Hardware Announcement
July 26, 2005

IBM TotalStorage SAN16B-2 fabric switch introduces 4 Gbps 16-port Fibre Channel switch designed for improved port density and performance

Overview

The IBM TotalStorage® SAN16B-2 fabric switch (2005-B16) joins the SAN32B-2 switch and SAN256B director as a member of the IBM TotalStorage SAN b-type 4 Gbps switch family. These products are designed to enhance storage networking with improved affordability, higher throughput, and increased port density when compared to prior IBM TotalStorage SAN b-type family products.

The SAN16B-2 is designed to provide:

- 4 Gbps port-to-port throughput with auto-sensing capability for connecting to existing 1, 2, and future 4 gigabit host servers, storage, and switches
- Up to 16 nonblocking ports with full-duplex throughput at 1, 2, or 4 Gbps link speeds
- High availability features: automatic path routing and many nondisruptive firmware upgrades
- Scalable ports on demand: 8-, 12-, or 16-ports to accommodate a broad range of connectivity solutions in 1U form factor for enhanced port density and space utilization
- Scalability from small to mid-range SAN fabric environments
- Open Fibre Channel Protocol (FCP) support
- Full compatibility with existing TotalStorage SAN b-type switches (IBM 2005, 2109, and 3534)
- Base B16 model firmware features: Advanced Zoning and Web Tools
- Optional features: additional Port Activation, Fabric Watch, Advanced Security, Enhanced ISL Trunking, and Performance Monitoring
- Support for 2 Gbps long wave and 4 Gbps short wave Small Form Factor Pluggable (SFP) optic transceivers

Key prerequisites

For a list of supported servers and storage systems, refer to the **Description** section.

For specific support dates, configuration options, server models, operating systems levels, and attachment capabilities, visit

http://www.ibm.com/totalstorage/san/b-type

Planned availability date

August 26, 2005

At a glance

The IBM TotalStorage SAN b-type switch family, which supports Fibre Channel connectivity for servers and storage, is expanded with the IBM TotalStorage SAN16B-2 fabric switch. It offers:

- 4 Gbps industry-standard Fibre Channel (FC) switch capability for systems that support 4 Gbps throughput
- Scalable ports on demand: 8-, 12- or 16-ports to accommodate small to mid-range Storage Area Network (SAN) fabric environments
- 1U form factor to enhance port density and space usage
- High availability design with automatic path routing and nondisruptive firmware upgrades
- Base switch firmware that includes Advanced Zoning and Web Tools
- Optional features, including additional 4-Port Activation, Full Fabric, Fabric Watch, Advanced Security, Enhanced Inter-Switch Link (ISL) Trunking, and Performance Monitoring

For ordering, contact:
Your IBM representative, an IBM Business Partner, or the Americas Call Centers at

800-IBM-CALL Reference: YE001

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Description

The IBM TotalStorage SAN16B-2 fabric switch (2005-B16) supports 4 Gbps Fibre Channel capabilities for systems that support 4 Gbps throughput. This improved performance is designed to support storage networking demands to help improve throughput and enhance security.

The SAN16B-2 (2005-B16) switch provides:

- 16 Fibre Channel ports that:
  - Provide multiple simultaneous connections, each capable of throughput speeds of 1, 2, or 4 Gbps with a maximum latency of 2 microseconds
  - Auto-sense and self-negotiate to the highest speed (1, 2, or 4 gigabits) supported by the server, storage, or switch
  - Self-configure as F_ports, FL_ports, or E_ports (Full Fabric feature required for E_ports)
- Operation with SFP optical transceivers that:
  - Support up to 4 Gbps speeds with 4 Gbps short wave SFPs for distances up to 150 meters
  - Support 1 and 2 Gbps speeds with 2 Gbps long wave SFPs for distances up to 10 km
  - Can be used in any combination of 1, 2, or 4 Gbps short wave and long wave SFPs
  - Have increased ordering and deployment flexibility because SFPs are not included within the base SAN16B-2 product but are ordered separately with a minimum order of 8 SFPs required with the initial model B16 switch purchase, and additionally in increments of four SFPs, up to a total of 16 SFPs
- 1U form factor designed to improve port density and rack space utilization. The SAN16B-2 fabric switch can also be ordered with country-specific power cords for tabletop use.
- Scalable ports on demand (8-, 12-, or 16-ports) to accommodate a broad range of connectivity solutions for a wide variety of host and storage types (optional Port Activation feature available for upgrade to 12 and 16 ports).
- Compatibility with IBM TotalStorage SAN b-type switch family (IBM 2005, 2109, and 3534).
- Auto Fabric discovery that allows external host and storage systems to discover other supported SAN-enabled systems that are connected to the fabric.
- Fabric Services such as Advanced Zoning and Web Tools are included in the base.

Optional features

B16 4-Port Activation (#7515)

- This option enables upgrade from 8 to 12 to 16 ports.
- You may optionally purchase port activation for ports 8 to 11 (first four-port increment), and ports 12 to 15 (second four-port increment).

B16 Full Fabric Activation (#7450/#7451): Full Fabric Activation is required to enable E_Ports. The switch, by default, cannot be connected to another switch until Full Fabric is installed. Without the license, the switch can be directly connected to hosts and storage devices. Full Fabric is a prerequisite to Advanced Security Activation and Performance Bundle Activation.

B16 Fabric Watch (#7550): Fabric Watch is designed to enable real-time proactive awareness of the health, performance, and security of each switch and automatically alert network managers to problems in order to help avoid costly failures.

- Real-time tracking of numerous fabric and switch elements
- Automatic event notifications when switch and fabric elements exceed thresholds
- Security, availability, and congestion monitoring thresholds and alerts

B16/B32 Advanced Security Activation (#7554): Advanced Security Activation is designed to enable policy-based security mechanisms integrated within Fabric Operating System V2.6, and later. To enable advanced security capabilities, all switches within the IBM SAN Switch Fabric must be configured with their respective fabric operating system version (2.6, or later) before activating the Advanced Security feature license key. When activated across the IBM SAN Switch Fabric, the Advanced Security Activation feature is designed to support the following security capabilities:

- Centralized security management (trusted switches)
- Fabric-wide security policies to control access
- Port-level access control
- Switch-level access control
- Management access controls (Telnet, SNMP, HTTP, and API)
- Encryption of management data such as passwords
- Strong and nonreputable authentication between switches

B16/B32 Performance Bundle Activation-Plant (#7555): Performance Bundle Activation is plant order only and supports both Enhanced Inter-Switch Link (ISL) Trunking and Performance Monitoring capabilities.

Performance Monitoring helps identify end-to-end bandwidth usage by host/target pairs and is designed to provide information for capacity planning.

Trunking is designed to enable Fibre Channel packets to be efficiently distributed across multiple Inter-Switch connections (links) between two SAN b-type fabric switches, while preserving in-order delivery. Both SAN b-type fabric switches must have ISL Trunking activated.

Enhanced ISL Trunking is supported between two SAN16B-2, SAN32B-2, or SAN256B 4 Gbps models and enables Fibre Channel packets to be distributed across up to eight 4 Gbps-capable ISLs for a combined bandwidth of up to 32 Gbps. When connecting the 4 Gbps-capable models to legacy 2 Gbps-capable b-type fabric switch models, ISL Trunking is supported with link speeds operational at 2 Gbps and Fibre Channel packets distributed across up to four ISLs for a combined bandwidth of up to 8 Gbps. Full Fabric Activation (#7450 or #7451) is required for ISL support with the B16 Performance Bundle Activation.

B16/B32 Performance Monitoring Activation-Field (#7556): Performance Monitoring Activation-Field is field order only and helps to identify end-to-end bandwidth usage by host/target pairs and is designed to provide information for capacity planning.

B16/B32 Enhanced Trunking Activation-Field (#7557): Enhanced ISL Trunking Activation is field order only.

Trunking is designed to enable Fibre Channel packets to be efficiently distributed across multiple Inter-Switch connections (links) between two SAN b-type fabric switches, while preserving in-order delivery. Both SAN b-type fabric switches must have ISL Trunking activated.

Enhanced ISL Trunking is supported between two SAN16B-2, SAN32B-2, or SAN256B 4 Gbps models and enables Fibre Channel packets to be distributed across up to eight 4 Gbps-capable ISLs for a combined bandwidth of up to 32 Gbps. When connecting the 4 Gbps-capable B16 model to legacy 2 Gbps-capable b-type fabric switch models, ISL Trunking is supported with link speeds operational at 2 Gbps and Fibre Channel packets distributed across up to four ISLs for a combined bandwidth of up to 8 Gbps.

Supported servers and storage systems

The IBM TotalStorage SAN16B-2 fabric switch is designed to support Fibre Channel connectivity for the following:

Servers

- IBM eServer® pSeries® and selected RS/6000® servers
- IBM eServer iSeries™ and selected AS/400® servers
- IBM eServer xSeries® and selected Netfinity® servers
- Other Intel™-based servers with Linux™, Microsoft™ Windows™ 2000, or Windows 2003
- Selected Sun and HP servers

Storage software

- IBM TotalStorage SAN Volume Controller (SVC)
- IBM TotalStorage SAN File System (SFS)

Storage systems

- IBM TotalStorage DS8000
- IBM TotalStorage DS6000
- IBM TotalStorage DS4000
- IBM TotalStorage Enterprise Storage Server™
- IBM TotalStorage FAStT Family of Storage Servers
- IBM TotalStorage 3580, 3588, 3590, and 3592 Tape Drives
- IBM TotalStorage 3494, 3582, 3583, and 3584 Tape Libraries
- IBM TotalStorage 3581 Tape Autoloader
- IBM TotalStorage 3584 High Availability Frame Model HA1
- Other selected storage systems

For specific support dates, configuration options, server models, operating systems levels, attachment capabilities, and throughput connectivity speeds, visit

http://www.ibm.com/totalstorage/san/b-type

Accessibility by people with disabilities

The following features support use by people with disabilities: Ports and connectors support connection of industry-standard devices.

Section 508 of the U.S. Rehabilitation Act

The IBM TotalStorage SAN16B-2 fabric switch is capable as of August 26, 2005, when used in accordance with IBM′s associated documentation, of satisfying the applicable requirements of Section 508 of the Rehabilitation Act, provided that any assistive technology used with the product properly interoperates with it. A U.S. Section 508 Voluntary Product Accessibility Template (VPAT) can be requested via IBM′s Web site at

http://www-3.ibm.com/able/product_accessibility/index.html

Business Partner information

If you are a Direct Reseller - System Reseller acquiring products from IBM, you may link directly to Business Partner information for this announcement. A PartnerWorld ID and password are required (use IBM ID).

BP Attachment for Announcement Letter 105-257

https://www.ibm.com/partnerworld/mem/sla.jsp?num=105-257

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IBM US Announcement Supplemental Information

July 26, 2005

Publications

The following publications are shipped with the product.

Title	Order number
IBM TotalStorage(R) SANB16–2 Installation, Service, and User's Guide	GC26–7753
IBM eServer(R) Translated Safety Notices	G229–9054
IBM TotalStorage SAN b–type 2005 Statement of Limited Warranty	GC26–7754

Additional copies of individual publications are available at

http://www.ibm.com/totalstorage/san/b-type

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For details on available IBM Business Continuity and Recovery Services, contact your IBM representative or visit

http://www.ibm.com/services/continuity

For details on education offerings related to specific products, visit

http://www.ibm.com/services/learning/index.html

Select your country, and then select the product as the category.

Technical information

Physical specifications: The IBM TotalStorage SAN16B-2 fabric switch (2005-B16) can be configured for either rack-mount or tabletop use. For tabletop use, you must order the required country-specific power cords.

Enclosure: 1U, 19-in.-EIA™ compliant, with non-port to port airflow.

	2005–B16 (1U)
Height	4.29 cm (1.69 in)
Width	42.85 cm (16.87 in)
Depth	30.73 cm (12.10 in)
System weight	3.99 kg (8.8 lb) without media

To support installability and serviceability in non-IBM industry-standard racks, review the installation planning information for any product-specific installation requirements.

Operating environment

- Temperature
  - Operating: -10° to 40°C (14 to 104°F)
  - Non-operating: -50° to 100°C (-58 to 212°F)
- Humidity operating: 20% to 85%, noncondensing at 40 C (104 F)
- Non-operating: 10% to 85%, noncondensing at 70 C (158 F)
- Operating altitude: Up to 3,000 m (9,800 ft)
- Storage altitude: Up to 12 km (32,200)
- Operating Shock: 20G, 6 ms half-sine
- Non-operating Shock: 15G, 12-18 ms trapezoid
- Vibration operating: 0.5 g sine, 0.4 grms random, 5 to 500 Hz
- Non-operating: 2.0 g sine, 1.1 grms random 5 to 500 Hz
- Airflow high-speed: 37 cu. ft./min (CFM)
- Airflow low-speed (65% speed): 18 CFM
- Noise goal: < 53 dB
- ac input nominal: 100 to 240 V ac, 2.0 A
- Frequency: 47 to 63 Hz
- Power consumption: 54 nominal, 66W maximum

EMC conformance

- CFR 47 Subpart B of Part 15 of the FCC Rules, Class A level
- CISPR22 Class A
- EN55022 Class A
- VCCI Class A ITE
- AS/NZS 3548 Class A
- CNS 13438 Class A

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- EMC Directive (89/336/EEC) for CE Marking in European Union

Product safety/Country testing/Certification:

- Underwriters Laboratories, UL60950
- Canadian Standards Association, CSA60950
- TUV Rheinland of North America, EN60950
- Nemko, EN60950
- Low Voltage Directive (73/23/EEC) for CE Marking in European Union

Hardware requirements: Specific details on supported operating systems, servers, and devices, storage products attachability, SAN connectivity products, and configuration options are available at

http://www.ibm.com/totalstorage/san/b-type

Software requirements: Specific details on supported operating system releases are available at

http://www.ibm.com/totalstorage/san/b-type

Compatibility

Rack requirements: An industry-standard 19-inch rack, or equivalent, with adequate space available (1 EIA unit for the SAN16B-2 switch) and sufficient power and cooling is required to support the SAN16B-2 switch. Included with the switch is a single 240 V power cord for attachment to the power distribution unit of the rack.

To assure installability and serviceability in non-IBM industry-standard racks, review the installation planning information for any product-specific installation requirements.

Non-rack-mounted installation is supported. You must order the required country-specific power cord.

Planning information

Cable orders

Fiber optic cable: A fiber optic cable is required for attaching the IBM TotalStorage SAN16B-2 fabric switch to the host system adapters or other storage area Fibre Channel components. The cable can be customer supplied or ordered with the 2005-B16 in the lengths available. The attaching fiber cable must be 50.0/125 micrometers for distances up to 300 meters at 2 Gbps speed or 150 meters at 4 Gbps. The attaching fibre cable must be 62.5/125 micrometers for distances up to 175 meters at 2 Gbps speed or 70 meters at 4 Gbps. The connection is an LC connector type.

Description	Feature number
Fiber Cable LC/LC 1m multimode	5601
Fiber Cable LC/LC 5m multimode	5605
Fiber Cable LC/LC 25m multimode	5625
SC/LC Coupling Cable 1m	5701
LC/SC Coupling Cable 2m	5702
9 Micron Fibre Cable 31m, singlemode SC/LC	5720
9 Micron Fibre Cable 31m, singlemode LC/LC	5721
9 Micron Fibre Cable 2m, singlemode SC/LC	5722

In many situations, the required lengths and installation of fiber optic cables will be unique to each customer's configuration and facility specifications. IBM Network Integration and Deployment Services, offered by IBM Global Services, can provide assistance for these unique cabling and installation requirements. Several cable features are available to accommodate simple installations where the Fibre Channel components and attaching subsystems are within specified distances.

Installability: Hardware installation time for the IBM TotalStorage SAN16B-2 switch is estimated at less than one hour.

Security, auditability, and control

This product uses the security and auditability features of host hardware, host software, or application software to which it is attached.

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

Volume orders: Contact your IBM representative.

IBM Global Financing: Yes

Warranty period: One year

Warranty service: If required, IBM provides repair or exchange service depending on the types of warranty service specified for the machine. IBM will attempt to resolve your problem over the telephone, or electronically via an IBM Web site. You must follow the problem determination and resolution procedures that IBM specifies. Scheduling of service will depend upon the time of your call and is subject to parts availability. If applicable to your product, parts considered Customer Replaceable Units (CRUs) will be provided as part of the machine's standard warranty service.

Service levels are response-time objectives and are not guaranteed. The specified level of warranty service may not be available in all worldwide locations. Additional charges may apply outside IBM's normal service area. Contact your local IBM representative or your reseller for country- and location-specific information. This product is covered by the following types of service.

Customer Replaceable Unit Service: IBM provides replacement CRUs to you for you to install. CRU information and replacement instructions are shipped with your machine and are available from IBM upon your request. CRUs are designated as being either a Tier 1 or a Tier 2 CRU.

Tier 1 CRU: Installation of Tier 1 CRUs is your responsibility. If IBM installs a Tier 1 CRU at your request, you will be charged for the installation.

Tier 2 CRU: You may install a Tier 2 CRU yourself or request IBM to install it, at no additional charge.

Based upon availability, CRUs will be shipped for next-business-day delivery. IBM specifies, in the materials shipped with a replacement CRU, whether a defective CRU must be returned to IBM. When return is required, return instructions and a container is shipped with the replacement CRU; you may be charged for the replacement CRU if IBM does not receive the defective CRU within 30 days of your receipt of the replacement.

The following parts have been designated as Tier 1 CRU parts: IBM TotalStorage SAN16B-2 fabric switch.

Warranty service upgrades and maintenance service options: During the warranty period, warranty service upgrades provide an enhanced level of on-site service for an additional charge. A warranty service upgrade must be purchased during the warranty period and is for a fixed term (duration). It is not refundable or transferable and may not be prorated. If required, IBM will provide the warranty service upgrade enhanced level of on-site service acquired by the customer. Service levels are response-time objectives and are not guaranteed.

IBM will attempt to resolve your problem over the telephone or electronically by access to an IBM Web site. You must follow the problem determination and resolution procedures that IBM specifies. Scheduling of service will depend upon the time of your call and is subject to parts availability.

On-site service: IBM will repair the failing machine at your location and verify its operation. You must provide a suitable working area to allow disassembly and reassembly of the IBM machine. The area must be clean, well-lit, and suitable for the purpose. The following service selections are available as warranty upgrades for your machine type.

- 9 hours per day, Monday through Friday, excluding holidays, 4-hour average, same-business-day response
- 24 hours per day, 7 days a week, 4-hour average response
- 24 hours per day, 7 days a week, 2-hour average response

Customer Replaceable Units (CRUs) may be provided as part of the machine′s standard warranty CRU Service except that you may install a CRU yourself or request IBM installation, at no additional charge, under one of the on-site service levels specified previously. For additional information on the CRU service, refer to warranty information.

Maintenance services: If required, IBM provides repair or exchange service depending on the types of maintenance service specified for the machine. IBM will attempt to resolve your problem over the telephone or electronically via an IBM Web site. You must follow the problem determination and resolution procedures that IBM specifies. Scheduling of service will depend upon the time of your call and is subject to parts availability. Service levels are response-time objectives and are not guaranteed. The specified level of maintenance service may not be available in all worldwide locations. Additional charges may apply outside IBM′s normal service area. Contact your local IBM representative or your reseller for country- and location-specific information. The following service selections are available as maintenance options for your machine type.

On-site service: IBM will repair the failing machine at your location and verify its operation. You must provide suitable working area to allow disassembly and reassembly of the IBM machine. The area must be clean, well-lit, and suitable for the purpose.

- 9 hours per day, Monday through Friday, excluding holidays, next-business-day response
- 9 hours per day, Monday through Friday, excluding holidays, 4 hour average response
- 24 hours per day, 7 days a week, 4-hour average response
- 24 hours per day, 7 days a week, 2-hour average response

Customer Replaceable Units: If your problem can be resolved with a CRU (for example, keyboard, mouse, speaker, memory, or hard disk drive), and depending upon the maintenance service offerings in your geography, IBM will ship the CRU to you for you to install. CRU information and replacement instructions are shipped with your machine and are available from IBM upon your request.

Based upon availability, CRUs will be shipped for next-business-day delivery. IBM specifies, in the materials shipped with a replacement CRU, whether a defective CRU must be returned to IBM. When return is required, return instructions and a container is shipped with the replacement CRU, and you may be charged for the replacement CRU if IBM does not receive the defective CRU within 30 days of your receipt of the replacement.

Customer Replaceable Units (CRUs) may be provided as part of the machine′s standard maintenance service except that you may install a CRU yourself or request IBM installation, at no additional charge, under any of the on-site service levels specified previously.

Usage plan machine: No

IBM hourly service rate classification: Two

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.

Field-installable features: Yes

Model conversions: No

Machine installation: Customer setup. Customers are responsible for installation according to the instructions IBM provides with the machine.

Graduated Program License Charges apply: No. This product does not contain licensed internal code or licensed machine code.

Educational allowance: A reduced charge is available to qualified education customers. The educational allowance may not be added to any other discount or allowance.

Description	Machine type/model	Feature number	Purchase price(1)	Field install only	Plant install only
SAN16B–2	2005–B16		$3,450	N	Y
GSA and/or Title with U.S. Gov.		0980	N/C	N	Y
2 Gbps LW SFP Transceiver		2220	1,099	N	N
2 Gbps LW SFP Trans 4 Pack		2224	1,575	N	N
4 Gbps SW SFP Transceiver		2410	150	N	N
4 Gbps SW SFP Trans 4–Pack		2414	550	N	N
Fiber Cable LC/LC 1m multimode		5601	70	N	N
Fiber Cable LC/LC 5m multimode		5605	105	N	N
Fiber Cable LC/LC 25m multimode		5625	210	N	N
SC/LC Coupling Cable 1m		5701	199	N	N
LC/SC Coupling Cable 2m		5702	199	N	N
9 Mic Fibre Cab 31m,sm SC/LC		5720	100	N	N
9 Mic Fibre Cab 31m,sm LC/LC		5721	100	N	N
9 Mic Fibre Cab 2m,sm SC/LC		5722	100	N	N
B16 Full Fabric Act — Plant		7450	950	N	Y
B16 Full Fabric Act — Field		7451	1,260	Y	N
B16 4–Port Activation		7515	1,570	N	N
B16 Fabric Watch		7550	2,280	N	N
B16/B32 Adv Security Act		7554	4,800	N	N
B16/B32 Perf Bundle — Plant		7555	7,110	N	Y
B16/B32 Perf Monitor — Field		7556	2,370	Y	N
B16/B32 Enh Trunking — Field		7557	4,740	Y	N
Desktop Install Power Cord		9205	N/C	N	Y
Power Cord 125V, 10A, 2.8 m Group 1		9800	N/C	N	Y
Power Cord 250V, 10A, 2.8 m Group 2		9820	N/C	N	Y
Power Cord 250V, 10A, 2.8 m Group 3		9825	N/C	N	Y
Power Cord 250V, 10A, 2.8 m Group 4		9829	N/C	N	Y
Power Cord 250V, 10A, 2.8 m Group 5		9830	N/C	N	Y
Power Cord 250V, 10A, 2.8 m Denmark		9821	N/C	N	Y
Power Cord 250V, 10A, 2.8 m Israel		9827	N/C	N	Y
Power Cord 250V, 10A, 2.8 m Switzerland		9828	N/C	N	Y
Power Cord 250V, 10A, 2.8 m Australia, New Zealand		9831	N/C	N	Y
Power Cord 250V, 10A, 2.8 m Thailand		9833	N/C	N	Y
Power Cord 250V, 10A, 2.8 m Uruguay, Argentina, Paraguay		9834	N/C	N	Y
Power Cord 250V, 6A, 2.8 m Peoples Republic of China		9840	N/C	N	Y
Power Cord 125V, 10A, 1.8 m U.S./Chicago		9986	N/C	N	Y

[1] Purchase price reflects the purchase price for a single unit acquired from IBM and is subject to change without notice. This price shall not limit, in any way, IBM resellers' ability to set their own price.

Alternative and maintenance service

Alternative service (ICA Warranty service upgrades)

Machine type/model	IOR 9 x 5	IOR 24 x 7
2005–B16	$200	$320

Annual minimum maintenance charges

Maintenance charges

Machine Type/model	MES removal	IOR 9 x 5	IOR 24 x 7
2005–B16	N	$347	$485

For ServiceElect (ESA) Maintenance Service Charges, contact IBM Global Services at 888-IBM-4343 (426-4343).

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