



IBM System/390 Multiprise 3000 Enterprise Server: Cost-Effective Platform

Overview

The IBM S/390® Multiprise® 3000 Enterprise Server enables you to fully exploit the most advanced S/390 applications and expand your overall capacity while reducing operating costs, all at a lower price than existing S/390 Multiprise Servers.

This powerful new addition to the IBM Multiprise family provides e-business processing enhancements including collaborative computing, e-commerce, enterprise resource planning, and application development. The Multiprise 3000 is an ideal platform for developing client/server applications, especially within coupling environments. Replacing existing S/370™ or S/390 processors with a Multiprise 3000 can be implemented because the Multiprise 3000 runs all existing S/390 applications and attaches to a number of I/O devices and control units currently supported by S/390. This cost-effective member of the Multiprise family can act as a server or a client within the LAN/WAN environment. Savings are the direct result of lower processor and DASD maintenance, energy, connectivity, and environmental costs.

The Multiprise 3000 incorporates internal Serial Storage Architecture (SSA) RAID-5 DASD, up to 4 GB of memory, and integrated battery backup units. It features Enterprise Systems Connection (ESCON®) and parallel adapters as well as PCI/ISA slots for connection to a wide variety of peripheral devices. Up to 216 GB of usable DASD resides within the base processor. If additional storage capacity is required, two expansion frames (each up to 288 GB of usable DASD) may be attached.

The Multiprise 3000 supports most current levels of OS/390®, VM/ESA®, and VSE/ESA®. New simplified software pricing is available for the Multiprise 3000. For further details, refer to Software Announcement 299-269, dated September 20, 1999.

Key Prerequisites

The S/390 Multiprise 3000 Server solution is supported by most current levels of OS/390, VM/ESA, and VSE/ESA.

Planned Availability Dates

- September 30, 1999, for the following models:
 - 7060-H30
 - 7060-H50
 - 7060-H70
 - 7060-P30
- October 29, 1999, for the following features:
 - OS/390 Application Base Pre-Load
 - OS/390 Workload Transition Pre-Load
- November 15, 1999, for the following feature:
 - 18.2 GB SSA DASD

At a Glance

Get additional capacity to implement the latest S/390 applications and reduce operating costs with the new, lower-priced IBM S/390 Multiprise 3000 Enterprise Server.

The Multiprise 3000 offers:

- Lower operating costs
- LAN/WAN connectivity as server or client
- Reference publications provided via the Internet
- Internal coupling (IC) channel
- Year 2000 support

The Multiprise 3000 is designed for maximum capacity and flexibility:

- Three easily-configured models with 1, 2, or 4 GB memory
- Internal S/390 I/O and DASD subsystem
- 792 GB of usable internal RAID-5 storage with expansion frames
- 56 ESCON and/or parallel channels with expansion frames
- Industry standard PCI/ISA slots
- Integrated battery backup units

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Description



This cost-effective S/390 server offers significant enhancements to the business enterprise. Its new features include an integrated processor and memory card, internal SSA RAID-5 DASD, industry standard PCI/ISA connections, parallel channel adapters, and ESCON channel adapters. This provides customers with a new S/390 platform to enable their applications, replace their S/370 and S/390 processors, and/or provide application servers in a single system unit.

The S/390 Multiprise 3000 Enterprise Server provides the standard S/390 architecture described in the *ESA/390™ Principles of Operation* (SA22-7201). In addition, the following facilities are supported: Compression, Expanded Storage, Expanded Sorting, Move Page (Facility 2), Access-List-Controlled Protection, Address-Limit Checking, Broadcasted Purging, Cancel I/O, Subspace Group, Compare Until Substring Equal, Incorrect-Length-Indication Suppression, Interpretative Execution, Move Inverse, MVS™ Assists (add Functional Recovery Routine, SVC Assist, Obtain Local Lock, Release Local Lock, Obtain CMS Lock, Release CMS Lock), Program-Event Recording 2, PER Extensions, Private Space, Set Address Space Control Fast, Square Root, Storage-Protection Override, String Instructions, Suppression on Protection, SIE I/O Assist, Called space identification facility, Branch-and-set-Authority Facility, Checksum facility and Compare-and-move-extended facility.

Base Processor and Expansion Frames Configuration, and Features

Integrated in the base processor configuration of the Multiprise 3000 are the following:

- N+1 power
- One processor-memory card
 - A uni-processor, SAP, and 1 GB — Model H30
 - A uni-processor, SAP, and 2 GB — Model H50
 - A dyadic-processor, SAP, and 4 GB — Model H70
- Four PCI adapter slots
- Three ISA adapter slots
- 12 parallel and/or ESCON adapter slots
- Differential SCSI adapter slot for attachments to 3490 Model F01 Tape Drive
- 14 GB of usable emulated DASD
- 16 slots for up to 216 GB of usable DASD
- Integrated 100/10 Mbps PCI Ethernet
- 4-mm DDS-3 DAT tape drive
- One CD-ROM and one diskette drive

Integrated in the first expansion frame configuration of the Multiprise 3000 are the following:

- 20 slots for up to 288 GB of usable DASD
- 16 slots for ESCON and/or parallel channel adapters

Integrated in the second expansion frame configuration of the Multiprise 3000 are the following:

- 20 slots for up to 288 GB of usable DASD

Features available for the Multiprise 3000 are:

- SSA RAID-5 DASD (18.2 GB drives available)
- ESCON Channel Adapters (2 ports per card)
- Parallel Channel Adapters (2 ports per card)
- Integrated Backup Battery
- TKE
- Cryptographic Co-processor
- Hardware Management Console (HMC)
- Token Ring Adapter
- Ethernet Adapter
- WAC RS-232 Adapter
- WAC V.35 Adapter
- WAC X.21 Adapter
- MultiPort Model 2 Adapter
- Differential SCSI Adapter

Note: When all 12 ESCON or parallel slots are occupied by ESCON/parallel, there are only two ISA slots available and no PCI slots available. For each PCI adapter plugged up to a maximum of four, there is a reduction of one ESCON/parallel adapter (each ESCON/parallel adapter has two channels). If the differential SCSI adapter and/or a ISA card (slot 20) is plugged, the number of

ESCON/parallel adapters that can be plugged is reduced by one each.

When the maximum DASD is installed in the base processor frame, you will have 216 GB of usable storage and 72 GB reserved for RAID-5 parity and spare support. In order to obtain more than 216 GB of usable storage, customers should consider attaching expansion frames or other peripheral devices. Each expansion frame may contain 288 GB of DASD. All storage drives may be "hot swapped."

Customers desiring direct access to S/390 DASD may implement this attachment using the ESCON channel and parallel channel adapter. This feature will also permit connection to many other supported I/O devices and control units. The parallel cards permit customers to connect to many types of parallel devices, such as tape media, printers, and communications controllers. Customers should consult with Business Partners to ensure ESCON or parallel channel adapter support is available for the devices which they are considering.

Note: IBM cannot confirm the accuracy of performance, compatibility, or any other claims related to non-IBM products. Questions regarding the capabilities of non-IBM products should be addressed to the suppliers of those products.

Replacement Processor

Users of S/390 general-purpose processors can gain substantial savings by moving to this new, attractively priced technology now. Many customers with existing S/390 hardware and software are participating in the Local Area Network (LAN) environment. The Multiprise 3000 addresses business needs by providing the opportunity to replace these existing systems and to grow in the future, while continuing to use S/390 applications and skills. Instead of porting S/370 applications to a new platform, the Multiprise 3000 allows for easy upgrades to the classic S/390 strengths. Thus, applications do not have to be moved to an entirely new platform lacking the S/390's advantages. In most cases you can continue to connect to existing tapes and printers with the parallel connection, or utilize the ESCON feature to connect to new devices as well as those which could not be connected in the past.

This system is a possible replacement for older IBM S/370 and S/390 processors (43XX, 9371, 9373, 9375, 9377, 9221, 9121, 2003, 3000, some 9021, and some 9672) depending on your requirements. Many customers in this group continue to run older, non-ESA software. By replacing S/370 systems with the Multiprise 3000, you can take advantage of the latest technology, including S/390 ESA software, while retaining current skills. The S/390 software provides complete Year 2000 support. Non-ESA software and S/370 mode are not supported.

Substantial savings may be achieved through lower maintenance costs on both the processor and DASD, lower energy costs, lower connectivity costs, and lower environmental costs. These potential benefits are derived from integrated disk characteristics with their high-reliability, low-power requirements, LAN connectivity, and CMOS technologies.

Application Server

Application servers have a variety of client/server usages. Some examples are:

- A distributed server with additional or legacy applications

- A distributed server with a single function, such as file serving or print serving
- A server packaged with a solution provider's application (S/390)

This application server is ideal for a department or small business, because it can run S/390 applications for the Multiprise 3000 unchanged. These offerings allow remote locations to run (some unattended), while providing remote users with data and consistent business applications across the enterprise. In addition, these application servers solve business needs by bringing specific workloads into LAN environments. The results include improved productivity, local control, and reduced telecommunication costs.

The Multiprise 3000 can participate as a server or client in an existing LAN with access to host data. As a client, it can seamlessly participate in any LAN environment. As a server, the Multiprise 3000 can run the appropriate LAN functions associated with S/390, depending on customer workload. This choice allows customers flexibility and availability while also satisfying the need to integrate business solutions with consistent applications.

Application Development

The S/390 Multiprise 3000 Server is a cost-effective platform used to develop client/server applications in the S/390 environment. This processor is ideal for application development teams in coupling environments (IC). It exploits the productivity of S/390 development tools and provides immediate access to the real S/390 architecture for testing and debugging applications.

Developers can use S/390 3GL and 4GL tools and object-oriented technology to shorten the development cycle for S/390 environments. When the Multiprise 3000 becomes a dedicated resource for development and testing, it can use the same tools as the host, thereby increasing the availability of the host production system, eliminating dependencies on the host, and reducing risks to the production system.

The Multiprise 3000 is an ideal platform for identifying and developing necessary changes without impacting the host system. The time-of-day (TOD) on the Multiprise 3000 is easily changed. The result is a dedicated platform for date-reliant testing of system applications.

Year 2000

This product does not have date dependencies and is therefore Year 2000 ready.

Euro Currency

This product is not impacted by euro currency.

Product Positioning

The S/390 Multiprise 3000 Enterprise Server provides greater performance than the existing S/390 Multiprise Server at a lower price.

For new workloads, many customers will receive great benefits from the installation of a S/390 Multiprise 3000 Enterprise Server. They will be able to reduce the operating costs of their S/390 environment while simultaneously gaining the additional capacity they require to start implementing new and exciting applications now available on the S/390 platform.

Capacity Planning for Existing and New Workloads

The Multiprise 3000 provides extra capacity to grow with new workloads. The Multiprise 3000 offers double the capacity at the manufacturer's suggested list price when compared to previous equivalent systems. This means that the Multiprise 3000 can support your existing environment, with capacity increases due to normal business growth, plus have additional capacity available for new workloads.

For example, if a customer has a Multiprise 2000 Model 207 supporting their current environment of IMS™ work executing under OS/390, the new Multiprise 3000 Model H30 (the entry of the three models) can support the existing IMS environment with a 10% growth rate over three years, plus have additional capacity available to support 500 Web connections per second.

The following are representative examples of the Multiprise 3000 capabilities.

Existing Environment	New Environment
VSE Executing CICS(R) Work Utilizing a 9221-211	H30 Executing PLUS up to All of the 60 Baan Existing Work Reference Users
VM Work Utilizing a 9221-211	H50 Executing PLUS up to All of the 640 Lotus Notes(R) Existing Work Active Users
OS/390 Executing IMS Work Utilizing a 9672-R52	H70 Executing PLUS up to All of the 270 SAP Existing Work Stress Test Users

For information related to your specific environment visit the easy to use Multiprise 3000 Web capacity planning tool at:

<http://www.ibm.com/s390/multiprise3000/>

IBM ResourceLink

IBM ResourceLink is new way of providing information to customers and Business Partners. It will provide all of the hardware and software information for the Multiprise 3000 Enterprise Server — including planning, education, product documentation, product service, discussion, two-way communication with IBM, and a project workroom. It will have links to PartnerCommerce, which is an e-commerce Web-enabled application that allows Business Partners to place orders over the Web.

The advantage of using IBM ResourceLink to provide information to our customers is the personalization and customization based on each customer order. ResourceLink supplies only information that customers need to plan for and use their IBM products. The profile area allows customers to request information about products that can be used with their existing IBM systems.

After placing an order, the customer is given a user ID and password to access a customized site. Business Partners are given access to a customized site based on the hardware and software ordered. Once the order is placed, both customers and Business Partners can administer access to members of their organizations.

To check out IBM ResourceLink refer to:

<http://www.ibm.com/servers/resourcelink>

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IBM US Announcement Supplemental Information

September 20, 1999

Publications

The following technical publications are available on IBM Resource Link under Publications:

<http://www.ibm.com/servers/resourcelink>

These will not be shipped in hardcopy with the product:

Title	Order Number
API User's Guide	SC28-8141
Link Fault Isolation	SY22-9533
Hardware Management Console Operations Guide	GC38-0602
Emulated Input/Output User's Guide and Reference	GC38-0610
Internal Disk Subsystem Reference Guide	SA22-1025
Internal Disk Subsystem User's Guide	SA22-1026
Internal Tape Drive Operations Guide	SA24-3500
IOCP User's Guide	GC38-0401
Maintenance Information for Fiber Optic Links	SY27-2597
Maintenance Information for Desktop Consoles	GC38-3115
Managing Your Processors	GC38-0452
Parts Catalog	S123-7471
Problem Analysis Guide	SY20-8801
PR/SM™ Planning Guide	GA22-7236
Standalone IOCP User's Guide	GC38-0458
Support Element Operations Guide	GC38-0607
System Overview	GA22-1029

The following publications are shipped with the product:

Title	Order Number
Safety Inspection	SY20-8802
Safety Notices	SY20-8803
Installation Manual	SY24-6154
Service Guide	SY24-6155

Technical Information

Specified Operating Environment

Physical Specifications

- Width: 520 mm (20.0 inches)
- Depth: 1,110 mm (43.0 inches)
- Height: 819 mm (31.5 inches)
- Weight: 155 kg maximum, 100 kg base (340 pounds maximum, 220 pounds base)

Note: This 340-pound system unit is fully configured with 16 DASD, integrated battery backup, CD-ROM, floppy drive, N+1 power, DAT tape drive, and all PCI slots filled. In the base configuration, there are only three 9 GB DASD, N+1 power, CD-ROM, floppy drive, and the DAT tape drive.

Standards: This system supports or complies with the following protocols:

- Peripheral Component Interconnect (PCI) specification 2.1
- Ethernet (10BASE-T)
 - IEEE 802.2 LAN MAC Protocols
 - IEEE 802.3 CSMA/CD Protocols
 - Ethernet V.2 Protocols
- Ethernet (100BASE-TX)
 - IEEE 802.3u CSMA/CD Protocols
- Token Ring
 - IEEE 802.2 LAN MAC Protocols
 - IEEE 802.5 MAC Protocols

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Operating Environment

- Temperature: 10° to 40°C (50° to 104°F)
- Relative Humidity: 8% to 80%
- Wet Bulb: 27°C (80.6°F) (Class C)
- Electrical Power: 1.32 kVA
- Capacity of Exhaust: 250 cfm/min, 500 cfm/min maximum
- Acoustical Noise Emission Level: Category 2E, LWAU (Operating) = 6.8B, LWAU (Idling) = 6.6B

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- Leakage and Starting Current: 200 milliamps/25 Ampere (peak)

Hardware Requirements

- S/390® Multiprise® 3000 Server

The Multiprise 3000 brings significant enhancements to the business enterprise segment of the server market. Integrating the processor card, internal SSA DASD, PCI/ISA connections, parallel channel adapters, and ESCON® channel adapters provides customers with a new S/390 platform for enabling their applications, replacing S/370™ processors, and providing application servers and/or new entry servers. Here are the highlights of the base processor frame:

- N+1 power.
- 1 GB to 4 GB of memory.
- Four PCI adapter slots.
- Three ISA adapter slots.
- 12 parallel and/or ESCON adapter slots.
- Differential SCSI adapter slot for attachments to 3490 Model F01 Tape Drive.
- 16 slots for up to 216 GB of usable DASD.
- Integrated 100/10 Mbps PCI Ethernet.
- 4-mm DDS-3 DAT tape provided only for software installation and service. S/390 PTFs are shipped on this medium.
- One CD-ROM and one diskette drive provided only for software installation and service.

Integrated in the first expansion frame configuration of the Multiprise 3000 are the following:

- 20 slots for up to 288 GB of usable DASD
- 16 slots for ESCON and/or parallel channel adapters

Integrated in the second expansion frame configuration of the Multiprise 3000 are the following:

- 20 slots for up to 288 GB of usable DASD

Features available for the Multiprise 3000 are:

- SSA RAID-5 DASD (18.2 GB drives available)
- ESCON Channel Adapters
- Parallel Channel Adapters
- Integrated Backup Battery
- TKE

- Triple DES
- Cryptographic Processor
- Hardware Maintenance Console (HMC)
- Token Ring Adapter
- Ethernet Adapter
- WAC RS-232 Adapter
- WAC V.35 Adapter
- WAC X.21 Adapter
- MultiPort Model 2 Adapter
- Differential SCSI Adapter

- Relevant Planning Information

- The following DASD volume types and devices are supported:
 - CKD — 3330, 3350, and 3375 devices.
 - ECKD™ — 3390 Models 1, 2, 3, and 9, 3380 Models E, J, and K, and 9345 devices.
 - FBA support for device types 3370, 3310, 0671-4, 9332, 9335, 9336-10, and FB-512 is available only in an emulated mode using the three 9G drives supporting the SE.
- In the base processor unit, there are up to 12 slots available for ESCON and parallel adapters. Four of the 12 slots for ESCON and parallel may be occupied by standard PCI cards. One slot may be occupied by a standard ISA card. If one installs either an ISA or PCI adapter the number of ESCON/parallel cards that may be installed is reduced by the number of PCI/ISA cards installed in the designated ESCON and/or parallel plug locations. The maximum number of Token Ring adapters that may be installed is four and the maximum of Ethernet is three. It must be noted that the base configuration already contains one integrated Ethernet adapter. The combination of Ethernet and Token Ring adapters may not exceed four adapters. If the differential SCSI adapter and/or an ISA card (in slot 20) is plugged, the number of ESCON/parallel adapters that can be plugged is reduced by one each.
- Internal Disk uses a disk cache with a user selectable size from 32 MB to 2 GB. This cache is allocated from the S/390 memory on the processor memory card.
- When considering DASD planning, please note the following:

	Emulated I/O	Base Frame	Expansion 1	Expansion 2
Min/Max Drives	3/3	0/16	0/20	6/20
Min/Max GB				
— Physical	27GB/27GB	0GB/291GB	0GB/364GB	109GB/364GB
— Usable	14GB/14GB	0GB/216GB	0GB/288GB	72GB/288GB
1st Increment	3 x 9.1GB	6 x 18.2GB	6 x 18.2GB	6 x 18.2GB
Increments	NA	5 x 18.2GB	7 x 18.2GB	7 x 18.2GB

Note: (1) There is no requirement to place any DASD in expansion frame #1. Some customers may expand into this frame due to channel requirements. The minimum represents the initial increment when expanding into frame #2. (2) With the exception of the Min/Max GB lines, the amount of DASD described is physical, not usable, capacity.

- In planning the number of HMC features, it should be noted that they require the dedicated use of a PCI adapter. It should be noted that the HMC features require the dedicated use of one or two PCI adapters. These are included in the total system limit of four PCI adapters.
- Subject to availability of ISA slots, there are planning groundrules that must be observed. The maximum number of MultiPort Model 2 cards that may be installed is two. Wide Area Connection cards (WAC) with a V.35, RS-232, or X.21 EIB may be installed in each of the three ISA slots. One of the three ISA slots is designated as a potential ESCON or parallel adapter slot.
- Refer to IBM Corporate Bulletin C-B 2-4700-009, dated 1992-08, when ordering and planning the installation of power line cords for the Multiprise 3000. The *Sales Manual* outlines the available cords with figure numbers listed in the corporate bulletin.
- A printer does not come with the Multiprise 3000. S/390 channel-attached printers are supported using either the S/390 Parallel Channel Adapter or the S/390 Serial (ESCON) Channel Adapter. LAN printers are supported via TCP/IP attachment.
- If you require the attachment of a SCSI tape drive, the IBM 3490-F01 36/18 track cartridge tape drive may be attached using a differential SCSI adapter feature. When this adapter is installed, the number of ESCON/parallel adapters is reduced by one.
- Internal coupling (IC) channels are supported.
- Communications with the host system can be established via SNA or TCP/IP connections.
- Emulated 3174 and 3274 is available only in a non-SNA DFT mode.

Software Requirements

- OS/390®, VM/ESA®, and VSE/ESA® operating systems and their associated S/390 products are available for the S/390 Multiprise 3000 Server. S/370 mode is not supported.
 - OS/390 Versions 1.3, 2.4, 2.5, 2.6, 2.7, and 2.8
 - VM/ESA Versions 2.2, 2.3, and 2.4 with PTFs UQ90016, UQ90017, UQ90019, UQ90020, UM29412, UM29417, and UM29422
 - VSE/ESA Versions 2.2, 2.3, and 2.4 with PTF for APAR DY45179
- The best S/390 software load option for the end-user customer is determined by the customer and Solution Provider.
 - Using an IBM service
 - Customized Solutions
 - System Pacs
 - Availability Center service
 - Using a Business Partner — Solution Provider's service
- Year 2000 Ready

The Multiprise 3000, when used in accordance with its associated documentation, is capable of correctly processing, providing, and/or receiving date data within and between the twentieth and twenty-first centuries, provided that all products (for example,

hardware, software, and firmware) used with the product properly exchange accurate date data with it.

The following are Year 2000 ready operating systems:

- OS/390 1.3, 2.4, 2.5, 2.6, 2.7, and 2.8
- VM/ESA 2.2, 2.3, and 2.4
- VSE/ESA 2.2, 2.3, and 2.4
- Software Pre-Loads

When ordering OS/390 Application Base Pre-Load (feature number 7000) or OS/390 Workload Transition Pre-Load Offering (feature number 7001), order the following software products and feature numbers. For further details about the OS/390 Workload Transition Offering, refer to Software Announcement 299-271, dated September 20, 1999.

 - 5647-A01 Feature 5802, OS/390 V2R6 Base (U.S. English)
 - 5647-A01 Feature 5600, OS/390 V2R6 Release Identifier
 - 5647-A01 Feature 5031, OS/390 V2R6 Security Server Feature
 - 5655-A46, Java for OS/390 (JDK 1.1.6)
 - No program number, Service Update Facility (SUF 2.1.2 —a service tool)

The following NLS features are included, but not enabled.

- 5647-A01 Feature 6728, Brazilian Portuguese
- 5647-A01 Feature 6794, Canadian French
- 5647-A01 Feature 6701, Danish
- 5647-A01 Feature 6746, Dutch
- 5647-A01 Feature 6755, French
- 5647-A01 Feature 6704, German
- 5647-A01 Feature 6713, Italian
- 5647-A01 Feature 6768, Japanese
- 5647-A01 Feature 6094, Upper Case English
- 5647-A01 Feature 6749, Korean
- 5647-A01 Feature 6737, Norwegian
- 5647-A01 Feature 6716, Spanish
- 5647-A01 Feature 6740, Swedish
- 5647-A01 Feature 6725, Swiss German
- 5647-A01 Feature 6743, Simplified Chinese
- 5647-A01 Feature 6752, Traditional Chinese

Reliability, Availability, and Serviceability

The S/390 Multiprise 3000 Enterprise Server offers high levels of reliability, availability, and serviceability (RAS) with the following capabilities.

Reliability

- High-reliability technology components
- Parts integration to reduce the number of parts in machine

Availability

- Enhanced Processor Design

The Central Processor contains dual Instruction/Execution Units that operate simultaneously. Results are compared, and in the event of a miscompare, Instruction Retry is invoked. This design simplifies checking, and virtually eliminates CP failures due to soft errors.

- Fault Tolerant Design

Fault tolerant design allows hardware recovery to be performed, in most cases, totally transparent to customer operation and eliminates the need for a repair action or defers a repair action to a convenient time scheduled by the customer.

- Error Correction Code (ECC)

Memory error checking and correction code detects and corrects single bit errors. Also, because of the memory structure design, errors due to single memory chip failure are corrected.

- Dynamic Memory Sparing

Memory cards are equipped with spare memory chips. During normal operations, the system monitors and records accumulation of failing bits in memory that are corrected by Error Correction Code (ECC). Before a failure threshold is reached, which could result in an error that can not be corrected, the system invokes a spare memory chip in place of the one with the accumulated failed bits. This action may prevent an unscheduled outage for replacement of the memory card.

- LPAR Dynamic Storage Reconfiguration (DSR)

PR/SM LPAR storage configuration can occur allowing nondisruptive add or removal to any partition with a cooperating guest.

- Enhanced LPAR Dynamic Storage Reconfiguration

This capability removes the restriction of storage reconfiguration only being possible from an adjacent and above logical partition.

- Subsystem Storage Protect

Subsystem storage protection and subspace group facility support, for use with CICS/ESA®, prevents application software from overwriting CICS® system soft control blocks and address spaces.

- Scrubbing Storage background scrubbing provides continuous monitoring of storage for correction of detected faults before the storage is used.

- SSA RAID-5 Integrated DASD with Concurrent Maintenance

SSA's bi-directional loop architecture provides data protection for critical applications by ensuring that a single cable failure will not prevent access to data. Should an SSA loop be broken, the RAID adapter continues to access devices on the loop segments. Once the path is restored, the adapter automatically reconfigures the system to return to normal operation. Should a disk fail, the concurrent maintenance capability allows the disk to be removed without disrupting access to data on the rest of the loop. Online rebuild which takes place in the background starts immediately when a device fails, using the hot spare drive which is available in each frame (base configuration and expansion frames). Once the failing

part has been replaced, the replacement HDD becomes the new hot spare drive for this frame.

- Predictive Failure Analysis®

The disk continuously performs predictive failure analysis (PFA) 3 and signals impending hardware failures to the SE, which can initiate service action requests. This allow one to replace a device before the failure occurs.

- End-to-End Disk Data Protection

When software writes a record, a corresponding CRC pattern is generated and recorded on disk next to the data. When the record is read again the CRC is used to validate the record data.

- Dual Power Feeds

The power system offers dual primary (AC) power feeds. Each feed is electrically isolated and enables redundant power paths.

- N+1 Power Thermal Subsystem with Concurrent Maintenance

The power subsystem is designed with N+1 redundancy. Failure of a power thermal component does not cause a system outage. Concurrent replacement of a failed component results in an avoidance of a planned outage.

- Internal Battery Feature (IBF)

The optional Internal Battery Feature provides backup input power. The feature is packaged internal to the machine. It can be used to provide additional protection from a power disruption.

- Concurrent Hardware Maintenance

Concurrent hardware maintenance allows the replacement of a failing unit concurrently with system operation. This function enhances the processor availability, since no outage is required for the repair action. Concurrent maintenance capability exists on the following:

- Power Elements
 - Thermal Elements
 - Integrated DASD
 - Support Element DASD
 - Hardware Management Console

- Concurrent Licensed Internal Code (LIC) Patch

Concurrent Code Patch allows the activation of a patch concurrent with system operation, thereby increasing the availability of the processor by reducing scheduled outages for LIC maintenance. This capability exists for code for the following elements:

- CP
 - IC
 - CFCC
 - SAP
 - LPAR
 - Power/thermal
 - ESCON channels
 - Parallel channels
 - Hardware management console

Not all patches are nondisruptive; some patches require a complete system outage to apply and activate while others may only require a Power on Reset to activate.

Serviceability: Standard features that provide a high level of serviceability include:

- Automatic error detection and fault isolation concurrent with system operation
- Automatic remote support capability
- High degree of concurrent maintenance capability in hardware and code
- N+1 power status indicator

Limitations: FBA DASD devices are only supported in emulated mode using the SE three 9G DASD drives. 14 GB of the DASD is customer usable capacity.

Tape read backwards commands are not supported on emulated devices like the 3480 on 4-mm DAT.

S/370 mode is not supported.

Emulated 3174 and 3274 is supported only in a non-SNA DFT mode.

Planning Information

Cable Orders: No cables are required.

Security, Auditability, and Control

The customer is responsible for evaluation, selection, and implementation of security features, administrative procedures, and appropriate controls in application systems and communications facilities.

Terms and Conditions

This product is available for purchase under the terms of the IBM Customer Agreement.

IBM hardware products are manufactured from new parts, or new and used parts. In some cases, the hardware product may have been previously installed.

Regardless, IBM warranty terms apply.

IBM Credit Corporation Financing: Yes

Warranty Period

S/390 Software Licensing: IBM System/390® program products that run on the IBM S/390 Multiprise 3000 Server are licensed under the terms and conditions of the ICA (Z125-4575) or IBM Customer Agreement — License (Z125-4593) and the Attachment for IBM GOLC S/390 License (Z125-3901-42).

- Customers who purchase a new version of S/390 software can run previous versions at no additional charge during a migration period of up to one year. Refer to Marketing Announcement 394-198, dated September 13, 1994, for additional information on single-version charging for S/370 and S/390 software.

Note: The S/390 system is licensed in the country of acquisition. If the S/390 system is transferred to another country, the S/390 software must be relicensed in the new country and the appropriate fees paid. These agreements must be signed and returned to IBM by the customer prior to placement of any order.

Warranty Period

- Multiprise Server (7060) and Multiprise Server Features: One year (24 hours a day, seven days a week)
- S/390 Software: Until program service is no longer available (End of Service —EOS)

Warranty Service: IBM On-Site Repair (IOR)

Maintenance Services (ESA): For ServiceElect (Z125-5510) and ServiceSuite (Z125-5745) Statements of Work

Warranty Service Upgrade: None

Maintenance Services: IBM On-Site Repair (IOR) 24 hours a day, seven days a week, same-day response

Rental Service: Not applicable

Usage Plan Machine: No

IBM Hourly Service Rate Classification: Three

Volume Maintenance Option: No

Mid-Range System Option: No

Corporate Service Option: No

Extended Maintenance Option: No

Central Facility Maintenance Service (CFMS) Option: No

When a type of service involves the exchange of a machine part, the replacement may not be new, but will be in good working order.

Rental Offering: No

Field-Installable Features: Yes

Model Conversions: Yes

Customer Setup: No

Graduated Charges: No

Licensed Internal Code: IBM Licensed Internal Code provided with the S/390 Multiprise 3000 Server is licensed for use by a customer on a specific machine, designated by serial number, under the terms and conditions of the IBM Agreement for Licensed Internal Code.

Educational Allowance: None

Charges

Product Charges

Prices are available upon request.

Description	Machine Type	Model	Feat Number	Chge/ No Chge	MMMC	Init/ MES	Re- moval
S/390 Multiprise 3000	7060	H30		C	M	Initial	C
S/390 Multiprise 3000	7060	H50		C	M	Initial	C
S/390 Multiprise 3000	7060	H70		C	M	Initial	C
H30 Processor with Crypto			0003	C		Initial	C
H30 Processor w/o Crypto			0013	C		Initial	C
H50 Processor with Crypto			0005	C		Initial	C
H50 Processor w/o Crypto			0015	C		Both	C
H70 Processor with Crypto			0007	C		Initial	C
H70 Processor w/o Crypto			0017	C		Both	C
P30 Processor with Crypto			0008	C		Initial	C
P30 Processor w/o Crypto			0018	C		Both	C
H30 Memory Unit, 1 GB			1624	C		Initial	C
H50 Memory Unit, 2 GB			1648	C		Both	C
H70 Memory Unit, 4 GB			1696	C		Both	C
Crypto Hdw Installed			0800	C		Both	C
Crypto Hdw Not Installed			0808	C		Both	C
DES with 1024 bit KM			0804	C		Both	C
DES with 1024 bit KM and TKE			0805	C		Both	C
TDES with 1024 bit KM			0824	C		Both	C
TDES with 1024 bit KM and TKE			0825	C		Both	C
Smart Card Reader			0807	C		Both	C
TKE Hardware (Tken Rng)			0806	C		Both	C
TKE Hardware (Ethernet)			0809	C		Both	C
18.2 GB SSA DASD			2109	C	M	Both	C
9.1 GB SSA DASD			2110	C	M	Both	C
ESCON Adapter Card			1540	C		Both	C
Parallel Adapter Card			1541	C		Both	C
Integrated Battery Backup			2500	C		Both	C
SSA Extender Card			2104	C		Both	C
SSA Module Card			2106	C		Both	C
SSA Adapter Card (SE DASD)			2107	C		Both	C
SSA Adapter Card (DASD)			2108	C		Both	C
Service Element			2701	C		Initial	C
Monitor 19in, Model P92			2805	C		Both	C
Monitor 21in, Model P202			2806	C		Both	C
4-MM DDS-3 DAT Tape Drive			2600	C		Initial	C
CD-ROM			2620	C		Initial	C
3.5-inch Floppy Disk Drive			2640	C		Initial	C
Base Frame			3000	C		Initial	C
DASD-I/O Expansion Frame			3001	C		Both	C
DASD Expansion Frame			3002	C		Both	C
DASD Cage			3050	C		Both	C
I/O Cage			3051	C		Both	C
Media Cage			3052	C		Initial	C
FIBB Card			3075	C		Both	C
HMC 19in Console Display			6090	C		Both	C
HMC 21in Console Display			6091	C		Both	C
PC Unit (Current)			0041	C		Both	C
PC Unit (Follow-on)			0061	C		Initial	C
HMC WAC Card			0038	C		Both	C
HMC Token Ring Card			0023	C		Both	C
HMC 3270			0026	C		Both	C
Token Ring MAU			6080	C		Both	C
Ethernet Hub			6081	C		Both	C
Token Ring Adapter			4000	C		Both	C
Ethernet Adapter			4001	C		Both	C
MultiPort Model 2 Adapter			4002	C		Both	C

Description	Machine Type	Model	Feat Number	Chge/ No Chge	MMMC	Init/ MES	Re- moval
WAC RS-232			4003	C		Both	C
EIB RS-232			4004	C		Both	C
WAC V.35			4005	C		Both	C
EIB V.35			4006	C		Both	C
WAC X.21			4007	C		Both	C
EIB X.21			4008	C		Both	C
Differential SCSI Adapter			4009	C		Both	C
Bridge Card			4010	C		Initial	C
RS-422 Adapter			4011	C		Initial	C
PCI Air Flow			4013	C		Both	C
ISA Air Flow			4014	C		Both	C
Modem 110V, Saudi Arabia			2940	C		Both	C
Modem 220V, Saudi Arabia			2941	C		Both	C
OS/390 Application Base			7000	C		Initial	
Pre-Load							
OS/390 Workload Transition			7001	C		Initial	
Pre-Load							
US/CN 110v 1800mm/5.9ft			2550	NC		Both	
US/CN 110v 4300mm/14.1ft			2551	NC		Both	
US/CN 220v 1800mm/5.9ft			2552	NC		Both	
US/CN 220v 4300mm/14.1ft			2553	NC		Both	
US/CN 110v 1800mm/5.9ft			2554	NC		Both	
US/CN 110v 4300mm/14.1ft			2555	NC		Both	
US/CN 220v 1800mm/5.9ft			2556	NC		Both	
US/CN 220v 4300mm/14.1ft			2557	NC		Both	
China 4300mm/14.1ft			2558	NC		Both	
Europe 4300mm/14.1ft			2559	NC		Both	
Denmark 4300mm/14.1ft			2560	NC		Both	
Australia 4300mm/14.1ft			2561	NC		Both	
South Africa 4300mm/14.1ft			2562	NC		Both	
UK 4300mm/14.1ft			2563	NC		Both	
Japan 4300mm/14.1ft			2564	NC		Both	
Switzerland 4300mm/14.1ft			2565	NC		Both	
Italy 4300mm/14.1ft			2566	NC		Both	
Israel 4300mm/14.1ft			2567	NC		Both	
Argentina 4300mm/14.1ft			2568	NC		Both	
Display, Northern Hemisphere			9930	NC		Both	
Display, Southern Hemisphere			9931	NC		Both	
US English			2924	NC		Both	
France			2928	NC		Both	
German			2929	NC		Both	
Spanish — Non Spain			2930	NC		Both	
Spanish			2931	NC		Both	
Italian			2932	NC		Both	
Canadian French			2935	NC		Both	
Portugal			2978	NC		Both	
Brazilian Portuguese			2979	NC		Both	
UK English			2980	NC		Both	
Norwegian			2983	NC		Both	
Sweden/Finland			2987	NC		Both	
Netherlands			2988	NC		Both	
Belgian French			2989	NC		Both	
Denmark			2993	NC		Both	
Swiss French, German			2997	NC		Both	
Luxembourg			5560	NC		Both	
Iceland			5561	NC		Both	
China			5562	NC		Both	
S/390 Application			7003	NC		Initial	
Development Pre-Load							

Model Conversion Purchase Prices

Model From	Model To	Model Conversion Purchase Price
H30	H50	Prices are available upon request.
H50	H70	
H30	H70	

Parts removed or replaced become the property of IBM and must be returned.

Feature Conversion Purchase Price

The following conversion applies to 7060 Models H30, H50, H70, and P30.

Feature From	To	Returned Parts	Continuous Maintenance	Feature Conversion Purchase Price
3002	3001	No	No	Price is available upon request.

Customer Financing: IBM Global Financing offers attractive financing to credit-qualified commercial and government customers and Business Partners in more than 40 countries around the world. IBM Global Financing is provided by the IBM Credit Corporation in the United States. Offerings, rates, terms, and availability may vary by country. Contact your local IBM Global Financing organization. Country organizations are listed on the Web at:

<http://www.financing.ibm.com>

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Year 2000 Readiness Disclosure

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