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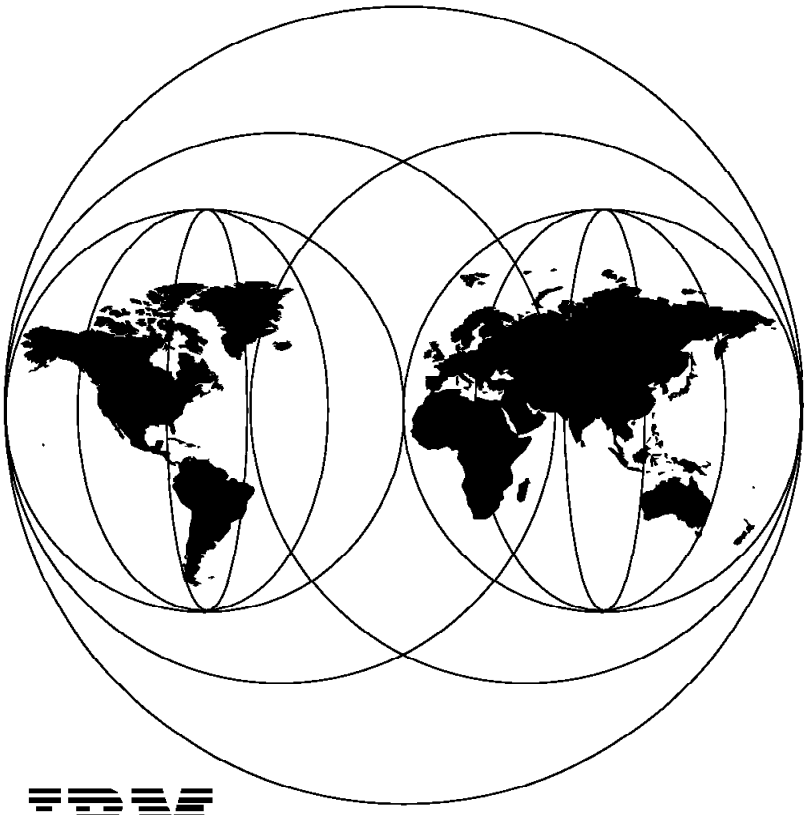
A Holistic Approach to AIX V4.1 Migration, Planning Guide

November 1995



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A Holistic Approach to AIX V4.1 Migration, Planning Guide

November 1995

Take Note!

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

First Edition (November 1995)

This edition applies to Version 3, Release 2, Modification Level 5 of the AIX Operating System, Program Number 5756-030, Version 4, Release 1, Modification Level 4 of the AIX Operating System, Program Number 5765-393, and associated Program Products.

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Abstract

This document takes a holistic view of planning a migration from AIX Version 3.2.5 to AIX Version 4.1. It covers the migration of complete systems—systems that include not only the AIX operating system but also applications, networking customizations, user information, and the many factors that make each system unique.

This document was written for current users of AIX Version 3.2.5 and associated products. Basic knowledge of the AIX operating system and the specific environment to be migrated is assumed.

(98 pages)

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Special Notices

This publication is intended to help administrators of systems that are currently running AIX Version 3.2.5 to plan the migration of their systems to AIX Version 4.1. The information in this publication is not intended as the specification of any programming interfaces that are provided by AIX. See the PUBLICATIONS section of the IBM Programming Announcement for AIX for more information about what publications are considered to be product documentation.

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Preface

The Webster's Ninth New Collegiate Dictionary defines holistic as:

1: *of or relating to holism* ***2:*** *relating to or concerned with wholes or with complete systems rather than with the analysis of, treatment of, or dissection into parts.*

This second definition describes the approach we have taken with the migration of systems from AIX Version 3.2 to Version 4.1. In the real world, a migration doesn't involve just the operating system. A computing environment includes applications from both IBM and independent software vendors and a great deal of site-specific customization of system and user environments. In this case, there are always going to be unique migration actions that cannot be performed automatically by migration tools.

Our testing included systems running applications such as HACMP and the Oracle database. It also included systems and groups of systems with extensive customizations in TCP/IP and SNA communications protocols. While it is obviously not possible to cover every specific environment, we hope that the environments we have chosen will provide a wide enough cross section to give system administrators clues or hints as to the problems they may discover in their own environments.

This document is the first part of a three-volume series on migration. The contents of each volume are listed below:

- *A Holistic Approach to AIX V4.1 Migration, Planning Guide*

  This covers the advance planning required for a successful migration. It includes such topics as documenting the existing system, determining the required levels of software for the new environment, verifying that hardware is supported at the new level, and scheduling the migration.

We expect to publish the following two redbooks in the near future.

- *A Holistic Approach to AIX V4.1 Migration, Volume 1*

  This is the first of two volumes to assist system administrators in actually performing the migration. It includes information on the base operating system, HACMP, Oracle, and migrating to Symmetric MultiProcessor Systems.

- *A Holistic Approach to AIX V4.1 Migration, Volume 2 - Communications*

  The final volume covers communications issues, such as advanced TCP/IP and SNA, as well as the migration from an X Windows and Motif window-manager environment to the Common Desktop Environment.

How This Document is Organized

The document is organized as follows:

- Chapter 1, “Why Migrate to AIX Version 4.1”

  This chapter is intended to answer the question "Why would I want to migrate to AIX Version 4.1?". It summarizes the enhancements that were introduced with the new software release.

- Chapter 2, “Planning for Migration”

This provides the outline of the migration process and takes the user through a feasibility study that allows them to determine if a migration is possible at this time. This evaluation should be made several weeks or months before the migration is scheduled to allow time to correct any potential "show stopping" mismatches.

- Chapter 3, “Software Migration Issues”

  This chapter details software-related issues to consider when planning the migration. It includes tables for mapping the existing IBM licensed products running on the user's system to the correct product and version to run under on AIX Version 4.1. It also lists the supported versions of many third-party software products.

- Chapter 4, “Hardware Migration Issues”

  This chapter lists RISC System/6000 models and features that are not supported under AIX Version 4.1. It also details features that are not yet supported but which will be supported under a future enhancement to AIX Version 4.1.

- Chapter 5, “Licensing Issues”

  It is important to understand changes that were made to the licensing and packaging of AIX when moving from Version 3.2 to Version 4.1. This chapter summarizes these changes.

- Appendix A, “Existing Environment Tables”

  This appendix provides tables that can be used when documenting the existing system environment.

- Appendix B, “Target Environment Tables”

  Similarly, this appendix assists the user in documenting the intended target environment and can then be used to determine the process required to move from the existing environment to the target environment.

- Appendix C, “IBM Key Centers”

  This appendix lists the contact details for IBM Key Centers worldwide and includes a registration form that can be copied, completed and faxed to your local Key Center.

Related Publications

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

- *Common Diagnostics and Service Guide*, SA23-2687
- *Service Request Number Cross-Reference*, SA23-2629
- *AIX Version 4.1 - Getting Started*, SC23-2527
- *AIX Version 4.1 - Installation Guide*, SC23-2550
- *All About AIX Version 4.1*

  This book was never officially published in hardcopy; however, it is available on the World-Wide Web at the URL:

  `http://www.austin.ibm.com/developer/aix/library/diff/df4main.html`

Within IBM, *All About AIX Version 4.1* is also available as ABOUT4_1 PACKAGE on the MKTTOOLS disk.

International Technical Support Organization Publications

The ITSO expects to publish the following two redbooks in the near future. Together with this book, they will provide a complete resource for planning and performing your migration to AIX Version 4.1.

- *A Holistic Approach to AIX V4.1 Migration, Volume 1*, SG24-4652
- *A Holistic Approach to AIX V4.1 Migration, Volume 2 - Communications*, SG24-4653

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Chapter 1. Why Migrate to AIX Version 4.1

AIX Version 4.1 includes the most significant enhancements to AIX since the initial introduction of AIX in 1990 while, in most cases, maintaining binary compatibility with AIX Version 3.2.

This chapter will give an explanation of the main benefits and new features of AIX Version 4.1 and is intended to answer the question "Why Migrate to AIX Version 4.1?"

AIX Version 3.2 should only be installed by new customers that have a solution requirement (hardware or software) that is not yet available or supported on AIX V4.1. In this event, it should be an interim solution only, and it should be coupled with a migration plan to AIX Version 4. Existing AIX Version 3.2 customers should have a migration plan in place to move to AIX V4.1 as soon as is practical.

AIX Version 4.1 will be the base for all major future enhancements to AIX, and has many enhancements over AIX Version 3.2.5. These enhancements can be categorized as follows:

- Enhanced kernel functions
- Industry standards
- Enhanced System Management functions
- Enhanced end-user environment
- PC network connectivity
- New packaging structure
- More flexible terms and conditions

Each of these categories is explained in more detail below.

1.1 Enhanced Kernel Functions

The AIX V4.1 kernel has been redesigned to provide many improvements. Following is a summary of these enhancements.

1.1.1 PowerPC and SMP Support

The AIX V4.1 kernel has new modules that provide support for the PowerPC 603 and 604 chips, the Power Personal Systems line of products and the RS/6000 Symmetric MultiProcessing (SMP) systems. At the same time, threads have been implemented within the kernel, allowing a one-to-one relationship between user threads and kernel threads. The AIX thread library is based on POSIX 1003.4A (Draft 7).

1.1.2 New Asynchronous Terminal Subsystem

AIX V4.1 uses a new asynchronous terminal subsystem based on UNIX System V.4-compatible streams that makes it easier to port streams-based applications to AIX. AIX V4.1 still supports the AIX V3.2 asynchronous terminal functionality from an applications perspective.

1.1.3 Journaled File System Fragmentation Support

In AIX V3.2, disk space was allocated in blocks of 4 KB. This method provided optimal performance, but wasted space in situations with many small files or files with final blocks containing only a few bytes. AIX V4.1 allows the system administrator to select from fragment sizes between 512 byte and 4 KB blocks, allowing more efficient disk-space utilization.

1.1.4 Disk Compression/Decompression

AIX V4.1 provides an on-the-fly software data compression/decompression option that achieves approximately 50 percent reduction in disk space requirements. It uses a fast Lempel-Ziv algorithm written at IBM that is similar to compression techniques available on personal computers. Even with software compression enabled, performance is very respectable.

1.1.5 Increased Maximum Filesystem Size

AIX V4.1 now supports filesystems up to 64 GB in size. This reduces the need to artificially distribute files where very large filesystems are in use. This affects many database and scientific application users and reduces the amount of systems administration involved in setting up the associated filesystems. Note that the size of an individual file was not affected — the limit remains at 2 GB per file in AIX V4.1.

1.1.6 Support for Logical Volume Manager Disk Striping

This function allows data to be striped across multiple disks. The data can be accessed by AIX from all the disks simultaneously, providing improved data access rates over non-striped data. This has major performance advantages for database applications.

1.1.7 Filesystem Defragmentation

AIX V4.1 provides a defragmentation utility that can reorganize filesystems on the fly. This utility is activated from a SMIT menu and can provide considerable performance improvements for fragmented filesystems.

1.2 Industry Standards

Application binary compatibility from AIX Version 3.2 has been a key focus in the development of AIX Version 4.1. Many, but not all, existing AIX applications will have full binary compatibility and will run without changes. AIX Version 4.1 continues to support customers' investments in previous IBM POWER, POWER2, and PowerPC systems, along with emerging PowerPC Reference Platforms.

AIX Version 4.1 is designed to conform to open standards for compatibility with other UNIX systems. There are several significant features of AIX Version 4.1:

- It meets the POSIX 1003.1 systems interfaces standard.
- It meets the POSIX 1003.2 shells and commands standard.
- Thread support is based on Draft 7 of the POSIX 1003.4A threads specification. The AIX V4.1-based Distributed Computing Environment (DCE) support is provided by a mapping layer that converts from Draft 4 interfaces to Draft 7 interfaces.

- XPG4 from X/Open is a superset of the POSIX 1003.1 and 1003.2 standards. It provides more commonality in commands and interfaces and better internationalization support than XPG3. AIX is branded as conforming to the following XPG4 profiles:
  - XPG4 Base Profile
  - XPG4 Internationalized Systems Calls and Libraries
  - XPG4 Commands and Utilities
  - XPG4 C Language
  - XPG4 Transport Service (XTI)
  - XPG4 Terminal Interface
  - XPG4 Magnetic Media
  - XPG4 Network File System (NFS)
- AIX V4.1 is branded as conforming with the X/Open UNIX 93 profile which is intended to provide a common UNIX interface specification.
- IBM has announced the intent to comply with the full Single UNIX Specification and to achieve UNIX 95 branding in a future release of AIX Version 4.

1.3 Enhanced System-Management Functions

System management has always been a strength of AIX. The system-management facilities and customization capabilities of AIX V4.1 have been greatly expanded to support a more diverse set of users with the introduction of the Power Personal systems.

System management and GUI enhancements include:

- Repackaging of AIX for customized installation
- Faster operating system installation
- Network Installation Manager (NIM)
- Visual Systems Manager (VSM)
- Installation Assistant (graphical and ASCII versions)
- Systems Management facilities provided by enhanced kernel functions
- Software Removal or Deinstallation
- Common Desktop Environment (CDE)

These enhancements, along with many others, are a direct response to customer requirements and feedback.

1.3.1 Custom Installation

One of the larger efforts in the development of AIX Version 4.1 was to completely restructure the packaging of the operating-system components to support custom installation and improved modularity. The objective was to automatically install the minimum operating environment for the system being installed, and then provide the facilities for the administrator to customize the system by installing additional operating-system components when needed.

In AIX Version 3.2, all the RISC System/6000 device support was installed on all systems, even if the hardware was not present or supported on the system. As the number of systems supported by AIX expanded and diversified, this procedure greatly increased software installation time and disk space usage. To alleviate this problem, AIX Version 4.1 now automatically installs a customized minimum operating-system environment. The device configuration subsystem has been extended to automatically install only the device packages required to support the installed hardware. If additional devices are added later, the appropriate device packages can be installed simply by taking a single menu selection.

Custom install will determine if a minimum graphical environment or an ASCII-only based environment should be installed. It will also automatically install the country-specific message packages, locales and helps for the primary language of the system to support the base operating system and all previously installed applications.

1.3.2 Faster Operating-System Installation

Installation of the base operating system is much simpler and faster than it was in AIX Version 3.2. Now, with fewer prompts and screens, it supports an optional no-prompt install using a data file on a diskette.

Installation of AIX V4.1 from tape takes about half the time required to install the same set of products at AIX V3.2. Using a CD-ROM installation, the install times have improved by even greater factors.

AIX Version 4.1 supports four installation modes:

- Overwrite: Completely re-installs the system
- Preservation: Re-creates the / and /usr filesystems and leaves everything else as it was
- Migration: Saves all the user's files, configuration information and applications, then migrates the installed operating system components to the latest level
- mksysb Installation: Restores the system from a previously created backup of the same system

Migration installation is new for AIX V4.1.

1.3.3 Network Installation Manager

A new Network Installation Manager (NIM) supports centrally administered, remote system installation of networked systems. This method offers flexibility for centralized operating system and application installation through push installs to one or more network clients, pull requests from clients and support of diskless and dataless clients from network servers.

NetView Distribution Manager (NetView DM) also offers remote application installation; however, NIM expands this capability by supporting remote operating-system installation as well. These installation capabilities are ideal for customers who have a large number of similar or identical installations.

1.3.4 Visual Systems Manager

The Visual Systems Manager (VSM) is IBM's graphical, object oriented, drag-and-drop systems-management tool. It provides about 80 percent of the functionality of the SMIT interface and is aimed at the new AIX user.

1.3.5 Installation Assistant

Once the minimum operating environment has been installed on the system, the new Installation Assistant is started. This facility guides users through the customization process by taking them through either graphical or text-based menus to complete the installation and system setup. The graphical version utilizes VSM to provide a drag-and-drop interface for tasks such as adding users, installing additional software and so on.

1.3.6 Software Removal or Deinstallation

At AIX Version 3.2, once a program product had been committed to the system, it was very difficult to remove it. AIX Version 4.1 allows the removal of products that are no longer required, freeing up their resources.

1.3.7 Common Desktop Environment

While AIX compares very favorably with other versions of UNIX in terms of ease of use, a number of further enhancements have been made to AIX V4.1.

Common Desktop Environment (CDE) is now bundled with AIX V4.1. For all users with graphics terminals, the CDE graphical user interface provides an intuitive easy-to-use, drag-and-drop way to manage their environment. Jointly developed by IBM, Hewlett-Packard, Novell, and SunSoft, it is based on best-of-breed technologies in the industry. The CDE interface increases user productivity through ease-of-use.

1.4 PC Network Connectivity

AIX Connections provides the capability to connect PC clients to UNIX data and applications running on the RISC System/6000. It supports clients running operating systems, including OS/2, Windows, Windows 95, Windows NT, UNIX, and Macintosh OS, and provides file and print server functions compatible with:

- IBM's LAN Server Version 4
- Microsoft's LAN Manager
- NWserver
- MACserver

Support is provided for a wide range of protocols, including IPX/SPX, TCP/IP, NetBIOS, RFC 1001/1002, AppleTalk, and SPX2.

AIX Connections is packaged as either an option for existing AIX client or server licenses or as an integrated offering that includes AIX Version 4.1 for Clients and the AIX Connections Version 4.1 option. It is priced according to the number of simultaneous logged-in connections to the server functions. AIX Connections Version 4.1 has a planned availability date of November 17, 1995.

1.5 Packaging

AIX Version 4.1 is packaged differently from its predecessors. Packaging changes have been made to ease the installation and maintenance of the AIX environment. This new improved granularity allows customers to install exactly what they need to create their required environment, allowing a smaller minimum installation size.

The new packaging terms are explained below.

1.5.1 Filesets

Filesets provide a specific function. For example, *bos.net.tcp.client* is a fileset in the *bos.net* package (Base Network Support and Applications) providing TCP/IP client support. A fileset is the smallest individually installable unit and each consists of a collection of functionally related files.

1.5.2 Fileset Update

A fileset update will either enhance or correct a defect in a previously installed fileset.

1.5.3 Package

A Package is a group of filesets with common function collected into a single installable image. The image is in Backup File Format (BFF).

1.5.4 Bundle

Bundles are collections of installable operating-system software components and Licensed Program Product (LPP) components that are grouped together and can be installed with one selection. AIX V4.1 supports both system-defined and user-defined bundles.

The system-defined bundles are defined as:

- Client: A collection of software products for single-user systems running in a stand-alone or networked client environment.
- Server: A collection of software products for multi-user systems running in a stand-alone or networked environment.
- Personal Productivity: A collection of software products for graphical desktop systems running AIX and PC applications.
- Application Development: A collection of software products for developing applications, for example, compilers/linkers, libraries and debuggers.
- DCE Client: The software required to be a client in a Distributed Computing Environment (DCE) network.
- Hardware Diagnostics: The group of filesets required to run concurrent hardware diagnostics.
- Media-Defined Bundle: This is a new feature included in the AIX Version 4.1.4 maintenance level. It allows bundles to be defined by the installation media and could be used by Independent Software Vendors (ISVs) to provide bundled installation of their software.

1.5.5 Maintenance Level Bundle

A maintenance-level bundle is a collection of fixes and enhancements that update the operating system to the latest level. Software is selected for installation if it is in the bundle you choose and on the installation media.

1.5.6 Licensed Program Products

These are complete software products, including all packages and filesets needed to provide a specific function. For example, the Base Operating System (BOS) is a Licensed Program Product (LPP).

1.5.7 Product Offerings

Product Offerings are selected sets of packages which are sold together on physical media. Product Offerings should not be confused with bundles (see previous section).

Examples of Product Offerings from IBM are:

- AIX Version 4.1 for Clients: This product offering is packaged with functionality aimed at satisfying the users of client systems. It is designed for customers who do not need to provide network server support for LAN/WAN attached devices. These systems can be used as: client systems, personal productivity workstations, print servers, name servers, and gateways.
- AIX Connections Version 4.1: This is an integrated offering that includes AIX Version 4.1 for Clients and the AIX Connections Version 4.1 option. For more information on the AIX Connections offering, see 1.4, “PC Network Connectivity” on page 5.
- AIX Version 4.1 for Servers: This product offering is packaged and priced for full server-system functionality. These systems can be used as: network file servers, data servers, print servers, iFOR/LS servers, compute servers, application servers, and so on.
  - AIX Version 4.1 Entry Server: The entry server is for the 2xx, 4xx and Cxx systems. Customers can purchase a 1-2 user or unlimited license.
  - AIX Version 4.1 Advanced Server: The advanced server is for the 3xx, 5xx, 9xx, Gxx, Jxx, and Rxx systems. Customers purchase a base 1-2 user license, and there is an incremental charge for the number of additional users. Incremental users can either be dedicated or network users.
- Hypertext: the complete InfoExplorer library product offering
- Diagnostics: full function diagnostic capability

1.6 Terms and Conditions

From the introduction of AIX Version 4.1 Modification 4 (AIX V4.1.4) in October, 1995, the AIX operating system has been standardized on a single worldwide license called an International Program License Agreement (IPLA). This license is much simpler and more flexible than the license used for AIX Version 3.2. It is the goal over time for all IBM licensed program products to use this license agreement, however, at present not all program products use this same license, and in fact the terms and conditions under which many program products are licensed may differ

between countries. You should verify the appropriate conditions in your country with your local IBM representative.

More details of the new licensing terms and conditions are given in Chapter 5, “Licensing Issues” on page 65.

Chapter 2. Planning for Migration

Migrating a working system from AIX Version 3.2 to AIX Version 4.1 is a complex procedure that should not be undertaken lightly. In most cases, the system being migrated is vital to the running of the company and any downtime must be minimized. It is therefore important to carefully plan the migration to ensure that all possible risks are discovered before the event so that they may be eliminated or reduced. Always try to think of areas where your environment is unique and may be different from those used as examples. In particular, pay attention to any third-party additions or extensions beyond the standard set of products. Invariably, the success of the migration will depend on your ability to identify and assess possible problems over and above those addressed in this document.

The migration planning process should not be viewed as an overhead or cost. As well as greatly assisting your migration, the planning process will result in documentation and an improved understanding of your system that can then be reused for establishing procedures such as change control, problem management and resolution, disaster recovery and capacity planning.

In order to perform a successful migration, a number of stages need to be completed:

1. Feasibility study
    - Document the existing environment (hardware and software)
    - Map the existing environment to the target environment
    - Determine if migration is achievable (consider the cost and availability of components)
2. Migration preparation
    - Order new software
    - Order new hardware
    - Port any existing in-house applications
    - Compile a list of migration steps
    - Schedule system downtime
    - Schedule a full system backup and verification
3. Perform the migration
    - Back up the system and verify the backup integrity
    - Upgrade the operating system
    - Acquire iFOR/LS licenses (if applicable)
    - Upgrade or install IBM Program Products
    - Upgrade or install third-party applications
4. Test the system
5. Back up the system and verify the backup integrity
6. Customer acceptance handover

In this chapter, we will look at the feasibility study and other areas that need to be addressed before the actual migration can take place. It should be read in conjunction with Chapter 3, “Software Migration Issues” on page 21, Chapter 4, “Hardware Migration Issues” on page 57 and Chapter 5, “Licensing Issues” on page 65 to help plan your migration.

2.1 Documenting the Existing Environment

When planning your migration, the main objective is to guarantee the same, or increased, functionality at the target level of AIX that you currently have in your existing environment. With this in mind, you need to thoroughly interrogate your system, and document exactly what is installed. It is important that you do not miss any components at this stage.

For each section, use the recommended methods to extract the information from the system and use it to complete Appendix A, “Existing Environment Tables” on page 71.

2.1.1 Hardware

We need to determine exactly what components are installed in each RS/6000 that is to be migrated. This information will be used to determine if each component is supported at AIX V4.1. We also need to know about devices that may be attached at a later date, for example, external tape drives. The device drivers for these products will need to be loaded once the migration installation has taken place. When documenting your system, be sure to highlight any third-party components.

Note: Non-AIX device drivers will be deleted from the system during the migration and therefore must be re-installed after migration.

2.1.1.1 RS/6000 System Model

To find out what model of RS/6000 you have, look on the front panel and read the name located on the IBM badge. If for some reason you cannot find the information on the machine or you are gathering the information remotely across a network, an alternative method is to use the information provided by the following command:

```
uname -m
```

The output will be similar to that shown in Figure 1. The ninth and tenth digits (counting from the left) relate to the CPU ID number. You can look up this number in the *Common Diagnostics and Service Guide*, SA23-2687, or in the *Service Request Number Cross-Reference Guide*, SA23-2629, to determine the associated model.

```
000005081800
```

Figure 1. Identifying the CPU Type

In our example, the number **18** refers to the 7013-53H.

2.1.1.2 Memory

Use the following command to find out what memory is installed:

```
lsdev -CHc mem*
```

The output will be similar to that shown in Figure 2.

```
name status    location description

mem0 Available 00-0B    16 MB Memory Card
mem1 Available 00-0D    16 MB Memory Card
mem2 Available 00-0F    16 MB Memory Card
mem3 Available 00-0H    16 MB Memory Card
```

Figure 2. Extracting Installed Memory Information

The location code in Figure 2 refers to the memory slot number for each installed memory card.

2.1.1.3 Hard Disk Drives

Use the following command to find out what hard disk drives are installed:

```
lsdev -CHc disk
```

The output will be similar to that shown in Figure 3.

```
name   status    location    description

hdisk0 Available 00-08-00-10 1.0 GB SCSI Disk Drive
hdisk1 Available 00-08-00-20 355 MB SCSI Disk Drive
```

Figure 3. Extracting Installed Hard Disk Drive Information

The location code in Figure 3 is in the format:

```
AB-CD-EF-GH
```

A detailed explanation of these codes may be found in the manual, *Common Diagnostics and Service Guide*, SA23-2687.

In our example, both disks are SCSI, and as such, the following information is of interest:

D - Microchannel slot number of the SCSI controller
G - SCSI Address of the device

Both `hdisk0` and `hdisk1` are attached to an SCSI controller that is located in microchannel slot `8`, and have an SCSI addresses of `1` and `2`, respectively.

The output produced from issuing the `lsdev -CHc disk` command will contain information about both internal and externally attached disks. For example, at the time this document was written, the 7135 RAIDiant Array was supported on only the very latest version of AIX V4.1; so it could be important to identify its use. Any disks associated with a 7135 will be shown as in the following example.

```
name   status    location    description

hdisk5 Available 00-08-00-00 670 MB SCSI Disk Drive
hdisk4 Available 00-07-00-50 2.0 GB SCSI Disk Drive
hdisk6 Available 00-07-00-60 2.0 GB SCSI Disk Drive
hdisk3 Available 00-06-01-00 7135 Disk Array Device
hdisk7 Available 00-05-00-11 7135 Disk Array Device
hdisk0 Available 00-06-01-02 7135 Disk Array Device
```

Figure 4. 7135 RAIDiant Array Sample

2.1.1.4 Other SCSI Devices

We need to extract information about other (non-disk) SCSI devices, such as tape drives and library changers. The easiest way to extract this information is to use the following command:

```
lsdev -CHs scsi
```

The output will be similar to that shown in Figure 5. The list will include attached SCSI disks, but these may be ignored as they have already been documented.

```
name   status    location    description

rmt0   Available 00-08-00-50 2.3 GB 8mm Tape Drive
hdisk0 Available 00-08-00-10 1.0 GB SCSI Disk Drive
hdisk1 Available 00-08-00-20 355 MB SCSI Disk Drive
cd0    Available 00-08-00-40 CD-ROM Drive
```

Figure 5. Extracting Other SCSI Device Information

2.1.1.5 Microchannel Adapters

Use the following command to find out what microchannel adapters are installed:

```
lsdev -CHc adapter -s mca
```

The output will be similar to that shown in Figure 6.

```
name  status    location description

sio0  Available 00-00    Standard I/O Planar
scsi0 Available 00-08    SCSI I/O Controller
ent0  Available 00-03    Ethernet High-Performance LAN Adapter
tok0  Available 00-05    Token-Ring High-Performance Adapter
gda0  Available 00-07    Color Graphics Display Adapter
```

Figure 6. Extracting Installed Microchannel Adapter Information

The location code in Figure 6 is in the format:

```
AB-CD
```

Where *D* refers to the microchannel slot number.

2.1.2 Software

Documenting the software installed on your machine may not be as simple as it first sounds. In theory, each RS/6000 administrator should have hardcopy documentation telling him exactly what is installed. We, of course, live in the real world and as such, shall concentrate on extracting the necessary information from the system itself.

2.1.2.1 Base Operating System

The base operating-system level should be documented along with the number of licensed users.

Use the following command to find out what version of AIX you currently have installed:

```
lslpp -m bos.obj
```

The output will be similar to that shown in Figure 7. The information of interest is shown in boldface type.

```
Processing.....Please Wait.
 Description                                          State     Fix Id
 ---------------------------------------------------  ------    ------------

 bos.obj 3.2.0.0
   3250 bos Maintenance Level                             C     U491123


State codes:
 A -- Applied.
 B -- Broken.
 C -- Committed.
 N -- Not Installed, but was installed/seen on some media.
 - -- Superseded, not Applied.
 ? -- Inconsistent State...Run lppchk -v.
```

Figure 7. Establishing the Base Operating-System Level

Note: If the `State` is shown as `B`, the system should be checked and any problems rectified before starting the migration.

To find the user license that is associated with the machine, refer to the licensing information associated with the RS/6000 in question. This information should be available; however, if it is not, we suggest that you contact your IBM License Administration Center. They will require the serial number of the machine along with a few other company details in order to check the license.

At this point, you may also wish to check the number of licensed users defined on the system. To do this, type in the following command:

```
smit chlicense
```

The output will be similar to that shown in Figure 8 on page 14. The information of interest can be found between the square brackets.

```
                        Change Number of Licensed Users

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                                      [Entry Fields]
  Number of licensed USERS                           [17-32]                +

F1=Help             F2=Refresh          F3=Cancel           F4=List
F5=Reset            F6=Command          F7=Edit             F8=Image
F9=Shell            F10=Exit            Enter=Do
```

Figure 8. Establishing the Number of Licensed Users

Thus, in our example, the system is licensed for use by up to 32 concurrent users.

2.1.2.2 IBM Program Products

Every RS/6000 potentially has a different set of IBM program products installed. Products can be Optional Program Products (OPPs) that are included with the base operating system, but not necessarily installed, or Licensed Program Products (LPPs) that can be purchased separately.

For each program product installed, we need to obtain its product number, name and version. There are a number of methods available for gathering this information, and the easiest of these is to use the AIX command `lslpp`.

The `lslpp` command has many flags that allow the user to extract multiple details about the installed program products. We are not interested in many of the fields and as such, will use a series of pipes and filters to extract the relevant information.

Use the following command to find out what program products you have installed:

```
lslpp -ciq | tr ':' ' ' | cut -f 3,5,7 -d' ' | cut -c1-20,23-40 | sort -u
```

In the line above, there are two instances of a pair of single quotes surrounding a single space character.

The output will be similar to that shown in Figure 9 on page 15

```
01.01.00.00 5696-623 perfmgr
01.01.00.00 5696-624 perfagent
01.02.00.00 5601-287 sna
01.02.00.00 5601-287 snamEn_US
01.02.00.00 5765-203 adsmserv
01.02.00.10 5765-203 adsm
01.02.03.00 5601-257 X11fnt
01.02.03.00 5601-257 X11mEn_US
01.02.03.00 5601-257 X11rte
01.02.07.01 5765-011 x3270
01.03.00.00 5601-249 xlccmp
03.02.00.00 5756-030 bos
03.02.00.00 5756-030 bosadt
03.02.00.00 5756-030 bosext1
03.02.00.00 5756-030 bosext2
03.02.00.00 5756-030 bosnet
03.02.00.00 5756-030 bsl
03.02.00.00 5756-030 bsmEn_US
```

Figure 9. Establishing which Program Products are Installed

The results obtained are presented in the following order:

```
<product version> <product number> <product name>
```

As you can see from the example, the product name is not very descriptive, and as such, we will use the product number and product version information to gain more details.

The product number will allow you to extract the full product name from the OPP/LPP mapping tables on 27 through 50. The product version information extracted here may not directly relate to the actual version of the program product. For example, `x3270` in our example has a product version shown as `01.02.07.01`. This is not a valid version number because we know, from the migration tables, that the latest version on x3270 is 01.02.02.00 . In cases such as these, it is necessary to investigate the product further. Occasionally, the product version is displayed when starting up the program product, or the information may be included in the associated README file in the /usr/lpp/<lpp name> directory, where <lpp name> refers to the program product name.

2.1.2.3 Third-Party Software

There is no consistent method to extract information on the third-party applications that are installed. Depending on how the application was written, it may or may not show up in an `lslpp` listing, and as such, you should not rely on this method. Generally, a third-party application will display its version and release information on startup. If this is not the case, the application vendor should be contacted.

2.1.2.4 In-House Developments

As with third-party applications, there are no commands available to extract information about what in-house developments reside on the system. This information must still be documented.

Any in-house developments, including customized shell scripts, need to be tested and modified, if necessary, before migration can take place. Please refer to 3.4, “In-House Developments” on page 54 for information on in-house development issues.

2.2 Mapping Between Environments

Once the system has been fully documented, the next step is to map the current AIX V3.2 environment to the AIX V4.1 equivalent. Use the following sections to help you complete Appendix B, “Target Environment Tables” on page 77.

2.2.1 Hardware

Hardware upgrades are not taken into consideration in this section. We will be concentrating on the hardware components currently installed in or attached to our existing AIX V3.2 RS/6000 and their ability to function at AIX V4.1.

Some uniprocessor-to-SMP hardware migration issues are discussed in 4.6, “SMP Upgrade Issues” on page 61, but they are not taken in consideration in this chapter.

2.2.1.1 IBM Hardware Components

Use Chapter 4, “Hardware Migration Issues” on page 57 to confirm that your current hardware environment is supported at AIX V4.1. For each individual component, check in 4.3, “Unsupported Hardware at AIX V4.1” on page 57 to see if it is included in the list. If it is, check to see if support for that particular component is planned.

Note: The migration may have to be delayed until a device driver is available, and the necessary testing has taken place.

If your hardware component is in the list of 4.3, Unsupported Hardware at AIX V4.1 and there are no plans to support it, the only option is to find a suitable replacement, unless you can operate without the component. Please contact your IBM representative for further information about possible replacements.

2.2.1.2 Third-Party Hardware

If you have any third-party hardware installed in your system, we recommend that you contact the hardware manufacturer to determine if the hardware has been tested at AIX V4.1. If it is supported, you may need to obtain additional device drivers unless there are generic device drivers standard with AIX that may be used.

2.2.2 Operating System

AIX V4.1 provides new packaging that focuses on the two primary types of system usage, the client and the server. Unlike AIX V3.2, these packages are functionally different. AIX V4.1 for Clients is packaged as a single-user system and provides the functionality necessary for the client environment. AIX V4.1 for Servers is packaged as a multi-user system and provides increased functionality over and above that included in the client version. Please refer to 3.1.2, “Client and Server Packaging” on page 22 to obtain detailed information about the functionality provided in each package.

After selecting the level of functionality you need, you can then select the appropriate package from the following list:

- AIX Version 4.1 for Clients (1-2 users)
- AIX Version 4.1 for Entry Servers (1-16 users)
- AIX Version 4.1 for Entry Servers (unlimited users)

- AIX Version 4.1 for Advanced Servers

Detailed information about the functionality that is provided by each of these packages may be found in 5.2, “AIX Version 4.1 Base Operating System” on page 66.

2.2.3 IBM Program Products

Probably the most difficult part of planning a migration is the task of mapping AIX V3.2 program products to their AIX V4.1 equivalents. The A.3, “IBM Program Products Table” on page 73 will be used in conjunction with 3.2, “Mapping IBM Program Products” on page 23 to work out what software will be required.

In our example scenario, we have the program products shown in Table 1.

Table 1. Software Installed at AIX V3.2.

Product Number	Product Name	Version
5696-623	AIX Performance Toolbox/6000	V1.1
5696-624	AIX Performance Aide/6000	V1.1
5601-287	SNA Services/6000	V1.2
5665-203	ADSM/6000	V1.2.0
5601-257	AIX Windows 2D	V1.2.3
5756-030	AIX Operating System	V3.2.5
5765-011	AIX X-Windows 3270 Emulator/6000	V1.2.1
5601-249	AIX XL C Compiler/6000 (Base Op)	V1.3

Taking each program product in turn, we can map them to their AIX V4.1. equivalent while taking note of the migration action and license required. After mapping the products, we end up with the list shown in Table 2.

Table 2. Program Products at AIX V4.1.

Product Number	Product Name and Version	Migration Action	License Key Required
5696-900	IBM Performance Toolbox V2.1	Free upgrade	-
5696-899	IBM Performance Aide V2.1	Chargeable upgrade	-
5765-582	SNA Server/6000 V3.1	Chargeable upgrade	-
5765-564	ADSM/6000 V2.1	Free upgrade	-
5765-393	AIX V4 for Advanced Servers, 32 User License	Base Operating System	-
5765-011	AIX X-Windows 3270 Emulator/6000 V1.2.2	Refresh	Yes
5765-423	IBM C for AIX V3	New Product	Yes

Notes:

1. We could have chosen to keep ADSM V1.2.0 and ordered the associated PTF to make it work; however, the upgrade to V2.1 is free and will provide greater functionality.
2. AIX Windows 2D is included in the AIX V4.1 base operating system, and as such, a replacement does not need to be ordered.
3. The license types are explained in Chapter 5, “Licensing Issues” on page 65.

With this information we could now place an order for the required software versions.

Use the information gathered in 2.1.2.2, “IBM Program Products” on page 14 to map your program products over to their AIX V4.1 equivalents. Remember that some of the products may now be included in the base operating system and as such, will not need to be mapped.

2.2.4 Third-Party Software

Some information about the availability of third-party software products at AIX V4.1 is included in 3.3.1, “Certified 3rd Party Applications” on page 51; however, it is strongly recommended that you contact the application vendor to see if:

1. The application has been ported or certified at AIX V4.1.
2. There are any additional pre-requisites over and above those at AIX V3.2.5.
3. There are any major issues that need to be taken into consideration.
4. There is a guide available to lead you through the migration of their product along with estimated times involved.
5. There have been any new announcements since this document was written.

This information should be gathered and documented along with the rest of the software information.

2.3 Migration Validation

Validating the planned migration at this stage is of upmost importance. You need to take all of the information that has been collated, and determine if you are in a position to go ahead with the migration.

2.3.1 Is the Migration Achievable?

By documenting the existing environment and then mapping it over to the AIX V4.1 equivalent, you should now know if the migration is achievable. If any major problems were highlighted in 2.2, “Mapping Between Environments” on page 16, they will have to be addressed in order to carry on with the migration. It may be that the migration is not possible at this point in time due to the availability of one or more of the vital components.

Hardware incompatibility problems will mean that you have to either:

- Wait for the hardware component to be certified as a valid AIX V4.1 component
- Find an alternative hardware component that will provide the same functionality
- Operate without the hardware component's functionality

Software migration problems will probably cost you time. Most major software packages available today under AIX Version 3.2.5 are now also available under AIX Version 4.1 in the form of an upgrade or complete replacement product. In some cases, the software may not yet be ported or tested on AIX V4.1. This information should be gathered when scheduling your migration.

2.3.2 Is the Migration Cost Within the Allocated Budget?

Providing that you have all of the resources necessary to complete the migration, you still need to work out how much it will cost.

Upgrading to AIX V4.1 will provide you with many benefits in the long term due to its superiority over AIX V3.2.5 and the support provided from IBM. In the short term, however, it is important to consider *all* of the costs associated with the upgrade.

There is a charge involved with migrating the base operating system from AIX V3.2 to AIX V4.1, but this is not the only cost that should be considered. Hardware replacement and software upgrades will obviously cost as will system downtime and human resources needed to complete the exercise. As each migration exercise is different, a detailed cost model will need to be drawn up.

The cost model, in its simplest form, should at least include the following sections:

- Base operating system upgrade cost
- The cost of upgrading IBM program products
- The cost of new IBM program products
- The cost of upgrading third-party applications
- The cost of upgrading, replacing or rewriting in-house developments
- The cost of replacement hardware
- Human resource costs
- Cost of lack of productivity due to system downtime

Your IBM salesman will help you to price the IBM components. IBM employees can use one of the IBM configurators, such as the *PC-Configurator* that is widely used in the UK, to get a rough cost for migrating the IBM components.

Note: The PC-Configurator may not be able to give you an exact cost and should be used as a guide only.

The completed model should, hopefully, give you a better feel for the cost involved and will allow you to make an informed judgement.

2.3.3 How Long Will the Migration Take?

When planning the migration, you will need to calculate the amount of time required to complete each of the migration stages. At this stage, the timings will be based on rough estimates; more detailed plans should be developed as and when appropriate. The initial plan should give us sufficient details to plan human resources and calculate the estimated project duration.

Complex systems will have many variables to consider, and as such, it is difficult to give a set of estimates for every possible migration scenario in this document.

A migration schedule can be drawn up similar to that shown in Figure 10 on page 20 using a suitable project-management tool. This chart is provided as an example and should not be used as a base for your timing estimates.

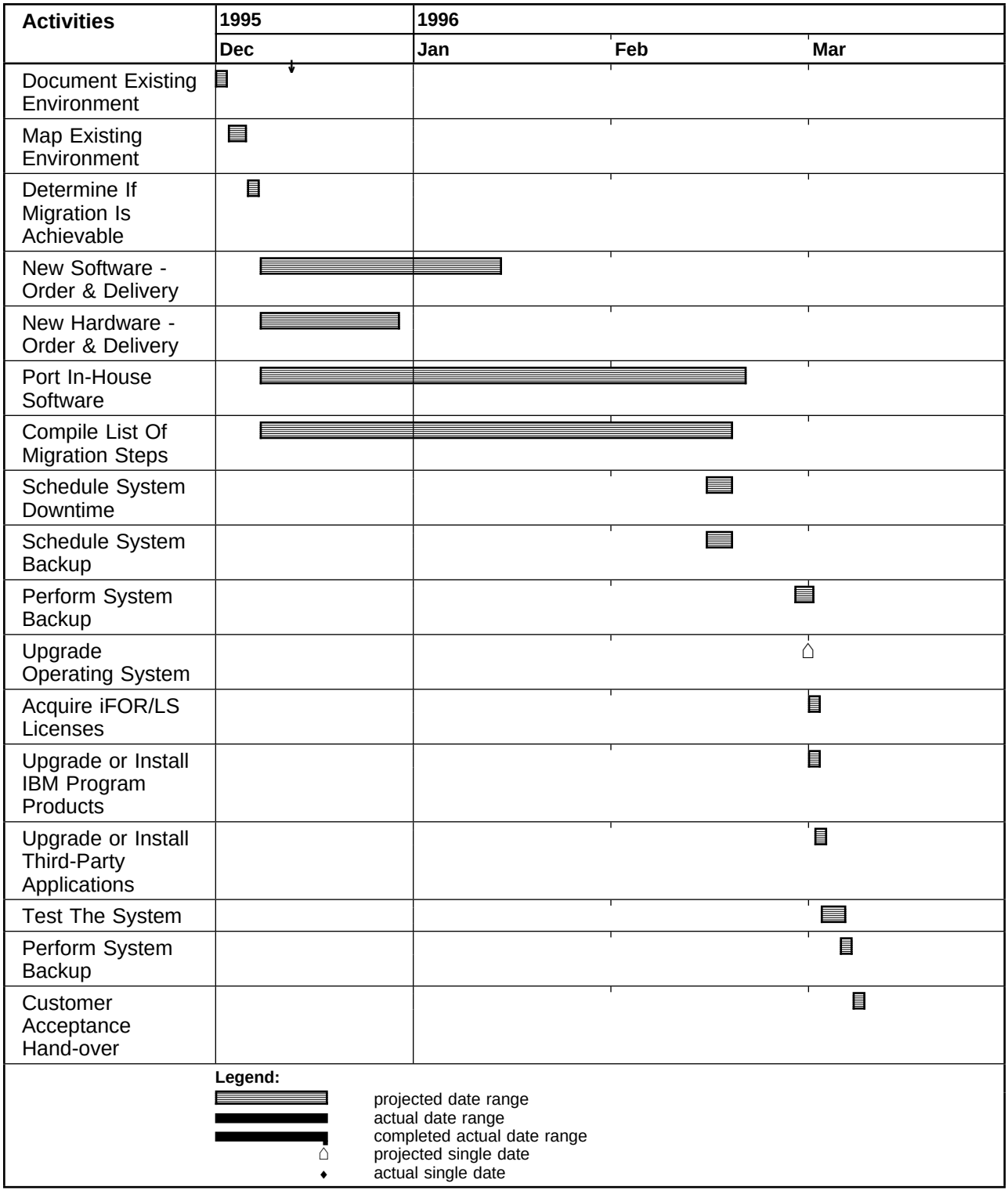

Figure 10. Example of a Typical Migration Planning Schedule

Chapter 3. Software Migration Issues

This chapter will focus on the major software-related issues that you will have to consider while planning your migration. It should be read in conjunction with Chapter 2, “Planning for Migration” on page 9. The installed software can be placed into one of four categories:

1. Base Operating System Software
2. IBM Program Products
3. Third-Party Products
4. In-house Developments

Taking each of the categories in turn, we will try to address the main issues.

3.1 Base Operating System Migration

Migrating the base operating system should be straightforward; however, there are a few items that need to be considered before the migration can take place.

3.1.1 Packaging Differences from AIX V3.2

The items shown in Table 3 were included in AIX V3.2 at no charge and are now unbundled as separately chargable features at AIX V4.1. They are listed with an explanation of the transition that was made for the feature:

Table 3. Unbundled Features

AIX V3.2 Feature	**AIX V4.1 Packaging**
Display Postscript	Chargable program for AIX V4.1
Data Encryption Support (DES)	Chargable program for AIX V4.1
Hypertext Libraries	Chargable program for AIX V4.1
Basic X.25 Support	Chargable program for AIX V4.1
XLC Compiler	Chargable program for AIX V4.1
Debugger	Use of dbx function in the C for AIX program is suggested

The items in Table 4 were separately chargable products or optional, chargeable features of the base operating system in AIX V3.2, but are now included at no charge in AIX V4.1.

Table 4. Newly Bundled Features

AIX V3.2 LPP/Feature	**AIX V4.1 Packaging**
XStation Manager	Included in Server packaging
AIXwindows 2D	Included with V4.1 (installation is optional)
Fiber Distributed Data Interface (FDDI) support	Included with AIX V4.1
Multi-Protocol Adapter (MPA) support	Included with AIX V4.1

The function shown in Table 5 on page 22 was offered as a separately chargable, optional feature of the base operating system under AIX V3, but is a separate product under AIX V4.1.

Table 5. Repackaged Products

AIX V3.2 LPP/Feature	AIX V4.1 Packaging
InfoExplorer License Extension	Chargable program for AIX V4.1

3.1.2 Client and Server Packaging

In AIX V4.1, there are two basic types of packaging, Client and Server. When planning the migration, it is important to understand the difference between the two versions in order to select the package with the necessary functionality. Probably the easiest way to explain the differences is to actually list what is included in each version.

3.1.2.1 AIX Version 4.1 Client Package Contents

- Operating system including JFS and LVM
- Native serial port support
- Mirrored disk support
- NFS/NIS for importing and exporting filesystems
- Network Information Services (NIS) Server Support *(from AIX 4.1.4 onwards)*
- TCP/IP
- DOS utilities
- INed editor
- UDP and UUCP support
- iFOR/LS & iFOR/LS server
- Accounting services
- Base application development tools
- Localization development toolkit
- Base performance tools
- Base terminal function/AT&T termcaps
- Text formatting services
- Local ASCII SMIT/Install Assistant
- InfoExplorer
- Entitled softcopy pubs for clients
- 2D Graphics device support
- AIXwindows 2D with:
  - Runtime and Development environments
  - X11R5
  - MOTIF 1.2.3
  - AIX CDE 1.0 (default) and AIXwindows Desktops
  - Graphical Install Assistant
  - Visual System Management (VSM)
- Base Services of DCE and DFS
  - DCE Client Configuration Runtime
  - DCE Client Security Runtime
  - DCE Client Cell Directory Services Runtime
  - DCE Client Time Services Runtime
  - DCE Client RPC Runtime
  - DCE Client Time Zone Runtime
  - DCE Client Administration Runtime
  - DCE Distributed File System (DFS) Base Services

The client package is limited to two concurrent users.

3.1.2.2 AIX Version 4.1 Server Package Contents

The Server package contains everything included in the Client version plus these additional functions:

- Support for greater than two concurrent AIX users
- NIM Server Support (Diskless/Dataless Clients, Network Install)
- AIX V3.2 Network Installation Compatibility Tools
- XStation Manager Runtime Environment
- Disk Quota Management
- Adapters Guide Softcopy Publications
- Assembler Reference & Technical Reference Softcopy Publications
- AIX DOS Server for use with AIX Access for DOS Users
- Portmaster Adapter/A Device Support
- Serial Linked Disk Adapter/Controller/Disk Device Support
- 16-Port Asynchronous Adapter EIA-422/232 Device Support
- X.25 Co-Processor/2 or Multiport/2 Adapter Device Support
- 128-Port Asynchronous Adapter Device Support

3.2 Mapping IBM Program Products

Although AIX V4.1 has been available since July 1994, the task of migrating and testing the vast range of IBM program products has continued through 1995. Some of the AIX V3.2 program products will still run without modification while others have been re-evaluated and altered to take advantage of the AIX V4.1 enhancements.

The migration tables in this chapter identify most of the program products available on AIX V3.2 systems, along with their replacements at AIX V4.1. If you find that you have an IBM AIX program product that is not included in the tables, please use the feedback form to let us know.

The migration tables are intended to help the migration planner determine the additional software that should be ordered. It should be noted that the status of program products are being updated on a daily basis and as such this information should be used for reference purposes only. Up-to-date information can be obtained from the associated product announcement letters or LPP databases.

Announcement Letters

IBM U.S. announcement letters are available on the World Wide Web. Connect to the IBM World Wide Web home page (http://www.ibm.com/); select Newsfeed, then U.S. Announcement Letters.

In addition, anyone who can receive E-mail from the Internet can subscribe to automatically receive the U.S. Announcement Letters for new or updated products in selected areas of interest. To subscribe to this service, send E-mail to the address announce@webster.ibmlink.ibm.com. In the body of the note, enter the keyword SUBSCRIBE. Leave the Subject line blank. You will receive a category form and further instructions by return E-mail.

Note: You should be aware that the Terms and Conditions under which AIX products are marketed can vary between countries. You should verify details of licensing issues with your local IBM representative or local announcement letters. In addition, it is important to be aware that not all products that are announced in the United States will be announced in all other countries.

IBM employees can get access to LPP Databases on the IBM internal World Wide Web to get up-to-date information about the availability of LPPs at AIX Version 4.1. From the IBM Austin home page (`http://w3.austin.ibm.com`), select Helpdesk, the AIX icon and AIX LPP Listing and Owners. IBM employees can also access some of this information in the ROADMAP file which is part of the AIXVER4 PACKAGE on the MKTTOOLS disk. The information in this book is current to the October 31, 1995 version of this file.

3.2.1 Migration Categories

There are eight categories into which all of the IBM Program Products can be placed when migrating from an AIX V3.2 environment to an AIX V4.1 environment. The categories are as follows:

1 The program product is packaged as part of the AIX Version 4.1 Base Operating System.

2 The program product will run As Is from AIX Version 3.2 product media.

3 The program product will run from AIX Version 3.2 product media when installed with additional program update (PTF).

4 A free upgrade to the same product at a later level is required.

5 A chargable upgrade to a new product number is required.

6 A free upgrade to a new product number is required.

7 The order of a new product is necessary.

8 A refresh of the software needs to be ordered.

Note: In this instance, the word *upgrade* refers to the pricing structure and does not necessarily correspond to the technical migration action.

In addition to the above listed categories for each program product, you will find an indication of its suitability for the RS/6000 Symmetric MultiProcessor (SMP) models G30, J30 and R30.

U The program product is uniprocessor-safe (it is not supported on an SMP system).

S The program product is SMP-safe (it will run both on a UP or SMP system).

The SMP information also appears under the category heading. If there is no corresponding SMP information in the table, the information was not available when this document was created.

3.2.2 Migration Tables

The following tables categorize the IBM Program Products and identify the AIX Version 4.1 equivalents:

- OPP/LPP Mapping - Graphics, Multimedia and User Interface Products
  Table 6 on page 27
- OPP/LPP Mapping - Emulation Products
  Table 7 on page 28
- OPP/LPP Mapping - Compilers and Runtime Environments
  Table 8 on page 29
- OPP/LPP Mapping - Development Toolkits and Libraries
  Table 9 on page 30
- OPP/LPP Mapping - Object Toolkits and Libraries
  Table 10 on page 32
- OPP/LPP Mapping - Computer-Aided Software Engineering
  Table 11 on page 33
- OPP/LPP Mapping - Backup and Availability
  Table 12 on page 34
- OPP/LPP Mapping - Communications and Drivers
  Table 13 on page 35
- OPP/LPP Mapping - System and Performance Management
  Table 14 on page 38
- OPP/LPP Mapping - Network Management
  Table 15 on page 39
- OPP/LPP Mapping - Transaction Processing and Distributed Computing
  Table 16 on page 45
- OPP/LPP Mapping - Database Products
  Table 17 on page 47
- OPP/LPP Mapping - Scheduling, Load Balancing and Parallel Support
  Table 18 on page 49
- OPP/LPP Mapping - General
  Table 19 on page 50

3.2.3 Withdrawn Products

You will see in the following tables that some software products running on AIX Version 4.1 have been, or are being, withdrawn from marketing. These products will be marked with the letters WDFM after the product name. Usually, the product is replaced by a later version or release; however, in some cases there is no replacement, or a replacement is available from an independent software vendor. Where possible, replacement information is shown in the table rows or notes following the withdrawn products.

In some cases, products have been announced for withdrawal, effective from a future date. In this case, the date is given in a note below the product. If no date is given, the withdrawal is already in effect.

Table 6. OPP/LPP Mapping - Graphics, Multimedia and User Interface Products

Program Number	AIX V3.2 Program Product	Program Number	AIX V4.1 Program Product	Category	License Key Required
5765-195	AIX 5086 Connectivity Enabler/6000 R1.1	5765-560	Connectivity Enabler For AIX 2.1	5,U	-
5601-257	AIXwindows 2D Display Postscript function	5696-904	IBM AIXwindows Display Postscript V1.1	7,S	-
5601-257	AIXwindows 2D	BOS	AIX Version 4.1 (Client and Server)	1,S	-
5601-257	AIXwindows (3D Option)	5696-939	OpenGL And GL 3.2 V4.1	7,U	-
5601-257	AIXwindows (3D option)	5696-907	PEX And PHIGS V4.1 For AIX	7,U	-
5756-027	AIXwindows Interface Composer/6000 (AIC)	5765-400	IBM UIM/X For AIX	5,S	-
5601-386	AIX Computer Graphics Interface Toolkit/6000	-	No Replacement (WDFM)	-	-
5765-005	AIX Graphics File Translator/6000	-	No Replacement (WDFM)	-	-
5765-004	AIX Graphics Plotting System/6000	-	No Replacement (WDFM)	-	-
5765-057	Visualization Data Explorer V1	5765-210	Visualization Data Explorer V2 (WDFM)	5,S	Yes
		5765-586	Visualization Data Explorer V3.1	5,U	Yes
		5765-587	Visualization Data Explorer for SMP V3.1	5,S	Yes
5765-210	Visualization Data Explorer V2	5765-210	Visualization Data Explorer V2 (WDFM)	2,S	Yes
		5765-586	Visualization Data Explorer V3.1	5,U	Yes
		5765-587	Visualization Data Explorer for SMP V3.1	5,S	Yes
5765-586	Visualization Data Explorer V3.1	5765-586	Visualization Data Explorer V3.1	2,U	Yes
		5765-587	Visualization Data Explorer for SMP V3.1	5,S	Yes
5696-709	AIX Ultimedia Services/6000 V1.1, V1.2 and V1.2.1	5696-906	Ultimedia Services for AIX V2.1	6,S	-
Note: The current level of Ultimedia Services for AIX is Version 2.1.3 which was released with AIX Version 4.1.4.					
79G9709	IBM AIX Continuous Speech Series/6000 Developer's Toolkit	79G9709	IBM AIX Continuous Speech Series/6000 Developer's Toolkit	3,S	-
79G9710	IBM AIX Continuous Speech Series/6000 Runtime	79G9710	IBM AIX Continuous Speech Series/6000 Runtime	3,S	-
5601-457	AIX XStation Manager/6000	BOS	AIX Version 4.1 BOS (Server only)	1,S	-

Table 7. OPP/LPP Mapping - Emulation Products

Program Number	AIX V3.2 Program Product	Program Number	AIX V4.1 Program Product	Category	License Key Required
5601-256	AIX 3278/79 Emulation/6000	5765-398	IBM 3270 Host Connection Program For AIX V2.1	7,S	-
5601-260	AIX 3270 HCON V1.3			5,S	-
5765-011	IBM 3270 Emulator for the X Window System (x3270) V1.2.0	5765-011	IBM 3270 Emulator for the X Window System (x3270) V1.2.2	8,S	Yes
5765-011	IBM 3270 Emulator for the X Window System (x3270) V1.2.1			8,S	Yes
5765-011	IBM 3270 Emulator for the X Window System (x3270) V1.2.2			8,S	Yes
Note: x3270 V1.2.2 fix level 1 (or fix level 2) is needed to support AIX V4.1					
5765-249	AIX 5080 Emulation Program/6000	5765-528	IBM Soft5080 for AIX V1.1	6,U	-
5765-509	IBM Soft5080 for AIX			6,U	-
5765-404	WABI for AIX	5765-315	WABI for AIX V2	5,U	-
5601-257	AIXwindows 2D (WABI Option)			5,U	-
5765-315	WABI for AIX V2			2,U	-
5601-263	AIX Personal Computer Simulator/6000	-	No Replacement	-	-

Table 8. OPP/LPP Mapping - Compilers and Runtime Environments

Program Number	AIX V3.2 Program Product	Program Number	AIX V4.1 Program Product	Category	License Key Required
5706-294	AIX Ada Runtime Environment/6000	-	No Replacement (WDFM)	-	-
5706-291	AIX Ada/6000	-	No Replacement (WDFM)	-	-
5765-012	AIX APL2/6000 V1.2	5765-012	AIX APL2/6000 V1.2	3,S	-
BOS	AIX XL C Compiler/6000	5765-423	IBM C For AIX V3	7,S	Yes
Note: The AIX XL C Compiler/6000 was included as standard with the AIX Version 3.2 operating system. Under AIX Version 4.1, the C compiler has been unbundled and must be ordered separately. The latest release of C for AIX is Version 3.1.3, which supports the PowerPC 604 processor.					
5765-186	IBM C Set ++ for AIX/6000 V2	5765-421	IBM C Set ++ V3 For AIX V4.1	5,S	Yes
5765-035	AIX XL C++ Compiler/6000 V1			5,S	Yes
Note: The latest release of C Set ++ for AIX is Version 3.1.3, which supports the PowerPC 604 processor.					
5765-018	AIX XL FORTRAN Compiler/6000 V2.3	5765-176	IBM XL FORTRAN V3 For AIX V3 & V4	5,S	Yes
5765-176	IBM XL FORTRAN V3 For AIX V3 & V4			2,S	Yes
5765-019	AIX XL FORTRAN Runtime Environment/6000 V2	5765-526	IBM XL FORTRAN Runtime Environment for AIX V3.2	6,S	-
5765-526	IBM XL FORTRAN Runtime Environment for AIX V3.2			2,S	-
5601-254	AIX XL Pascal Compiler/6000	5765-245	AIX XL Pascal Compiler/6000 V2	5,S	Yes
5601-251	AIX XL Pascal Runtime Environment/6000			7,S	Yes
5765-245	AIX XL Pascal Compiler/6000 V2			2,S	Yes
5764-057	AIX REXX/6000	5764-057	AIX REXX/6000	2,U	-
Note: AIX REXX/6000 must be ordered as RPQ P04285. This RPQ may not be available in all countries.					
5601-258	AIX VS COBOL Compiler/6000	28H2176 (CD) 33H4408 (8 mm)	COBOL Set for AIX Version 1	7,S	-
5601-259	AIX VS COBOL Runtime Environment/6000	-	No replacement	-	-
Note: COBOL runtime components are included with the COBOL Set for AIX compiler package. Runtime components such as dynamically linked libraries can be distributed with compiled COBOL programs. No separate runtime component is distributed.					

Table 9 (Page 1 of 2). OPP/LPP Mapping - Development Toolkits and Libraries

Program Number	AIX V3.2 Program Product	Program Number	AIX V4.1 Program Product	Category	License Key Required
Note: For parallel toolkits and libraries, see Table 18 on page 49.					
5765-107	AIX CallPath/6000	5765-266	AIX CallPath Server/6000	7,U	-
5765-108	AIX CallPath Toolkit/6000			7,U	-
5765-266	AIX CallPath Server/6000			3,U	-
5601-060	AIX ESSL/6000 Version 1	5765-042	AIX ESSL/6000 V2.2.1	5,U	-
5765-042	AIX ESSL/6000 V2.1			4,U	-
5765-042	AIX ESSL/6000 V2.2.0			4,U	-
5765-042	AIX ESSL/6000 V2.2.1			2,U	-
5601-060	AIX ESSL/6000 Version 1	5765-042	AIX ESSL/6000 V2.2.2	5,U	-
5765-042	AIX ESSL/6000 V2.1			4,U	-
5765-042	AIX ESSL/6000 V2.2.0			4,U	-
5765-042	AIX ESSL/6000 V2.2.1			4,U	-
5765-042	AIX ESSL/6000 V2.2.2			2,U	-
5621-013	AIX OSL/6000 V1.2.0	5621-013	AIX OSL/6000 V1.2.1	8,U	
5621-013	AIX OSL/6000 V1.2.1			2,U	
BOS	Info Explorer Manuals	5696-919	IBM Hypertext Information Base Libraries V1.1	7	-
5696-108	IBM AIX Infocrafter/6000	5696-108	IBM AIX Infocrafter/6000	2,U	-
		5696-893	IBM Infocrafter V2.1 For AIX	6,U	-
OPP	InfoExplorer License Extension Option	5696-898	IBM AIX InfoExplorer License Extension V1.1	7,S	-
5758-SM3	ezBRIDGE Transact on AIX/6000 for IBM MQSeries	5765-115	MQSeries for AIX V2.1 (WDFM)	5,U	-
		27H8436 (CD) 27H8430 (8 mm)	MQSeries for AIX V2.2	7,U	-

Table 9 (Page 2 of 2). OPP/LPP Mapping - Development Toolkits and Libraries

Program Number	AIX V3.2 Program Product	Program Number	AIX V4.1 Program Product	Category	License Key Required
5765-115	MQSeries for AIX V2.1	5765-115	MQSeries for AIX V2.1 (WDFM)	2,U	-
		27H8436 (CD) 27H8430 (8 mm)	MQSeries for AIX V2.2	7,U	-
27H8436 (CD) 27H8430 (8 mm)	MQSeries for AIX V2.2	27H8436 (CD) 27H8430 (8 mm)	MQSeries for AIX V2.2	2,U	-

Note: MQSeries is not compatible with AIX Version 4.1 threads, however it can be run unthreaded. MQ Series V2.1 and V2.2 provide identical functions, however V2.2 has some additional PTFs applied. The release number was changed as part of a move to a new ordering process. The equivalent of V2.2 can be obtained by applying the latest PTFs to V2.1.

Table 10. OPP/LPP Mapping - Object Toolkits and Libraries

Program Number	AIX V3.2 Program Product	Program Number	AIX V4.1 Program Product	Category	License Key Required
96F8648	SOMobjects Developers Toolkit for AIX/6000 V2.0	10H9780	SOMobjects Developer Toolkit V2.1 for AIX, OS/2 and Windows	5,S	-
96F8649	SOMobjects Publications			7,S	-
10H9767	SOMobjects Developer Toolkit V2.1 for AIX, OS/2 and Windows	10H9767	SOMobjects Developer Toolkit V2.1 for AIX, OS/2 and Windows	2,S	-
96F8676	SOMobjects Workgroup Runtimes for AIX/6000 V2.0	10H9784	SOMobjects Workgroup Enabler V2.1 for AIX, OS/2 and Windows	5,S	-
96F8674	SOMobjects Workstation Runtimes for AIX/6000 V2.0			7,S	-
10H9769	SOMobjects Workgroup Enabler V2.1 for AIX, OS/2 and Windows	10H9769	SOMobjects Workgroup Enabler V2.1 for AIX, OS/2 and Windows	2,S	-

Table 11. OPP/LPP Mapping - Computer-Aided Software Engineering

Program Number	AIX V3.2 Program Product	Program Number	AIX V4.1 Program Product	Category	License Key Required
5696-550	C++ PowerBench V1	5765-421	IBM C Set ++ V3 For AIX V4.1	5,S	Yes
5696-733	C++ PowerBench V2			6,S	Yes
Note: The latest release of C Set ++ for AIX is Version 3.1.3, which supports the PowerPC 604 processor.					
5765-039	IBM AIX CMVC SERVER/6000 V1	5765-207	Configuration Management Version Control/6000 V2	6,U	Yes
5765-069	IBM AIX CMVC Clients V1			5,U	Yes
5765-207	Configuration Management Version Control/6000 V2			2,U	Yes
Note: CMVC V2 currently only supports DB2 V1 at AIX V4.1					
5696-761	COBOL PowerBench V1	31H6368 (CD) 31H6516 (8 mm)	IBM COBOL Set for AIX V1	5,S	-
5696-551	FORTRAN Powerbench V1	5765-176	IBM XL FORTRAN V3 For AIX V3 & V4	6,S	Yes
Note: The CASE features are now included with the FORTRAN compiler.					
5696-037	IBM AIX SDE Workbench/6000 Version 1	-	No Replacement	-	-
5696-524	IBM AIX SDE Workbench/6000 Version 2			-	-
5696-137	IBM AIX SDE Integrator/6000 Version 1	-	No Replacement	-	-
5696-523	IBM AIX SDE Integrator/6000 Version 2			-	-

Table 12. OPP/LPP Mapping - Backup and Availability

Program Number	AIX V3.2 Program Product	Program Number	AIX V4.1 Program Product	Category	License Key Required
5765-203	ADSM/6000 V 1.2.0	5765-203	ADSM/6000 V 1.2.0 (WDFM)	3,S	-
		5765-564	ADSM/6000 V2.1	6,S	-
5697-078	ADSM/6000 V 1.2.1	5697-078	ADSM/6000 V 1.2.1 (WDFM)	2,S	-
		5765-564	ADSM/6000 V2.1	6,S	-
5765-564	ADSM/6000 V2.1	5765-564	ADSM/6000 V2.1	2,S	-
Note: ADSM/6000 V1.2.0 cannot be loaded onto AIX V4.1 from AIX V3.2 product media, however it will continue to work at AIX V4.1 after a migration installation if the required PTF is installed. ADSM/6000 V1.2.1 will be withdrawn from marketing, effective December 29, 1995. ADSM is also available as SystemView for AIX feature code 5614.					
5696-708	AIX File Storage Facility/6000 (FSF) V1	-	No Replacement	-	-
5765-111	HACMP/6000 V1.2	5696-933	HACMP V4.1 For AIX	5,S	-
5765-257	HACMP/6000 V2.1			5,S	-
5696-923	HACMP/6000 V3.1			5,S	-
5765-190	Legato NetWorker for RISC System/6000	5765-316	Legato NetWorker for RISC System/6000 V4	5, S	-
5765-316	Legato NetWorker for RISC System/6000 V4			2, S	-
5697-032	Optical Library Manager For IBM 3995	-	No Replacement	-	-
5696-398	UniTree For AIX/6000	-	No Replacement (WDFM)	-	-

Table 13 (Page 1 of 3). OPP/LPP Mapping - Communications and Drivers

Program Number	AIX V3.2 Program Product	Program Number	AIX V4.1 Program Product	Category	License Key Required
5765-268	AIX Async Terminal Server-Accelerator/6000 For Ethernet	-	Support planned for 2Q96	-	-
5621-051	AIX AS/400 Connection Program/6000 V1	5798-RZB	IBM Connection Program/400 for UNIX Environments V3.6	5	-
5765-173	AIX AS/400 Connection Program/6000 V2			6	-
5798-RZB	IBM Connection Program/400 for UNIX Environments V3			3	-
5798-RZB	IBM Connection Program/400 for UNIX Environments V3.6			2	-
Note: The IBM Connection Program/400 for UNIX Environments is an AS/400 product, not an RS/6000 LPP. V1 and V2 products were RS/6000 LPPs.					
OPP	Block Multiplexer (BMUX) Channel Connectivity Option	5697-037	IBM Block Multiplexer Channel Adapter For AIX V1 (WDFM)	5,U	-
		5765-604	Block Multiplexer Channel Connectivity for AIX V1.1	5,S	-
Note: The Block Multiplexer Channel Adapter LPP (5697-037) supports only TCP/IP protocols on the BMUX adapter. Block Multiplexer Channel Connectivity for AIX V1.1 (5765-604) supports both TCP/IP and SNA protocols and includes SMP support. Customers can upgrade from Block Multiplexer Channel Adapter to Block Multiplexer Channel Connectivity at no charge. The Block Multiplexer Channel Adapter LPP (5697-037) will be withdrawn from marketing, effective from December 12, 1995.					
OPP	ESCON Connectivity Option	5765-603	ESCON Channel Connectivity for AIX V1.1	5,S	-
5648-129	Client Input Output/Sockets V2	-	Support planned for 4Q95 as MVS offering	-	-
5696-658	AIX HIPPI Driver Group/6000	5765-551	AIX HIPPI Driver Group/6000	5,U	-
5697-024	LAN Server for AIX V1.1	BOS	AIX Connections Additionally charged feature - see 1.4, “PC Network Connectivity” on page 5	1	-
5765-449	MERVA for AIX V1	-	Support planned for 4Q95 (V1.1.1)	-	-
5765-382	IBM AIX NetBIOS And IPX Support/6000	5765-550	IBM NetBIOS And IPX/SPX V2.1	5,S	-
		BOS	AIX Connections Additionally charged feature - see 1.4, “PC Network Connectivity” on page 5	1	-

Table 13 (Page 2 of 3). OPP/LPP Mapping - Communications and Drivers

Program Number	AIX V3.2 Program Product	Program Number	AIX V4.1 Program Product	Category	License Key Required
24H3660	NetSP Secured Network Gateway	33H4322	Internet Connection Secured Network Gateway	5	-
Note: At present, the Internet Connection Secured Network Gateway product runs only on AIX Version 3.2.5 and Version 4.1.3. It does not support AIX Version 4.1.4. If you order your AIX Version 4.1 software through normal channels, you will receive Version 4.1.4. PRPQ P91154 allows you to order AIX Version 4.1.3 specifically, however this PRPQ may not be announced in all countries.					
5696-236	Netware for AIX/6000 V3.11B	5697-021	IBM Netware V3.11B	5,S	-
		BOS	AIX Connections Additionally charged feature - see 1.4, “PC Network Connectivity” on page 5	1	-
5696-385	AIX OSI Services/6000 (OSI/6000) V1	MH-88AIX	Open Systems Standard Communications (OSSC)	7	-
5765-085	Open Systems Interconnect/6000 (OSIMF)			7	-
Note: OSSC is a family of OSI networking products jointly developed by IBM Government Industry/Houston and Retix/Telegenics. OSSC is ordered directly from Retix/Telegenics. For more information, see the WWW page `http://www.clearlake.ibm.com/ossc/ossc.html`.					
5696-038	Realtime Interface Co-processor AIX Support	-	See 4.5, “Recently Supported Devices” on page 59	-	-
5765-419	Desktop SNA for AIX V1.1	5765-582	SNA Server 3.1	5,S	Yes
5696-943	SNA Application Access for AIX V1.1	-	Support planned for 2Q96	-	-
5696-944	SNA Client Access for AIX V1.1	5696-944	SNA Client Access for AIX V1.1	2	-
5601-287	IBM AIX System Network Architecture (SNA) Services/6000 V1	5765-247	SNA Server/6000 V2.2 (WDFM)	5,U	-
		5765-582	SNA Server V3.1	5,S	Yes
5765-247	SNA Server/6000 V2.1	5765-247	SNA Server/6000 V2.2 (WDFM)	4,U	-
		5765-582	SNA Server V3.1	5,S	Yes
5765-261	SNA Gateway/6000 V2.1	5765-261	SNA Gateway/6000 V2.2 (WDFM)	4,U	-
		5765-582	SNA Server V3.1	5,S	Yes
Note: SNA Server V3.1 includes the Gateway functions that were a separate product in SNA Version 2. Upgrade pricing is also available from SNA Server V2.2 and SNA Gateway V2.2 running on AIX Version 4.1 to SNA Server V3.1. The SNA Server V2.2 and SNA Gateway V2.2 products will be withdrawn from marketing, effective December 29, 1995.					
5765-233	AIX SNA Manager/6000 V1.1	-	No replacement	-	-

Table 13 (Page 3 of 3). OPP/LPP Mapping - Communications and Drivers

Program Number	AIX V3.2 Program Product	Program Number	AIX V4.1 Program Product	Category	License Key Required
BOS	AIX X.25	5696-926	AIXlink/X.25 V1.1	7,S	-
5696-868	IBM AIX X.25 V1.1			5,S or 6,S	-
5696-383	AIX Access For DOS Users V3.1	5696-383	AIX Access For DOS Users V3.1 (WDFM)	2	-
5696-383	AIX Access For DOS Users V3.2	5696-383	AIX Access For DOS Users V3.2 (WDFM)	2	-

Note: The AIX Access for DOS Users products were based on Locus Computing Corporation's PC Interface product. Locus Computing Corporation can be reached at:

Locus Computing Corporation
9800 La Cienega Boulevard
Ingelwood, CA 90301
1-310-670-6500
http://www.locus.com/

Table 14. OPP/LPP Mapping - System and Performance Management

Program Number	AIX V3.2 Program Product	Program Number	AIX V4.1 Program Product	Category	License Key Required
5696-735	IBM AIX Distributed SMIT/6000 V1.1	5696-902	Distributed SMIT (DSMIT) V2.2 For AIX	6,S	-
Note: DSMIT is also available SystemView for AIX feature code 5615.					
5696-624	AIX Performance Aide/6000 V1.1	5696-899	IBM Performance Aide V2.1 For AIX	5,S	-
5696-624	AIX Performance Aide/6000 V1.2			5,S	-
5696-623	AIX Performance Toolbox/6000 V1.1	5696-900	IBM Performance Toolbox V2.1 For AIX	5,S	-
5696-623	AIX Performance Toolbox/6000 V1.2			5,S	-
5765-140	Print Services Facility/6000 V1.1	5765-505	Print Services Facility for AIX V2.1	5,S	-
5765-140	Print Services Facility/6000 V1.2			5,S	-
5765-505	Print Services Facility for AIX V2.1			2,S	-
Note: 370 Channel card device driver support not yet available at AIX V4.1 Print Services Facility is also available as SystemView for AIX feature codes 5618 and 5619.					
5765-273	IBM Printing Systems Manager for AIX V1.1	-	No replacement	-	-
5765-456	IBM Printing Systems Manager Graphical User Interface for AIX V1.1	-	No replacement	-	-
5696-465	Network License System (NetLS) Toolkit	5696-465	Network License System (NetLS) Toolkit	2,U	-
5621-027	Resource License Manager/6000 (RLM)	BOS	AIX Version 4.1 BOS NetLS (iFOR/LS)	1,S	-

Table 15 (Page 1 of 6). OPP/LPP Mapping - Network Management

Program Number	AIX V3.2 Program Product	Program Number	AIX V4.1 Program Product	Category	License Key Required
80G3078 (8 mm) 80G3079 (1/4 in)	ATM Campus Manager for AIX V1	80G3078 (8 mm) 80G3079 (1/4 inch)	ATM Campus Manager for AIX V1	2	-
		31H7098 (8 mm) 31H7099 (1/4 inch)	Nways Campus Manager ATM for AIX V1	5	-
		33H8457 (8 mm) 33H8458 (1/4 inch)	Nways Campus Manager Suite for AIX V1	5	-
Note: ATM Campus Manager is also available as SystemView for AIX feature code 5613.					
5765-343	AIX Router and Bridge Manager/6000 V1	31H7089 (8 mm) 31H7090 (1/4 inch)	Nways Campus Manager LAN for AIX V1	5	-
		33H8448 (8 mm) 33H8449 (1/4 inch)	Nways Campus Manager Suite for AIX V1	5	-
Note: Router and Bridge Manager is also available as SystemView for AIX feature code 5611.					
31H7060 (8 mm) 31H7061 (1/4 inch)	Nways Campus Manager LAN for AIX V1	31H7060 (8 mm) 31H7061 (1/4 inch)	Nways Campus Manager LAN for AIX V1	2	-
31H7063 (8 mm) 31H7064 (1/4 inch)	Nways Campus Manager ATM for AIX V1	31H7063 (8 mm) 31H7064 (1/4 inch)	Nways Campus Manager ATM for AIX V1	2	-

Table 15 (Page 2 of 6). OPP/LPP Mapping - Network Management

Program Number	AIX V3.2 Program Product	Program Number	AIX V4.1 Program Product	Category	License Key Required
33H8430 (8 mm) 33H8431 (1/4 inch)	Nways Campus Manager Suite for AIX V1	33H8430 (8 mm) 33H8431 (1/4 inch)	Nways Campus Manager Suite for AIX V1	2	-
5765-292	AIX RMONitor/6000 V1	5765-292	AIX RMONitor/6000 V1.1.2	8,U	-
		33H8395 (8 mm) 33H8393 (1/4 inch)	Nways LAN ReMon AIX	5,S	-
		33H8396 (8 mm) 33H8394 (1/4 inch)	Nways LAN ReMon Advance AIX	5,S	-
Note: RMONitor is also available as SystemView for AIX feature code 5629.					
33H8382 (8 mm) 33H8381 (1/4 inch)	Nways LAN ReMon AIX	33H8382 (8 mm) 33H8381 (1/4 inch)	Nways LAN ReMon AIX	2,S	-
		33H8398 (8 mm) 33H8397 (1/4 inch)	Nways LAN ReMon Advance AIX	5,S	-
33H8384 (8 mm) 33H8383 (1/4 inch)	Nways LAN ReMon Advance AIX	33H8384 (8 mm) 33H8383 (1/4 inch)	Nways LAN ReMon Advance AIX	2,S	-
5765-264	AIX LAN Management Utilities/6000 V1.1	5765-264	AIX LAN Management Utilities/6000 V1.1.3	8	-
Note: LAN Management Utilities are also available as SystemView for AIX feature code 5605.					
5765-251	LAN Network Manager for AIX	5765-527	SystemView - LAN Network Manager feature code 5607	6	-

Table 15 (Page 3 of 6). OPP/LPP Mapping - Network Management

Program Number	AIX V3.2 Program Product	Program Number	AIX V4.1 Program Product	Category	License Key Required
5621-107	AIX NetView Service Point V1	5621-107	AIX NetView Service Point V1.2.2	3,U	-
Note: Netview Service Point Version 1.2.2 is required to support AIX V4.1. PTF U439055 should be installed by those users that are using the MDS LU 6.2 transport.					
5765-214	AIX NetView Distribution Management Agent/6000 V1	5765-214	AIX NetView Distribution Management Agent/6000 V1	8,3,S	-
Note: NetView DMA/6000 at level 1.0.2 will run on AIX V4.1, however a refresh of the software may be needed to obtain this level. The following PTFs should also be ordered: U436929 (AIX V4.1 - Motif 1.2 support) and U438390. To run the GUI over Motif 1.2, AIXwindows PTFs U424846, U435138 and any other prerequisites must be installed.					
5765-196	AIX NetView Distribution Manager/6000 V1.2	5765-196	AIX NetView Distribution Manager/6000 V1.2	3,S	-
Note: AIX V4.1 support needs PTF U436928 (server) and U436929 (agent). To run the GUI over Motif 1.2, AIXwindows PTFs U424846, U435138 and any other prerequisites must be installed. NetView Distribution Manager is also available as SystemView for AIX feature code 5624.					
5765-221	AIX NetView Host Command and Distribution Facility/6000		No replacement	-	-
Note: Some of the features of AIX NetView Host Command and Distribution Facility are performed by NetView Distribution Manager.					
5696-464	AIX Netview/6000 Entry	5696-905	NetView Entry for AIX V3	5,U	-
		5765-527	SystemView - NetView V4.1 for AIX feature code 5608	6,U	-
5696-905	NetView Entry for AIX V3	5696-905	NetView Entry for AIX V3	3,U or 8,U	-
		5765-527	SystemView - NetView V4.1 for AIX feature code 5608	6,U	-
Note: Netview Entry V3 will work on AIX V4.1 if U437267 is installed before upgrading. A software refresh is necessary if installation at AIX V4.1 is required.					
5765-077	AIX Netview/6000 V1	5696-731	NetView for AIX V3	5	-
		5765-527	SystemView - NetView V3.1 for AIX feature code 5601	5 or 6	-
		5765-527	SystemView - NetView V4.1 for AIX feature code 5608	5 or 6	-

Table 15 (Page 4 of 6). OPP/LPP Mapping - Network Management

Program Number	AIX V3.2 Program Product	Program Number	AIX V4.1 Program Product	Category	License Key Required
5696-362	AIX SystemView NetView/6000 V2	5696-731	NetView for AIX V3	5	-
		5765-527	SystemView - NetView V3.1 for AIX feature code 5601	5 or 6	-
		5765-527	SystemView - NetView V4.1 for AIX feature code 5608	5 or 6	-
5696-731	NetView for AIX V3	5696-731	NetView for AIX V3	3 or 8	-
		5765-527	SystemView - NetView V3.1 for AIX feature code 5601	5 or 6	-
		5765-527	SystemView - NetView V4.1 for AIX feature code 5608	5 or 6	-
5765-527	SystemView - NetView V3.1 for AIX feature code 5601	5765-527	SystemView - NetView V3.1 for AIX feature code 5601	2	-
		5765-527	SystemView - NetView V4.1 for AIX feature code 5608	5 or 6	-
Note: NetView V3.1 and NetView V4.1 features of SystemView are both different feature codes of the same product. In this case, the upgrade is be from one feature code to the other.					
5765-527	SystemView - NetView V4.1 for AIX feature code 5608	5765-527	SystemView - NetView V4.1 for AIX feature code 5608	2	-
Note: NetView for AIX V3 will work at AIX V4.1 if U438007 and U438561 are installed before upgrading. A software refresh and U438561 are required if installation at AIX V4.1 is required.					
Note: IBM US has announced a promotion allowing a free upgrade from earlier Netview versions to SystemView NetView features with the purchase of other SystemView features, or a discount on the upgrade without the purchase of other SystemView features. For details see US announcement letter 395-121. In other countries, contact your local representative to determine if the same promotion applies.					

Table 15 (Page 5 of 6). OPP/LPP Mapping - Network Management

Program Number	AIX V3.2 Program Product	Program Number	AIX V4.1 Program Product	Category	License Key Required
Various	IBM AIX NetView Hub Management Program/6000 (IHMP/6000) Entry V1	80G3052 (8 mm) 80G3053 (1/4 inch)	IBM Intelligent Hub Manager for AIX Entry Version 2	5	-
		80G3050 (8 mm) 80G3051 (1/4 inch)	IBM Intelligent Hub Manager for AIX Version 2	5	-
Various	IBM AIX NetView Hub Management Program/6000 (IHMP/6000) V1	80G3050 (8 mm) 80G3051 (1/4 inch)	IBM Intelligent Hub Manager for AIX Version 2	5	-
80G3052 (8 mm) 80G3053 (1/4 inch)	IBM Intelligent Hub Manager for AIX Entry Version 2	80G3052 (8 mm) 80G3053 (1/4 inch)	IBM Intelligent Hub Manager for AIX Entry Version 2	2	-
		80G3050 (8 mm) 80G3051 (1/4 inch)	IBM Intelligent Hub Manager for AIX Version 2	5	-
80G3050 (8 mm) 80G3051 (1/4 inch)	IBM Intelligent Hub Manager for AIX Version 2	80G3050 (8 mm) 80G3051 (1/4 inch)	IBM Intelligent Hub Manager for AIX Version 2	2	-
Note: IHMP Entry is also available as SystemView feature code 5610. IHMP is available as SystemView feature code 5609.					
5622-242	Netview FTP Client V1.1 for AIX	-	No replacement	-	-
5765-435	Netview FTP Server V1.1 for AIX	-	No replacement	-	-
5765-142	Systems Monitor/6000 V1	5765-527	SystemView - Systems Monitor V2.2 feature codes 5632 and 5633	6,U	-
5765-410	Systems Monitor for AIX V2.1			6,U	-

Table 15 (Page 6 of 6). OPP/LPP Mapping - Network Management

Program Number	AIX V3.2 Program Product	Program Number	AIX V4.1 Program Product	Category	License Key Required
-	Trouble Ticket features of Netview	5765-265	AIX Trouble Ticket/6000 V3.2	5	-
5765-265	AIX Trouble Ticket/6000 V3			4	-
5765-265	AIX Trouble Ticket/6000 V3.2			3	-

Note: For AIX V4.1 support of Trouble Ticket, PTF U437812 must be installed before upgrading.

Table 16 (Page 1 of 2). OPP/LPP Mapping - Transaction Processing and Distributed Computing

Program Number	AIX V3.2 Program Product	Program Number	AIX V4.1 Program Product	Category	License Key Required
5765-148	AIX CICS/6000 V1.1	5765-553	CICS for AIX V2.1	5,S	-
5765-148	AIX CICS/6000 V1.1.1			5,S	-
5765-148	AIX CICS/6000 V1.2			5,S	-
5765-152	AIX Client for CICS/6000 V1.1	5765-553	CICS for AIX V2.1	7,S	-
5765-152	AIX Client for CICS/6000 V1.1.1			7,S	-
5765-152	AIX Client for CICS/6000 V1.2			7,S	-
Note: AIX Client for CICS/6000 is now an integrated part of the CICS for AIX Version 2.1 offering.					
5765-427	CICS Systems Manager for AIX V1.1	5765-427	CICS Systems Manager for AIX V1.1	2	-
5765-117	AIX DCE Base Services/6000 V1	BOS	AIX Version 4.1 (Client & Server)	1,S	-
		5765-554	Encina Client for AIX V2.1	7,S	-
		5697-533	Encina Monitor Suite for AIX V2.1	7,S	-
Note: Under AIX Version 3.2 and DCE and Encina Version 1.3, the Encina Base Services (including client functions) were packaged as an optional feature of the DCE Base Services LPP. Under AIX Version 4.1 and DCE and Encina Version 2.1, the DCE Base Services are shipped as part of the Base Operating System. The Encina Base Services are shipped as a new LPP, which is available independently or as part of the Encina Monitor Suite.					
5765-118	AIX DCE Security Server/6000 V1	5765-533	DCE Security Services for AIX V2.1	5,S	-
5765-119	AIX DCE Cell Directory Server/6000 V1	5765-534	DCE Cell Directory Services for AIX V2.1	5,S	-
5765-121	AIX DCE Enhanced Distributed File System/6000 V1	5765-537	DCE Enhanced Distributed File System for AIX V2.1	5,S	-
5765-232	AIX DCE Threads/6000 V1	BOS	AIX Version 4 (Client & Server)	1,S	-
Note: In AIX Version 4.1, threads are an integral part of the base operating system. Note that the AIX 4.1 threads implementation is based on a later revision of the POSIX threads standard than the DCE threads LPP. Thus code written for DCE threads may need to be modified to run under AIX Version 4.1.					
5765-457	DCE NFS to DFS Authenticating Gateway for AIX V1	5765-540	DCE NFS to DFS Authenticating Gateway for AIX V2.1	5,S	-
5765-120	AIX DCE Global Directory Server/6000 V1	-	No replacement	-	-
5765-259	AIX DCE Global Directory Client/6000 V1	-	No replacement	-	-
5765-456	AIX DCE Manager for AIX V1	-	No replacement	-	-

Table 16 (Page 2 of 2). OPP/LPP Mapping - Transaction Processing and Distributed Computing

Program Number	AIX V3.2 Program Product	Program Number	AIX V4.1 Program Product	Category	License Key Required
5696-240	Encina Server for AIX/6000 V1	5765-558	Encina Server for AIX V2.1	5,S	-
		5697-195	Encina Monitor Suite for AIX V2.1	5,S	-
5696-237	Encina Structured File Server for AIX/6000 V1	5765-556	Encina Structured File Server for AIX V2.1	5,S	-
		5697-195	Encina Monitor Suite for AIX V2.1	5,S	-
5696-239	Encina Monitor for AIX/6000 V1	5765-559	Encina Monitor for AIX V2.1	5,S	-
		5697-195	Encina Monitor Suite for AIX V2.1	7,S	-
5765-458	Encina Monitor for AIX/6000 V1.3 (V2)	5765-559	Encina Monitor for AIX V2.1	5,S	-
		5697-195	Encina Monitor Suite for AIX V2.1	7,S	-
Note: In some places, Encina Monitor Version 1.3 was referred to as Version 2. Do not confuse this version of Encina Monitor, running with the other V1.3 Encina products on AIX Version 3.2.5, with the newly announced Encina Monitor V2.1 running on AIX Version 4.1.					
5696-238	Encina Peer-to-Peer Executive for AIX/6000 V1	5765-555	Encina PPC Executive for AIX V2.1	5,S	-
		5697-195	Encina Monitor Suite for AIX V2.1	7,S	-
5696-931	Encina PPC Executive with SyncPoint Level 2 V1	5765-555	Encina PPC Executive for AIX V2.1	5,S	-
		5697-195	Encina Monitor Suite for AIX V2.1	7,S	-
5696-347	Encina Peer-to-Peer Gateway for AIX/6000 V1	5765-557	Encina PPC Gateway for AIX V2.1	5,S	-
5696-930	Encina PPC Gateway with SyncPoint Level 2 V1			5,S	-
5765-482	LAN Distributed Platform/6000 (LANDP) V2	-	No replacement	-	-

Table 17 (Page 1 of 2). OPP/LPP Mapping - Database Products

Program Number	AIX V3.2 Program Product	Program Number	AIX V4.1 Program Product	Category	License Key Required
5765-363	DataPropagator Relational Apply/6000 V1.1	5765-363	DataPropagator Relational Apply/6000 V1.2 (WDFM)	8	-
		33H2003	DB2 Data Replication Starter Kit for UNIX Operating Systems	5	-
5765-363	DataPropagator Relational Apply/6000 V1.2	5765-363	DataPropagator Relational Apply/6000 V1.2 (WDFM)	2	-
		33H2003	DB2 Data Replication Starter Kit for UNIX Operating Systems	5	-
Note: All DB2 for AIX Version 1.2 products will be withdrawn from marketing, effective December 17, 1995.					
33H1960 (CD) 33H1962 (8 mm)	DB2 Data Replication Starter Kit for UNIX Operating Systems	33H1960 (CD) 33H1962 (8 mm)	DB2 Data Replication Starter Kit for UNIX Operating Systems	2	-
5765-218	DB2 Client Application Enabler/6000 V1.1	5765-218	DB2 Client Application Enabler/6000 V1.1	2	-
		-	DB2 Client Application Enabler/6000 V2.1	7, S	Yes
-	DB2 Client Application Enabler/6000 V2.1	-	DB2 Client Application Enabler/6000 V2.1	2, S	Yes
Note: Version 2.1 of Client Application Enabler will be shipped at no charge with DB2 for AIX V2.1 Server or DB2 DDCS for AIX V2.3 Multi-User Gateway.					
5765-205	DB2 Client Support/6000 V1.1	5765-205	DB2 Client Support/6000 V1.1 (WDFM)	3	-
		-	DB2 Client Support V2.1	7,S	Yes
5765-466	DB2 Client Support V1.2	5765-466	DB2 Client Support V1.2 (WDFM)	2	-
		-	DB2 Client Support V2.1	7,S	Yes
5765-460	DB2 Client Support/6000 V1.2 - SNA Feature	5765-460	DB2 Client Support/6000 V1.2 - SNA Feature (WDFM)	2	-
		-	DB2 Client Support V2.1 - SNA Feature	7,S	Yes
-	DB2 Client Support V2.1	-	DB2 Client Support V2.1	2,S	Yes
Note: 5765-205 (DB2 Client Support/6000 V1.1) could also be replaced by both 5765-466 (DB2 Client Support/6000 V1.2) and 5765-460 (DB2 Client Support/6000 V1.2 - SNA Feature), however these products will be withdrawn on December 27, 1995. With DB2 for AIX V2.1, the Client Support functions are included with DB2 for AIX V2.1 Server or DB2 DDCS for AIX V2.3 Multi-User Gateway.					

Table 17 (Page 2 of 2). OPP/LPP Mapping - Database Products

Program Number	AIX V3.2 Program Product	Program Number	AIX V4.1 Program Product	Category	License Key Required
5765-248	DB2 Software Developer's Kit/6000 V1.1	5765-248	DB2 Software Developer's Kit/6000 V1.1 (WDFM)	3	-
		41H2138	DB2 Software Developer's Kit for AIX V 2.1	5,S	Yes
5765-459	DB2 Software Developer's Kit/6000 V1.2	5765-459	DB2 Software Developer's Kit/6000 V1.2 (WDFM)	2	-
		41H2138	DB2 Software Developer's Kit for AIX V 2.1	5,S	Yes
41H2138	DB2 Software Developer's Kit for AIX V 2.1	41H2138	DB2 Software Developer's Kit for AIX V 2.1	2,S	Yes
Note: 5765-248 (DB2 Software Developer's Kit/6000 V1.1) could also be replaced by 5765-459 (DB2 Software Developer's Kit/6000 V1.2) however this product will be withdrawn from marketing effective December 27, 1995.					
5765-172	DB2/6000 V1.1	5765-172	DB2/6000 V1.1 (WDFM)	3	-
		41H2127	DB2 for AIX V2.1 Single-User	5, S	Yes
		41H2128	DB2 for AIX V2.1 Server	5, S	Yes
5765-464	DB2/6000 V1.2	5765-464	DB2/6000 V1.2 (WDFM)	2	-
		41H2127	DB2 for AIX V2.1 Single-User	5, S	Yes
		41H2128	DB2 for AIX V2.1 Server	5, S	Yes
41H2127	DB2 for AIX V2.1 Single-User	41H2127	DB2 for AIX V2.1 Single-User	2,S	Yes
41H2128	DB2 for AIX V2.1 Server	41H2128	DB2 for AIX V2.1 Server	2,S	Yes
Note: DB2 for AIX V1.1 will run at AIX V4.1 if ordered (or refreshed) after July 1994. Alternatively, service pack U430989 should be ordered if not upgrading to V2.1. 5765-172 (DB2/6000 V1.1) could also have been replaced by 5765-464 (DB2/6000 V1.2), however this product will be withdrawn from marketing effective December 27, 1995.					
5765-197	DDCS/6000 V1.1	41H2133	DDCS for AIX V2.3 Multi-User Gateway	5,S	Yes
5765-465	DDCS/6000 V1.2	5765-465	DDCS/6000 V1.2 (WDFM)	2	-
		41H2133	DDCS for AIX V2.3 Multi-User Gateway	5,S	Yes
41H2133	DDCS for AIX V2.3 Multi-User Gateway	41H2133	DDCS for AIX V2.3 Multi-User Gateway	2,S	Yes
5696-937	ICL Search Accelerator for AIX	-	No replacement	-	
5765-326	Query for AIX/6000 (Visualizer Query V1.1)	5765-326	Query for AIX/6000 (Visualizer Query V1.1)	2, U	Yes
		33H2655	Visualizer Query for AIX V1.2.1	6, U	Yes
33H2635	Visualizer Query for AIX V1.2.1	33H2635	Visualizer Query for AIX V1.2.1	2, U	Yes

Table 18. OPP/LPP Mapping - Scheduling, Load Balancing and Parallel Support

Program Number	AIX V3.2 Program Product	Program Number	AIX V4.1 Program Product	Category	License Key Required
5765-381	Job Scheduler for AIX	-	Support planned for 4Q95	-	-
5765-145	LoadLeveler V1.2	5765-145	LoadLeveler V1.2.1	8,U	-
5765-144	AIX Parallel Environment V1.1	5765-543	Parallel Environment for AIX V2.1	5,U	-
5765-144	AIX Parallel Environment V1.2			5,U	-
5765-297	AIX Parallel I/O File System V1.1	5765-297	AIX Parallel I/O File System V1.1	2,U	Yes
5765-392	AIX Parallel OSL (OSLp) V1.1.0	5765-392	AIX Parallel OSL (OSLp) V1.1.1	8,U	Yes
5765-296	Parallel System Support Products V1.1	5765-529	Parallel System Support Products V2.1	5,U	-
5765-296	Parallel System Support Products V1.2			5,U	-
5765-529	Parallel System Support Products V2.1			2,U	-
5765-469	Parallel Visual Explorer (PVE) for AIX	5765-469	Parallel Visual Explorer (PVE) for AIX	2,U	-
5765-246	PVMe for AIX V1.1	5765-544	PVMe for AIX V2.1	5,U	-
5765-246	PVMe for AIX V1.2			5,U	-
5765-246	PVMe for AIX V1.3			5,U	-
5765-444	Recoverable Virtual Shared Disk V1.1	5765-444	Recoverable Virtual Shared Disk V1.1.1	8,U	-

Table 19. OPP/LPP Mapping - General

Program Number	AIX V3.2 Program Product	Program Number	AIX V4.1 Program Product	Category	License Key Required
5765-001	AIX DirectTalk/6000	-	No replacement	-	-
5765-086	BookManager Read/6000 V1.2	5765-086	BookManager Read/6000 V1.2	2	-
Note: BookManager Read/6000 V1.2 will work at AIX V4.1 if the fileset X11.compat.lib.Motif114 (included with Base Operating System) is installed.					
5765-270	FlowMark for AIX V1	5765-270	FlowMark for AIX V1	2,U	-
		10H0891	FlowMark for AIX V2	7,U	-
10H0891	FlowMark for AIX V2	10H0891	FlowMark for AIX V2	2,U	-
5765-352	OpenMail for AIX VB.01	5765-352	OpenMail for AIX VB.02 (WDFM)	4,U	Yes
5765-352	OpenMail for AIX VB.02			2,U	Yes
Note: OpenMail for AIX Version B.02 is supported on AIX Version 4.1, however this product will be withdrawn from marketing effective December 10, 1995. Openmail continues to be available through Hewlett-Packard and several OpenMail resellers.					
5765-319	AIX Time and Place/6000 V1.1	5765-319	AIX Time and Place/6000 V1.1	2,U	-

3.3 Third-Party Software

IBM is working closely with many of its software partners to aid in the migration and testing of their software products. Third-party products are becoming AIX V4.1-certified on a daily basis, and as such, it is difficult to provide an up-to-date list of what is currently available. There are a number of concerns that need to be addressed before the migration can take place:

1. Are the relevant third-party products available at AIX V4.1 ?
2. Do the third-party products depend upon IBM program products, and if so, are they available?
3. What will the migration involve, and how much downtime should be allocated?
4. Will there be a cost associated with the move between software levels ?

The best source of information for each of these questions is the third-party application vendor themselves. IBM holds a limited amount of information about the major applications that have been ported to AIX, and your AIX Support Representative should be able to provide this information on request.

IBM employees can get access to the latest internal IBM version of the certified third-party application list by subscribing to the AIXVER4 package on MKTTOOLS. The information on certified third-party applications appears in the file AIX4ISV. This book is current with the June 23, 1995 version of this file.

3.3.1 Certified 3rd Party Applications

It should be noted that this list of applications is only a snap-shot taken at the time of publication and should not be referenced as the definitive list. IBM has to rely on availability information provided by the third-party application vendors and as such, cannot guarantee that the information provided here is valid.

3.3.1.1 Database

Oracle	Available	v 7.1.4
Informix	Available	v 7.1.0
Sybase	Available	v 10.0.2/SMP
Progress	Available	v6.3F, v7.3
Software AG	Available	ADABAS-C v2.2/Uni
	Available	Entire Network V2.1/Uni
	Available	NATURAL/Uni&SMP
	Available	NATURAL Security/Uni&SMP
Redbrick	Available	v2.1,v3.0
CA/Ingres	Available	OpenIngres/Uni
Object Design	Available	
Information Builders	Available	FOCUS v6.5.1
	Available	EDA/SQL
Information Mgmt Co.	Available	Tuxedo ETP

3.3.1.2 PICK/RDBMS

PICK Systems	Available	Advanced PICK
UniData	Available	UniData RDBMS
VMark	Available	UniVerse

3.3.1.3 Manufacturing

SAP	Available	R/3 - Uni & SMP
Baan	Available	Triton
qad.inc	Available	MFG/PRO
Oracle	Available	v 10.5
Marcam	Available	MXP
SSA	Available	BPCS
Camstar	Available	
Cimlinc	Available	Linkage
FASTech	Available	CELLworks
GE Fanuc	Available	CIMPLICITY
Gensym	Available	G2. Dynamic Scheduling Package
Hilco	Available	MONITROL/US
US Data	Available	FactoryLink
Vertex	Available	BridgeNet

3.3.1.4 MCAD

Dassault France	Available	CATIA/40P only
Dassault US	Available	CADAM 3.6
Autodesk	Available	Release 12
	Available	HOOPS
SDRC	Available	I-DEAS v 2.0
MacNeal Schwendler	Available	NASTRAN v 68.1
StereoCAD	Available	

3.3.1.5 Accounting/Human Resources

SAS	Available	SAS/Uni

3.3.1.6 EDA

Cadence	Available	
Mentor Graphics	Available	
ViewLogic	Available	Powerview 5.3.1

3.3.1.7 GIS

ESRI	Available	ARC/Info

3.3.1.8 Petroleum

Halliburton ES	Available	
AVS	Available	AVS 5.0

3.3.1.9 Securities (Trading)

Reuters (Effix)	Available	ATW
Teknekron	Available	Rendezvous
Micrognosis	Available	MIPS (V3.2.5 Binaries on AIX V4.1)
	Available	Infotrade

3.3.1.10 Health

HBO & Co.	Available	CLINSTAR
EPIC Healthcare	Available	EPICare
	Available	Managed Care
	Available	Cadence
	Available	Resolute
Intersystems	Available	Open M Enterprise C/S
Cerner	Available	PathNet
	Available	RadNet
	Available	MS-Meds

	Available	Open Engine
	Available	Open Clinical Foundation

3.3.1.11 Distribution (Retail)

PDX, Inc	Available	Pharmacy Solution

3.3.1.12 Computational Chemistry

Biosym Tech	Available	Converter
	Available	DMol
	Available	DelPhi
	Available	Discover
	Available	Homology
	Available	Insight II
	Available	NMRchitect
	Available	Polymer
	Available	Small Molecule
	Available	Solid State SW Modeling
	Available	TurboMole
Molecular Simulation	Available	Quanta
	Available	Cerius2
	Available	CHARMm
	Available	XPLOR
Wavefunction	Available	Spartan
Aspen	Available	Aspen Plus

3.3.1.13 Systems Management

Computer Associates	Available	Unicenter
Candle	Available	

3.3.1.14 Office/Productivity

Frame	Available	FrameMaker 4
Interleaf	Available	Interleaf 5.4, 6.0
Lotus	Available	Notes/Uni
		Office
Novell (WordPerfect)	Available	WordPerfect 6.0
		Office
	Available	SoftWindows v1.2
VSystems	Available	VSI-Fax
Geo. Davidson & Son	Available	
Softlinx	Available	Replix

3.3.1.15 Application Development

MicroFocus	Available	COBOL
Taligent	Available	CommonPoint Toolkit Beta
Synon		
Template	Available	SNAP
Franz, Inc	Available	Allegro Common LISP
Neuron Data	Available	Open Interface Elements

3.3.1.16 Multimedia

AimTech	Available	IconAuthor (MM Authoring)
Insoft	Available	Communique! (Video Conferencing)

3.3.1.17 Networking

KI Research	Available	OpenDNA, OpenDNM

3.4 In-House Developments

Although in many cases binary compatibility is preserved between AIX Version 3.2 and Version 4.1, any in-house-written applications must still be tested and certified at the new level and ported, if required.

A few suggestions when moving to AIX V4.1:

- If your applications use complex kernel extensions, you may need to make straightforward modifications to port them to the new kernel environment. You must also make the kernel extension MP safe if you want to run it on an SMP system.
- Look at the contents of the bos.compat and X11.compat packages, and determine if you are relying on commands, links, or libraries that are obsolete. If so, you should remove your dependency on them.
- For help or advice concerning porting your application, we have excellent staff at our AIX porting centers who are backed by the AIX development team.

3.4.1 Shell Scripts

With the erratic way in which UNIX was developed, similar commands evolved using slightly different flags or output conventions on different UNIX versions. As the operating system has matured, the industry has agreed upon standards for operating-system commands and libraries, such as POSIX 1003.2 and XPG4. As these standards have developed, IBM has, where necessary, modified the behavior of AIX to comply with these standards. Most of these changes were made when moving from Version 3.2 to Version 4.1, though more modifications continue as the standards are refined.

In some cases, the changes may affect the operation of some shell scripts written in-house by systems administrators. The following list includes the changed commands that are most likely to cause problems. Details on the actual changes that were made to these commands are available in *A Holistic Approach to AIX V4.1 Migration, Volume 1*, SG24-4652 and *All About AIX Version 4.1*, which can be viewed on the World Wide Web at the URL:

`http://www.austin.ibm.com/developer/aix/library/diff/df4main.html`

IBM staff can also access a LIST3820 and postscript version of this manual by requesting ABOUT4_1 PACKAGE from the MKTTOOLS disk.

Changed commands:

- acctdusg
- admin
- axeb
- awk
- backbyname
- bc
- bsh
- catman
- chuser
- cksum
- cmp
- cp
- cpio
- csh
- ctags
- date
- delta
- df
- diff
- diskusg
- du
- ebxa
- echo
- ed
- expr
- fold
- fsdb
- getconf
- head
- iconv
- istat
- join
- ksh
- ksh built-in commands
  - echo
  - fc
  - jobs
  - trap
  - wait
- lex
- locale
- localedef
- lp
- lsfs
- lsjfs
- man
- more
- nice
- nm
- nohup
- od
- pack
- paste
- pax
- renice
- sed
- sort
- strings
- stty
- tctl
- tee
- touch
- uniq
- wc
- what
- yacc

In AIX Version 3.2, the default shell, /usr/bin/sh, was linked to the Bourne shell /usr/bin/bsh. In AIX Version 4.1, /usr/bin/sh is linked to /usr/bin/ksh. In most cases, this will not cause problems as ksh is mostly a superset of bsh.

3.4.2 Compatibility Filesets

Compatibility filesets are available at AIX V4.1.3 to help simulate the AIX V3.2 environment and make the transition between operating system levels as easy as possible. These filesets will be discontinued at a later date and should be only used as a migration aid. Any time a customer must install a compat fileset, the application may need to be modified to execute on future versions of AIX.

The information provided in Table 20 is a list of AIX Version 4.1 compatibility filesets:

Table 20. Compatibility Filesets

Package Name/Fileset	Description
bos.compat	Base Compatibility Functions
bos.compat.cmds	AIX Version 4.1 Compatibility Commands
bos.compat.imk	Base System Locale AIX Version 3.1 Compatibility Links
bos.compat.lan	LAN COMIO Compatibility Software
bos.compat.libs	AIX Version 3.2 Compatibility Libraries
bos.compat.links	AIX Version 3.2 to AIX Version 4.1 Compatibility Links
bos.compat.msg	AIX Version 3.1 Message Compatibility Links
bos.compat.net	AIX Version 3.2 TCP/IP Compatibility Commands
bos.compat.NetInstl	AIX Version 3.2 Network Installation Tools
bos.compat.termcap	AIX Version 3.2 Termcap Source and Library
bos.compat.termcap.data	AIX Version 3.2 Termcap Source Data
bos.loc.pc_compat	Base System Compatibility Locale PC Code Set
bos.loc.pc_compat.com	Common Locale Support - PC Code Set
bos.loc.pc_compat.fnt	Base System Locale PC Compatibility Fonts
bos.loc.pc_compat[lang]	Base System Locale PC Code Set - [lang]
bos.msg[lang]	Base Messages for [lang]
bos.msg.en_US.compat.cmds	AIX Version 4.1 Compatibility Commands Messages - U.S. English
X11.compat	AIXwindows Compatibility
X11.compat.fnt.pc	AIXwindows PC850 Fonts Compatibility
X11.compat.lib.Motif10	AIXwindows Motif 1.0 Libraries Compatibility
X11.compat.lib.Motif114	AIXwindows Motif 1.1.4 Libraries Compatibility
X11.compat.lib.X11R3	AIXwindows X11R3 Libraries Compatibility
X11.compat.lib.X11R4	AIXwindows X11R4 Libraries Compatibility
X11.compat.samples.util	AIXwindows Sample Utilities Compatibility
X11.x_st_mgr.compat	XStation Manager Compatibility

Chapter 4. Hardware Migration Issues

This chapter will focus on the major hardware issues that you will have to think about while planning your migration. It should be read in conjunction with Chapter 2, “Planning for Migration” on page 9.

4.1 AIX V4.1 System Support

All IBM POWER, POWER2 and PowerPC systems are supported at AIX V4.1 with the exception of:

- RS/6000 Model 730 (old graphics model)
- RS/6000 Model N40 Notebook (new PowerSeries models replace this model)
- 9076 POWERparallel System SP1 (SP2 or RS/6000 SP is supported)

4.2 AIX V4.1 Basic System Requirements

Clients running AIX Version 4.1 for Clients require a minimum of 16 MB of system memory and 128 MB of disk storage to boot, install, and execute without graphics. An additional 72 MB of disk storage is required for graphics client systems.

Servers running AIX Version 4.1 for Servers require a minimum of 16 MB of system memory and 164 MB of disk storage to boot, install and execute without graphics. An additional 72 MB of disk storage is required for graphic server systems.

Note: The above figures refer to a fresh AIX V4.1 install and are not appropriate for a migration installation.

4.3 Unsupported Hardware at AIX V4.1

The following is a list of devices that have no planned support at AIX V4.1 and above. If you currently have one of these devices, a suitable replacement should be identified before migration can take place.

- High Performance 8-Bit 3D Color Graphics Processor
- High Performance 24-Bit 3D Color Graphics Processor
- M-Video Capture Adapter (VCA) - NTSC
- M-Video Capture Adapter (VCA) - PAL
- M-Audio Capture and Playback Adapter (ACPA)
- Speech Accelerator 1 Adapter
- Speech Accelerator 2 Adapter
- Fiber Channel Adapter/266

  Note that IBM has recently announced a new fiber adapter, the Fiber Channel Adapter/1063, which is supported under AIX Version 4.1.4 on specific RS/6000 and RS/6000 SP models.
- Lago Datawheel
- Legato Prestoserve

- ICL Accelerator

4.4 Availability Roadmap for Unsupported Devices

The following devices are not currently supported on AIX Version 4.1. Planned availability dates are based on latest information from the relevant product organizations. The target date information section of this listing is intended for planning purposes only and may change at any time without prior notice. Exact dates will be made available through the normal IBM channels when appropriate.

IBM employees can get access to the latest internal IBM version of the device availability roadmap by subscribing to the AIXVER4 package on MKTTOOLS. The device availability roadmap is contained in the file AIX4DD TERS3820. This document is current to the October 23, 1995 version of this file.

Please note that the hardware devices listed may not be supported on all models.

4.4.1 Communications Adapters

The planned general availability (GA) dates for unsupported IBM communications adapters are listed below:

- Network Terminal Accelerator Adapter

  Planned GA: 2Q96

- Voice Server Adapter

  Planned GA: 4Q95

  This adapter is supported by the DirectTalk LPP.

- Voice Server Dual Adapter

  Planned GA: 4Q95

  This adapter is supported by the DirectTalk LPP.

- System/370 Channel Emulation Adapter

  Planned GA: 2Q96

  The device driver for this adapter is expected to be configured as a hardware feature code.

- System/390 ESCON Channel Emulation Adapter

  Planned GA: 2Q96

  The device driver for this adapter is expected to be configured as a hardware feature code.

4.4.2 External Storage Devices

- 3490-C1A, C2A
  - System/370 Channel Emulation/A Adapter attachment

    Planned GA: 2Q96

    The device driver will be shipped as a hardware feature code.
  - System/390 ESCON Channel Emulation Adapter attachment

    Planned GA: 2Q96

The device driver will be shipped as a hardware feature code.

- 3590-B1A
  - System/370 Channel Emulation/A Adapter attachment

    Planned GA: 2Q96

    The device driver will be shipped as a hardware feature code.
  - System/390 ESCON Channel Emulation Adapter attachment

    Planned GA: 2Q96

    The device driver will be shipped as a hardware feature code.

Note: SCSI attachment of these tape libraries is already supported. The device driver for the tape libraries will be shipped as a hardware feature code.

4.4.3 Communications Devices

The following external communications device support is expected:

- 7318 Network Terminal Server

  Planned GA: 2Q96 (SMP support and Network Terminal Accelerator attachment)

4.5 Recently Supported Devices

Support for the following devices was added to AIX Version 4.1 recently — in most cases with the announcement of AIX Version 4.1.4 on October 10, 1995. If you intend migrating a system that contains some of these devices, you should verify that you have the latest AIX Version. In some cases, support for the device has been announced, but is not yet generally available. These cases are noted below.

4.5.1 Storage Adapters

Support for the following adapter was added to AIX V4.1 with the 4.1.4 modification level.

- SSA 4-port Adapter

  This adapter is now supported in both SMP and UP systems. SMP support of this adapter is only included in the AIX Server packaging.

4.5.2 Communications Adapters

The following communications adapters were also recently added to the list of those adapters supported by AIX Version 4.1.

- 64-port Adapter

  Note that the 64-port adapter is not, and will not be, supported on SMP systems (the 128-port adapter is available and supported). The 64-port adapter has been withdrawn from marketing. Support is provided at this time for existing customers only.

- Fiber Channel Adapter/1063

  This adapter is currently supported on specific 5xx and 9xx UniProcessor systems only. The planned GA date for support on SMP systems is 2Q96.

Note that this is a different card to the one that is supported on AIX V3.2.5 - the Fiber Channel Adapter/266. There are no plans to provide support for the old adapter at AIX Version 4.1. In some countries, an RPQ may be available to allow a customer to upgrade from a Fiber Channel Adapter/266 to a Fiber Channel Adapter/1063.

This card is planned for limited availability on January 19, 1995 and general availability on or before March 29, 1995.

- Turboways 100 Asynchronous Transfer Mode (ATM) Adapter
- Turboways 155 Asynchronous Transfer Mode (ATM) Adapter

  General availability of support for these adapters is December 1, 1995.

- Block MUltipleXer (BMUX) Adapter

  Support for this adapter on SMP systems (G30, J30, J01, R30 and R3U) is now generally available. This support only applies to the SNA protocol - TCP/IP support will be available on December 1, 1995. Under AIX Version 3.2.5, this adapter was supported by a separately chargeable, optional feature of the base operating system. In AIX Version 4.1, BMUX support is provided by a separate LPP— Block MultipleXer Connectivity (5765-604).

- ESCON Control Unit Adapter

  Support for this adapter will be available on December 1, 1995 and will include both SNA and TCP/IP support. Under AIX Version 3.2.5, this adapter was supported by a separately chargeable, optional feature of the base operating system. In AIX Version 4.1, ESCON support is provided by a separate LPP— ESCON Channel Connectivity (5765-603).

- High Performance Parallel Interface Adapter (HiPPI)

  This adapter and the associated LPP HIPPI/6000 are now supported on 5xx and 9xx systems running AIX Version 4.1. Support for SMP systems is expected in 2Q96.

- ARTIC Multi-Protocol Adapters
  - ARTIC960 Multi-Protocol 1 MB Adapter
  - ARTIC960 Multi-Protocol 4 MB Adapter
  - ARTIC960 Multi-Protocol 8 MB Adapter

  The device drivers for these adapters are shipped with the adapter. They are also available through the ARTIC Developer's Assistance Program (see below).

- Portmaster and Multiport Adapters
  - Realtime I/F Co-Processor: Portmaster Adapter/A (1 MB)
  - Realtime I/F Co-Processor: Portmaster Adapter/A (2 MB)
  - Multiport/2 0.5 MB
  - Multiport/2 1.0 MB
  - Multiport/2 EIB 4-Port 232
  - Multiport/2 EIB 6-Port SYNC
  - Multiport/2 EIB 8-Port 232
  - Multiport/2 EIB 8-Port 422

– Multiport/2 EIB 4-232/4-422

In AIX Version 3.2.5, these adapters were supported by the Realtime Interface Co-Processor AIX Support LPP. These device drivers are now available free of charge for AIX V4.1 or V3.2.5 by contacting the ARTIC Developer's Assistance Program:

– `artic@vnet.ibm.com` (from the Internet)
– 1-800-IBM-3333 Extension ARTIC160
– 1-407-443-7948
– 1-800-465-2222 (in Canada)
– Bulletin board access will be available 4Q95 and Internet access in 1Q96.

IBM staff can also access the ARTIC WWW page on the IBM network at the address:

– `http://artic00.bocaraton.ibm.com/`

4.5.3 External Storage Devices

Support for external storage devices has recently been enhanced as follows:

- 7135-110 RAIDiant Array

  Support for this disk subsystem is now generally available. Customers that wish to upgrade an existing 7135-110 to AIX Version 4.1 must obtain and install the latest versions of the controller and drive microcode.

- 3590-B11, B1A

  – SCSI attachment only

    The device driver is shipped as a hardware feature with new orders.

4.5.4 Communications Devices

The following external communications device support has been recently enhanced:

- 7318 Network Terminal Server

  This device is currently supported on UP systems only. Also, connection using the Network Terminal Accelerator (NTA) adapter is not currently supported. Support for SMP systems and NTA attachment are planned for 2Q96.

4.6 SMP Upgrade Issues

There are a number of issues that need to be addressed before upgrading from a uniprocessor machine to one of the multiprocessor models, G30, J30 or R30. It is difficult to cover every possible scenario as each situation will depend on the existing hardware configuration that you are migrating from. When planning the SMP upgrade from an AIX V3.2 machine, each of the sections in the planning for migration chapter are still relevant, but you will have to document your system in more detail.

It is strongly recommended that you use one of the IBM configurators to help plan the UP to SMP upgrade. The configurators will take into account what components can be taken across to the SMP box and which will need to be replaced.

For a full discussion of the issues related to the migration of an SMP system, see *A Holistic Approach to AIX V4.1 Migration, Volume 1*, SG24-4652.

4.6.1 SMP Hardware Support

The list of IBM components that are supported on the SMP machines differs from the uniprocessor list. The IBM configurator is the best tool for determining which devices are supported and is recommended for this purpose. For a full listing of the features that are not supported, see *A Holistic Approach to AIX V4.1 Migration, Volume 1*, SG24-4652.

4.6.2 Memory

The memory cards that are supported in the SMP machines are different than those used in the traditional uniprocessor (UP) models. Some parts of the newer 128 MB and 256 MB memory cards can be re-used in the SMP models. This is achieved by transferring the SIMMs from the old UP memory boards and mounting them on new SMP memory boards.

Two memory conversion kits are available. The SIMMs of two 128 MB memory cards are needed to populate one 256 MB SMP memory board (256 MB memory conversion kit). The SIMMs of two 256 MB memory cards are needed to populate one 512 MB SMP memory board (512 MB memory conversion kit).

The cost of these conversion kits is far less than purchasing new cards and provides a cost effective upgrade path.

If the memory cards currently installed in your existing machine are less than 128 MB in size, they will have to be replaced. IBM currently has a buy-back option for memory cards below the size of 128 MB.

4.6.3 Microchannel Adapter Slots

The J30 has a total of seven microchannel slots that may be used to accommodate adapter cards compared with eight on the 5xx models. If you are planning to move from a UP model that has all of its microchannel slots populated, you may have to also purchase the J01 expansion unit to provide the extra slots.

Check to see if you have an integrated Ethernet adapter in your existing system, and take this into account when calculating how many microchannel slots will be needed. There is no integrated Ethernet on the current SMP models.

4.6.4 Graphics Displays

The SMP range of servers do not have native keyboard, mouse or tablet ports. Feature code 2736 is available for the G30 which enables keyboard and mouse attachment, but this feature must be ordered. The J30 and R30 do not support native keyboard and mouse attachment and as such, do not support graphics adapters or graphics screens.

If graphics functionality is required for a J30 or R30 SMP system, IBM recommends that an X Station be attached.

4.6.5 Printers and Serial Terminals

The SMP machines each have three native serial ports compared with two on the 3xx, 5xx, 9xx, and Rxx models. The additional port can be used to provide a remote service console in another location.

The presence of this additional port can cause problems with the migration of your existing serial port definitions. This problem and a workaround procedure are described in detail in *A Holistic Approach to AIX V4.1 Migration, Volume 1*, SG24-4652.

Chapter 5. Licensing Issues

Once you have successfully mapped all of your AIX V3.2 software to their logical AIX V4.1 equivalents, the next step is to clarify the licenses that you need to obtain.

This section deals with the licensing of the AIX Operating System as well as the use of license-management software to monitor and enforce the licenses of some associated program products.

With the announcement of AIX V4.1.4 in October 1995, the licensing of the AIX Operating System has been standardized worldwide on a single common license, known as an International Program License Agreement (IPLA). It is the long term goal for all of IBM's AIX Licensed Program Products to use this license; however, at present, the terms and conditions under which AIX program products are licensed can vary between products and between countries. In some cases, the license type used for a specific LPP was changed between AIX Version 3.2 and Version 4.1—usually as a result of the LPP adopting IPLA licensing.

Note

The specific details of the Terms and Conditions under which AIX program products are licensed can vary among countries. You should verify the appropriate conditions in your country with your local IBM representative or by referring to local product announcement letters.

Each purchased IBM Program Product requires a license. With some products, the license is enforced by the iFOR/LS license-management software through the use of a software key that is specific to the system for which the software is licensed. In this case, the key must be requested from a Key Center after the software is installed. The 3.2.2, “Migration Tables” on page 25 indicate whether an iFOR/LS license key is required for each particular Program Product at AIX V4.1.

5.1 International Program License Agreement

The advantages of the IPLA license over the form of license used for AIX Version 3.2 include:

- The IPLA license need not be physically signed by the customer.

  In most countries, a customer licensing AIX and some LPPs would have to physically sign an individual license for each product or sign some form of document that grouped the products and allowed a single signature to cover multiple licenses. This is not required with an IPLA license.

  The IPLA license is accepted by the customer in two ways:

  – By electronic signature the first time the software is started

  – Implicitly through the use of the software

- The IPLA license is identical to that used for most IBM PC software and is now common throughout the world.

  The IPLA license has long been used for most PC software and has gradually been introduced for AIX LPPs. For early modification levels of AIX Version 4.1, IPLA licenses were used in some countries. With the introduction of AIX

Version 4.1.4 in October 1995, a new version of the IPLA license was adopted for AIX worldwide. This greatly simplifies matters for international customers that deal with IBM in several countries.

5.2 AIX Version 4.1 Base Operating System

There are a few details about both AIX V4.1 Client and Server licensing that need to be understood before a migration can take place. At AIX V3.2, the job of deciding what user license to buy for each machine was fairly simple to understand: calculate the maximum number of concurrent users, select the appropriate user band and add up the tiers. At AIX V4.1, the concepts of "Designated" and "Networked" users have been introduced for the high-end server versions of the base operating system.

5.2.1 AIX Version 4.1 for Clients

AIX V4.1 for Clients is intended for any RS/6000 model that will be used as a single-user system. It has a default licensing mode fixed at 1-2 concurrent logins.

5.2.2 AIX Connections Version 4.1

The AIX Connections package or LPP is licensed and priced according to the maximum number of AIX concurrent connections that will be used at any time. This form of licensing is used only for AIX Connections.

5.2.2.1 Concurrent Connections

An AIX Concurrent Connection, or AIX Connect, is defined as any system that logs into the AIX Connections Version 4.1 function using the group or userid and password of the AIX Connections Version 4.1 function. This includes specifiying a userid and password to logon to a server to access file and printer services. It does not include interactive login sessions such as telnet and nwtty. These interactive sessions are counted as users—see 5.2.3.1, “Users” on page 67 below.

5.2.3 AIX Version 4.1 for Entry Servers

AIX V4.1 for Entry Servers comes in two forms, 1-16 users and unlimited users. The Low-End Server options are only applicable to our low-end server systems (group D5) which are listed below:

- 7006-41x
- 7006-42x
- 7011-2xx
- 7009-Cxx
- 7024-E20
- 7020-40P
- 7248-43P
- IBM Personal Computer Series 830 and 850
- IBM Thinkpad Series 820 and 850

An upgrade path is available to move from 1-16 users to unlimited users.

5.2.3.1 Users

An AIX Version 4.1 user is a terminal, remotely or locally attached, currently logged into AIX for entry of, and display or printing of, information. Terminals logged into programs executing under the control of AIX where the terminal does not create an AIX logon are not considered AIX users. In AIX Version 4.1, the following logins are counted as users:

- telnet
- login
- rlogin
- dtlogin
- nwtty
- nbtty

5.2.4 AIX Version 4.1 for Advanced Servers

AIX V4.1 for Advanced Servers comes with a 1-2 user license as standard—this may be increased by purchasing additional designated or networked users. The High-End Server options are only applicable to our high-end server systems which are listed below:

- 7012-3xx
- 7012-Gxx
- 7013-5xx
- 7013-Jxx
- 7015-9xx
- 7015-Rxx
- 7030-3xT

AIX V4.1 for Advanced Servers uses the definition of a user as given in 5.2.3.1, “Users” above, but further classifies the users as designated or network users.

5.2.4.1 Designated Users

Designated users, similar to AIX V3.2 users, are restricted to a specific machine. Designated users need only be purchased up to an additional 78 (2 are included with the base license) for the machine on which they are restricted. There is no additional charge for users beyond 80 (unlimited) on that machine.

5.2.4.2 Networked Users

Networked System Users can "float" around a network and can be used concurrently, limited only by the number of nodes at the location and the number of Networked System Users authorized on each particular node. Networked System Users can be purchased in any desired quantity. There is no unlimited option available. The exact quantity of users must be specified and paid for. Networked System Users are controlled by an iFOR/LS server on the network. iFOR/LS is included with AIX V4.1, but must be set up prior to activating the Networked System Users.

5.2.4.3 Designated or Networked Users?

It is generally advisable to select Networked users unless the following conditions apply:

- There is no network.
- More than 80 users require access to a single RS/6000.
- There are several discrete machines, with users who each log on to only one application, some of which may be supporting more than 80 users.

Example: A customer has two RS/6000s on a network and 140 users. Consider three possible scenarios:

- All users need access to both systems concurrently.

  Buy a 1-2 user High-End Server license for each machine, and buy 78 designated users for each machine. This provides unlimited usage on each machine (there is no charge after 80 users).

- All users access both systems but only one at a time.

  Buy a 1-2 user High-End Server license for each machine. Buy 138 Networked User licenses so that users can float on the network and log onto either machine.

- 110 users use the first machine and 30 use the second.

  Buy a 1-2 user High-End Server license for each machine. Buy 78 Designated users for the first machine and 28 for the second.

The most expensive scenario is the first example, and the least expensive is the third. In all cases, it is worth considering the addition of new users or machines that may affect what user licenses are purchased initially.

5.3 Software License Management

iFOR/LS is an application for managing and distributing software licenses electronically. The primary purpose of iFOR/LS is for software license compliance. It allows software vendors to distribute CD-ROMs or tapes while protecting the assets on them.

iFOR/LS is also known as iFOR, and was previously called NetLS. Some of our license management software still uses the NetLS name.

5.3.1 iFOR/LS License Types

There are five types of software licenses that need to be considered:

- Nodelock
- Concurrent Use
- Compound License
- License Combinations
- Developer License

Note: Concurrent Use, Compound, Combination, and Developer Licenses need an iFOR/LS license server to be set up and configured in order to operate; this should be included in your migration plan, if appropriate.

5.3.2 Requesting an iFOR/LS Password

Passwords can only be requested once the iFOR/LS license server has been installed. If you are upgrading a product to a new version that uses iFOR/LS, it is imperative that you are aware that the product will not be enabled until the password has been obtained and installed.

If you did not use iFOR/LS (NetLS) at AIX V3.2, you will have to obtain passwords for each iFOR/LS-controlled product that you install. If you did use iFOR/LS products at AIX V3.2 and you will be using the same products at perhaps a later version/release, it may not be necessary to obtain new passwords for these products. It is recommended that you call the iFOR/LS registration centers to clarify the situation.

When the product has been delivered, you will need to complete the information on the IBM Product Registration Information Forms before contacting the Registration Center. A template Information Form is supplied with the software, and is also provided in C.6, “Registration Form” on page 92.

The product and machine information is required each time a product is registered with IBM. Information about your company and your IBM representative is needed only the first time you register any product.

The IBM Product Registration Information Form requires that you supply the iFOR/LS target IDs of the iFOR/LS license server nodes where you want to install the product licenses. You must install the iFOR/LS License Server code before the iFOR/LS target ID can be obtained successfully. You can obtain the iFOR/LS target IDs for the iFOR/LS license server nodes by running the `ls_targetid` program that will be supplied with AIX V4.1. The information returned is unique for each iFOR/LS license server node.

After you have collected the above information, you will be ready to contact the IBM License Key Center.

Contact details for IBM Registration Centers around the world are given in Appendix C, “IBM Key Centers” on page 83.

5.3.3 Completing the Registration Information Form

You will need to collate this information before contacting the Registration Center.

The registration form is provided in a README file with the products and is included in C.6, “Registration Form” on page 92.

Note: You need one form for each target iFOR/LS server.

5.3.3.1 Product and Machine Information Needed for Registration

The following information is required by the Key Center to enable them to process you registration. You will need to complete this section of the registration form for each product and server required.

Product Information:

- IBM Program Name
- IBM Program Number

- Version
- Release

Machine Information:

- Target Operating System (for example: AIX Version 4.1.3)
- iFOR/LS Target ID
- Number of Concurrent Accesses
- Machine Model

5.3.3.2 Company Data Needed for Registration

Please complete the information on this page when you are doing your *first* product registration or when you desire to change the company profile maintained by the Registration Center.

Note: Please include International Country codes and area codes for phone numbers where appropriate.

Your Company Information:

- Your IBM Customer Number
- Company Name
- Physical Address
- Your License Administrator's name
- Country Code
- Phone number for License Administrator
- FAX number for sending license passwords

Your IBM Representative Information (Optional):

- Branch Office Number
- Name
- Address
- Country Code
- Phone

Appendix A. Existing Environment Tables

Use the following worksheets to document your existing environment.

A.1 Hardware

Table 21. RS/6000 Processor.	
Model	**Description**

Table 22. Memory. Command: `lsdev -CHc mem*`		
Name	**Location**	**Description**
mem__		
mem__		
mem__		
mem__		
mem__		
mem__		
mem__		
mem__		

Table 23. Hard Disk Drives. Command: `lsdev -CHc disk`		
Name	**Location**	**Description & Capacity**
hdisk__	00-	
hdisk__	00-	
hdisk__	00-	
hdisk__	00-	
hdisk__	00-	
hdisk__	00-	
hdisk__	00-	
hdisk__	00-	
hdisk__	00-	
hdisk__	00-	
hdisk__	00-	
hdisk__	00-	
hdisk__	00-	
hdisk__	00-	
hdisk__	00-	
hdisk__	00-	
hdisk__	00-	
hdisk__	00-	

Table 24. Other SCSI Devices. Command: `lsdev -CHs scsi`		
Name	**Location**	**Description**
	00-	
	00-	
	00-	
	00-	
	00-	
	00-	
	00-	
	00-	
	00-	
	00-	
	00-	
	00-	

Table 25. Microchannel Adapter. Command: `lsdev -CHc adapter -s mca`		
Name	**Location**	**Description**
	00-01	
	00-02	
	00-03	
	00-04	
	00-05	
	00-06	
	00-07	
	00-08	
	00-11	
	00-12	
	00-13	
	00-14	
	00-15	
	00-16	
	00-17	
	00-18	

A.2 Operating System

Table 26. Operating System.		
	Description	**Command**
Version/PMP		`lslpp -m bos.obj`
# Licensed Users		`smitty chlicense`

A.3 IBM Program Products Table

Type in the following command on the command line to see what program products are installed:

```
> lslpp -ciq | tr ' ' ':' | cut -f3,5,7 -d: | cut -c1-20,23-40 | sort -u
```

Table 27. Program Products.		
Product Number	**Product Name**	**Version**

A.4 Third-Party Products

Table 28. Third-Party Products.		
Vendor	**Application Name**	**Version**

A.5 Filesystems

Table 29. Filesystems. Command: df							
Filesystem	**TotalKB**	**Free**	**%used**	**iused**	**%iused**	**Mnt**	

Appendix B. Target Environment Tables

Use the following worksheets to document your existing environment.

B.1 Hardware

Table 30. RS/6000 Processor.	
Model	**Description**

Table 31. Memory. Command: `lsdev -CHc mem*`		
Name	**Location**	**Description**
mem__		
mem__		
mem__		
mem__		
mem__		
mem__		
mem__		
mem__		

Table 32. Hard Disk Drives. Command: `lsdev -CHc disk`		
Name	**Location**	**Description & Capacity**
hdisk__	00-	
hdisk__	00-	
hdisk__	00-	
hdisk__	00-	
hdisk__	00-	
hdisk__	00-	
hdisk__	00-	
hdisk__	00-	
hdisk__	00-	
hdisk__	00-	
hdisk__	00-	
hdisk__	00-	
hdisk__	00-	
hdisk__	00-	
hdisk__	00-	
hdisk__	00-	
hdisk__	00-	
hdisk__	00-	

Table 33. Other SCSI Devices. Command: `lsdev -CHs scsi`		
Name	**Location**	**Description**
	00-	
	00-	
	00-	
	00-	
	00-	
	00-	
	00-	
	00-	
	00-	
	00-	
	00-	
	00-	

Table 34. Microchannel Adapter. Command: `lsdev -CHc adapter -s mca`		
Name	**Location**	**Description**
	00-01	
	00-02	
	00-03	
	00-04	
	00-05	
	00-06	
	00-07	
	00-08	
	00-11	
	00-12	
	00-13	
	00-14	
	00-15	
	00-16	
	00-17	
	00-18	

B.2 Operating System

Table 35. Operating System.		
	Description	**Command**
Version/PMP		`lslpp -m bos.obj`
# Licensed Users		`smitty chlicense`

B.3 IBM Program Products Table

Type in the following command on the command line to see what program products are installed:

```
> lslpp -ciq | tr ' ' ':' | cut -f3,5,7 -d: | cut -c1-20,23-40 | sort -u
```

Table 36. Program Products.		
Product Number	**Product Name**	**Version**

B.4 Third-Party Products

Table 37. Third-Party Products.		
Vendor	**Application Name**	**Version**

B.5 Filesystems

Table 38. Filesystems. Command: df

Filesystem	TotalKB	Free	%used	iused	%iused	Mnt	

Appendix C. IBM Key Centers

This appendix includes contact details for IBM Key Centers around the world. We have also included a registration form that you can photocopy, complete and fax to your local Key Center.

You may contact the IBM Key Center in your area by telephone, FAX, IBM Office Vision Mail, or E-mail through the Internet or the IBM Mail.

The Key Center will send password information to the FAX number you specify in the information form or to your E-mail address. Passwords can be issued over the telephone; however, FAX and E-mail are more accurate methods for you to receive them.

The contact details for the IBM Key Centers around the world are listed below.

C.1 IBM Key Centers in Asia Pacific

Australia

IBM AUSTRALIA
Coonara Avenue
West Pennant Hills
AUSTRALIA 2125
ATTN: REGISTRATION CENTRE - FA43

Hours: Monday through Friday,
6:30 a.m. - 5:00 p.m. (Sydney time).
Closed weekends and holidays.

Phone
008-812-894 (free call)

Fax
008-650-434 (free call)

OV Mail
KEYS at SYDVM1

Internet
keys@vnet.ibm.com

Japan

Contact either:

- Your IBM Marketing Representative
- An IBM Business Partner acting as your agent or your remarketer

Other Countries in Asia Pacific

IBM AUSTRALIA
Coonara Avenue
West Pennant Hills
AUSTRALIA 2125
ATTN: REGISTRATION CENTRE - FA43

Hours: Monday through Friday,
6:30 a.m. - 5:00 p.m. (Sydney time).
Closed weekends and holidays.

Phone
61-2-354-4801

Fax
61-2-354-7856

OV Mail
KEYS at SYDVM1

Internet
keys@vnet.ibm.com

Where available, FreeFAX numbers have been established:

Hong Kong	800 2957
Indonesia	0080061 614
New Zealand	0800 44 2218
Singapore	800 6161 181
Taiwan	0080 61 1150
Thailand	001 800 61 3202

C.2 IBM Key Center in Canada

Canada

IBM DIRECT, DEPT 320
ATTN: SOFTWARE KEYS REGISTRATION CENTRE
4175 14TH AVENUE
MARKHAM, ONTARIO
L3R 5R5

Hours: Monday to Friday
Hours: 8AM to 6PM (Eastern Standard Time)
Holidays excluded - emergency support available

Phone
1-800-IBM-CALL (426-2255)

Fax
1-800-565-6612
1-905-316-7771

OV Mail
SWKEYS AT TOROVM1

IBM Link
SWKEYS AT TORIBM

IBM Mail
CAIBM3GZ at IBMMAIL

Internet
swkeys@vnet.ibm.com

C.3 IBM Key Centers in Europe, the Middle East and Africa

Austria

IBM Österreich
Internationale Büromaschinen Ges.m.b.H
IBM Direct SW Keys Center
Obere Donaustrasse 95
A-1020 Wien
Austria

Phone
0222-21145-2600

Fax
0222-21145-3388

OV Mail
SWKEYS at VIEVMA

Bahrain

GBM
PO BOX 819
MANAMA
STATE OF BAHRAIN

Phone
973 - 210 880

Fax
973 - 210576

OV Mail
JULIE at BAHVM1

IBM Mail
BHGBMHBM at IBMMAIL

Cyprus

IBM SEMEA S.p.A. Cyprus Branch
42-44, GRIVAS DIGHENIS AVENUE
P.O.BOX 2019,
NICOSIA, CYPRUS

Phone
357 - 2 - 443949

Fax
357 - 2 - 456372

OV Mail
PETROU at ATHVM1

Denmark

IBM Nordic Software Key Center
Nymoellevej 91
DK-2800 Lyngby
Denmark

Phone
45-934545 Ext. 3858

Fax
45-887091

OV Mail
SWKEYD at DKIBMVM2

IBM Mail
DKIBMPHL at IBMMAIL
DKIBMHX9 at IBMMAIL

Egypt

IBM WTC Egypt Branch
56, Gameat Al-Dowal Al-Arabeya Str.
Mohandesseen 12311, Giza
Egypt

Phone
(20) (2) 3492533

Fax
(20) (2) 5726350

OV Mail
EZABY at CAIVM1

France

IBM France
Immeuble Poinville
50/56 av Pierre Curie
BP 25
45801 St JEAN DE BRAYE CEDEX
France

Phone
33-1-36-63-10-20

Fax
33-38-21-72-31

OV Mail
CLES at BDLVM2

IBM Mail
FRIBMQP7 at IBMMAIL

Germany

IBM Deutschland
Informationssysteme GmbH
Niederlassung Hannover
Postfach 72 12 80
30532 HANNOVER

Phone
49-511/516-4803

Fax
49-511/516-4086

OV Mail
VOGT at PHAVM01

IBM Mail
DEIBMHXN at IBMMAIL

Greece

IBM HELLAS S.A.
26, FILELLINON STREET
GR.105 58
ATHENS,
GREECE

Phone
30 - 1 - 3281111

Fax
30 - 1 - 3222257

OV Mail
ANTONA at ATHVM1

Iran

IBM SEMEA S.p.A.
Circonvallazione Idroscalo
I20009 Segrate (Milan)
Italy

Phone
0039259622558

Fax
0039270300107

OV Mail
COLOMBO at ITAVMP01

Israel

IBM Israel
IBM House
2 Weizmann St.
P.O. Box 33666
Tel Aviv 61336
Israel

Phone
(03) 6978-368

Fax
(03) 6959-985

Italy

IBM SEMEA S.p.A.
IBM Direct
Via Lecco 61
20059 Vimercate Italy

Phone
1670.17001

Fax
039.600.5099/90

OV Mail
75880601 at ITHVM05

IBM Mail
ITIBMKCZ at IBMMAIL

Internet
gpwd@it.ibm.com

Netherlands

IBM Nederland N.V.
T.a.v. F. de Groot
Winthontlaan 1
Postbus 8303
3503 RH Utrecht
The Netherlands

Phone
31-30(2*)853269

Fax
31-30(2*)853505

OV Mail
NL32605 at EAMSVM1

IBM Mail
NLIBMQQL at IBMMAIL

Internet
keysnl@vnet.ibm.com

Pakistan

Attention: Mr. Hasan Asim
IBM Semea
Avari Plaza
Fatima Jinnah Road
Karachi - Pakistan

Phone
92 21 525-181

Fax
92 21 568-2411

OV Mail
ASIM at PAKVM1

IBM Mail
PKIBMRVM at IBMMAIL

Portugal

Companhia IBM Portuguesa, SA
Praca De Alvalade, 7
1799 Lisboa Codex
Portugal

Phone
351-1-7915122

Fax
351-1-7915261

OV Mail
PO70480 at LISBVM1

IBM Mail
PO70480 at LISBVM1

Saudi Arabia

Saudi Business Machines Ltd.
P.O.Box No.5648
Jeddah-21432 Saudi Arabia

Phone
6600007

Fax
966-2-6651163

OV Mail
KHRISHN AT JEDVM1

South Africa

Private Bag 9907
Sandton
South Africa 2146

Phone
011-320-9122

Fax
011-320-9113

OV Mail
PETERMOI at JOHIC1

IBM Mail
ZA2MH5B2 at IBMMAIL

Spain

IBM S.A.
Centro De Atencion Al Cliente
Dpto. 2010 - Despacho 3710
Santo Hortensia 26-28
28002 Madrid
Spain

Phone
901-200-400

Fax
34-1-519-3484

OV Mail
83827022 at SPAVM1

IBM Mail
ESIBMNFK at IBMMAIL

Sweden

IBM Nordic Software Key Center
Nymoellevej 91
DK 2800 Lyngby
Denmark

Phone
00 45 45-934545 Ext. 3404

Fax
00 45 45-887091

OV Mail
SWKEYS at DKIBMVM2

IBM Mail
DKIBMHX9 at IBMMAIL
DKIBMPHL at IBMMAIL

Switzerland

IBM Schweiz
Software Order Link
Hohlstrasse 604
CH-8048 Zuerich
Switzerland

Phone
41-1 / 436 70 70

Fax
41-1 / 436 70 60

Turkey

IBM TURK LIMITED SIRKETI
BUYUKDERE CADDESI, 80613
LEVENT - ISTANBUL
TURKIYE

Phone
90-212-280 09 00

Fax
90-212-278 04 37

OV Mail
SERAP AT ISTVM2

United Kingdom

IBM UK LTD
UK Software Key Centre
Alencon House
Alencon Link
BASINGSTOKE
HANTS RG21 1EJ

Phone
44-256-34-3331

Fax
44-256-816953

OV Mail
3SWKEYS at NHBVM7

IBM Mail
GBIBMNHG at IBMMAIL

Other Countries in Europe, Middle East, and Africa

IBM Software Manufacturing Solutions
Sortemosevej 21
DK-3450 Alleroed
Denmark
Att. ISMS Software Keys Group

Phone
45-48-17-55-79

Fax
45-48-17-55-66

OV Mail
KEYS at DKIBMVM1

IBM Mail
DKIBMRSK at IBMMAIL

C.4 IBM Key Centers in Latin America

Argentina

IBM ARGENTINA
Ing. Enrique Butty 275 Piso 17
1300 Capital Federal
Buenos Aires
Argentina

Phone
54-1-319-6838
54-1-319-6837

Fax
54-1-319-6810
54-1-319-6719

Brazil

Av. Presidente Vargas
824/16 andar - Centro
Rio de Janeiro
RJ CEP: 20071-001

Phone
0800-21-6157

Fax
55 + 21 + 253-2587

Chile

IBM Chile S.A.C.
Marek Gardulski
Key Fulfillment Center
Providencia 655
Casilla 3630
Santiago
CHILE

Phone
56-2-6334400

Fax
56-2-6396999

Colombia

IBM Del Colombia S.A.
Transversal 38 No. 100-25
Bogota
Colombia

Phone
1-257-0111

Fax
1-257-9839

Ecuador

IBM Ecuador C.A.
Av. Almagro 2054 y Whimper
Quito - Ecuador
South America

Phone
593-2-565100/1

Fax
593-2-565142

OV Mail
WILSON at VMANDINO

LCR

IBM Latin America Caribbean Center
Columbus Center, 1 Alhambra Plaza
Coral Gables, Fl. 33134
USA

Phone
305-442-3734

Fax
305-442-3510

OV Mail
CHARLIEH at RHQVM15

Mexico

Mariano Escobedo 595 HQ-05-2
Colonia Polanco Chapultepec
11560 Mexico D.F.

Phone
3.27.45.06

Fax
3.27.46.46

Peru

IBM DEL PERU SA
(SOFTWARE KEY CENTER)
APARTADO 151
LIMA 100
PERU

Phone
51-14-366345

Fax
51-14-369711

Venezuela

IBM DE VENEZUELA, S.A.
APARTADO 64778
CARACAS 1060, VENEZUELA

Phone
58-2-908-8527

Fax
58-2-908-8923

OV Mail
ALEJANGE at VMANDINO

Other Countries in Central America and Latin America

IBM Software Manufacturing Solutions
Sortemosevej 21
DK-3450 Alleroed
Denmark
Att. ISMS Software Keys Group

Hours: Monday through Friday
9:00 am - 4:00 pm, Central European Time

Phone
45-48-17-55-79

Fax
45-48-17-55-66

OV Mail
KEYS at DKIBMVM1

IBM Mail
DKIBMRSK at IBMMAIL

C.5 IBM Key Center in the United States

United States

Hours: Monday through Friday,
6:00 a.m. - 6:00 p.m. USA Mountain Standard Time.
Closed weekends and holidays.

Phone
1-800-446-8989
1-303-924-4671
1-303-924-4679

Fax
1-303-924-9644

OV Mail
KEYREGS1 at MAHVM1
KEYREGS2 at MAHVM1
KEYREGS3 at MAHVM1

Internet
keyregs1@vnet.ibm.com
keyregs2@vnet.ibm.com
keyregs3@vnet.ibm.com

C.6 Registration Form

Table 39. Product and Machine Information. (Required for each product and server)	
Company Information	
Your IBM Customer Number:	
Company Name:	
Product Information	
IBM Program Name:	
IBM Program Number: -	Version:
Machine Information	
Target Operating System: (for example AIX)	
iFOR/LS / NetLS Target ID: (CPU Planar ID)	Machine Model:
License Information	
License Type: Permanent or Trial	Length of Trial: (Maximum 90 days)
License Type: Nodelocked or Concurrent Access	Number of Nodelock Users or Concurrent Accesses: (OPTIONAL)
Note: *Use the command* `/usr/lib/netls/bin/ls_targetid` *to obtain the Target ID.*	

Table 40. Company Information. (Required for your first registration)
Company Information
Your IBM Customer Number:
Company Name:
Address:
City, State/Province, Postal Code:
Country:
Your License Administrator's Name:
Phone Number for License Administrator: (Please include country code)
FAX number for sending passwords: (Please include country code)
E-mail address for sending passwords: (Internet, IBM Mail or OV Mail)
IBM Representative Information (Optional)
Branch Office Number:
Name:
Address:
City, State/Province, Postal Code:
Phone Number: (Please include country code)

List of Abbreviations

2xx	Represents any RISC System/6000 model with a model number starting with 2. For example, 220 or 25T.
3xx	Represents any RISC System/6000 model with a model number starting with 3. For example, 350 or 39H.
5xx	Represents any RISC System/6000 model with a model number starting with 5. For example, 580 or 591.
9xx	Represents any RISC System/6000 model with a model number starting with 9. For example, 98B or 990.
ACPA	Audio Capture and Playback Adapter
AIX	Advanced Interactive eXecutive
AIX V3.2	AIX Version 3.2 Operating System
AIX V4.1	AIX Version 4.1 Operating System
ADSM	Adstar Distributed Storage Manager
ALP	Agreement for IBM Licensed Programs
ARTIC	A Real Time Interface Coprocessor
ASCII	American Standard Code for Information Interchange
BFF	Backup File Format
BMUX	Block MUltipleXer
BOS	Base Operating System
Cxx	Represents any RISC System/6000 model with a model number starting with C. For example, C10 or C20.
CD	Compact Disc
CDE	Common Desktop Environment
CD-ROM	Compact Disc Read Only Memory
COU	Conditions Of Use
CPU	Central Processing Unit
DCE	Distributed Computing Environment
DES	Data Encryption Standard
DOS	Disk Operating System
DSLO	Distributed Systems License Option
ESCON	Enterprise Systems Connection
FDDI	Fibre Distributed Data Interface
GA	General Availability
Gxx	Represents any RISC System/6000 model with a model number starting with G. For example, G30.
IBM	International Business Machines Corporation
iFOR/LS	information For Operation and Retrieval / License System
IPLA	International Program License Agreement
IPX	Internetwork Package eXchange
ITSO	International Technical Support Organization
JFS	Journalled File System
Jxx	Represents any RISC System/6000 model with a model number starting with J. For example, J30.
LAN	Local Area Network
LPP	Licensed Program Product
LVM	Logical Volume Manager
MPA	Multi-Protocol Adapter
NetBIOS	Network Basic Input Output System
NIM	Network Installation Manager
NT	New Technology
NTA	Network Terminal Accelerator
NW	NetWare
OPP	Optional Program Product
OS	Operating System
OS/2	Operating System/2
PC	Personal Computer
POSIX	Portable Operating System Interface for Computer Environments

POWER	Performance Optimization With Enhanced RISC
PTF	Program Temporary Fix
RFC	Request For Comment
RISC	Reduced Instruction Set Computer or Reduced Instruction Set Cycles
RS/6000	IBM RISC System/6000
RS/6000 SP	IBM RISC System/6000 Scalable POWERParallel
Rxx	Represents any RISC System/6000 model with a model number starting with R. For example, R24 or R30.
SCSI	Small Computer Systems Interface
SIMM	Serial In-line Memory Module
SMP	Symetric Multi-Processor
SNA	Systems Network Architecture
SP1	IBM Scalable POWERParallel Systems 1
SP2	IBM Scalable POWERParallel Systems 2
SPX	Sequenced Packet eXchange Transport Protocol
SPX2	Enhanced Sequenced Packet eXchange Transport Protocol
TCP/IP	Transmission Control Protocol / Internet Protocol
TTY	TeleType or asynchronous terminal
UDP	Unreliable Datagram Protocol
UNIX	UNIX Operating System
UK	United Kingdom
UP	Uni-Processor
US	United States of America
UUCP	Unix to Unix Copy Program
VCA	Video Capture Adapter
VSM	Visual Systems Manager
WDFM	Withdrawn From Marketing
WWW	World Wide Web
XPG4	X/Open Portability Guide, Issue 4

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