



# IBM Introduces Nine New Models of the IBM @server z800 Family of Servers

## Overview

The newest additions to the IBM @server z800 family of servers consist of eight general-purpose models and a Coupling Facility only model.

The z800 family uses key functional characteristics of IBM @server z900 in a package that delivers excellent price/performance for those requiring zSeries functionality with total capacity less than that currently offered by the z900. The z800 is intended to provide a transition into the new world of e-business servers exploiting z/Architecture, and is intended to take full advantage of the IBM Framework for e-business. These new models of the z800 family, along with the IBM @server zSeries Offering for Linux announced on January 29, 2002, which uses the z800 OLF model as its foundation, and the new z/OS™.e operating system software being announced today, are intended to satisfy mission-critical enterprise server requirements for e-business transaction processing and data management with the same qualities of service as the IBM @server z900 while helping customers to exploit the fast-growing world of e-business and new workload data management applications on the IBM @server z800. These new models of the z800 family, when used in concert with the IBM Framework for e-business, are designed to help you build the innovative infrastructure required for the transition into the new world of e-business.

z800 is:

- An ideal lower-entry-point, new workload platform for those who want the zSeries qualities of service using Linux or z/OS.e
- Ideal for VSE customers who have growing traditional S/390® workloads, have growing new Linux workloads due to e-business applications or server consolidation, or are migrating to z/OS
- Ideal for z/VM™ customers who want to consolidate Linux workloads onto a single zSeries server or who require support for varied operating system environments
- An excellent choice to meet the application development needs of those who require a 64-bit target platform

A new optional offering introduced January 29, 2002, IBM Network Integration and Deployment Services for zSeries Fiber Cabling, is also available on z800 servers. The zSeries Fiber Cabling Service is intended to provide personalized, scalable, flexible cabling options for the z800 to support your current system environment, with the future in mind.

Also being announced today is zSeries Entry Licensing Charge (zELC), a new, attractive software pricing structure for the z800.

## Key Prerequisites

Refer to the **Description** section.

## At a Glance

The IBM @server zSeries 800 family is an attractively priced solution for those requiring zSeries functionality with total capacity less than that currently offered by the z900. It offers:

- Eight general-purpose models from an entry-level sub-uniprocessor up to a quadratic processor (4+1)
- A Coupling Facility only model on which one to four engines can be enabled
- IBM @server zSeries Offering for Linux
- zSeries Fiber Cabling Service

### For ordering, contact:

Your IBM representative, an IBM Business Partner, or IBM Americas Call Centers at

**800-IBM-CALL**

Reference: YE001

## Planned Availability Date

March 29, 2002

**MES Planned Availability Dates** are as follows:

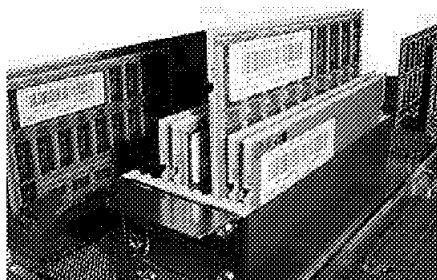
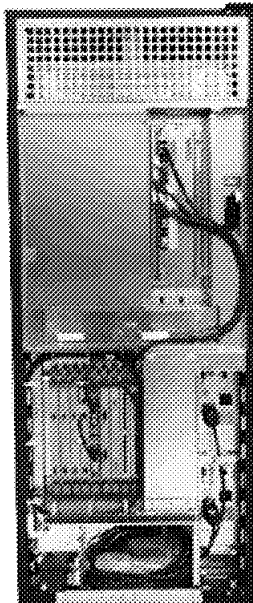
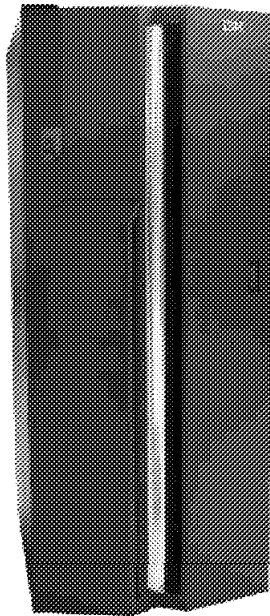
- Features — June 30, 2002
- Vertical Upgrades — September 30, 2002

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## Description

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### Key Prerequisites

- Refer to the **Software Requirements** section of this announcement.

- Customers who are still using parallel-attached devices must obtain a parallel channel converter box such as:

- The IBM 9034, which may be available through IBM Global Financing (IGF).
- A third-party parallel channel converter box such as the Optica 34600 FXBT. For more information about Optica offerings, contact Optica at:

<http://www.opticatech.com/>

- A Systems Assurance Pre-Installation Review is required for the first installation in a customer location. For details, refer to the *z800 Systems Assurance Product Review (SAPR) Guide* (SA01-007), available via Resource Link™:

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

### The z800

The IBM @server z800 is a zSeries branded system that is intended to provide:

- Growth and continuity for traditional zSeries installations requiring zSeries functionality with total capacity less than that currently offered by the IBM @server z900
- Compatible functions and characteristics, such as reliability, availability, and serviceability (RAS), comparable to the IBM @server z900
- zSeries coupling and clustering capabilities
- Improved I/O capabilities and capacity as compared to the Multiprise® 3000
- Continuity with existing applications and a bridge to new workloads that use IBM middleware and the IBM Framework for e-business

The z800 introduces zSeries 64-bit capability to customers requiring zSeries functionality with total capacity less than that currently offered by the IBM @server z900.

The z800 offers:

- Simple setup
- A single self-contained frame package
- Ease of installation and operation
- Components and functions common with the z900
- RAS features comparable to those of the z900
- Functional similarity to the z900 at a lower cost

### Performance for Your e-business Advantage

The IBM @server z800 brings 64-bit architecture capability and key functional characteristics of the IBM @server z900 to customers requiring zSeries functionality with total capacity less than z900.

The IBM @server z/800 combined with z/OS.e is intended to bring increased flexibility, choice, and capacity to you for adding new workloads and for running a mix of new and traditional work. A few examples of the potential capacity increases available to you are:

- The z/800 Model 001 is expected to support up to 25% more SAP throughput or up to 25% more Lotus Notes® users as compared to the G5 9672 Model T16.
- The z/800 Model 001 is expected to support up to 25% more throughput in Web-based transactions as compared to the G5 9672 Model T16. IBM's @server

z/800, with its z/Architecture, is expected to enable additional transactions to be executed, and, with the workload manager part of z/OS.e or z/OS in combination with balanced hardware, it is also expected to be well suited to contain and manage the spikes generated by Web transactions.

64-bit architecture, compared with the architecture available on many of the systems currently in use in this performance range, should offer improvements beyond those stated below for the processor comparisons. Not all comparisons are listed here. For more detailed information, including Large System Performance Reference (LSPR) information, contact your IBM representative.

When comparing the z800 family to many of the currently used systems in the same performance category, the following performance improvements may be possible:

- Improvements in batch elapsed time through the use of FICON™ Express
- Performance improvements for data compression and Crypto functions

**Performance Processor Comparison Estimates with OS/390® Version 2 Release 10:** Compared to some of the 9672 Generation 4 servers, the z800 server is expected to offer the following performance advantage:

2066-0A1	1.1 — 1.4	times 9672-R15
2066-0B1	1.6 — 2.0	times 9672-R15
2066-0C1	1.7 — 2.4	times 9672-R15
2066-0A2	1.9 — 2.4	times 9672-R25
2066-0A2	1.3 — 1.7	times 9672-R35

Relative to the following 9672 G5 models, the expected performance of the selected z800 server models is:

2066-0A1	0.9 — 1.0	times 9672-RA6
2066-0B1	1.2 — 1.4	times 9672-RA6
2066-0C1	1.1 — 1.3	times 9672-R16
2066-001	1.4 — 1.7	times 9672-T16
2066-0A2	1.0 — 1.3	times 9672-R26
2066-002	0.9 — 1.2	times 9672-R36
2066-003	1.0 — 1.3	times 9672-R46
2066-004	1.1 — 1.3	times 9672-R56

Relative to the following MP3000 servers, the expected performance ratios to selected z800 server models is:

2066-0A1	1.2 — 1.5	times 7060-H30
2066-0B1	0.9 — 1.1	times 7060-H50
2066-0A2	1.1 — 1.3	times 7060-H70

The above performance estimates are Internal Throughput Rate Ratios (ITRR) based on measurements and projections using standard IBM benchmarks in a controlled environment and are subject to change without notice. The actual throughput that any user will experience will vary depending upon considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve throughput improvements equivalent to the performance ratios stated here. Such performance estimates are provided "AS IS" and no warranties or guarantees are expressed or implied by IBM. Software licenses that are based on machine performance will be billed based on these estimates until such time that IBM determines and publishes final performance measurements, at which time appropriate billing adjustments may be made as determined by IBM.

For more detailed performance information, including Large System Performance Reference (LSPR) information, contact your IBM representative.

## Technical Description/High-Level Design

The z800 is a stand-alone single-frame package, designed such that all of the system configurations fit into one frame. The z800 frame holds the following subsystems:

- Processor Subsystem
- I/O Subsystem
- Power, Packaging, and Cooling Subsystem
- Service Element Subsystem

**Processor Subsystem:** The Processor Subsystem for the z800 is provided on one unique building block, the Basic Processor Unit (BPU) card, which is similar to the processor card in the Multiprise 3000. The processor MCM carries five Processor Unit chips, memory, and optional Cryptographic Co-processors.

**I/O Subsystem:** The I/O Subsystem of the z/800 supports the new I/O features common with the z/900 and provides a plugging capability for up to 16 I/O Books integrated in the frame.

- Channels: 16-Port ESCON, FICON Express
- OSA-Express, Gb Ethernet, Fast Ethernet, Token Ring, 155-ATM
- PCI Cryptographic Coprocessor (PCI-CC), and PCI Cryptographic Accelerator (PCI-CA)
- Coupling links: ISC-3 (CFP)

The system provides hot plug and concurrent upgrade/repair capabilities for these attachments, just as in the z900. FICON Express hardware provides native FICON or FICON Bridge support.

**Power Packaging and Cooling (PPC) Subsystem:** The PPC Subsystem provides the mechanical, power, and cooling support for the z800 system as a dense, cost-efficient, self-contained package for entry offerings.

**Service Element (SE) Subsystem:** The SE Subsystem is based on IBM's standard SE design of the z900 server family, also packaged on a ThinkPad® inside the frame. Just like the z900, two SEs are standard on the z800 and the z800 system requires a connection to a Hardware Management Console. The code package includes a Repair & Verify package with online guided repair procedures.

## Functions and Features: The IBM zSeries 800

The following table describes the content of the eight z800 general-purpose models including, by model, the number of:

- Processor Units (PUs)
- Central Processors (CPs)
- System Assist Processors (SAPs)
- Optional Internal Coupling Facilities (ICFs)
- Optional Integrated Facility for LINUX features (IFLs)
- Spare Processor Units (Spares)
- Available engines for Capacity Upgrade on Demand (CUoD)
- Available engines for Capacity Back Up (CUBU)

Each model has a mandatory quantity of CPs, SAPs, and spare PUs assigned. Any remaining PUs may be assigned to optional functions such as optional ICFs, IFLs, CUoD, or CBU.

## Processor Unit Usage

Model	CPU	PU	ICF/ IFL	SAPs	CBU/ CUoD Engines Avail	Maximum Spares if NO CBU/CUoD
Mod 0A1	1	5	0	1	0-2	3
Mod 0A1	1	5	1	1	0-1	2
Mod 0A1	1	5	2	1	0	1
Mod 0B1	1	5	0	1	0-2	3
Mod 0B1	1	5	1	1	0-1	2
Mod 0B1	1	5	2	1	0	1
Mod 0C1	1	5	0	1	0-2	3
Mod 0C1	1	5	1	1	0-1	2
Mod 0C1	1	5	2	1	0	1
Mod 001	1	5	0	1	0-2	3
Mod 001	1	5	1	1	0-1	2
Mod 001	1	5	2	1	0	1
Mod 0A2	2	5	0	1	0-1	2
Mod 0A2	2	5	1	1	0	1
Mod 0A2	2	5	2	1	0	0
Mod 002	2	5	0	1	0-1	2
Mod 002	2	5	1	1	0	1
Mod 002	2	5	2	1	0	0
Mod 003	3	5	0	1	0-1	1
Mod 003	3	5	1	1	0	0
Mod 004	4	5	0	1	0	0

The z800 0CF has a mandatory number of SAPs and Spare PUs assigned, as illustrated in the table below. Any remaining PUs may be assigned to optional functions such as optional spares, CBU, or CUoD.

### Processor Unit Usage Chart for z800 0CF

Model/Feature Number	Number of Engines	PU	SAPs	Spares
0CF/3601	1	5	1	3
0CF/3602	2	5	1	2
0CF/3603	3	5	1	1
0CF/3604	4	5	1	0

**ESAME 64-bit Architecture:** ESAME is a 64-bit architecture mode that is a superset of ESA/390. The ESAME architecture was first exploited in the z900 and is now available to customers requiring zSeries functionality with total capacity less than that currently offered by the z900.

ESAME has:

- 64-bit general registers.
- New 64-bit integer instructions. Many ESA/390 instructions with 32-bit operands have new 64-bit and 32-to-64-bit analogs.
- New 64-bit branch instructions. 64-bit addressing is supported for both operands and instructions.
- 64-bit address generation. ESAME provides 64-bit virtual addressing in an address space, and 64-bit real addressing. Addressing is expanded from 2 gigabytes to 16 exabytes.
- Exploitation of access registers to allow use of 2K multiple 64-bit address spaces.
- 64-bit control registers. ESAME control registers can specify regions or segments, or can force virtual addresses to be treated as real addresses.

- An expanded prefix area, from 4K to 8K bytes.
- New instructions that provide quad word storage consistency.

The 64-bit I/O architecture offers an Indirect Address List, which allows all programs to designate data addresses for I/O. Use of 64-bit operands and general registers for all I/O instructions is added. Gigabit Ethernet architecture is expanded to allow 64-bit Queued I/O queuing structures, in addition to the 64-bit Indirect Addressing List for data addresses for I/O. IEEE Floating Point architecture adds 12 new instructions for 64-bit integer conversion. The Coupling architecture allows CFCC to drive the ISC3 and ICB3 channels and allows full CFCC 64-bit addressing. 64-bit addressing CFCC can be loaded into VM guest storage. The 64-bit SIE architecture allows an ESAME host to have an ESA/390 or ESAME guest. Zone Relocation is expanded to 64-bit for LPAR and z/VM. Use of 64-bit operands and general registers for all Crypto Coprocessor instructions and PCI Crypto instructions is added.

## Hardware Offering Assumptions

**Multi Chip Module (MCM):** The MCM Part Number is fully populated with five Processor Units. Model granularity is delivered via Licensed Internal Code Control Code (LICCC). The largest model (4+1) does not include a spare PU, similar to G5 and G6 offerings but different than the z900.

**Memory:** Minimum physical memory is 8 GB with additional offerings of 16 GB, 24 GB, and 32 GB in 8 GB increments. The z800 also contains one keystore DIMM, which will support all memory configurations. Each DIMM pair is a Field Replaceable Unit (FRU).

**Cryptography (Crypto):** The Crypto coprocessor hardware is optional on the z800. Two Crypto chips (packaged as SCMs) can be plugged onto the processor card. The Crypto SCMs are FRUs which can be plugged in the field. The PCI-Crypto cards, PCI-CC and PCI-CA, are available on all eight general-purpose models. PCI-CA only is available on the Linux only model (0LF). The Crypto coprocessor is a prerequisite for the PCI-CC and PCI-CA.

Balanced utilization of all hardware cryptographic engines is the key to the performance achievements of zSeries servers. z/OS transparently routes requests for cryptographic services to an appropriate, available engine and in the case of Secure Sockets Layer (SSL) transactions, cryptographic requests are load-balanced across all available engines, taking maximum advantage of zSeries scalability.

z800 cryptographic functions are intended to include the full range of cryptographic operations used for e-business, e-commerce, and financial institution applications.

**Configuration Capabilities:** The Channel Subsystem provides six 1 gigabyte/second STI links for I/O and Coupling Facility connectivity. Of these six I/O domains, four can have their Gigabyte STI links be multiplexed to four 333 megabyte/second I/O slots. These 16 I/O slots are intended to provide ample I/O connectivity capabilities. Each of these slots can drive one of the new I/O features common with the z/900 (15-ESCON, FICON Express, OSA-E channels, and so on) such that 240 ESCON channels can be provided. The remaining two I/O domains can be used to drive ICB Peer CF links (CBP), IC links (ICP), and other devices that require CHPID numbers.

**Geographically Dispersed Parallel Sysplex™ (GDPS™):** The IBM @server z800 is intended to support the GDPS in the same way the IBM @server z900 does.

In e-business, two of the most stringent demands for survival are continuous availability and near-transparent disaster recovery (D/R). Systems that deliver continuous availability combine the characteristics of high availability and continuous operations to deliver high levels of service (24x7x52). To attain the highest levels of continuous availability and near-transparent D/R, the solution should be based on geographical clusters and data mirroring. These technologies are the backbone of the GDPS solution.

Since IBM Parallel Sysplex® clustering technology enables resource sharing and dynamic workload balancing, enterprises are now able to dynamically manage workloads across multiple sites to achieve high levels of availability. GDPS complements a multisite Parallel Sysplex implementation, and is intended to provide a single, automated solution to dynamically

manage storage subsystem mirroring (disk and tape), processors, and network resources to allow a business to attain continuous availability and near-transparent business continuity (disaster recovery) without data loss. GDPS is intended to minimize and potentially eliminate the impact of any failure, including disasters or a planned outage. It is intended to provide the ability to perform a controlled site switch for both planned and unplanned site outages, with no data loss, maintaining full data integrity across multiple volumes and storage subsystems and the ability to perform a normal Data Base Management System (DBMS) restart — not DBMS recovery — at the opposite site. GDPS is application independent (covers your complete application environment) and supports both the synchronous (PPRC) as well as the asynchronous (XRC) forms of remote copy.

GDPS is intended to provide the following functions:

- PPRC and XRC configuration management, which automates the management of the remote copy infrastructure
- Planned reconfiguration support, which automates operational tasks from a single point of control
- Unplanned reconfiguration support, which automates recovery from a z/OS, OS/390, software subsystem, processor, Coupling Facility, storage subsystem, or site failure
- Automatic enablement of Capacity Back Up (CBU)
- FlashCopy exploitation
- Coupled XRC (CXRC) support
- Peer to Peer Virtual Tape Server support
- Management of Linux for zSeries images

For a more detailed description of GDPS, refer to the white paper available at:

<http://www.ibm.com/server/eserver/zseries/psol/library.html>

**Coupling Considerations:** The z800 system includes the technology intended to support Parallel Sysplex environments. If z800 systems are coupled with other z800 or z900 systems in a Parallel Sysplex cluster, it is recommended that Peer Mode ISC or ICB (CFP, CBP) links be configured for the coupling links.

Coupling connections to non-z/Architecture systems such as G5 and G6 servers can be provided via the ISC-3 (CFP) links configured as Compatibility Mode (CFS, CFR) links, if necessary. There will be no ICB Compatibility Mode links offered.

The z800 also supports the Internal Coupling links (ICP) for connectivity to Coupling Facilities within the same server.

The required external time reference (ETR) for Parallel Sysplex is provided via an ETR connection to a Sysplex Timer® via an OSC/ETR card (which contains one port per card). This connection is included in the optional zSeries Fiber Cabling Service.

The OCF Coupling Facility models of the z800 are intended to initially support the Coupling Facility Control Code (CFCC) level 12, which includes 64-bit addressing, thus eliminating the 2 GB control store limit.

**Clustering Architecture — The Intelligent Resource Director:** Several architecture features are provided that enable the z/OS Workload Manager (WLM) to interact with the I/O Supervisor and with the channel subsystem which

is intended to provide more efficient use of the system's resources. These new facilities allow the central processors, channels, and associated DASD I/O resources to be managed by z/OS WLM on a policy basis for the LPARs within the cluster. They are intended to provide z/OS WLM with the ability to dynamically interact with PR/SM™ in order to control the use of CPU and channel path resources within the Intelligent Resource Director. Additionally, they allow z/OS WLM to prioritize the execution of queued I/O operations at the channel subsystem.

**LPAR CPU Management:** This architecture facility is intended to provide z/OS WLM with the ability to dynamically alter the logical partition (LP) weights for each of the logical partitions within the LPAR cluster, thereby influencing PR/SM to help each logical partition receive the percentage of shared CPU resources necessary to meet its workload goals.

**Dynamic Channel Path Management (DCM):** These interfaces allow z/OS WLM to dynamically reconfigure channel path resources within the cluster and are intended to help ensure that a business-critical application's I/O processing requirements, necessary to meet its workload goals, are not being delayed due to the unavailability or overutilization of channel path resources.

**Channel Subsystem Priority Queuing:** This facility provides z/OS's WLM with the ability to prioritize and thereby influence the channel subsystem's execution of queued I/O requests. The benefit is intended to ensure that the most important I/O across all LPARs will be handled before less important I/O requests that are waiting to use some channel.

**Performance:** The performance design of the z/Architecture helps to enable the entire server to support a new standard of performance for all applications by expanding upon the balanced system approach. As CMOS technology has been enhanced to support additional processing power and more engines, the IBM @server z800 was designed to support the increase in processing power. The I/O subsystem supports greater bandwidth through the use of FICON Express and associated DASD, thus providing for larger and quicker data movement into the server. Support of larger amounts of data within the server required improved management of storage configurations made available through combination of the software operating system and hardware support of 64-bit for real and virtual storage. New coupling links in the architecture allow customers to continue to exploit the advantage of the leading clustering solution in the industry, Parallel Sysplex. The combined balanced system effect allows for dramatic increases in performance across a broad spectrum of applications.

**Subchannel Constraint Relief:** As users see their I/O configurations grow, and in order to meet the high storage and high availability demands of their workloads, they must define more and more devices and subchannels to their system. Moreover, users that exploit the Parallel Access Volumes (PAV) or Peer-to-Peer Remote Copy features, including the PPRC Dynamic Address Switching (P/DAS) capability, of the IBM Enterprise Storage Server™ may require additional subchannel growth for improved performance and continuous availability.

The z800 supports 512K HSA subchannels, the maximum for all logical partitions (LPs) and up to 63K in basic mode and for each logical partition (LP) in LPAR mode.

**Capacity Upgrade on Demand (CUoD):** Improving on IBM's G6 CUoD capability, the z800 offers more flexible

concurrent upgrades. If an installation projects that their present capacity would be satisfied by a small z800 model, but envisions growth to a larger model, CUoD allows concurrent upgrade capability. By planning ahead, your installation can react quickly to increased capacity demands.

While model upgrades to the processor itself are concurrent, your software may not be able to take advantage of the increased capacity without performing an Initial Program Load (IPL).

**Network Connectivity — OSA-Express Features:** The Open Systems Adapter-Express (OSA-Express) features in combination with the z800 continue to offer you an open platform delivering integrated, direct connectivity to the Local Area Network (LAN) and Asynchronous Transfer Mode (ATM) network, intended to reduce overhead and latency and to continue to reduce the total cost of computing across your enterprise.

The dual-port OSA-Express features support the Gigabit Ethernet, Fast Ethernet, ATM, and Token Ring environments and are all capable of achieving line speed. Results will vary depending upon customer environment and applications.

All of the OSA-Express features can be configured to utilize Queued Direct Input/Output (QDIO), a highly efficient data transfer architecture that breaks many of the barriers associated with the Channel Control Word (CCW) architecture. QDIO supports TCP/IP environments only.

The OSA-Express Fast Ethernet, ATM, and Token Ring features can also be configured to support non-QDIO environments, either TCP/IP passthru (LCS — LAN Channel Station) or Systems Network Architecture/Advanced Peer-to-Peer Networking®/High Performance Routing (SNA/APPN®/HPR) environments.

The software requirements for the OSA-Express features are dependent upon the operating mode and media type. Refer to the **Software Requirements** section of this announcement, or to the *Open Systems Adapter-Express Customer's Guide and Reference* (SA22-7476).

**HiperSockets:** The HiperSockets function provides "Network in the Box" functionality that allows high-speed any-to-any connectivity among OS images within a zSeries server without requiring any physical cabling. This "Network in the Box" concept minimizes network latency and is intended to maximize bandwidth capabilities between z/VM, Linux, and z/OS images (or among combinations of these) to enable optimized e-business and ERP solutions within a single server. Up to four separate "Cluster LANs" can be configured within a server, thereby allowing OS images to be grouped according to the function they provide. These groupings are independent of sysplex affiliation.

Performance is drastically improved over the currently available OSA-Express Gigabit LPAR to LPAR latency, depending upon the workload characteristics. The z800 does a direct move from one LPAR's memory to another's memory using QDIO.

**I/O — CHPIDs Assignment:** The ability to assign channel paths IDs independent of the installed physical position that channel cards have within the I/O cage is a Customer Engineer-only function on the z800 Support Element that allows the active channels to be assigned CHPID numbers chosen by you. All 256 CHPID numbers may be assigned; no more "blocked CHPIDs."

**Availability Mapping Tool:** A Web-based tool is available through IBM's Resource Link to enable an installation to remap CHPID assignments after the server is ordered, but before it is installed. If you want to remap CHPID numbers at install time, this tool must be used to create a diskette to be provided to the install team. The tool can also optionally aid an installation in choosing channels for control units that best exploit the reliability, availability, and serviceability characteristics of the system.

**Inter-System Channel (ISC-3), Integrated Cluster Bus (ICB-3), and Internal Coupling Channel (IC-3):** To help ensure Sysplex environments continue to scale with today's efficiency as IBM @server zSeries performance grows, the zSeries coupling link design has been improved. To optimize z800 performance either between other IBM @server zSeries servers, or among S/390 Parallel Enterprise Servers, two modes of coupling links are now available: Peer Mode and Compatibility Mode.

- Peer Mode supports coupling between IBM @server zSeries servers and provides benefits of both sender and receiver capability on the same link for reduced link requirements, increasing the amount of buffer sets (subchannels) from 2 to 7, 64 KB data buffers for performance improvements with large messages, protocol changes for better performance, and increased link capacity.

With these design improvements, the Peer Mode ISC-3 (CFP) connections perform at 200 MB/sec for distances less than 10 km (compared to 100 MB/sec in Compatibility Mode) and, with an RPQ, at 100 MB/sec up to 20 km. Peer Mode ICB-3 (CBP) connections perform at a peak capacity of up to 1000 MB/sec, although effective data rates would be approximately 20% slower. Peer Mode Internal Coupling links (ICP) provide an effective data transfer rate of 1250 MB/sec for connectivity to coupling.

- ISC-3 links support Compatibility Mode between zSeries and S/390 Parallel Enterprise Servers, or between IBM @server zSeries servers. ICB-3 are the only ICB links supported on the z800, and thus can be configured only with other IBM @server zSeries servers.

z800 servers support a maximum of 24 ISC-3 links; five ICB-3 links on a general-purpose z800; or six ICB-3 links on the OCF model. The z800 general-purpose models and OCF model also allow the definition of up to 32 internal coupling (IC-3) links.

It is not possible to get the maximum ISC-3 (24) and ICB-3 (5 or 6) on the same machine. Following are examples of combinations that are possible:

- 24 ISC-3 plus 2 ICB-3
- 18 ISC-3 plus 3 ICB-3
- 12 ISC-3 plus 4 ICB-3
- 6 ISC-3 plus 5 ICB-3

**64-bit Architecture (with z/OS):** 64-bit architecture is intended to eliminate bottlenecks associated with lack of addressable memory by making the addressing capability nearly unlimited (up to a theoretical 16 exabytes; this limit compares to the prior capability of 2 Gbytes in S/390 systems). As an application's server capacity requirements grow, the requirement for greater addressability increases as well. As addressability begins to be constrained, the lack of real storage increases overhead and ultimately constrains system growth. This situation exacerbates critical situations in which explosive systems growth has been a result of successful e-business implementation.

IBM's zSeries 64-bit architecture is intended to:

- Enable optimal use of memory resources
- Provide for migration flexibility
- Use a single level of operating system for both S/390 and zSeries servers, across the entire enterprise
- Allow nondisruptive testing and migration and provide for ease of transition for systems support staff
- Ensure maximum transparency to the operating system and complete transparency to system applications

**64-bit Addressing — Memory Constraint Relief:** The z800 provides up to 32 GB memory and enables significant paging overhead reduction. 64-bit real addressing is intended to give immediate constraint relief to customers with real memory bottlenecks today. This is intended to benefit DB2®, Domino™, TSO, and other UNIX®-based applications.

**z800 Support for Linux:** The zSeries Offering for Linux offers a comprehensive server environment for multiple Linux systems on a single z800 server. zSeries Offering for Linux is an easy-to-use, high-performance Linux Offering which has the capability to have one to four enabled engines.

The S/390 Integrated Facility for LINUX previously announced for 9672 Parallel Enterprise Servers, G5 and G6, and also for IBM @server z900 is also available on z800. This feature provides the ability for an independent processing capacity for Linux applications. An installation may purchase additional processing capacity, exclusively for Linux workloads, with no effect on the z800 model designation. No additional IBM operating system or middleware charges will be incurred due to the additional capacity unless the software is actually running in that additional capacity. The hardware feature is isolated from general use, is dedicated for Linux use only, and cannot run other IBM operating systems except z/VM Version 4.

IBM continues to support a full complement of middleware for Linux on zSeries.

### **IBM zSeries Fiber Cabling Service for the z800**

IBM zSeries Fiber Cabling Service, available with the z800, is designed to provide you with:

- A scalable, flexible solution tailored to support your current system environment, with the future in mind.
- Fiber optic connectivity expertise; personnel trained to deploy a proven fiber optic cabling methodology.
- Personalized services to effectively plan and install the fiber optic cabling needed to interoperate with your current infrastructure while planning for future needs.
- Reliable cabling components that meet IBM physical interface specifications.

In the world of open systems and Storage Area Networks (SANs), the changing requirements for fiber optic cabling are fast becoming directly dependent upon the physical system configuration in the data center. As industry-standard components continue to be embraced in the open systems and SAN environment, the fiber optic cabling options become numerous and complex.

Today's marketplace is seeing the adoption of new small form factor (SFF) fiber optic connectors, short wavelength (SX) and long wavelength (LX) laser transceivers, and increasing link speeds from 1 Gigabits per second (Gbps)

to 10 Gbps. New industry-standard SFF fiber optic connectors and transceivers are utilized on the z800 ESCON and FICON Express features and must coexist with the current infrastructure that utilizes a different "family" of fiber optic connectors and transceivers.

zSeries Fiber Cabling Service is designed to deliver to you a contracted service to meet the needs of your system configuration, be it small, medium, or large. Included in this service is an analysis of your existing fiber optic infrastructure and the z800 configuration to determine the cabling options, including jumper cables and speciality cables customized for your system environment.

IBM connectivity experts will help you select the option that is best suited to achieve your business goals to simplify the z800 deployment with effective on-site fiber optic cable planning and installation support.

**Cabling Responsibilities:** The following tasks must be performed prior to machine installation if the cabling services contract is not purchased:

- All fiber cable planning and support
- All purchasing of correct qualified fiber cables
- All installation of any required fiber mode conditioners
- All installation of any required fiber conversion cables
- All routing of fiber cables to correct floor cutouts for proper installation to machine
  - Use the CHPID report/mapping to accurately route all cables.
- All labeling of fiber cables with CHPID numbers for proper installation to machine.
  - Use the CHPID report/mapping to accurately label all cables.

Additional service charges may be incurred during the machine installation if the above cabling tasks are not accomplished as directed.

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### IBM zSeries Satisfaction Guarantee

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The following guarantee applies in applicable countries:

If you, the original user of an IBM zSeries machine or zSeries model upgrade, are dissatisfied with its quality or reliability, IBM will replace your equipment with the same machine model or model upgrade, when requested in writing by you within one year of its initial installation date. The replaced equipment must be transferred to IBM with clear title, free of liens and encumbrances, and in unaltered condition. This guarantee applies only in the country of purchase, does not apply to replacement equipment, and does not cover damage caused by alterations, misuse, accident, unsuitable physical operating environment, improper maintenance, or improper installation by a third party.

IBM may change the terms of this guarantee at any time. However, any change would not be retroactive.

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### Accessibility by People with Disabilities

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The IBM @server z800 is capable on delivery, when used in accordance with IBM's associated documentation, of satisfying the applicable requirements of Section 508 of the Rehabilitation Act of 1973, 29 U.S.C. Section 794d, as implemented by 36 C.F.R. Part 1194, provided that any

Assistive Technology used with the product properly interoperates with it.

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### Euro Currency

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This product is not impacted by euro currency.

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### Product Positioning

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IBM @server z800 servers are intended to provide an attractively priced solution in a package that offers excellent price/performance for customers requiring zSeries functionality and total capacity less than that currently offered by the z900. The z800 offers existing S/390 and zSeries customers a transition to the new world of e-business servers exploiting z/Architecture, and is intended to take full advantage of the IBM Framework for e-business. The z800 is intended to satisfy mission-critical enterprise server requirements for e-business transaction processing and data management with the same qualities of service as the IBM @server z900. It is a lower-entry-price, new workload platform for customers who want the zSeries qualities of service using either Linux or z/OS.e; it is ideal for VSE customers who have growing traditional S/390 workloads, those who have growing new Linux workloads due to e-business applications or server consolidation, or those migrating to z/OS; and it is ideal for z/VM customers who want to consolidate Linux workloads onto a single zSeries server or who require support for varied operating system environments. In addition, the z800 is an excellent application development platform for large customers or Independent Software Vendors (ISVs) requiring a 64-bit target platform.

The z800 is intended to fully exploit the IBM Framework for e-business and the middleware that implements it.

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### Statement of General Direction

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IBM is also announcing today that it plans to support a new function for Linux programs on the zSeries processors:

- Open Fiber Channel Protocol (FCP)

All statements regarding IBM's future plans, direction, and intent represent the current intentions of IBM. IBM development plans are subject to change or withdrawal without further notice. Any reliance on this Statement of Direction is at the relying party's sole risk and will not create any liability or obligation for IBM.

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### Reference Information

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- |            |              |                   |       |
|------------|--------------|-------------------|-------|
| • Hardware | Announcement | 100-323,          | dated |
|            |              | October 3, 2000   |       |
| • Hardware | Announcement | 101-308,          | dated |
|            |              | October 4, 2001   |       |
| • Hardware | Announcement | 102-030,          | dated |
|            |              | January 29, 2002  |       |
| • Services | Announcement | 602-003,          | dated |
|            |              | February 19, 2002 |       |
| • Software | Announcement | 202-031,          | dated |
|            |              | February 19, 2002 |       |
| • Software | Announcement | 202-032,          | dated |
|            |              | February 19, 2002 |       |



- Software Announcement 202-036, dated February 19, 2002

**Trademarks**

zSeries is a trademark of International Business Machines Corporation.

The e-business logo, z/OS, z/VM, Resource Link, FICON, GDPS, Geographically Dispersed Parallel Sysplex, PR/SM, and Enterprise Storage Server are trademarks of International Business Machines Corporation in the United States or other countries or both.

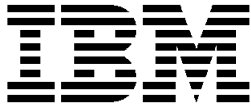
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UNIX is a registered trademark is a registered trademark of the Open Company in the United States and other countries.

Domino is a trademark of Lotus Development Corporation and/or IBM Corporation.

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Other company, product, and service names may be trademarks or service marks of others.



# IBM US Announcement Supplemental Information

February 19, 2002

## Education Support

Your primary source for education on the zSeries 800 should be the courses provided in the Education section on the Resource Link™ Web site. You may also call IBM Education and Training at 800-IBM-TEACH (426-8322) for other catalogs, schedules, and enrollments.

## Publications

The following publications are shipped with the announced product:

- Install Manual (G229-9023)
- Service Guide (G229-9029)
- Safety Inspection (G229-9031)

### Publications for zSeries 800

Publications for the zSeries 800 can be obtained via Resource Link by accessing:

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

Using the instructions on the Resource Link panels, obtain a user ID and password. Resource Link has been designed for easy access and navigation.

*z800 publications that are available February 19, 2002, in the Library section of Resource Link:*

- System Overview (SA22-1028)

*z800 publications available at general availability in the Library section of Resource Link:*

- Open Systems Adapter-Express Customer's Guide and Reference (SA22-7476)
- PR/SM™ Planning Guide (SB10-7033)
- Stand-Alone IOCP User's Guide (SB10-7032)
- IOCP User's Guide (SB10-7029)
- ESCON® and FICON™ CTC Reference (SB10-7034)
- HMC Guide (The form number for this document will change with the version number. Check the Resource Link Library for the current document.)
- Operation Guide (The form number for this document will change with the version number. Check the Resource Link Library for the current document.)
- Managing Your Processors (GC38-0452)
- API Guide (SB10-7030)
- Maintenance Information for Desktop Consoles (G229-3115)
- Maintenance Information for ThinkPad® Consoles (G229-3117)
- Parts Catalog (G123-7473)

- Maintenance Information for Fiber Optic Links (SY27-2597)
- Planning for Fiber Optic Links (GA23-0367)
- Fiber Optic Cleaning Procedures (SY27-2604)

Publications available at general availability of the z800 in the Library section of Resource Link and as part of publications ship group:

- Install Manual (G229-9023)
- Service Guide (G229-9029)
- Safety Inspection (G229-9031)

### IBM Resource Link

IBM's e-business strategy is evolving in sophistication from simple delivery of e-business applications to more advanced applications.

IBM Resource Link is the Web site for product planning, administering, training, and communicating with customers and Business Partners for zSeries 800. Resource Link increases your satisfaction, reduces warranty and installation costs, provides timely support, and delivers customized product information.

Initially available on September 30, 1999, Resource Link provides postsale information and support using the Internet. The primary areas include planning, education, library, forums, and technical support for Enterprise Servers.

Resource Link continues to extend this function to IBM @server zSeries 800. Resource Link function includes:

#### • Customized Planning Aid

This tool provides a streamlined plan for the installation of a system. Each aid will be tailored to a specific order and used as a guide to hardware planning information.

#### • Forums

Forums provide online collaboration for sharing ideas and concepts between IBM and customers who participate in the product introduction programs for zSeries 800 hardware and the early ship programs for z/OS™ software products. "Up-to-the-minute" information is available about program status and related topics.

#### • Web-based multimedia education

Education is provided to keep up with rapidly changing technology. Numerous courses have been developed to teach you basic system operation and provide guidance on specific tasks and tools. The course catalog is continually expanding as new system functions and features are added.

*This announcement is provided for your information only. For additional information, contact your IBM representative, call 800-IBM-4YOU, or visit the IBM home page at: <http://www.ibm.com>.*

- **Access to cross-server technical support**

Part of the technical support function within the Resource Link site, cross-server technical support allows customers and Business Partners to quickly locate Web-based and non-Web-based technical support information and services for all IBM server products. It also provides the ability to obtain assistance from IBM if your needs require more than the Web site offers.

- **Personalization of site content**

“Subscription” allows customers and Business Partners to organize site content by specifying their interests in the area called “personal folders.” Site-resident content is “pushed” to you by e-mail, notifying you of updates and changes. This is particularly useful for remaining current on such things as product publications, hardware planning material, and certain machine information.

Some specific current functions in support of the z800 include:

- A CHPID Mapping Tool that allows you to change the default CHPID numbers for the channels on your IBM @server zSeries 800
- Installation planning details by machine serial number configuration, which define unique requirements for individual orders
- Specific machine data and information, based on serial number, including account numbers and warranty information, that provides:
  - EC/MCL levels and descriptions of MCLs not yet installed
  - Ability to register for e-mail notification if MCL apply is overdue
  - Ability to register for e-mail notification if a HIPER MCL is released for the affected machine
- N+1 power status (if enabled), obtained from the last scheduled call home, which provides the ability to register for e-mail if N+1 power is not available
- Second SE status (if enabled), obtained from the last scheduled call home, which provides the ability to register for e-mail if second SE is not operating
- Weekly call home status (if enabled), which provides the ability to register for e-mail if weekly call home stops
- Listing of all HIPER MCLs with descriptions
- Purpose and Description files for all microcode versions
- Registered interest across the entire site
- Push technology that dynamically informs you of internal code status and changes
- Rapid information access that uses the Web as the first source of IBM information
- Web-based multimedia education that keeps up with rapidly changing technology
- Ability to push solutions and information to you based on personal knowledge and preferences
- Access to Q&As and the opportunity to comment on ideas and concepts

- Profile-driven e-mail that leverages our account knowledge and allow rapid push of product technology offerings, announcements, and press releases

Once you get to the site, instructions are provided for obtaining a password and ID that will gain you access to this powerful information source. IBM’s Customer Care Advantage includes publications that support the zSeries.

**Technical Support Portal** is world-class, Web-based technical support. Navigate and access related Web sites to find technical support libraries, user-to-user collaboration, installation planning, and access to geography local support teams.

For more information refer to:

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

The following publication will be available at general availability on March 29, 2002.

To order, contact your IBM representative.

Title	Order Number	Web Address
Technical Introduction: IBM z/800 Series	SG24-6515	www.redbooks.ibm.com

The Publication Notification System (PNS) is available by order number/product number. Customers currently subscribing to PNS will automatically receive notifications by e-mail. Customers who wish to subscribe can visit the PNS Web site location at:

<http://www.ibm.com/shop/publications/pns/>

The publications listed on the notification can be ordered by calling the Pubs Support Group in Raleigh at 800-879-2755, option 1.

The IBM Publications Center Portal:

<http://www.ibm.com/shop/publications/order>

The Publications Center is a worldwide central repository for IBM product publications and marketing material with a catalog of 70,000 items. Extensive search facilities are provided, as well as payment options via credit card. Furthermore, a large number of publications are available online in various file formats, which can currently be downloaded free of charge.

Note that PNS subscribers most often order their publications via the Publication Center.

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## Technical Information

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### *Specified Operating Environment*

**Physical Specifications:** The mechanical package for the IBM @server z800 servers conforms to EIA guidelines for frames.

The 2066 requires 30 inches of service clearance on all four sides.

- Width: 720.0 mm
- Depth: 1,145.6 mm
- Height: 1,810.8 mm
- Weight: 545.0 kg

## **Operating Environment**

- Input Supply Voltage Range: 200-240 V single phase
- Supply Voltage Tolerance: +/- 10% when input is 240 V, then +6%/-10%
- Supply Power Frequency: 50/60 Hz
- Frequency Tolerance: +/- 3 Hz
- Power Factor Correction: PF greater than 0.99 at rate max input current
- Harmonic Currents: Applicable to JEIDA standard
- Intake Air Temperature: 10° to 35°C
- Cooling Method: Air flow cooling
- Humidity: 20% to 80%
- Acoustics Noise: Category 2D, LWAu=7.0 bels, operating and idling modes
- Vibration/Shock Resistance: 3.5 (in operate)
- Electromagnetic Compatibility: Meets FCC Class A; CISPR and CE Conformity

**Hardware Requirements:** For the appropriate peripheral hardware and device attachments, contact your IBM representative.

IBM devices previously attached to IBM S/370™ or S/390® systems are supported for attachment to z800 server channels, unless noted. The subject I/O devices must meet ESCON or FICON architecture requirements to be supported. I/O devices that meet OEMI architecture requirements are supported only via an external converter. Prerequisite Engineering Change Levels may be required. For further detail, contact IBM service personnel.

Refer to the **Key Prerequisites** section of this announcement for additional information regarding how to obtain external converters.

**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.

**New Hardware Functions and Capabilities with the IBM z800:** In addition to the traditional functions of S/390 servers, the z800 provides:

### **1. Enhanced Storage Protect Keys**

The z800 has enhanced the memory storage protect key design by adding a third key array to the keystore DIMM. The arrays are parity checked and employ a Triple Voting strategy to assure accuracy.

### **2. ESCON Port Sparing**

The new ESCON 16-port I/O card is delivered with one unused port dedicated for sparing in the event of a port failure on that card. Other unused ports are available for nondisruptive growth of ESCON channels.

### **3. Concurrent Maintenance/Upgrade for Coupling**

The z800 introduces concurrent maintenance for the ISC-3 adapter card. Also, coupling links may now be added concurrently when the new receiver or peer-mode coupling links have been predefined in the IOCDs, prior to an IML. This eliminates the need for

scheduled downtime in the demanding sysplex environment.

### **4. Crypto Coprocessors**

The Cryptographic Coprocessor is optional on the z800. Two Crypto chips (packaged as SCMs) can be plugged onto the processor card. The Crypto SCMs are FRUs which can be plugged in the field.

### **5. Concurrent Service for I/O Cards**

All cards that plug into the I/O cage are able to be added and replaced concurrent with system operation to eliminate any need for scheduled outages to service or upgrade the I/O subsystem.

## **Hardware Functions and Capabilities (Standard and Optional)**

- Capacity Upgrade on Demand
- Optional Cryptographic Coprocessor Feature
- IEEE Floating Point Arithmetic support
- CP, SAP, ICF, and IFL Sparing
- Dynamic Memory Sparing
- Enhanced Error Correction Code (ECC) on memory arrays
- Application Preservation
- Coupling Facility Control Code (CFCC)
- Internal Coupling (IC) Channels
- Concurrent patch capability for channel functions, Hardware Management Console, Support Element, power control, CP, SAP, PR/SM LPAR, and CFCC
- Hardware-Assisted Data Compression
- Logical String Assist
- TCP/IP Check Sum Assist
- Asynchronous Pageout Facility
- CICS® Subsystem Storage Protection (improves availability by eliminating outages caused by application code overlays to CICS system code)
- Subspace Group Facility
- External Time Reference (ETR)
- ESCON Channel to Channel (CTC) support, including basic mode
- Hot plugging of channels, Open System Adapters, and coupling links to minimize unplanned outages
- ESCON
- OSA-Express
- FICON Express
- FICON Channel-to-Channel (CTC) Support
- MOVEPAGE Facility (MVPG/1) and Enhanced MOVEPAGE (MVPG/2)
- Scalar Enhancements (Square Root only)
- Concurrent power and thermal maintenance
- N+1 power supply and cooling technology
- Independent dual power feed capability
- Dynamic I/O reconfiguration Management (DRM)

- DB2® Sort Assist
- PR/SM:
  - PR/SM LPAR as a standard function
  - LPAR mode logical central processor (CP) vary on/off
  - Enhanced partition weight management
  - Enhanced Multiple Image Facility (EMIF) for sharing of ESCON channels, Coupling Facility sender channels, FICON channels, and Open Systems Adapters across PR/SM partitions
  - Automatic Reconfiguration Facility (ARF)
  - Enhanced Dynamic Storage Reconfiguration (EDSR)
  - CPU Resource Capping
  - LPAR time management reporting
  - Alternate wait management (an OS/390® function)
  - Capacity Backup Upgrades

### Reliability

Parts integration reduces the number of parts in the machine, which should lead to higher reliability.

A Systems Assurance Pre-Installation Review is required for the first installation in a location. For details, refer to the *z800 Systems Assurance Product Review (SAPR) Guide* (SA01-007), available via Resource Link:

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

### Availability

The standard features that are intended to provide a high level of availability include:

- Enhanced Processor Design
 

All z800 servers are provided with an enhanced processor design. Each central processor (CP) contains dual Instruction/Execution Units, which operate simultaneously. Results are compared, and in the event of a miscompare, Instruction Retry is invoked. This design is intended to simplify checking, and reduces CP failures due to soft errors.
- Alternate Support Element (Standard)
- Fault Tolerant Design
 

Fault tolerant design allows hardware recovery to be performed, in most cases, totally transparent to operation and helps reduce the need for a repair action, or defers a repair action to a convenient time scheduled by you.
- Processor Unit Sparing
 

Spare PUs are provided, whenever the configuration allows, to maintain performance levels should an active CP, Integrated Coupling Facility (ICF) feature, System Assist Processor (SAP), or Integrated Facility for Linux (IFL) feature, fail on a z800 server model. The general philosophy is to provide a spare PU whenever possible; that is, when the number of CPs, ICFs, SAPs, and IFLs is less than the total number of PUs available.

  - Sparing is transparent in all modes of operation and requires no operator intervention to invoke a spare PU (if available).

As a further enhancement, in most cases, the application that was running on the failed CP will be preserved and will continue processing on a new CP with no customer intervention required. Refer to the Enhanced Application Preservation section below.

- Dynamic SAP Sparing/Reassignment

Dynamic recovery is provided for failure of the SAP. In the event of a SAP failure, if a spare PU is available, in most cases the spare PU will be dynamically activated as a new SAP. If there is no spare PU available, and the CPC has more than one CP, an active CP will be reassigned as a SAP. In either case, there is no customer intervention required. This capability helps reduce the occurrence of an unplanned outage and can permit a service action, if necessary, to be deferred to a more convenient time.

- Enhanced Application Preservation

Application Preservation captures the machine state in the event of a CP failure and will, in most cases, switch processing to a spare PU or another active CP without intervention. This capability helps reduce unplanned outages, helps reduce intervention in the recovery process, and helps to preserve your application processing environment.

- Dynamic ICF Expansion

Dynamic ICF Expansion is a function that allows a Coupling Facility (CF) logical partition with dedicated ICF processors to acquire additional processing power from the LPAR pool of shared general-purpose CPs or shared ICFs being used to execute production and/or test work on the system. This function is very useful when the CF logical partition in a z800 general-purpose model backs up another CF. In this event, the CF logical partition, using Dynamic ICF Expansion, can acquire additional processing capacity to handle the full CF workload. Also, Dynamic ICF Expansion can be used to handle a peak workload situation when the CF logical partition is being used as the primary CF. This feature adds considerable flexibility to the configurability of the CF logical partition in z800 general-purpose models and optimizes the use of the processing power in the system.

The Dynamic ICF Expansion feature is available to every CF logical partition with dedicated ICF processors. Each ICF coupling facility partition has its own ability to specify the number of ICF features that are dedicated to that partition and the amount of additional capability it can acquire. The tradeoff between using ICF features and the CPs in the LPAR shared pool is the exemption from software license fees.

Dynamic ICF Expansion is available on all z800 general-purpose models.

- Dynamic CF Dispatching

The Dynamic CF Dispatching function helps enable continuous computing in the event of a CF failure without requiring a stand-alone backup CF. Enhanced dispatching algorithms help you to define a backup CF in a logical partition (LPAR) on your system. While this logical partition is in backup mode, although it is sharing resources with other LPARs running other active workload, it uses very little processor resource. When the backup CF becomes active, only the resource necessary to provide coupling is allocated.

- Error Correction Code (ECC)

Memory error checking and correction code is intended to detect and correct single bit errors. Also, because of the memory structure design, errors due to a single memory chip failure are corrected.

- Dynamic Memory Sparing

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

- LPAR Dynamic Storage Reconfiguration (DSR)

PR/SM LPAR storage reconfigurations can occur, allowing nondisruptive addition or removal to any partition with a cooperating guest.

- Enhanced LPAR DSR

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

- Single Storage Pool

The single storage pool function is provided on z800 general-purpose models. With this function, all physical storage is dynamically designated by LPAR as either central storage or expanded storage as requirements of active logical partitions dictate.

As a result, the need to predesignate storage as either central storage or expanded storage prior to IML into LPAR mode on the Storage Page of the RESET Profile panel is no longer necessary and is no longer provided. The system programmer now has greater flexibility when planning the division of storage in order to satisfy anticipated logical partition definitions.

Without this function, a non-optimum designation of storage might be made in order to accommodate a range of logical partition definitions that typically vary from time to time. Single storage pool streamlines the planning effort for any configuration as the need arises. This function aids in the migration from 31-bit OS/390 where logical partitions are, at most, 2 GB of central storage plus optional expanded storage, to 64-bit z/OS, where logical partitions use only central storage and no expanded storage.

- Subsystem Storage Protect

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

- Scrubbing

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

- Dynamic I/O Configuration

Dynamic I/O configuration enhances system availability by supporting the dynamic addition, removal, or modification of channel paths, control units, I/O devices, and I/O configuration definitions to both hardware and software without requiring a planned outage.

- Concurrent Channel Upgrade within the I/O cage

It is possible to concurrently add ESCON, FICON Express, OSA-Express, and OSA channels and Coupling Facility Links, provided an STI is available and there are unused channel positions and channel adapter cards (for channels) or Coupling Links available. This capability may help eliminate an outage to upgrade the channel configuration.

- Concurrent Channel Maintenance

Concurrent channel maintenance allows replacement of a channel card without having to take the system or the channel group down. All CHPIDs on the affected card must be configured offline.

- Dual Power Feeds

The power system offers dual primary (ac) power feeds. Each feed is electrically isolated and enables redundant power paths to each server. To take full advantage of the redundant power paths built into the z800, it is necessary to provide dual electrical service to the server to minimize any outage due to a single-path power interruption.

- Redundant Power Thermal Subsystem

The ac and dc power subsystems are designed with N+1 redundancy. Failure of a single power thermal component does not need to cause a system outage.

- Storage Recovery

z800 servers have error checking and correction of L2 and L3 storage. The servers also have line delete for L1 and L2 Caches and Directories and line relocate for the Caches and L2 Directory. z800 servers perform ECC, background scrubbing, and dynamic sparing of L3, L4 memory, as well as ECC on the system memory buses.

- External Time Reference (ETR)

The Sysplex Timer® has been a key element in the Parallel Sysplex® environment since its introduction. It is intended to ensure that multiple z/OS and OS/390 systems can appear as a single system image, synchronizing the Time-of-Day (TOD) clocks of all of the attached systems, helping to ensure a consistent time stamp. When multiple systems update the same database, all updates are time-stamped in sequence.

The ETR function is now standard on zSeries. There are two ETR cards located in the CEC cage, each with a fiber optic connection to provide the capability to attach to the Sysplex Timers. Previously, the ETR feature was optional.

The z800 ETR connections have an optical transceiver that supports the ESCON Duplex connector and 62.5/125-multimode fiber.

- Concurrent Hardware Maintenance

Concurrent maintenance helps enable the replacement of failed units concurrently with system operation. This enhances the processor availability by reducing the need for a system outage to effect the repair. Concurrent maintenance capability exists for the following elements:

- Power/Thermal
- ESCON channels
- FICON Express
- Coupling links

- Integrated cluster bus (STI) cable
- OSA-Express
- Hardware Management Console
- Support Element
- Concurrent Licensed Internal Code
- External Time Reference (ETR) —depending on ETR link operation
- Patch Enhancements

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

- CP
- SAP
- LPAR
- Coupling Facility Control Code
- Power/Thermal
- ESCON channels
- FICON Express
- Coupling links
- Integrated cluster bus channels
- Internal coupling channels
- OSA-Express
- Hardware Management Console
- Support Element

**Note:** Not all patches are nondisruptive. Some patches still require a Power On Reset to be activated.

The optional features that provide a high level of availability include:

- Redundant Coupling Links

Redundant Coupling Links can be configured between a processor and the CF. This potentially removes a single point of failure for the processor's data sharing capability in the Parallel Sysplex environment.

- Capacity Upgrade on Demand (CUoD)

CUoD is intended to provide the capability to add CPs, ICFs, and IFLs nondisruptively in most cases, eliminating the need for a scheduled outage.

- Capacity Back Up (CBU)

CBU can enable automatic management of a reserved processor unit (PU) provided by the CBU feature in the event of a processor failure.

### Serviceability

The standard features that are intended to 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
- Multiple Channel Swap — an enhancement for channel problem determination allowing up to four channels to be swapped
- Status Panel showing status of N+1 power system
- Enhanced diagnostics for coupling links

### Software Requirements

*IBM e(logo)server z800 Software Support:* The IBM @server z800 will be supported by the following operating systems:

- z/OS.e, a new offering for the IBM @server zSeries 800 designed for new workloads. It has the same code base as the z/OS operating system customized with new system parameters. As a specially priced offering of z/OS, z/OS.e provides select function at an attractive price. z/OS.e is intended to help customers exploit the fast growing world of next-generation e-business.

For more information on z/OS.e refer to Software Announcement 202-032, dated February 19, 2002.

z/OS and z/OS.e must both be run in 64-bit mode on a z800 server. z/OS is required to run in 64-bit mode on z900 and z800 servers. z/OS.e can run only on a z800 server.

- OS/390 Version 2 Release 8, 9, 10\*
- z/OS Version 1 Release 1\*, 2\*, 3\*
- VM Versions:
  - VM/ESA® Version 2.4.0
  - z/VM™ Versions 3.1\*, 4.1\*, 4.2\*
- VSE/ESA™ Versions 2.4, 2.5, 2.6
- TPF Version 4.1
- Linux:
  - Kernel 2.2 based Linux for S/390 — 31-bit Distribution
  - Kernel 2.4 based Linux for S/390 — 31-bit Distribution
  - Kernel 2.4 based Linux for zSeries — 64-bit Distribution

The IBM @server z800 does **not** support operating systems in 370 mode.

\* Indicates planned availability levels that support 64-bit Real Architecture

*Support Levels and Schedules for all Operating Systems, Applications:* The operating system planned availability dates shown below may not always match the z800 GA dates. The z800 systems will be supported at planned availability by the then currently available releases of the operating systems as listed above. Where necessary, APARs and/or SPEs will be provided.

**OS/390, z/OS,** Support in Basic mode and LPAR mode will be provided as follows:

- OS/390 Releases Supported:
  - OS/390 V2R8
  - OS/390 V2R9
  - OS/390 V2R10
- z/OS Releases Supported (must be run in 64-bit on z900 and z800 server):
  - z/OS V1R1
  - z/OS V1R2
  - z/OS V1R3

**z/OS.e** Releases, Support in LPAR mode only:

- z/OS.e V1R3

**VM**, Support in Basic mode and LPAR mode will be provided as follows:

Releases Supported:

- VM/ESA 2.4.0 with APARs VM62676, VM62811, VM62942, and VM62665
- z/VM 3.1.0
- z/VM 4.1.0
- z/VM 4.2.0 with APARs VM62938 and PQ51738 (required for HiperSockets support)

**VSE**, Support in Basic mode and LPAR mode will be provided as follows:

Releases Supported:

- VSE/ESA Version 2 Release 4
- VSE/ESA Version 2 Release 5
- VSE/ESA Version 2 Release 6

**TPF** Releases Supported: TPF Version 4 Release 1

*Software Requirements for the OSA-Express Features:*  
The minimum software requirements for the Open Systems Adapter-Express (OSA-Express) features are identified below:

**Note:** The Queued Direct Input/Output (QDIO) mode described herein is for TCP/IP traffic only. The non-QDIO mode described herein is for Systems Network Architecture/Advanced Peer-to-Peer Networking®/High Performance Routing (SNA/APPN®/HPR) traffic and/or TCP/IP traffic (LAN Channel Station —LCS).

Gigabit Ethernet supports IP traffic only, and therefore supports only the QDIO mode. Fast Ethernet and Token Ring are supported both in the QDIO and non-QDIO modes. If a 155 ATM feature is configured for Ethernet LAN Emulation, the QDIO mode is supported. The 155 ATM features support the non-QDIO mode.

The QDIO mode and the non-QDIO mode are mutually exclusive. Each port on an OSA-Express feature (two ports per feature) can be configured for only one mode, QDIO or non-QDIO. The non-QDIO mode requires the use of the Open Systems Adapter Support Facility (OSA/SF) for setup and customization.

**For OSA-Express Gigabit Ethernet; QDIO mode only**

- OS/390 Version 2 Release 7 and Communications Server (an element of OS/390) with PTFs
- z/VM Version 3 Release 1 with TCP/IP feature 3A0
  - For IP Multicast support
- VM/ESA Version 2 Release 4 with TCP/IP feature for guest support
- VSE/ESA Version 2 Release 6
  - TCP/IP for VSE/ESA Version 1 Release 4
- For Linux support, visit the Web site at:  
<http://www10.software.ibm.com/developerworks/opensource/linux390>
- TPF Version 4.1 with PUT 13 or higher; requires APAR J27333

**For OSA-Express Fast Ethernet QDIO mode** one or more of the following are required.

- OS/390 Version 2 Release 8 and Communications Server (an element of OS/390) with PTFs

- z/VM Version 3 Release 1 with TCP/IP feature 330
  - For IP Multicast support
- VM/ESA Version 2 Release 4 with TCP/IP feature
- VSE/ESA Version 2 Release 6
  - TCP/IP for VSE/ESA Version 1 Release 4
- For Linux support, visit the Web site at:

<http://www10.software.ibm.com/developerworks/opensource/linux390>

**For OSA-Express Fast Ethernet non-QDIO mode** one or more of the following are required.

- OS/390 Version 2 Release 6 and Communications Server (an element of OS/390)
- VM/ESA Version 2 Release 4
  - TCP/IP feature in VM/ESA Version 2 Release 4
  - ACF/VTAM® for VM/ESA Version 4 Release 2.0
- VSE/ESA Version 2 Release 6 (TCP/IP support only; LAN Channel Station —LCS)
  - TCP/IP for VSE/ESA Version 1 Release 4

**For OSA-Express 155 ATM Ethernet LAN Emulation QDIO mode** one or more of the following are required.

- OS/390 Version 2 Release 8 and Communications Server (an element of OS/390) with PTFs
- z/VM Version 3 Release 1 with TCP/IP feature 330
  - For IP Multicast support
- VM/ESA Version 2 Release 4 with TCP/IP feature
- VSE/ESA Version 2 Release 6

**For OSA-Express 155 ATM non-QDIO mode** one or more of the following are required.

- OS/390 Version 2 Release 6 and Communications Server (an element of OS/390)
- VM/ESA Version 2 Release 4 with TCP/IP feature
  - For Native ATM (classical IP —RFC 1577, RFC 2225)
- VM/ESA Version 2 Release 4
  - TCP/IP feature in VM/ESA Version 2 Release 4
  - ACF/VTAM® for VM/ESA Version 4 Release 2.0
- VSE/ESA Version 2 Release 6 (TCP/IP support only; LAN Channel Station —LCS)
  - TCP/IP for VSE/ESA Version 1 Release 4

**For OSA-Express Token Ring QDIO mode** one or more of the following are required.

- OS/390 Version 2 Release 10 and Communications Server (an element of OS/390)
- z/VM Version 4 Release 2 with TCP/IP feature 420
- VSE/ESA Version 2 Release 6
- For Linux support, visit the Web site at:

<http://www10.software.ibm.com/developerworks/opensource/linux390>

**For OSA-Express Token Ring non-QDIO mode** one or more of the following are required.

- OS/390 Version 2 Release 6 with PTFs and Communications Server (an element of OS/390)



- VM/ESA Version 2 Release 4
  - TCP/IP feature in VM Version 2 Release 4
  - ACF/VTAM for VM/ESA Version 4 Release 2
- VSE/ESA Version 2 Release 6
  - TCP/IP for VSE/ESA Version 1 Release 4

The Open Systems Adapter Support Facility Version 2 Release 1 (OSA/SF) is required for the OSA features under the following circumstances.

- For setup and customization of OSA-Express Fast Ethernet and OSA-Express Token Ring if not using the default OSA Address Table (OAT), or if configured for TCP/IP LAN Channel Station —LCS.
- For setup and customization of the OSA-Express 155 ATM features if running in non-QDIO mode or if using the QDIO mode with 155 ATM Ethernet LAN Emulation. OSA/SF is used for the definition of the emulated/logical ports.

OSA/SF is available for the z/OS, OS/390, z/VM, VM/ESA, and VSE/ESA environments as identified below.

- OSA/SF Version 2 Release 1 is a separate program product (5655-B57) for OS/390 Version 2 Release 6 and Release 7.
- OSA/SF is provided with and supported on OS/390 V2R8.
- OSA/SF is provided with and supported on VM/ESA V2R4.
- OSA/SF is provided with and supported on all versions/releases of z/VM.
- OSA/SF is provided with and supported on VSE/ESA V2R4.

**Limitations:** The following are not being offered on the IBM @server z800:

- Compatibility I/O cage.
- Parallel channels. An ESCON-to-Parallel converter box is required.
- OSA-2.
- Internal Battery Feature (IBF). An external Universal Power System (UPS) is recommended.
- Power Save.
- Integrated Cluster Bus (ICB) technology prior to ICB-3.
- Concurrent memory upgrades.
- Upgrades INTO any z800 model (from 9672, 7060, and so on).
- Spare PU on Model 004 —similar to the largest models of 9672.
- Individual cable feature codes; cables are ordered via IBM's zSeries Fiber Cabling Service offered by IBM Global Services.
- Concurrent upgrades with all software levels.\*

\* While model upgrades to the processor itself are concurrent, your software may not be able to take advantage of the increased capacity without performing an Initial Programming Load (IPL).

IPL engines can be used only to run Linux workloads.

## Planning Information

### Cable Orders

**IBM zSeries Fiber Cabling Service for the z800:** Fiber optic cables for the IBM @server z800 may be ordered via the IBM Network Integration and Deployment Services for zSeries Fiber Cabling (zSeries Fiber Cabling Service) offered by IBM Global Services. I/O fiber optic cables for the z800 are not available as features.

The zSeries Fiber Cabling Service delivers a convenient, packaged solution to reduce the complexity of planning, ordering, and installing fiber optic cables. This solution is packaged as follows:

- A selection of 24 predefined sizes is available.
- Each size is offered at a fixed price.
- The e-configuration tool calculates the number of fiber optic cables that should be required.
- Select the appropriate size based upon the z800 channel configuration.

Refer to the services section of Resource Link for further details.

Access Resource Link at:

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

**Cabling Responsibilities:** The following tasks must be performed prior to machine installation if the cabling services contract is not purchased:

- All fiber cable planning and support
- All purchasing of correct qualified fiber cables
- All installation of any required fiber mode conditioners
- All installation of any required fiber conversion cables
- All routing of fiber cables to correct floor cutouts for proper installation to machine
  - Use the CHPID report/mapping to accurately route all cables.
- All labeling of fiber cables with CHPID numbers for proper installation to machine
  - Use the CHPID report/mapping to accurately label all cables.

Additional service charges may be incurred during the machine installation if the above cabling tasks are not accomplished as directed.

### 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.

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### Terms and Conditions

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

IBM hardware products are manufactured from parts that may be new or used. In some cases, a hardware product may not be new and may have been previously installed.

Regardless, IBM appropriate warranty terms apply.

The following table provides software groups and processor MSUs for z800 models:

Model	MSUs
0A1	13
0B1	20
0C1	25
001	32
0A2	44
002	60
003	84
004	108

The above performance measurements are estimates only, and are subject to change without notice. Software licenses that are based on machine performance will be billed based on these estimates until such time that IBM determines and publishes final performance measurements, at which time appropriate billing adjustments will be made for both future and retroactive software usage.

**IBM Credit Corporation Financing:** Yes

**Warranty Period:** One year

**Warranty Service:** IBM On-Site Repair (IOR) 24 hours a day, 7 days a week, same-day response

**ServiceSuite™ and ServiceElect (formerly ESA) Maintenance:** IOR 24 hours a day, 7 days a week, same-day response

**Usage Plan Machine:** No

**IBM Hourly Service Rate Classification:** Three

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 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. The Licensed Internal Code for the machine type 2066 0LF may only be used to support Linux workloads and may not be used for any other purposes.

## z800 Feature Summary

The following features are installed in the z800 I/O cage. The total number of ESCON, FICON Express, ISC-3, OSA Express, PCI-CA, and PCI-CC cannot exceed 16 features per system. Refer to the Feature Descriptions section for more details. Normally, the purchase increment is one feature. The exceptions are noted for ESCON and ISC-3.

z800 Features	Per System			Increments/ Ports per Feature	Purchase Increments
	Minimum Features	Maximum Features	Maximum Ports		
ESCON	0 <sup>1</sup>	16	240	16 <sup>2</sup>	4 <sup>3</sup>
FICON Express	0 <sup>1</sup>	16	32	2	1
ISC-3	0	8	24	4	1 <sup>4</sup>
OSA Express	0	12	24	2	1
PCI-CA	0	6 <sup>5</sup>	12 accelerator cards	2 <sup>6</sup>	1
PCI-CC	0	8 <sup>5</sup>	16 coprocessors	2 <sup>7</sup>	1

- <sup>1</sup> A minimum of four ESCON channels or two FICON Express channels is required.
- <sup>2</sup> Each ESCON card has 16 ports; 15 ports may be activated. One port is assigned as a spare.
- <sup>3</sup> ESCON ports are purchased in increments of four ports/channels and are activated via Licensed Internal Code, Control Code (LICCC). Ports are activated equally across all installed 16-Port ESCON features for high availability.
- <sup>4</sup> ISC-3 is offered in 1-port increments. A maximum-configured ISC-3 feature contains four ports. If two ports are purchased, two ISC-3 features will be shipped, since activated ports are balanced across pairs of card features for high availability. A maximum of 24 ports can be activated across a maximum of eight features.
- <sup>5</sup> The total number of PCI-CA and PCI-CC cannot exceed eight features per system.
- <sup>6</sup> Each PCI-CA feature has two PCI accelerator cards. It does not have ports and does not use fiber optic cables.
- <sup>7</sup> Each PCI-CC feature has two PCI coprocessors. It does not have ports and does not use fiber optic cables.

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## Feature Descriptions

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### ***ISC-M (#0217), ISC-D (#0218), ISC-3 Port (#0219)***

The InterSystem Coupling-3 (ISC-3) feature represents the third generation of coupling technology. The ISC-3 feature is used by coupled systems to pass information back and forth over high-speed links. The ISC-3 feature is compatible with HiPerlink Coupling links/HiPer links on S/390 Generation 3 — Generation 6 servers.

The ISC-3 feature is composed of a mother card (ISC-M #0217) and one or two daughter cards (ISC-D #0218). Each daughter card has two ports, for a total of four ports per feature. Ports are purchased in increments of one. Each port is activated via Licensed Internal Code, Control Code (LICCC). The ISC-M feature and the ISC-D feature are not orderable features. When the quantity of ISC-3 port (#0219) features is selected, the appropriate number of ISC-Ms and ISC-Ds will be selected by the configuration tool.

Each ISC-3 port has a peak data rate capability of 200 megabytes per second if operating in peer mode (z800 to z800 or z800 to z900) and a peak data rate of 100 megabytes per second if a z800 is connected to a coupling-capable server that is not a z800 or z900 and is operating in Compatibility Mode. Each ISC-3 link supports an unrepeated distance of up to 10 km (6.2 miles).

Each ISC-3 port utilizes a long wavelength laser as the optical transceiver, and supports use of a 9/125-micrometer single mode fiber optic cable terminated with an industry-standard small form factor LC Duplex connector. When the ISC-3 feature is operating in Compatibility Mode, it accommodates, at reduced distances, reuse of 50 micron multimode fiber optic cables. A pair of Mode Conditioning Patch (MCP) cables is required. MCP cables are for one gigabit links only.

- Minimum Number of Features: None.
- Maximum Number of Features: Eight (24 ports). A maximum of 24 ports can be activated across a maximum of eight features.
- Increments: One port. It is recommended that a first time order of this feature be an increment of two ports.
- Prerequisites: None.
- Corequisites: None.
- Compatibility Conflicts: The ISC-3 feature supports use of an LC Duplex connector. A conversion kit may be required if there are fiber optic cables with SC Duplex connectors.
- Customer Setup: No.
- Limitations: None.
- Field Installable: Yes. Parts removed as a result of this feature change become the property of IBM.
- Cable Order: A 9/125-micrometer single mode fiber optic cable terminated with an LC Duplex connector is required.

### ***PCI-CC (#0861)***

The Peripheral Component Interconnect Cryptographic Coprocessor (PCI-CC) feature is an optional addition to the System Cryptographic Coprocessors, along with the Peripheral Component Interconnect Cryptographic Accelerator (PCI-CA) feature number 0862. PCI-CC is programmable, to rapidly deploy new standard functions,

to enable migration from the IBM 4753 external cryptographic product, and to meet unique customer requirements — User Defined Extensions (UDX). Each PCI-CC feature has two independent PCI coprocessors.

- Minimum Number of Features: None.
- Maximum Number of Features: Eight (16 coprocessors).
- Increments: Two coprocessors (one feature).
- Prerequisites: Crypto feature number 0800.
- Corequisites: None.
- Compatibility Conflicts: PCI-CC can be utilized only when the System Cryptographic Coprocessors are enabled. PCI-CC must match the security level of the System Cryptographic Coprocessors.
- Customer Setup: No.
- Limitations: The total number of PCI-CCs (#0861) and PCI-CAs (#0862) cannot exceed eight per system.
- Field Installable: Yes. Parts removed as a result of this feature change become the property of IBM.
- Cable Order: None. The PCI-CC feature has a direct connection to an STI bus. No cables are required.

### ***PCI-CA (#0862)***

The Peripheral Component Interconnect Cryptographic Accelerator (PCI-CA) feature is an optional addition to the System Cryptographic Coprocessors, along with the Peripheral Component Interconnect Cryptographic Coprocessor (PCI-CC) feature number 0861. The PCI-CA is a very fast cryptographic processor designed to provide leading-edge performance of the complex RSA cryptographic operations used with the Secure Sockets Layer (SSL) protocol. Each PCI-CA feature has two independent PCI accelerator cards, and is designed specifically to help maximize SSL acceleration.

- Minimum Number of Features: None.
- Maximum Number of Features: Six (12 accelerator cards).
- Increments: Two accelerator cards (one feature).
- Prerequisites: Crypto feature number 0800.
- Corequisites: None.
- Compatibility Conflicts: PCI-CA can be utilized only when the System Cryptographic Coprocessors are enabled.
- Customer Setup: No.
- Limitations: The total number of PCI-CCs (#0861) and PCI-CAs (#0862) cannot exceed eight per system.
- Field Installable: Yes. Parts removed as a result of this feature change become the property of IBM.
- Cable Order: None. The PCI-CA feature has a direct connection to an STI bus. No cables are required.

### ***FICON Express LX (#2319)***

The FICON Express LX (long wavelength) feature is an optional feature with an enhanced design that includes a high performing 66 MHz, 64-bit Peripheral Component Interconnect (PCI) infrastructure. The FICON Express LX feature utilizes an LC Duplex connector.

The FICON Express LX feature has two independent ports, each port supporting attachment to an ESCON Director Model 5 with a FICON LX Bridge feature, to a Fibre Channel Director with a Fibre Channel/FICON LX feature, or to a control unit with a Fibre Channel/FICON LX feature. FICON Express LX works with any LX feature supporting FICON. The FICON Express LX feature utilizes a long wavelength laser as the optical transceiver and supports use of a 9/125-micrometer single mode fiber optic cable terminated with an LC Duplex connector.

- Minimum Number of Features: None (a minimum of four ESCON channels or two FICON Express channels is required).
- Maximum Number of Features: 16 (32 ports).
- Increments: Two ports (one feature).
- Prerequisites: None.
- Corequisites: None.
- Compatibility Conflicts: The FICON Express LX feature supports use of an LC Duplex connector. A conversion kit may be required if there are fiber optic cables with SC Duplex connectors. Ensure the attaching/downstream device has a long wavelength (LX) feature. FICON Express works with any LX feature supporting FICON.
- Customer Setup: No.
- Limitations: The total quantity of FICON Express LX features and FICON Express SX features cannot exceed 16 per system.
- Field Installable: Yes. Parts removed as a result of this feature change become the property of IBM.
- Cable Order: A 9/125-micrometer single mode fiber optic cable terminated with an LC Duplex connector is required for connecting this feature to the selected device.

If multimode fiber optic cables are being reused with the FICON Express LX feature, a pair of Mode Conditioning Patch (MCP) cables is required, one for each end of the link. MCP cables are for use with one gigabit per second links only (100 MB/sec) and may reduce the maximum distance over which FICON Express LX can transmit.

### ***FICON Express SX (#2320)***

The FICON Express SX (short wavelength) feature is an optional feature with an enhanced design that includes a high performing 66 MHz, 64-bit PCI infrastructure, which can improve performance.

The FICON Express SX feature has two independent ports, each port supporting attachment to a Fibre Channel Director with a Fibre Channel/FICON SX feature, or to a control unit with a Fibre Channel/FICON SX feature. FICON Express SX works with any SX feature supporting FICON. The FICON Express SX feature utilizes a short wavelength laser as the optical transceiver, and supports use of a 50/125-micrometer multimode fiber optic cable or a 62.5/125-micrometer multimode fiber optic cable terminated with an LC Duplex connector.

- Minimum Number of Features: None (a minimum of four ESCON channels or two FICON Express channels is required).
- Maximum Number of Features: 16 (32 ports).
- Increments: Two ports (one feature).
- Prerequisites: None.

- Corequisites: None.
- Compatibility Conflicts: The FICON Express SX feature supports use of an LC Duplex connector. A conversion kit may be required if there are fiber optic cables with SC Duplex connectors. Ensure the attaching/downstream device has a short wavelength (SX) feature.
- Customer Setup: No.
- Limitations: The total quantity of FICON Express LX features and FICON Express SX features cannot exceed 16 per system.
- Field Installable: Yes. Parts removed as a result of this feature change become the property of IBM.
- Cable Order: A 50/125-micrometer multimode fiber optic cable, or a 62.5/125-micrometer multimode fiber optic cable terminated with an LC Duplex connector is required for connecting this feature to the selected device.

### ***16-Port ESCON (#2323)***

The high-density ESCON feature has 16 ports, 15 of which can be activated for customer use. One port is always reserved as a spare, in the event of a failure of one of the other ports. ESCON cards are installed in increments of two.

This is not an orderable feature. The configuration tool will select the quantity of features based upon the order quantity of ESCON port feature number 2324, distributing the ports across pairs of features for high availability.

- Minimum Number of Features: None (a minimum of four ESCON channels or two FICON Express channels is required).
- Maximum Number of Features: 16.
- Increments: Four ports.
- Prerequisites: ESCON port feature number 2324.
- Corequisites: None.
- Compatibility Conflicts: The 16-Port ESCON feature supports use of an MTRJ connector. A conversion kit may be required if there are fiber optic cables with ESCON Duplex connectors.
- Customer Setup: No.
- Limitations: None.
- Field Installable: Yes. Parts removed as a result of this feature change become the property of IBM.
- Cable Order: A 62.5/125-micrometer multimode fiber optic cable terminated with an MTRJ connector is required.

### ***ESCON Channel Port (#2324)***

ESCON channels are ordered in increments of four. Ports are activated via Licensed Internal Code, Control Code (LICCC). Ports are activated equally across all installed 16-Port ESCON features for high availability. Each ESCON port utilizes a Light Emitting Diode (LED) as the optical transceiver, and supports use of a 62.5/125-micrometer multimode fiber optic cable terminated with an industry-standard small form factor MTRJ connector.

- Minimum Number of Ports: None (a minimum of four ESCON channels or two FICON Express channels is required).

- Maximum Number of Ports: 240.
- Increments: Four ports.
- Prerequisites: None.
- Corequisites: None.
- Compatibility Conflicts: The 16-Port ESCON feature supports use of an MTRJ connector. A conversion kit may be required if there are fiber optic cables with ESCON Duplex connectors.
- Customer Setup: No.
- Limitations: None.
- Field Installable: Yes. Parts removed as a result of this feature change become the property of IBM.
- Cable Order: A 62.5/125-micrometer multimode fiber optic cable terminated with an MTRJ connector is required.

### ***OSA Express 155 ATM SM (#2362)***

The OSA Express 155 ATM SM (single mode) feature has two independent ports, each port supporting attachment to a 155 megabits per second (Mbps) Asynchronous Transfer Mode (ATM) network. The feature has a long wavelength optical transceiver that supports use of a 9/125-micrometer single mode fiber optic cable terminated with an SC Duplex connector.

- Minimum Number of Features: None.
- Maximum Number of Features: 12 (24 ports).
- Increments: Two ports (one feature).
- Prerequisites: None.
- Corequisites: None.
- Compatibility Conflicts: None.
- Customer Setup: No.
- Limitations: The total quantity of all OSA Express features cannot exceed 12 per system.
- Field Installable: Yes. Parts removed as a result of this feature change become the property of IBM.
- Cable Order: A 9/125-micrometer single mode fiber optic cable terminated with an SC Duplex connector is required for connecting this feature to the selected device.

### ***OSA Express 155 ATM MM (#2363)***

The OSA Express 155 ATM MM (multimode) feature has two independent ports, each port supporting attachment to a 155 Mbps Asynchronous Transfer Mode (ATM) network. The feature utilizes a Light Emitting Diode (LED) as the optical transceiver, and supports use of a 62.5/125-micrometer multimode fiber optic cable terminated with an SC Duplex connector.

- Minimum Number of Features: None.
- Maximum Number of Features: 12 (24 ports).
- Increments: Two ports (one feature).
- Prerequisites: None.
- Corequisites: None.
- Compatibility Conflicts: None.
- Customer Setup: No.

- Limitations: The total quantity of all OSA Express features cannot exceed 12 per system.
- Field Installable: Yes. Parts removed as a result of this feature change become the property of IBM.
- Cable Order: A 62.5/125-micrometer multimode fiber optic cable with an SC Duplex connector is required for connecting this feature to the selected device.

### ***OSA Express GbE LX (#2364)***

The OSA Express GbE (Gigabit Ethernet) LX (long wavelength) feature has two independent ports, each supporting attachment to a one gigabit per second (Gbps) Ethernet Local Area Network (LAN). The feature utilizes a long wavelength laser as the optical transceiver, supporting a 9/125-micrometer single mode fiber optic cable terminated with an SC Duplex connector.

- Minimum Number of Features: None.
- Maximum Number of Features: 12 (24 ports).
- Increments: Two ports (one feature).
- Prerequisites: None.
- Corequisites: None.
- Compatibility Conflicts: None.
- Customer Setup: No.
- Limitations: The total quantity of all OSA Express features cannot exceed 12 per system.
- Field Installable: Yes. Parts removed as a result of this feature change become the property of IBM.
- Cable Order: A 9/125-micrometer single mode fiber optic cable terminated with an SC Duplex connector is required for connecting this feature to the selected device.

If multimode fiber optic cables are being reused with the GbE LX feature, a pair of Mode Conditioning Patch (MCP) cables is required, one for each end of the link. MCP cables are for use with one gigabit per second links only (100 MB/sec) and may reduce the maximum distance over which OSA Express GbE LX can transmit.

### ***OSA Express GbE SX (#2365)***

The OSA Express GbE (Gigabit Ethernet) SX (short wavelength) feature has two independent ports, each supporting attachment to a one gigabit per second (Gbps) Ethernet Local Area Network (LAN). The feature utilizes a short wavelength laser as the optical transceiver, and supports use of a 50/125-micrometer multimode fiber optic cable or a 62.5/125-micrometer multimode fiber optic cable terminated with an SC Duplex connector.

- Minimum Number of Features: None.
- Maximum Number of Features: 12 (24 ports).
- Increments: Two ports (one feature).
- Prerequisites: None.
- Corequisites: None.
- Compatibility Conflicts: None.
- Customer Setup: No.
- Limitations: The total quantity of all OSA Express features cannot exceed 12 per system.

- Field Installable: Yes. Parts removed as a result of this feature change become the property of IBM.
- Cable Order: A 50/125-micrometer multimode fiber optic cable, or a 62.5/125-micrometer multimode fiber optic cable terminated with an SC Duplex connector is required for connecting this feature to the selected device.

### ***OSA Express Fast Ethernet (#2366)***

The OSA Express Fast Ethernet feature has two independent ports, each supporting attachment to either a 10BASE-T (10 Mbps) or a 100BASE-TX (100 Mbps) Ethernet LAN. The feature automatically adjusts to 10 Mbps or 100 Mbps, depending upon the LAN to which it is attached. The Ethernet LAN must conform to either the IEEE 802.3 (ISO/IEC 8802.3) standard or to the Ethernet V2.0 specifications.

- Minimum Number of Features: None.
- Maximum Number of Features: 12 (24 ports).
- Increments: Two ports (one feature).
- Prerequisites: None.
- Corequisites: None.
- Compatibility Conflicts: None.
- Customer Setup: No.
- Limitations: The total quantity of all OSA Express features cannot exceed 12 per system.
- Field Installable: Yes. Parts removed as a result of this feature change become the property of IBM.
- Cable Order: An EIA/TIA category 5 unshielded twisted pair (UTP) cable terminated with an RJ-45 connector is required for attaching the OSA-Express Fast Ethernet feature to the selected device.

### ***OSA Express Token Ring (#2367)***

The OSA Express Token Ring feature has two independent ports, each supporting attachment to either a 4 Mbps, 16 Mbps, or 100 Mbps Token Ring Local Area Network (LAN).

The OSA Express Token Ring feature supports autosensing as well as any of the following settings: 4 Mbps half- or full-duplex, 16 Mbps half- or full-duplex, 100 Mbps full-duplex. Regardless of the choice made, the network switch settings must agree with those of the OSA Express Token Ring feature. If the LAN speed defaults to autosense, the OSA Express Token Ring feature will sense the speed of the attached switch and insert into the LAN at the appropriate speed. If the Token Ring feature is the first station on the LAN and the user specifies autosense, it will default to a speed of 16 Mbps and will attempt to open in full-duplex mode. If unsuccessful, it will default to half-duplex mode. The OSA Express Token Ring feature conforms to the IEEE 802.5 (ISO/IEC 8802.5) standard.

- Minimum Number of Features: None.
- Maximum Number of Features: 12 (24 ports).
- Increments: Two ports (one feature).
- Prerequisites: None.
- Corequisites: None.
- Compatibility Conflicts: None.
- Customer Setup: No.

- Limitations: The total quantity of all OSA Express features cannot exceed 12 per system.
- Field Installable: Yes. Parts removed as a result of this feature change become the property of IBM.
- Cable Order: A shielded twisted pair (STP) or an unshielded twisted pair (UTP) interface terminated with an 8-pin RJ-45 connector is required for attaching the OSA Express Token Ring feature to the selected device.

### ***Fiber Quick Connect Delivers!***

Fiber Quick Connect (FQC) is an option in the e-configuration tool.

The FQC features are for factory installation of IBM Fiber Transport Services (FTS) fiber harnesses for connection to ESCON channels in the I/O cage of the z800. FTS fiber harnesses enable connection to FTS direct-attach fiber trunk cables from IBM Global Services.

FQC, coupled with IBM FTS from IBM Global Services, delivers a solution to reduce the amount of time required for on-site installation and setup of cabling, to minimize disruptions, and to isolate the activity from the active system as much as possible. FQC facilitates adds, moves, and changes of ESCON multimode fiber optic cables in the data center and can reduce fiber connection time by up to 80%.

IBM Global Services provides the direct-attach trunk cables, patch panels, and Central Patching Location (CPL) hardware, as well as the planning and installation required to complete the total structured connectivity solution. Four trunks, each with 72 fiber pairs, can displace up to 240 fiber optic cables, the maximum quantity of ESCON channels in an I/O cage on the z800. This significantly reduces ESCON cable bulk.

The CPL panels use the small form factor fiber optic connector, called Single Connector-Dual Contact (SC-DC). Use of the SC-DC connectors in the CPL panel instead of the ESCON Duplex connectors has reduced the required floor space by 50%.

CPL planning and layout are done prior to arrival of the server on-site using the default CHannel Path IDentifier (CHPID) placement report, and documentation is provided showing the CHPID layout and how the direct-attach harnesses are plugged.

**Note:** FQC supports all of the ESCON channels in the I/O cage. FQC cannot be ordered for selected channels.

### ***Fiber Quick Connect (#7933, #7934, #7935)***

The FQC features are for factory installation of IBM FTS fiber harnesses for connection to ESCON channels in the I/O cage.

These descriptions are for information purposes only. They are not orderable. The configuration tool selects the appropriate features and quantities based upon the system configuration, when FQC is requested in the configuration tool.

**Note:** FQC supports all of the ESCON channels in the I/O cage. FQC cannot be ordered for selected channels.

### **MTP Base Bracket (#7933)**

The MTP Base Bracket is not an orderable feature. When FQC is ordered, the configuration tool selects the required number of brackets based upon the ESCON card quantity.

### **MTP Additional Brackets (#7934)**

This is not an orderable feature. When FQC is ordered, the configuration tool selects the required number of brackets based upon the ESCON card quantity. Each bracket has positions for 10 MTP connectors to be plugged, each MTP supporting 12 fiber pairs (six ESCON channels), for a total of 120 fiber pairs (60 ESCON channels) for each MTP mounting bracket.

### **MTRJ 6 ft Harnesses (5) (#7935)**

This is not an orderable feature. This description is for information purposes only. A quantity of five harnesses supporting 30 channels is supplied with this feature. This direct-attach harness supports 62.5/125-micrometer multimode fiber optic trunk cables. The fiber harness is for use in the I/O cage and supports the 16-Port ESCON feature with the optical transceiver supporting the industry-standard small form factor MTRJ connector.

The fiber harness has six MTRJ connectors on one end to attach to six ESCON ports. The opposite end has one MTP connector for plugging into the MTP Coupler Bracket. When FQC is ordered, the configuration tool selects the required number of harnesses based upon the ESCON card quantity.

- Prerequisites: None
- Corequisites: None
- Compatibility Conflicts: None
- Customer Setup: No
- Limitations: None
- Field Installable: No

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## **Prices**

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Prices are available upon request from IBM.

### **Products**

<b>Description</b>	<b>Machine Type</b>	<b>Model</b>	<b>Feature Number</b>	<b>MMMC Indicator</b>	<b>Plant/Field Install</b>
zSeries 800	2066	0A1 0B1 0C1 001 0A2 002 003 004 0CF			
1-way Processor		0A1	4600	Y	P/F
1-way Processor		0B1	4601	Y	P/F
1-way Processor		0C1	4602	Y	P/F
1-way Processor		001	4603	Y	P/F
2-way Processor		0A2	4604	Y	P/F
2-way Processor		002	4605	Y	P/F
3-way Processor		003	4606	Y	P/F
4-way Processor		004	4607	Y	P/F
1-engine CF		0CF	3601	Y	P/F
2-engine CF		0CF	3602	Y	P/F
3-engine CF		0CF	3603	Y	P/F
4-engine CF		0CF	3604	Y	P/F

#### **Standard Features:**

Base Frame			2000	Y	P/F
Service Element (SE):					
SE (TR/Enet)			0086	Y	P/F
SE (Dual Ethernet)			0087	Y	P/F

Description	Machine Type	Model	Feature Number	MMMC Indicator	Plant/Field Install
Language:					
U.S. English			2924	Y	P
France			2928	Y	P
German			2929	Y	P
Spanish			2930	Y	P
Spain			2931	Y	P
Italian			2932	Y	P
Canadian/French			2935	Y	P
Portugal			2978	Y	P
Brazilian/Portuguese			2979	Y	P
U.K. English			2980	Y	P
Norwegian			2983	Y	P
Sweden/Finland			2987	Y	P
Netherlands			2988	Y	P
Belgian/French			2989	Y	P
Denmark			2993	Y	P
Swiss/French/German			2997	Y	P
Luxembourg Orders from Belgium			5560	Y	P
Iceland Orders from Denmark			5561	Y	P
China Orders from Hong Kong			5562	Y	P
Structure (choose one modem type and/or one hemisphere):					
110 V Modem			2940	Y	P
220 V Modem			2941	Y	P
Northern Hemisphere			9930	Y	P
Southern Hemisphere			9931	Y	P
Line Cords (choose one):					
6 ft Chicago Line Cord			2700	Y	P
14 ft U.S./Canada/Japan			2701	Y	P
14 ft World Trade Line Cord			2702	Y	P
<b>Optional Features:</b>					
Server:					
IFL Engines on Gen'1 Purp Mod			3700	Y	P/F
ICF Engines on Gen'1 Purp Mod			3702	Y	P/F
Capacity Back Up			3704	Y	P/F
Storage:					
8GB Memory increment			1208	Y	P/F
Fiber Quick Connect (FQC)					
MTP Base Bracket			7933	Y	P
MTP Additional Brackets			7934	Y	P
MTRJ 6 ft Harnesses (5)			7935	Y	P
I/O and Logic:					
ICB Cable			0227	Y	P/F
ISC-M Card			0217	Y	P/F
ISC Port on FC 0218 Card			0219	Y	P/F
STI-M Card			0222	Y	P/F
PCI Cryptographic Coprocessor			0861	Y	P/F
PCI Cryptographic Accelerator			0862	Y	P/F
Triple DES PCI			0865	Y	P/F
TKE / Token Ring			0866	Y	P/F
TKE / Ethernet			0869	Y	P/F
TKE Hardware (Token Ring)			0876	Y	P/F
TKE Hardware (Ethernet)			0879	Y	P/F
Triple DES Code with TKE			0875	Y	P/F
ICB-3 Function			0993	Y	P/F
FICON Express LX			2319	Y	P/F
FICON Express SX			2320	Y	P/F
16-Port ESCON Card			2323	Y	P/F
ESCON Port Function			2324	Y	P/F
OSA-Express 155 ATM SM			2362	Y	P/F
OSA-Express 155 ATM MM			2363	Y	P/F
OSA-Express GbE LX			2364	Y	P/F



Description	Machine Type	Model	Feature Number	MMMC Indicator	Plant/Field Install
OSA-Express GbE SX			2365	Y	P/F
OSA-Express Fast Ethernet			2366	Y	P/F
OSA-Express High Speed TR			2367	Y	P/F
Power:					
PSC24V Card			0223	Y	P/F
Power Sequence Control			6402	Y	P/F
Miscellaneous:					
Crypto Hardware Present			0800	Y	P/F
EMEA Special Ops			1022	Y	P
Custom Quick Ship			1748	Y	P
JCM Ops			2029	Y	P
I/O Cards:					
Full Airflow Card			0112	Y	P/F
ISC-D Airflow			0113	Y	P/F
Airflow (PSC24V and STI-M)			0225	Y	P/F
Service Element (SE):					
8-Port MAU			0088	Y	P/F
8-Port HUB			0089	Y	P/F
Hardware Management Console (HMC):					
HMC White			0073	Y	P/F
17-in White Console Display			6090	Y	P/F
21-in White Console Display			6091	Y	P/F
Token Ring / HMC			0023	Y	P/F
Ethernet / HMC			0024	Y	P/F
DVD			0047	Y	P/F
HMC w/TR Enet, DVD — Black			0074	Y	P/F
17-in Black Console Display			6092	Y	P/F
21-in Black Console Display			6093	Y	P/F

Y = Yes

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

If field installed on a purchased machine, parts removed or replaced become the property of IBM and must be returned.

### Model Conversions

From	Model To
0A1	0B1
0A1	0C1
0A1	001
0A1	0A2
0A1	002
0A1	003
0A1	004
0B1	0C1
0B1	001
0B1	0A2
0B1	002
0B1	003
0B1	004
0C1	001
0C1	0A2
0C1	002
0C1	003
0C1	004
001	0A2
001	002
001	003
001	004
0A2	002
0A2	003
0A2	004
002	003
002	004
003	004
0CF	001
0CF	0A2
0CF	002
0CF	003
0CF	004
004	104

There are no upgrades from other machine types (for example, 9672, 7060) to IBM @server z800.

### Feature Conversions

Feature From	Feature To	Returned Parts	Continuous Maintenance
4600	4601	Y	Y
4600	4602	Y	Y
4600	4603	Y	Y
4600	4604	Y	Y
4600	4605	Y	Y
4600	4606	Y	Y
4600	4607	Y	Y
4601	4602	Y	Y
4601	4603	Y	Y
4601	4604	Y	Y
4601	4605	Y	Y
4601	4606	Y	Y
4601	4607	Y	Y
4602	4603	Y	Y
4602	4604	Y	Y
4602	4605	Y	Y
4602	4606	Y	Y
4602	4607	Y	Y
4603	4604	Y	Y
4603	4605	Y	Y
4603	4606	Y	Y
4603	4607	Y	Y
4604	4605	Y	Y
4604	4606	Y	Y
4604	4607	Y	Y
4605	4606	Y	Y

Feature		Returned Parts	Continuous Maintenance
From	To		
4605	4607	Y	Y
4606	4607	Y	Y
3601	3602	Y	Y
3601	3603	Y	Y
3601	3604	Y	Y
3602	3603	Y	Y
3602	3604	Y	Y
3603	3604	Y	Y
3601	4603	Y	Y
3601	4604	Y	Y
3601	4605	Y	Y
3601	4606	Y	Y
3601	4607	Y	Y
3602	4605	Y	Y
3602	4606	Y	Y
3602	4607	Y	Y
3603	4606	Y	Y
3603	4607	Y	Y
3604	4607	Y	Y
0086	0087	Y	Y
4607	1054	Y	Y

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**Note:** Shipments will begin after the planned availability date.