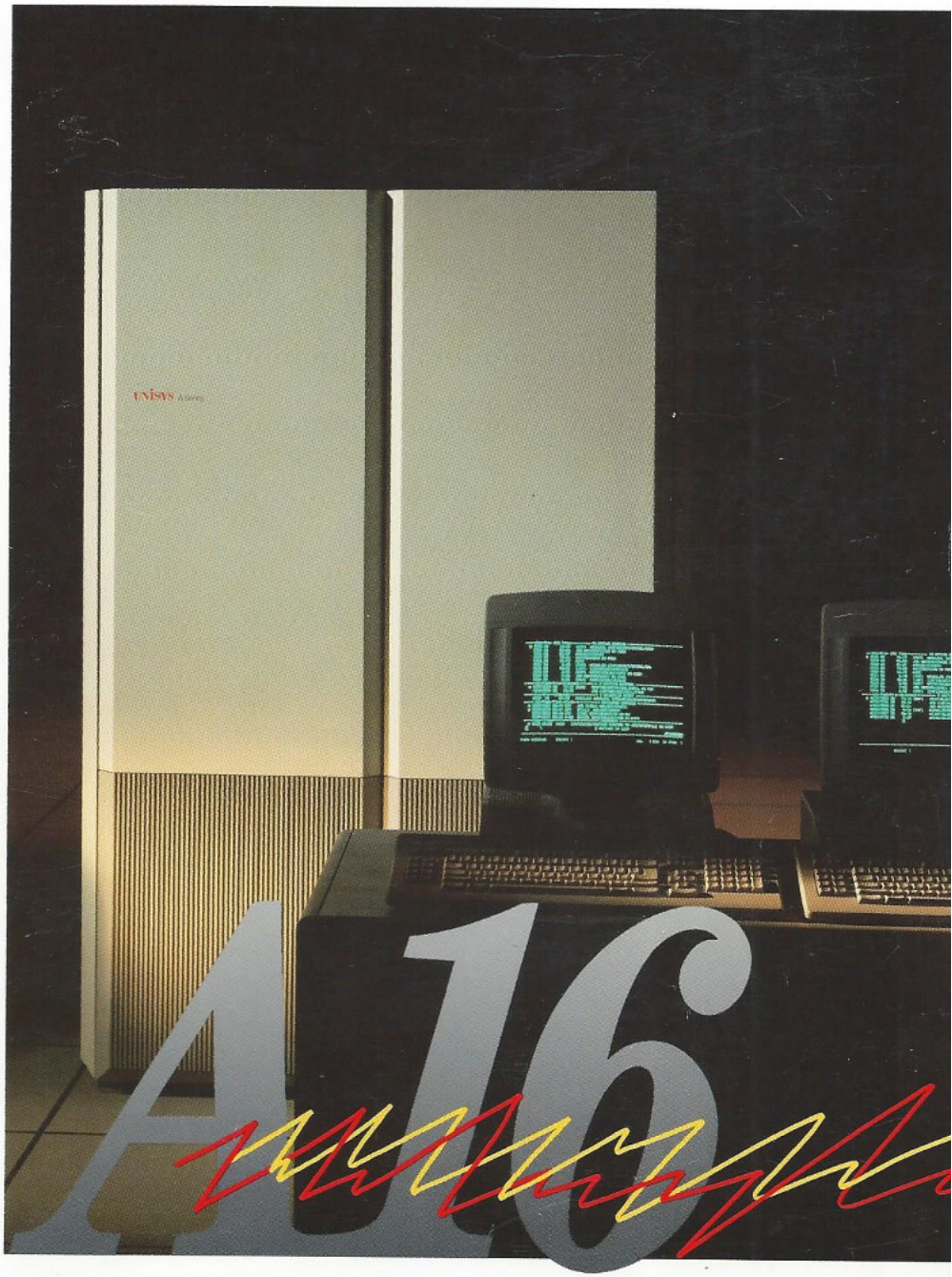
A 16 Computer Systems

The IS Decision Maker's Guide

UNISYS

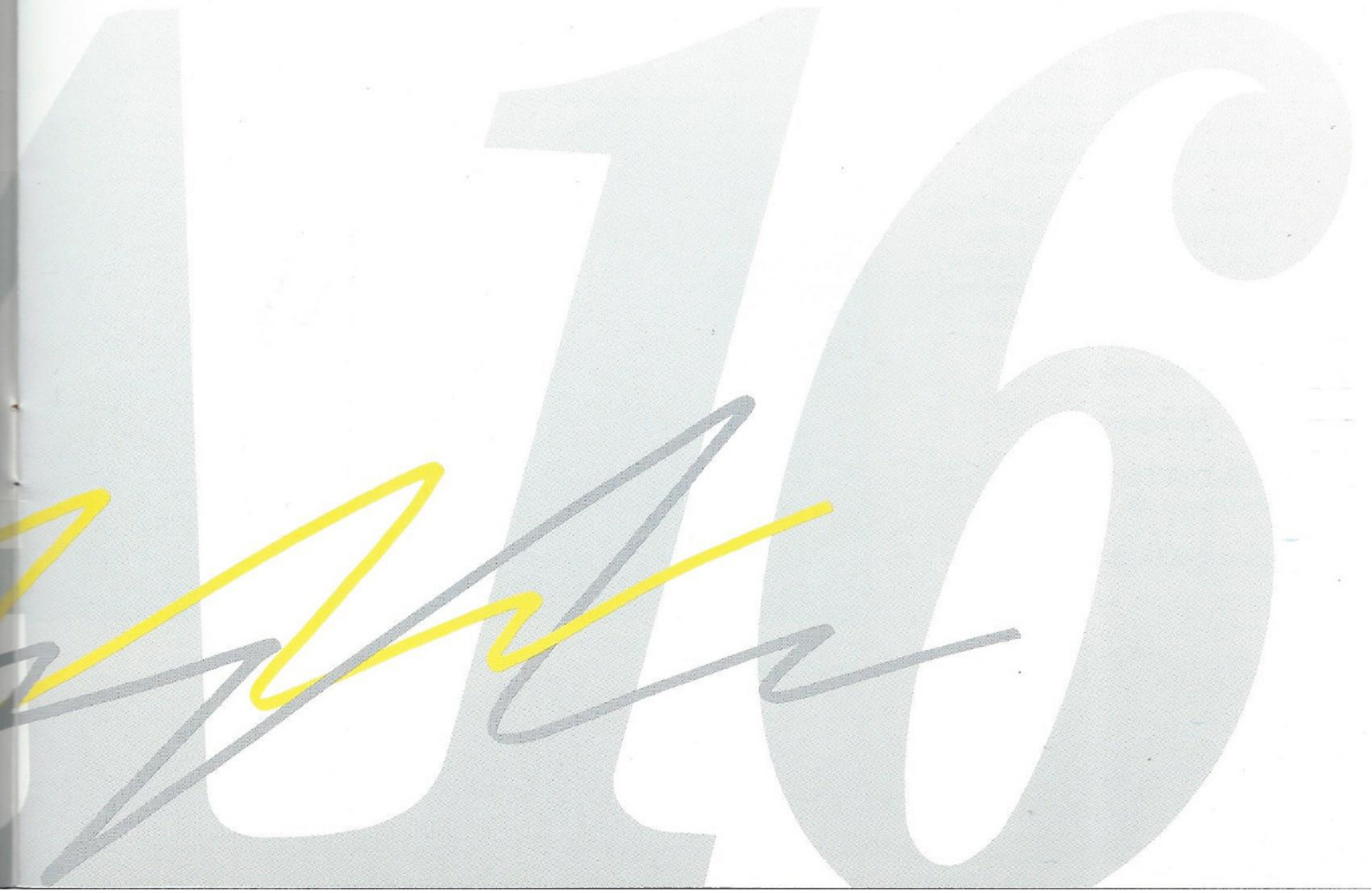


power
where you need it

A16 Systems provide a powerful combination of mainframe performance, adaptability, availability, and economy in a unit that requires less than ten square feet. A16 Systems are available in single- and dual-processor configurations. You can partition a dual-processor system as two secure and independent systems, or use it as one single-system image.

A16 Systems provide these outstanding values:

- *High-performance, single-processor systems for conventional transaction processing implementations*
- *Partitionable dual-processor systems for redundancy, to separate application development from production activities, or combined to handle peak workloads*
- *Exceptionally high levels of system availability*
- *Compact design and environmental efficiencies*
- *Fewer components for increased reliability and serviceability*
- *Superior price/performance*
- *Object-code compatibility for conversion-free growth*
- *A large array of peripherals and communications interfaces*
- *Cost-effective total cost of ownership*
- *An excellent platform for your "Information Hub"*



Discover the Power of the A16

The success, growth, and changing requirements of Unisys customers created the need for A16 mainframe computer systems. They are members of the Unisys ASeries — the broadest line of code-compatible systems in the industry today.

A16s are adaptable, high-performance, compact systems that not only provide growth and performance upgrade paths for current A9, A10, A12, and A15 users; they are state-of-the-art, add-on systems, with fault-tolerant features, for current and first-time Unisys customers as well.

The elegant architecture of A16 Systems provides unique capabilities to any enterprise that has heavy processing requirements. And it can be interconnected with many other vendors' host systems too.

A16 Systems are superior platforms for Unisys Information Hubs — critical components of global information networks that are emerging in the 1990s. In many cases, the entire flow of an enterprise relies on a set of mission-critical applications where data is updated in real time.

Future implementations of Unisys Information Hubs on A16 platforms will provide all the system attributes to perform critical hub functions in very high volume OLTP environments. These attributes include

- Open Interoperability
- High-Productivity Application Environments
- Advanced Database Software
- High-Volume Transaction Processing
- Unlimited Growth
- Non-Stop, Continuous Processing
- Unattended Operations
- High Security

We've used many new technologies in the design of our A16 Systems to give you power where you need it. Power within the system itself. And power where your business needs it most.

Here are some of the key benefits you'll derive from the outstanding features of A16 Systems.

Availability

Computing solutions only are effective solutions if your system is up and running when you need it.

The latest technologies are implemented in A16 Systems. Highly advanced, compact components and new packaging techniques have been incorporated in A16 Systems, significantly increasing their reliability and availability.

Fault-tolerant features ensure resiliency and availability — a must for mission-critical business applications. From the System Console Processor (SCP), faults can be dynamically corrected in the central processing unit and I/O modules.

Self-correcting memory is so advanced that an entire 6-million-bit, dual in-line memory module can fail and be corrected without any system interruption. You can even replace power supplies without any interruption to the system or to users' tasks.

Lower Operating Costs

Innovative packaging and the smaller number of components also significantly reduce the maintenance requirements for Unisys A16 Systems. And, your environmental costs are much lower than for previous large-scale ASeries models — up to 30% for electricity, 75% for cooling, and 80% for floor space. You get comparable performance in one-third the footprint of a DEC VAX 9000.

Most comparable systems you'll find on the market today require costly, maintenance-intensive, water-cooling systems. Because A16 systems are air cooled, you'll cut costs and reduce your maintenance requirements.

Investment Protection

No code conversion of your current ASeries applications is required when you move up to an A16 System. They are fully object-code compatible with every other system in the ASeries product line.

A16 Systems allow for substantial field-upgradable growth within the original cabinet: 3.5 times growth in processor power, 8 times growth in memory, and 4 times growth in I/O capacity.

Unisys offers a wide range of new peripherals and, notwithstanding the sophistication of an A16, many of your existing peripherals may remain fully compatible.

Application Software and Development Tools

Because an A16 System is fully compatible with the entire ASeries, you have access to a large array of general-purpose and industry-specific applications from Unisys and many independent software developers. Unisys offers proven CASE and 4GL application development tools in its LINC II and MAPPER systems. And Unisys OFIS Ensemble software helps you create a fully-integrated office environment.

The A16 as a Support System

The low total cost of ownership of an A16 System makes it ideal for uses other than as your primary system. The small floor-space, electrical, and cooling requirements make it very cost-effective for both disaster recovery and application development.

Disaster Recovery
If you are a large-scale ASeries user, an A16 System provides you more processing power and reliability at your remote disaster-recovery site. If you're currently developing a disaster recovery plan, now is the time to consider an A16 System as your platform of choice.

Our new software product, Remote Database Backup (RDB), gives you a simple way to describe and maintain a system of duplicate databases on a remote A16 system at your disaster recovery site. Primary databases are update-capable and the remote databases are inquiry-capable. (For more information on RDB, see Page 12.)

A16 Application Development Systems

For large ASeries sites with heavy application development requirements, an A16 is an excellent solution.

Use a single-processor A16 as a separate development/test system, dedicated solely to this function. A dual-processor A16 lets you use one "partition" for application development and the other for production. During shifts when no development or testing is being done, you can combine the partitions into a single system for heavy transaction and/or batch processing. (See page 6 for a description of partitioning.)

Customer Satisfaction By Design

Industry-recognized surveys by Datapro and others have shown that users of large-scale ASeries systems are more satisfied with their systems than are users of comparable systems from IBM and other vendors.

Unisys will continue to meet customer expectations in the future by continuing to enhance the rich functionality and ease-of-operation features inherent in the MCP/AS operating system and environmental software.

Datapro User Survey* Large-Scale A Series Systems Took Top Honors Over IBM

	IBM 3090 (mid-range)	IBM 3090 (high-end)	Unisys (Large-scale A Series)
Ease of Operation	7.7	7.4	9.0
Ease of Expansion	8.2	7.8	9.3
Operating System	8.0	8.6	9.3
Power/Energy Efficiency	7.9	7.4	9.0
Productivity Aids	6.7	6.3	7.9
Overall Satisfaction	8.3	8.4	8.5

The A Series Data Management System Versus IBMs'

	IBM IMS	IBM DB2	Unisys DMS II
Ease of Use	5.9	6.7	8.3
Overall Satisfaction	6.4	6.8	8.2

*Users were asked to rate systems on a scale of 1 to 10. A rating of 10 is "excellent."

A16 Technical Overview

Growth Potential

The A16 is offered in five models, from the single-processor A16 Model 511 to the high-end, dual-processor A16 Model 622. Each model occupies a single cabinet that requires less than 10 square feet (0.9 square meters) of your precious floor space.

These five models represent 3.5 times growth in processing power that can be accomplished through field upgrades in the original cabinet. The 8 times memory growth (48 MB to 384 MB) and 4 times I/O growth can also be accomplished on site, in the same cabinet.

Connectivity

The value inherent in A16 Systems is reinforced by the connectivity of a wide selection of peripherals. The A16 currently supports the Message Level Interface (MLI) and the Intelligent Peripheral Interface (IPI), for peripheral connections.

Technological Excellence

Unisys is one of the first vendors to deliver a high-performance mainframe computer system that utilizes Motorola's very advanced MCA III implementation of high-density, bipolar, emitter-coupled logic (ECL) gate array technology. This technology not only offers an extremely high level of circuit integration (10,000 gates per chip), but also makes it possible for the Central Processor Module (CPM) to be designed on a single board, while previous ASeries models required twenty-three boards for the CPM.

When used in conjunction with Complementary Metal Oxide Semiconductor (CMOS) technology, MCA III also allows for a single-board I/O Module (IOM) implementation, instead of the nineteen boards required in previous models.

The one-megabit DRAM chip makes it possible to provide 48 MB on a single memory board — the Memory Storage Unit (MSU). A single system can accommodate eight MSUs for a total memory capacity of 384 MB.

The use of Dual In-Line Memory Module (DIMM) packaging not only allows a single board to contain 48 MB of memory, but also integrates all memory control on the same board.

These implementations of advanced technologies provide greater reliability and serviceability in the A16 models and substantially reduces these units' environmental requirements (i.e., floor space, power, and cooling).

The New CPM Architecture

The new architecture of the A16's Central Processor Module makes it excel in array processing, providing significant performance improvement over the A15 and A17 in FORTRAN language operations using vector operators. The scientific/FORTRAN performance of an A16 rivals that of many attached vector processors found in other systems.

The system mainframe modules feature high-density ECL gate-array and CMOS technologies. Combined with high-density, multi-chip packaging, this design produces substantial improvements in reliability, packaging, and total cost of ownership (TCO). System value is enhanced even further by direct communication between system memory, the CPM, and the IOM.

A16 System Configurations

A basic A16 System consists of four elements:

- Central Processor Module (CPM)
- Input/Output Module (IOM) and associated channel adapters
- Memory Storage Unit (MSU)
- Maintenance Subsystem

Single- and Dual-Processor Configurations

An A16 System can have two CPMs, two IOMs with associated channel adapters, and up to eight MSUs configured in one or two separate system partitions — within a single cabinet.

Each partition contains its own power, cooling, and a State Access Module (SAM) that provides the maintenance interface and master clock. You can operate each partition as an independent system, or, when the need arises, you can merge the two partitions into a single monolithic system.

Partitioning
Fully redundant A16 models can be divided into two independent systems (partitions). A partition must include one CPM, one IOM, and at least one MSU. Each partition in a dual-processor system can accommodate up to four MSUs for a total of 192 MB of memory. Every A16 model can address up to eight MSUs for a total of 384 MB of memory.

Each partition is managed by its own copy of the operating system, the Master Control Program (MCP/AS). When running as a split system consisting of two independent partitions, each partition is autonomous and is unaffected by the actions of the other partition.

In a partitioned mode, you can run maintenance tests on one partition while the other executes as the active system. The executing partition is protected against interference from the partition being tested.

Software establishes partitioning, hardware enforces it. Partitioning involves control of the system interface, the I/O Subsystem interface, and the maintenance interface.

The I/O Subsystem

The I/O Subsystem controls all transfers of information between the A16 and the local/remote system peripherals such as terminals, disk storage units, magnetic tape units, and printers. The I/O Subsystem can also interface the host A16 with other host systems through data communications interfaces.

You can configure the A16 I/O Subsystem in a variety of ways, depending on your needs and the requirements of the system.

The IOM consists of these components:

- Memory Interface Unit (MIU)
- I/O Processor Unit (IOU)
- Channel Manager Unit (CMU)
- Data Transfer Unit (DTU)
- Task Control Processor Unit (TCU)

The implementation of bipolar ECL and CMOS technologies has allowed all of these I/O components to be placed on a single board — an IOM.

A basic IOM has eight I/O channels serviced by two Channel Manager Units (CMUs), each of which supports four I/O channels. Two additional CMUs can be added to provide for a maximum configuration of sixteen channels per IOM. A maximum of thirty-two channels can be configured with two IOMs in the dual-processor models.

Self Monitoring and Correction

The extensive self-diagnostics and self-correction capability designed into A16 systems provide a level of system availability unsurpassed by other systems in this performance range. These valuable features derive from the functionality of the intelligent System Console Processor (SCP) and its interface with main system components.

The CPM and IOM constantly monitor themselves and report to the SCP when a fault occurs. In most cases, the SCP can diagnose the problem, correct it, and return the system to a fully operational state without any interruption to user programs.

Memory in the A16 is scrubbed automatically. On each Read operation, memory is updated with corrected data if the error-checking mechanism detects a single-bit failure. This permits constant single-bit error correction, thus minimizing multiple-bit errors.

Memory error correction is so sophisticated that an entire DIMM (6 million bits) could fail and be corrected without any system interruption.

The Maintenance Subsystem

The A16 features a totally new, compact, Maintenance Subsystem, the central component of which is the UNIX OS-based intelligent System Console Processor (SCP). The SCP uses an advanced microcomputer that interfaces with displays that function as operator or maintenance displays.

The dedicated Maintenance Subsystem of the A16 provides the following functions:

- Initialization, control, and monitoring of the A16 System
- Diagnostics and debug aids for the mainframe components
- Remote support and DLP maintenance access
- Software power control and monitoring of all mainframe units and other PowerNet-capable devices (I/O cabinets and peripherals)

The Maintenance Subsystem is available with optional redundant capability. Tests and programs can be executed either by on-site maintenance personnel or from a Remote Support Center (RSC). From an RSC Unisys can help you:

- Control system power
- Analyze maintenance logs
- Control and monitor the system state
- Analyze memory dumps
- Perform mainframe and I/O diagnostics
- Configure and analyze the A16 System

Systems that Meet Your Requirements

Now you can choose a system that gives you just the right amount of processing power you need. If what you need is sheer power, choose the single-processor model that fits your capacity requirements. If you need redundancy and maximum availability as well as power, a dual-processor model gives you both. See the table, "A16 Models at a Glance," for details.

A 16 Models at a Glance

	Initial Configuration			
Single-Processor Models	**Minimum Memory**	**CPUs**	**I/O Processors**	**Performance Factor**
A16-511	48 MB	1	1	1.0
A16-611	48 MB	1	1	1.8
Dual-Processor, Partitionable Models				
A16-422	96 MB	2	2	1.0
A16-522	96 MB	2	2	1.9
A16-622	96 MB	2	2	3.5

Software Application Development Tools

The LINC II System
To make the most of scarce and expensive development resources, you'll want to make sure that the application you start results in the application your users need.

That's not easy using conventional application development techniques. Business changes so rapidly that, by the time you create an application, your users have new challenges they must respond to that the original specifications didn't address. The result: Wasted effort neither you nor your users can afford.

With the LINC II Computer Aided Software Engineering (CASE) system, as soon as you have a concept, you can build a working blueprint. You're ready to prototype and test your design before you commit the time and resources to create the complete application.

Today's CASE tools help developers dramatically improve their productivity by automating the steps required in a conventional development cycle:

- Planning
- Analysis
- Specification
- Design
- Coding
- Test
- Implementation

Most CASE products on the market today still break development into these individual steps. And, different CASE products are often required for each step. Upper-CASE products address the first three steps; Lower-CASE products automate the following three.

When you carry out these functions using different products, it's difficult to pass data from one step to the next. As a result, you may need several different skills —and different teams —to produce one application.

The LINC II system combines all Upper-CASE and Lower-CASE functions into two steps: Specification and system generation. You use only one system, one set of skills, and one development team to do analysis, specification, prototyping, and design.

Then, the LINC II system performs the generation tasks, automating both the coding and implementation. All you have to do is verify that the application meets your users' business needs.

The MAPPER System
The MAPPER system is an open, responsive, user-driven computing environment with powerful ad hoc processing and reporting capabilities. It provides an easy-to-use, non-procedural means to make the problem- solving power of your ASeries system available to every end user in your enterprise.

The MAPPER system provides an interactive application development environment for all Unisys ASeries models that support the MCP/AS operating system. Interfaces are provided for other software applications within the ASeries and for network links to other MAPPER systems.

The MAPPER system supplies its own database management system to provide both ease of use and power in a multi-user environment. The database is organized like filing cabinets, with file "drawers" that contain individually labeled reports.

Your end users can utilize the MAPPER system to accomplish numerous tasks, including:

- Storing and accessing information quickly and easily
- Creating and modifying reports using timely information
- Combining reports or portions of reports into master reports
- Displaying data graphically in a variety of colors, patterns, and chart styles
- Performing word processing on the reports
- Sending and receiving electronic mail throughout the information network
- Controlling access to confidential information
- Performing "What if?" analyses to identify trends
- Integrating a series of functions into a run procedure invoked by a single command

The MAPPER system offers its extensive processing power to a broad range of users. They don't need to be skilled programmers to take advantage of its many features.

Operating System Software

Master Control Program/ Advanced System (MCP/AS)

Unisys is a recognized leader in operating system design and implementation. For more than twenty-five years, Unisys has been committed to providing its users additional growth, capacity, and performance, — without requiring any form of application program conversion or recompiling. These valuable characteristics are directly attributable to its operating system — MCP/AS.

MCP/AS is the single operating system for every computer system in the ASeries. Functionally, MCP/AS allocates all system resources, including processors, to meet the needs of the programs introduced into ASeries systems. It dynamically assigns memory, manages I/O functions, schedules waiting jobs, communicates with the operator, provides security access control, logs system use, loads programs as needed, manages allocation of mass storage, and supervises many other functions.

MCP/AS supports automatic allocation of processor resources in multiprocessor configurations as its normal mode of processing. Each processor can execute any application program and equally participates in providing operating system services.

MCP/AS also makes physical device control transparent to your programmers and end users. As far as a programmer is concerned, all devices are read and written the same way. All files are dynamically assigned to devices by file name.

Unisys pioneered the virtual memory concept over two decades ago, and has continuously optimized its implementation under MCP/AS. The virtual memory management technique employed in Unisys ASeries systems is exceptionally efficient. Analysts can, and often do, write programs whose total memory requirement exceeds the system's physical memory size.

System Security

Security means controlled access to the system and its component parts. MCP/AS provides several levels of access control. Each system administrator can choose the degree to which various security features are implemented.

User access is controlled through IDs, passwords, and access codes. System access is controlled through log-on procedures. File access can be applied to all disk files, but altered only by the owner of the file.

Changes in access privileges can be expanded or revoked easily and quickly at the discretion of the Chief Security Officer or system administrator.

The InfoGuard security module provides controlled access protection that adheres to the Class "C2" of secure systems as defined by the National Computer Security Center. It gives you security assurance in the areas of authentication, access control/resource allocation, audit, and reporting.

Screen Design Facility Plus (SDF Plus) helps you create a complete User Interface System (UIS) that includes screen forms, logic, form flow, and HELP text.

SDF Plus offers extensive flexibility for screen formatting, data validation, highlighting, cursor control, defaults for data, input and output substitution, and HELP text. With SDF Plus, you can introduce high quality online systems in less time, with improved screen format maintainability, and increased end-user satisfaction.

You can define and manage screen flow among screens in the user interface, menus, multi-page forms, user-directed form traversal, application-supplied prefill data, standard screen borders, context-sensitive online HELP text, scripts to record and replay interactions, and translations of screens.

SDF Plus also lets you distribute the entire UIS to Unisys BTOS II Open Systems B25 universal workstations, Unisys PW^2 PCs, IBM PCs, and PC-compatible workstations. You can store and run the user interface locally to provide validated data to an application program running on the ASeries system.

Communications Management System (COMS) is a communication monitor that supports high-volume online transaction processing (OLTP). COMS provides menu-assisted definition and maintenance of the transaction environment, flexibility to address diverse transaction requirements, simplified application program support, and extended end-user support.

The hallmark of COMS is its flexibility. Your administrators can dynamically define and change the transaction-handling rules for a variety of COMS transactions, including:

- Defining transaction entities and their relationships
- Creating new configurations
- Modifying existing configurations

Advanced Data Dictionary System (ADDS) is the cornerstone of the A Series Repository. It provides improved control, consistency, and reliability of data definitions. Supplemented by a menu-assisted definition module, ADDS replaces conventional data definition languages.

ADDS is an effective facility for organizing and managing information descriptions for a broad range of information entities. The automation provided in ADDS makes the information environment more controlled and productive.

It provides centralized definition, storage, and retrieval of information descriptions, relationships among information elements, screen forms (in conjunction with SDF Plus), and a number of other information resource descriptions.

Operations Control

Operating a computer system is a complex task that requires skilled personnel. In most operating system environments, most operator entries must be made in a special "command language."

Menu Assisted Resource Control (MARC) is a human interface for MCP/AS. It uses easy-to-understand menus to guide your operators through entry of even the most complex system control commands.

MARC also provides context-sensitive HELP with a single keystroke. Your operations people can receive short, concise help, or they can scroll through multiple pages of online text.

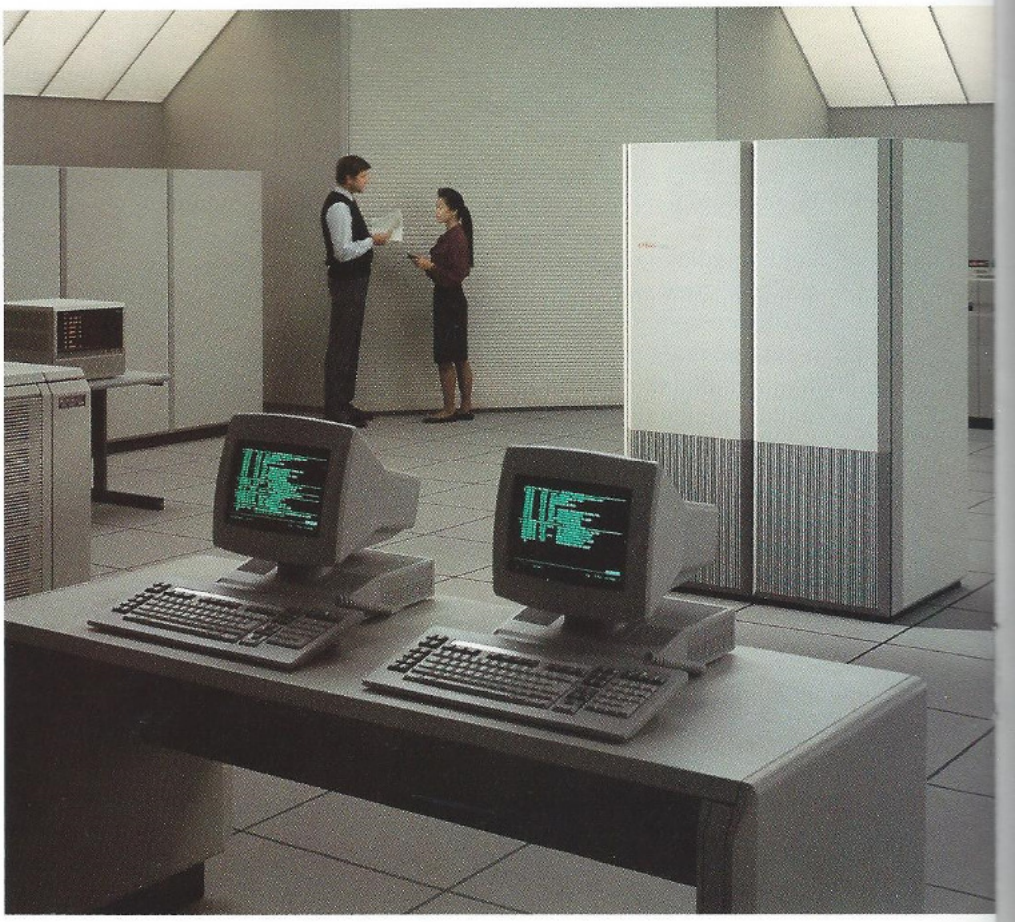
Advanced Database Management Systems

Information is the lifeblood of every enterprise. Management makes minute-by-minute decisions based on information stored and processed on your computer system(s).

Data Models

Since the introduction of computers, the problem of how to store information and efficiently retrieve it has been an issue of great importance. Recently, this issue has been addressed by definition of several specific data models.

Briefly, a data model is a way of describing how you can capture real-world situations in a form appropriate for use with computers. A data model has three components: objects to organize data,



operators for manipulating these objects, and a set of rules (integrity constraints) to ensure that only correct changes are allowed. A data model also provides a methodology for mapping real-world facts onto objects in a database.

A database management system is an implementation of a particular data model on a computer. The choice of data model can significantly affect the characteristics of the resulting system. Performance, data integrity, user productivity (for both programmers and end users), and the flexibility to accommodate change all are affected by your choice of data model.

Database Management Flexibility

It is important to choose the data model best suited to your organization's needs. Unisys offers three database management systems:

- Data Management System II (DMS II), a hierarchical/network data model
- Semantic Information Manager (SIM), an object-oriented data model
- Structured Query Language (SQL), an ANSI-standard relational database management system.

Data Management System II (DMS II) is used to implement hierarchical/network data models. DMS II provides highly efficient access to a carefully designed database where the structure reflects the way data is related and will be accessed. This design is best suited to a transaction processing environment where high speed is important and the organization's database changes infrequently.

Semantic Information Manager (SIM) is a database management system based on a semantic data model.It contains many object-oriented features. SIM provides data integrity, data independence, is easy to use, and is highly flexible.

Object-oriented/semantic data models provide flexible database systems without sacrificing data integrity and performance. Here are some of the many advantages:

- Less information is required when the database is accessed because semantics can be defined within the database system.
- High-level data integrity is possible because SIM can specify constraints on both relationships and data values.
- These two advantages help make users of the database more productive. Programs are shorter, less complex, and less error prone. Programming and debugging time is reduced.
- Commonly-used relationships are pre-defined, thus the system can optimize SIM performance.

Structured Query Language (SQL) adds relational database capabilities to the existing rich database management environment. It provides the functional capabilities for designing, accessing, controlling, and protecting the database.

SQL expands the A Series interoperability by offering a high degree of portability across all systems through the development of applications that adhere to the ANSI standard.

Continuous Processing

High levels of availability can be achieved by implementing several complementary A Series features that provide nearly 100% system availability.

Mirror Disk is an integral part of MCP/AS that gives you continuous availability of your disk subsystem(s) and offers the potential for increased system performance.

The mirror disk feature allows two, three, or four disk units to function in parallel as a mirrored set, that is, as exact copies of each other. An error on one mirror is completely transparent to application programs and end-users.

Mirror disk is dynamic — it can be adapted quickly to a changing environment.You can create, expand or contract, and move mirrored sets based on your fault-tolerance or performance needs.

DMS II Online Backup lets you do database archiving — traditionally an "off hours" process that can cause scheduling problems and increase staffing expenses — at any time. Online dumps can be performed while DMS II/SIM/ Structured Query Language (SQL) databases are being updated.

Remote Database Backup (RDB)

RDB is a remarkable new software product that ensures higher levels of database availability. RDB will maintain, in real time, a back-up copy of a production database on a secondary A Series system. It's easy to implement and has many configuration options.

Primary and secondary A Series systems can be co-located or geographically distant. A remote secondary database satisfies the requirement for a disaster recovery facility. RDB helps you implement a business resumption plan. Should a failure occur at the primary site, the secondary database can become operational on the disaster recovery site.

RDB can be used with A Series systems that implement the LINC II system, Structured Query Language (SQL), SIM, or DMS II.

The RDB Information Center
While RDB is primarily for disaster recovery, you can also use RDB-configured A Series systems to perform tasks unrelated to the critical RDB-managed databases.

Because it houses a real-time copy of critical production databases, the RDB remote site can serve as an Information Center. Batch reports, typically run on the third shift, can be distributed to the remote site to help reduce the workload at your primary site during peak activity periods.

RDB remote sites add incremental production value to your organization. They can be used to expand into new business areas while still providing critical disaster recovery backup.

Communications Processor 2000 (CP 2000)

Unisys CP 2000s offload terminal and network communications processing from the A16 System to save valuable Central Processor Module resources for other tasks.

The CP 2000 is based on a multiple-microprocessor design that provides extensive connectivity and flexibility for implementing distributed networks. It can be used as a remote controller or concentrator for terminal networks, providing gateway connections to other, non-Unisys networks. CP 2000s can be shared by any number of A Series and other systems via the Communications Processor Local Area Network (CPLAN).

CPLAN is a high-speed, 10 MB LAN for connecting A Series systems of any performance level to CP 2000s. In combination with BNA Distributed System Services, CPLAN supports protocols for functions, such as file transfer, file access, and resource sharing among computer systems.

The Productivity Advantage

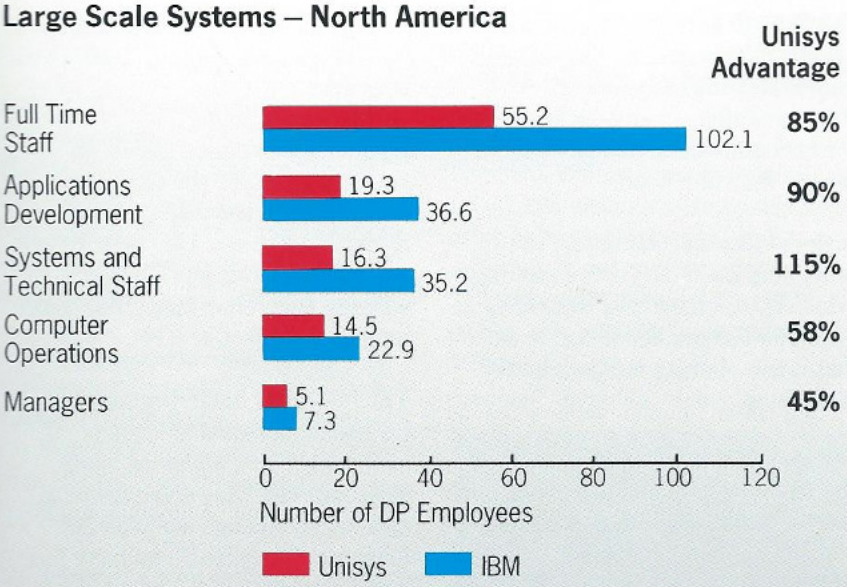
No matter which A16 model you choose, operations are straightforward and easy to learn. Unisys has a tradition of hardware design and software implementation that consistently provides its users unequalled productivity. This productivity advantage translates to substantial bottom-line benefits for our users worldwide.

A study of staffing levels at comparable Unisys and IBM sites demonstrates the Unisys advantage. The survey criteria ensured that the systems were comparable.

Unisys ASeries systems required fewer data processing people and therefore cost less to operate than comparable IBM systems.

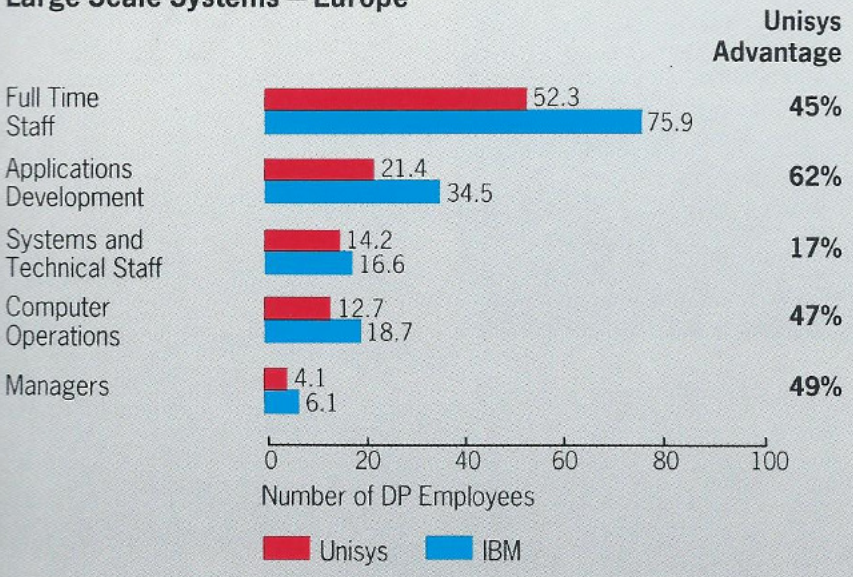
This can result in savings over five years greater than your total initial investment for the system. The human resources data contained in these charts is based on a 1988 survey of over 200 user sites, conducted by Customer Satisfaction Research Institute. Overall results were obtained by averaging all surveyed Unisys sites and IBM sites.

Large Scale Systems – North America



The Unisys advantage for large systems was 85%. Large IBM systems require more than twice the systems and technical staff.

Large Scale Systems – Europe



The Unisys advantage for large systems was 45%. Large IBM systems required more than one and one half times the applications development staff.

Peripheral Options

Unisys offers a comprehensive selection of subsystems and devices to support A16 Systems:

- Disk drives
- Magnetic tape drives
- Automatic cartridge loaders
- Non-impact and band printers
- Line and matrix printers
- Terminals
- Workstations
- Special purpose devices

Disk Drives

Unisys M9710 Disk Subsystems

The M9710, available in two different sizes, provides large-capacity, high-performance disk storage for A Series systems. These disk subsystems can be expanded in increments to handle requirements for additional storage.

M9710 Disk Subsystems conform to the 19-inch, Electronic Industries Association (EIA) rack-mount design standards. You can expand these systems within a single cabinet, thus reducing floor space requirements and avoiding physical room alterations.

Expansion is done on-site by sliding new modules into place and connecting them; no disruptive external electrical work is required.

Each module contains two independent, 674 MB spindles for a total formatted capacity of 1.3 GB. Dual drive trays can accommodate two independent disk drive modules, each with its own fan, power supply, power distribution unit (PDU), power cord, and head disk assembly (HDA).

The 1.0-meter-high cabinet can contain six dual-drive modules (12 spindles) for a maximum capacity of 8.1 GB. The 1.75-meter-high cabinet can accommodate ten dual-drive modules (twenty spindles) for a maximum capacity of 13.4 GB.

The M 9710 data transfer rate is 4.0 MB per second; average access time is 25.7 milliseconds. The HDA contains seven 8-inch disk platters and one actuator with twelve thin-film heads.

Disk devices can coexist on the same bus. Each disk drive also has a dedicated, embedded controller with a 65 KB pre-fetch buffer so that it can operate independently of the host.

Unisys 9399-H/B 9494-24 Disk Drive

Based on the Intelligent Peripheral Interface (IPI) standard, this large capacity, high-performance disk storage subsystem is compliant with ANSI X.31937-1987 and FIPS 130 standards.

9399-H/B9494-24 Disk Subsystems can only be attached to IPI Input/Output-capable host systems. It interfaces directly to the host system via a 10 MB per second IPI connection and can contain up to sixteen actuators with a maximum unformatted capacity of 20 GB.

The B9494-24 disk drive attaches to the host via the 9399-H Dual String Controller. The B9494-24 is a quad actuator on two spindles of disk (two actuators per disk), with an unformatted capacity of 5 GB. The B9494-24 has an average seek time of 17ms, with an average rotational latency of 8.3ms, yielding an average access time of 25.3ms. The transfer rate of the disk is 3 MB per second.

Rotational Position Sensing (RPS) provides disk controller sharing to reduce the amount of time the string controller is busy due to rotational latency. In effect, the string controller provides multi-tasking management of data transfers.

Dynamic Reconnect allows an actuator to share the two string controllers in the 9399-H Dual String Controller. This feature lowers the probability of finding a string controller busy, thus maximizing the effect of RPS.

The full-track buffering feature for host systems that employ host-based disk cache memory improves the I/O performance of disk cache. Using two 9399-HC features, the 9399-H can have four host data paths.

Magnetic Storage Subsystems

Unisys 5073/0899 Cartridge Tape Subsystem
This cartridge tape subsystem features a compact cartridge that is capable of reading and writing performance far beyond that of open reel technology. The transfer rate of the 5073/0899 is 3.0 MB per second.

The 5073 cartridge tape controller can be interfaced to as many as four host channels. Dual access is achieved with dual controllers. The minimum one 5073 controller/one 0899 dual drive tape unit subsystem can be expanded to a dual controller with as many as sixteen tape drives or eight dual drive tape units.

0899-ACL Automatic Cartridge Tape Loader
This is an optional feature for the 0899-02 dual drive cartridge tape unit. One ACL feature provides autoload capabilities to two tape transports.

The ACL consists of the entry stacker, loading position, loader/unloader, and eject tray. The entry stacker holds up to five cartridges with the sixth cartridge in the loading position.

The three-position switch lets the operator select manual, automatic, and system modes.

Printers

Unisys 9246-14T Band Printer
The 9246-14T is a moderate-speed band printer that provides high quality printing to fulfill moderate-volume requirements.

The 9246-14T rated speed is 1210 lines per minute (LPM) with a 64-character-set print band, 700-910 LPM with a 96-character-set, or 670-730 LPM with a 128-character-set. The 9246-14T has a dual print-speed mode for enhanced print quality.

Unisys 9246-25H Band Printer
The 9246-25H is a high-speed band printer that provides enhanced-quality printing for optical character recognition (OCR) applications to fulfill medium- to high-volume print needs.

The 9246-25H can print at up to 1800 LPM with a 48-character-set print band for enhanced quality printing. It can accommodate 6-part forms, widths of 4 to 17 inches, and lengths from 8 to 14 inches.

Advanced Workstations

Unisys offers three families of workstations, each with its own array of display features and communications and expansion capabilities.

- The BTOS family of open, intelligent workstations
- The powerful Personal Workstation^2 (PW^2) personal computers
- The T27 Series of general-purpose, high-performance terminals

The Unisys Open BTOS II System
The BTOS systems (including the B28, B38, B39, and XE-530) are advanced, modular, high-performance microcomputers that use both BTOS and MS-DOS operating systems. They can run hundreds of today's most popular MS-DOS programs.

The multi-tasking capabilities of BTOS let a user run several applications simultaneously. Multiuser features allow work groups to share resources.

BTOS workstations employ a "building block" technique that lets you add more power and more options by simply snapping on new modules. You can custom build the workstations and clusters (LANs) you need to accommodate growth and change.

BTOS LANs can be integrated into ASeries and other networks in many ways:

- The BTE Emulator lets users access ASeries host files and programs.
- OFIS Deskset BTOS products interact with ASeries hosts' OFIS Link systems.
- BTOS workstations can preprocess data destined for transmission to a host-based application.
- BTOS LANs can be peers to ASeries systems in BNAv2 networks; resources can be used by either system.
- OSI and POSIX message handling and file transfer facilities are supported under BTOS with Ethernet, Token-Ring, and TCP/IP communications protocols.
- BTOS coexists with IBM SNA protocols.

The Unisys PW^2 Family of Workstations

Personal Workstation^2 systems provide access to a wide range of business software written for personal computers. Each Unisys PW^2 provides the control and fast response of a PC and the networking capability to share information with other users, larger microcomputers, and mainframes. Some Unisys PW^2 workstations models can run multiple operating systems:

- MS-DOS 4.0 to protect investments in mature applications
- Microsoft OS/2 to run the latest generation of PC applications in a multi-tasking environment
- Microsoft Windows to allow concurrent use of multiple MS-DOS applications
- USERNET^2 to let you connect to servers, locally or remotely
- SCO XENIX to provide UNIX application development and multiuser access (PW^2 Series 500 and 800 only).

The Unisys PW^2 Series 800
The Series 800 models, based on the Intel 80386 microprocessor, are the top performers in the PW^2 Family of Personal Workstations.

These models are designed for use as network file servers for workgroup systems or as powerful, single-user workstations. The PW^2 Series 800 workstations run powerful 32-bit applications such as spreadsheet analysis, database management, process control, engineering design, and desktop publishing.

The Unisys PW^2 Series 500
PW^2 500 models are low-cost workstations based on the innovative Intel 80386SX microprocessor. Efficient design yields about 60 percent more performance than most 10 MHz 80386-based PCs.

The Unisys PW^2 Series 300
The PW^2 300/10 economical workstation uses the Intel 80286 microprocessor. Innovative component integration provides a ten-fold performance advantage over first-generation PCs, yet maintains compatibility with software designed for 8086/8088 based microcomputers.

Unisys T27 Series Terminals

The T27 Series are general-purpose, high-performance terminals. They support up to three separately configurable screen addresses, offering simultaneous connectivity and operations with more than one host application.

A comprehensive multi-window system lets you view up to three separate environments on the screen simultaneously. The system, which offers horizontal window separation, provides both full- and split-screen viewing options with configurable window sizes. The display can be configured to support 40, 80, or 132 characters per line.

Comprehensive Support and Services

Unisys hardware and software for ASeries systems are backed by a worldwide network of well-equipped and highly trained service professionals to provide you service second to none.

We can help you plan and select the right system and software to match your needs. Our installation teams can bring your system on-line quickly and make certain it's operating up to your standards.

Ongoing Unisys support can include software implementation, consulting and development, telephone assistance, on-site help, and remote diagnostics.

As you grow, our experienced computer and industry-specific professionals can recommend enhancements and advise you on the best ways to meet your changing requirements.

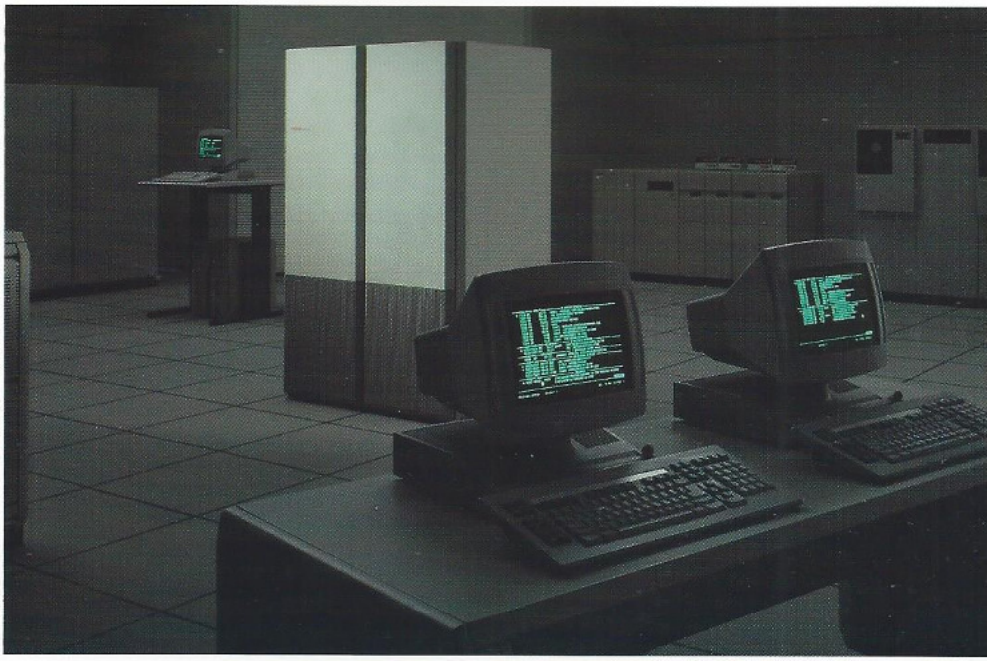
Unisys can provide a service plan that covers both hardware and software — under a single contract. Our service plan lets you choose just the right level of service that fits your needs.

Service and maintenance programs are backed by a worldwide network of customer service centers in 100 countries around the world.

Power Where You Need It

Unisys A16 computer systems are ready and waiting to help you give your enterprise the power where it needs it. The power within the A16 will let you provide you users a higher level of availability than ever before. And the partitionable feature will let you provide your enterprise the power where it needs it most.

Call your Unisys representative today. If you would like to know more about these systems, ask for a copy of the Unisys A16 Computer System "Capabilities Overview."



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