisks to their user IDs. The F3 menu always allocates a single OS/2 file for *every* user minidisk, for example, SAMPLE.191 and SAMPLE.192. This menu does not support the allocation of multiple minidisks, but it does display any MDISK statements that you have entered manually to map a single volume into smaller minidisks.

Why would you want to allocate user minidisks this way?

- To group all the pieces of a particular program product together.

   The P/390 VM/ESA preconfigured system on CD-ROM does this. (See for example, HLASM.SRC, an OS/2 file that contains seven minidisks.)

- To provide a pool of disk space that can be allocated to users while VM is running.

   Normally, if you add a minidisk while VM/ESA is running, any new device addresses are not available to VM until you END P/390 and then IPL P/390.

- To keep the number of devices in DEVMAP less than the limit of 256.

The task described below shows you how to allocate a single, larger OS/2 file and then suballocate it into multiple user minidisks. Part of the task is performed with the P/390 Configurator, and part uses an OS/2 editor.

Note: You *must* be familiar with editing the VM user directory to perform this task.

1. Start at the P/390 Configurator **FUNCTIONS** main menu.

   See "Starting the Configurator" on page 62 for instructions on how to get to the Configurator's main menu (cnfuns).

2. Choose the option *Update System Devices* by pressing **F2**.

   An **UPDATE SYSTEM DEVICES** menu similar to the following appears:

```
                    U P D A T E   S Y S T E M   D E V I C E S          Mode = ESA


                                    ── Available disk space in bytes:20,570,112──
        Addr Device  Label  Atype  Size    Mgr   FN/P        Path:>G:\VM

        ----------------------------------------------------------------------------
        >     >       >      >      >       >  >
        100  3370    SAM191  PERM   1400K      1  G:\VM\SAMPLE.191








        Mgr Codes: 1=AWSFBA    2=AWSCKD    3=AWS3274  4=LAN3274  5=AWS3215  6=AWS2821
        7=AWS2540  8=LAN3172  9=LCS3172  A=MGR3172  B=WAN3172  C=AWSICA   D=AWSTAPE
        E=SCSI3480 F=SCSI3420 G=AWS3480  H=AWS3420  I=AWSOMA   J=AWSPCSRV K=AWSICE


        F1 Help    ALT-F1 Function Key Definitions    F10 Main Menu   ESC No Changes
                                                                        ──cnsysdev┘
```

3. Move the cursor to the new entry line and fill in:

   a. *Addr* with the real device address.

      You can specify any three- or four-digit real address that is supported by your operating system.[20]

   b. *Device* with the S/390 device type. For user minidisks, the recommended type is 3370.[21]

   c. *Label* with a unique 6-character volume label.

   d. *Atype* with the allocation type PERM.[22]

   e. *Size* with the desired file size in megabytes (**M**), kilobytes (**K**), 512-byte blocks (**B**), cylinders (**C**), for full-pack (**D**).

   f. *FN/P* with an OS/2 file name.

      You can specify any valid OS/2 subdirectory and file name. If left blank, it defaults to *Path\label.addr.* where *path* is the drive letter and subdirectory name displayed in the *Path* field at the top of the menu, and *label* and *addr* are taken from the entry fields.

4. When you have completed all the entry fields, press **ENTER**.

---

[20] In VM/370 mode, you must choose a real address that corresponds to the desired DASD type as defined in the VM DMKRIO.ASM (real I/O configuration) file.

[21] The possible choices include 3370, 3310, 0671, 9332, 9335, 9336, or FB-512 (for FBA DASD) and 3380, 3330, 3350, 3375, 3390, or 9345 (for CKD DASD).

[22] For CKD DASD, *always* specify CKD as the allocation type. CKD volumes are *not* formatted automatically by the Configurator as are FBA volumes (this is why we recommend specifying an FBA device type for all user minidisks). You *must* use the ICKDSF Device Support Facilities program to prepare CKD volumes for use by VM/ESA.

EXAMPLE:

```
                                    ── Available disk space in bytes:20,570,112──────┐
 │Addr Device  Label  Atype  Size     Mgr   FN/P         Path:>G:\VM                 │
 │-------------------------------------------------------------------------------------
 │>101 >3370  >USER01 >perm >60000b    >   >                                         │
```

After pressing **ENTER**, the file is allocated and the device record is inserted into the
main display, sorted by real address. The *Mgr* field defaults to 1 (AWSFBA) based
on the device type (3370). The file name defaults to the subdirectory in the *Path:>*
field, the label, and the real address (G:\VM\USER01.101). Here is the resulting
menu:

```
                                      ── Available disk space in bytes:18,522,112──────┐
 │Addr Device  Label  Atype  Size     Mgr   FN/P         Path:>G:\VM                   │
 │-------------------------------------------------------------------------------------
 │>     >      >       >      >         >   >                                          │
 │100   3370   SAM191  PERM   1400K     1   G:\VM\SAMPLE.191                           │
 │101   3370   USER01  PERM   30000K    1   G:\VM\USER01.101                          │
```

5. To save your work and exit from the Configurator, press **F10** to return to the
   FUNCTIONS main menu.

6. Press **F6** (*END – SAVE ALL, then EXIT*) to save the updates you made.

   Note: None of the changes that you have specified are saved until you exit
   from the Configurator. However, DASD volumes that you allocate will
   still exist as OS/2 files on your S/390 Server fixed disk even if you
   choose not to save the other changes you made.

7. Use an OS/2 editor (for example, TEDIT or EPM with a *monospace* font) to edit
   your VM user directory file, d:\VMESA\USER.DIR.

8. Add MDISK statements in each of the desired USER sections to map the new
   DASD volume that you have just allocated.

   The usual VM Directory rules apply.

EXAMPLE: Add three minidisks to user ID SAMPLE

```
USER SAMPLE SAMPLE 10M 32M G                                          SAMPLE
 INCLUDE USERPROF                                                     SAMPLE
 IPL CMS                                                              SAMPLE
 MDISK 191 FB-512 16      2800   SAM191 MR ALL                        SAMPLE
**> These are the new statements:                                    SAMPLE
 MDISK 192 FB-512 16     20000   USER01 MR ALL                        SAMPLE
 MDISK 193 FB-512 20016 20000    USER01 MR ALL                        SAMPLE
 MDISK 194 FB-512 40016 19984    USER01 MR ALL                        SAMPLE
```

Note that the first user minidisk ***must*** start at block 16 (cylinder 1 for CKD volumes). This results in there being only 59984 blocks available for suballocation.

Note: You must make sure that the Start and Extent ranges chosen for each minidisk do not result in overlaps. This will result in destroyed minidisk data. This a normal VM practice. The P/390 Configurator does *not* check for overlaps on multiple minidisk volumes; it assumes you know what you are doing. It does alert you when an MDISK statement is part of a multiple minidisk suballocation by displaying an informational message when the cursor is under that MDISK line on the F3 menu.

9. Save the changes made to the USER.DIR file.

10. IPL VM/ESA on the P/390.

11. The Operator's PROFILE EXEC will automatically PCOPY in the file USER.DIR as USER DIRECT A, and invoke DIRECTXA command to apply the new directory. If there are any syntax errors, they will be displayed now.

12. Log on to the user IDs and use the CMS FORMAT command to format each new minidisk.[23]

Customers who have a large number of users may choose to *entirely* manage the VM user directory from VM/ESA using normal VM methods or products (such as the DIRMAINT program product). In this case, all DASD volumes should be allocated via the **F2 UPDATE SYSTEM DEVICES** menu, and then the chosen VM directory management product should be informed about the new volume. If you are using this method, then blank out the Directory > field on the password screen of the P/390 Configurator. This will disable the F3 set of user menus.

---

[23] If you allocated a CKD DASD file, then ICKDSF must be used to initialize the entire volume prior to using any of the minidisks. See the ICKDSF documentation for instructions. That is why we recommend using only FBA DASD (such as 3370) for user minidisks.

Chapter 8. Configuring the 3172 SDLC Gateway

This chapter explains how to configure the 3172 SDLC Gateway. Because the P/390 3172 SDLC Gateway and 3172 SNACOM are built from the same code base, the 3172 SNACOM manual *3172 SNA Communications Program User's Guide*, GC30-3675, is also a useful reference as long as one keeps in mind that the sections describing the 3172 host configuration are different from those used by P/390. This chapter focuses on considerations unique to the P/390 3172 SDLC Gateway implementation.

Overview

Devices connected to the S/390 Integrated Server through SDLC lines are configured to VTAM as token-ring LAN devices. The 3172 SDLC Gateway provides a protocol translation between VTAM LAN (XCA) and SDLC. Existing VTAM ICA or NCP definitions may be used as a basis for the VTAM 3172 SDLC Gateway definitions required for the S/390 Integrated Server. Because 3172 SDLC Gateway presents VTAM with an XCA interface, many of the SDLC parameters are specified using the 3172 SDLC Gateway configuration program. Parameters specified using the 3172 SDLC Gateway configuration program will override similar definitions that may be configured in any applicable VTAM switched-network definitions.

Each SDLC line is configured to VTAM as a separate XCA token-ring PORT (using a different ADAPNO to associate each XCA definition to a different SDLC port) that:

- Allows an operator to enable and disable each SDLC line
- Is used in reporting network management events such as alerts

The SDLC support has the following key features:

Leased lines

SDLC lines can be configured for permanent connection operation. Each line can support either point-to-point operation to a single remote linkstation, or multipoint operation to a number of stations. Multipoint operation is architecturally limited to 253 stations, but, for line performance reasons, would not typically exceed eight stations. A leased line can support either point-to-point half-duplex or full-duplex. It also can support multipoint half-duplex or full-duplex; multipoint half-duplex requires the secondary to be switched RTS.

A poll list is configured to the 3172 SDLC Gateway for all primary, multipoint, leased line devices. PU 2 and PU 2.1 devices are defined to VTAM as switched and are configured in a VTAM SWNET major node. The 3172 SDLC Gateway polls the SDLC devices and, when contact is made, performs an incoming connection to VTAM. The SDLC device's XID parameters of either IDNUM/IDBLK or CPNAME are used to identify the specific node definition in the SWNET major nodes.

If a leased device is incapable of sending an XID, the 3172 SDLC Gateway can be configured to provide a proxy XID on behalf of the SDLC device. This use of a proxy XID is typically required only for older SDLC devices that cannot be configured for XID support. For an example of specifying proxy XID, see step 4 on page 153.

Proxy XID is also useful when connecting to downstream devices through a 3174 that does not support Passthru (RPQ 8Q0800).

SDLC attached PU4s (NCP) and PU5s (VTAM connected through another 3172 SDLC Gateway) are configured to VTAM as leased-line attached devices under the VTAM XCA PORT statements. All these devices support XID, therefore the proxy XID feature is not used. SWNET definitions are not required for these connections because PU4s and PU5s follow VTAM leased-line (DIAL=NO) protocol models.

Switched lines

The 3172 SDLC Gateway supports switched lines configured for dial-in operation to the 3172 SDLC Gateway. Modems that are configured for auto-answer can be used, and data set ready (DSR) is used by the modem to indicate an incoming call. Modems that use CD (or RLSD) to modulate receive data (old, true half-duplex modems) may not be usable with the 3172 SDLC Gateway. A switched line can support either point-to-point half-duplex, or full-duplex. Usable devices include Communications Manager/2, Personal Communications/3270, and Retail Store controllers.

The 3172 SDLC Gateway accepts incoming calls and, if configured as either Primary or Negotiable, polls the device with an XID. The calling device sends its XID, which is forwarded to VTAM for the purpose of selecting a SWNET major node definition. If VTAM accepts the XID, a logical connection is established with the device. If VTAM does not accept the XID, or if the device does not send one, the 3172 SDLC Gateway terminates the call by lowering data terminal ready (DTR).

Synchronous or asynchronous operation

SNA/SDLC devices traditionally have operated over synchronous modems. The 3172 SDLC Gateway also can support asynchronous operation as defined in ISO standard 3309.1. This function allows remote devices, such as personal computers, to use asynchronous internal modems to dial the 3172 SDLC Gateway and operate as SNA/SDLC sessions. Software that supports this asynchronous SNA/SDLC communication mode includes Communications Manager/2 and Personal Communications/3270.

Data transfer options

The 3172 SDLC Gateway can support devices that handle data either in a single direction at one time, or in both directions simultaneously. This full-duplex operation is supported by devices such as NCP, IBM 3174 Establishment Controller, and other 3172 SDLC Gateway nodes. Use of full-duplex increases the throughput of the line and reduces response times for interactive transactions.

Group Poll

The 3172 SDLC Gateway supports devices such as the 3174 Establishment Controller that have a Group Poll function. This means that the device receives a single poll, but it may respond with data from any one of many downstream devices. This feature improves the efficiency and utilization of the communications channel.

Capacities

The 3172 SDLC Gateway supports up to 16 lines using either the ARTIC MultiPort Model2 or the WAC adapters. You can use the following adapters:

- WAC Adapter, 2 SDLC lines at up to 256 Kbps each. Each line can be used by SDLC.

- ARTIC MultiPort Model2 adapter, 4 V.35 lines at up to 64 Kbps each
- ARTIC MultiPort Model2 adapter, 8 EIA 232 lines at up to 19.2 Kbps each

You can use a total of three adapters in any combination.

How to Configure for 3172 SDLC Gateway

The following section provides instructions for configuring the 3172 SDLC Gateway for operation on the P/390. See "Examples of 3172 SDLC Gateway Configurations" on page 155 for examples of 3172 SDLC Gateway configuration. Do the following steps.

Complete these steps:

1. Plan your network.
2. Configure VTAM on the host.
3. Install the 3172 SDLC Gateway program.
4. Configure the host channels and subchannels.
5. Configure SDLC lines.
6. Back up the configuration files.

Planning Your Network

The *3172 SNA Communications Program User's Guide* contains worksheets that can help you plan and configure your system.

Configuring VTAM on the Host

SDLC devices attached through the 3172 SDLC Gateway are defined to VTAM as if they were attached to a token-ring LAN and require a VTAM XCA major node and a switched major node for PU2 devices. To define 3172 SDLC Gateway devices to VTAM, create these files:

- eXternal Communication Adapter (XCA) major node definition
- Switched (SWNET) major node definition for PU2 devices

The following sections describe these files.

For more information on configuring VTAM, refer to *VTAM Resource Definition Reference*.

XCA Major Node Definition

Defining an XCA major node requires coding VTAM definition statements to define the following characteristics:

- The node type (VBUILD definition statement)
- The port used by the LAN (PORT definition statement)
- Any switched nodes attached to the 3172 SDLC Gateway SDLC line (GROUP, LINE, and PU definition statements)

Code a VBUILD definition statement and a PORT definition statement for the major node, and code GROUP, LINE, and PU definition statements for any switched nodes.

Switched Major Node Definition

The switched major-node definition provides VTAM device specific parameters that VTAM will use to communicate with the remote devices through the 3172 SDLC Gateway and identifies:

- Node type (VBUILD definition statement)
- Network resources (PU and LU definition statements)

Installing the 3172 SDLC Gateway Program

Do the following steps to install the 3172 SDLC Gateway program:

1. Ensure that you have a supported MultiPort Model2 or WAC adapter installed.

2. The LAN Adapter and Protocol Support (LAPS) programs *must* be installed on the C: drive in order to use this option.

3. Open an OS/2 window.

4. Type

   inst3172

   to install the programs necessary for 3172 SDLC Gateway.

5. Edit CONFIG.SYS by removing **rem** from the beginning of the WAN3172 SDLC statement in P/390 communication card section of CONFIG.SYS.

6. Exit and save the changes.

7. Shutdown and reboot OS/2.

8. Review the information contained in file C:\SNACOM\SNA3172.DOC.

Configure the Host Channels and Subchannels

Go to the P/390 Configurator Main Menu. Select **F2 Update System Devices** menu. Next, you will configure SDLC ports.

onfiguring SDLC Ports

To allocate SDLC ports, complete the following steps:

1. Select **F11** from the **P/390 Configurator** menu.

The SNA Communications Program Configurator window appears.
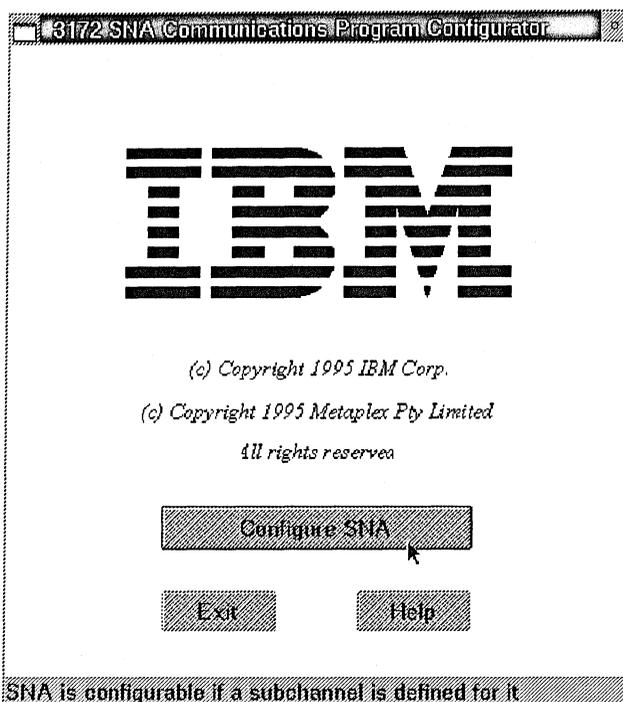
Figure 23. 3172 SDLC Gateway Configurator Window

2. Click on **Configure SNA**. The SNA Configuration window appears.
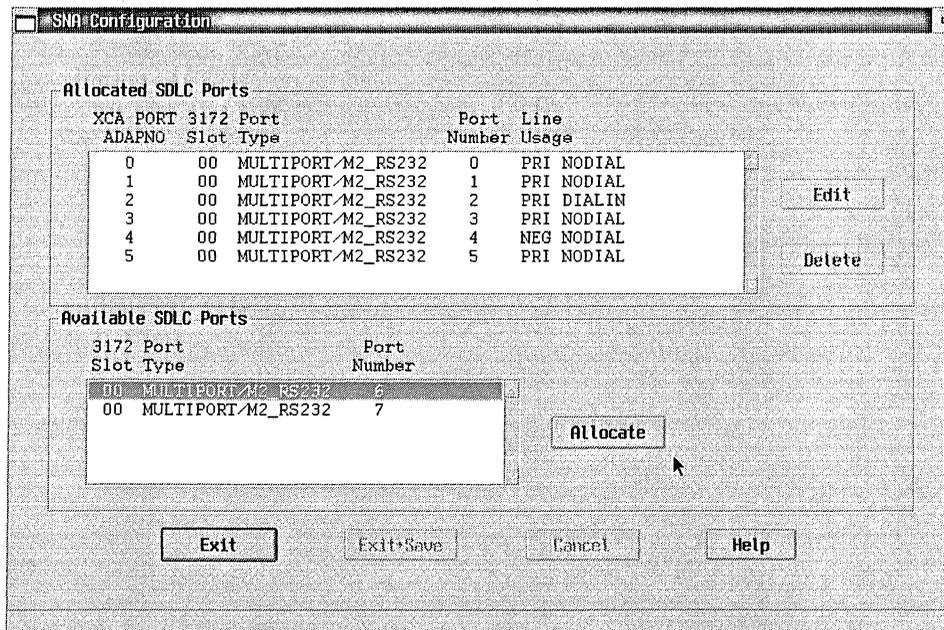
Figure 24. SNA Configuration Window

The SNA Configuration Window shows both currently allocated SDLC ports and other available SDLC ports.

The Port Type can be:

- MultiPort Model2 RS-232

- MultiPort Model2 V.35
- MultiPort Model2 X.21
- MultiPort Model2 RS-422
- WAC_V.35
- WAC_X.21
- WAC EIA 232
- WAC EIA 422

The Slot number is the S/390 Integrated Server adapter number. The Port number is the line/port on the adapter.

3. To allocate a port, select an available SDLC port and click on **Allocate**, or, to change the parameters of a port, select the port from the Allocated ports list and click on **Edit**.

In either case, the SDLC Port Edit window appears.

Figure 25. SDLC Port Edit Window

Note: If a multipoint line coded as full-duplex on the primary side is to support a half-duplex secondary station, the secondary station must support XID type 1 or XID type 3. If this same line is coded as half-duplex, the secondary station will be half-duplex regardless of the type of XID support at the secondary station.

4. To set the poll parameters, click on **Set Poll Parms**. The SDLC Poll Parameters window appears:
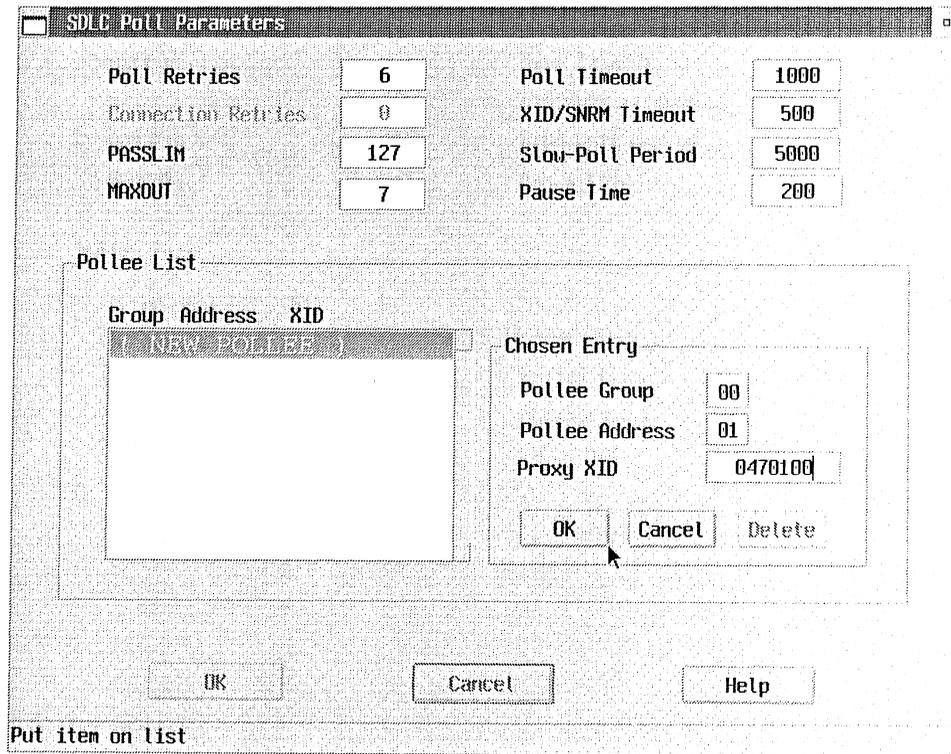
Figure 26. SDLC Poll Parameters Window

a. To add a pollee list, double-click on **New Pollee**.

b. Enter the appropriate values for Pollee Group, Pollee Address, and Proxy XID in the Chosen Entry window. The pollee address is the (addr) address of the VTAM switched major node. The proxy XID is the first three characters of the IDBLK followed by the five characters of the IDNUM.

c. Click on **OK**. The pollee appears in the pollee list.

d. Repeat steps 4a through 4c for each pollee.

e. Click on **OK** at the bottom of the window. The SDLC Port Edit window reappears.

5. To set the EIA parameters, click on **Set EIA Parms**. The EIA Parameters window for the ARTIC MultiPort Model2 or WAC adapter appears.
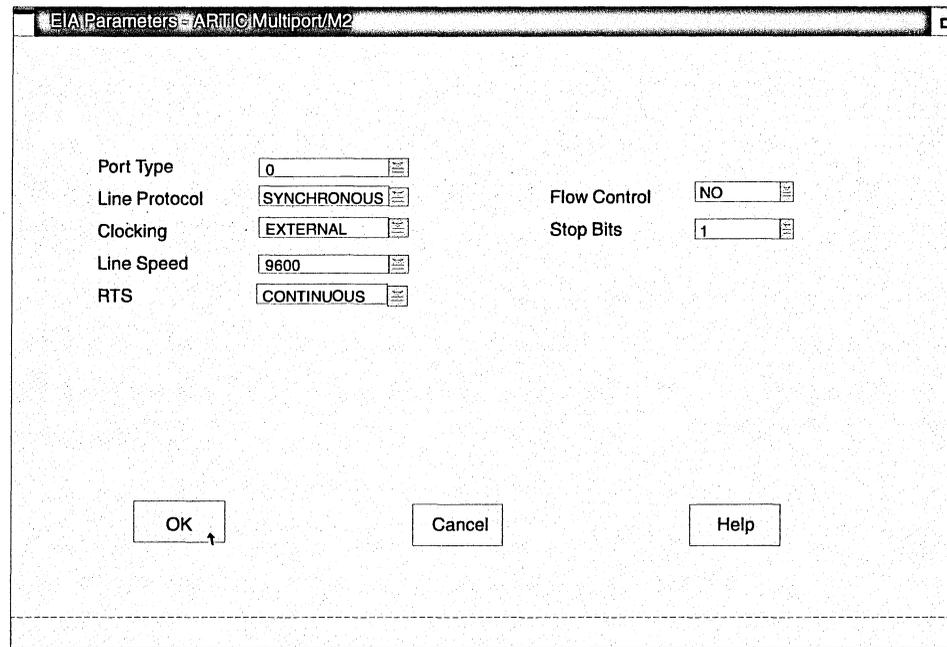
Figure 27. EIA Parameters Window—ARTIC MultiPort/M2
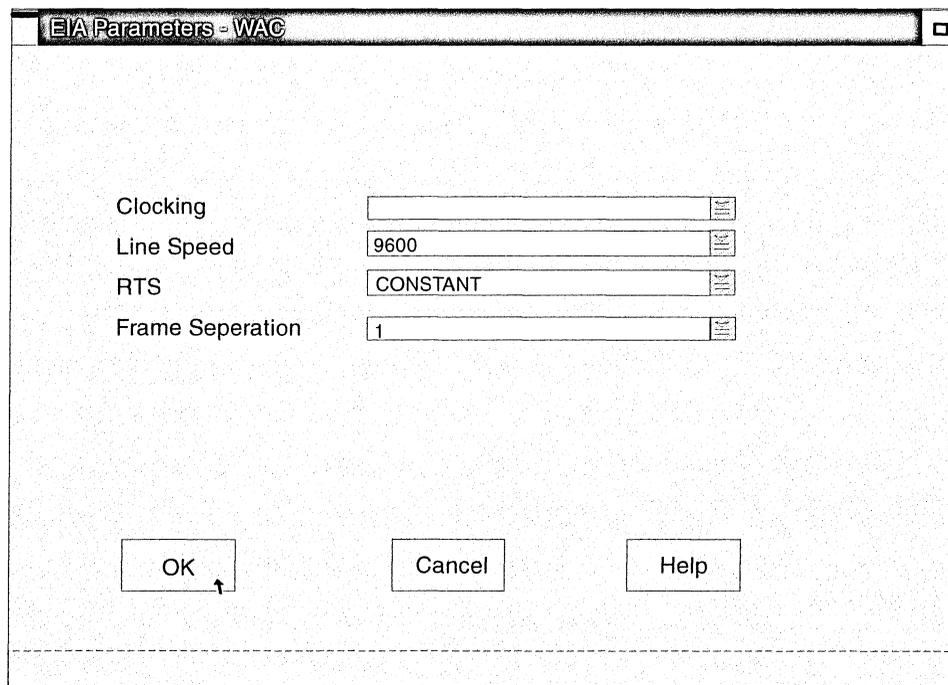
Figure 28. EIA Parameters Window—WAC

a. Enter the appropriate values in the edit fields.

b. Click on **OK**. The SDLC Port Edit window reappears.

6. Click on **OK** on the SDLC Port Edit window. The SNA Configuration window appears.

7. Repeat steps 3 on page 152 through 7 (this step) for each MultiPort Model2 or WAC adapter port you wish to configure. When you are finished, click on **Exit + Save**. The 3172 SDLC Gateway Configurator window appears.

8. Follow the on-screen instructions for exiting the 3172 SDLC Gateway Configurator, saving the changes, and updating the required files. The OS/2 window appears.

You have completed SDLC line configuration.

Examples of 3172 SDLC Gateway Configurations

This section contains a sample 3172 SDLC Gateway network configuration. It describes the VTAM files and shows how the 3172 SDLC Gateway screens can be used to set up a particular network. This section also shows the steps involved in configuring each part of a network. Use these examples as a guideline when configuring your network. Figure 29 on page 156 shows a sample network. The letters **A** through **E** correspond to the examples that follow.

These configurations assume the following adapters are installed in the S/390 Integrated Server:

- Artic EIA 232 MultiPort Model2 adapter in slot 3 (8 ports)
- Artic EIA 232 MultiPort Model2 adapter in slot 4 (8 ports)
- WAC with two V.35 ports in slot 5 (2 ports)
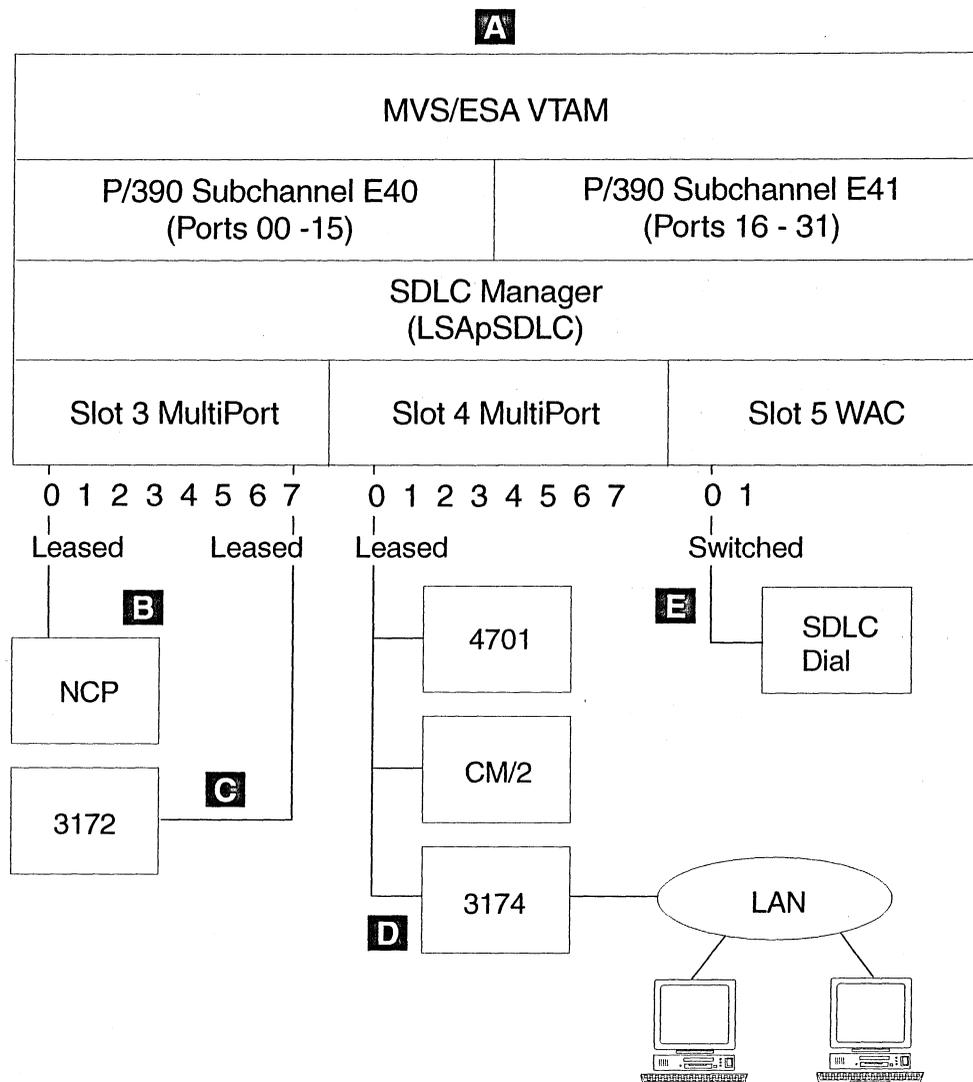
Figure 29. A Sample 3172 SDLC Gateway Network

Example A. Configuring P/390 Subchannels E40 and E41

Because the S/390 Integrated Server in this example will support more than 16 ports, (8 ports for each MultiPort Model2 and 2 ports for the WAC for a total of 18), this example includes two subchannels. Each port requires its own XCA major node definition. The port is specified by the ADAPNO= value on the XCA PORT statement. Because the maximum value VTAM can accept for ADAPNO= is 15, two subchannels are used to provide addressability for 32 ports. The lowest subchannel is assigned Ports 00 through 15 and the highest subchannel is assigned to ports 16 through 32. In other words, on the lower subchannel (E40), ADAPNO=0 selects 3172 SDLC Gateway port number 0 and on the upper subchannel (E41), ADAPNO=0 selects 3172 SDLC Gateway port number 16. The 3172 SDLC Gateway port number is shown on the "SDLC Port Edit" screen as the XCA PORT ADAPNO and is sequentially assigned (by default) in the order in which "Available SDLC Ports" are selected for allocation on the "SNA Configuration" screen.

Use P/390 Configurator (F2, Update System Devices menu) to configure two subchannels for use with the 3172 SDLC Gateway. In the **Device** field, specify 3088. In the **Mgr** field, specify the manager code for WAN3172 (for Wide Area Network), B. See Figure 30 on page 157. The **FN/P** field has the following optional comments: 3172 SDLC Gateway (00-15) and 3172 SDLC Gateway (16-31).

The 3172 SDLC Gateway port number assignments are made using the 3172 SDLC Gateway configuration utility (LSApCFG.EXE). It is the user's responsibility to coordinate the port assignments made during 3172 SDLC Gateway configuration with the VTAM XCA Major Node definitions.

```
                                Available disk space in Mbytes: 36
     Addr Device  Label  Atype  Size    Mgr   FN/P     PATH:>E:\                          <
     ---------------------------------------------------------------------------------
     >    |       >       >      >       >   >


      E40   3088                           B   3172 SDLC Gateway (00-15)
      E41   3088                           B   3172 SDLC Gateway (16-31)



     Mgr Codes: 1=AWSFBA    2=AWSCKD    3=AWS3274   4=LAN3274   5=AWS3215  6=AWS2821
     7=AWS2540  8=LAN3172   9=LCS3172   A=MGR3172   B=WAN3172   C=AWSICA   D=AWSTAPE
     E=SCSI3480 F=SCSI3420  G=AWS3480   H=AWS3420   I=AWSOMA    J=AWSPCSRV K=AWSICE


      F1 Help   ALT+F1 Key Definitions   F10 Main Menu   ESC Cancel Input      cnsysdev
```

Figure 30. Example of a P/390 device configuration

Example B. Configuring Leased SDLC Subarea Connection to NCP

1. From the P/390 Configurator Main Menu, select **F11**, **Configuring the 3172 SDLC Gateway**. (Or type, LSApCFG from an OS/2 window.)

2. Select **Configure SNA**.

3. On the SNA Configuration window:

   a. Select **MULTIPORT MODEL2_RS232**, Slot **03**, Port Number **0**.

   b. Select **Allocate**.
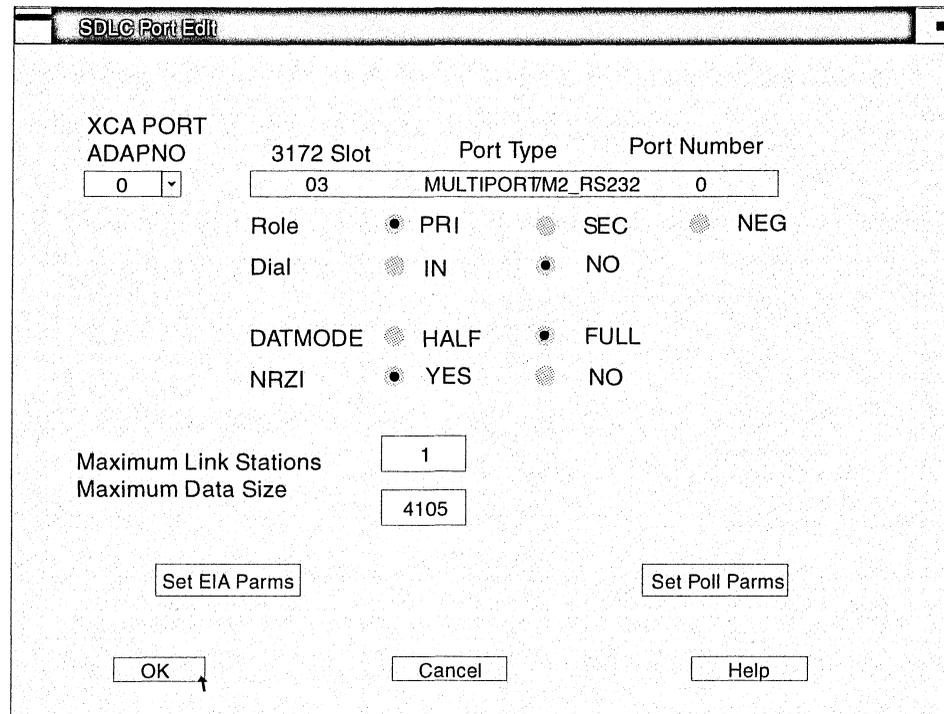
Figure 31. SDLC Port Edit Window

4. On the SDLC Port Edit window:

   a. Select **Full** for DATMODE.

   b. Enter **4105** for Maximum Data Size.

   c. Leave all other values as defaults.

XCA VTAM Definition

```
********
XCANCP    VBUILD TYPE=XCA
*
PRTNCP    PORT   CUADDR=E40,
                 MEDIUM=RING,
                 ADAPNO=0,
                 TIMER=60,
                 SAPADDR=04
*
GRPNCP    GROUP  DIAL=NO
*
LNNCP     LINE
PUNCP     PU     MACADDR=000000000001,
                 PUTYPE=4,
                 TGN=01,
                 SUBAREA=1,
                 SAPADDR=04
```

Note: The POLL ADDRESS is the low-order byte of the MACADDR field, which is 0x01 in this example (the five high=order bytes of the MACADDR are reserved and should be set to zero). TGN and SUBAREA must match those values of the remote NCP.

SWNET VTAM Definition

None.

NCP Definition

The 3172 SDLC Gateway does the polling because its role is primary to the secondary role of the NCP. As indicated in the following sample definition, the value specified (or defaulted) for TADDR in the NCP definition must match the lower order "byte" of the MACADDR in the XCA VTAM definition.

```
***********************************************************************
*        ADDRESS 034:  INN LINK, SDLC, LEASED, 19.2KB LINE           *
***********************************************************************
*
A23LEAS3 GROUP ACTIVTO=60.0,
               MODE=SEC,
               DIAL=NO,
               LNCTL=SDLC,
               MODULO=8,
               REPLYTO=3,
               TYPE=NCP
*
A23S34   LINE  ADDRESS=(064,FULL),
               TADDR=01,
               CLOCKNG=EXT,
               DUPLEX=FULL,
               ISTATUS=INACTIVE,
               NEWSYNC=NO,
               NRZI=YES,
               SPEED=19200,
               TRANSFER=41
*
A23P23I  PU    AVGPB=256,
               IRETRY=YES
               MAXDATA=4105,
               MAXOUT=7,
               PUTYPE=4,
               TGN=1
```

Example C. Configuring Leased SDLC Connection to Another 3172

1. From the P/390 Configurator Main Menu, select **F11, Configuring the 3172 SDLC Gateway**. (Or type, LSApCFG from an OS/2 window.)

2. Select **Configure SNA**

3. On the SNA Configuration window:

   a. Select **MULTIPORT MODEL2_RS232**, Slot **03**, Port Number **7**.

   b. Select **Allocate**.

```
┌─────────────────────────────────────────────────────────────────┐ ■
│ ┌─ SDLC Port Edit ──────────────────────────────────────────────┐│
│ │                                                                ││
│ │    XCA PORT                                                    ││
│ │    ADAPNO       3172 Slot     Port Type       Port Number      ││
│ │    ┌─────┐┌─┐  ┌──────────────────────────────────────────┐    ││
│ │    │  7  ││▾│  │   03        MULTIPORT/M2_RS232      1     │    ││
│ │    └─────┘└─┘  └──────────────────────────────────────────┘    ││
│ │                  Role    ● PRI      ○ SEC      ○ NEG           ││
│ │                  Dial    ○ IN       ● NO                      ││
│ │                                                                ││
│ │                  DATMODE ○ HALF     ● FULL                    ││
│ │                  NRZI    ● YES      ○ NO                      ││
│ │                                                                ││
│ │                             ┌─────┐                            ││
│ │    Maximum Link Stations    │  1  │                            ││
│ │    Maximum Data Size        └─────┘                            ││
│ │                             ┌──────┐                           ││
│ │                             │ 4105 │                           ││
│ │                             └──────┘                           ││
│ │                                                                ││
│ │      ┌──────────────┐                   ┌───────────────┐      ││
│ │      │ Set EIA Parms│                   │ Set Poll Parms│      ││
│ │      └──────────────┘                   └───────────────┘      ││
│ │                                                                ││
│ │    ┌─────────┐          ┌──────────┐          ┌──────────┐     ││
│ │    │   OK    │          │  Cancel  │          │   Help   │     ││
│ │    └─────────┘          └──────────┘          └──────────┘     ││
│ └────────────────────────────────────────────────────────────────┘│
└─────────────────────────────────────────────────────────────────┘
```

4. On the SDLC Port Edit window:

   a. Select **7** for XCA PORT ADAPNO.

   b. Select **Full** for DATMODE.

   c. Enter **4105** for Maximum Data Size.

   d. Leave all other values as defaults.

XCA VTAM Definition

```
********
XCA3172   VBUILD TYPE=XCA
*
PRT3172   PORT   CUADDR=E40,
                 MEDIUM=RING,
                 ADAPNO=7,
                 TIMER=60,
                 SAPADDR=04
*
GRP3172   GROUP  DIAL=NO
*
LN3172    LINE
PU3172    PU     MACADDR=000000000002,
                 PUTYPE=5,
                 TGN=02,
                 SUBAREA=2,
                 SAPADDR=04
```

Note: The POLL ADDRESS is the low-order byte of the MACADDR field, which is 02 in this example. TGN and SUBAREA must match values specified at the remote node.

SWNET VTAM Definition

None.

Example D. Configuring Leased SDLC Multipoint Connection

1. From the P/390 Configurator Main Menu, select **F11, Configuring the 3172 SDLC Gateway**. (Or type, LSApCFG from an OS/2 window.)

2. Select **Configure SNA**.

3. On the SNA Configuration window:

   a. Select **MULTIPORT MODEL2_RS232**, Slot **04**, Port Number **0**.

   b. Select **Allocate**.

```
┌──────────────────────────────────────────────────────────────────────┐  ■
│  SDLC Port Edit                                                        │
│                                                                        │
│                                                                        │
│    XCA PORT                                                            │
│    ADAPNO        3172 Slot      Port Type       Port Number            │
│    ┌ 8 ┐ ▼    ┌   04      MULTIPORT/M2_RS232      0   ┐                │
│                                                                        │
│              Role       ● PRI      ● SEC        ● NEG                  │
│              Dial       ● IN       ● NO                               │
│                                                                        │
│              DATMODE    ● HALF     ● FULL                             │
│              NRZI       ● YES      ● NO                               │
│                                                                        │
│                                                                        │
│    Maximum Link Stations      ┌   5   ┐                               │
│    Maximum Data Size                                                   │
│                               ┌  521  ┐                               │
│                                                                        │
│        ┌ Set EIA Parms ┐                    ┌ Set Poll Parms ┐        │
│                                                            ↑           │
│                                                                        │
│      ┌    OK    ┐         ┌   Cancel   ┐         ┌   Help   ┐         │
│                                                                        │
└──────────────────────────────────────────────────────────────────────┘
```

4. On the SDLC Port Edit window:

   a. Select **8** for XCA PORT ADAPNO.

   b. Select **PRI** for Role.

   c. Enter **5** for Maximum Link Stations.

   d. Leave all other values as defaults.

   e. Select **Set Poll Parms**.

5. Define the 4701 connection:

   a. Select **(NEW POLLEE)**.

   b. Leave Pollee Group as 00.

   c. Enter **01** as Pollee Address.

   d. Enter **04701000** as Proxy XID. Click on **OK**.

6. Define the Communications Manager/2 connection:

   a. Select **(NEW POLLEE)** again.

   b. Leave Pollee Group as 00.

   c. Enter **02** as Pollee Address.

   d. Leave Proxy XID as 00000000. Click on **OK**.

7. Define the 3174 PU connection:

   a. Select **(NEW POLLEE)** again.

   b. Enter **C0** as Pollee Group.

   c. Enter **C1** as Pollee Address.

   d. Leave Proxy XID as 00000000. Click on **OK**.

8. Define the 3174 downstream LAN connection:

   a. Select **(NEW POLLEE)** again.

   b. Enter **C0** as Pollee Group.

   c. Enter **C2** as Pollee Address.

   d. Leave Proxy XID as 00000000. Click on **OK**.

9. Define the 3174 downstream LAN connection:

   a. Select **(NEW POLLEE)** again.

   b. Enter **C0** as Pollee Group.

   c. Enter **C3** as Pollee Address.

   d. Leave Proxy XID as 00000000. Click on **OK**.

Note: There are 3 configuration support levels of 3174 microcode. Configuration support B and configuration support C require proxy XID to be defined in the 3172 for devices downstream of the 3174. Configuration support B with RPQ will pass through XIDs from downstream devices, and does not require proxy XID to be defined.

XCA VTAM Definition

```
********
XCAMPT    VBUILD TYPE=XCA
*
PRTMPT    PORT   CUADDR=E40,MEDIUM=RING,ADAPNO=8,TIMER=60,SAPADDR=04
*
GRPMPT    GROUP  DIAL=YES
*
LNMPT1    LINE   ANSWER=ON,CALL=IN,ISTATUS=ACTIVE
PUMPTX1   PU     ISTATUS=ACTIVE
*
LNMPT2    LINE   ANSWER=ON,CALL=IN,ISTATUS=ACTIVE
PUMPTX2   PU     ISTATUS=ACTIVE
*
LNMPT3    LINE   ANSWER=ON,CALL=IN,ISTATUS=ACTIVE
PUMPTX3   PU     ISTATUS=ACTIVE
*
LNMPT4    LINE   ANSWER=ON,CALL=IN,ISTATUS=ACTIVE
PUMPTX4   PU     ISTATUS=ACTIVE
*
LNMPT5    LINE   ANSWER=ON,CALL=IN,ISTATUS=ACTIVE
PUMPTX5   PU     ISTATUS=ACTIVE
```

SWNET VTAM Definition

```
********
SWNMPT    VBUILD TYPE=SWNET
*
PUMPT1    PU     ADDR=01,PUTYPE=2,DLOGMOD=B22NNE,
                 ISTATUS=ACTIVE,MAXDATA=265,
                 MODETAB=LMT3270,
                 IDBLK=047,IDNUM=01000
LUMPT12   LU     LOCADDR=1
*
PUMPT2    PU     ADDR=02,PUTYPE=2,DLOGMOD=B22NNE,
                 ISTATUS=ACTIVE,MAXDATA=521,
                 MODETAB=LMT3270,CPNAME=PUU60114
LUMPT22   LU     LOCADDR=2
*
PUMPT3    PU     ADDR=C1,PUTYPE=2,DLOGMOD=B22NNE,
                 ISTATUS=ACTIVE,MAXDATA=521,
                 MODETAB=LMT3270,
                 IDBLK=017,IDNUM=03174
LUMPT32   LU     LOCADDR=2
*
PUMPT4    PU     ADDR=C2,PUTYPE=2,DLOGMOD=B22NNE,
                 ISTATUS=ACTIVE,MAXDATA=521,
                 MODETAB=LMT3270,CPNAME=PUU60314,
                 IDBLK=05D,IDNUM=20002
LUMPT42   LU     LOCADDR=2
*
PUMPT5    PU     ADDR=C3,PUTYPE=2,DLOGMOD=B22NNE,
                 ISTATUS=ACTIVE,MAXDATA=521,
                 MODETAB=LMT3270,CPNAME=PUU60414,
                 IDBLK=05D,IDNUM=20003
LUMPT52   LU     LOCADDR=2
```

Note: For a point-to-point connection, the XCA VTAM definition would be the same as given in this example, except only LNMPT1 would be defined. LNMPT2 through LNMPT5 would be deleted. There is no change for the SWNET VTAM definition for a point-to-point connection.

Example E. Configuring Switched SDLC Connection for Dial-In

1. From the P/390 Configurator Main Menu, select **F11, Configuring the 3172 SDLC Gateway**. (Or type, LSApCFG from an OS/2 window.)

2. Select **Configure SNA**.

3. On the SNA Configuration window:

   a. Select **WAC/V.35**, Slot **05**, Port Number **0**.

   b. Select **Allocate**.
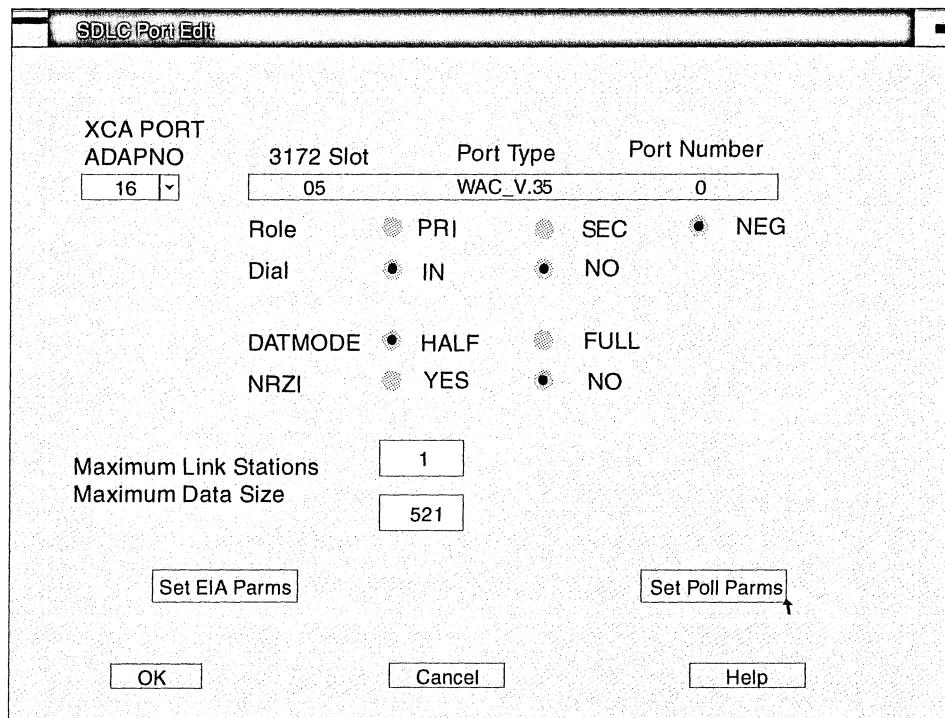
Figure 32. SDLC Port Edit Window

4. On the SDLC Port Edit window:

   a. Select **16** for XCA PORT ADAPNO.

   b. Select **IN** for Dial.

   c. Leave all other values as defaults.

XCA VTAM Definition

```
*******
XCADIAL  VBUILD TYPE=XCA
*
PRTDIAL  PORT  CUADDR=E41,
               ADAPNO=0,
               MEDIUM=RING,
               SAPADDR=4,
               TIMER=60
*
GRPDIAL  GROUP DIAL=YES,
               CALL=IN,
               ANSWER=ON
*
LNDIAL   LINE
PUDIALX  PU
```

SWNET VTAM Definition

```
*******
SWNDIAL  VBUILD   TYPE=SWNET
*
PUDIAL   PU   IDBLK=F02,
              IDNUM=00104,
              ADDR=C1,
              MAXDATA=265,
              USSTAB=NGUSSS,
              DLOGMOD=HTPCMD2E,
              MODETAB=KGNMODE
*
LUDIAL   LU   LOCADDR=1
```

Chapter 9. Using the P/390 Manual Operations Session

The P/390 Manual Operations session is a general-purpose debug facility. It is similar in function to the maintenance console found on many mainframes, and provides the ability to modify the S/390 memory and control registers. For this reason, it should be used with extreme care.

The Manual Operations session provides several functions to the P/390; these are described in this chapter. You should read this chapter in its entirety before you use the Manual Operations facility for the first time.

Knowledge of ESA/390 and CP/390 architecture is essential to the proper use of these P/390 control functions. Information about ESA/390 architecture is found in the *ESA/390 Principles of Operation* manual.

Entering the Manual Operations Session

To enter the Manual Operations session, select the P/390 Manual Operations icon. The Manual Operations window appears.

Figure 33. Manual Operations window

The Manual Operations Window Format

Various portions of the system can be viewed using Presentation Manager windows:

- S/390 memory (virtual or real)
- S/390 registers:
  - Program Status Word
  - General Registers
  - Floating Point Registers
  - Control Registers
  - Access Registers– in ESA/390 mode only
  - Prefix Register – in ESA/390 mode only
- Communication buffer (COMBUF)

  Note: The Communication buffer is used for communication between the P/390 and the S/390 Server Processor Complex. It is for internal use, and we do not recommend that you edit it for any reason. There may be times, however, when the information displayed in the Communication Buffer is important if you are reporting a problem.

You use other command bar options to control the system. Many of the functions, such as alter and display registers, or search, require execution of the adapter licensed internal code. The licensed internal code must be loaded (through the Load Microcode function) for these operations to function.

Manual Operations Session Options

The following command bar options are available:

Start/Stop

Choose this function to toggle the adapter between executing and stopped status.

While the P/390 is executing S/390 instructions, the menu bar displays a "Stop." Selecting this function, or pressing F2, stops the adapter.

While the adapter is stopped, the menu bar displays a "Start." Selecting this function, or pressing F2, causes the adapter to start or resume executing S/390 instructions.

Windows

Using this menu, you can make any of the currently open windows the foreground window. The following new windows can also be selected using this menu:

- S/390 registers
- Communication buffer
- S/390 memory (absolute)
- S/390 memory (real)
- S/390 memory (virtual)
  - Primary
  - Secondary
  - Home
  - AR mode
- IOCB
- I/O timer
- Shared memory

- SCHIB

IPL

Select this function to select a device address and to issue an Initial Program Load (IPL) request to the P/390.

Because the IPL requires devices to be operational to load the program, the device emulators and channel simulation code must be running before you select this function.

Using this method to IPL the adapter, the operator can specify that the P/390 stop immediately after the IPL is completed and before executing any instructions. This is useful for debugging the IPL program.

Control

Use this menu to choose various system functions:

Address Stop Use this option to change the address compare mode for the adapter. While operating under address compare mode, the adapter executes instructions until the instruction address reaches an address range specified by the user. This option is also used for restoring the address compare mode to normal operation.

External Interrupt Selecting this option causes an external interruption condition to be indicated to the adapter. When enabled, the adapter processes an external interruption with a code indicating the interrupt key.

Instruction Step Use this option to change the rate control for the adapter. The rate control specifies the number of instructions that the adapter executes when started. This option is also used for restoring the rate control to normal operation.

Interval Timer This option disables or enables operation of the interval timer on the adapter. By default, the interval timer operates normally, but selecting this control once disables the interval timer. Pending interval timer interruptions are unaffected by this control. Selecting this option when the interval timer is disabled enables the interval timer. This option can take effect only while in S/370 mode.

Restart Activating the Restart option causes a restart interruption to be indicated to the adapter. The adapter processes a restart interruption.

Store Status Selecting this option initiates a store status operation, which can be used with a stand-alone dump program for the analysis of major program malfunctions. For such an operation, the following sequence is called for:

1. Activation of the Stop or CPU Reset key
2. Activation of the Store Status key
3. Activation of the IPL key to enter a stand-alone dump program

TOD Set Enable Selecting this option momentarily allows execution of the SET CLOCK instruction by the adapter. When attempting to change the time-of-day (TOD) clock on the adapter, you must select this option at the specified time to synchronize the clock and allow the clock to be set.

Normally, the TOD Set Enable is not activated, and the state and value of the TOD Clock is protected against change.

Device Interrupt Use this control to generate pseudo-interrupts for an emulated device. The device emulation code must be running before you make this selection.

Device Debug Use this option to control debug options for I/O devices. Each device address can be controlled separately to specify one or more debug options:

Trace I/O Operations
Causes all I/O operations for the device to be traced.

Stop on I/O
Causes the adapter to stop executing when an I/O instruction is executed for the device.

Stop on Interrupt
Causes the adapter to stop executing when an I/O interrupt is received for the device.

Stop on Error
Causes the adapter to stop executing when an I/O interrupt indicating an error is generated for the device.

I/O Adapter Trace
Enables tracing on the AWSICE adapter for this device.

The device emulation code must be running before you make this selection.

Kernel Trace Selecting this option turns on tracing for all kernel operations, much like the Device Debug allows tracing of selected device addresses. The kernel handles all interrupts to and from the adapter and passes the interrupts to the appropriate device.

Resets

Use this menu to initiate a P/390 Reset or to load the adapter's licensed internal code (microcode). The following reset options are available:

System Reset Normal
Issues a CPU Reset followed by a reset of the I/O subsystem. Stops the adapter and clears outstanding interrupts.

System Reset Clear
Issues a Clear Reset followed by a reset of the I/O subsystem. Stops the adapter, clears outstanding interrupts, clears memory, and initializes all internal registers. Issues a Program Reset.

CPU Reset
Issues a CPU Reset to the adapter, without affecting the I/O subsystem. Stops the adapter and clears outstanding interrupts.

Load Microcode
Loads the adapter with licensed internal code (microcode) and issues a CPU reset. A window is given to select the desired mode (S/370 or ESA/390). You should not modify the file name.

Search

Select this function to perform a search on the S/390 real memory. You are prompted for a string of bytes, a start, and an end address to bound the search. The system searches the memory for the existence of the string and reports all occurrences sequentially.

Note: Because the search facility uses a routine in the adapter licensed internal code to speed up the search, it is necessary for this code to be loaded (through the load microcode function) before performing the search. The P/390 is stopped when performing the Search function.

Load S/390

Select this function to load S/390 text decks into real memory. This can be used to load small stand-alone programs. Assembly programs can be assembled normally using a standard S/390 assembler. Download the text deck in binary format, and use this function to specify the text deck to be loaded.

Exit

Select this function or press F3 to exit the Manual Operations Session.

Help

Use this menu to access help information for the P/390 Manual Operations Session. An online portion of the ESA/390 Reference Summary is also available from this selection.

Green Card

Select this function to see an online portion of the ESA/390 Reference Summary. This is equivalent to the S/390 Reference Option in the Help menu.

Editing Registers

Both the general-purpose Registers (GPRs) and the program status word (PSW) register are displayed in the S/390 registers (GPR) window. These registers can be edited only when the P/390 is stopped, and they are accurate only when the P/390 is stopped.

The floating-point, control, access, and prefix registers must be displayed before they can be edited.

To edit S/390 registers, follow these steps:

1. Click on **Stop** or press the **F2** key to stop the P/390.
2. Make the register window active.
3. Use the **F4** key to select the desired registers.
4. Enter desired changes.
5. Press the **ENTER** key to update changes.
6. Click on **Start** or press the **F2** key to restart the P/390.

Editing Main Storage (Real and Virtual)

The Manual Operations facility provides the ability to edit either real or virtual main storage. The main storage fields can be edited only when the P/390 is stopped.

The storage display area of the window initially displays real main storage. Sixteen bytes of storage are displayed on each line. The 6-digit addresses (either virtual or real) are displayed on the left side of the window, followed by the storage contents. The real address corresponding to the first virtual address displayed is shown enclosed in square brackets above the virtual address. The EBCDIC translation of the storage data is displayed in the far right area of the window.

You can specify the starting address of the storage display by typing an address in the storage edit address field. Note that this field is located in the upper leftmost corner of the window, where the first storage address is displayed.

The storage data on the menu is not constantly updated while a running program is changing it. To request periodic updates, press the right mouse button.

Note: This is also true of registers. Registers are accurate only when the P/390 is stopped.

If you exit the Manual Operations session and then re-enter it, the status and contents are updated.

If you enter an incorrect character in any of the input fields (except the storage edit address field), the alarm sounds, and the cursor is placed under the incorrect character, prompting you for a correction.

Editing Real Storage

To edit real storage, follow these steps:

1. Click on **Stop** or press the **F2** key to stop the P/390.
2. Make the S/390 Memory [R] window the active window.
3. Enter the desired changes to either the storage address or the main storage fields.
4. Press the **ENTER** key to update the storage data displayed on the menu.
5. Click on **Start** press the **PF2** key to start the P/390.

Editing Virtual Storage

You can edit primary, secondary, home, and access registers of virtual memory according to which selection you made. To edit virtual memory, follow these steps:

1. Click on **Stop** or press the **F2** key to stop the P/390.

2. Display virtual main storage by selecting CREATE WINDOW from the WINDOWS menu option, then select virtual main storage.

3. Make the S/390 Memory [V] window the active window.

   Note: If VM/ESA has not set up virtual storage, the contents of the virtual storage window are blank and the title bar will say Invalid address.

4. Enter the desired changes to either the storage address or the main storage fields.

5. Press the **ENTER** key to update the storage data displayed on the menu.

6. Click on **Start**, or press the **PF2** key to start the P/390.

Instruction Step Function

To use the Instruction Step function, follow these steps:

1. Click on **Stop** or press the **F2** key to stop the P/390.

2. Select the CONTROL menu option; then select Instruction Step.

3. Enter the number of instructions to be counted into the count field. Leading zeros of the instruction count need not be typed.

4. Select ISTEP ON to turn on Instruction Step mode.

5. Click on **Enter**.

6. Click on **Start**, or press the **F2** key to start the P/390.

If the INSTR STEP mode is *on* and the P/390 is stopped, pressing the **F2** (START) function key causes the number of instructions specified in the INSTR STEP COUNT count value field to be executed. When the instruction count expires, the P/390 stops. Pressing the **F2** key to stop the P/390 before the count expires also stops the P/390 prematurely.

If an address compare match occurs, or if the **F2** key is pressed to stop the P/390 before the instruction count expires, the P/390 is stopped but the instruction count specified in the count field is not decreased by the number of instructions actually executed. Therefore, when the **F2** key is pressed again while the INSTR STEP mode is *on,* the original instruction count is used again.

When the INSTR STEP is toggled to OFF, the instruction count has no effect on how many instructions are executed when the **F2** key is pressed to start the P/390.

Address Stop Function

The Address Stop function automatically stops the P/390 when it detects an instruction execution within a given logical address range.

To use the Address Stop function, follow these steps:

1. Click on **Stop**, or press the **F2** key to stop the P/390.

2. Select the Control menu option, then select Address Stop.

3. Select ADSTOP ON to turn on the address compare mode.

4. Enter the logical address range into the From and To fields. Leading zeros of the address range must be typed.

5. Click on **Enter** to confirm the address range.

6. Click on **Start** or press **F2** to start the P/390.

Starting the P/390 causes the Instruction Counter to be compared against the address range. The P/390 stops when the Instruction Counter is equal to or greater than the lower-limit address and less than or equal to the upper-limit address.

The address-comparison action is performed continuously until ADSTOP OFF is selected. The ADDR COMPARE address range remains as-is when the Address Compare function is toggled to OFF.

The Address Compare function has some limitations:

- It is only an instruction address compare stop and not a data address compare stop.

- The address entered must be the address of the start of the instruction. If the first byte of the instruction is within the specified address range, the P/390 stops. If the first byte of the instruction is not within the address range, the P/390. does not stop.

Chapter 10. Exploiting the S/390 Integrated Server with VSE/ESA

The S/390 Integrated Server has several unique features that make using VSE/ESA easier. This chapter describes these capabilities and provides guidance on their use.

Using the Emulated Card Reader Support

The S/390 Integrated Server provides the AWS2540 device manager to emulate a 2540 card reader. The device manager monitors the contents of the OS/2 directory specified in the device map. When a file appears in that directory, the file is passed to VSE/ESA as card images. If a subdirectory named OLD is set up, the device manager also saves any input files after they have been passed to VSE/ESA. You can use an OS/2 editor to create job streams to be executed by VSE/ESA, or you can distribute job streams using PC-formatted tape or diskette.

Attention: Disable the timeout function by specifying /NT when defining the emulated card reader. The timeout function causes the file to be erased or moved if VSE/ESA does not read at least one card per minute after reading the first card. This causes a problem, for example, if job control is reading directly from the card reader and any step takes more than one minute to execute. The problem is minimized only if the VSE/POWER RDR task is used to read from the 2540, but it can be completely eliminated by specifying /NT.

Setup

Follow these steps to use the 2540 card reader emulator:

1. Define an OS/2 directory that the device manager should monitor for new files. The directory can be on a local drive or a file server. Here is an example of the OS/2 command needed to create the directory:

   ```
   mkdir d:\rdr
   ```

2. You can have the 2540 device manager automatically save old card decks after they have been passed to VSE/ESA. To do so, define a directory named OLD under the directory defined in the previous step. Using the example above, issue the following OS/2 command:

   ```
   mkdir d:\rdr\old
   ```

3. You can have the 2540 device manager automatically save bad card decks, which the device manager could not read, after they have been passed to VSE/ESA. To do so, define a directory named BAD under the directory defined in step 2. Issue the following OS/2 command:

   ```
   mkdir d:\rdr\bad
   ```

4. Define a 2540 card reader in the device map using the P/390 Configurator. The new definition is not active until the DEVMAP has been saved and the P/390 restarted.

   Only one 2540 card reader can be defined; if multiple readers are defined, an error message will be issued and all but the first will be ignored.

The address used, such as 00C, must be the same as one defined to VSE/ESA (see the following step).

5. You can either use an ADD statement to define a 2540 card reader to VSE/ESA in the IPL procedure ($IPLESA.PROC), or use the VSE/ESA hardware definition dialogs. Here is an example using the address 00C as shown above:

```
ADD 00C,2540R
```

6. Start a VSE/POWER reader task to the 2540 card reader. This can be accomplished by including the following command in the VSE/POWER Autostart:

```
PSTART RDR,00C
```

ASCII-to-EBCDIC Translation

The 2540 emulator examines the first few characters of the first card image in any input file. If these are the ASCII characters "//" or "* $$", the emulator assumes the entire file is ASCII and performs ASCII-to-EBCIDIC translation as it passes the card images to VSE/ESA. Each ASCII record is delimited with a X'0D0A' or "end-of-line" sequence. Short records are padded with blanks to 80 bytes. Long records are split into multiple cards.

If the first characters examined are not recognized, the entire file is assumed to be binary and is not translated; this includes any JECL and JCL in the file. The file is read 80 bytes at a time until the entire file has been processed.

Input File Processing Sequence

The 2540 card reader emulator uses the "last written" date to determine the sequence the files should be passed to the VSE/ESA system. It passes the oldest files first. However, the OS/2 file system only keeps timestamps to a 2-second resolution, so files written to the directory within a 2-second interval could be passed out of order.

Note: The OS/2 COPY command does not update the "last written" date when it copies a file unless specifically directed to by use of the "+ ,," option. If you want to ensure that a file being copied into the 2540 card reader directory has the current date and time, you must include the "+ ,,".

Example:

```
copy c:\jobs\testfile.jcl + ,, d:\rdr\testfile.jcl
```

Saving "Old" Card Decks

If a subdirectory named OLD does not appear under the one defined in the device map, then once the card file has been passed to VSE/ESA the file is erased. If a subdirectory named OLD does exist, once the file has been passed to VSE/ESA, it is moved to the OLD subdirectory. If a file with the same name as the one just read already exists in the OLD subdirectory, it is replaced.

Using the Emulated 3420/3422 Tape Drive Support

The S/390 Integrated Server includes the AWSTAPE device manager that emulates IBM 3422 magnetic tape drives. Data is stored in OS/2 disk files. The files can reside on either disk or diskette, using either the HPFS or FAT file system.

A file to be processed as an input tape must be in a special format, and thus must have been originally created as an output tape by the tape emulator of an S/390 Integrated Server.

Setup

Follow these steps to use the 3422 emulator:

1. Define one or more 3422 tape drives in the device map. To use an emulated tape device, use the AWSTAPE device manager. The new definitions are not active until the DEVMAP has been saved and the P/390 restarted.

   Note: The OS/2 file name can be changed dynamically during VSE/ESA operation using either the OS/2 AWSMOUNT command or executing the TMOUNT program in VSE/ESA; see "Mounting Tapes and Disks" on page 178 for more information.

2. You can either use ADD statements to define one or more 3422 tape drives to VSE/ESA in the IPL procedure ($IPLESA.PROC), or use the VSE/ESA hardware definition dialogs. Include each 3422 tape address defined in the device map. Here is an example using the address 580:

   ```
   ADD 580,3430
   ```

3. Re-IPL VSE/ESA to activate the 3422 tape definitions in VSE/ESA.

Operation

- The PC file is opened when data is read from or written to the tape, or when tape positioning commands like FORWARD SPACE FILE (FSF) or FORWARD SPACE RECORD (FSR) are issued.

- The PC file is closed when a REWIND or REWIND UNLOAD is issued.

- REWIND UNLOAD does not actually unload or demount the tape. Instead, it sets the sense bits so that SENSE, READ, and WRITE commands report "intervention required." However, if you issue other commands, such as REWIND or FSF, they succeed, and tape status is reset so subsequent WRITE or READ commands proceed normally.

- The read-only (no ring) status is presented to VSE/ESA if the PC file has the OS/2 read-only attribute set.

- "Equipment check" is seen by VSE/ESA if a file is accessed that is not in the tape emulation format.

- When data is written to an existing emulated tape file, any data following the record written is erased. This allows the file to grow and shrink as the "tape" is reused.

- See "Mounting Tapes and DASD" on page 194 for a description of how to mount and dismount tapes on an emulated tape drive.

Mounting Tapes and Disks

As you run VSE/ESA on the S/390 Integrated Server, you will need to mount and dismount emulated magnetic tapes (and possibly S/390 FBA-only DASD). The S/390 Integrated Server provides two tools you can use to do this: AWSMOUNT.EXE for use in an OS/2 window, and the TMOUNT program for use in a batch job under VSE/ESA.

Using the AWSMOUNT Command in OS/2

The AWSMOUNT command can be used to either query the existing file name or mount a new emulated tape or disk. Issue the following command from an OS/2 window:

AWSMOUNT *devaddr* [*fname*] /*option*

devaddr   The S/390 address (*cuu*) of the emulated tape drive.

fname   The fully qualified name of the OS/2 file used to emulate the tape. This field is required only to mount a new tape or disk file.

option

/Q   Query the file allocated to dev_addr

/O   Overlay the old file association with the new association

/C   Create a new file if one does not already exist

/R   Make the allocated file appear read only to the S/390 Integrated Server

/W   Make the allocated file appear read/write to the S/390 Integrated Server

/D   Demount the file allocated to dev_addr

Options for emulated tape devices are:

/REW   Close and rewind the file

/RUN   Close, rewind, and unload the file

/C   Create the file if necessary

Using the TMOUNT Command in VSE/ESA

The TMOUNT command is a special program that can be executed in a VSE/ESA batch partition to either query the existing file name, or mount a new emulated tape or disk.

The TMOUNT program is supplied on the VSE/ESA compact disc. It can be installed onto the VSE/ESA system by copying the member to the directory you have set up for the emulated 2540 card reader and starting a VSE/POWER reader task to that device. See "Using the Emulated Card Reader Support" on page 175.

Here is the JCL required to use the TMOUNT program to query the existing file:

```
// ASSGN SYS004,500
// EXEC TMOUNT,SIZE=AUTO,PARM='500 (QUERY'
```

The above example assumes an emulated tape drive at address 500.

Here is the JCL required to use the TMOUNT program to mount a new file:

```
// ASSGN SYS004,500
// EXEC TMOUNT,SIZE=AUTO,PARM='500 D:\VSE\MYTAPE.500'
```

The above example assumes an emulated tape drive at address 500. The *filename* parameter is limited to 17 characters maximum.

Using the 1403 Line Printer Support

The S/390 Integrated Server provides the AWS2821 device manager that makes a printer appear to VSE/ESA as a real 1403 printer. This device manager is useful when you want to print something from the VSE/ESA system on a PC printer attached to the S/390 Integrated Server. Or you may want to write the print output to a disk file. When printer output is written to disk, the output is converted from EBCDIC to ASCII. Thus, the output can be used, for example, by an OS/2 applications.

Setup

Follow these steps to use the 1403 printer emulation support:

1. Define one or more 1403 printers in the device map. The new definition is not active until the DEVMAP has been saved and the P/390 restarted.

2. Either you can use ADD statements to define one or more 1403 printers to VSE/ESA in the IPL procedure ($IPLESA.PROC), or use the VSE/ESA hardware definition dialogs. Include each printer address defined in the device map. Here is an example using the address 00E:

   ```
   ADD 00E,1403
   ```

3. Re-IPL VSE/ESA to activate the printer definitions in VSE/ESA.

Operation

To use this support, start a VSE/ESA printer task print writer to the specified address (PSTART LST,00E). This can be included in the VSE/POWER AUTOSTART, if desired, so that the print writer is started automatically. If you print to an OS/2 disk file and it already exists, the file is opened in append mode.

Note: Some procedure needs to be set up to periodically purge any print files on disk. Otherwise, the disk will gradually fill up.

Using Client Support on the LAN

Any PC or workstation that is on the LAN can access the VSE/ESA system that is running on the S/390 Integrated Server. There are two ways to provide 3270 sessions to your clients:

- TCP/IP Telnet (TN3270) sessions
- VTAM SNA 3270 sessions

Setup of TCP/IP Telnet (TN3270) Sessions

To VSE/ESA, these clients appear to be local, non-SNA, DFT 3270 devices. You do not need to run TCP/IP S/390 code to use this function. See the instructions in the d:\P390\LAN3274.DOC.

Setup of VTAM SNA 3270 Sessions

To VSE/ESA, these clients appear to be switched SNA 3270 devices attached through an IBM 3172 controller. They can have the full range of 3270 facilities available to them, including file transfer, if the 3270 emulator software being used on the client supports them. Each client can have one or more host sessions active with the S/390 Integrated Server; the actual number depends on the 3270 emulator being used on the client.

To use the client support on a OS/2, DOS, or Windows workstation, see the LAN3172.DOC, or do the following:

- On the S/390 Integrated Server:

  - Using the P/390 Configurator, update the device map to include one or more 3172 entries, each using the LAN3172 driver.

  - On the VSE/ESA system:

    - For each LAN3172 entry, include an ADD statement for a CTCA in the VSE/ESA IPL procedure ($IPLESA.PROC):

      ```
      ADD 300,CTCA
      ```

    - Define the 3172 connection to VTAM: (The following sample code is for a Token-Ring only).

      - Define a VTAM Communications Adapter Major Node (XCA).

        ```
        // EXEC LIBR
        ACC S=PRD2.CONFIG
        CAT SYS1XCA.B          R=Y
        SYS1XCA  VBUILD TYPE=XCA
        PORT1    PORT  MEDIUM=RING,ADAPNO=0,CUADDR=300,        X
                       TIMER=60,SAPADDR=8
        GROUP1   GROUP DIAL=YES,CALL=INOUT,ANSWER=ON,          X
                       ISTATUS=ACTIVE
        LINE1    LINE
        PU1      PU
        /+
        /*
        ```

      - Define a VTAM Switched Major Node (SWNET):

```
// EXEC LIBR
ACC S=PRD2.CONFIG
CAT VTMSW2.B          R=Y
VTMSW2    VBUILD TYPE=SWNET,MAXNO=400,MAXGRP=400
SYS1PU    PU     ADDR=C1,IDBLK=05D,IDNUM=00000,            X
                 LANSW=YES,LANSDWDW=(1,),MAXDATA=1200,     X
                 MAXPATH=4,SAPADDR=8,PUTYPE=2,             X
                 USSTAB=VTMUSSTR,DLOGMOD=SP3272QS,         X
                 MODETAB=IESINCLM
SYS1PATH PATH   DIALNO=0108400000212000,GRPNM=GROUP1
LOC300    LU     LOCADDR=2,LOGAPPL=DBDCCICS
/+
/*
```

- On each client DOS or Windows system:

  - Install the LAN support for DOS.

  - Install and configure the 3270 emulator to be used.

Using the Emulated Optical-Media-Attach Support

The S/390 Integrated Server provides the AWSOMA device manager to emulate an IBM OMA device. This emulation has these purposes:

1. Loading IBM PID tapes from OMA-formatted CD-ROMs
2. Allowing an S/390 operating system to have direct read-only access to an OS/2 file.

This section discusses item 2. AWSOMA looks like a 3422 tape drive to VM/ESA and a 3423 tape drive to MVS/ESA and OS/390. There is a companion OS/2 file that instructs AWSOMA on what to read. This OS/2 file, called a tape descriptor file or TDF, should be added to the DEVMAP. The file should include the following input[24]:

First line	@TDF
Next line or lines	Drive, path, and filename and extension of the OS/2 file to be read, followed by the word TEXT.
Next to last line	TM
Last line	EOT

Here is an example of a file called D:\OS2.TDF:

```
@TDF
C:\CONFIG.SYS    TEXT
C:\AUTOEXEC.BAT TEXT
TM
EOT
```

Here is an example of how to use AWSOMA in VM/ESA. It can be modified for any other S/390 operating system.

1. DEVMAP points to D:\OS2.TDF for AWSOMA at address 580.

---

24 Input must be in all CAPITAL letters.

2. In VM/ESA, log on and attach 580 (to your ID) as 181.

```
ATT 580 * 181
```

3. Define an input and an output device:

```
FI INMOVE TAP1
FI OUTMOVE TERM
```

4. Issue a MOVEFILE command to read the CONFIG.SYS file from C:\ to your terminal.

```
MOVE
```

5. If you issue MOVEFILE again, you will get AUTOEXEC.BAT.

AWSOMA can be used to read from a file without duplicating it. This allows you to maintain sole authority data sets without having to use up large quantities of disk space. Any S/390 operating system that uses 3420 tapes can now read files from a LAN under program control.

Using the PCOPY Utility

A sample of the PCOPY utility is provided on an as-is basis in the latest releases of VSE/ESA in the ICCF Library 59 (PCOP*). It allows file transfers between OS/2 and VSE/ESA.

Automating VSE/ESA IPL at OS/2 Startup

If you wish to have VSE/ESA started every time you boot OS/2, do the following:

1. On the OS/2 desktop, open the Startup window and the Personal Communications window.

2. Place a shadow of the **Start Personal Communications** icon from the Personal Communications window in the Startup folder.

3. Open the P/390 folder.

4. Place a shadow of the **IPL P/390** icon from the P/390 folder in the Startup folder.

utomating the Shutdown of VSE/ESA

VSE/ESA should always be shut down in a controlled manner. This is done through the VSE/ESA console by issuing a series of commands to CICS/VSE, ACF/VTAM, VSE/POWER, and possibly other programs such as SQL/DS™. The P/390 includes optional support to issue the required commands automatically, whenever the P/390 operation is stopped.

See the END_VSE.CMD file in the \P390 subdirectory for the names of the files supplied and details for implementing the support.

Chapter 11. Exploiting the S/390 Integrated Server with MVS/ESA and OS/390

The S/390 Integrated Server has several unique features that make using MVS/ESA and OS/390 easier. This chapter describes these capabilities and provides guidance on their use.

Using the Emulated Card Reader Support

You can use an OS/2 editor to create job streams to be executed by MVS/ESA or OS/390, or you can distribute job streams using PC-formatted tape or diskette. The S/390 Integrated Server provides a device manager to emulate a 2540 card reader. The device manager monitors the contents of the OS/2 directory specified in the device map. When a file appears in that directory, the file is passed to MVS/ESA or OS/390 as card images. If a subdirectory named OLD is set up, the device manager also saves any input files after they have been passed to MVS/ESA or OS/390.

Warning: Disable the timeout function by specifying /NT when defining the emulated card reader. The timeout function causes the file to be erased or moved if MVS/ESA does not read at least one card per minute after reading the first card.

Setup

Follow these steps to use the 2540 card reader emulator:

1. Define an OS/2 directory that the device manager should monitor for new files. The directory can be on a local drive or a file server. Here is an example of the OS/2 command needed to create the directory:

   ```
   mkdir d:\rdr
   ```

2. You can have the 2540 device manager automatically save old card decks after they have been passed to MVS/ESA or OS/390. To do so, define a directory named OLD under the directory defined in the previous step. Using the example above, issue the following OS/2 command:

   ```
   mkdir d:\rdr\old
   ```

3. Define a 2540 card reader in the device map using the P/390 Configurator. The new definition is not active until the DEVMAP has been saved and the P/390 restarted.

   Only one 2540 card reader can be defined; if multiple readers are defined, an error message will be issued and all but the first will be ignored.

   The address used, such as 00C, must be the same as one defined to MVS/ESA or OS/390 (see the following step).

4. Define a 2540 card reader to JES and in the hardware configuration definition (HCD).

ASCII-to-EBCDIC Translation

The 2540 emulator examines the first few characters of the first card image in any input file. If these are the ASCII characters "//" or "* $$", the emulator assumes the entire file is ASCII and performs ASCII-to-EBCIDIC translation as it passes the card images to MVS/ESA or OS/390. Each ASCII record is delimited with an X'0D0A' or "end-of-line" sequence. Short records are padded with blanks to 80 bytes. Long records are split into multiple cards.

If the first characters examined are not recognized, the entire file is assumed to be binary and is not translated; this includes any JCL in the file. The file is read 80 bytes at a time until the entire file has been processed.

Input File Processing Sequence

The 2540 card reader emulator uses the "last written" date to determine the sequence the files should be passed to the MVS/ESA or OS/390 system. It passes the oldest files first. However, the OS/2 file system only keeps timestamps to a 2-second resolution, so files written to the directory within a 2-second interval could be passed out of order.

Note: The OS/2 COPY command does not update the "last written" date when it copies a file unless specifically directed to by use of the "+ ,," option. If you want to ensure that a file being copied into the 2540 card reader directory has the current date and time, you must include the "+ ,,".

Example:

```
copy c:\jobs\testfile.jcl + ,, d:\rdr\testfile.jcl
```

Saving "Old" Card Decks

If a subdirectory named OLD does not appear under the one defined in the device map, then once the card file has been passed to MVS/ESA or OS/390, the file is erased. If a subdirectory named OLD does exist, once the file has been passed to MVS/ESA or OS/390, it is moved to the OLD subdirectory. If a file with the same name as the one just read already exists in the OLD subdirectory, it is replaced.

Using the Emulated 3420/3422 Tape Drive Support

The S/390 Integrated Server includes a device manager that emulates IBM 3420 magnetic tape drives. Data is stored in OS/2 disk files. The files can reside on either disk or diskette, using either the HPFS or FAT file system.

A file to be processed as an input tape must be in a special format, and thus must have been originally created as an output tape by the tape emulator (AWSTAPE) of a S/390 Integrated Server.

Setup

Follow these steps to use the 3420 emulator:

1. Define one or more 3420 tape drives in the device map. The new definitions are not active until the DEVMAP has been saved and the P/390 restarted.

   Note: The OS/2 file name can be changed dynamically during MVS/ESA or OS/390 operation using either the OS/2 AWSMOUNT command or

executing the TAPE MOUNT program in MVS/ESA or OS/390; see "Mounting Tapes" on page 185 for more information.

2. Verify that the 3420 tape drives are defined in your MVS/ESA or OS/390 system at the corresponding address.

Operation

- The PC file is opened when data is read from or written to the tape, or when tape positioning commands like FORWARD SPACE FILE (FSF) or FORWARD SPACE RECORD (FSR) are issued.

- The PC file is closed when a REWIND or REWIND UNLOAD is issued.

- REWIND UNLOAD does not actually unload or demount the tape. Instead, it sets the sense bits so that SENSE, READ, and WRITE commands report "intervention required." However, if you issue other commands, such as REWIND or FSF, they succeed, and tape status is reset so subsequent WRITE or READ commands proceed normally.

- The read-only (no ring) status is presented to MVS/ESA or OS/390 if the PC file has the OS/2 read-only attribute set.

- "Equipment check" is seen by MVS/ESA or OS/390 if a file is accessed that is not in the tape emulation format.

- When data is written to an existing emulated tape file, any data following the record written is erased. This allows the file to grow and shrink as the "tape" is reused.

- See "Mounting Tapes" for a description of how to mount and dismount tapes on an emulated tape drive.

Mounting Tapes

As you run MVS/ESA or OS/390 on the S/390 Integrated Server, you will need to mount and dismount emulated magnetic tapes. The S/390 Integrated Server provides two tools you can use to do this: AWSMOUNT.EXE for use in an OS/2 window, and the JCL for use in a batch job under MVS/ESA or OS/390.

Using the AWSMOUNT Command in OS/2

The AWSMOUNT command can be used to either query the existing file name or mount a new emulated tape. Issue the following command from an OS/2 window:

AWSMOUNT *devaddr* [*fname*] /*option*

devaddr   The S/390 address (*cuu*) of the emulated tape drive.

fname   The fully qualified name of the OS/2 file used to emulate the tape. This field is required only to mount a new tape.

option

      /Q   Query the file allocated to dev_addr

      /O   Overlay the old file association with the new association

      /C   Create a new file if one does not already exist

      /R   Make the allocated file appear read only to the S/390 Integrated Server

/W Make the allocated file appear read/write to the S/390 Integrated Server

/D Demount the file allocated to dev_addr

Options for emulated tape devices are:

/REW Close and rewind the file

/RUN Close, rewind, and unload the file

/C Create the file if necessary

Using the Emulated Optical-Media-Attach Support

The S/390 Integrated Server provides the AWSOMA device manager to emulate an IBM OMA device. This emulation has these purposes:

1. Loading IBM PID tapes from OMA-formatted CD-ROMs
2. Allowing an S/390 operating system to have direct read-only access to an OS/2 file.

This section discusses item 2. AWSOMA looks like a 3422 tape drive to VM/ESA and a 3423 tape drive to MVS/ESA and OS/390. There is a companion OS/2 file that instructs AWSOMA on what to read. This OS/2 file, called a tape descriptor file or TDF, should be added to the DEVMAP. The file should include the following input[25]:

First line @TDF

Next line or lines Drive, path, and filename and extension of the OS/2 file to be read, followed by the word TEXT.

Next to last line TM

Last line EOT

Here is an example of a file called D:\OS2.TDF:

```
@TDF
  C:\CONFIG.SYS TEXT
  C:\AUTOEXEC.BAT TEXT
  TM
  EOT
```

Here is an example of how to use AWSOMA in VM/ESA. It can be modified for any other S/390 operating system.

1. DEVMAP points to D:\OS2.TDF for AWSOMA at address 580.

2. In VM/ESA, logon and attach 580 (to your ID) as 181.

```
ATT 580 * 181
```

3. Define an input and an output device:

```
FI INMOVE TAP1
FI OUTMOVE TERM
```

---

[25] Input must be in all CAPITAL letters.

4. Issue a MOVEFILE command to read the CONFIG.SYS file from C:\ to your terminal.

   MOVE

5. If you issue MOVEFILE again, you will get AUTOEXEC.BAT.

AWSOMA can be used to read from a file without duplicating it. This allows you to maintain sole authority data sets without having to use up large quantities of disk space. Any S/390 operating system that uses 3420 tapes can now read files from a LAN under program control.

Using the 1403 Line Printer Support

There may be times when you want to print something from the MVS/ESA or OS/390 system on a PC printer attached to the S/390 Integrated Server. Or you may wish to transfer the print output to another node in your network as a file. The S/390 Integrated Server provides a 1403 emulator device manager that appears to the MVS/ESA or OS/390 system as a real 1403 printer. Print output can be directed to this device manager, and will actually be stored in an OS/2 disk file or directed to a PC printer.

Setup

Follow these steps to use the 1403 printer emulation support:

1. Define one or more 1403 printers in the device map. The new definition is not active until the DEVMAP has been saved and the P/390 restarted.

2. Update the MVS I/O configurator to include the devices in the DEVMAP.

3. Re-IPL MVS/ESA or OS/390 to activate the printer definitions in the operating system.

Using Client 3274 Support on the LAN

Any PC or workstation that is on the LAN can access the VSE/ESA system that is running on the S/390 Integrated Server. There are three ways to provide 3270 sessions to your clients:

- TCP/IP Telnet (TN3270) sessions
- VTAM SNA 3270 sessions
- S/390 TCP/IP sessions

Setup of TCP/IP Telnet (TN3270) Sessions

To MVS/ESA, these clients appear to be local, non-SNA, DFT 3270 devices. You do not need to run TCP/IP S/390 code to use this function. See the instructions in the d:\P390\LAN3274.DOC.

Setup VTAM SNA 3270 Sessions

To MVS/ESA or OS/390, these clients appear to be switched SNA 3270 devices attached through an IBM 3172 controller. They can have the full range of 3270 facilities available to them, including file transfer, if the 3270 emulator software being used on the client supports them. Each client can have one or more host sessions active with the S/390 Integrated Server; the actual number depends on the 3270 emulator being used on the client.

To use the client support on OS/2, DOS, or Windows workstations, see the instructions d:\P390\LAN3172.DOC or do the following:

1. On the S/390 Integrated Server:

   a. Using the P/390 Configurator, update the device map to include one or more 3172 entries, each using the LAN3172 driver.

2. On the MVS/ESA or OS/390 system:

   a. For each LAN3172 entry, add a CTCA entry using the CBDCHCD program. (This is the HCD program running under TSO.)

   b. Define the 3172 connection to VTAM and place it in a partitioned data set. (The following sample code is for a Token Ring only).

      - Define a VTAM Communications Adapter Major Node (XCA). Place it in a partitioned data set called 'SYS1.VTAMLST(XCAE40)'.

```
*** USIBMNG ***************************************** XCAE40/SYS1 **
*                                                                 *
* 3172 (LAN3172) DEVICES (E40) - SAMPLE XCA MAJOR NODE DEFINITION *
*                                                                 *
*                                  USE WITH LANE40 (SWITCHED NETWORK *
*                                  DEFINITIONS FOR CM/2 TERMINALS)   *
*                                                                 *
*******************************************************************
*
NG1XCA   VBUILD TYPE=XCA
*
NG1XE40    PORT CUADDR=E40,ADAPNO=0,SAPADDR=4,MEDIUM=RING,         -
                DELAY=0,TIMER=20
*
*-----------------------------------------------------SUBAREA NODES
*-----------------------------------------------------------------
*
*----------------------------------------------------- SUBAREA SYS2
NG1XSNG2 GROUP DIAL=NO
*
NG1XSXL2  LINE USER=SNA,ISTATUS=ACTIVE
*
NG1XSXP2    PU PUTYPE=5,MACADDR=400074900002,SAPADDR=4,            -
                SUBAREA=2,TGN=1
*
*--------------------------------------------------- PERIPHERAL NODES
*-----------------------------------------------------------------
*
NG1XPG     GROUP DIAL=YES,ISTATUS=ACTIVE,CALL=INOUT,ANSWER=ON
*
NG1XPL00 LINE
NG1XPP00   PU
*
NG1XPL01 LINE
NG1XPP01   PU
*
NG1XPL02 LINE
NG1XPP02   PU
*
NG1XPL03 LINE
NG1XPP03   PU
```

- Define a VTAM Switched Major Node (SWNET). Place it in a
  partitioned data set called 'SYS1.VTAMLST(LANE40)'.

```
    *** USIBMNG ***************************************** LANE40/SYS1 **
    *                                                                  *
    *    SAMPLE SWITCHED NETWORK DEFINITIONS FOR CM/2 TERMINALS        *
    *                                                                  *
    *    IDBLK=05D/IDNUM=00000:00003 | CPNAME=NG1SXP00:NG1SXP03        *
    *                                                                  *
    ********************************************************************
    *
    NG1SLAN VBUILD TYPE=SWNET
    *
    *          -  -- --------------------------------------------- NGHSXP00
    *
    NG1SXPP0    PU PUTYPE=2,ADDR=C1,MAXDATA=1460,                      -
                   IDBLK=05D,IDNUM=00000,CPNAME=NGHSXP00,             -
                   DLOGMOD=SNX32702,USSTAB=NGUSSS
    *
    NG1SXL02    LU LOCADDR=2
    NG1SXL03    LU LOCADDR=3
    NG1SXL04    LU LOCADDR=4
    NG1SXL05    LU LOCADDR=5
    *
    *          -  -- --------------------------------------------- NGHSXP01
    *
    NG1SXPP1    PU PUTYPE=2,ADDR=C1,MAXDATA=1460,                      -
                   IDBLK=05D,IDNUM=00001,CPNAME=NGHSXP01,             -
                   DLOGMOD=SNX32702,USSTAB=NGUSSS
    *
    NG1SXL12    LU LOCADDR=2
    NG1SXL13    LU LOCADDR=3
    NG1SXL14    LU LOCADDR=4
    NG1SXL15    LU LOCADDR=5
    *
    *          -  -- --------------------------------------------- NGHSXP02
    *
    NG1SXPP2    PU PUTYPE=2,ADDR=C1,MAXDATA=1460,                      -
                   IDBLK=05D,IDNUM=00002,CPNAME=NGHSXP02,             -
                   DLOGMOD=SNX32702,USSTAB=NGUSSS
    *
    NG1SXL22    LU LOCADDR=2
    NG1SXL23    LU LOCADDR=3
    NG1SXL24    LU LOCADDR=4
    NG1SXL25    LU LOCADDR=5
    *
    *          -  -- --------------------------------------------- NGHSXP03
    *
    NG1SXPP3    PU PUTYPE=2,ADDR=C1,MAXDATA=1460,                      -
                   IDBLK=05D,IDNUM=00003,CPNAME=NGHSXP03,             -
                   DLOGMOD=SNX32702,USSTAB=NGUSSS
    *
    NG1SXL32    LU LOCADDR=2
    NG1SXL33    LU LOCADDR=3
    NG1SXL34    LU LOCADDR=4
    NG1SXL35    LU LOCADDR=5
```

3. Add the member names identified in the previous step to the VTAM startup
   procedure, which is typically called 'SYS1.VTAMLST(ATCCON00)'.

4. On each client DOS or Windows system:

a. Install the LAN support for DOS.

b. Install and configure the 3270 emulator to be used.

Setup of S/390 TCP/IP sessions

This requires you to install TCP/IP S/390 programs. See the instructions in the
d:\P390\LCS3172.DOC.

Chapter 12. Exploiting the S/390 Integrated Server with VM/ESA

The S/390 Integrated Server has several unique features that VM/ESA can exploit and make using VM/ESA on the S/390 Integrated Server even more beneficial than merely using the S/390 Integrated Server as just another platform for VM/ESA. This chapter describes these capabilities and provides guidance on their use. In addition to the capabilities described here, see "Installing P/390 CMS Utilities" on page 43 and Chapter 14, "OS/2 Utilities" on page 221.

Using the Emulated Card Reader Support

The S/390 Integrated Server provides the AWS2540 device manager to emulate a 2540 card reader that can be used either as a CP spooling card reader, or as a dedicated guest virtual machine. The device manager monitors the contents of the OS/2 directory specified in the device map. When a file appears in the OS/2 directory, the file is passed to VM/ESA as card images in the same manner as they would have been if there had been a real 2540 card reader on the channel. If a subdirectory named OLD is set up, the device manager also saves any input files after they have been passed to VM/ESA. If a subdirectory named BAD is set up, this device manager can place card decks that could not be read into a subdirectory. If the OS/2 directory is made visible to other workstations on a LAN by utilizing LAN file serving software, then users permitted to write to the directory can put their own "card decks" into the "hopper". Users can use their preferred workstation-based editor to create and alter the card decks that they want to place in the "hopper."

If you are dedicating the 2540 to a VSE/ESA guest under CP as opposed to using it as a CP spooling card reader, you may need to use the /NT parameter when defining the emulated card reader.

Setup

Here are the steps for using the 2540 card reader emulator:

1. Define an OS/2 directory that the device manager should monitor for new files. The directory can be on a local drive or a file server. Here is an example of the OS/2 command needed to create the directory:

   ```
   mkdir d:\rdr
   ```

2. You can have the 2540 device manager automatically save old card decks after they have been read. To do so, define a directory named OLD under the directory defined in the previous step. Using the example above, issue the following OS/2 command:

   ```
   mkdir d:\rdr\old
   ```

3. You can have the 2540 device manager automatically save bad card decks, which the device manager could not read, after they have been passed to VM/ESA. To do so, define a directory named BAD under the directory defined in step 2 on page 175. Issue the following OS/2 command:

   ```
   mkdir d:\rdr\bad
   ```

4. Define a 2540 card reader in the device map using the P/390 Configurator. The new definition is not active until the DEVMAP has been saved and the P/390 restarted.

Only one 2540 card reader can be defined; if multiple readers are defined, an error message will be issued and all but the first will be ignored.

The address used, such as 00C, must be the same as one defined to VM/ESA in the VM/ESA SYSTEM CONFIG file. An example of a statement in the SYSTEM CONFIG for VM/ESA is:

```
RDEVICE 000C TYPE RDR CLASS A
```

5. If using the card reader as a CP spooling card reader, then the spooling operator must start it with a CP START command.

ASCII-to-EBCDIC Translation

The 2540 emulator examines the first few characters of the first card image in any input file. If these are the ASCII characters "USERID", "ID", "//" or "* $$", the emulator assumes the entire file is ASCII and performs ASCII-to-EBCIDIC translation as it reads the card images. Each ASCII record is delimited with a X'0D0A' or "end-of-line" sequence. Short records are padded with blanks to 80 bytes. Long records are split into multiple cards.

If the first characters examined are not recognized, the entire file is assumed to be binary and is not translated. This process will fail if you attempt to use the card reader as a CP spooling card reader because CP requires the first token on the first card to be "USERID" or "ID" for the deck to be valid. However, if the card reader is dedicated to a guest virtual machine, then the guest can read the card deck. The file is read 80 bytes at a time until the entire file has been processed.

Spooling Card Reader Operation

Information on operating VM/ESA spooling card readers can be found in the *VM/ESA System Operation* publication in the VM/ESA system reference library. The requirements for the CP user ID or CP ID card are replicated here for your convenience.

When you read in a deck of cards for a VM/ESA user, CP puts the data in a reader spool file and sends it to the user's virtual reader. VM/ESA requires that the first card of an input card deck have a certain format. The format follows:

1. The first card must be a CP identification (CP ID) card. The format of this card is either:

```
USERID userid CLASS n NAME name TAG tagtext
        or
```

```
ID userid CLASS n NAME name TAG tagtext
```

where:

userid   is the logon ID of the user for whom you are reading this card deck.

n   is an optional class.

name   is an optional name that CP assigns to the spool file that it will create.

tagtext   is optional data that will be associated with the spool file.

2. The USERID or ID keyword must begin in column 1.

3. All keywords and operands must be separated by one or more blanks.

4. If the TAG operand is included, it must be the last operand on the card.

Input File Processing Sequence

The 2540 card reader emulator uses the "last written" date to determine the sequence the files should be read next. It processes the oldest files first. However, the OS/2 file system only keeps timestamps to a 2-second resolution, so files written to the directory within a 2-second interval could be passed out of order.

Note: The OS/2 COPY command does not update the "last written" date when it copies a file unless specifically directed to by use of the "+ ,," option. If you want to ensure that a file being copied into the 2540 card reader directory has the current date and time, you must include the "+ ,,".

Example:

```
copy c:\vm\fix80.crd + ,, d:\rdr\fix80.crd
```

Saving "Old" Card Decks

If a subdirectory named OLD does not appear under the one defined in the device map, then once the card file has been read, the file is erased. If a subdirectory named OLD does exist, once the file has been read, it is moved to the OLD subdirectory. If a file with the same name as the one just read already exists in the OLD subdirectory, it is replaced. To try out the AWS2540 device manager function, you can use the demo REXX programs that reside on SDISKADD.370. The filenames are: SF CMD, TELL CMD, and RDRLOOP EXEC.

Using the Emulated 3420/3422 Tape Drive Support

The S/390 Integrated Server includes the AWSTAPE device manager that emulates IBM 3422 magnetic tape drives. This can be used for backing up your system to another server, or exchanging data with other P/390s. Data written to a tape drive managed by the AWSTAPE device manager is stored in OS/2 disk files. The files can reside on either disk, diskette, or LAN, using either the HPFS or FAT file system.

A file to be processed as an input tape must be in a special format. The data can be written to an AWSTAPE emulated tape drive in order to get the OS/2 file into that special format. VM/ESA CMS users of CMS level 12 or higher have the option of creating data in the AWSTAPE file format by using the AWSTAPE operand of the BLOCK stage of CMS PIPELINES. Issue the CMS command

```
PIPE AHELP BLOCK
```

to get the PIPELINE author's help for the AWSTAPE operand of the BLOCK stage.

Setup

Follow these steps to use the 3422 emulator:

1. Define one or more 3422 tape drives in the device map. To use an emulated tape device, use the AWSTAPE device manager. The new definitions are not active until the DEVMAP has been saved and the P/390 restarted.

> **Note:** The OS/2 file name can be changed dynamically during VM/ESA
> operation using either the OS/2 AWSMOUNT command or executing
> the MOUNT program provided with S/390 Integrated Server in CMS;
> see "Mounting Tapes and DASD" on page 194 for more information.

2. Shutdown VM/ESA and END-390 and IPL-390 to load the new DEVMAP
   containing the newly defined 3422. VM/ESA should dynamically sense the
   3422 and bring it online.

Operation

- The PC file is opened when data is read from or written to the tape, or when
  tape positioning commands like FORWARD SPACE FILE (FSF) or FORWARD
  SPACE RECORD (FSR) are issued.

- The PC file is closed when a REWIND or REWIND UNLOAD is issued.

- REWIND UNLOAD does not actually unload or demount the tape. Instead, it
  sets the sense bits so that SENSE, READ, and WRITE commands report
  "intervention required." However, if you issue other commands, such as
  REWIND or FSF, they succeed, and tape status is reset so subsequent WRITE
  or READ commands proceed normally.

- The read-only (no ring) status is presented to VM/ESA if the PC file has the
  OS/2 read-only attribute set.

- "Equipment check" is seen by VM/ESA if a file is accessed that is not in the
  tape emulation format.

- When data is written to an existing emulated tape file, any data following the
  record written is erased. This allows the file to grow and shrink as the "tape" is
  reused.

- See "Mounting Tapes and DASD" for a description of how to mount and
  dismount tapes on an emulated tape drive.

Mounting Tapes and DASD

As you run VM/ESA on the S/390 Integrated Server, you will need to mount and
dismount emulated magnetic tapes and disks from an AWSTAPE emulated tape
drive. The S/390 Integrated Server provides two tools you can use to do this:
AWSMOUNT.EXE for use in an OS/2 window, and the MOUNT command from
CMS. AWSMOUNT can also be used to mount or dismount emulated FBA DASD
volumes.

Using the AWSMOUNT Command in OS/2

The AWSMOUNT command can be used to either query the existing file name or
mount a new emulated tape or disk. Issue the following command from an OS/2
window:

AWSMOUNT *devaddr* [*fname*] /*option*

devaddr   The S/390 address (*cuu*) of the emulated tape drive or FBA DASD
          volume

fname   The fully qualified name of the OS/2 file used to emulated the tape or
          disk. This field is required to mount a new tape or disk file.

option

/Q   Query the file allocated to dev_addr

/O   Overlay the old file association with the new association

/C   Create a new file if one does not already exist

/R   Make the allocated file appear read only to the S/390 Integrated Server

/W   Make the allocated file appear read/write to the S/390 Integrated Server

/D   Demount the file allocated to dev_addr.

Options for emulated tape devices are:

/REW Close and rewind the file

/RUN Close, rewind, and unload the file

/C   Create the file if necessary

Before changing the assignment with AWSMOUNT, detach and vary off emulated FBA DASD volumes from the VM System Operator.

Using the MOUNT Command in CMS

The MOUNT command is a special program that can be executed from a virtual machine running CMS to either query the existing file name or mount a new emulated tape. The tape drive must be attached to the virtual machine executing the MOUNT command.

The MOUNT program is supplied on the VM/ESA preconfigured system CD-ROM. It can also be found on the MAINT.370 minidisk on the preconfigured system CD-ROM if you have built your own VM/ESA system and would like to install it on your own VM/ESA system.

Here is an example of using MOUNT.

```
CP ATTACH 580 TO * AS 181
MOUNT 181 A:TAPE.OUT
TAPE DUMP * EXEC C
TAPE REW
```

To query the OS/2 file currently associated with the tape drive, use the QUERY option.

```
MOUNT 181 (QUERY
```

To have the results of the query stacked LIFO to the CMS stack so that it can be read by an exec or program, use the STACK option.

```
MOUNT 181 (STACK
```

Using CMS PIPELINE Support

The S/390 Integrated Server comes with these CMS PIPELINE stages that are unique to the S/390 Integrated Server:

- OS2
- OS2FILE

OS2FILE

See "PIPE OS2FILE CMS Command" on page 217 for the syntax for the OS2FILE command. The target for writing an OS2FILE does not have to be an OS/2 DASD file. It can also be a logical printer port under OS/2 An example for exploiting this is to use IBM's Document Composition Facility (DCF or SCRIPT) to create a POSTSCRIPT output file and have that output saved to a file on a CMS disk. DCF produces its POSTSCRIPT files in ASCII so that translation from EBCDIC to ASCII is not required upon transmission to OS/2. In the following example, let's assume you have executed DCF and the result is a POSTSCRIPT output file named GARY LISTPS A. You can also assume that the requirements for using the OS2FILE stage on the CMS user ID have been met. You can then issue the following command:

```
PIPE < GARY LISTPS A | OS2FILE LPT4 BINARY
```

The file is read from the CMS disk and written directly to the OS/2 LPT4 print queue. The BINARY option suppressed translation to ASCII because the file was already in ASCII. The LPT4 print queue is associated with a postscript printer. The printer can be either directly attached to the S/390 Integrated Server or it can be controlled by a LAN print server to which the S/390 Integrated Server is a client.

Using the 1403 Line Printer Support

There may be times when you want to print something from the VM/ESA system on a PC printer attached to the S/390 Integrated Server. Or, you may wish to transfer the print output to another node in your network as a file. The S/390 Integrated Server provides a 1403 emulator device manager that appears to the VM/ESA system as a real 1403 printer. Print output can be directed to this device manager and will actually be stored in an OS/2 disk file or directed to a PC printer.

Setup

Follow these steps to use the 1403 printer emulation support:

1. Define one or more 1403 printers in the device map. The new definition is not active until the DEVMAP has been saved and the P/390 restarted.

2. Update the VM SYSTEM CONFIG file to include a statement like:

   ```
   RDEVICE 00E TYPE IMPACT CLASS A FORM *
   ```

   for each printer address.

3. Re-IPL VM/ESA to activate the printer definitions in the operating system.

Using Client Support on the LAN

Any PC or workstation that is on the LAN can access the VSE/ESA system that is running on the S/390 Integrated Server. There are two ways to provide 3270 sessions to your clients:

- TCP/IP Telnet (TN3270) sessions
- VTAM SNA 3270 sessions

Setup of TCP/IP Telnet (TN3270) Sessions

To VSE/ESA, these clients appear to be local, non-SNA, DFT 3270 devices. You do not need to run TCP/IP S/390 code to use this function. See the instructions in the d:\P390\LAN3274.DOC.

Setup of VTAM SNA 3270 Sessions

To VSE/ESA, these clients appear to be switched SNA 3270 devices attached through an IBM 3172 controller. They can have the full range of 3270 facilities available to them, including file transfer, if the 3270 emulator software being used on the client supports them. Each client can have one or more host sessions active with the S/390 Integrated Server; the actual number depends on the 3270 emulator being used on the client.

To use the client support on a OS/2, DOS, or Windows workstation, see the LAN3172.DOC.

Using the Emulated Optical-Media-Attach Support

The S/390 Integrated Server provides the AWSOMA device manager to emulate an IBM OMA device. This emulation has these purposes:

1. Loading IBM PID tapes from OMA-formatted CD-ROMs
2. Allowing an S/390 operating system to have direct read-only access to an OS/2 file.

This section discusses item 2. AWSOMA looks like a 3422 tape drive to VM/ESA and a 3423 tape drive to MVS/ESA and OS/390. There is a companion OS/2 file that instructs AWSOMA on what to read. This OS/2 file, called a tape descriptor file or TDF, should be added to the DEVMAP. The file should include the following input[26]:

First line	@TDF
Next line or lines	Drive, path, and filename and extension of the OS/2 file to be read, followed by the word TEXT.
Next to last line	TM
Last line	EOT

Here is an example of a file called D:\OS2.TDF:

```
@TDF
C:\CONFIG.SYS    TEXT
C:\AUTOEXEC.BAT TEXT
TM
EOT
```

Here is an example of how to use AWSOMA in VM/ESA. It can be modified for any other S/390 operating system.

1. DEVMAP points to D:\OS2.TDF for AWSOMA at address 580.

2. In VM/ESA, logon and attach 580 (to your ID) as 181.

---

[26] Input must be in all CAPITAL letters.

```
ATT 580 * 181
```

3. Define an input and an output device:

```
FI INMOVE TAP1
FI OUTMOVE TERM
```

4. Issue a MOVEFILE command to read the CONFIG.SYS file from C:\ to your terminal.

```
MOVE
```

5. If you issue MOVEFILE again, you will get AUTOEXEC.BAT.

AWSOMA can be used to read from a file without duplicating it. This allows you to maintain sole authority data sets without having to use up large quantities of disk space. Any S/390 operating system that uses 3420 tapes can now read files from a LAN under program control.

Chapter 13. CMS Commands

This chapter describes the CMS commands that are shipped with the P/390.

The *CMS commands* reside on the P/390 S-disk. Because VM users do not know about these commands, you should make documentation about them available to all users of the P/390. These CMS commands provide function that is essential to the operation of the P/390. They are:

CMS Command	Used to:	Information on page:
MOUNT	Associate an OS/2 file specification with an S/390 Integrated Server emulated tape drive.	200
NEWDIR	Import the current VM user directory from OS/2 and make it active in VM.	203
OS2	Execute an OS/2 command from a P/390 virtual machine.	204
PCOPY	Copy files back and forth between OS/2 and VM.	206
PIPE OS/2	Execute an OS/2 command from CMS pipelines.	213
PIPE OS2FILE	Read or write OS/2 files from CMS pipelines.	217

All of these commands require 370ACCOM ON in the virtual machine. The covering EXECs save the state of 370ACCOM and restore it upon completion of the command. For TFA and CACHE, the state of 370ACCOM is restored when a STOP is issued.

MOUNT CMS Command

Use the MOUNT command to associate an OS/2 file specification with a P/390 emulated tape drive.

Tape emulation on diskettes allows you to move data easily between P/390s. Unlike PCOPY, the data stays in an internal VM format so it can be recreated exactly on another P/390 without any special parameters or concern for binary/ASCII translation.

Tape emulation also allows you to use CMS commands such as DDR for backup. The OS/2 file can either be on diskette, on fixed disks, or on remote disks managed by a LAN server.

OS/2 files written by P/390 tape emulation are suitable for processing only by other P/390s. The data in them cannot be accessed by other PC programs or by other S/390 processors. P/390 tape emulation should be used only for temporary storage or transportation of data, not for archival.

Tape emulation uses a standard PS/2-OS/2 formatted diskette. Other files on the diskette reduce the apparent maximum size of your tape. If the diskette is write-protected, the tape associated with it shows file protection (ring=out). You can also write-protect individual files by using the OS/2 ATTRIB command. For example:

```
ATTRIB +R C:TAPE.OUT
```

makes the C:TAPE.OUT read/only. It appears as a tape with ring=out (write-protected) to VM.

REWINDing the tape from VM causes the OS/2 file to be closed. YOU MUST REWIND or DETACH the tape BEFORE REMOVING THE DISKETTE. REWIND ensures that all the data is actually written and the OS/2 disk directory updated. TAPE REW, TAPE RUN, REWIND, and DETACH all perform a rewind. Any one of these commands is sufficient.

Syntax

```
MOUNT      vaddr filespec (options


           Options:
                    QUERY
                    STACK
```

Required Parameters
vaddr   The virtual address of the tape drive in your virtual machine.
                   Typically, the virtual address for the primary CMS tape drive is
                   181. The virtual address is the second address on the ATTACH
                   command (for example: ATTACH 580 TO OPERATOR AS 181).

filespec   The OS/2 file name (specification) associated with this emulated tape drive. The following examples show three ways to specify the OS/2 file name:

```
MOUNT 181 C:\TEST\TAPE.OUT
MOUNT 181 TAPE.OUT
MOUNT 181 C:TAPE.OUT
```

- In the first example, the file specification includes the drive, path, file name, and extension.

- In the second example, the file specification includes just the file name and extension. When you specify only the file name and extension, the current drive and path are used.

- In the third example, the file specification includes only a drive, file name, and extension. The current path is used.

The maximum length of the file specification is 17 characters.

Optional Parameters
QUERY   Display the file currently associated with the address.

STACK   (LIFO) the file currently associated with the address.

Example
The following sequence of commands dumps all the EXECs on the CMS C-disk to the file TAPE.OUT on the PS/2 diskette, which is in the A: diskette drive.

```
CP ATTACH 580 TO * AS 181
MOUNT 181 A:TAPE.OUT
TAPE DUMP * EXEC C
TAPE REW
```

Note: You MUST REWIND or DETACH the tape before removing the diskette. These commands force OS/2 to close the file and update the diskette directory.

Return Codes and Error Messages

Return Code	Error Message	Explanation
1	AWSMNT001E Unknown CSW from mount	An unknown error from mount.
3	AWSMNT003E Device ... not defined	The device does not exist.
4	AWSMNT004E Invalid virtual address	The first parameter must be in hexadecimal.
5	AWSMNT005E No fileid specified	The OS/2 file ID is the second parameter.
6	AWSMNT006E OS/2 filename too long.	A maximum of 17 characters is allowed.
24	AWSMNT024E Invalid option	Only STACK and QUERY are allowed.

Errors from Tape Commands
FILE PROTECTED

- The diskette is write-protected; you must change the write protect tab.

- The OS/2 file has the read/only attribute. REWIND the tape and use the OS/2 ATTRIB command to make the OS/2 file read/write.

EQUIPMENT CHECK

- The OS/2 file associated with the tape is not an emulated tape file. It was not created with the AWSTAPE tape emulation control unit.

- If the file was new and you were writing, there is some reason the OS/2 file could not be created—for example, an invalid name or disk file specification.

ERROR READING TAPE

- The CMS command you were using to read the tape was incompatible with the command that wrote the tape. For example, the tape was written with MOVEFILE, and you tried to read it with TAPE or DDR.

- The OS/2 file you associated with the tape drive does not exist.

- An OS/2 error was encountered while reading the file.

NEWDIR CMS Command

Use the NEWDIR command to import the current VM user directory from OS/2 and make it active in VM. If you are not using the P/390 Configurator to maintain your directory, then the NEWDIR command does not apply.

The NEWDIR command locates the copy of the VM user directory that is maintained by the P/390 Configurator, (the default is d:\VMESA\USER.DIR), PCOPYs it onto the OPERATOR's A-disk (as USER DIRECT), and executes the DIRECTXA command to write the directory and set it active.

Syntax

```
NEWDIR
```

NEWDIR command operates in this manner:

1. The default DEVMAP is determined by using a special PCOPY function.
2. The name and location of the user directory file is extracted from DEVMAP.
3. This file (USER.DIR) is then PCOPYed to the OPERATOR's A-disk as USER DIRECT.
4. The CP DIRECTXA command is invoked to write the directory and set it active.

NEWDIR is called from the OPERATOR's PROFILE EXEC to make the most current VM user directory active before any users log on. You can invoke NEWDIR at any time afterwards to bring in a new copy of the directory.

Note: If you have used the P/390 Configurator to add *new* minidisks that were never in DEVMAP, these volumes *cannot* be accessed by the P/390 until you have shut down VM, clicked on the End P/390 icon, and re-IPLed VM using the IPL P/390 icon. DEVMAP is only read by the P/390 program when the P/390 I/O subsystem is started, and any changes to DEVMAP while it is running do not take effect until the next time the I/O subsystem is started.

If you are changing the MDISK cards for *existing* DEVMAP entries, or if you are changing or adding some other non-minidisk user data in the directory, NEWDIR makes these changes active.

OS2 CMS Command

Use the OS2 command to execute an OS/2 command from a P/390 virtual machine and display the results on the terminal.

Attention:

Do not attempt to execute OS/2 commands that display more than 64000 bytes of output. Execution of such commands can hang your S/390 Integrated Server.

Do not attempt to execute commands that rely on or attempt to change the state of the OS/2 environment. Environment changes cannot be preserved across calls to the OS/2 system. For example, the following sequence does not necessarily display the XYZ subdirectory:

```
OS2 CD \XYZ
OS2 DIR
```

If you need to execute several OS/2 commands in sequence, put them in a CMD file and use the OS2 command to execute the CMD file.

Syntax

```
OS2          [ options (] command

             Options:

                     TYPE
                     STACK
                     LIFO
                     FIFO
OS2CMD    STEM x. (command
```

Required Parameters
command   An OS/2 command, followed by its parameters, if any.

Optional Parameters
TYPE   Type the output on the CMS console.

STACK   Put the output on the CMS stack in LIFO order.

LIFO   Put the output on the CMS stack in LIFO order.

FIFO   Put the output on the CMS stack in FIFO order.

STEM   Put the output into a REXX array. The STEM option must be followed by an array variable. For example: STEM X. puts the output into the variable X.1 through X.N. X.0 is set to the total lines of output. The stem option is valid only in a REXX or EXEC2 EXEC. You must invoke the OS2CMD MODULE, not the OS2 EXEC, to use this option.

Examples

The following command:

```
OS2 DIR G:\*.EXE
```

executes the DIR command against the G root directory and displays all files with a file extension of EXE.

PCOPY CMS Command

The PCOPY command copies files between the VM/CMS environment and the OS/2 environment on the PS/2. This operation is called the *import/export* function. You import files to VM from OS/2, or export files from VM to OS/2. You can also use PCOPY with Transparent File Access (TFA) to upload and download files between the PS/2 and the host system.

Because the operating systems (OS/2 and VM) have different file structures and character codes, you may have to specify some options to move the data into the form you want. Generally, you use PCOPY to move character data between OS/2 and CMS. SCRIPT files, EXECs, and source programs are examples of character data, which generally includes anything that can be processed by a text editor. These files need to be translated from EBCDIC (on the P/390) to ASCII (for the S/390 Server), and vice versa. The files have variable-length records in VM and end-of-line characters in OS/2.

Binary data, on the other hand, is data that should *not* be translated between EBCDIC and ASCII. Modules, TEXT decks, and LOADLIBs are examples of binary data. Generally, binary data is the result of programs such as compilers and assemblers. Normally, you do not need to move such binary data between OS/2 and VM, but if you do, PCOPY provides the capability. For example, you might want to use PCOPY in conjunction with TFA to upload an OS/2 file to the host so it can be downloaded and used on another P/390. Or you may want to copy a CMS module to a diskette so you can carry it to another workstation.

Syntax

```
PCOPY          source destination (options

               Options:
               ASCII    EOF       NEWFile      PUNCH
               BINary   NOEOF     REPlace


               EOL      RECFM F   LRECL nnnnn  TRUNC        AIXNL
               NOEOL    RECFM V                NOTRUNC
```

Required Parameters

source and destination   File specifications. One of these must be an OS/2 file specification, and the other must be a CMS file specification.

OS/2 FILE SPEC: drive:[\path\]filename.[ext]

CMS FILE SPEC: [AWS:]filename filetype filemode

Note: You must include the drive letter in the OS/2 file specification, and the OS/2 file specification must not include any blanks. In the above example, path and ext are optional parts of an OS/2 file specification that must include a drive

letter and must not contain any blanks. AWS is the P/390 identifier. This prefix is optional.

HPFS long names are *not* supported.

Optional Parameters

The defaults for the PCOPY command are based on the file type. If the file type ends in the letters BIN, binary defaults are used; otherwise, character defaults are chosen:

Character defaults
ASCII, EOF, EOL, RECFM V, NEWfile, NOTrunc

Binary defaults
BINARY, NOEOF, NOEOL, RECFM V, NEWfile, NOTrunc

If you are importing and exporting SCRIPT or other text files, the only option you need is REPLACE. You should use it if you want to overlay an existing file.

If you are importing and exporting source programs, you may want to use the RECFM F and LRECL 80 options to import the programs, because most CMS compilers accept that format. For exporting programs to work with an OS/2 editor, you should use the RECFM V LRECL 72 TRUNC options. These produce an OS/2 file without sequence numbers.

ASCII	Translate the EBCDIC file on CMS to or from ASCII on OS/2.
BINary	Do not translate the file. This implies NOEOF and NOEOL.
EOF	Add an end-of-file mark (X'1A') to the exported file. Remove it from an imported file. (This is the ASCII default.)
NOEOF	Do not look for (or add) EOF marks. (This is the BINARY default.)
NEWfile	DO *not* replace an existing file. (This is the default.)
REPlace	If necessary, replace an existing file with the copied file.
PUNCH	The punch option is used to import binary files and output them directly to the virtual punch. It is intended for use by system programmers to import IPLable decks that have been downloaded to the PC. PUNCH requires the BINARY option and does not allow a CMS file ID to be specified.
EOL	Add end-of-line markers (X'1A') to exported files and remove them from imported files. EOL marks are required for RECFM V files (if you want to import them again), and are recommended for nonbinary fixed-length files. (This is the ASCII default.)
NOEOL	Do not look for (or add) EOL marks. (This is the BINARY default.)
RECFM FIV	Make the target file fixed (F) or variable (V) record format. See "Record Format" on page 208 for more information.
LRECL nnnn	Logical record length. If the input records are longer, they are shortened. If they are shorter and RECFM F is specified, they are padded with blanks (for ASCII files) or binary zeros (for BINARY files).
TRUNC	Delete trailing blanks. Requires ASCII and RECFM V.

NOTrunc　　　　Do not truncate trailing blanks. (This is the default.) Use AIX–style new line characters as end-of-line markers. This option is useful when a TCP/IP NFS mounted AIX file directory is used as a source disk for a PCOPY operation. AIX uses new line characters as end-of-line markers, rather than the ASCII carriage return/line-feed (X'0D0A') characters. This option is only effective when the EOL option has been specified or is the default.

Record Format

CMS supports two record formats: fixed and variable. In fixed-format files, all the records of the file have the same length. In variable-format files, each record can have a different length (but each must be at least one byte long). The logical record length (LRECL) is not present in the data. It is stored separately.

OS/2 does not have any special length format. The end of a record is indicated by special end-of-line (EOL) characters. Many programs recognize these end-of-line characters and treat them as separators. For example, the TYPE command starts a new line when it finds an EOL sequence.

The options on PCOPY control how the record format and logical record length attributes of a CMS file map to the OS/2 output file, and how the EOL and EOF characters found in an OS/2 file are to be treated when the file is imported to CMS.

IMPORT: OS/2 to CMS

The following table describes the effects of options on the PCOPY command when you are importing a file from OS/2 to CMS.

If You Specify . . .	Then:
EOL	Records in the input file are separated by EOL characters.
RECFM V	RECFM V is the default. Each record in the OS/2 file becomes one record in the CMS file. **Note:** If you do not specify LRECL, the entire record is read in.
TRUNC	Trailing blanks (EBCDIC X'40's are removed before the data is put into the CMS file. Null lines (two EOL strings in a row) are converted to a line with a single blank (ASCII) or null X'00' (BINARY).
LRECL with EOL	The CMS file is created with the record size you specify. If some of the OS/2 records are longer than what you specify, they are truncated. If you have also specified RECFM F, OS/2 records that are shorter than the LRECL are padded with blanks (for ASCII) and zeros (for binary) up to the specified length. Padding is not done for RECFM V.
LRECL with NOEOL	The OS/2 file is imported and broken into records according to the LRECL. If RECFM F is specified, the last record is padded with blanks or binary zeros.
EOF	When the first EOF character (X'1A') is found, it represents the end-of-file, and no more data is read, even if there is more data in the OS/2 file. Normally, OS/2-readable text files contain on EOF only as the last character of the file. OS/2 binary files can contain X'1A' characters anywhere in the file as valid data bytes. Therefore, the EOF option should not be used with binary files.
NOEOF	If an EOF character is at the end of the file, you will have an extra byte at the end of the transferred file. If you also specified EOL, the EOF is probably the first and only character of the last record (if there is one).

EXPORT CMS to OS/2

The following table describes the effects of options on the PCOPY command when you are exporting a file from CMS to OS/2.

If You Specify . . .	Then:
EOL	ASCII EOL (X'0D0A') characters are added to the end of each line exported. You should specify EOL if you are exporting a RECFM V file with more than one record. Without EOL characters, PCOPY cannot determine the original size of each record.
LRECL	The records are truncated if they are longer. If you do not specify LRECL, the LRECL of the CMS file is used.
RECFM F	Each output record is padded to the logical record length. ASCII files are padded with blanks and binary files are padded with nulls (X'00').
TRUNC ASCII RECFM V	Trailing blanks are removed from each record before it is exported. If LRECL is also specified, the record is first shortened, and trailing blanks are then deleted. This may be useful for eliminating XEDIT sequence numbers from source programs. For example, the options *RECFM V LRECL 72 TRUNC* may be specified to delete the sequence numbers in columns 72–80 and to delete trailing blanks before column 72.

Exporting Binary Data: If you are exporting binary data to use with OS/2, you should just specify BINARY and take the default options NOEOL and NOEOF. The data in the file is then written out as a continuous string of data, without regard to its record format in CMS.

If you are exporting binary data and intend to import the file to CMS later, and if you want to preserve its record format, there are several options:

If the File is . . .	Then:
RECFM F	Write down the record length, and export the file with the BINARY option and its defaults, NOEOL and NOEOF. When you import the file, use the options *BINARY RECFM F LRECL nnn*, where *nnn* is the record length of the original CMS file you had previously written down.
RECFM V	You can try to export the file with the EOL option. However, if the file already contains EOL sequences, PCOPY issues an error message. (It still exports the file, but you will not be able to import again correctly.) You can also use the EOL option with RECFM F files. That way, you specify only the RECFM F (or RECFM V) and EOL options.
RECFM V with EOL sequences	If the file is RECFM V and it contains EOL sequences, such as a CMS *MODULE* type file, you have to create an intermediate file with the CMS command *COPYFILE (PACK.* This transforms your variable-length file into a fixed-length file. You can then export and import the file in the same manner as that described in the RECFM entry in this table. After importing the file, use *COPYFILE (UNPACK* to recreate the original file.

Examples
Export a File

```
PCOPY MYFILE SCRIPT C:\MYFILE.SCR
```

Import a File

```
PCOPY G:USER.DIR USER DIRECT A (RECFM F LRECL 80
```

Wildcards

Wildcards (* for OS/2 file specs and = for CMS file specs) are allowed only in the destination file specification:

```
PCOPY PROFILE EXEC A C:\*.*

PCOPY G:USER.DIR = DIRECT A
```

PCOPY Usage Notes

Listed below are several bits of information about the PCOPY command and its usage:

- The maximum record length allowed is 65536.

- Any file transferred from VM to OS/2 that is translated into ASCII may differ from the original CMS file once it is transferred. This is due to the translated tables used during the copy. To prevent problems, the BINARY option should be used to avoid data translation.

- If wildcards (global file names) are used in the OS/2 file specification, the file extension produced is the first three characters of the CMS file type.

- PCOPY expects to be told what S/390 device address to use to reach the server. This can be done by any of these methods:

  – Setting up a global variable set to the address
  – Using a system-defined default

  The system-defined defaults are set by modifying the PCOPY EXEC to set the desired addresses. If a global variable is used, the PCOPY EXEC is coded to search for the following:

  ```
  GROUP    NAME = AWSPARMS
  VARIABLE NAME = PCOPY_PARMS = raddr max vaddr
  ```

  The default value for PCOPY_PARMS is '460 463 460'.

Return Codes and Error Messages

Return Code	Error Message	Explanation
001	AWSPCY001W Variable length files exported w/o EOL characters cannot be correctly imported.	See *CMS Command Reference* for assistance.
1xxx	AWSPCY001E FSWRITE error xxx on file	See *CMS Application Reference - Assembler.*
2xxx	AWSPCY002E FSREAD error xxx on file	See *CMS Application Reference - Assembler.*
3xxx	AWSPCY003E FSSTATE error xxx on file ..... or PCOPY CMSUT1.	See *CMS Application Reference - Assembler.*
4xxx	AWSPCY004E ATTACH command error trying to access the PCSERVER device.	
0023	AWSPCY023E Extended PLIST missing or invalid.	PCOPY must be invoked from the PCOPY exec.
0024	AWSPCY024E Incomplete fileid specified	You must specify the full CMS file ID (3 words) and the full OS/2 fileid (drive:name.ext).

Return Code	Error Message	Explanation
0024	AWSPCY024E Too many words in fileid specifications	Do not put any blanks in the OS/2 file ID specification. Options must be preceded by a left parenthesis.
0028	AWSPCY028E Target file already exists. Specify REPLACE option'	The name specified for the target file already exists.
0030	AWSPCY030E Incomplete fileid specified.	You must specify the full CMS file ID (3 words).
0031	AWSPCY031E Invalid LRECL specified.	The word following the LRECL option was invalid. It was either too big (more than 65535) or not a positive number. Plus signs, commas, and so on, are not allowed in the LRECL specification.
0032	AWSPCY032E Missing parenthesis before options.	Do not put any spaces in the OS/2 fileid specification.
0033	AWSPCY033E Invalid option	PCOPY did not recognize an option in the command.
0035	AWSPCY035E Incomplete CMS fileid specified.	You must specify the full CMS fileid (3 words) and the full OS/2 fileid (drive:name.ext).
0036	AWSPCY036E DISK x is read/only	You have tried to import a file to a read/only disk.
0037	AWSPCY037E PCSERVER address invalid or not available.	PCOPY uses a *real* (to CP) I/O device to move data to the PS/2. PCOPY could not find one to use. They may all have been in use, or you may not have enough defined with the configurator, or your virtual machine may not be using the right address, which is defined in GLOBALV table AWSPARMS variable PCOPY_PARMS.
0038	AWSPCY038E Error opening OS/2 file.	OS/2 cannot open the file. You may have specified an incorrect disk letter, or the disk may not be available.
0039	AWSPCY039E Error closing OS/2 file.	OS/2 cannot close the file. The PS/2 disk may be full, or there may be a hardware error on the disk.
0040	AWSPCY040E Error reading OS/2 file.	OS/2 cannot read the file. The PS/2 disk may have an error, or another program may have erased the file the PCOPY was trying to import.
0041	AWSPCY041E Error writing OS/2 file.	OS/2 cannot write to the file. The PS/2 disk may be full, or there may be a hardware error on the disk.
0042	AWSPCY042E PCSERVER device address missing.	The PCOPY command was invoked without the PCSERVER address.
0043	AWSPCY043E Error closing CMS file.	OS/2 cannot close the CMS file. The CMS minidisk may be full.

Return Code	Error Message	Explanation
0044	AWSPCY044E Error erasing original OS/2 file.	OS/2 could not erase the original OS/2 file when REPLACE was specified. There may be a disk error, or some other program might have erased the file between the time the PCOPY command started and ended.
0047	AWSPCY047E Error renaming PCOPY CMSUT1.	PCOPY imports data into a temporary file PCOPY CMSUT1. The last step is to rename this file to the correct file ID. For some reason, this rename failed. For example, you specified PCOPY CMSUT1 as the target file. RENAME then fails; specify another file.
0048	AWSPCY048E File already exists.	
0049	AWSPCY049E Error creating OS/2 file.	OS/2 cannot open the file. You may have specified an incorrect disk letter, or the disk may not be available, or there may not be enough space.
0050	AWSPCY050E Insufficient storage.	There was not enough storage to get the working buffer. The buffer size depends on the LRECL of the file you are trying to import/export, and on your LRECL specification. Define a larger virtual machine, or free some storage.
0051	AWSPCY051E Incorrect wildcard specification.	The file id entered contained an incorrect wildcard specification.
0053	AWSPCY053E *fn ft fm* contains ASCII End-of-line or end-of-file characters.	
0060	AWSPCY060E LRECL is to long for default RECFM F.	The records in the input file are too long to for processing with a defaulted LRECL. You should specify LRECL 64000 and RECFM V. Import the file, and then either use COPYFILE to change it to RECFM F, or note the true LRECL and reimport it, specifying that LRECL and RECFM F.
0061	AWSPCY061E Input file xxx does not contain fixed length records.	The OS/2 file to be imported has records that are longer than the first record. Either import the file as a variable length file, or specify an LRECL with RECFM F, in which case the records are padded or truncated as necessary.

PIPE OS2 CMS Command

Use the OS/2 stage command to issue OS/2 commands from a pipeline running in CMS on a P/390 and to write the responses from the commands to the pipeline rather than to the terminal. If the CMD keyword is specified, the command following it is passed to OS/2 for execution. Primary input stream records are read and passed to OS/2 as commands. Terminal output from these commands is written to the OS/2 stage command's primary output stream, if it is connected. Each line of output is written as a separate record.

If its secondary output stream is connected, the OS/2 stage command writes the return codes from each command to the secondary output stream.

Syntax

```
                 ┌─460──┐    ┌─VMCodepage 037─┐   ┌─PCCodepage 850─┐
►►──┬─OS/2─┬─────┼──────┼────┼────────────────┼───┼────────────────┼──►
    └─OS2──┘     └─device─┘  └─VMCodepage mmm─┘   └─PCCodepage nnn─┘

►──────────────────────────────────────────────────────────────────►◄
    └─CMD──string─┘
```
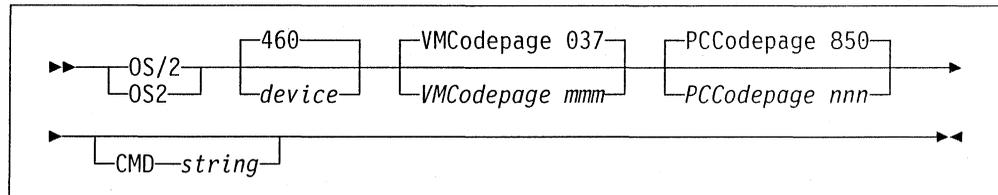
Operands

device   Is a three-character hexadecimal number specifying the virtual address at which a PCSERVER 3088 device is attached to your virtual machine. These devices are referred to as PCOPY devices in the P/390 Configurator. The default is 460.

VMCodepage mmm

Specifies the EBCDIC codepage being used in the CMS system. The default is 037. These codepages are supported: 037 273 274 275 277 278 279 280 281 282 283 284 285 297 500 871.

PCCodepage nnn

Specifies the ASCII codepage being used in the OS/2 system. The default is 850. These codepages are supported: 437 819 850 863 865.

CMD string Specifies an optional command to be passed to OS/2 for execution. If the CMD operand is specified, it must be the last operand. The CMD operand is not accepted if the secondary output stream is connected; in that case, the OS/2 stage command issues only the commands that it reads from its primary input stream.

Streams Used

Primary input stream

The OS/2 stage command reads records from its primary input stream. Input records must contain a command to be passed to OS/2 for execution.

Primary output stream

The OS/2 stage command causes any terminal output from the commands to be written to its primary output stream. Each line of output is written as a separate record.

Secondary output stream

If its secondary output stream is connected, the OS/2 stage command writes the return codes from each command to its secondary output stream after it writes the terminal output from that command to its primary output stream.

Usage Notes

1. OS/2 does not delay the records.

2. The OS/2 stage command issues commands to OS/2 using a PCSERVER 3088 device. That device must already be attached to your virtual machine. Only one OS/2 or OS2FILE stage command can use a given PCSERVER device at any one time.

3. Not all OS/2 commands can be issued using the OS/2 stage command. The underlying interface fails if a command issued by the OS/2 stage command produces more than 64-bytes of output.

4. Requires 370ACCOM mode to be on to run the pipeline stage.

5. See also "PIPE OS2FILE CMS Command" on page 217.

Examples

The following example issues an OS/2 DIR command to list the files in the C:\P390 directory that have a file type of DOC and issues CMS EXEC PCOPY commands to copy those files to a CMS minidisk accessed at mode Z:

```
'PIPE',
  'literal dir c:\p390\*.doc |',    /* OS/2 command to be issued.  */
  'os/2 |',                         /* Issue it.                   */
  'drop 5 |',                       /* Discard DIR header lines.   */
  'drop last 2 |',                  /* Discard DIR trailer lines.  */
  'spec',                           /* Build EXEC PCOPY commands:  */
    '=EXEC PCOPY C:\P390\= 1',      /*   literal,                  */
    'word 1 next',                  /*   filename,                 */
    '=.DOC= next',                  /*   literal,                  */
    'word 1 nextword',              /*   filename,                 */
    '=DOC Z= nextword |',           /*   literal.                  */
  'command |',                      /* Issue EXEC PCOPY commands.  */
  'console'                         /* Display any response.       */
```

Example 2

This example uses an OS/2 DIR command to list the contents of the D:\VMESA directory, selects the entries for VM paging and spooling "volumes", and reformats those entries into OS/2 ATTRIB commands to mark the OS/2 files corresponding to VM paging and spooling volumes "hidden" and "system" so that they will not be backed up when the VM system is shut down and an OS/2 BACKUP command is run:

```
'PIPE',
   'os/2 cmd DIR D:\VM /A:-D |',      /* Issue OS/2 DIR command.     */
   'zone 1.6 all /SPOOL/ ! /PAGING/ |', /* Select only page/spool.   */
   'spec',                             /* Build ATTRIB commands:      */
      '=ATTRIB D:\VM\= 1',            /*    literal,                  */
      'word 1 next',                  /*    filename,                 */
      '=.= next',                     /*    literal,                  */
      'word 2 next',                  /*    filetype,                 */
      '=+S +H= nextword |',           /*    literal.                  */
   'os/2 461'                          /* Issue the ATTRIB commands.  */
```

Note that separate PCSERVER devices are used for the two OS/2 stage commands, 460 (the default) for the first OS/2 and 461 for the second. Both of these devices must have been attached to the virtual machine before the PIPE command is issued.

Return Codes

Each command issued by the OS/2 stage command completes with three return codes:

a   The first return code is from the dosexecpgm call. This value is nonzero in situations such as path not found, program not found, and so on. It corresponds to the message number in the SYSnnnn error message that would have been issued if the command had been typed directly to the OS/2 system.

b   The second return code, termcodepid, describes why a "child" process was terminated abnormally. The values defined for this number are:

0   Normal exit
1   Hard error halt
2   Trap for 16-bit process
3   Unintercepted doskillprocess
4   Trap for 32-bit process
c   The third return code is the return code from the OS/2 command itself.

If the OS/2 stage command has no secondary output stream, it produces a return code for each command by using this logic:

```
select
    when c>0 then rc=c+10000
    when b>0 then rc=b+20000
    when a>0 then rc=a+30000
otherwise
    rc=piperc
end
```

where a, b, and c are as defined above. Thus, if the return code for a command is less than 10000, it is a return code from CMS Pipelines. The return code for the OS/2 stage is the highest value obtained by this method for any command issued by the stage.

If OS/2 has a secondary output stream, a return code record is written to the secondary output stream following the completion of each command. This record contains three words corresponding to the values of a, b, and c above. When an

OS/2 stage has a secondary output stream, its return code is zero unless the stage is specified incorrectly.

PIPE OS2FILE CMS Command

PIPE OS2FILE reads or writes OS/2 files from CMS Pipelines. Use the OS2FILE stage command in a pipeline running under CMS on a P/390 to read or write an OS/2 file on the associated OS/2 system.

When an OS2FILE stage is the first stage of a pipeline, it reads the specified file and writes the records to its primary output stream. When an OS2FILE stage is not the first stage of a pipeline, it writes all the records from its primary input stream (including null records) to the specified file, replacing any previously existing file of the same name. If the primary output stream is connected, OS2FILE copies all records from its primary input stream to its primary output stream.

Syntax

```
                        ┌─460───┐    ┌─VMCodepage 037─┐
►►──OS2FILE──path─┬─────────┬──┬──────────────────┬──────────────►
                  └─device──┘  └─VMCodepage mmm──┘

     ┌─PCCodepage 850─┐
►──┬──────────────────┬──┬──────────┬──►◄
   └─PCCodepage nnn───┘  ├─BINARY───┤
                          └─BIN──────┘
```
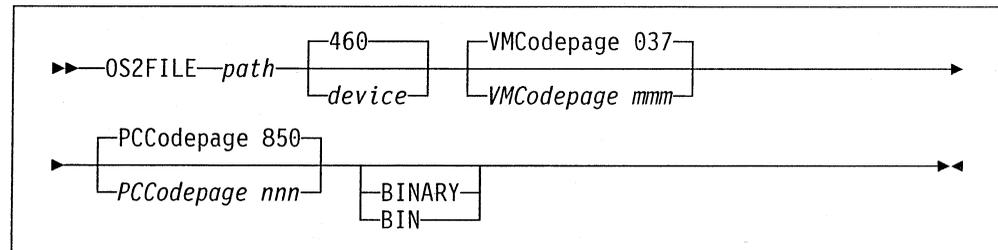
Operands

path
Is the path name of the OS/2 file to be read from or written to. The current directory is always the P390 directory; thus, if some other directory is to be used, the path name should be fully qualified.

device
Is a three-character hexadecimal number specifying the virtual address at which a S/390 Server device is attached to your virtual machine. (These devices are referred to as "PCOPY devices" in the P/390 Configurator.) The default is 460.

VMCodepage mmm
Specifies the EBCDIC codepage being used in the CMS system. The default is 037. These codepages are supported: 037 273 274 275 277 278 279 280 281 282 283 284 285 297 500 871.

PCCodepage nnn
Specifies the ASCII codepage being used in the OS/2 system. The default is 850. These codepages are supported: 437 819 850 863 865.

BINary
Specifies that the file being read or written is not to be translated between codepages and blocked/deblocked.

When an OS/2 file is being read, the default is to translate it from ASCII to EBCDIC and to deblock it with the stage command `deblock string x0D0A terminate eof 1A`. When an OS/2 file is being written, the default is to translate it from EBCDIC to ASCII and to block it using those same operands.

Streams Used

Primary input stream

When an OS2FILE stage is not the first stage of a pipeline, it reads records from its primary input stream.

Primary output stream

When an OS2FILE stage is the first stage of a pipeline, it writes the records read from the file to its primary output stream. When an OS2FILE stage is not the first stage of a pipeline, it copies its primary input stream records, including null records, to its primary output stream.

Usage Notes

1. OS2FILE does not delay the records.

2. The OS2FILE stage command issues commands to OS/2 using a PCSERVER device. That device must already be attached to your virtual machine. Only one OS/2 or OS2FILE stage command can use a given PCSERVER device at any one time.

3. See also "PIPE OS2 CMS Command" on page 213

Example 1

To list the items in the SET PATH command in the OS/2 file CONFIG.SYS:

```
'PIPE',
    'os2file c:\config.sys |',          /* Read CONFIG.SYS.            */
    'find SET PATH|',                   /* Select SET PATH command.    */
    'change /SET PATH// |',             /* Remove command itself.      */
    'split anyof /=;/|',                /* Split one item per line.    */
    'literal  |',                       /* Prepend blank line.         */
    'literal   Search Path|',           /* Prepend title line.         */
    'console'                           /* Display on console.         */
```

Example 2

To modify the CP nucleus file C:\VMESA\SYSRES.300 shipped in the VM/ESA preconfigured system to change the value of the SYSTIME macro from:

```
SYSTIME ID=LCL,LOC=WEST,ZONE=0
```

to

```
SYSTIME ID=EST,LOC=WEST,ZONE=5
```

```
'PIPE',
    'os2file c:\vmesa\sysres.300 binary |',        /* Read CP nucleus. */
    'change x00000000D3C3D3 xFFFFB9B0C5E2E3 |',    /* Correct SYSTIME. */
    'os2file c:\vmesa\sysres.new 461 binary'       /* Write CP nucleus. */
```

The CHANGE stage command changes four bytes of binary zeros followed by the characters *LCL* to the four-byte integer value -5 followed by *EST*. The file is then written under a different name. Note that separate PCSERVER devices are used for the two OS2FILE stage commands, 460 (the default) for the first OS2FILE and

461 for the second. Both of these devices must have been attached to the virtual machine before the PIPE command is issued.

Return Codes

The OS2FILE stage command issues these nonzero return codes:

Code	Meaning
681	Input record length (<number>) is over the maximum allowed (<number>).
687	Relational operator expected; found <word>.
689	Workstation file is missing: <word>.
690	Logical drive was not found: <word>.
691	Directory is missing: <word>.
692	No diskette in drive: <word>.
694	Error <number> on <word> (file: <word>).
1000	You need PIPELINE MODULE level 110600A4 (1.0106/165).

Chapter 14. OS/2 Utilities

The S/390 Integrated Server provides several OS/2 utility programs as part of the software. These are located in the \P390 subdirectory. You can use these when you are writing your own device manager or if you want to accomplish a task without using one of the S/390 Integrated Server interactive interfaces. These utilities are:

OS/2 Utility	Used to:	Information on page:
ALC.EXE	Allocates and initialize files as FBA DASD	222
AWSCFG.CMD	Invokes the P/390 Configurator	223
AWSEND.CMD	Stops the P/390 if it is running	224
AWSMOUNT.EXE	Changes the DASD or the tape configuration dynamically	225
AWSPROF.EXE	Records the location of DEVMAP in the OS2.INI file	226
AWSSTART.EXE	Starts S/390 Integrated Server device managers	227
AWSSTAT.EXE	Displays or changes the status of the I/O subsystem	228
CKDALC.EXE	Allocates files as CKD DASD	229
DEV2NAME.CMD	Creates an ASCII file from a DEVMAP file	230
ICEDEV	Stand-alone scan of the channel for devices	232
ICEINIT	Initializes and loads the ARTIC960, S/390 Parallel Channel, and ESCON Channel adapters	232
ICEMAP	Displays the devices claimed by AWSICE and their settings	232
ICETRACE	Gets an internal S/390 Parallel Channel or ESCON Channel card trace dump	232
IPL.CMD	Starts P/390 I/O subsystem if it is not running	233
LTRENAME.EXE	Changes the titles of 3270 sessions	235
RDEVMAP.CMD	Reconfigures a DEVMAP	236
SENDLOG.CMD	Transmits logs and traces to IBM via the Internet for problem analysis.	237

Figure 34. OS/2 Utility Programs Provided by the S/390 Integrated Server

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ALC.EXE OS/2 Utility

ALC allocates and initializes files for use by the P/390 as FBA DASD. ALC can also display information about an existing volume, and it can change a volume label. ALC can be used to allocate files such as paging, spooling, or TDISK as part of an installation process, instead of using the interactive process with the P/390 Configurator.

The ability to change a volume label is useful when you are moving volumes between systems or reconfiguring a system. It is especially useful when the volume must have a specific name, such as VM CP-owned volumes, which may require you to change the CP configuration if the name changed.

See "CKDALC.EXE OS/2 Utility" on page 229 for a utility to allocate count-key-data DASD files.

Syntax

```
ALC filename /Ssize /Vvolume /Ttype /Z /R /C /Q /ESA
```

Required Parameters

filename	Fully qualified OS/2 file name
/Ssize (decimal)	Usable file size in bytes (K, M) or blocks (B) allowed—where K=1024 bytes, M=1,048,576 bytes, B=512 bytes
/Vvolume	A DASD volume label (6 characters)

Optional Parameters

/Ttype	Space allocation type (either PERM, TDSK, PAGE, TEMP, PARM, SPOL, DRCT, VSE). PERM is the default. For a list of valid allocation types on each mode (370 or ESA), enter ALC ?
/Z (no operands)	Write zeroes to file.
/R (no operands)	Read (display) file attributes.
/C (no operands)	Change DASD volume name.
/Q (no operands)	Quiet—no messages displayed.
/ESA	Must be specified when the files will be used with VM/ESA Release 1.2.1 or higher. The default is 370.

Examples

```
ALC d:\VMESA\PAGING.302 /vPAGING /s10M /tPAGE /ESA
ALC d:\VMESA\SYSRES.300 /R
```

AWSCFG.CMD OS/2 Utility

AWSCFG is the program behind the P/390 I/O Configuration icon. It invokes the P/390 Configurator (AWSCNF.EXE) after checking parameters and supplying defaults.

Syntax

```
AWSCFG [devmap] [S=0|1|2|3] [L=nn]
       [devmap /NEW]
```

Optional Parameters

devmap
: If the DEVMAP location is not specified, the current DEVMAP (as kept by AWSPROF) is used. If a DEVMAP is specified, it becomes the new current DEVMAP and is used the next time the P/390 is IPLed.

S
: Causes the P/390 Configurator to skip either zero (0), the first (1), the first two (2), or the first (3) frames and go directly to the password, MAIN menu, or UPDATE SYSTEM DEVICES menu. Zero is the default.

L=nn
: Specifies the number of lines in the OS/2 window for the Configurator menus. The default and minimum number of lines is 27. The maximum number of lines is 95. For larger values, scroll bars appear on the right side of the screen. To avoid this and to see all the lines at one time, set a different font size for the OS/2 window.

/NEW
: A DEVMAP comes with the preconfigured operating system (for example, DEVMAP.1VM, DEVMAP.VSE, and DEVMAP.MVS). If you do not have one and need to create a DEVMAP, use the /NEW option. This makes a DEVMAP containing a single 3278 device at address 200. Use the P/390 Configurator to add additional devices.

AWSEND.CMD OS/2 Utility

AWSEND checks the P/390 I/O subsystem. If it is running, AWSEND stops it.

Syntax

```
AWSEND        [ASK|NOASK|KILL ]
```

Optional Parameters

AWSEND is used to terminate the operating system being run by the P/390. It is
called by the END P/390 icon on the P/390 Main Menu.

ASK   Prompt for confirmation before terminating

NOASK   Do not prompt for confirmation before terminating

KILL   Do not try to shutdown the operating system

AWSMOUNT.EXE OS/2 Utility

AWSMOUNT supports the AWSOMA and AWSTAPE device managers.
AWSMOUNT changes the P/390 DASD configuration while the P/390 is running.
The effect on the P/390 is the same as if an operator physically removed one
volume and put in a new one. Just as in a mainframe system, this change must be
coordinated with the operating system. In general, you should vary the device
address offline before using AWSMOUNT to change the assignment.

AWSMOUNT can also be used to change a volume address from R/W to R/O (or
vice versa). AWSMOUNT does not change the actual PC attributes, but it does
make the volume appear R/O to the P/390. The device manager rejects any write
requests.

AWSMOUNT can also be used to query the status of a designated device.

Syntax

```
AWSMOUNT dev_addr file_name [options]
```

Required Parameter
dev_addr   A three-character hexadecimal device address.

Optional Parameters
file_name   A fully qualified OS/2 file name (optional).

/O   Old file is replaced (file name required).

/R   Make allocated file read-only (file name optional).

/W   Make allocated file read/write (file name optional).

/Q   Query file allocated to dev_addr (file name not used).

/D   Demount file allocated to dev_addr (file name not used).

?   Display help text.

Additional options for emulated tape devices:

/REW   Rewind – reposition the file to the beginning of the tape.

/RUN   Rewind unload – close and disassociate file from dev_addr.

/C   Create a file, if necessary.

Example
```
AWSMOUNT 300 /q
        Device allocated to D:\VMESA\SYSRES.300 (r/w)
```

AWSPROF.EXE OS/2 Utility

AWSPROF records the location of DEVMAP in the OS2.INI file. If you have multiple DEVMAPs, you need to issue AWSPROF to deactivate one and activate another. (The AWSCFG.CMD file uses AWSPROF to determine the default DEVMAP to edit, and IPL uses it to determine which DEVMAP to use during IPL.)

Syntax

```
AWSPROF drive:\path\devmap.1vm
                [/Q /C]
```

Required Parameters

devmap   The DEVMAP location should be fully qualified with the drive and path included in the specification as well as the file name.

/Q   Query current profile values

/C   Clear current profile values

?   Display help text

AWSSTART.EXE OS/2 Utility

AWSSTART is used to start P/390 device managers. It is called from IPL.CMD.

Syntax

```
AWSSTART manager.EXE N|P|T managerparms
```

Optional Parameters

manager	The name of the P/390 device manager, for example, AWS3274.
N	Start with a null session. Most device managers are started with a null session. An exception is AWS3215, which starts with a Presentation Manager session. AWSSAD is another exception.
P	Start with a Presentation Manager session.
T	Start with a text session.
managerparms	See the online help (*.DOC) for each of the device managers.

AWSSTAT.EXE OS/2 Utility

AWSSTAT displays or changes the status of the P/390 I/O subsystem. Three of the main uses for AWSSTAT are to stop an individual device manager that is malfunctioning, to list the device managers that are currently started, or to cancel the whole I/O subsystem.

Syntax

```
AWSSTAT manager_name /Q /C /W /Ttimeout /D /L /K
```

Optional Parameters

manager_name   Name of the manager to be stopped.

/Q   Query the status of the P/390.

/C   Force clear of all "manager waiting" semaphores.

/W   Wait for all managers to initialize (wait forever).

/Ttimeout   Wait for all managers to initialize but give up after *timeout* seconds.

/D   Display managers that are still being initialized.

/L   List all active managers.

/K   Cancel all active managers and the P/390 I/O subsystem. This is the same as selecting the **End P/390** icon.

Example

```
AWSSTAT AWSICE
```

stops the S/390 Parallel Channel and ESCON Channel device manager.

Return Codes

Return codes for the query (Q) option are as follows:

0   The P/390 I/O subsystem is running.
1   The P/390 adapter card is not installed or the wrong device driver is installed.
2   The 7437 is not powered-on.
3   The P/390 device driver is not in CONFIG.SYS.
4   The P/390 I/O subsystem is not running.
6   The P/390 processor is STOPPED.
7   The P/390 processor is in a Disabled Wait State.

CKDALC.EXE OS/2 Utility

CKDALC allocates and initializes files for use by the P/390 as CKD DASD. CKDALC can also display information about an existing volume, and it can change a volume label. CKDALC can be used to allocate files such as paging, spooling, or TDISK as part of an installation process, instead of using the interactive process with the P/390 Configurator.

Notice that all CKDALC volumes require an extra step to format and allocate them using the ICKDSF facility.

Syntax

```
CKDALC filename /Ssize /Vvolume /Ddevice /Z /R /C /Q
```

Required Parameters

filename   Fully qualified OS/2 file name

Ssize (decimal)   File size in cylinders (3380 cylinders=737,280 bytes, 3375 cylinders=430,080 bytes)

Vvolume   A DASD volume label (6 characters)

Ddevice   Device type is 3375 or 3380 (default)

Optional Parameters

/Z (no operands)   Write zeroes to file.

/R (no operands)   Read (display) file attributes.

/C (no operands)   Change DASD volume name.

/Q (no operands)   Quiet—no messages displayed.

You can allocate a PAGING volume as a 3380 CKD device.

Example

```
CKDALC d:\VMESA\PAGING.302 /vPAGING /s200 /d3380
```

DEV2NAME.CMD OS/2 Utility

Use DEV2NAME to create an ASCII file from a DEVMAP file suitable for reading or processing by a subsequent REXX program. The output file has the same name and path as the input file, but with the extension .NME.

There are many uses for DEV2NAME. For example:

- To quickly compare two DEVMAPs to look for differences.

- To write a REXX program to read the DEVMAP.NME, read the 3088 definitions, and automatically generate the RSCS and PVM control files.

The following is a sample of some of the output of DEV2NAME:

```
:nick.ENV1 :ipl.0300 :gmt.0000  :cpuid.001970 :cache.00 :font.

:nick.ENV2 :node.CRB

:nick.0100 :dmgr.AWS3880  :dtype.0671 :ctype.3880 :label.USER01 :ro.NO
           :parm.E:\VM\MAINT.191

:nick.0101 :dmgr.AWS3880  :dtype.3370 :ctype.3880 :label.USER02 :ro.NO
           :parm.E:\VM\OPERATOR.191

:nick.0440 :dmgr.LAN3088  :dtype.3088 :ctype.3088
           :parm.CHUCK.NET

:nick.0441 :dmgr.LAN3088  :dtype.3088 :ctype.3088
           :parm.CHUCK.PVM
```

Explanation of Tags

nick   If the value is a valid hexadecimal string, the entry is a device address. Otherwise, it is a special record like ENV1 or ENV2 that describes some other non–device-specific characteristic.

dmgr   Device manager type.

dtype   Device type.

ctype   Control unit type.

label   Appears only on DASD volumes. This is the label the P/390 Configurator last saw on the volume. (It is possible a CP or CMS program, or the ALC utility, was used to change the volume label since the DEVMAP file was last saved.)

RO   Does the P/390 Configurator have the volume marked read-only?

parm   The parameter/filename field.

exclude   If the value YES appears for the **exclude** parameter, the record is excluded from DEVMAP. That is, if the tag does not appear, the record is not excluded.

node   The Local Area Network NetID from DEVMAP.

IPL   The default IPL address from DEVMAP.

gmt	The GMT offset.
cpuid	The CPU ID from DEVMAP.
cache	The cache size.
font	The font for 3215 sessions.
loadparm	The system IPL PARM
sysmode	The P/390 IML mode: 370 or ESA
xstore	Expanded store size

Syntax

```
DEV2NAME devmap_filespec
```

Required Parameters

devmap_filespec   The name of the input DEVMAP file.

AWSICE OS/2 Utilities

You can get help on these commands by specifying ? after the name of the command at the OS/2 prompt.

ICEDEV   Stand-alone scan of the channel for devices. For usage and syntax of the ICEDEV command, see the file ICEDEV.DOC.

ICEINIT   Initializes and loads the ARTIC960, S/390 Parallel Channel, and ESCON Channel adapters

ICEMAP   Displays the devices claimed by AWSICE and their settings

ICETRACE   Gets an internal S/390 Parallel Channel or ESCON Channel card trace dump

Example

```
iceinit ?
```

IPL.CMD OS/2 Utility

IPL checks the P/390 I/O subsystem, and if it is not running, starts it. After the channel and devices have been initialized, the command IPLs the P/390. The WARM and CKPT options work only in VM/ESA.

Syntax

```
IPL [ipladdr] [CLEAR|NOCLEAR|NOIPL] [WARM|CKPT|NOAUTO]

    [/MAP devmap] [/MODE mode] [/PARM loadparm]

    [/NOCLKGET]   [/NOCLKSET] [/NOCLKCLR]
```

Optional Parameters

All the options on the IPL command can be specified on the UPDATE SYSTEM ENVIRONMENT (F4) menu of the P/390 Configurator. If they are not specified on the IPL command, the P/390 Configurator defaults prevail, that is, the options contained in the active DEVMAP.

ipladdr   The device address to be IPLed. This is a three- or four-digit hexadecimal address.

ipltype   The type of IPL.

CLEAR   Clear storage before IPLing.

NOCLEAR Do not clear storage before IPLing. This is the default.

NOIPL   Start the I/O subsystem, but do not IPL. NOIPL is useful if you want to start the channel subsystem and do some testing from the P/390 Manual Operations session, or try to recover from a system crash without IPLing the operating system.

The following options are used to start VM and can be used only with VM/ESA:[27]

WARM   Only try to warm-start the VM system.

---

[27]

- For VM/ESA (370 Feature), the operator console must be defined as a 3215 to use these options. If these options are specified, they automatically answer NO to the TOD clock question and then answer the WARM, CKPT, FORCE, COLD message as either WARM or CKPT.

- For VM/ESA (ESA Feature), the operator console must be a TCP/IP attached 3270 to use these options. If these options are specified, they automatically press ENTER for the TOD clock question and also press ENTER for the WARM, FORCE, COLD message (which implies "warm"). If a FORCE start is necessary, then one will be performed unless the NOAUTO option was specified.

CKPT   Try a warm start, but try a CKPT if warm fails. This is the default.

Note: For VM/ESA (ESA Feature), WARM and CKPT options are identical.

NOAUTO   Do not automatically answer VM questions during IPL.

/MAP devmap   This option issues the AWSPROF command to switch to this DEVMAP before starting the P/390 I/O subsystem. This option has no effect if the P/390 I/O subsystem is already running. First stop the P/390 I/O subsystem by selecting the **END P/390** icon. Then issue the IPL command.

/MODE mode   The architectural mode, either 370 or ESA.

/PARM loadparm   The load parameter specifies a 1- to 8-character load parameter. If fewer than eight characters are specified, the load parameter is left-justified and padded with blanks. The load parameter can be retrieved by the operating system during its IPL sequence. Its use is determined by the operating system, such as indicating the nucleus to be loaded during the IPL sequence.

/NOCLKGET   This parameter stops the OS/2 clock from being read and leaves the S/390 clock as UNSET. This parameter is useful for testing year 2000 solutions.

/NOCLKSET   This parameter specifies that the S/390 TOD clock is set, it should not write to the OS/2. This parameter is useful for testing year 2000 solutions.

/NOCLKCLR   This parameter specifies that the S/390 TOD clock will not reset on a CLEAR-RESET. This parameter is useful for testing year 2000 solutions.

Example

```
IPL 300 CLEAR /MAP D:\VMESA\DEVMAP.1VM  /MODE ESA  /PARM 0200
```

This command IPLs device 300 (as defined in the specified DEVMAP) in ESA/390 mode and passes the IPL console address 0200 to VM. Specifying the /PARM option to VM/ESA causes the VM/ESA Stand Alone Loader (SALIPL) screen to be displayed and it allows you to specify which CP nucleus file you want to IPL.

LTRENAME.EXE OS/2 Utility

This utility allows you to dynamically change the session titles on Personal Communications 3270 sessions (PC/3270 or PCOMM). It can change the title of any PCOMM session, not just those controlled by the P/390.

Syntax

```
LTRENAME s title
```

Optional Parameters

s   The Personal Communications session ID, a single letter from A–Z that designates which PC/3270 session should be renamed.

title   A string specifying the title for that session.

RDEVMAP.CMD OS/2 Utility

RDEVMAP reconfigures a DEVMAP. It is used during installation of the Starter System, but can also be used when reconfiguring a system. Instead of using the P/390 Configurator to change DASD volume locations interactively, you can use RDEVMAP to make mass changes to the volumes.

Syntax

```
RDEVMAP [c:\path\DEVMAP.1vm] [ D=d ] n ]
                            [ D=d:\old\ n:\new\ ]
```

Optional Parameters

devmap
If the DEVMAP location is not specified, the current DEVMAP (as kept by AWSPROF) is used. If a DEVMAP is specified, that DEVMAP is modified and made the current DEVMAP. The old DEVMAP file is saved as:

c:\path\devmap.2VM

D=d
Used during installation to globally change the drive letter of all DASD devices and DMKRIO.ASM, USER.DIR, and DEVMAP.1VM in DEVMAP.

D=d n
Used to change only drive letter *d* to drive letter *n* every time it occurs. Use this form if you have, for example, added a hard disk and need to change all the subdirectories on a given drive.

D=d:\old\ n:\new\
If two paths are specified, a selective replacement occurs:

d:\old
the drive and path to be searched for and changed.

n:\new
the drive and path that replaces d:\old\

SENDLOG.CMD OS/2 Utility

Use the SENDLOG.CMD utility to collect and transmit logs and traces to IBM via the Internet for problem analysis.

Only use this command when instructed to do so by IBM Support personnel. You need an IBM problem number before you can submit any logs or traces.

Syntax

```
SENDLOG [ICON]
```

Optional Parameters

ICON   This parameter is used for the "Send Maintenance Logs to IBM" icon in the P/390 folder to cause the utility to pause when completed, enabling the messages to be read.

Chapter 15. Modifying CP and CMS (VM/ESA Only)

The S/390 Integrated Server can be ordered with a preconfigured system, which is a full-function VM/ESA system on a CD-ROM. The VM/ESA is tailored and sized for the P/390. Therefore, you can use it for production without modification. However, you can choose to install VM/ESA using the base product CD on tape. This chapter provides only guidance and suggestions. For additional information about building CMS and CP, refer to *VM/ESA Planning and Administration* and the *VM/ESA Installation Guide*.

VM/ESA consists of two primary components:

- CMS
- CP

Considerations for Modifying CMS

In general, the CMS nucleus and 190 S-disk files that are provided with the preconfigured system can be used as is. Minimal changes, such as customization of the SYSPROF EXEC and SYSTEM NETID files, may be required. One reason for having to reinstall CMS is if you want to install a newer release or service level of CMS, or if you need to expand the size of the 190 S-disk.

If you do build a new CMS S-disk, you will need to copy onto it several P/390 CMS files. See "P/390 S-Disk Additional Files" on page 246 for more information about these files.

Considerations for Modifying CP

In VM/ESA Release 1.2.1 and higher, the CP nucleus does not require regeneration to modify most parameters. A SYSTEM CONFIG file is located on a special CMS-formatted *PARM* disk that is accessed by CP during system initialization. Contained on this disk is information that used to be specified in the CP nucleus files HCPRIO, HCPSYS, and HCPBOX. This includes:

- Time zone definitions
- CP-owned volume list
- System node name
- Special I/O device definitions
- Operator console addresses
- Logon screen pictures
- Other system features

A complete description of this file is given in *VM/ESA Planning and Administration*.

Two other important system files are located on OPERATOR'S A-disk:

CLASS OVERRIDE   This file specifies CP command class overrides.

USER DIRECT   This file contains the VM user directory information.

Both of these files are applied by the Operator's PROFILE EXEC when the system starts up.

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Building VM/ESA on the S/390 Integrated Server

VM/ESA on the S/390 Integrated Server should be built and installed in exactly the same manner as any other System/390 mainframe. Build steps detailed in the *VM/ESA Installation Guide* or the *VM/ESA Service Guide* will not be repeated here. However, some hints are included in this chapter that will help familiarize you with the preconfigured system that is supplied with your S/390 Integrated Server.

You rebuild VM/ESA for the S/390 Integrated Server directly on the S/390 Integrated Server. You need sufficient disk space to load all of the VM/ESA maintenance minidisks. Note that you do not have to load the VM/ESA maintenance minidisks on *every* S/390 Integrated Server system—only on the system that will be used primarily for VM/ESA servicing and system builds.

After building the various components of VM/ESA (CP nucleus file, CMS S-disk, GCS NSS, and other parts), you can use OS/2 utilities to copy the affected OS/2 files to other S/390 Integrated Server systems. This "cloning" function is discussed in Chapter 4, "Installing a Non-Preconfigured Operating System" on page 31.

Tailoring the CP Configuration Files

The following sections present information you should consider before attempting to modify the following CP files:

USER DIRECT
SYSTEM CONFIG
CLASS OVERRIDE

In this manual, the same file may be referred to by one of three names, depending on which step you are performing. Figure 35 shows the names that CP files take at different steps in the build procedure:

Figure 35. Names of CP Files			
Name on MAINT 300	**Name on OPERATOR 191**	**Name on MAINT 191**	**Name in d:\VMESA**
	USER DIRECT	DIRECT P390	USER.DIR
SYSTEM CONFIG		CONFIG P390	SYSTEM.CFG
	CLASS OVERRIDE	CLASS OVERRIDE	CLASS.OVR

Directory Considerations

The file DIRECT P390 corresponds to the configuration of the preconfigured system you are currently running.

Note: It is strongly recommended that you use the P/390 Configurator instead of editing the USER DIRECT file. This ensures that the directory (USER.DIR) and device map (DEVMAP.1VM) files on the S/390 Server are properly updated. See Chapter 6, "Configurator Overview" on page 59 for details on using the Configurator.

Before making any changes, you should read all the topics under "Directory Considerations."

Updating the MAINT User ID

You may want to update the MAINT user ID to add system disks, such as Y 19E for local tools.

Be sure to keep the definitions for the preconfigured system in the directory. Do not delete any entries.

Defining Real Device Addresses

To continue running the preconfigured system, do not alter the following entries:

DIRECTORY 301	Statement at top of USER.DIR
MAINT MDISK 300	PARM disk that contains the CP nucleus and system configuration files
MAINT MDISK 400	Backup PARM disk
MAINT MDISK 301	Location of the CP directory
MAINT MDISK 190	Preconfigured system CMS IPL disk

Adding User IDs and Allocating Minidisks

You should use the Configurator to add new user IDs and to allocate new system volumes and user minidisks to the P/390. The Configurator is described in Chapter 6, "Configurator Overview" on page 59. You should also use the Configurator to create directory entries for any system user IDs needed to install licensed programs.

The Configurator supports only a single minidisk or allocation type per volume, and each volume is represented on the S/390 Server disk by an individual OS/2 file. The naming convention for the file is:

userid.vaddr	for user minidisks
cplabel.raddr	for system volumes

It is better to add directory entries with the Configurator *before* the P/390 is IPLed. Although it is possible to add users and minidisks to the system while the P/390 is running, it requires more steps to get the new minidisks online.

Directory Profiles

A directory profile USERPROF is supplied in DIRECT P390 and is used by the P/390 user IDs SAMPLE and OPERATOR. The user is encouraged to include this profile on the **User Environment** menu of the Configurator. If you replace, delete, or rename this profile or add other profiles before transferring the VM/ESA system to the user, you should give the user instructions about which profile to use.

A second directory profile SYSPROF is supplied for system users who require special IPL, OPTION, or CONSOLE statements (for example, RSCS).

SYSTEM CONFIG File Considerations

The CONFIG P390 file corresponds to the preconfigured system configuration you are currently running. The active file is called SYSTEM CONFIG, and is located on the CP PARM disk (MAINT's 300 disk). There is also a backup copy of this file and a backup CP nucleus on the second PARM disk (MAINT's 400 disk). Both of these minidisks are located on volume SYSRES.300.

Note: Unlike normal user minidisks that are allocated by the P/390 Configurator, these special PARM minidisks are on a CP-owned volume with allocation type "PARM" instead of "PERM". Also, pages 0 - 3 (blocks 0 - 31) are reserved on CP-owned volumes, so these special PARM disks *must* start at block 32, instead of block 16 for normal user minidisks.

You should understand the following P/390-specific information before changing or adding anything. Also read the comments contained in the actual SYSTEM CONFIG file.

System_Residence

The Checkpoint and Warmstart CP areas are located on the volume called SYSWRM.306. Checkpoint starts at page 4 (FBA block 32). Warmstart starts at page 260 (FBA block 2080). Each area is 256 pages in length.

CP_Owned

There are seven separate CP-owned volumes for the preconfigured system System. Keep the functions on separate volumes to make the task of backing up files and distributing them to other S/390 Integrated Servers easier.

The system volumes are OS/2 files using the following naming convention:

cplabel.raddr

You should not change the volume names listed below, because after you allocate the new volumes, you will still be running under the preconfigured system System nucleus CP_Owned list.

- **SYSRES.300** consists of two PARM disks (MAINT 300 and MAINT 400) that contain the primary and backup copies of the CP nucleus file (CPLOAD MODULE), CP configuration file (SYSTEM CONFIG), and the Logon screen pictures (LOGO CONFIG and imbedded files).

  The first 4 pages (32 blocks) of this volume contain the stand-alone IPL loader. SAPL is the program that is actually IPLed when you click on the IPL P/390 icon to issue an `ipl390 300 CLEAR`. The SAPL feature of VM/ESA ESA Feature gives you the option of IPLing alternate nuclei, for instance the backup copy of CP, if a new version of the CP nucleus fails to IPL properly.

  To access the SAPL screen, specify the following OS/2 command:

  `ipl390 300 CLEAR /PARM 0200 /MODE ESA`

  where 0200 is the address of your 3270 System Operator console.

- **direct.301** contains space for two copies of the user directory.

- **paging.302** is the system paging space. The preconfigured system defines a default FBA paging volume, but the size you require depends on the number of simultaneous virtual machines you expect to run. This can be allocated at each user's S/390 Integrated Server using either the P/390 Configuration program or the ALC program (See "ALC.EXE OS/2 Utility" on page 222).

  If you are using VM/ESA 2.2 or higher, you may want to consider the allocation of a CKD (3380) volume for paging. CKD provides better paging performance due to full-track reads and writes. To allocate a CKD volume, use either the OS/2 utility, CKDALC, or the Update System Devices function in the P/390 Configurator. On the Update System Devices screen, specify 3380 as the

device type and CKD as the allocation type. *All* CKD volumes must be formatted using ICKDSF, either independently or under VM/ESA. Neither the P/390 Configurator nor OS/2 utilities format or allocate CKD volumes.

- **tdisks.303** is for temporary disks. Users will allocate whatever space they need for their application using the P/390 Configuration program.

- **spools.304** is for system spooling space, Named Saved Systems (NSS), for example, CMS and VM Program Product discontiguous saved segments, overflow paging, and auto-allocated dump space. The preconfigured system allocates a nominal sized file. You may want to increase this space, based on the applications programs that you will be running, using the P/390 Configuration program.

  Because the size of a volume cannot easily be expanded, you will have to erase the old spools.304 and allocate a new, larger one. Before erasing spools.304, use SPTAPE to back up the NSS files to an AWSTAPE file. Here is a procedure for backing up the NSS files:

  VM must be up and running.

  1. From an OS/2 prompt:

     `AWSMOUNT 580 d:\NSSBACK.580 /C /O`

  2. From the VM/ESA OPERATOR:

     `SPTAPE DUMP 580 NSS ALL RUN`

     Wait for the completion message:

     `SPTAPE FUNCTION ON DRIVE 0580 COMPLETE.`

  3. Shutdown the P/390 and click on the End P/390 icon.

  4. Use the P/390 Configurator F2 **Update System Devices** menu to delete the old spools.304. Then allocate a new one that is larger. Ensure the allocation type is SPOL.

  5. IPL the P/390

  6. From an OS/2 prompt:

     `awsmount 580 d:NSSBACK.580 /O /R`

  7. From the VM/ESA OPERATOR:

     `SPTAPE LOAD 580 NSS ALL RUN`

     This loads all of the CMS product shared segments. When the load is complete, IPL CMS on the OPERATOR to verify it.

  8. IPL CMS

  9. spool1.305 is a small spool volume that initially contains the CMS NSS files. These files can also be found in an emulated tape volume D:\VMESA\P390NSS.580. Use the SPTAPE LOAD procedure just described to reload these files in a critical situation.

- **spools** is an extra CP-owned volume label, that should be left for the user to allocate a second volume of choice (probably SPOL or PAGE) without having to alter the SYSTEM CONFIG file.

User_Volume_Include

You *must* have this statement to allow all newly created user minidisks to be automatically brought on line when VM/ESA is IPLed:

```
User_Volume_Include *
```

Timezone_Definition

In the preconfigured system, the time zone offset is set to 5 hours west of GMT (Eastern Standard Time). Ensure that the same offset is set in the P/390 Configurator F4 **System Environment** menu *before* VM is IPLed. The local S/390 Server clock is used as the source for the P/390 time of day (TOD) clock. If it is *not* set to EST, then you must alter both the default Timezone_definition statement and the System GMT Offset field in the P/390 Configurator.

CP_Access

These statements are necessary for CP to access and use the primary and backup PARM disks (MAINT 300 and 400) at system initialization time. Do *NOT* alter these statements.

Operator_Consoles

The preconfigured system defines the 3270 consoles that are present in the DEVMAP.1VM device map that is shipped with the preconfigured system. Do *not* alter these statements.

Rdevice

VM/ESA 1.2.1 and higher supports dynamic sensing of I/O devices to determine the device characteristics. Therefore, an HCPRIO ASSEMBLE file containing device definitions for all real I/O devices is not required except for the following condition: If you need to have preferred guest recovery for a V=R guest of VM/ESA ESA Feature, the devices dedicated to the V=R guest must be defined in HCPRIO. This restriction does not exist in VM/ESA ESA 2.1.0.

Some S/390 emulated devices may need an RDEVICE statement in the SYSTEM CONFIG file, specifically those S/390 devices that do not respond to the SENSE-ID instruction and those devices that do not respond with complete information. Examples of devices that do not respond are 3420 tape drives and 1403 printers. Even if a 1403 printer can respond that it is a 1403, it cannot respond via the SENSE-ID with information such as the printer class and printer forms to be used. An example Rdevice statement for a 1403 printer defined in a P/390 DEVMAP is:

```
Rdevice 000E Type IMPACT Class A Form *
```

Other emulated devices may need statements. See the SYSTEM CONFIG file shipped with the preconfigured system for more details.

Also, some of the execs supplied with P/390 may have to be modified if you change certain real device addresses. These execs and addresses are listed in the following table:

Figure 36. Exec names and device addresses	
Device	**Exec**
000E	PROFILE (OPERATOR)
0460 - 0463	PCOPY, OS/2

CP Command Class Overrides

The file CLASS OVERRIDE (on OPERATOR's 191 disk) is used to redefine the privilege classes of CP commands.

If you modify this file, you *must* keep the ATTACH command as class G because general users need to attach the S/390 Integrated Server devices through the PCOPY and OS/2 EXECs (if these commands are available to general users).

The OVERRIDE command is executed from the OPERATOR's PROFILE EXEC at VM/ESA IPL time. If you alter this file and want the changes to take effect immediately, you can either run the OPERATOR's PROFILE again, or issue the following command from the OPERATOR's ID:

```
OVERRIDE CLASS (IMMEDIATE
```

OPERATOR's Profile

The PROFILE EXEC that is supplied with the preconfigured system for OPERATOR performs several major functions:

- Set up the OPERATOR's virtual machine

- Update the VM/ESA User Directory[28]

  The NEWDIR EXEC is called. The OS/2 file USER.DIR is copied onto the OPERATOR's 191 disk as USER DIRECT A. The OS/2 drive and path location is determined from the value for the directory that is contained in the current DEVMAP file. The DIRECTXA command is then run to place the directory online.

- Start the system printer

- Enable all terminal ports

- Apply CP Class Overrides

  This applies the CLASS OVERRIDE file.

- Autolog user IDs

  The AUTOLG EXEC is called. You can edit this exec and place the user IDs you want to be autologged in this file. Some examples are already included, but are commented out. Do *not* define the AUTOLOG1 user ID on a P/390. OPERATOR *must* update the user directory before any user IDs are autologged.[29]

---

[28] If you are not using the P/390 Configurator to maintain your user directory, remove this call to NEWDIR from the OPERATOR's PROFILE EXEC.

[29] If you are not using the P/390 Configurator to maintain your user directory, the restriction on autologging does not apply.

P/390 S-Disk Additional Files

If you do build a new CMS S-disk, you will need to copy it onto several P/390 CMS files.

S-Disk Files

A set of P/390 EXEC, MODULE, and HELPCMS files are included with the VM/ESA preconfigured system on the MAINT 190 S-disk. These include P/390 CMS programs, such as PCOPY and OS/2 commands. These files are also included in volume SDISKADD.370, which is MAINT's 370 disk. This allows you to easily add these files to a new S-disk that you may create. For example,

```
ACCESS 490 T
ACCESS 370 R
COPY * * R2 = =  T2 (OLDD REPL
```

OPERATOR's 191 Disk Files

Also included on MAINT's 370 disk (as file mode 1) are the files that are present on the VM/ESA OPERATOR.191 disk. If you create a new OPERATOR.191 disk, or lose some of the original programs, they can be copied from the MAINT 370 disk. OPERATOR's EXEC files on MAINT 370 need to be renamed during the copy operation. For example, from the OPERATOR user ID this would copy *just* the OPERATOR's PROFILE EXEC:

```
LINK MAINT 370 370 RR
ACCESS 370 R
COPY OPERATOR PROFILE R1 PROFILE EXEC A1 (OLDD
```

See the P370SDSK PACKAGE that is on MAINT 370 for further instructions.

Modifying CP

Here are suggestions for modifying CP for the P/390. You can maintain and modify CP using the usual manner, that is, as if it is a mainframe.

Build a New CP Nucleus

You should be logged on to the user ID from which you are building CP for the P/390. This may be either the:

- P/390 user ID, MAINT, (if you have loaded all maintenance disks onto the S/390 Integrated Server and you are servicing VM/ESA directly on the P/390 or

- Host user ID (if you are servicing VM/ESA for the P/390 on the host)

Here are the steps to build a new CP nucleus:

1. Set up the necessary minidisk access order using the normal VM/ESA system maintenance tools.

2. Assemble, using your standard method, any files you may have changed.

3. Build the new CP nucleus.

   To build the new CP nucleus, use your normal method, for example:

   ```
   vmfins build ppf esa cp cpload (all nolink
   ```

This will build a new CP nucleus file, CPLOAD MODULE, on the LOCALMOD disk, 2C4.

Make a Backup Copy of CP

Here are the steps to make a backup copy of the CP:

1. Power on the S/390 Server and bring up OS/2. Do *not* IPL the P/390 yet! If the P/390 is already running, stop it by double-clicking on the **End P/390** icon.

2. Open an OS/2 window.

3. Make the drive and the subdirectory that contains the VM/ESA disks current.

   The OS/2 prompt should display the following drive and subdirectory. If you installed the preconfigured system on a drive other than d:, substitute the correct drive letter.

   `[C:\] d:`

   `[D:\] cd: \vmesa`

   `[D:\vmesa]`

4. Copy the CP nucleus and directory volumes:

   `[D:\vmesa] copy SYSRES.300 SYSRES.SAV`

   `[D:\vmesa] copy DIRECT.301 DIRECT.SAV`

Bring Up VM/ESA on the P/390

1. Ensure Personal Communications is started.

2. IPL the P/390 by double-clicking on the **IPL P/390** icon from the **System/390** folder.

3. Double-click on the **System Operator** icon or (or select the System OPERATOR 3270 session from the OS/2 task window).

   The following message will follow various information messages.

   `HCPWRS2512I Spooling initialization is complete.`

   At completion you will see the following messages:

   `P/390 VM/ESA Initialization Complete`

   `Ready; T=n.nn/n.nn nn:nn:nn`

Activate the New CP Nucleus

If you have built the new CP nucleus on a VM/ESA host system, begin with step 1. If you have built the new CP nucleus directly on the P/390, then begin with step 4 on page 248.

1. Double-click the first 3270 Emulator host session from the OS/2 desktop. If you followed the standard installation instructions, this is probably the "A" session.

2. Log on to the P/390 maintenance user ID on the host (from "Build a New CP Nucleus" on page 246).

   `logon hostmaint`

3. Start the Host Server.

```
awshost
```

The CMSSERV panel appears. Wait for the active message to appear.

```
CMSSERV is active in DFT mode
```

4. Double-click on a local 3270 emulator session or select one from the OS/2 task window.

5. Log on to the P/390's MAINT user ID. (The default password is maint.)

```
logon maint
```

From this step on, all commands are issued from the P/390.

6. Execute the PROFILE EXEC by pressing the **Enter** key.

7. If you are downloading the CP nucleus from the host, go to step 8. If you built the new CP nucleus on the P/390, go to step 11.

8. Start the P/390 component of TFA.

```
tfa start
```

9. Link to the host user ID's LOCALMOD disk.

```
hlink hostmaint 2C4 291 rr
```

10. Access the host user ID's LOCALMOD disk as E.

```
access 291 e
```

then go to step 12.

11. Access the P/390's LOCALMOD disk as E.

```
access 2C4 e
```

12. Copy the CP nucleus file from the host disk to the P/390 local disk.

```
query cpdisk
LABEL  USERID  VDEV  MODE  STAT  VOL-ID  RDEV  TYPE  STARTLOC  ENDLOC
PARM1  MAINT   0300  A     R/O   SYSRES  0300  FBA         32   24031
PARM2  MAINT   0400  B     R/O   SYSRES  0300  FBA      24032   48031

cprel a
HCPZAC6730I CPRELEASE request for disk A completed.

link * 300 300 mr
access 300 z erase cpsave module z
rename cpload module z cpsave module z
copy cpload module e = = z (olddate
release z (detach
cpaccess maint 300 a rr
```

You will see the following message:

```
HCPZAC6732I CPACCESS request for MAINT's 0300 in mode A completed.
```

Shutdown and IPL the new CP

1. Double-click on the **System Operator** icon and shut down the P/390 system, and IPL the SYSRES volume.

```
cp shutdown reipl
SYSTEM SHUTDOWN STARTED
HCPWRP9277I SYSTEM TERMINATION COMPLETE.
ATTEMPTING RESTART
```

You will see messages similar to these:

```
VM/ENTERPRISE SYSTEMS ARCHITECTURE SYSTEM RESTART FROM SHUTDOWN REIPL
VM/ENTERPRISE SYSTEMS ARCHITECTURE   RELEASE 2.2 SERVICE LEVEL LLLL;
SYSTEM NUCLEUS CREATED ON MM/DD/YY AT HH:MM:SS, LOADED FROM SYSRE S

HCPZCO6718I Using parm disk 1 on volume SYSRES (device 0300).
HCPZCO6718I Parm disk resides on blocks 32 through 12024.

HCPISU951I CP VOLID SPOOL2 NOT MOUNTED
The directory on volume DIRECT at address 0301 has been brought online.

HCPWRS2513I Spool files available      nnnn
HCPWRS2512I Spooling initialization is complete.

FILES: nnnn RDR, nnnn PRT, nnnn PUN
LOGON AT hh:mm:ss EST today mm/dd/yy
GRAF  0200 LOGON  AS  OPERATOR USERS = 1
HCPIOP952I 0031M system storage
FILES: nn RDR, nn PRT, nn PUN

VM/ESA CMS 2.2 10/25/94
Printer 000E dump unit CP NOIPL NOPRINT
DEV  0460 ATTACHED TO OPERATOR 0460 BY OPERATOR
DEV  0460 DETACHED OPERATOR 0460 BY OPERATOR
VM/ESA USER DIRECTORY CREATION PROGRAM - RELEASE 2.2
EOJ DIRECTORY UPDATED AND ON LINE
DMSACP723I B (222) R/O
PRT 000E STARTED      SYSTEM   CLASS A
PRT 000E FORM *         MANUAL NOSEP NO3800  LIMIT NONE
PRT 000E DEST OFF        DEST - NONE - DEST - NONE - DEST - NONE -
PRT 000E AFP
Command complete
EOJ OVERRIDE FILE UPDATED

P/390 VM/ESA Initialization Complete.
Ready; T=n.nn/n.nn hh:mm:ss
```

2. You are now logged on to the OPERATOR user ID.

Test the New System

1. Log on to another user ID and check to see that CMS properly IPLs and that basic CP commands work.

   If the re-IPL fails:

   a. Examine the PSW and/or dump. Refer to the CP load map (CPLOAD MAP). The P/390 Manual Operations program (See Chapter 9, "Using the P/390 Manual Operations Session" on page 167) can be very useful for debugging CP problems.

   b. If CP will not IPL, try the backup copy of the CP nucleus that you saved in "Activate the New CP Nucleus" on page 247.

      1) From an OS/2 prompt, type:

         ```
         IPL 300 CLEAR /parm 0200
         ```

         This displays the Stand Alone IPL menu on device 0200.

      2) On the SAIPL menu, press **F9** to display a filelist of the PARM1 disk.

    3) Move the cursor down under `CPSAVE MODULE` and press **F11** to select the backup file.

    4) Press **F10** to load the backup CP nucleus.

  c. If the backup CP will not IPL, copy the saved copy of the IPL volume that you made in "Make a Backup Copy of CP" on page 247.

    1) Double-click the **End P/390** icon.

    2) Copy SYSRES.SAV as SYSRES.300

    3) Copy DIRECT.SAV as DIRECT.301

  d. Now you can double-click on the **IPL P/390** icon to IPL the P/390 with the old version of CP. After fixing the problem (check, for instance, any changes you made to the SYSTEM CONFIG file), repeat "Build a New CP Nucleus" on page 246 through "Shutdown and IPL the new CP" on page 248 to build and test a new version of CP.

2. Verify that the modifications you made to CP work as expected.

Chapter 16. Performance Hints and Tips

OS/2 CONFIG.SYS Tuning

MAXWAIT

MAXWAIT in CONFIG.SYS defines the number of seconds that an OS/2 thread
waits before being assigned a higher dispatching priority. Applications that are
I/O-intensive could benefit from setting **MAXWAIT=1** in CONFIG.SYS. Because
the S/390 operating system running on the S/390 Integrated Server is likely to be
I/O-intensive, setting **MAXWAIT=1** is generally recommended on the S/390
Integrated Server. The valid ranges for MAXWAIT are 1 to 255. The OS/2 default
is 3 seconds. Tuning this setting may show only results when there is other OS/2
work being performed in addition to the S/390 workload.

PRIORITY_DISK_IO

The PRIORITY_DISK_IO command in the CONFIG.SYS file controls whether an
application running in the foreground of the OS/2 desktop receives priority for its
disk accesses over an application running in the background. Because the S/390
operating system is probably serving multiple clients accessing the system over
LAN or other communication methods, you would not want users of the S/390
operating system to receive secondary access for the S/390 I/Os if someone opens
an OS/2 application or window in the foreground.

Specifying **PRIORITY_DISK_IO=NO** is recommended. NO specifies that all
applications (foreground and background) are to be treated equally with regard to
disk access. The default is YES; YES specifies that applications running in the
foreground are to receive priority for disk access over applications running in the
background.

OS/2 HPFS Cache

Warp Server (Base) System HPFS Cache Size

The HPFS.IFS device driver delivered with OS/2 has a maximum cache size of
2048KB (2 megabytes). The **/CACHE:nnnn** parameter of the IFS device driver
specifies the size of the cache. The default is 10% of available RAM (if not
specified) with a maximum of 2048KB. The specified value after installing OS/2 is
dependent on installed RAM at the time of installation. If you are using the
standard OS/2-provided IFS device driver, specifying **/CACHE:2048** is highly
recommended. Enter HELP HPFS.IFS at the OS/2 command prompt for further
explanation of the parameters.

/CRECL on IFS HPFS Cache

The **/CRECL** parameter of the HPFS IFS driver allows you to specify the size of the largest record eligible for this cache. The OS/2 default is 4KB. From an S/390 perspective, increasing this value may increase cache read hits if the S/390 operating system is performing repetitive I/Os of the same data in blocks bigger than the default 4KB. You can use performance analysis tools for each S/390 operating system to understand the characteristics of I/Os that are being performed by the S/390 operating system and applications. OS/2 performance tools, like IBM's SPM/2 V2, can also assist in tuning the /CRECL value. System configurations that make significant use of CKD disk emulation (using the AWSCKD device manager) will generally get better performance by specifying **/CRECL:64**.

Enter *HELP HPFS.IFS* at the OS/2 command prompt for further explanation of the parameters.

LAZY Writes

Lazy writes are defaulted to ON with OS/2's HPFS. If lazy writes are enabled then when a write occurs for a block of data that is eligible for the HPFS cache, the application is given completion status *before* the data is actually written to the hard drive. The data is actually written to the hard drive during idle time or when the maximum age for the data is reached. Lazy writes are a *significant* performance enhancement.

Attention: There is a risk to the data in the event of a OS/2 software failure or power loss before the data is written from the cache to the hard drive. You can use the OS/2 CACHE command to control whether lazy writes are enabled, as well as the maximum age and idle times for the disk and cache buffers. Enter "HELP CACHE" at the OS/2 command prompt for further information.

OS/2 FAT Cache

LAZY Writes

Lazy writes are defaulted to ON with OS/2's FAT DISKCACHE. If lazy writes are enabled, then when a write occurs for a block of data that is eligible for the FAT cache, the application is given completion status *before* the data is actually written to the hard drive. The data is actually written to the hard drive during idle time or when the maximum age for the data is reached. Lazy writes are a **significant** performance enhancement.

Attention: There is a risk to the data in the event of a OS/2 software failure or power loss before the data is written from the cache to the hard drive.

DASD Device Drivers

Functional Differences

The AWSCKD device driver has some functional differences when compared with the AWSFBA device driver. The AWSCKD device driver currently reads and writes a full track when an I/O is performed. The device driver has an internal cache where the track is kept until it must be flushed. As the AWSFBA device driver does not currently implement an internal cache, the performance characteristics between the two can be different depending upon the I/O workload. FBA DASD performance may be improved by specifying multiple device driver threads to handle different DASD addresses. Consult the AWSFBA.DOC file for further information. VM/ESA ESA Feature's block paging methodology seemed to benefit from the internal cache of the AWSCKD device driver in controlled laboratory experiments. You should consider using 3380 volumes for VM/ESA ESA Feature paging volumes for this reason.

You should not generalize this observation into a statement that AWSCKD performs better than AWSFBA. In fact, AWSFBA DASD volumes performed extremely well in laboratory experiments and offer some benefits over AWSCKD, including finer granularity on OS/2 file allocation sizes and a close mapping to the underlying sectors of the DASD media. VM/ESA and VSE/ESA utilize FBA DASD in a very efficient manner. The flexibility of the S/390 Integrated Server in supporting both CKD and FBA emulated volumes in a mixture allows you to easily have both types in your configuration.

Chapter 17. How the P/390 Supports the S/370 and S/390 Architecture

This section provides general information about the S/370 and ESA/390 architecture and how it is supported by the P/390.

Compatibility

Any program (including its support programs) written for S/370 or ESA/390 mode operates on the P/390 in the same mode, provided that the program:

1. Is not time-dependent.
2. Does not depend on system facilities (such as storage capacity, I/O equipment, or optional facilities) being present when the facilities are not included on the P/390.
3. Does not depend on system facilities being absent when the facilities are included on the P/390. For example, the program must not depend on interruptions caused by the use of operation codes or command codes that are not installed in some models but installed on the P/390.
4. Does not depend on results or functions that are defined in the appropriate *Principles of Operation* to be unpredictable or model-dependent or to affect compatibility.

Any problem-state program written for System/360 operates in the S/370 mode provided that the program:

1. Complies with the limitations described previously.
2. Is not dependent on control program facilities, which are unavailable on the P/390.

For more details about compatibility, see the appropriate *Principles of Operation*.

Operator-Information

Prior to entering the Check-Stop state, a machine check would occur and cause a pop-up window to appear to alert the operator. In addition, the operator can identify the Check-Stop state from the System/390 Activity window that will display **ChkStop**.

If the P/390 enters a PSW loop due to an invalid program new PSW, or an external new PSW that is enabled for certain external interrupts, a pop-up window will appear to alert the operator. The P/390 enters the stopped state to end the loop.

To perform a Store Status function, the MANOPS program should be used. See "Manual Operations Session Options" on page 168.

Model-Specific Implementation

The Time-of-Day Clock resolution is bit 51 (1 microsecond). Sub-microsecond bits (bits 52-56) are maintained in order to guarantee unique values for every STORE CLOCK instruction. The tolerance of the clock is plus or minus 100 parts per million (0.01%).

The Interval Timer (in native S/370 mode and S/370 using the interpretive-execution facility) resolution is 3.3 msec. The tolerance of the timer is the same as the Time-of-Day clock.

The CPU Timer and Clock Comparator resolution is bit 51 (1 microsecond). The tolerance is the same as the Time-of-Day clock. The CPU timer is decremented whenever the P/390 is in the operating state.

The change bit is set under those conditions described in the *Principles of Operation* with no exceptions.

The reference bit is set under those conditions described in the *Principles of Operation*. Prefetching of instructions is done by the hardware, and the reference bit may be set even though the instruction is not executed. Also, following a RESET REFERENCE BIT instruction (RRB or RRBE), instructions executed in the operand page of the RRB instruction may have been prefetched, so it is unpredictable whether the reference bit is set if the instructions are later executed.

The implementation of STORE CPU ID is as follows:

1. The version code in bits 0-7 of the operand field depends on the hardware version of the P/390 adapter, and may change when the card is replaced or serviced.
2. The CPU identification number in bits 8-31 of the operand field are provided by the P/390 configurator program as shown on the F4 (Update System Environment) screen. The CPUID is from the devmap that was active when the P/390 was last IPLed. See "Update System Environment Menu" on page 89 for more information on the CPUID.
3. The model number in bits 32-47 of the operand field contain the value X'7490'.
4. In S/370 mode, bits 48-63 (MCEL) contain the value X'0200'. In ESA/390 mode, bits 48-63 are architecturally reserved, and contain zeros.

Supported Facilities

The following sections identify System/370 and ESA/390 facilities that are supported and unsupported by the S/390 Integrated Server.

S/370 Facilities

The S/390 Integrated Server provides all of the S/370 functions defined as standard in Appendix D of the *System/370 Principles of Operation*. In addition, the S/390 Integrated Server provides the following S/370 facilities:

- Branch and Save
- Conditional Swapping
- CPU Timer and Clock Comparator
- Dual Address Space

- Expanded Storage
- Extended; which includes:
  - Common-segment
  - Low-address protection
  - The instructions IPTE and TPROT
- Extended-Control Program Support
- Extended-Precision Floating Point
- Extended Real Addressing
- Floating Point
- Move inverse
- MVS/370 Assists
  - Add Functional Recovery Routine
  - Fix Page
  - SVC Assist
  - Obtain Local Lock
  - Release Local Lock
  - Obtain CMS Lock
  - Release CMS Lock
  - Trace SVC Interruption
  - Trace Program Interruption
  - Trace Initial SRB Dispatch
  - Trace I/O Interruption
  - Trace Task Dispatch
  - Trace SVC Return
- PSW-Key Handling (the instructions SPKA and IPK)
- Recovery Extensions
- Segment Protection
- Service Signal
- Square root
- Storage-Key-Instruction Extensions (the instructions ISKE, RRBE and SSKE)
- Storage-Key 4K-Byte Block
- Test Block
- TOD-clock-synchronization
- Translation; which includes:
  - Dynamic Address Translation (DAT)
    - 64KB or 1MB Segment Sizes
    - 4KB Page Size only
  - Extended-Control (EC) Mode
  - Program-Event Recording (PER) (with GR alteration events)
  - Reference and change recording
  - SSM Suppression
  - Store Status
  - The instructions LRA, PTLB, RRB, STNSM and STOSM
- Virtual Machine Assists
  - The instructions IPK, ISK, LPSW, RRB, SPKA, SSK, SSM, STCTL, STNSM, STOSM and SVC
  - Common-segment modification
  - Segment-protection modification
  - Extended-storage-key extension

The I/O subsystem provides the following S/370 facilities:

- Channel Indirect Data Addressing
- Clear I/O

- Command Retry
- Fast Release (the instruction SIOF)
- Halt Device
- Recovery Extensions
- 31-Bit IDAWs

ESA/390 Facilities

The S/390 Integrated Server provides all ESA/390 functions defined as standard in Appendix D of the *ESA/390 Principles of Operation*. In addition, the S/390 Integrated Server provides the following ESA/390 facilities:

- Access-List-Controlled Protection
- Address-Limit Checking
- Branch and Set Authority
- Broadcasted purging
- Called-space identification facility
- Cancel I/O
- Checksum facility
- Compare-and-move-extended facility
- Compare Until Substring Equal
- Compression
- Expanded Storage
- Extended Sorting
- Immediate and Relative Instruction
- Incorrect-Length-Indication Suppression
- Interpretive Execution
  - Interception format 2
  - PER extensions
  - VM-data-space
  - Storage-Key Function
- Move Inverse
- Move Page (Facility 2)
- MVS assists
  - Add Functional Recovery Routine
  - SVC Assist
  - Obtain Local Lock
  - Release Local Lock
  - Obtain CMS Lock
  - Release CMS Lock
- Perform Locked Operation
- Program-Event Recording 2 (PER 2)
- PER extensions
- Private Space
- Set Address Space Control Fast
- SIE I/O Assist
- Square Root
- Storage-Protection Override
- String Instructions
- Subspace Group
- Suppression on Protection

Unsupported ESA/390 Functions

The following functions are not supported by the S/390 Integrated Server:

- Asynchronous Data Mover Facility
- Asynchronous Pageout Facility
- Channel-Subsystem Call
- Concurrent Sense
- Coupling (Parallel Sysplex, Coupling Links, Integrated Coupling Migration Facility)
- Dynamic Reconfiguration Management
- ICRF (Cryptography)
- IEEE Floating Point
  - Basic Floating Point Extensions
  - Floating Point Support Extensions
  - Hexadecimal Floating Point Extensions
  - Binary Floating Point
- PR/SM™
- Sysplex
- Sysplex Timer® (ETR)
- Vector Facility

Appendix A. Documentation and Related IBM Manuals

This section lists IBM books that can help you plan and install your S/390 Integrated Server and the operating systems supported on it.

S/390 Integrated Server Booklets and Manuals

The following publications, along with this book, make up the S/390 Server system library provided to you with your IBM S/390 Integrated Server. These additional books contain more information on installing and using your S/390 Integrated Server.

The following books are separately orderable:

> *IBM S/390 Integrated Server Technical Application Brief*, GK21-0291.

> *IBM S/390 Integrated Server Service Guide*, SY24-6161.

OS/2 Manuals

The following manual is supplied with the OS/2 software that comes with the S/390 Integrated Server. It contains more information on installing and using the OS/2 operating system.

> *Up and Running! OS/2 Warp Server*, 25H8004

VM/ESA Manuals

The *VM/ESA: General Information*, GC24-5745, describes the books in the VM/ESA library.

VSE/ESA Manuals

The *VSE/ESA Library Guide*, GC33-6519, describes the manuals available for VSE/ESA, their contents and how to use them.

MVS Manuals

The library guides in the following list provide information on the contents of the manuals in the MVS/ESA library. The guides also explain the contents, who the manuals are for, and how the manuals can be used to help you plan for, install, and use MVS/ESA on the S/390 Integrated Server.

> *MVS/ESA SP V4 Library Guide*, GC28-1601
> *MVS/ESA SP V5 Library Guide with JES2*, GC28-1423
> *MVS/ESA SP V5 Library Guide with JES3*, GC28-1424

OS/390 Manuals

OS/390 Information Roadmap, GC28-1727

Operating System Architecture References

- *IBM System/370 Principles of Operation*, GA22-7000
- *Enterprise Systems Architecture/390 Principles of Operation*, SA22-7201
- *Enterprise Systems Architecture/390 Data Compression*, SA22-7208

Softcopy

Softcopy documentation for VM/ESA, VSE/ESA and MVS/ESA is available on
compact discs that come with the operating system. The compact discs contain
online prebuilt books only. Source for the books is not provided on the compact
discs. BookManager Read/2 is also provided to access the books.

- The *IBM Online Library Omnibus Edition: VM Collection*, SK2T-2067, contains
  all of the VM/ESA manuals. In addition, the collection contains:

  - Complete libraries for current releases of VM/ESA and most optional IBM
    program products.

- The *IBM Online Library Omnibus Edition: VSE Collection*, SK2T-0060, contains
  all of the VSE/ESA manuals except for the *VSE/ESA Master Index*. In addition,
  the collection contains:

  - Complete libraries for current releases of VSE/ESA and most optional IBM
    program products.

- The *IBM Online Library Omnibus Edition: MVS Collection*, SK2T-0710, contains
  all of the MVS/ESA manuals. In addition, the collection contains:

  - Complete libraries for current releases of MVS/ESA and many optional IBM
    program products.

- The *IBM Online Library Omnibus Edition: OS/390 Collection*, SK2T-6700,
  contains all of the OS/390 manuals. In addition, the collection contains:

  - Complete libraries for current releases of IBM program products that run on
    OS/390.

List of Abbreviations

APPN®	Advanced Peer-to-Peer Networking®		**ISA**	industry standard architecture
ARP	Address Resolution Protocol		**ISFC**	ISFC Inter-System Facility for Communication
CART	channel resource allocation table		**KB**	kilobyte
CCU	communications control unit			
CCW	channel command word		**LAN**	local area network
CDLC	Channel Data Link Control		**LAPS**	LAN adapter and protocol support
CKD	count key data		**LIC**	licensed internal code
CLDP	controller load and dump program		**LIFO**	last in, first out
CMC	communication management configuration		**LIPT**	link IPL port trace
CMOS	complementary metal oxide semiconductor		**LLC**	logical link control
CM/2	Communications Manager/2		**LPDA**	Link Problem Determination Aid
CMS	conversational monitor system		**LRECL**	logical record length
CPU	central processing unit		**LSCD**	Large Scale Computing Division
CTC	channel-to-channel		**LT**	logical terminal
CUA®	Common User Access®		**LU**	logical unit
DLC	data link control		**MAC**	medium access control
DLL	data link library		**MB**	megabyte
ECA	ESCON channel adapter		**MHz**	megahertz
ECC	error correcting code		**MOSS**	maintenance and operator subsystem
ECF	Enhanced Connectivity Facilities		**NCP**	Network Control Program
EDF	extended disk format		**NCP MS**	NCP Multinetwork Server
EIB	electrical interface board		**NTS/2**	Network Transport Services/2
EOF	end of file		**OEM**	original equipment manufacturer
EOL	end of line		**PCA**	parallel channel adapter
ESA	extended systems architecture		**PCI**	peripheral component interconnect (Intel bus standard)
FAT	file allocation table		**PIU**	path information unit
FBA	fixed block architecture		**PU**	physical unit
FIFO	first in, first out		**PVM**	pass-through virtual machine
GDDM	Graphical Data Display Manager		**PC**	personal computer
GPR	general-purpose register		**P/390**	System/390 MicroProcessor Complex
HPFS	high-performance file system		**PSW**	program status word
HPOFS	High Performance Optical File System		**RAID**	redundant arrays of independent disks
ICA	integrated communications adapter		**RECFMS**	record formatted maintenance statistics
IOCB	I/O control blocks		**RIP**	Routing Information Protocol
IOSP	I/O service processor		**RTS**	request to send
I/O	input/output		**SAP**	service access point
IP	Internet Protocol		**SBC**	single board computer
IPL	initial program load		**SCSI**	small computer systems interface

SDLC	Synchronous Data Link Control		**TOD**	time of day
SIGP	Signal processor		**TR**	token-ring
SIO	start I/O		**TSAF**	transparent services access facility
SIT	scanner interface trace		**UCW**	unit control word
SMMF	SSCP monitor mode function		**USB**	universal serial bus
SNA	Systems Network Architecture		**XGA**	extended graphics adapter
SRPI	Server-Requester Programming Interface		**XID**	exchange identification
SSA	serial storage architecture		**VLSI**	very large scale integration
SSCP	system services control point		**VM**	virtual machine
TDF	tape descriptor file		**WAC**	Wide Area Connector
TFA	transparent file access		**WAN**	wide area network
TIC	token-ring interface coupler			

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Readers' Comments — We'd Like to Hear from You

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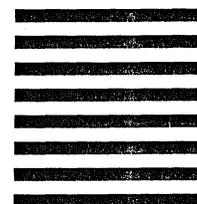
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