

**IBM Advanced Interactive Executive/370
(AIX/370)
General Information
Version 1.2.1**

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IBM Advanced Interactive Executive/370
(AIX/370)

General Information

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AIX/370 General Information
Edition Notice

Edition Notice

Third Edition (March 1991)

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Subtopics

FRONT_1.1 Trademarks and Acknowledgments

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Trademarks and Acknowledgments

Trademarks and Acknowledgments

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AIX/370 General Information
About This Book

About This Book

This book is an overview of the IBM Advanced Interactive Executive/370 (AIX/370). It is a general introduction to AIX/370 and its capabilities.

This book does not contain complete information about AIX/370 use and operation. Other manuals must be consulted prior to a decision to purchase AIX/370. Please consult the "Documentation" section of this book for sources of more detailed information about AIX/370.

Subtopics

Who Should Read This Book

What You Should Know

AIX/370 General Information
Who Should Read This Book

Who Should Read This Book

This book is intended for data processing professionals who are considering the purchase of AIX/370. It is a general introduction to AIX/370 and its capabilities.

AIX/370 General Information
What You Should Know

What You Should Know

This book assumes that you have a basic understanding of computer hardware and software, communications, and operating systems, including UNIX.

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Introducing AIX/370

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What this booklet contains

1.1

What this booklet contains

AIX/370 General Information

1.2

<p>AIX/370</p> <p>UNIX operating system</p> <p>IBM AIX offerings</p>	<p>2.0</p> <p>2.4</p> <p>2.5</p>	<p>AIX/370 is the AIX system for System/370 processors. This section is an overview of UNIX operating systems and IBM's AIX offerings.</p>
<p>AIX/370 function overview</p>	<p>3.0</p>	<p>AIX/370 is consistent with UNIX System V.2 and the 4.3 Berkeley Software Distribution (4.3BSD), and contains significant IBM enhancements.</p>
<p>Operating environment</p>	<p>4.0</p>	<p>AIX/370 runs under VM.</p>
<p>Transparent Computing Facility (TCF)</p>	<p>5.0</p>	<p>Several processors and their resources can be connected into a cluster. The cluster is designed to behave like a single system.</p>
<p>Communication and networking</p>	<p>6.0</p>	<p>AIX/370 provides networking and mail facilities. It supports Ethernet and IBM Token-Ring networks and TCP/IP.</p>
<p>Interface to Personal Computers</p>	<p>6.5 8</p>	<p>IBM PC-DOS and AIX/370 can cooperate using AIX Access for DOS Users in the PC or PS/2.</p>
<p>Other functions and enhancements</p>	<p>7.0</p>	<p>AIX/370 offers shells, editors, compilers, and printing and security facilities.</p>
<p>Documentation</p>	<p>8.0</p>	<p>There is online and printed documentation.</p>
<p>Hardware and software requirements</p>	<p>9.0</p>	<p>This section</p>

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		describes requirements for CPUs, control units, workstations, and software; migration; licensing.
An example of an AIX system	10.	Members of the AIX family are described in a sample environment.

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AIX/370

2.0

AIX/370

Subtopics

2.1 An AIX operating system implementation on System/370

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AIX/370 General Information

An AIX operating system implementation on System/370

2.1

An AIX operating system implementation on System/370

AIX/370 General Information

2.2

IBM Advanced Interactive Executive/370 (AIX/370) is an AIX operating system implementation for IBM System/370 processors.

Here are some reasons to choose AIX/370:

An installation has a UNIX operating system but needs more computing power - for example, vector processing or more file space - than workstations can provide.

An installation is running IBM's VM operating system and wants to add UNIX operating system functions (possibly because of a need to install an application package that runs under a UNIX operating system).

An installation wants a transparent and dependable computing environment for its UNIX operating system.

An installation wants to connect one or more System/370 machines and several IBM PS/2s to form a cluster of machines with the AIX Transparent Computing Facility (TCF).

An installation wants some or all of its machines to interact with the user in Japanese Language.

AIX/370 General Information
Highlights

2.3

Highlights

Consistency with UNIX System V and
Berkeley Software Distribution; POSIX
compliance

Transparent Computing Facility (TCF)

Industry-standard networking facilities,
including TCP/IP on Ethernet and IBM
Token-Ring

X-Windows

IBM 3090 Vector Facility support

Interface to personal computers under
IBM PC-DOS

AIX/370 General Information

UNIX operating system overview

2.4

UNIX operating system overview

There are several versions of UNIX operating systems for a variety of computers. Most of these versions are based on one of two major implementations:

UNIX System V

Berkeley Software Distribution (BSD)

Various versions of UNIX operating systems usually have much in common. Programs written in C language are typically portable from one UNIX operating system to another.

UNIX operating systems are used in many installations, including universities and businesses. Many software houses have made numerous application programs available for UNIX operating systems.

Subtopics

2.4.1 Multi-user system

2.4.2 Kernel

2.4.3 Shell

2.4.4 Programs

2.4.5 File system

AIX/370 General Information
Multi-user system

2.4.1

Multi-user system

UNIX operating systems are interactive, multi-user operating systems.

Several users can work with the system concurrently and independently, and each user can run several processes (programs or commands) at the same time. Users can share files if those files have the appropriate access permissions.

AIX/370 General Information

Kernel

2.4.2

Kernel

The kernel is the part of the system that interfaces with the hardware and provides services for the other system layers such as system calls, file system support, and device drivers.

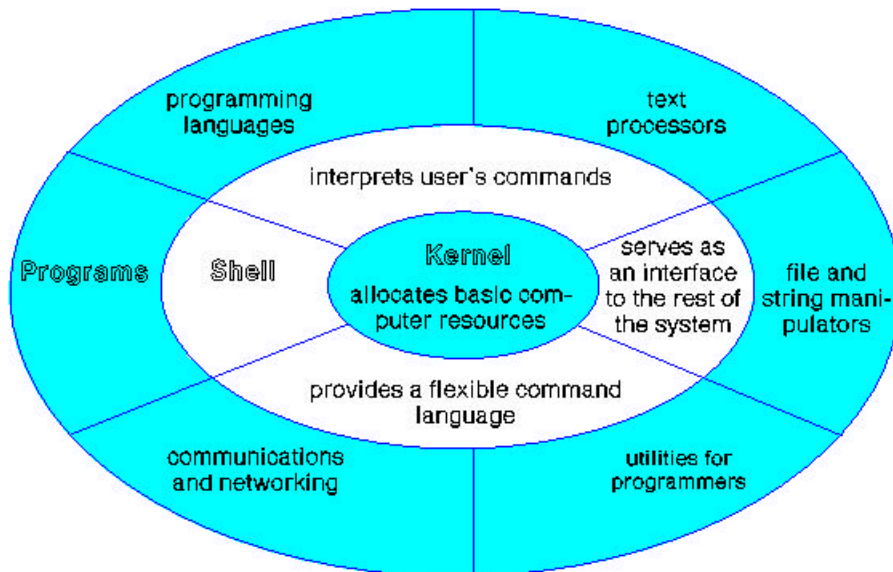
Interfacing with the kernel are various programs, including the shell. The shell provides a flexible interface between the users and the rest of the system. It is a command interpreter with programming facilities.

When a command is entered, the shell interprets it and calls the appropriate program to perform the work. The program the shell invokes may be a simple command, a chain of commands, or an application program such as an editor or a debugging tool.

Several commands and control statements can be put into a file (*shell script*) that can then be executed by the shell as a new command.

A shell treats displays, printers, and other input/output (I/O) devices the same way that it treats files. Normally, the input for a program or command comes from the keyboard, and the output goes to the display. But with the shell, input can come from any file or device, and output can go to any file or device. This is called *I/O redirection*. Using a standard shell command, the user can print a file on the display. However, the output from this command can be redirected to another file.

The shell also makes it easy to use the output of one command as the input to another command. This is called *piping*.



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Programs

2.4.4

Programs

UNIX operating systems contain many commands and a wide variety of programs and functions. They are especially equipped with tools for software development like high-level languages (C language, in particular), a symbolic debugger, a source code control system, a compiler, and a lexical analyzer. There are also tools for text processing, file and string manipulation, document production, and networking functions.

AIX/370 General Information

File system

2.4.5

File system

UNIX operating systems have a simple yet powerful file system that consists of directories and files.

Files are considered to be strings of characters without any further structure. Any information structure is assumed only by the processing programs.

Files are grouped into directories. The directories are structured in a hierarchy, starting with the "root" directory. Files can be found relative to the current directory or by absolute path name.

Access rights can be defined for each file or directory for reading, writing, and executing. These rights can be different for the file's owner, the group of which the owner is a member, and all other users. For example, the owner could define a file that:

The owner can read, write, and execute

Members of the owner's group can only read and execute

Everyone else can only read

AIX/370 General Information
The IBM AIX family

2.5

The IBM AIX family

IBM offers the following AIX family products:

IBM Advanced Interactive Executive/370 (**AIX/370**). This is the AIX offering for mid-range to high-end processors (IBM 9370, 4381, and 3090) that use System/370 architecture and System/370 Extended Architecture (XA). AIX/370 should be considered when a System/370 operating environment is required. The larger System/370 processors provide the most extensive AIX disk storage capacity, memory, and CPU processing capability, with 3090 vector facility support for large-scale numeric-intensive computing.

AIX Version 3 for RISC System/6000. This is a multi-tasking demand-paged virtual memory operating system that can operate as a single-user or multi-user system. It is POSIX compatible, as well as offering significant IBM enhancements. It will be the foundation for future offerings of AIX PS/2 and AIX/370. For further information, see *IBM RISC System/6000 Software Offerings Overview*, GC23-2189.

IBM Advanced Interactive Executive for the RT (**AIX/RT**). AIX/RT is a mid-range AIX offering that uses the Reduced Instruction Set Computer (RISC) architecture. AIX/RT supports a wide range of communications facilities, allowing attachment to UNIX operating systems and other operating systems. AIX/RT has an extensive library of applications for commercial, engineering, and scientific environments, especially those requiring high-function graphics or numeric-intensive computing.

IBM Advanced Interactive Executive for the Personal System/2 (**AIX PS/2**). AIX PS/2 is the entry level AIX offering. It uses the 386 architecture. AIX PS/2 satisfies the requirement for a small single- or multi-user UNIX operating system or workstation, migrations from PC XENIX Version 2.0, or a high degree of affinity with IBM PC-DOS.

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AIX/370 Function Overview

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AIX/370 Function Overview

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3.1 Functions of System V and BSD

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Functions of System V and BSD

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Functions of System V and BSD

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3.3.1 Functional equivalence to UNIX System V Release 2

3.3.2 Berkeley functions

3.3.3 IBM enhancements

AIX/370 General Information
Functional equivalence to UNIX System V Release 2

3.3.1 *Functional equivalence to UNIX System V Release 2*

AIX/370 is functionally equivalent to UNIX System V Release 2.

AIX/370 General Information

Berkeley functions

3.3.2

Berkeley functions

AIX/370 is functionally equivalent to release 4.3 of the Berkeley Software Distribution (4.3BSD), including the following:

- C Shel
- Job contro
- TCP/I
- System call
- Socket
- Signal
- Librarie
- Long file name
- Utilitie

Some System V commands have been replaced by the equivalent BSD commands with more options.

AIX Family Definition Overview, GC23-2002, describes the details of System V.2 and 4.3BSD functional compatibility and equivalency.

POSIX Compliance: AIX/370 conforms to IEEE standard 1003.1 for POSIX (Portable Operating System for Computer Environments).

AIX/370 General Information
IBM enhancements

3.3.3

IBM enhancements

AIX/370 contains the following functions in addition to those in System V.2 and 4.3BSD:

Transparent computing (using TCF, the Transparent Computing Facility) within a cluster of computers connected by Ethernet or IBM Token-Ring

Local area networks consisting of System/370 computers, IBM RTs, and Personal System/2s

TCP/IP on Ethernet and IBM Token-Ring connections, and channel-to-channel

Cooperation with IBM Personal Computers and PS/2s under IBM PC-DOS using AIX Access for DOS Users

Mail facilities and file transfer to and from other IBM System/370 operating systems

System/370 and XA modes of operation

Invocation of CMS commands from an AIX cluster (**onhost**)

AIX/370 General Information
IBM enhancements

Full-screen editor with "windowing" (the
INed editor), in addition to *vi*

Japanese Language Support

Printer queueing and System/370
printing facilities

Optimizing C compiler

VS FORTRAN compiler and library

IBM 3090 Vector Facility support

Support for Engineering and Scientific
Subroutine Library (ESSL).

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VM Operating Environment

4.0

VM Operating Environment

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4.1 AIX/370 runs under VM

4.2 Several operating systems can share one processor

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AIX/370 runs under VM

4.1

AIX/370 runs under VM

AIX/370 General Information

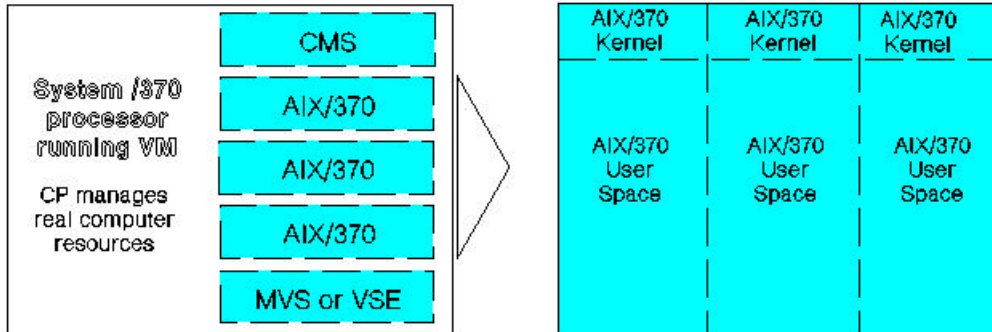
Several operating systems can share one processor

4.2

Several operating systems can share one processor

AIX/370 General Information

4.3



AIX/370 runs under VM as a "guest" (an operating system running in a virtual machine provided by VM).

The VM control program, called *CP*, manages real computer resources such as memory and disk space. To do this, CP creates one or more simulated computers (*virtual machines*) that use simulated computer resources. Each virtual machine behaves like a real computer, and is independent of other virtual machines.

AIX/370 runs in its own virtual machine. Therefore, AIX/370 users, with the occasional exception of the system operator and administrator, interact only with AIX/370. At the same time, other virtual machines on the same VM host system might be used to run:

CMS - a single-user interactive system designed specifically to run in a virtual machine

A service virtual machine, such as RSCS (Remote Spooling Communication Subsystem), for job networking

A multi-user operating system, such as MVS or VS

Additional AIX production or test virtual machines

Thus, AIX/370 can run in parallel with other operating environments on the same processor.

Because of the processing power of AIX/370, less demand is imposed on VM's own processing resources. AIX/370 manages most of its own needs for I/O,

AIX/370 General Information

paging, spooling, and scheduling.

AIX/370 has two distinct modes of operation, with two different kernels.

The **XA** mode (XA kernel) runs on VM/XA SP. XA mode features 31-bit addressing capability, one gigabyte of address space, and 768 megabytes for each user process.

The **370** mode (370 kernel) runs on VM/SP, with or without the HPO option. This mode features 24-bit addressing capability, 16 megabytes of address space, and 8 megabytes for each user process.

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Transparent Computing Facility (TCF)
Transparent Computing Facility (TCF)

5.0

Subtopics

5.1 Single system image

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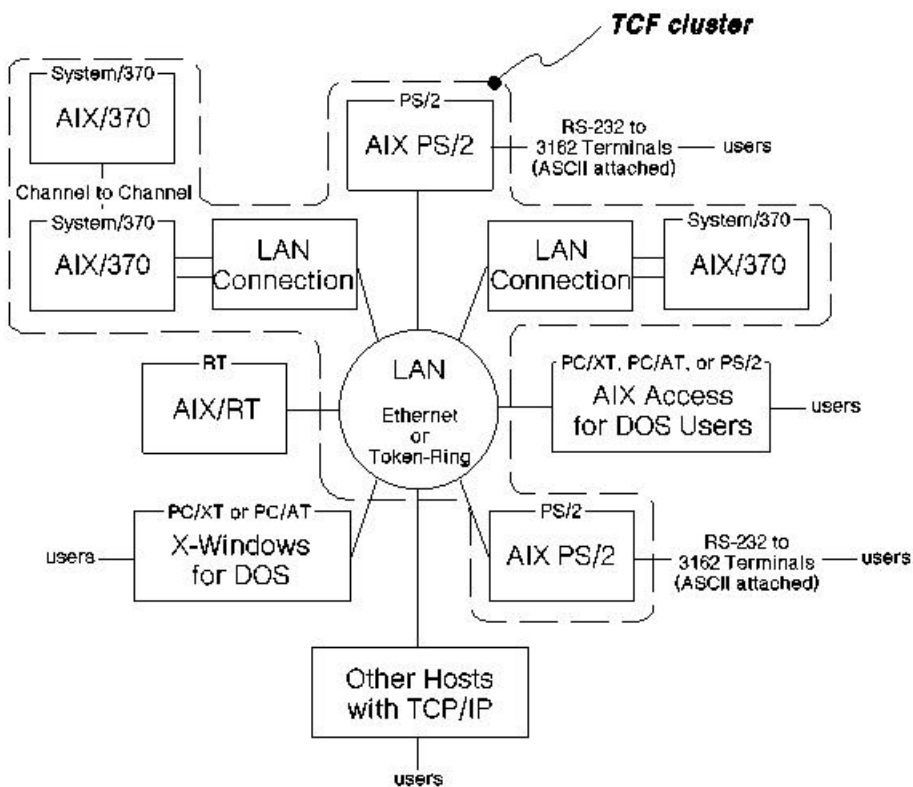
Single system image

Single system image

5.1

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5.2



Subtopics

5.2.1 Cluster of processors

AIX/370 General Information

Cluster of processors

5.2.1

Cluster of processors

It is possible to couple up to 31 System/370 processors running AIX/370, and IBM PS/2s running AIX PS/2 TCF, into a *cluster*. Elements of the cluster must be connected by a local Ethernet, an IBM Token-Ring network, or a System/370 channel-to-channel adapter.

This cluster then appears as a single machine resource and shows a single system image to any user in the cluster. Neither end users nor application programs need to know how the processors and devices are connected, or where data or programs reside in the cluster.

A workstation that is operating in a European-based language locale displays a listing of these resources in Roman-based characters. A workstation that is operating in a Japanese language locale displays some mixture of Japanese and Roman-based characters. Regardless of the characters being displayed, however, the resources indicated are exactly the same. Japanese and European language machines can be mixed in the same network.

A user who logs in to any computer in the cluster has access to the resources of all the computers in that cluster. Furthermore, this access is the same as on a single-machine AIX system. The user does not need to know how the cluster is configured.

An AIX cluster behaves like a single-computer system when it communicates outside the cluster. All users within the cluster are regarded as local users, and all users outside the cluster are regarded as remote users.

Distributed processing: User processes can run on any processor in the cluster regardless of where the user is logged in. The AIX system takes care of the processes and their resources as it would in a single-computer system (*process transparency*). However, the user can also explicitly control where processes are run.

Cluster transparency: All computers and devices connected to a cluster behave like a single machine resource running under one operating system. All resources are named in a unique way, and the same name is used from all sites of the cluster (*name transparency*). Objects can be moved from one site to the other, and their name does not change (*location transparency*). Commands and options always give the same service regardless of the site on which they are issued (*semantic transparency*).

Distributed file system: A user can access files that are stored on any site of the cluster, without knowing where the data actually is. The collection of all data in the cluster looks like a single file system. Access to all files and directories is the same as in a single-computer system. This capability is called *data transparency*.

Load leveling: AIX/370 provides various commands to balance the load on the different cluster sites, including *on*, *loads*, *migrate*, and the *fast* alias.

Locale: Each process operates in its own *locale*. This is a set of environment variables that the process uses to function in different ways according to the demands of different cultural traditions. It includes factors such as the language in use, date-handling conventions, and the system of monetary notation.

Dynamic cluster reconfiguration: Computers can be added to a cluster and

AIX/370 General Information

Cluster of processors

taken away from it as needed. To users, AIX/370 always appears as a consistent system, made up of the resources that are currently available in the cluster. If parts of the cluster become unavailable, as much as possible remains available for use.

Replicated file system: AIX/370 allows storing of several copies of selected files and directories within the cluster. This facility provides backup and reduces the access time to files that are usually read rather than modified. The system automatically keeps each copy of the replicated files and directories up-to-date.

File integrity: An AIX/370 cluster has a reliable file system because of the "pooling" of resources and the file replication facilities.

The atomic file mechanism causes regular updates to the files. It increases the reliability of the file system and ensures that the file contents are always consistent and up-to-date for all copies in the system. The application program may specify that the old information is replaced with new information only when the application closes the file or requests the update.

A *locking* mechanism for files and logical records works transparently across an entire cluster.

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Communication and Networking

6.0

Communication and Networking

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6.1 Local Area Networks

6.2 Networking and Mail Facilities

6.3 VM-based networks

6.4 Interface to personal computers

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Local Area Networks
Local Area Networks

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Networking and Mail Facilities

6.2

Networking and Mail Facilities

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Interface to personal computers

6.4

Interface to personal computers

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6.5

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- 6.5.2 TCP/IP
- 6.5.3 AIX/370 Network File System
- 6.5.4 Inter-System Communication
- 6.5.5 Mail facilities
- 6.5.6 ASCII support
- 6.5.7 VM-based networks
- 6.5.8 Interface to Personal Computers

AIX/370 General Information

Local Area Networks

6.5.1

Local Area Networks

AIX/370 supports two local area networks (LANs):

Ethernet

IBM Token-Ring

LAN connections in AIX/370 are currently supported for the integrated adapters of the IBM 9370 Information Systems and the IBM 8232 LAN Channel Station.

These connections can be used to couple processors to a cluster, to interface with personal computers, and to provide networking and mail facilities with TCP/IP.

AIX/370 General Information

TCP/IP

6.5.2

TCP/IP

TCP/IP (Transmission Control Protocol/Internet Protocol) is a network protocol that connects to other systems that support TCP/IP. TCP/IP allows a user to send and receive mail and transfer files across the network, print files and run commands on remote systems, and log in to remote systems.

AIX/370 provides TCP/IP support on Ethernet and IBM Token-Ring networks.

AIX/370 General Information
AIX/370 Network File System

6.5.3

AIX/370 Network File System

AIX/370 Network File System (AIX/370 NFS; program number 5688-046) is a separately orderable companion product to AIX/370. NFS uses TCP/IP on an Ethernet, IBM Token-Ring LAN, or channel-to-channel, and provides client and server functions for distributed processing among AIX and non-IBM systems. With NFS, an AIX/370 system can share files with another system on that same LAN. Compatible versions of NFS must be installed on the other AIX or UNIX operating system (Version 3.2 of the Sun Microsystems NFS Protocol).

NFS provides transparent file sharing, directory level remote mount, yellow pages directory lookup, and the Remote Procedure Call (RPC) interface for remote processing.

AIX/370 General Information
Inter-System Communication

6.5.4

Inter-System Communication

AIX supports several facilities for communications between AIX and other UNIX operating systems. These facilities include:

bellnet, which consists of standard UNIX System V networking functions such as **uucp** (UNIX-to-UNIX copy protocol) and **uux**.

connect - a command that allows the user to log in to remote AIX/370 and UNIX systems.

AIX/370 General Information
Mail facilities

6.5.5

Mail facilities

Sendmail - an inter-network mail router that sends mail transparently between local and remote systems and among multiple remote protocols.

The INmail program - an electronic message sending and receiving facility. The INmail program is menu-driven and includes an editor and help facilities with windows.

The INnet program - an extension of the INmail program that provides communication facilities between two or more systems or clusters that support the INnet program, such as AIX/RT and PC XENIX Version 2.0. The INnet program also provides an interface to the **uucp** network.

Text files used as messages can be written in Japanese characters and sent from one Japanese-configured user to another. Such files will be handled properly if sent via the SMTP protocol over Ethernet or Token-Ring connections, even if they must pass through ASCII-only AIX machines along the way. Japanese messages are not supported over *uucp* connections or by the standard *mail* program.

Japanese language messages are not supported over *uucp* connections. The standard *mail* program supports Japanese text for in-cluster communications, but not to remote sites outside the cluster.

For communication between clusters, text files used as messages can be written in Japanese characters and sent from one user to another. Both users must be operating in a Japanese language locale. Such files are properly handled if the SMTP protocol is used to send over Ethernet or Token-Ring connections, even if the files must pass through other AIX machines that are operating in ASCII character locales.

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ASCII support

6.5.6

ASCII support

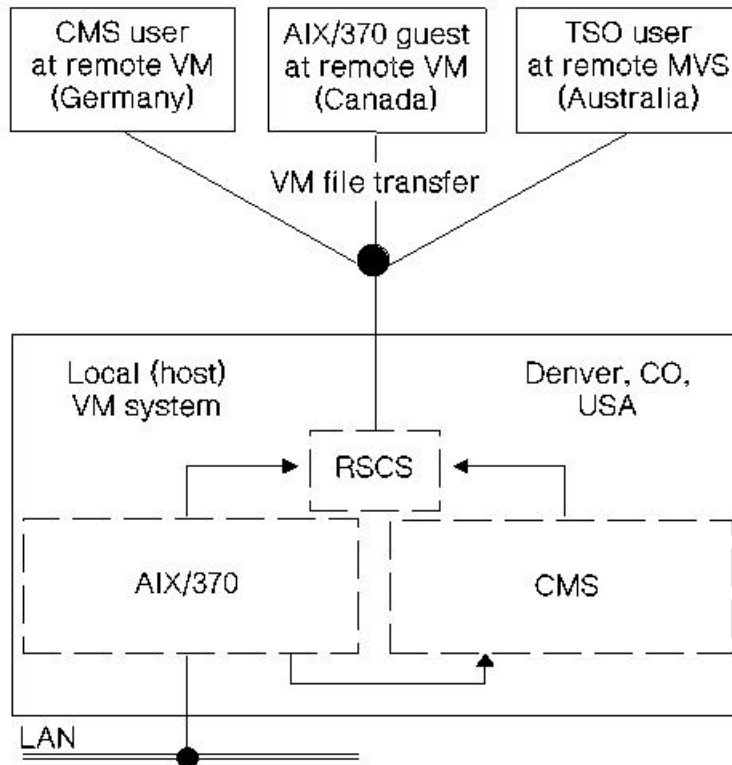
AIX/370 supports ASCII terminals connected to AIX PS/2 terminals, in conjunction with the Transparent Computing Facility (TCF).

AIX/370 General Information

VM-based networks

6.5.7

VM-based networks



An AIX/370 user has access to the networking facilities of the VM system in which AIX/370 operates as a "guest."

Host file transfer support: Allows AIX/370 users to send files to and receive files from other users in a network. Files are transferred by use of the Network Job Entry facility of RSCS (Remote Spooling Communication Subsystem). The **uvcp** and **vucp** commands are provided for copying between VM and AIX operating systems. Files containing multibyte characters can be transformed into *Host code (SI/SO)*, so that they are printable by System/370 printers equipped with Japanese fonts and readable by VM users who have Japanese support.

Host file transfer allows the user to receive files sent by a local or remote VM/CMS user, an MVS/TSO user, or another AIX/370 user. Similarly, files may be sent to those users accessible over the network. Conversion between EBCDIC and ASCII takes place by default.

onhost facility: Allows AIX/370 users access to commands in the Conversational Monitoring System (CMS). These commands may be used to start program execution. CMS command output may be used as input to AIX programs.

AIX/370 General Information
Interface to Personal Computers

6.5.8

Interface to Personal Computers

AIX/370 and IBM PC-DOS can closely cooperate if IBM AIX Access for DOS Users is installed on the IBM Personal Computer or PS/2.

The PCs must be connected to AIX/370 by an Ethernet or IBM Token-Ring LAN.

IBM AIX Access for DOS Users supports the following functions:

The AIX/370 file system can be written to and read by IBM PC-DOS user and IBM PC-DOS applications as if it resided on a local disk.

Files created on the AIX/370 system by an IBM PC-DOS user are accessible by AIX/370 users and programs.

PC-DOS users can access the AIX/370 system printer as if it were local PC printer.

The PC can operate like an ASCII terminal connected to AIX/370

AIX/370 General Information
Other Functions and Enhancements

7.0

Other Functions and Enhancements

Subtopics

7.1 Shells

7.2 Editors

7.3 Compilers and Additional Facilities

7.4

AIX/370 General Information
Compilers and Additional Facilities
Compilers and Additional Facilities

7.3

AIX/370 General Information

7.4

Subtopics

7.4.1 Shells

7.4.2 Editors

7.4.3 Compilers

7.4.4 Additional features

AIX/370 General Information

Shells

7.4.1

Shells

AIX/370 provides the following shells:

Bourne shell: This is the standard shell in System V, and it is also available in BSD. It is the standard shell in AIX/370.

C shell: This is the standard BSD shell, incorporating a command history and recall mechanism, job control facilities, a substitution mechanism, and C-like syntax. If desired, it can be made the default shell in AIX/370.

Restricted shell: This is a subset of the Bourne Shell with user restrictions for system integrity purposes. It is available both in System V and in AIX/370.

AIX/370 General Information

Editors

7.4.2

Editors

Besides the line editors **ed**, **ex**, **sed**, and the **vi** full-screen editor, the **INed** editor is also available in AIX/370. The INed editor allows full-screen editing and also supports "windowing." That is, multiple windows can be created to edit one or more files, and information transferred between them.

The simple, line-oriented UNIX operating system-style editors (**ed**, **ex**, and **sed**) do not support entry or editing of Japanese text. **vi** allows fullscreen editing of Japanese text even when characters occupy more than one column on the display screen. Regular expressions containing multibyte characters can be searched for and changed.

AIX/370 General Information

Compilers

7.4.3

Compilers

C compiler: AIX/370 has an optimized C compiler.

VS FORTRAN compiler: AIX/370 supports the optimizing VS FORTRAN Compiler and Library in AIX/370. This compiler adheres to the ANSI X3.9-1978 standard. The Engineering/Scientific Subroutine Library (ESSL) is also supported. This FORTRAN and ESSL support, combined with large processor size, provides a base for numerically intensive computing applications.

AIX/370 General Information
Additional features

7.4.4

Additional features

Service tools: AIX/370 provides a uniform installation method for applications and service updates.

Printing facilities: AIX/370 takes advantage of the VM spooling system to provide a printer queueing system. The AIX/370 administrator sets up print queues for various VM system printers.

Security and auditability: AIX/370 has integrated facilities for user and data access control. For example, a journaling facility is provided for all LAN traffic.

X-Windows: X-Windows is a windowing system that provides simultaneous views of several executing programs. AIX/370 supports the client function of X-Windows at version 11. The client function allows AIX PS/2, AIX/RT, IBM PC-DOS, or other UNIX operating systems with the X-Window Server function, connected to a TCP/IP network with AIX/370, to provide all-points-addressable presentation graphics management to AIX/370 applications.

X.25 support: The X.25 protocol is supported in AIX/370 through the PS/2 with AIX PS/2. Refer to *AIX PS/2 General Information*, GC23-2055, for details of this support.

AIX/370 General Information
Documentation

8.0

Documentation

Subtopics

8.1

AIX/370 General Information

8.1

Subtopics

8.1.1 Online documentation

8.1.2 Printed documentation

8.1.3 Related IBM publications

AIX/370 General Information
Online documentation

8.1.1

Online documentation

AIX/370 has online reference information for commands, system calls, subroutines, and file formats. The **man** command is entered to display this preformatted information at the workstation, either by requesting a specific name, or by using a hierarchical task index.

AIX/370 General Information
Printed documentation

8.1.2

Printed documentation

AIX/370 has a library that contains user information, system support information, and reference material.

The following publications are available when AIX/370 is delivered:

SC23-2324	AIX Library Guide, Glossary, and Master Index
GC23-2065	AIX/370 Planning Guide
SC23-2066	Installing and Customizing the AIX/370 Operating System
SC23-2088	AIX/370 Administration Guide
SC23-2291	Using the AIX Operating System
SC23-2293	Managing the AIX Operating System
SC23-2304	AIX Programming Tools and Interfaces
SC23-2090	AIX/370 Diagnosis Guide
SC23-2292	AIX Operating System Commands Reference (Volume 1)
SC23-2184	AIX Operating Commands Reference (Volume 2)
SC23-2300	AIX Operating Technical Reference (Volume 1)
SC23-2301	AIX Operating Technical Reference (Volume 2)
SC23-2057	AIX C Language User's Guide
SC23-2058	AIX C Language Reference
SC23-2294	AIX Operating System Messages Reference
SC23-2309	AIX Operating System TCP/IP User's Guide
SC23-2290	Installing and Customizing the AIX PS/2 Operating System
SC23-2044	AIX PS/2 Text Formatting Guide
SC23-2037	AIX PS/2 Keyboard Description and Character Reference
SC23-2001	AIX PS/2 INed
SC23-2076	AIX PS/2 INmail/INnet/INftp User's Guide
GC23-2055	AIX PS/2 General Information
GC23-2002	AIX Family Definition Overview
GC23-2333	AIX Guide to Multibyte Character Set (MBCS) Support
NISC18-0834	AIX Japanese Language Support User's Guide

AIX/370 General Information
Related IBM publications

8.1.3

Related IBM publications

Besides the AIX/370 and AIX family documentation, the following IBM publications may be of interest:

GA22-7000	IBM System/370 Principles of Operation
GA22-7085	IBM System/370 Extended Architecture Principles of Operation
GC20-1838	VM/SP General Information
GC23-0362	VM/XA SP General Information
GH24-5004	RSCS Version 1 General Information
GH24-5055	RSCS Version 2 General Information
GC24-5206	VM/SP: Planning Guide and Reference
SC19-6223	VM/SP HPO Planning Guide and Reference
GC23-0378	VM/XA Planning
GC26-4219	VS FORTRAN Version 2 General Information
GA27-3785	IBM 8232 LAN Channel Station Operators Guide
GA27-3796	IBM 8232 LAN Channel Station Installation and Testing
SC30-3458	IBM 8232 LAN Channel Support Program User's Guide

AIX/370 General Information
Hardware and Software Requirements

9.0

Hardware and Software Requirements

Subtopics

9.1 VM requirements

9.2 AIX/370 requirements

9.3 Migration

9.4 Licensing

9.5

AIX/370 General Information
VM requirements
VM requirements

9.1

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AIX/370 requirements

AIX/370 requirements

9.2

AIX/370 General Information

9.5

Subtopics

- 9.5.1 VM Software requirements
- 9.5.2 VM/SP Hardware Requirements
- 9.5.3 VM/XA Hardware Requirements
- 9.5.4 AIX/370 System Requirements
- 9.5.5 Migration
- 9.5.6 Licensing

AIX/370 General Information
VM Software requirements

9.5.1

VM Software requirements

AIX/370 can run on any IBM processor that is supported by VM/SP Release 5 (Program Number 5664-167), VM/SP HPO Release 5 (Program Number 5664-173), or VM/XA SP Release 1 (Program Number 5664-308), or later releases. AIX/370 runs as a guest operating system and is supported V=V, V=R (without the Preferred Machine Assist feature of VM/SP HPO), or V=F (XA mode only).

The following (no-charge) programs are required for error reporting and analysis:

Environmental Recording, Editing, and Printing (EREP) program for V (Program Number 5654-260)

Device Support Facilities (Program Number 5747-DS1)

VM file transfer requires RSCS Networking Version 1 Release 3 (Program Number 5748-XP1) or Version 2 Release 1 (Program Number 5664-188) or later releases of these products. AIX/370 RSCS line drivers are distributed with AIX/370.

Note: The AIX/370 system can co-exist with other VM guest operating systems as well as CMS.

AIX/370 General Information
VM/SP Hardware Requirements

9.5.2

VM/SP Hardware Requirements

The minimum configuration needed to run VM/SP alone is described in this section. For complete VM/SP planning information, see *VM/SP Planning Guide and Reference*, SC19-6201.

Processor: An IBM 4381, 3090, or 9370 processor with at least one megabyte of real storage

DASD: One IBM 3370, 3375, 3380, 9332, or 933

Tape: One IBM 3420, 3422, 3430, 3480, 8809, or 934

Console: One 3270 display device

Printer: One. (1)

AIX/370 General Information
VM/XA Hardware Requirements

9.5.3

VM/XA Hardware Requirements

The minimum configuration needed to run VM/XA alone is described below. For additional VM/XA planning information, see *VM/XA Planning*, GC23-0378.

Processor: One IBM 4381 or 3090 Processor running in Extended Addressing Mode

DASD: One IBM 338

Tape: One IBM 3420 or 348

Console: One 3270 display device

Printer: One. (1)

- (1) Output can be directed to VM printer(s) through the use of the AIX print command. This output is translated from ASCII to EBCDIC. Users should ensure that the VM printer has the proper character set for translated ASCII characters.

AIX/370 General Information
AIX/370 System Requirements

9.5.4

AIX/370 System Requirements

The following additional hardware is required for each AIX/370 system:

Four megabytes of additional real storage are required. However, six megabytes of additional real storage are recommended. For example, one AIX/370 system with VM/SP requires a minimum of five megabytes of real storage (one for VM/SP and four for AIX/370). Two AIX/370 systems require a minimum of nine megabytes of real storage (one for VM/SP and four for each AIX/370 system).

One IBM 3270 or equivalent display station for installing and operating the AIX/370 system. The VM operator's console can be used for this purpose.

Disk storage of 210 megabytes. This storage can be divided among three VM minidisks, one of which must be at least 120 megabytes. The device(s) can be one of the following: IBM 3380 Models A04, AA4, AD4, AE4, AJ4, AK4, B04, BD4, BE4, BJ4, or BK4. With a VM/SP system, IBM 3370, 9332, and 9335 devices are also supported.

There are several methods for a user to gain access to AIX/370

- A user on an ASCII terminal may gain access through terminal ports connected to a PS/2 via TCF to AIX/370. In this configuration, the PS/2 can handle most of the load of echoing characters to the terminal or running full-screen applications.
- A user with an IBM Personal Computer or IBM Personal System/2 can gain access through AIX Access for DOS Users. In this configuration there are several alternatives for access to the system. A user can execute DOS applications and also execute AIX commands, and also use X-Windows for access to the host.
- The user can use TELNET to connect to AIX/370 over Ethernet or IBM Token-Ring LAN.
- Japanese users can gain access through one of two standard units: IBM PS/55s or IBM 5550s. The PS/55 is the Japanese-specific version of the PS/2 family. It needs to be provided with X-11 and AIX PS/2 Version 1.2.1 software. The 5550 is the Japanese version of the IBM XT-class machine, and will function as the normal intelligent terminal of such a system.

A System/370 network device is required to provide the interface between the S/370 or 370/XA channel and the Ethernet or IBM Token-Ring LAN. The IBM 8232 LAN Channel Station is supported as a channel-attached device.

The following are also supported for attaching a 9370 processor to LAN:

- IEEE 802.3 LAN Subsystem Controller to support Ethernet.
- IBM Token-Ring Subsystem Controller.
- Japanese users can gain access through one of two standard system units: IBM PS/55 or IBM 5550. The PS/55 is the Japanese-specific version of the PS/2 family. It needs to be provided with the X-11 and AIX PS/2 Release 1.2.1 software. The 5550 is the Japanese

AIX/370 General Information
AIX/370 System Requirements

version of the IBM XT-class machine and functions as the normal intelligent terminal of such a system.

AIX/370 General Information Migration

9.5.5

Migration

Application programs written for the C and f77 FORTRAN compilers in IX/370 are upward-compatible to AIX/370 at the source level. Linkage convention differences will require assembler program modification.

IX/370 file systems must be converted to run with AIX/370. This can be done by off-loading the file system to tape under IX/370, recreating the file system, and then reloading the data under AIX/370. AIX/370 requires a different workstation configuration than IX/370 because AIX/370 does not support Series/1, 9370 ASCII Subsystem Controller, or 3270 terminals.

Within the AIX Family Definition, application programs are source-level compatible, and the end-user interface (C shell and Bourne shell) is consistent.

Programs written according to the UNIX System V Interface Definition (SVID) are source-code compatible provided they use only the functions and system calls supported by AIX/370. Likewise, programs written under 4.3BSD are source-code compatible, provided that they use only the functions and system calls supported by AIX/370.

AIX/370 General Information
Licensing

9.5.6

Licensing

This program is licensed under the terms and conditions of the Agreement for IBM Licensed Programs.

The program is available as object code only. No source material will be made available.

Central service, including the IBM Support Center, is available until discontinued by IBM upon six months written notice.

AIX/370 General Information
Example of an AIX System

10.0

Example of an AIX System

Subtopics

10.1 Tying together AIX product capabilities

10.2

AIX/370 General Information

Tying together AIX product capabilities

10.1

Tying together AIX product capabilities

AIX/370 General Information

10.2

The AIX family of products provides a wide range of function and capabilities. AIX products span three hardware platforms and allow integration of processors in various hardware classes. Supported software products include different languages, communications packages, numerous graphics applications, data base systems, operating system integration packages for DOS, AIX, VM, and many different types of application programs. In addition, DOS application programs can be made available to AIX/370 users.

The following discussion shows how a system might be built from AIX products.

An initial system is configured with AIX Access for DOS Users in the PCs. This product makes a System/370 processor available to DOS users for both batch and interactive use. PC users can use their DOS systems as front ends to the AIX/370 machine, and can start tasks on the 370 machine from DOS. Data can be shared. DOS files can be stored on the 370 and DOS application programs can have transparent access to the data or can execute the files. In addition, users can use **vi** or another DOS-based editor for local editing of data (stored either on the DOS machine or on the 370).

Host print services are also available to the DOS machines, through Ethernet or IBM Token-Ring. This configuration limits users to ASCII-only interactions and assumes that all users have a DOS machine available to them to access the system.

ASCII terminals can also be used to support non-Japanese users. If ASCII terminals are the only user access path, then a PS/2 can be connected to the System/370 via a LAN, using AIX PS/2 with TCF. This will produce a transparent cluster in which non-Japanese users at ASCII terminals perform editing and other highly interactive functions on the PS/2. As the interactive load increases or the number of non-Japanese user connections increases, additional PS/2 machines can be added to the cluster to support the increased load.

Users who prefer a windows-oriented interface to the system may gain access through X-Windows software. Many Japanese users will want such an interface because the PS/55s of the cluster use X-Windows to display Japanese characters.

X-Windows users have several options. They can obtain the *AIX DOS X Server* package and run it on the DOS machines. Or they can obtain PS/2s or RTs with AIX and X-Windows support. Either of these options is entirely sufficient for an ASCII-only user, and either option can display Japanese characters sent by the system (provided the receiving workstation is equipped with the needed Japanese fonts).

But any Japanese user who wishes to interact fully with the system in Japanese characters will require either a PS/55 with AIX PS/2 Release 1.2.1 and X-Windows support or an IBM 5550 XT-class machine. Both of these units include Japanese keyboards which will accept Japanese Language responses from the user in Katakana, Hiragana or Romaji characters.

All of the X-Windows options above require an Ethernet or IBM Token-Ring LAN interface to exchange the data. The IBM 5550 uses a ROM-based Japanese support system and does not need X-Windows; it can function

AIX/370 General Information

through a serial line.

If a PS/2 is selected, the AIX PS/2 TCF package can also be used. This system of the PS/2 and the 370 machines will make additional applications available to the user community, because the two hardware bases have different applications.

X-Windows applications can place a heavier load on systems than ASCII terminals connected to AIX. As a configuration's load grows, the Transparent Computing Facility can make it possible to add computing resources with minimal impact to the existing hardware base.

Using the AIX TCP/IP packages and the appropriate LAN or LANs, data can be exchanged with other TCF clusters, other AIX machines, or other UNIX operating system machines. Using **telnet**, **rsh**, or **rlogin** allows potential access to other TCP/IP machines.

By using AIX Distributed Services or AIX Network File System, data can be shared between clusters or hosts over an Ethernet or IBM Token-Ring LAN. NFS may communicate with machines other than AIX machines. However, note that NFS does not provide all the function of Distributed Services. Using Distributed Services between AIX clusters or machines provides an intercluster data exchange that can span administrative boundaries and provide more security controls than NFS.

Host print services are also available to the DOS machines through Ethernet or IBM Token-Ring. These configurations limit users to ASCII-only interactions and assume that all users have a DOS machine available to them for access to the system.

ASCII terminals can also be used to support non-Japanese users. If ASCII terminals are the only user access path, then a PS/2 can be connected to the System/370 over a LAN, using AIX PS/2 with TCF. This produces a transparent cluster in which non-Japanese users at ASCII terminals perform editing and other highly interactive functions on the PS/2. As the interactive load increases or the number of non-Japanese user connections increases, additional PS/2 machines can be added to the cluster to support the increased load.

Users who prefer a windows-oriented system interface can use the X-Windows software. Japanese users may want this interface because the PS/55s in the cluster can use X-Windows to display Japanese characters.

X-Windows users have several options. They can obtain the AIX DOS Server package and run it on the DOS machines, or they can obtain PS/2s or RTs with AIX and X-Windows support. Either of these options suffices for a European language user and either option displays Japanese characters sent by the system, so long as the receiving display station is equipped with the necessary Japanese fonts.

But any Japanese user who wishes to interact fully with the system in Japanese must have either a PS/55 with AIX PS/2 Version 1.2.1 and X-Windows, or an IBM 5550 XT-class machine. Both of these units include Japanese keyboards that accept Japanese language responses from the user in Katakana, Hiragana, or Romaji input formats.

All of the X-Windows options described above require an Ethernet or IBM Token-Ring LAN interface to exchange the data. The IBM 5550 uses a ROM-based Japanese support system and does not need X-Windows; it can function through a serial line.

AIX/370 General Information

As the processing load on the base cluster grows, machines can be added or replaced in the cluster.

This discussion only partially addresses the capabilities of the AIX family, but shows some examples of how the products can be used as building blocks of a powerful, diverse, and effective system.