IBM z/OS V1.9 delivers a highly secure infrastructure you need for your demanding data serving requirements

At a glance

With z/OS V1.9, IBM introduces:

- A revised and expanded Statement of z/OS System Integrity
- Support for up to 54 engines in a single image
- Simplified and centralized policy-based networking
- Advancements in ease of use for both new and existing IT professionals coming to z/OS
- Support for zIIP-assisted IPSec, and support for eligible portions of DB2 9 XML parsing workloads to be offloaded to zAAP processors
- Expanded options for AT-TLS and System SSL network security
- Improved creation and management of digital certificates with RACF, SAF, and z/OS PKI Services
- Additional centralized ICSF encryption key management functions for applications
- Support for new IBM Tivoli Directory Server for z/OS (originally available first quarter 2007 with z/OS V1.8)
- Improved availability with Parallel Sysplex and Coupling Facility improvements
- Enhanced application development and integration with new System REXX facility, Metal C facility, and z/OS UNIX® System Services commands
- Enhanced Workload Manager in managing discretionary work and zIIP and zAAP workloads

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Your IBM representative or the Americas Call Centers at

800-IBM-CALL Reference: LE001

Overview

With z/OS® V1.9, IBM delivers functionality that continues to solidify System z™ leadership as the premier data server. z/OS V1.9 offers enhancements in the areas of security, networking, scalability, availability, application development, integration, and improved economics with more exploitation for specialty engines. But why do System z and z/OS persist as such a phenomenal data-serving platform? The platform's classic strengths come to mind, but at the root of these classic capabilities — a foundational element of the platform — is z/OS's tight interaction with the System z hardware and its high level of system integrity.

First issued in 1973, IBM's MVS™ System Integrity Statement and subsequent statements for IBM OS/390® and z/OS have stood for three decades as a symbol of IBM's confidence in and commitment to the z/OS operating system. Today, IBM reaffirms its commitment to z/OS System Integrity.

IBM's commitment includes designs and development practices intended to prevent unauthorized application programs, subsystems, and users from bypassing z/OS security — that is, to prevent them from gaining access to, circumventing, disabling, altering, or obtaining control of key z/OS system processes and resources unless allowed by the installation. Specifically, z/OS "System Integrity" is defined as the inability of any program not authorized by a mechanism under the installation's control to circumvent or disable store or fetch protection, access a resource protected by the z/OS Security Server (RACF®), or obtain control in an authorized state; that is, in supervisor state, with a protection key less than 8, or Authorized Program Facility (APF) authorized. In the event that an IBM System Integrity problem is reported, IBM will always take action to resolve it.

IBM's long-term commitment to System Integrity is unique in the industry, and forms the basis of z/OS's industry leadership in system security. z/OS is designed to help you protect your system, data, transactions, and applications from accidental or malicious modification. This is one of the many reasons System z remains the industry's premier data server for mission-critical workloads.

Building on the solid foundation of z/OS System Integrity, IBM has added more security capabilities to z/OS V1.9 to help you protect your data. z/OS V1.9 has enhanced PKI Services and RACF to help improve the creation, authentication, renewal, and management of digital certificates for user and device authentication. In addition, the z/OS Integrated Cryptographic Service Facility (ICSF) is planned to be enhanced to include the PKCS#11 standard. ICSF is part of the base of z/OS mainframe encryption, which enables you to encrypt and decrypt data, generate and manage cryptographic keys, and perform other cryptographic functions dealing with data integrity and digital signatures. By adopting the PKCS#11 standard, ICSF enables the strength of mainframe encryption, and secure centralized key management can be brought to and used by Web-based application and networking environments more easily.

z/OS V1.9 adds enhancements to help secure your network traffic, including additional exploiters for z/OS System SSL and Application Transparent — Transport Layer Security (AT-TLS). z/OS can also help you secure network traffic using IP Security (IPSec). And to make IPSec a more attractive option, the z/OS Communications Server has been enhanced to allow IPSec processing to take advantage of IBM System z9™ Integrated Information Processors (zIIPs) — in effect, making the zIIP a high-speed encryption engine. This is designed to allow you to take advantage of IPSec network security to protect your valuable business transactions and bulk data movement using your z/OS host, but with the cost-saving benefits of zIIP.

In addition to supporting network security capabilities such as AT-TLS and IPSec, z/OS has additional enhancements which can help simplify overall network and network security management. The z/OS Communications Server uses a Policy Agent to centrally collect and distribute network settings you define in a simplified, centralized, manageable, and auditable manner. With this ability to provide centralized policy services for network Intrusion Detection Services (IDS), Quality of Service (QoS), IPSec, and AT-TLS, and now with Network Security Services (NSS) and TCP/IP Policy-Based Routing (PBR), you in effect have the ability to customize your network to suit the needs of your applications and data more easily.

In addition to its commitment to secure and reliable data serving, z/OS V1.9 also continues to deliver on IBM's commitment to simplify z/OS systems management. This release offers many, many improvements in the areas of problem diagnosis and problem determination; network and security management; and overall z/OS, I/O configuration, sysplex, and storage operations. These improvements are intended to help simplify systems management, to improve application programmer, system programmer, and operator productivity, and to make the functions easier to understand and use.

Of course, z/OS V1.9 continues to enhance its classic data-serving strengths. Scalability is improved with new 54-way single image support, and availability is improved with Parallel Sysplex® and Coupling Facility improvements. z/OS Workload Manager has enhanced its capabilities in managing discretionary work and workloads exploiting zIIPs and zAAPs. Support for the robust IBM Tivoli® Directory Server for z/OS (originally available first quarter 2007 with z/OS V1.8) offers a more scalable, more available, and better performing LDAP for z/OS. Furthermore, for those investigating expanding the System z data-serving role to include XML-based service-oriented architecture solutions, z/OS V1.9 now enables part of DB2® 9 XML parsing workloads to be made eligible for zAAP processors — enabling the efficient integration of XML flexibility to data serving excellence.

Note: The total number of processors defined in a z/OS logical partition is the sum of

general-purpose processors (CPs), System z9 Application Assist Processors (zAAPs), and System z9 Integrated Information Processors (zIIPs).

Key prerequisites

z/OS V1.9 will run on these IBM System z servers:

- z9 BC
- z9 EC
- z900
- z990
- z800
- z890

For a complete description of z/OS V1.9 software prerequisites, refer to z/OS Planning for Installation (GA22-7504), when available.

Planned availability date

September 28, 2007

Description

Ease of use

With increased focus on simplifying z/OS for IT professionals, z/OS V1.9 provides improvements in the areas of simplifying diagnosis and problem determination; network and security management; as well as overall z/OS, I/O configuration, sysplex, and storage operations. These improvements can help simplify systems management, improve application programmer, system programmer, and operator productivity, and make the functions easier to understand and use.

z/OS V1.9 has made the following systems management improvements:

- The new System REXX (SYSREXX) component makes possible execution of REXX routines in an authorized environment. Now SYSREXX execs can be used to automate complex operator commands and other system functions. SYSREXX execs can be invoked by a program interface, and by operator command. IBM will also make this available for z/OS V1.8 and z/OS.e V1.8 via a Web deliverable.
- The IBM Health Checker for z/OS has new health checks for z/OS UNIX System Services, TSO/E, the Virtual Storage Manager component of the z/OS BCP, and z/OS Communications Server. In addition, IBM Health Checker for z/OS supports checks that are written in REXX using the new SYSREXX facility available with z/OS V1.9. This new SYSREXX facility makes it easier for you to write your own checks.
- RRS provides a new batch interface supporting functions that allow you to query and update RRS information from batch jobs. These functions duplicate those available using the RRS ISPF panels; however, the batch interface makes it easier to save information and perform or schedule RRS operations more easily.

  You can use the query commands to retrieve information about resource and work managers, units of recovery (UR), and additional information about RRS itself. This collected information is expected to be especially useful during problem determination.

  You can use update commands to remove resource managers' interests in URs, resolve UR states to commit or back out, remove resource managers' identities, and unregister resource managers' involvement with RRS.

- In z/OS V1.9 the z/OS Communications Server is enhanced with new high-performance Network Management Interfaces (NMIs). The new NMIs are designed for fast data collection of large amounts of information on your network security associations (such as IP filters and IP tunnels) for use with network management tools. IBM Tivoli OMEGAMON® XE for Mainframe Networks is planned to exploit these NMIs.

- SDSF is being enhanced to add the capability to provide access to SDSF functions through REXX variables. The variables will be loaded with data from the SDSF panels. This will enable them to be processed by REXX execs. The data can also be changed; this provides capabilities similar to those provided in the SDSF dialog by action characters and overtyping.
- In z/OS V1.9 ISPF improvements include:
  - Support for editing and browsing z/OS UNIX and ASCII files.
  - Support for sharing ISPF profile variables across multiple systems in a Parallel Sysplex. This can eliminate the need for multiple profile datasets in a sysplex.
  - Support for system symbols in data set names on panels.
  - Extensions to ISPF Edit Undo processing that will now keep Edit Undo buffers across Save commands, to allow you to specify that changes be removed from edited data even after the data has been saved.
  - Enhancements to the DSLIST command, command table support, and REXX variables processing.
- RACF administration is simplified with the support of the Java™ programming language. In z/OS V1.9, RACF provides a Java interface to administer or query users and groups in RACF. This is intended to increase the accessibility and usability of RACF by allowing programmatic access to RACF from Java programs.
- The Hardware Configuration Manager (HCM, an optionally priced feature of z/OS) in and of itself simplifies System z I/O configuration. HCM provides centralized I/O management with one process for defining and documenting System z processors, switches, and devices. It is intuitive and easy to use; you can define disk subsystems with a few mouse clicks, and print configuration reports on demand. Furthermore, it improves system availability by helping to validate data and helping prevent configuration errors. In z/OS V1.8 the HCM allowed you to perform performance data integrated with RMF™ and introduced wizards that simplified complex configuration tasks.

  With z/OS V1.9 the HCM report printing function is improved with the ability to print the processor, channel path, CTC, and ESCON® link information based on selected processors and switches.

  Additional z/OS V1.9 HCM usability enhancements include:
  - Loading large HCM configuration files more quickly.
  - Allowing you to define new partitions and channel subsystems more quickly.
  - Improving the resynchronization processing that HCM may need to initiate. It is now expected to take much less time.
  - Allowing easy sequential sharing of the same HCM configuration file between multiple HCM users by providing a new option to place an HCM configuration file on the host. This is intended to allow you and others who work with the host-based HCM configuration files to work with the most up-to-date versions.
  - Enhancing the HCM Subsystem Creation Wizard so that changes can be performed on an existing DASD subsystem, allowing for quick definition of changes to I/O (for example, a DASD upgrade).
  - Making a new Vertical Processor View available in order to show a consistent physical picture of the processor. The new view shows all channel subsystems above each other, allowing only PCHIDs to be shown even for spanned CHPIDs. It is possible to toggle between the existing Horizontal Processor View and the new Vertical Processor View.
- IBM adds additional fields to the DFSMShsm™ function statistics records (FSRs) to improve the data available for statistical analysis of the DFSMShsm environment.
- DFSMSdfp™ OAM (Object Access Method) introduces two new sublevels into the tape level of the OAM storage hierarchy. This effectively expands OAM's storage hierarchy into four levels: disk, optical, tape sublevel 1 (TSL1), and tape sublevel 2 (TSL2). In addition to providing the ability to write and read object data directly to and from a given sublevel, this support provides the ability to transition object data within the tape family (for example: from VTS to native tape) during an OSMC storage group cycle. Prior to this support, data movement within the tape family could only be accomplished manually via the MOVEVOL or RECYCLE commands.
- System symbol support is added for DFSMSrmm™ parmlib members. This enhancement is designed to allow you to share DFSMSrmm parmlib members more easily. Additionally, you

can use indirection to point to another parmlib member which might contain system-specific options.

- DFSMSrmm SEARCH subcommands with CLIST are enhanced so that you can optionally append to an existing CLIST data set. Almost any format of CLIST data set is supported and the subcommands support a way to break the results into chunks for easier results management.
- DFSMSrmm is enhanced to support almost any unqualified data set name up to 44 characters. The product version can be alphanumeric and volumes and data sets can be declassified.
- Several enhancements are made for VSAM system-managed buffering (SMB). VSAM SMB uses an algorithm to calculate the storage and buffer numbers needed for a specific access type. Each algorithm is called an Access Bias. In z/OS V1.9, the informational IEC161I message that was issued at OPEN time to indicate what Access Bias was selected for a particular VSAM component being opened is no longer issued. Now, the message will only appear if the user has requested it for diagnostic or analytical purposes. You can add a new JCL keyword on the AMP parameter of the DD statement, MSG=SMBBIAS, to specify that the system should issue the IEC161I message as it did before.

  To restrict the amount of storage used for the data component of a data set when Access Bias DO (Direct Optimization) is specified, you previously had to modify the JCL for each job. This can be cumbersome for batch jobs in which a large number of data sets are allocated. In z/OS V1.9, you can restrict VSAM SMB DO storage usage using an SMS DATACLAS parameter, without changing the JCL for each job step.

Simplified network and network security management:

- The z/OS Communications Server as a whole can help simplify overall network and network security management. The z/OS Communications Server uses a Policy Agent to centrally collect and distribute the network settings you define. With z/OS V1.9 the z/OS Communications Server Policy Agent is enhanced to take on additional roles that support the goal of centralized policy management. The Policy Agent is able to be configured to act as a policy server. In this role it can not only read and install local policies for a set of TCP/IP stacks, but can also load policies on demand for policy clients. This is designed to allow all policies for a set of systems to be administered on a single system. Policy Agent is also able to be configured to act as a policy client. In this role it can connect to the policy server and retrieve remote policies that are then installed in the local TCP/IP stacks.

  You can use the z/OS Communications Server with its Policy Agent to centrally configure and manage your network Intrusion Detection Services (IDS), Quality of Service (QoS), IP Security (IPSec), and Application Transparent — Transport Layer Security (AT-TLS). With z/OS V1.9 the z/OS Communications Server Policy Agent adds Network Security Services (NSS) and TCP/IP Policy-Based Routing (PBR). Refer to the Networking and Security sections for more details.
- In addition to providing the simplified management and control of centralized policy-based networking, the z/OS Communications Server has a modern and intuitive graphical user interface that simplifies the configuration of the functions listed above.

  z/OS V1.7 z/OS Communications Server introduced the z/OS Network Security Configuration Assistant which combined the power of a network policy agent with a modern and intuitive graphic user interface to centrally manage IPSec and AT-TLS configuration. In z/OS V1.8 IDS and QoS interfaces were added to the configuration assistant and it was renamed the IBM Configuration Assistant for the z/OS Communications Server. With z/OS V1.9 the IBM Configuration Assistant for z/OS Communications Server is extended to include support for PBR (TCP/IP Policy-Based Routing) and NSS (Network Security Services) configuration. This support allows an administrator to configure IPSec, AT-TLS, QoS, IDS, and PBR policy using a single, simple, consistent user interface.

  Other new function in the IBM Configuration Assistant for z/OS Communications Server allows the configuration information for all of these technologies to be managed collectively, providing health check operations designed to provide consistent configuration across the supported technologies. The configuration information can be saved and accessed on a z/OS system or on a Windows™-based file system. The Configuration Assistant for z/OS Communications Server is a separate download. For more information refer to

Sysplex management and maintenance is improved and simplified in the following areas:

- In z/OS V1.9, enhancements are made for the D XCF, COUPLE, TYPE=BPXMCDS command

to include the current defined values for MAXSYSTEMS, MOUNTS and AMTRULES for the TYPE (BPXMCDS) couple dataset. As these values can be updated dynamically, it will be easier to keep track of changes that could impact the shared file system configuration.

- RMF provides information about the CF processor resources consumed by each Coupling Facility (CF) structure. This information is provided by both Postprocessor and Monitor III. These enhancements are intended to allow better CF performance monitoring and problem determination by tracking utilization at a CF structure level. This requires CFCC Level 15, which is available on System z9 servers. This new function is also made available on z/OS V1.6 with APAR OA17055 (XES) and APAR OA17070 (RMF).
- z/OS V1.9 includes support for a number of usability enhancements to the CF structure REALLOCATE process (the SETXCF START,REALLOCATE system command). These enhancements were originally made available for z/OS V1.4 and higher via APAR OA08688. The REALLOCATE process itself provides a simple, easy-to-use mechanism for dynamically optimizing the placement of CF structures among the CFs in a Parallel Sysplex. It determines the "most preferred" CF locations for the CF structure instances based on the CFRM policy and current conditions, and serially moves the structures to those most preferred CFs in a nondisruptive fashion. The new enhancements to REALLOCATE include:
  - A structure-level CFRM policy control to allow selected structures to be bypassed by REALLOCATE processing, if necessary.
  - Support to automatically initiate duplexing for CF structures that should be duplexed.
  - The capability to complete a pending policy change for structures without rebuilding the structure, whenever possible.
  - Improved processing of structures which make use of the exclusion list (EXCLLIST) option in the CFRM policy.
- z/OS V1.9 includes support for placing coupling facilities into a new state, called "maintenance mode." When a CF is in maintenance mode, it is logically ineligible for CF structure allocation purposes, as if it had been removed from the CFRM policy entirely (although no CFRM policy updates are required to accomplish this). Subsequent rebuild or REALLOCATE processing will also tend to remove any CF structure instances that were already allocated in that CF at the time it was placed into maintenance mode.

  In conjunction with the REALLOCATE command, the new maintenance mode support can greatly simplify operational procedures related to taking a CF down for maintenance or upgrade in a Parallel Sysplex. In particular, the need to laboriously update or maintain several alternate copies of the CFRM policy that omit a particular CF which is to be removed for maintenance, is avoided.

Additional ease of use enhancements:

- The z/OS V1.9 base elements and optional features documentation will be delivered for the first time in Information Center format. The z/OS V1R9 Information Center is offered as a beta site to introduce z/OS customers to Information Center delivery, to solicit feedback, and to gather customer requirements. All feedback can be provided by using the "Contact z/OS" link on the Information Center itself. The z/OS V1.9 Information Center is offered in addition to our traditional deliverables and formats.
- In addition to supporting BookManager® Book and Adobe PDF document types within Shelf containers, Library Server has been extended to integrate support for Eclipse Document Plug-ins that are contained within InfoCenters.

Scalability

z/OS V1.9 is designed to help provide constraint relief, improve overall scalability and performance, and enhance measurement capabilities. It includes new designs to help provide up to 54-way single image support; improved SMF data collection and management; and improved performance for Coupling Facility (CF) Duplexing, Global Resource Serialization (GRS), Couple Data Set (CDS) I/O, and applications using Language Environment® heap pools.

- Starting with z/OS V1.6, up to 32 processors are supported in a single logical partition on IBM System z9 EC and z990 servers. With z/OS V1.9, IBM provides support for z/OS to run up to 54 processors in a single logical partition on z9 EC servers.

  Note: The total number of processors defined in a z/OS logical partition is the sum of general-purpose processors (CPs), System z9 Application Assist Processors (zAAPs), and System z9 Integrated Information Processors (zIIPs).

- SMF data management is enhanced. SMF can be configured to use System Logger to write data to one or more log streams. When the Coupling Facility (CF) is used, this is expected to allow the system to support far higher data write rates than can be supported when using SYS1.MAN data sets. The use of DASDONLY log streams is also supported. You can specify that different SMF record types be written to separate log streams, and that the same SMF record type be written to multiple log streams. Different retention periods can be specified for each log stream. This can help improve both scalability and SMF data management. A new SMF dump program, IFASMFDL, is introduced to process SMF data stored in log streams. Its output is the same as that from the existing IFASMFDP program, which can allow you to perform downstream SMF data processing compatibly.
- IBM plans to enhance System-Managed Coupling Facility (CF) Duplexing to streamline CF-to-CF synchronization protocols. This is expected to result in improved response time for duplexed CF requests that can take advantage of this enhancement. This may help reduce the overhead of CF Duplexing, and may help make duplexing a more viable alternative for use in providing high availability for CF structure data. It requires CFCC Level 15, which is available on System z9 servers. This enhancement will be made generally available by first quarter 2008, on z/OS V1.6 through V1.9, delivered in the service stream.
- GRS is now designed to relieve virtual storage constraints and offer some improved serialization performance. In z/OS V1.9, GRS has been changed to:
  - Exploit 64-bit addressing in all GRS modes. This is expected to dramatically increase the number of concurrent ENQs that can be supported on a z/OS system.
  - Better align its latch-related control blocks with hardware cache boundaries. This is expected to improve GRS Latch performance.
  - Decrease internal lock contention to help increase throughput.
- z/OS V1.9 includes support for improved parallelism in Couple Data Set access channel programs for all supported types of Couple Data Sets. XCF design has been changed to take advantage of increased parallelism. This is expected to result in improved I/O performance and throughput. This enhancement was originally made available for z/OS V1.4 and later releases with APAR OA15409.
- Language Environment is designed to help improve the performance of applications in the following manner:
  - Language Environment is designed to allow for the heap pools control data and individual cells to be aligned to better optimize use of the processor cache. Language Environment is designed to further reduce stack transitions for AMODE 31 XPLINK applications using heap pools.
  - Language Environment is designed to remove stack transitions during long long division and long long multiplication in AMODE 31 XPLINK applications.
- In z/OS V1.9, IOS is designed to provide 31-bit virtual constraint relief by relocating configuration data tables (CDTs). To reduce the amount of common storage required, most CDT blocks will be moved to a common area data space (CADS).
- In order to free up private storage below the 16 MB line, z/OS BCP Allocation's dynamic storage areas have been moved above 16 MB.
- In z/OS V1.7, DFSMS provided support for large, nonextended format sequential data sets (DSNTYPE=LARGE) which can be larger than 65,535 tracks. In z/OS V1.9, these TSO/E functions are updated to support these data sets:
  - LISTDSI, used in REXX execs and CLISTs
  - PRINTDS command
  - TRANSMIT and RECEIVE commands
- IBM reduces the amount of storage that DFSMShsm uses below 16 MB in an effort to address storage-related abends (878, 80A, and so on).

Application integration

IBM continues to embrace open and industry standards to support your requirements for application portability. z/OS V1.9 has several important functions intended to extend existing applications, integrate new applications, and support industry and de facto standards: the ability for select XML processing to be eligible for the zAAP processor means new XML-based workloads become more attractive on the platform; adopting the PKCS#11 standard allows mainframe encryption and centralized key management to be used by Web-based applications

and networking environments; improvements to LDAP enable application registries to be more easily centralized, managed, and recovered; improvements to z/OS UNIX System Services help enable porting of UNIX applications to z/OS; and Language Environment has enhancements to language, currency, multicast source filtering, and XPLINK support, in addition to other items.

- On April 18, 2007, IBM announced its intent to enhance z/OS XML System Services to exploit zAAP and zIIP specialty engines. Today IBM is announcing that z/OS XML System Services is now enabled to exploit the zAAP specialty engine. Portions of XML parsing workloads performed by z/OS XML System Services are eligible to be redirected to the zAAP processor. Specifically, all z/OS XML System Services parsing performed in TCB mode is eligible to be executed on the zAAP processor. The immediate exploiter and benefactor of this enhancement is DB2 9 for z/OS, specifically the parsing of XML data from locally connected applications. The function is available with z/OS V1.9 and will be made available on z/OS V1.7 (with APAR OA16303 and APAR OA20308) and V1.8 (with APAR OA20308). Though DB2 9 is the first exploiter, any application that uses z/OS XML System Services can have the same benefit of zAAP.

  With respect to DB2, z/OS XML System Services parsing eligibility for zAAPs means that locally attached applications (ISV or homegrown) that leverage the pureXML capabilities of DB2 9 can store XML data in DB2 with the potential cost benefits of the zAAP processor, and without any anticipated changes to the application. Individual XML document inserts, XML updates requested from local thread or stored procedures, and bulk table loads are eligible for the zAAP.

  Only XML parsing from local applications and performed by z/OS XML System Services is eligible for zAAP. Note that any SQL/XML queries and document inserts from any application over DRDA® via TCP/IP connection are processed in enclave SRBs and are not eligible for zAAP, but are eligible to be partially directed to zIIP processors, when present — which is the same as any DRDA workload running today. Refer to the Statements of direction for more detail on z/OS XML System Services futures.

  If you are currently running z/OS V1.7 or later and DB2 9 for z/OS and you are interested in leveraging pureXML capabilities in DB2 9 for z/OS, performance information on the pureXML capabilities of DB2 9 for z/OS is planned to be made available:

  – A whitepaper showing results of XML document inserts and XML table loads is planned to be available August 2007.

  – A second whitepaper on XML mixed transaction workload, additional application tuning and performance, and DB2 9 accounting record updates is planned for the first quarter of 2008.

  Note: Overall XML performance and the amount of workload eligible for zAAP will be highly dependent on the amount of XML data being processed and parsed as well as other XML data characteristics.

  If you are testing with DB2 9 and XML today, with the proper levels of software (z/OS V1.9 or z/OS V1.7 and V1.8 with PTFs and DB2 9 running in New Function Mode) you can run XML inserts, loads, and queries and the PROJECTCPU facility in z/OS will measure these workloads and can show what workload is eligible for zAAPs and zIIPs (current zIIP documentation can help with sizing DRDA workloads).

- IBM adds C/C++ support for z/OS XML with z/OS V1.9 (satisfying the statement of direction in Software Announcement 206-039, dated February 28, 2006). The function is available on z/OS V1.7 and V1.8 with APAR OA18713.

- IBM WebSphere® Developer for System z V7.0 (5724-L44) includes new support for XL C/C++ mainframe development. The support is available for z/OS V1.8 XL C/C++ whose function can be ordered in the z/OS V1.8 C/C++ without Debug feature. Core features include:

  – XL C/C++ support for development, editing, content assist, enhanced code navigation, and remote syntax checking

  – XL C/C++ builds on MVS and on z/OS UNIX System Services

  – Integrated client debugging via Debug Tool

  – Debugging via z/OS dbx

  – Access to z/OS and z/OS UNIX file system resources

  For more information, refer to Software Announcement 206-320, dated December 5, 2006, IBM WebSphere Developer for System z V7.0.

- IBM provides z/OS dbx support for WebSphere Developer Debugger for System z V7.0 (5724-N06) and WebSphere Developer for System z V7.0 (5724-L44). The z/OS dbx

enhancements provide an Eclipse-based graphical user interface (GUI) for interactive, source-level debugging capabilities for compiled System z applications. Running under z/OS UNIX System Services, dbx is designed to enable developers to examine, monitor, and control the running of z/OS UNIX System Services application programs written in C, C++, and High Level Assembler on a z/OS system.

The z/OS dbx support for WebSphere Developer Debugger for System z V7.0 and WebSphere Developer for System z V7.0 is also provided on z/OS V1.8. This support is provided by APAR OA20223. This capability is integrated into z/OS V1.9. Also refer to Software Announcement 206-320, dated December 5, 2006, IBM WebSphere Developer for System z V7.0, and to Software Announcement 206-324, dated December 5, 2006, IBM WebSphere Developer Debugger for System z V7.0.

- XL C/C++ has made the following enhancements for z/OS V1.9:
  - A new METAL compiler option for XL C provides support for system program development.
  - The METAL compiler option is introduced in z/OS V1.9 for XL C system program development. You can use it to generate code that does not have Language Environment runtime dependencies. In addition, language features are provided to embed pieces of HLASM source within C statements. Any system services required by the XL C application program can be obtained directly by calling Assembler Services.
  - A new CDAHLASM utility aids in debugging METAL C applications.
  - The new CDAHLASM utility produces debug information in DWARF format and ADATA format. This allows debuggers to use this information to debug METAL C applications.
  - New decimal floating-point (DFP) formats are supported.
  - z/OS V1.9 XL C/C++ supports the decimal floating-point formats in addition to the current hex and binary floating-point formats. DFP arithmetic is better suited for business and financial applications.
  - New compiler options, suboptions, and pragma directives are added to the XL C/C++ contained in the z/OS V1.9 C/C++ Without Debug Tool feature of z/OS V1.9. These include performance improvements to take advantage of new instructions in the hardware architecture. Existing source code without code changes can be recompiled to take advantage of the performance improvements.

  Note that z/OS V1.9 does not include the C/C++ IBM Open Class® (IOC) Dynamic Link Libraries (DLLs). The publication IBM Open Class Library Transition Guide, a reference for migrating code from the IBM Open Class Library to the Standard C++ Library, is available at

  http://publibz.boulder.ibm.com/epubs/pdf/cbcit100.pdf

- The System REXX (SYSREXX) component makes possible execution of REXX routines in an authorized environment. SYSREXX execs can be used to automate complex operator commands and other system functions. SYSREXX execs can be invoked by a program interface, and by operator command. IBM also makes this available for z/OS V1.8 and z/OS.e via a Web deliverable.
- SDSF is being enhanced to add the capability to provide access to SDSF functions through REXX variables. The variables will be loaded with data from the SDSF panels. This will enable them to be processed by REXX execs. The data can also be changed; this provides capabilities similar to those provided in the SDSF dialog by action characters and overtyping.
- z/OS V1.9 provides support for the PKCS#11 standard. PKCS (Public Key Cryptography Standards) is offered by RSA Laboratories of RSA Security Inc. PKCS#11, also known as Cryptoki, is the cryptographic token interface standard. It specifies an application programming interface (API) to devices, referred to as tokens. The PKCS#11 API is an industry-accepted standard commonly used by cryptographic applications. PKCS#11 applications developed for other platforms can be recompiled and run on z/OS.

  Integrated Cryptographic Services Facility (ICSF) supports PKCS#11, providing an alternative to IBM's Common Cryptographic Architecture (CCA) and broadening the scope of cryptographic applications that can make use of zSeries® cryptography. RACF provides PKCS#11 support. The RACF RACDCERT command provides token management of certificate, public key, and private key objects.

- With z/OS V1.9, multiple functions are provided which are intended to better align with SUSv3:
  - The Language Environment C/C++ Run-Time Library is updated to better align with SUSv3 with respect to the Threads option (pthread functions).

  - The Language Environment C/C++ Run-Time Library is updated to implement miscellaneous missing headers and functions in order to better align with SUSv3, specifically the X/Open System Interface Extension (XSI).
  - The Language Environment C/C++ Run-Time Library implements a new environment variable that controls errno values returned from certain functions in order to better align with SUSv3.
- Enhancements are made for z/OS UNIX File System application programming capability for asynchronous socket communications by allowing I/O completion notification to be delivered to a message queue. This allows sockets and even specific asynchronous requests to be partitioned in such a way that the I/O completions are delivered to specific queues.
- Language Environment also provides support for XPLINK applications running as IMS™ transactions. Support is added for IMS regions running with or without Language Environment Library Routine Retention (LRR) active.
- The Language Environment C/C++ Run-Time Library is designed to provide multicast source filtering APIs as documented in RFC3678.
- Language Environment satisfies the following customer requirements:
  - There is reduced usage of lower case English characters in the Options Report, Storage Report, and CEEDUMP, when NATLANG is UEN or JPN.
  - A new callable service, CEE3MC2, is created that will return both the national and international currency symbols.
  - Enhancements to the CICS® CLER transaction have been made.
  - A pair of new callable services have been created, CEE3DLY and CEEDLYM, that are designed to enable Language Environment-conforming applications to suspend execution. These new services are intended to allow you to migrate COBOL applications away from ILBOWAT0.
  - Language Environment provides AMODE 64 functions that assist in tracing the call chain backwards and allow a "goto" capability to a known location in the program call stack. These functions are similar to the AMODE 31 services CEETBCK and CEEGOTO.
- Diagnostic tools for Language Environment have been improved:
  - CEEDUMP contents, CEEDUMP processing, and the IPCS formatter support in the LEDATA VERBEXIT have been improved, meeting several customer requirements.
  - Language Environment is designed to improve DLL error messages, provide an environment variable that can control the amount of diagnostic information provided at application runtime, and to record the last ten DLL failures (accessible using CEECAA) in order to help with DLL failure resolution.
  - Language Environment has added a trace for the CEEPIPI environment. You can format the trace information using the LEDATA VERBEXIT.
- Enhancements are made for the Language Environment CEEBLDTX utility which are designed to run in a z/OS UNIX shell environment. This utility will be made available as a shell command.
- Enhancements are made to some z/OS UNIX commands. These changes are intended to help enable the porting of UNIX applications and shell scripts to the z/OS platform and the development of portable applications. The enhancements include changes to these commands: awk, bc, ed, file, mailx, od, sed, tr, uuencode, and uudecode. Updates include:
  - Options for the **file command** for user-specified sequencing of tests, and alternate "magic files"
  - uuencode and uudecode support of the MIME Base64 algorithm
- These enhancements are included for the Program Management Binder:
  - A C front end to binder APIs is designed to simplify using both the regular binder APIs and fastdata APIs for C and C++ programmers. The APIs are intended to automatically manage the loading and deleting of binder modules, and obtaining and releasing of buffer storage. Additional utility interfaces are also provided.
  - A new binder module map is designed to provide debuggers with a mapping of the symbols that make up the program. Various important pieces of information about each symbol are stored in the mapping, which is designed to be quickly read and processed. This is intended

to provide an alternative to using the binder APIs for cases where processing time is critical.

- Definition Side-Files in z/OS UNIX archives are intended to allow programmers to package their Dynamic Link Library (DLL) side-decks in UNIX archive files produced by the ar utility. This offers the archive library provider a transparent mechanism for switching their users from statically linked objects in archives libraries to dynamically linked libraries.
- The fastdata API rewrite is designed to provide improved reliability for fastdata APIs. In addition, storage constraints are expected to be relieved below 2 GB, because these APIs are now designed to exploit above-the-bar storage.
- Improvements to AMBLIST XREF are intended to provide improved execution time and capability when processing cross-reference information of large programs.
- RECFM=U verification is designed to provide the same protection against writing programs into non-program PDS libraries as is provided for PDSE libraries. The binder is now designed to write programs only into libraries having an undefined record format (RECFM=U), to help prevent changing the DCB attributes of other libraries, unless you specify that it should do so (for example, by specifying RECFM=U on a DD statement).
- The new -IMMED option on the CHANGE and REPLACE control statements allows more flexibility by causing the control statements to operate on the symbols already included in the module rather than the symbols in the next input module.
- A new binder INFO option will list all installed PTFs in the binder SYSPRINT output. This is intended to allow you to simply and quickly determine the service level of the binder program you are using.

Security

IBM has designed z/OS V1.9 to help improve and extend the world-class security capabilities of the platform in the following: z/OS Communications Server allows IPSec processing to take advantage of IBM System z9 Integrated Information Processors (zIIPs) which helps provide better price performance for select network encryption workloads; enhancements to PKI Services, RACF, and SAF help improve the creation, authentication, renewal, and management of digital certificates; z/OS System SSL and AT-TLS are opened up to more application exploiters; RACF has added infrastructure for password phrase support and AES cryptography; and the z/OS Communications Server has introduced many functions for centralized security and policy-based management, in addition to other items.

- z/OS Communications Server allows IPSec processing to take advantage of zIIPs. In effect, the zIIP may be used as a high-speed encryption engine that is designed to provide better price performance for eligible IPSec workload. The new zIIP Assisted IPSec function is designed to move most of the IPSec processing from general-purpose processors to the zIIPs. In addition to performing eligible encryption processing, the zIIP will also handle cryptographic validation of message integrity, and IPSec header processing. This is designed to allow you to take advantage of the cost saving benefits of the zIIP when you implement IPSec to help secure your valuable business transactions and bulk data movement and to protect your host. The z/OS Communications Server is designed to interact with z/OS Workload Manager to have all of z/OS Communications Server's IPSec enclave Service Request Block (SRB) work made eligible to run on the zIIP. IBM plans to make the zIIP-assisted IPSec function available in August 2007 on z/OS V1.8 with APAR PK40178.
- In z/OS V1.9 an extension is added to the Password Phrase support first available in z/OS V1.8. The minimum length of a password phrase has been lowered from 14 characters to 9. Password phrases from 9 to 13 characters in length can be used only if the new password phrase exit (ICHPWX11) allows them. A sample exit is provided, which uses the new System REXX facility to call a REXX exec in which you can code password phrase quality rules. A sample REXX exec is also provided. The REXX exec implements several configurable quality rules, including a minimum length check. In a future release, the password change logging and enveloping functions will be extended to include RACF password phrases.
- In z/OS V1.9, RACF provides a Java interface to administer or query users and groups in RACF. This is intended to increase the accessibility and usability of RACF by allowing programmatic access to RACF from Java programs.
- z/OS Communications Server has a new Network Security Services function to provide centralized certificate services, monitoring, and management for IPSec security across z/OS systems within and across sysplexes. Network Security Services will allow IPSec certificates to be kept in a single location, rather than having them reside on each z/OS node. The z/OS Communications Server IKE daemon is enhanced so that it can be configured to act as a

Network Security client. Configuration is on a per-stack basis, such that each NSS-enabled stack will appear to the Network Security Server as an independent client. For TCP/IP stacks that are not configured to use Network Security Services, the IKE daemon will continue to manage certificates out of a local key ring.

- In z/OS V1.9, System SSL has been enhanced to provide application exploiters added functional flexibility as well as notification when cryptographic processing switches from using hardware cryptography to software cryptography.
  - Tuning capabilities for CRL checking — Through the addition of a new SSL environment attribute, the level of security to be enforced when validating certificates and their certificate revocation lists (CRLs) can be tailored to meet the needs of the application. The level of CRL security attribute controls whether certificate validation requires the LDAP server containing the CRLs to be contactable and whether a CRL entry must be defined.
  - Callback rehandshake notification — Two callback functions have been added to allow applications to know when a secure connection is being renegotiated, and when it is again ready for normal secure communications. Applications will then be able to suspend for periods when communicating SSL applications may not be able to send or receive application data and to know when a renegotiation is occurring.
  - Hostname validation granularity — The gsk_validate_hostname API has been introduced to allow callers to specify how client/server hostname validation is to be performed with respect to the Common Name (CN) and/or the subject alternate name extensions contained within an x.509 certificate.
  - Hardware to software cryptography notification — Enhancements have been added to provide information about when a System SSL application has switched from using hardware cryptography to software cryptography. In previous releases, when a System SSL application had encountered a serious error when using hardware services through ICSF, System SSL would transparently switch from hardware support for the failing encryption type and perform the crypto in its software implementation. In V1R9, when the switch occurs, System SSL through its GSKSRVR started task will write an initial message to the console and more detailed messages to the GSKSRVR job log about the cryptographic processing switch.
- The z/OS Network Authentication Service is enhanced to support the AES cryptographic algorithm. This support will enhance interoperability with other Kerberos implementations by extending the z/OS's cipher suite. Because RACF can act as the registry for the z/OS Network Authentication Service, RACF provides the management interfaces for cryptographic keys. RACF commands are extended to allow the specification of AES as a supported cipher. The z/OS Network Authentication Service is also enhanced to provide support for the SPKM-3 and LIPKEY GSS-API security mechanisms.

  These functions are designed to support these RFCs:
  - RFC3962 — Advanced Encryption Standard (AES) Encryption for Kerberos 5
  - RFC2025 — The Simple Public-Key GSS-API Mechanism (SPKM)
  - RFC2253 — UTF-8 String Representation of Distinguished Names
  - RFC2459 — X.509 Public Key Infrastructure
  - RFC2847 — LIPKEY — A Low Infrastructure Public Key Mechanism Using SPKM
- The FTP server, FTP client, and TN3270 server can now optionally be configured to use Application Transparent TLS (AT-TLS) to manage TLS security. AT-TLS supports several security functions that the FTP server, FTP client, and TN3270 servers do not. For example, AT-TLS is designed to allow you to:
  - Specify the label of the certificate to be used for authentication instead of using the Default certificate
  - Support SSL Session Key Refresh
  - Support SSL Sysplex Session ID Caching
  - Support new or multiple key rings
  - Under security administrator control, optionally trace decrypted SSL data in a data trace
  - Receive more detailed diagnostic messages in syslogd
- Within z/OS V1.9 the following enhancements to PKI Services and RACF digital certificate have been made:

- Writeable SAF key rings intended to enable z/OS applications to programmatically populate certificates in SAF/RACF key rings.
- Support of certificates with two-byte UTF8 characters that can be mapped to code page 1047. Such certificates can be installed in RACF, managed and exploited through the RACDCERT functions. They can also be used for authentication to RACF. For example, the Spanish letter "n" with tilde will be able to be included in a distinguished name.
- The use of SDBM credential for the LDAP administrator in PKI Services. The LDAP server has multiple backends. It allows ACLs for entries using X.500 type user ID or RACF-style user ID. Currently PKI Services only accepts the X.500 type user ID. The PKI daemon code will be enhanced to accept the RACF user ID credential.
- An e-mail notification for the PKI administrator for pending certificate requests. For previous z/OS versions, administrators must submit queries to determine whether there are pending approval requests.
- A change in the maximum limit of the certificate validity period from 3650 days to 9999 days.
- Ability to issue queries to determine which certificates will expire based on the number of days remaining until they expire.
- Automated certificate renewal designed to send renewal certificates via e-mail when the expiration dates for older certificates are approaching.
- A new REFRESH reminder message issued after changes made to a certificate or a certificate filter profile through the RACDCERT command, to indicate that a refresh to the DIGTCERT or DIGTMAP class is needed after the affected RACDCERT commands when the DIGTCERT or DIGTNMAP class is RACLISTed.
- Avoidance of the generation of unused serial numbers in the event of an ICSF failure when the PKI CA has a hardware key.

Effective November 15, 2007, the Cryptographic Support for z/OS V1.7 through z/OS V1.9 and z/OS.e V1.7 through z/OS.e V1.8 Web deliverable will become available. This Web deliverable will support z/OS V1.7 through z/OS V1.9 and z/OS.e V1.7 through z/OS.e V1.8. To obtain this Web deliverable, visit

http://www.ibm.com/server/eserver/zseries/zos/downloads

Support for ISO Format 3 PIN blocks: The PIN processing functions in the CCA (Common Cryptographic Architecture) API are enhanced to support the ISO Format 3 PIN block, as defined in the ISO 9564-1 standard. This PIN format provides added security by padding the PIN block with random data before it is encrypted, rather than padding with predictable values as used in other formats.

Support for RSA keys up to 4096 bits: The RSA services in the CCA API are extended to support RSA keys with modulus lengths up to 4096 bits. The services to which this support has been added include those for key generation, RSA-based key management, digital signatures, and other functions related to these. This support requires a new PKDS to be created to allow for the larger keys, and the existing PKDS needs to be copied into the newly allocated dataset. A toleration APAR (OA21807) is required for the 4096 bit support on lower level releases of ICSF to support mixed environments. CCA services for key management, digital signatures, key storage, and query services have been modified to support these longer RSA keys and require an MCL, which will be available fourth quarter 2007, for Crypto Express2 Coprocessor feature. The following machines support this feature: z9 EC and z9 BC. The following operations are not supported with 4096-bit RSA keys:

- Creation of 4096-bit retained keys using CSNDPKG.
- IBM is changing its support for private RSA keys that are stored in a cryptographic coprocessor. This change does not affect RSA keys that are already stored in a cryptographic coprocessor or those stored in a key storage data set.

  Previously, two kinds of private RSA keys could be stored in a cryptographic coprocessor, those intended for key management usage and those intended for signature usage. Starting with Cryptographic Support for z/OS V1.7 - V1.9 and z/OS.e V1.7 - V1.8, ICSF FMID HCR7750, storing private RSA keys intended for key management usage in a cryptographic coprocessor is not supported. Storing private RSA keys intended for signature usage in a cryptographic coprocessor continues to be supported when the modulus length is 2048 bits or less.

Random Number Generator Long: A new ICSF callable service is being provided that is designed to improve throughput and reduce CPU consumption for generating random numbers greater than 8 bytes. Hardware-generated random numbers up to 8096 bytes in length are now available through the new callable service CSNBRNGL.

ICSF support for enhanced TKE auditing: The Payment Card Industry Data Security Standard (PCI DSS) requires auditing of all changes to the crypto system. On System z, crypto system changes can be initiated from either ICSF or TKE. ICSF is designed to provide this support by providing the additional information required by PCI DDS for each event in SMF type 82 subtype 16 records for the request and reply commands sent by the TKE workstation.

Availability

z/OS V1.9 continues to help address requirements for uninterrupted application availability. In z/OS V1.9, support designed to help improve system and application availability is provided in the Consoles component of the BCP, System Logger, z/OS UNIX System Services, z/OS UNIX File System (zFS), Sysplex Failure Management, and others.

- In z/OS V1.9, the Consoles component integrates the Message Flood Automation function. This function was also made available via APAR OA17514 for z/OS V1.6,and later.

  Message Flood Automation provides specialized, policy-driven automation for dealing with high volumes of messages occurring at very high message rates. The policy can be set in a PARMLIB member and examined and modified through operator commands. The policy specifies the types of messages that are to be monitored, the criteria for establishing the onset and ending of a message flood, and the actions that may be taken should a flood occur. Multiple levels of policy specification allow criteria and actions to be applied to message types, jobs, or even individual message IDs. The actions that may be taken during a message flood include:

  – Preventing the flood messages from being displayed on a console

  – Preventing the flood messages from being logged in the SYSLOG or OPERLOG

  – Preventing the flood messages from being queued for automation

  – Preventing the flood messages from propagating to other systems in a sysplex (if the message is not displayed, logged, or queued for automation)

  – Preventing the flood messages from being queued to the Action Message Retention Facility (AMRF) if the message is an action message

  – Taking action against the address space issuing the flood messages, by issuing a command (typically a CANCEL command)

  A message rate monitoring facility is provided to assist the installation in establishing Message Flood Automation policy.

- System Logger is designed to improve availability by providing support for log stream data set asynchronous recalls that will allow for multiple, concurrent migrated data set recall requests to be processed by System Logger.

- In z/OS V1.9, enhancements are made for z/OS UNIX System Services to improve management of automount file systems that are managing a directory located in an automove(unmount) file system. The automount file system will now inherit the automove(unmount) attribute rather than being mounted as automove(yes). Note that IBM Health Checker for z/OS flags the inconsistent settings when an automount file system is mounted as automove(yes).

- Enhancements are also made for z/OS UNIX File System to make the following reliability, availability, and serviceability improvements:

  – In a Shared File System configuration, more consistent (and predictable) file system shutdown/recovery behavior is provided based on the file system AUTOMOVE setting. In prior releases, the AUTOMOVE specification is not honored if the file system is mounted in a mode which the Physical File System (PFS) provides "sysplex-aware" capability.

  – The F BPXOINIT,FILESYS=FIX command is enhanced to add support to detect and correct CDS serialization state information when failed system recovery processing is in progress.

  – F BPXOINIT, RECOVER=LATCHES is enhanced to take multi-address-space, multisystem dumps for z/OS UNIX System Services file system problems when it detects that physical file system operations are not completing.

  - Use of the Mount Latch is reduced and RECOVER=LATCHES will be enhanced to terminate system tasks in some circumstances.
  - z/OS UNIX file and directory deletion will be recorded with a new subtype of the SMF type 92 records for improved auditability.

- Currently, if RRS was unable to properly or completely unset a resource manager (RM) while processing a Registration Services "unregister" RM request, the resource manager could be left in a "unregister" state with Registration Services but still set with RRS. This situation cannot be resolved without recycling RRS. To avoid an RRS warm start, z/OS V1.9 has an option to reset the resource manager on the RRS panels. This is designed to allow for less disruptive recovery and allows the terminated RRS resource manager to restart and recover quickly.
- WLM design is changed to increase the priority of canceled address spaces so they can be terminated more quickly when the system is very busy. This can eliminate the need to reset the priority of a canceled job, task, or user to speed address space termination when resolving resource contention issues.
- WLM adds a new parameter on the IWMSLIM service to allow server regions to tell WLM that a number of minimum server regions should be started in parallel. The new parameter can allow applications to control whether WLM should start server regions in parallel or sequentially.
- In z/OS V1.9, the maximum specifiable size of the MVS System Trace is increased from the current value of 999K per CPU. The practical maximum is expected to be many MB per processor and will vary depending on the size of the LPAR and the applications that contend for real storage.
- The Sysplex Failure Management (SFM) function in z/OS is enhanced to support a new policy specification for how long a system should be allowed to remain in the sysplex when it appears unresponsive because it is not updating its system status on the Sysplex Couple Data Set, yet it is still sending XCF signals to other systems in the sysplex. A system that is in this state is definitely not completely inoperable (since it is sending XCF signals), and yet it may not be fully functional either, so it may be causing sysplex sympathy sickness problems for other active systems in the sysplex.

  The new SFM policy externally provides a way for installations to limit their exposure to problems caused by such systems, by automatically removing them from the sysplex after a specified period of time.
- The Sysplex Failure Management (SFM) function in z/OS is enhanced to support a new policy specification to indicate that, after a specified period of time, the system may automatically terminate XCF members which have been identified as stalled and who also appear to be causing sympathy sickness problems. If allowed to persist, these stalled members can lead to sysplex-wide hangs or other problems, not only within their own XCF group, but also for any other system or application functions that depend on the impacted function. Automatically terminating these members is intended to provide improved application availability within the sysplex.
- z/OS V1.9 provides an option for SLIP to trace five words of variable information into the unique fields of system trace entries using a new STDATA keyword.
- The TRSMAIN program has been added to the BCP element of z/OS, and it has been redesigned to support large format sequential data sets. This program, often used to send dumps to IBM, has also been rewritten to follow IBM programming conventions.

Optimization and management capabilities

z/OS V1.9 continues to offer outstanding overall resource utilization capabilities and policy-based workload management: the z/OS WLM (Workload Manager) is enhanced with improved management of discretionary workloads and sysplex routing; z/OS supports the recent Common Information Model (CIM) standard to help z/OS to integrate with more industry tools; and z/OS support for EWLM is enhanced to include the OpenGroup ARM 4.1 (Application Response Measurement) extensions of the ARM standard.

- WLM design has been enhanced to improve management of discretionary work. During periods of 100% CPU utilization, discretionary workloads (low-importance workloads, as defined by your installation) might not be dispatched for execution. In z/OS V1.9, you can specify that work that is ready to run but not getting CPU service within a certain time interval be temporarily promoted. RMF measurements for this new function are also provided.

- EWLM's Application Response Measurement (ARM) V4.1 support implements the ARM 4.1 extensions to provide z/OS support for monitoring applications based on an asynchronous messaging model. ARM V4.1 is currently a draft standard and is expected to be published by the Open Group, refer to

  http://www.opengroup.org/arm

  Additional extensions for asynchronous messaging are provided for applications running under CICS using the WLM Delay Monitoring Services.

- WLM's sysplex routing services are enhanced to recognize the zAAP and the zIIP capacity of a System z server. This can allow functions that route workloads to different systems to make routing decisions based on CP, zAAP, and zIIP capacity.

- z/OS V1.9 includes a new version of the Common Information Model (CIM). This includes the upgrade of the CIM Server Runtime Environment to V2.6 of OpenPegasus from the Open Group, an upgrade of the CIM Schema to 2.11, and new instrumentation to enable simplified management for z/OS Sysplex Resources, jobs, and z/OS UNIX System Services processes. Key features of the new CIM Server for z/OS are the support for Automatic Restart Manager and authentication of clients through SSL certificates. CIM provides an industry-standard way to externalize information about computing systems so that it can be processed by common tools.

- The serialization used by DFSMSrmm for its CDS is changed to use a new resource name that includes the CDS ID. This can allow you to run multiple RMMplexes in the same sysplex without contention for CDS resource.

- DFSMSrmm interaction with system managed volumes in an IBM system managed library is improved through multiple changes that are expected, especially in larger VTS installations, to result in shorter elapsed time and more flexibility during inventory management.

- DFSMSrmm is enhanced so that you can now control long-running local subsystem requests. These requests can be ended, held, and released. This enhancement enables better management when required either by system automation or by the operator because of operational priorities.

- DFSMSrmm CIM provider code is updated to support the latest OpenPegasus CIM Server, and the subclasses supported are extended to cover all DFSMSrmm managed resources.

- DFSMSrmm media management capabilities are expanded to enable non-IBM, and non-enterprise, removable media to be defined. A programming interface is provided to enable removable media types and characteristics to be maintained as volumes are mounted and used.

- DFSMSrmm also collaborates with the new IBM Integrated Removable Media Manager for the Enterprise on System z (IRMM). IRMM runs on Linux™ for System z and helps enable management of distributed system removable media resources in the enterprise from one central control point. All IRMM function is available through the command line interface so the z/OS and Linux on System z (as well as other distributed system) tape media can be managed from a central z/OS system For additional information on IRMM, refer to Software Announcement 207-174, dated August 7, 2007.

Networking

z/OS Communications Server for z/OS V1.9 enters into a new era of z/OS middleware enablement by enhancing the security and control of network communications. Security capabilities are enhanced with expanded application-transparent security for TN3270 and FTP. Control enhancements are in the areas of network traffic and sysplex operations. Additional enhancements include:

- The Network File System (NFS) is a distributed file system that provides transparent processing capability for data and information on worldwide and heterogeneous networks. The z/OS NFS provides the implementation that allows the z/OS platform to participate in these networks. A new industry-wide version of the communication protocol, Version 4, has been defined and formalized as a standard and attempts to resolve deficiencies identified in the previous versions of the NFS protocol in the areas of security, Internet performance, and cross-platform interoperability.

  The z/OS NFS V1.9 work builds on the previous NFS V4 work delivered in z/OS V1.7 and V1.8 and provides constraint relief, added function, and serviceability enhancements:

  – The z/OS NFS server was originally developed to have all tasks which interact with z/OS MVS data sets have their stacks and heaps defined to reside below the 16 MB line. With

z/OS V1.9, z/OS NFS will move the stacks and heaps above the 16 MB line, and any control blocks which must reside below the 16 MB line will be explicitly allocated there.

  - With z/OS V1.9, the z/OS NFS Client implements support for the new NFS Version 4 Protocol which allows the z/OS NFS Client to be able to communicate with NFS Servers via the V4 protocol, as well as the NFS V2/V3 protocols.
  - With z/OS V1.9, z/OS NFS will continue the conversion of the z/OS NFS Server diagnostics collection from the old ERRlog interface to the enhanced NFSTRACE interface. An additional serviceability enhancement includes updating the z/OS NFS Server Ctrace function to exploit the enhanced capabilities developed for z/OS NFS V1.8.

- z/OS Communications Server now allows you to specify that it should dynamically adjust how frequently an OSA-Express2 interrupts a z/OS system for inbound traffic. By monitoring traffic patterns, the TCP/IP stack can adjust the interrupt timing values to maximize throughput. To use this function, an IBM system z9 EC or z9 BC is required with an OSA-Express 2 having Dynamic LAN idle timer support and the OSA-Express2 must be configured in QDIO mode (CHPID type OSD). IBM plans to make this function available in third quarter 2007 with z/OS V1.8 via APARs OA21405 and PK46764.
- z/OS Communications Server is enhanced to include a new function, policy-based routing. Policy-based routing enables the TCP/IP stack to make routing decisions that take into account criteria other than just the destination IP address/subnet (as is done with both static and dynamic routing). The additional criteria can include the job name, source port, destination port, protocol type (TCP or UDP), source IP address, NetAccess security zone, and security label. With policy-based routing, you can define a policy to select the network that will be used for outbound traffic based on the application originating the traffic. The IBM Configuration Assistant for z/OS Communications Server is enhanced to support policy-based routing as well.
- z/OS Communications Server enhances its multicast support to allow an application to filter the datagrams it receives based on the source address. An extension to the original Any-Source Multicast (ASM) model called Source-Filtered Multicast (SFM) has been developed for this purpose. This new function:
  - Supports new APIs to allow applications to specify source filter lists. This allows a local system to filter on source addresses even if the system is not attached to a multicast router that supports source address filtering.
  - Provides host support for IGMPv3 and MLDv2. The system responds to queries from multicast routers and reports the source filter state of each interface.

  Note: z/OS Communications Server does not support any multicast routing protocols and therefore does not support any multicast routing functions of IGMPv3 or MLDv2.
- FTP adds support for more Unicode code pages for file storage and file transfer. For file transfer, FTP adds support for code pages UTF-16, UTF-16LE, and UTF-16BE. For file storage, FTP supports code page UTF-16. FTP always stores Unicode files in big endian format.
- Prior to z/OS V1.6, the TN3270E Telnet server runs as a subtask of the TCPIP address space. In z/OS V1.6 through z/OS V1.8, you can run the TN3270E Telnet server as a separately started address space from TCPIP, or continue to run the TN3270E Telnet server as a subtask of the TCPIP address space. In z/OS V1.9, the TN3270E Telnet server is supported only when run in its own address space.

Pricing options

IBM plans to further enhance the System z New Application License Charges (zNALC) pricing alternative for z/OS by allowing subcapacity zNALC pricing when z/OS is run as a guest of z/VM®. Currently subcapacity zNALC pricing is supported only when z/OS is run as a native system.

To take advantage of this enhancement for z/OS VM guest systems that are zNALC subcapacity eligible, you must install both the BCP PTF for APAR OA20314 and the SCRT deliverable targeted for fourth quarter 2007 (or higher) for a complete solution. The Sub-Capacity Reporting Tool Web site will be updated to reflect when this SCRT is deliverable is available, and able to be downloaded from this site.

http://ibm.com/zseries/swprice/scrt/

Approximately 30 days before the availability of this SCRT deliverable, registered SCRT users

will receive an e-mail notifying them of the availability date.

Note: Full-capacity zNALC pricing is already supported for both native z/OS systems and when z/OS is run as a guest of z/VM and does not require the installation of the BCP PTF for APAR OA20314 or the SCRT deliverable targeted for fourth quarter 2007 (or higher).

zNALC replaces New Application License Charges (NALC) and z/OS.e, and is intended to be IBM's strategic z/OS offering for new workloads. For additional information, refer to the zNALC Software Announcement 207-006, dated January 9, 2007.

Product positioning

The many enhancements in z/OS V1.9 continue to position z/OS as IBM's flagship mainframe operating system. These innovations provide proof points of IBM's commitment to System z. Designed and developed together with System z servers and key IBM middleware such as DB2, IMS, CICS, and WebSphere Application Server, z/OS provides the qualities of service that thousands of customers rely upon for their mission-critical business data, transactions, and applications.

System z and z/OS are ideally suited to perform as a data serving hub for the enterprise. The platform's classic strengths of availability, security, reliability, scalability, and management have made the mainframe the de facto gold standard for data serving and OLTP. Market requirements for increased security and simplified data management, and the increasing need for real-time Business Intelligence make consolidating more data onto the mainframe an attractive option for many enterprises. New technologies, such as XML, represent net data serving workloads on the platform.

System z and z/OS are ideal for participating in service-oriented architecture (SOA) solutions. SOA services may be considered similar to and treated the same as transactions ... and one of the key strengths of the mainframe and z/OS is transaction processing. As organizations adopt SOA as the guiding architectural framework for development of enterprise applications, the newly deployed services quickly become business-critical components of the application infrastructure. Eventually, SOA services must be treated as mission critical and should be deployed on the robust, scalable, secure, high-performance platform offered by z/OS.

With four decades of cooperation, coordination, and integration between z/OS and System z hardware, the mainframe is an ideal security hub for the enterprise. IBM's commitment to z/OS System Integrity coupled with the latest security enhancements can help your business protect users, applications, and data which can ultimately help manage risk and meet compliance guidelines. Centralized definition, application, maintenance, and management of security policies help simplify security infrastructures as well.

To address mainframe skills at a functional level, z/OS will also continue to deliver on IBM's commitment of simplifying z/OS (as well as overall mainframe) operations. z/OS simplification is not intended to "dumb-down" z/OS function. Rather, the intent is to simplify systems management, improve application, system programmer, and operator productivity, and make the functions easier to understand and use for both current and new IT professionals.

Statements of direction

- Support for the VSAM KEYRANGE attribute will not be withdrawn as stated in announcement IBM z/OS V1.6: Integrating new applications and Preview: z/OS V1.7, Software Announcement 204-180, dated August 10, 2004. No supported release of z/OS allows you to define new VSAM data sets with the KEYRANGE attribute. On modern storage devices, KEYRANGE is generally detrimental to performance. For this reason, IBM recommends that you minimize or eliminate your use of KEYRANGE. Striped data sets are expected to provide better performance than KEYRANGE, and can be viewed as a good replacement for KEYRANGE data sets. To detect the KEYRANGE attribute on existing data sets, refer to INFO APAR II13894. Use the DFSMShsm ARCTOOLS (FINDKRDS) to detect this attribute for data sets migrated with DFSMShsm. Details on how to use this tool are in the DFSMShsm Implementation and Customization Guide (SC35-0418).
- z/OS XML to be enabled for both zAAP and zIIP specialty engines.

  In z/OS V1.8, IBM introduced a new z/OS component, z/OS XML System Services (z/OS XML). z/OS XML is a system-level XML parser integrated with the base z/OS operating system. It is designed to deliver an optimized set of services for parsing XML documents. z/OS XML has also been made available on z/OS V1.7 via APAR OA16303. The initial

beneficiaries of this system component were middleware and applications requiring high-performance nonvalidating XML parsing. z/OS XML may be accessed by an Assembler or C/C++ programming interface. One of the first exploiters is DB2 9 for z/OS with its pureXML capabilities.

With z/OS V1.9, IBM is announcing that the z/OS XML component is enabled to take advantage of System z Application Assist Processors (zAAPs). This enhancement means that middleware and applications requesting z/OS XML System Services (for example, DB2 processing using a local connection) have the capability for a portion of z/OS XML System Services processing to execute on a zAAP. Specifically, z/OS XML System Services parsing executing in TCB mode may be eligible to be redirected to a zAAP, when present.

In the future, IBM intends to enable z/OS XML to take additional advantage of IBM System z9 Integrated Information Processors (zIIPs). Today, z/OS XML processing running under DB2 9 can already be partially directed to zIIPs when part of a distributed request (like DB2 DRDA). In the future, IBM intends to direct all eligible z/OS XML System Services processing to a zIIP when it forms part of any zIIP eligible workload (like DRDA). Specifically, z/OS XML System Services parsing workload run in enclave service request block (SRB) mode is planned to be redirected to a zIIP, when present.

IBM also intends to extend and expand on the use of z/OS XML System Services for additional enhancements:

– IBM intends to enhance the XML Toolkit for z/OS so eligible workloads use z/OS XML. This allows eligible XML Toolkit processing to exploit zAAP specialty engines.

– IBM intends to add validating parsing to z/OS XML System Services. This extends zAAP and zIIP exploitation to include XML validating parsing workload as well.

- IBM intends to remove support for CPU affinity. CPU affinity originally provided support for assigning work to the same CP. However, this predates PR/SM™, which introduced logical processors. CPU affinity has long been obsolete for z/OS partitions operating under PR/SM™, which makes the CP on which a piece of work executes unpredictable. z/OS V1.9 is planned to be the last release to provide support for the assignment of CPU affinity to a logical processor. Future releases will ignore any attempt to assign CPU affinity. For example, specifications for assigning a program to a specific logical processor or processors using the Program Properties Table (PPT) or a SCHEDxx member of parmlib will be ignored.

IBM intends to take the following actions in a future release:

- In a future release of z/OS, when DFSMShsm or DFSMSdss™ recalls or restores a VSAM data set with either IMBED or REPLICATE attribute or both, the attributes will be removed. No supported release of z/OS allows you to define new VSAM data sets or catalogs with the IMBED or REPLICATE attributes, and using them for existing data sets can waste DASD space and can often degrade performance. IBM recommends that you stop using these attributes. For information about how to detect IMBED and REPLICATE attributes on existing data sets and catalogs, refer to INFO APAR II13894.
- In a future release of z/OS, the Network Database (NDB) function will be removed from the z/OS Communications Server component. Customers who currently use or plan to use the NDB function should investigate the distributed data facility (DDF) provided by z/OS DB2, and the DB2 Run-Time Client. DDF allows client applications running in an environment that supports DRDA to access data at DB2 servers.
- In a future release of z/OS, the Dynamic Host Configuration Protocol (DHCP) server function will be removed from the z/OS Communications Server component. Customers who currently use or plan to use the z/OS DHCP server should investigate using a DHCP server on Linux for System z.
- In a future release of z/OS, the Boot Information Negotiation Layer (BINL) function will be removed from the z/OS Communications Server component. Customers using this function should investigate the use of IBM Tivoli Provisioning Manager for OS Deployment for network-based operating system installation services.

All statements regarding IBM's plans, directions, and intent are subject to change or withdrawal without notice.

Hardware and software support services

SmoothStart™/installation services

IBM offers a number of remote and on-site IBM Operational Support Services, Migration Services, and Installation Services designed to accelerate productive use of the IBM solution. These services are provided by IBM or an IBM Business Partner at an additional charge. For additional information, contact an IBM representative and ask for IBM Global Technology Services (GTS) Services for z/OS.

Reference information

- Software Announcement 207-018, dated February 6, 2007, Preview: IBM z/OS V1.9 advanced infrastructure solutions for your business needs
- Software Announcement 206-190, dated August 8, 2006, IBM z/OS V1.8 — Extending the enterprise-wide role
- Software Announcement 206-191, dated August 8, 2006, IBM z/OS.e V1.8 — Affordability for mainframe enterprise and Web-based applications
- Software Announcement 207-008, dated January 16, 2007, IBM Encryption Facility for z/OS, V1.2 (5655-P97) — Encryption Facility for z/OS, V1.2 offers more flexibility for security-rich exchange of data with business partners

Business Partner information

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

BP Attachment for Announcement Letter 207-175

https://www.ibm.com/partnerworld/mem/sla.jsp?num=207-175

Trademarks

Installation and customization

The IBM Migration Checker for z/OS® helps simplify migration to z/OS V1.8 and V1.9. The Migration Checker is a set of batch programs available as an "as is" tool from the z/OS download Web page. You can run the Migration Checker programs on your current system to help determine whether a z/OS migration action is even applicable to your system, or you can run it on your target system to help determine if the migration action you did was completed properly. This tool will not perform any migration actions on your system. It is intended to be used with z/OS Migration book to help you create your migration plan.

The Migration Checker for z/OS is primarily intended to help with migrations from z/OS V1.7 to z/OS V1.8, but some programs are useful for other migration paths. The Migration Checker for z/OS is planned to have current programs updated to include z/OS V1.9 information and

additional programs specific for z/OS V1.9 migrations added. The Migration Checker for z/OS with updates for z/OS V1.9 is planned for fourth quarter 2007.

For more information go to

http://www.ibm.com/servers/eserver/zseries/zos/downloads/

Effective with z/OS V1.9 availability, the entitled Customized Offerings (for example, CBPDO, ServerPac, Customized Offerings Driver) plan to provide the following enhancements:

- The ServerPac: Installing Your Order document will be available in Adobe PDF format for workstation-based viewing, in addition to the existing BOOK format for online viewing. The obsolete LIST1403 and LIST3820 formats will be removed. The PDF version of the ServerPac: Installing Your Order document can be viewed with the Adobe Acrobat Reader, a product of Adobe Systems Incorporated.
- Similarly, for CBPDO Internet orders, the CBPDO Memo to User Extension document will be available in PDF format on the download page in ShopzSeries. However, the PDF format will not be provided as part of the CBPDO package. The LIST1403 format remains for both physical and Internet CBPDO orders.
- The CPPUPDT job has been restructured to provide better usability and restartability by adding a CHECK function to validate changes before actually performing those changes.
- The Customized Offerings Driver (COD) is a prebuilt stand-alone driving system that can be used to drive the install of CBPDO or ServerPac if you do not have a driving system or your driving system does not meet the minimum driving system requirements. The Customized Offerings Driver V2.3.1 (5655-M12) contains a subset of z/OS V1.7 and has been service updated to support the minimum driving system requirements for installing z/OS V1.9.

Fee-based software services offerings

CustomPac enhancements

New SystemPac® and ProductPac® Internet Delivery Options: ShopzSeries now supports Internet delivery options for z/OS and subsystem SystemPac and ProductPac orders. For z/OS orders, SystemPac can be downloaded in both full-volume dump and dump-by-data-set formats. These new delivery options are available in addition to the existing options for tape delivery. For more information, see

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

or

http://www.ibm.com/software/shopzseries

SystemPac has extended ordering of z/OS V1.8.

In the past, IBM has made the previous release of z/OS available via SystemPac after its ServerPac availability was withdrawn. SystemPac availability for z/OS V1.8 will continue for a period of time after the general availability of z/OS V1.9.

- June 23, 2008: Recommended last date for submitting z/OS V1.8 orders via SystemPac. This date will allow for adequate order processing time.
- July 21, 2008: Last date for ordering z/OS V1.8 via SystemPac.

CustomPac Installation Guide will be in PDF format for online viewing.

The CustomPac Installation Guide will be available in Adobe PDF format for workstation-based viewing, in addition to the existing BOOK format for online viewing. The obsolete LIST1403 and LIST3820 formats will be removed. The PDF version of the CustomPac Installation Guide can be viewed with the Adobe Acrobat Reader, a product of Adobe Systems Incorporated.

RefreshPac will provide enhanced preventive service maintenance options.

RefreshPac will be enhanced to provide Recommended Service Update (RSU) only service packages, in addition to the current combination of RSU and PUT levels, to help you maintain a more stable and resilient system.

When ordering an RSU only deliverable you will get a collection of PTFs identified with a SOURCEID of RSUyymm, where yy indicates the last two digits of the year and mm indicates the month. Additionally, HIPER and PE-fixing PTFs will be shipped along with a customized installation guide and installation dialog jobs to install the service. The APPLY job supplied will allow you to apply only those PTFs for RSUyymm without the HIPER/PE PTFs.

CICS® Transaction Server SVC numbers will be customizable in an FVD SystemPac.

In a Full Volume Dump formatted SystemPac,you will have the option to specify the SVC numbers for both the CICS Type 3 SVC and the HPO SVC for your z/OS system. If not specified, the default values of 216 and 215 will be defined to the SVC numbers, respectively.

For more information on the CustomPac offerings, visit

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

Important Web sites

- z/OS Web site

  http://www.ibm.com/servers/eserver/zseries/zos/

- z/OS.e Web site

  http://www.ibm.com/servers/eserver/zseries/zose/

- z/OS V1R9.0 Introduction and Release Guide

  http://publibz.boulder.ibm.com/cgi-bin/bookmgr_OS390/BOOKS/E0Z2A119

- General Q & A

  http://www.ibm.com/servers/eserver/zseries/faq/

- Previously announced statements of direction

  http://www.ibm.com/servers/eserver/zseries/zos/zos_sods.html

- z/OS Internet Library

  http://www.ibm.com/servers/eserver/zseries/zos/bkserv/

- z/OS Basic Skills Information Center

  http://publib.boulder.ibm.com/infocenter/zoslnctr/v1r7/index.jsp

- Descriptions of courses worldwide

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

- z/OS downloads

  http://www.ibm.com/servers/eserver/zseries/zos/downloads/

- CustomPac

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

- ShopzSeries

  http://www.ibm.com/software/shopzseries

- z/OS Communications Server

  http://www.ibm.com/software/network/commserver/zos/

- IBM Open Class® Library Transition Guide

  http://publibz.boulder.ibm.com/epubs/pdf/cbcit100.pdf

Education support

Here are just a few of the courses available for classroom delivery:

- Introduction to z/OS Environment (ES050)
- Fundamental System Skills for z/OS (ES10A)
- z/OS Facilities (ES155)
- z/OS Operations (ES270)
- z/OS Installation (ES41A)
- Basic z/OS Tuning Using the Workload Manager (WLM) (ES545)
- Basics of z/OS RACF® Administration (ES191)
- Introducing z/OS UNIX® System Services (OP052)

In the U.S. and Canada, call 800-IBM-TEACH (426-8322) to enroll in one or more of these classes. To find other z/OS-related courses, visit

http://www.ibm.com/training/us/catalog/zseries

Technical information

Specified operating environment

Hardware requirements: z/OS V1.9 runs on the following IBM servers:

- IBM System z9™ EC or z9 BC
- zSeries z900 or z990
- zSeries z800 or z890

Software requirements: The z/OS base is a system that can be IPLed. There are no software prerequisites in order to IPL. Specific functions may require additional products not included in the z/OS base, or in the optional features of z/OS. Refer to z/OS Planning for Installation (GA22-7504) for a listing of specific software requirements at

http://publibz.boulder.ibm.com/cgi-bin/bookmgr_OS390/BOOKS/E0Z2B119

Compatibility

Coexistence, release migrations, and fallback: z/OS gives you compatibility and flexibility as you migrate systems in a multisystem configuration by allowing multiple releases of z/OS to coexist. This includes non-Parallel Sysplex® and Parallel Sysplex multisystem configurations.

Coexistence allows systems within a multisystem configuration to be upgraded to a new release level of z/OS one system at a time. This is contingent on the fact that the release you are migrating to can coexist with the lowest release running in your multisystem configuration.

The Coexistence-Migration-Fallback and Service policies are aligned. IBM intends to continue the practice of providing service support for each release of z/OS for three years following its general availability (GA) date. IBM, at its sole discretion, may choose to leave a release supported for more than three years. In that case, more than three releases may be coexistence, migration, and fallback supported. However, any z/OS release having three or fewer months of

service remaining at the time of GA of a new release will not be coexistence, migration, and fallback supported.

Note: These statements represent current intention of IBM. IBM reserves the right to change or alter the Coexistence-Migration- Fallback policy in the future or to exclude certain releases beyond those stated. 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 does not create any liability or obligation for IBM.

Migration forward as well as fallback should be made within the same z/OS releases supported by the coexistence policy.

The following table shows the z/OS releases that are coexistence-supported with z/OS V1.9.

Coexistence-supported releases

Release	Coexistence-supported with release in Column 1
z/OS V1.7 or z/OS.e V1.7	z/OS V1.4 (1), z/OS V1.5 (1), z/OS V1.6 (2), z/OS V1.7, z/OS.e V1.4, z/OS.e V1.5, z/OS.e V1.6, z/OS.e V1.7
z/OS V1.8 or z/OS.e V1.8 (3)	z/OS V1.5 (1), z/OS V1.6 (2), z/OS V1.7, z/OS V1.8, z/OS.e V1.5, z/OS.e V1.6, z/OS.e V1.7, z/OS.e V1.8
z/OS V1.9	z/OS V1.7, z/OS V1.8, z/OS V1.9, z/OS.e V1.7, z/OS.e V1.8
z/OS V1.10 (4)	z/OS V1.8, z/OS V1.9, z/OS V1.10, z/OS.e V1.8
z/OS V1.11 (4)	z/OS V1.9, z/OS V1.10, z/OS V1.11

(1) z/OS V1.4, z/OS.e V1.4, z/OS V1.5, and z/OS.e V1.5 end of service was March 2007.
(2) z/OS V1.6 and z/OS.e V1.6 end of service will be September 2007.
(3) z/OS.e V1.8 was the last release of z/OS.e. It has been replaced with the new zNALC pricing offering available with z/OS.
(4) Operating system levels beyond z/OS V1.9 represent current intentions of IBM.

This consistent coexistence, migration, and fallback policy applies to release migrations for all configurations, whether they are:

- Single-system configurations
- Individual systems within a multisystem configuration
- Cases where a simultaneous IPL is used to migrate all systems in a multisystem configuration at the same time

It is very important that you order the required z/OS release you need for migration and coexistence while it is still available. Refer to information under Key dates to find out how long z/OS V1.9 will remain orderable.

For additional information on z/OS coexistence and release migration information, refer to z/OS Planning for Installation (GA22-7504) at

http://publibz.boulder.ibm.com/cgi-bin/bookmgr_OS390/BOOKS/E0Z2B119

For migrations inside the IBM migration and coexistence policy, IBM Global Technology Services (GTS) has fee-based offerings that provide a PTF on demand service for toleration and coexistence maintenance based upon a customer's SMP/E Consolidated Software Inventory (CSI). With these offerings, you specify the release of z/OS, or other products, or hardware (for example, 2094) to which you are migrating, and all configured toleration/coexistence maintenance for your current system (as specified by your CSI) will be delivered to you as a customized package in electronic or physical format. This is provided through the S/390® SoftwareXcel offering, via the Service Request and Delivery (SRD) function.

GTS also provides hands-on fee-based services to assess whether a migration outside the migration and coexistence policy might be possible. For more information on the migration services that GTS provides for both inside and outside the migration and coexistence policy, contact your local IBM sales specialist.

JES coexistence, release migrations, and fallback: IBM recommends that you migrate to the next version of JES2 or JES3 at the same time you migrate to the rest of z/OS. This way, you benefit directly from the new function provided by the most current JES and enable other elements and features to benefit from this level.

Fallback for z/OS is at a system level, rather than an element or feature level. When you migrate to JES2 or JES3 at the same time you migrate to z/OS, you cannot back out JES2 or JES3 separately; you can only back out the entire z/OS product.

However, because such a migration is not always practical, certain prior levels of JES2 and JES3 are supported with z/OS V1.9 so that you can stage your migration to z/OS V1.9 JES2 or JES3 (that is, migrate your JES2 or JES3 later). If you stage your migration to z/OS V1.9 JES2 or JES3, coexistence and fallback to a prior JES2 or JES3 is supported so long as the prior z/OS level can coexist with other z/OS and z/OS.e systems in the same MAS or multisystem complex.

For additional information on z/OS JES release migration and coexistence, refer to z/OS Planning for Installation (GA22-7504) by visiting

http://publibz.boulder.ibm.com/cgi-bin/bookmgr_OS390/BOOKS/E0Z2B119

Performance considerations: Additional information on z/OS V1.9 performance will be published at general availability. Contact an IBM representative at or after general availability.

User group requirements: z/OS V1.9 satisfies or partially satisfies requirements from IBM customers and one or more of the worldwide user group communities. Information on the specific user group requirements (numbers and descriptions) can be found at

http://www.ibm.com/servers/eserver/zseries/zos/bkserv/user_group_reqs.html

Planning information

Direct customer support

Direct customer support for questions about the installation and use of the product is provided by IBM Operational Support Services — SoftwareXcel Enterprise Edition or SoftwareXcel Basic Edition. These fee services can help enhance productivity by providing voice and electronic access into the IBM support organization. IBM Operational Support Services — SoftwareXcel Enterprise Edition or SoftwareXcel Basic Edition will help answer questions pertaining to usage, how to, and suspected software defects for eligible products.

Installation and technical support is provided by IBM Global Technology Services. For more information on services, call 1-888-426-4343.

To obtain information on customer eligibility and registration procedures, contact the appropriate support center.

Security, auditability, and control

Data security and auditability in the z/OS environment are enhanced by the functions available in the optional Security Server for z/OS feature. The customer is responsible for evaluation, selection, and implementation of security features, administrative procedures, and appropriate controls in application systems and communication facilities.

Ordering information

Ordering z/OS through the Internet

ShopzSeries provides an easy way to plan and order your z/OS ServerPac or CBPDO. It will analyze your current installation, determine the correct product migration, and present your new configuration based on z/OS. Additional products can also be added to your order (including determination of whether all product requisites are satisfied). ShopzSeries is available in the U.S., Canada, and several countries in Europe. In countries where ShopzSeries is not available yet, contact your IBM representative (or IBM Business Partner) to handle your order via the traditional IBM ordering process. For more details and availability, visit the ShopzSeries Web site at

http://www.ibm.com/software/shopzseries

Current licensees

For pricing information previously announced for z/OS V1, refer to:

- Software Announcement 200-352, dated October 3, 2000
- Software Announcement 202-036, dated April 30, 2002
- Software Announcement 202-190 dated August 13, 2002
- Software Announcement 203-131 dated May 13, 2003
- Software Announcement 204-056, dated April 7, 2004
- Software Announcement 205-167, dated July 27, 2005
- Software Announcement 207-006, dated January 9, 2007

Key dates

- **August 7, 2007:** z/OS V1.9 CFSW configurator support for stand-alone path (5694-A01) and price proposal support.
- **September 14, 2007:** First date for ordering z/OS V1.9 ServerPac, SystemPac, CBPDO using CFSW configuration support, or ShopzSeries, the Internet ordering tool. Note that most z/OS media (executable code) is shipped only through Customized Offerings (ServerPac, SystemPac, and CBPDO).
- **September 28, 2007:** z/OS V1.9 planned general availability via ServerPac, CBPDO, and SystemPac.
- **September 28, 2007:** Planned general availability of System REXX Support for z/OS V1.8 and z/OS.e V1.8 Web deliverable. This Web deliverable will support z/OS V1.8 and z/OS.e V1.8.
- **October 9, 2007:** Recommended last date for submitting z/OS V1.8 orders via the entitled Customized Offerings (ServerPac and CBPDO). This date will allow for adequate order processing time.
- **October 22, 2007:** Last date for processing orders for z/OS V1.8 via ServerPac and CBPDO.
- **November 15, 2007:** Planned general availability of the Cryptographic Support for z/OS V1R7-R9 and z/OS.e V1R7-R8 Web deliverable. This Web deliverable will support z/OS V1.7 through z/OS V1.9 and z/OS.e V1.7 through z/OS.e V1.8.
- **June 23, 2008:** Recommended last date for submitting z/OS V1.8 orders via the fee Customized Offering SystemPac. This date will allow for adequate order processing time.
- **July 21, 2008:** Last date for processing orders for z/OS V1.8 via SystemPac.

To obtain the Web deliverables listed above, visit

http://www.ibm.com/server/eserver/zseries/zos/downloads

The end of service for a Web deliverable occurs at end of service for the release on which it runs.

It is very important that you order the required z/OS release you need for migration and coexistence while it is still available. Refer to information under Key dates to find out how long z/OS V1.8 will remain orderable.

For z/OS.e (5655-G52), z/OS.e V1.8 is the last release of the z/OS.e product. Refer to following recommendations for placing last orders.

- **October 9, 2007:** Recommended last date for submitting z/OS.e V1.8 orders via the Customized Offerings (ServerPac and SystemPac). This date will allow for adequate order processing time.
- **October 22, 2007:** Last date for ordering z/OS.e V1.8 via ServerPac and SystemPac.

- Since z/OS.e V1.8 is the last release of z/OS.e, no new z/OS.e orders will be created after October 22, 2007, for either ServerPac or SystemPac.
- In addition, the z/OS.e ServerPac and SystemPac product checklists will no longer exist after October 22, 2007.
- To order any product that runs with z/OS.e, please use the z/OS product catalog in ShopzSeries.
- z/OS.e service ordering should also be done using the z/OS service path in ShopzSeries.

Products that are unavailable via CBPDO, ServerPac, or SystemPac, such as Lotus® Domino® (5655-B86), can also be separately ordered for use with z/OS.

ServerPac, CBPDO, and SystemPac are offered for electronic delivery, where ShopzSeries product ordering is available. For more details on electronic delivery, refer to the ShopzSeries help information

http://www.software.ibm.com/ShopzSeries

As of October 31, 2007, the SWINFO Web site will be discontinued

http://www.ibm.com/servers/eserver/zseries/software/swinfo/

Refer to the ShopzSeries Web site for product catalogs for the Customized Offerings

https://www14.software.ibm.com/w
ebapp/ShopzSeries/ShopzSeries.jsp

If a product catalog for your country is not available in ShopzSeries, please use one of the following countries, United States or Germany, and select English language for the most complete product catalogs for the Customized Offerings.

Current licensees of z/OS V1

z/OS V1 customers can migrate to z/OS V1.9 by ordering the release through the Customized Offerings (ServerPac, SystemPac, CBPDO) as they have done in the past.

For more details, refer to the **New licensees** section under **Ordering information.**

New licensees of z/OS V1.9

This product ships its executable code via Customized Offerings (ServerPac, SystemPac, CBPDO). The media type is chosen during the customized offering ordering procedure. Refer to the Customized Offerings section for the media types offered.

Production of z/OS V1.9 orders will begin on the planned general availability date, **September 28, 2007.** Ship dates for orders will be based on order sequence, Customized Offering selected, production capability, and customer-requested arrival date. Due to the amount of customization of ServerPac orders, shipments will begin approximately **two weeks after** general availability. Due to the amount of additional customization of SystemPac orders, shipments will begin approximately four weeks after order and data input verification. For CBPDO orders, shipments will begin one week after general availability. In all cases, no delivery commitments are to be made to the customer until confirmed arrival dates are in ESW.

Basic license

To order a basic license, specify the z/OS V1.9 program number 5694-A01. Proceed to select the feature numbers listed, which are required, and then select any optional feature numbers.

Single version charging: To elect single version charging, the customer must notify and identify to IBM the prior program and replacement program and the designated machine the programs are operating on.

Basic machine-readable material: The following no-charge features are added to z/OS V1.9 and can be ordered effective **August 7, 2007.** These features have pricing/billing features associated with them. Refer to the **Notes** below for details on past announcements for this information.

z/OS V1.9 feature description	z/OS V1.9 orderable supply ID
Base	S013TF8

Notes:

- The billing features and pricing information for the above feature descriptions remain unchanged and are provided in:
  - Software Announcement 200-352, dated October 3, 2000
  - Software Announcement 202-036, dated February 19, 2002
  - Software Announcement 202-105, dated April 30, 2002
  - Software Announcement 202-190, dated August 13, 2002
  - Software Announcement 203-131, dated May 13, 2003
  - Software Announcement 204-056, dated April 7, 2004
  - Software Announcement 205-167, dated July 27, 2005
  - Software Announcement 207-006, dated January 9, 2007

- This product ships its executable code via Customized Offerings (ServerPac, SystemPac, CBPDO). The media type is chosen during the customized offering ordering procedure. Refer to the Customized offerings section for the media types offered.

Basic publications

A program directory and one copy of the following publication are supplied automatically with the basic machine-readable material:

Basic unlicensed hardcopy publications

Title	Order number
z/OS Hot Topics Newsletter	GA22-7501

The z/OS publications are available on the Internet at

http://www.ibm.com/servers/eserver/zseries/zos/bkserv/

Basic unlicensed softcopy publications

Title	Order number
z/OS Version 1 Release 9 Collection	SK3T-4269

Starting with z/OS V1.4, as books are updated, they will be available in softcopy only on the softcopy collection and the Internet.

For a fee, the customer can order the softcopy collections or any z/OS V1.9 documents available in hardcopy using the IBM Publications Center on the Web

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

For customers in 23 countries, the IBM Publications Center offers the option to order hardcopy publications or softcopy collections by customer number.

For other publications ordering options, visit

http://www.ibm.com/servers/eserver/zseries/zos/bkserv/order_books.html

z/OS Version 1 Release 9 Collection (BookManager® and PDF) contains the z/OS V1.9 product books in both BookManager and PDF softcopy formats on CD-ROM. If this collection is refreshed after general availability, an updated collection will be automatically sent to z/OS V1.9 licensees.

By general availability, the z/OS V1.9 books will be available at

http://www.ibm.com/servers/eserver/zseries/zos/bkserv/

For creating softcopy repositories, SoftCopy Librarian is the strategic tool for uploading and managing BookManager and PDF softcopy files on a z/OS host or server and on LANs and workstations. SoftCopy Librarian is a free program that is available on the softcopy tools disc of the collections or the Web. Use it to obtain and manage shelves from IBM or OEM (original equipment manufacturers), CD or DVD collections, or the Internet from the IBM PUBLIB Web site, as well as from other Web sites that provide support for the SoftCopy Librarian.

Starting in October 2003, SoftCopy Librarian is supported only on Windows™ 2000 and Windows XP.

The latest version of the SoftCopy Librarian can be downloaded from this Web site

http://publib.boulder.ibm.com/epubs/df/ebrsclwj.exe

Optional machine-readable material: To order, select the feature number for the desired distribution medium.

Optional unpriced features — z/OS V1.9: The following optional features, offered at no additional charge, are added to z/OS V1.9 and can be ordered effective **August 7, 2007.**

z/OS V1.9 feature description	z/OS V1.9 orderable supply ID
Communications Server Security Level 3	S013TFT
z/OS Security Level 3	S013TD8

Notes:

1. This product ships its executable code via Customized Offerings (ServerPac, SystemPac, CBPDO). The media type is chosen during the customized offering ordering procedure. Refer to the Customized Offerings section for the media types offered.
2. All the above features can be exported outside the U.S.
3. These features should be ordered during this release cycle, since they are not automatically included in all orders, due to need for export regulation tracking.

Optional priced features: The following optional no-charge features are added to z/OS V1.9 and can be ordered effective **August 7, 2007.** These features have pricing/billing features associated with them. Refer to**Notes** below for details on past announcements for this information.

z/OS V1.9 feature description	z/OS V1.9 orderable supply ID
BDT FTF	S013TDC
BDT SNA NJE	S013TF7
BookManager Build	S013TFD
C/C++ without Debug	S013TFZ
DFSMSdss,hsm	S013TDH
DFSMSrmm	S013TCP
DFSMSdss	S013TFM
DFSMStvs	S013TDL
DFSORT	S013TD6
GDDM-PGF	S013TCT
GDDM-REXX	S013TF5
HCM	S013TCZ
HLASM Toolkit	S013TFX
Infoprint Server	S013TG0
JES3	S013TFJ
RMF	S013TDJ
SDSF	S013TG2
Security Server	S013TFC

Notes:

1. The billing features and pricing information for the above feature descriptions are described in:

- Software Announcement 200-352, dated October 3, 2000
- Software Announcement 202-036, dated February 19, 2002
- Software Announcement 202-105, dated April 30, 2002
- Software Announcement 202-190, dated August 13, 2002
- Software Announcement 203-131, dated May 13, 2003
- Software Announcement 204-056, dated April 7, 2004
- Software Announcement 205-167, dated July 27, 2005
- Software Announcement 207-006, dated January 9, 2007

1. This product ships its executable code via Customized Offerings (ServerPac, SystemPac, CBPDO). The media type is chosen during the customized offering ordering procedure. Refer to the Customized Offerings section for the media types offered.
2. If the customer subsequently enables any of the optional priced features, those features also become subject to the payment terms of the existing z/OS license as described in :cit.z/OS Licensed Program Specifications:ecit. (GA22-7503). The customer must notify IBM when an optional feature is enabled that was shipped disabled from IBM.
3. One or both of the BDT optional features (File-to-File or SNA NJE) must be ordered and installed in order to use the BDT function shipped with the base.
4. The DFSMSdss feature cannot be ordered with the DFSMSdss,hsm feature. Likewise, the DFSMSdss,hsm feature cannot be ordered with the DFSMSdss feature.

Optional unpriced National Language Version (NLV) features: The z/OS V1.9 NLV support features will become generally available on the same date the release becomes available.

z/OS V1.9 provides support in the languages listed below. However, not all elements within z/OS V1.9 are translated into each language. Refer to z/OS Planning for Installation (GA22-7504) for information on which elements are translated into which languages, by visiting

http://publibz.boulder.ibm.com/cgi-bin/bookmgr_OS390/BOOKS/E0Z2B119

The following optional features, offered at no additional charge, are added to z/OS V1.9 and can be ordered effective **August 7, 2007.**

The NLV features for z/OS V1.9 are:

z/OS V1.9 NLV feature description	z/OS V1.9 orderable supply ID
Brazilian Portuguese Base (PTB)	S013TFG
Brazilian Portuguese BookMgr Build	S013TF9
Canadian French Base (FRC)	S013TD1
Canadian French BookMgr Build	S013TD4
Danish Base (DAN)	S013TDZ
Dutch Base (NLD)	S013TCV
French Base (FRA)	S013TCR
French BookMgr Build	S013TDM
German Base (DEU)	S013TDK
German BookMgr Build	S013TDB
Italian Base (ITA)	S013TFV
JPN Base	S013TCW
JPN C/C++ Without Debug	S013TF4
JPN DFSORT	S013TD7
JPN Infoprint Server	S013TDS
JPN RMF	S013TFH
JPN SDSF	S013TD3
JPN Security Server	S013TDW
Upper Case English Base (ENP)	S013TDX
Korean Base (KOR)	S013TDV
Norwegian Base (NOR)	S013TFN
Spanish Base (ESP)	S013TCS
Spanish BookMgr Build	S013TFK

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Swedish Base (SVE)                  S013TF3
Swiss German Base (DES)             S013TD9
Simplified Chinese Base (CHS)       S013TDN
Traditional Chinese Base (CHT)      S013TD5
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Notes:

- The above feature descriptions are offered at no additional charge.
- This product ships its executable code via Customized Offerings (ServerPac, SystemPac, CBPDO). The media type is chosen during the customized offering ordering procedure. Refer to the Customized offerings section for the media types offered.

Optional unlicensed publications

Optional unlicensed softcopy publications: The following optional one-time charge features are added to z/OS V1.9 and can be ordered effective **August 7, 2007.**

Subscriptions to the following softcopy collections may be ordered for a fee by specifying the OTC feature numbers listed below:

Title	Order number	Orderable supply ID
z/OS Software Products Collection	SK3T-4270	S013TDD
IBM System z Redbooks Collection	SK3T-7876	S013TFB
z/OS Security Server RACF Collection	SK3T-4272	S013TDT
z/OS Version 1 Release 9 and Software Products DVD Collection	SK3T-4271	S013TFS

Notes:

- The Redbooks collection is updated, concurrently, with z/OS releases.
- The z/OS Security Server RACF Collection is updated, concurrently, with z/OS releases, and is available one week after the release general availability to licensees of the z/OS Security Server optional feature. The update for z/OS V1.9 is planned to be available October 5, 2007.
- The feature descriptions listed above are the same offered in z/OS V1.8.
- When the above softcopy collections are ordered as features of z/OS V1.9, the special subscription price includes automatic shipment of all updates made while the product version can be ordered.

The z/OS Software Products Collection now includes more than 1,730 unlicensed online documents for more than 290 z/OS software products and Parallel Sysplex, and a softcopy tools disc. This collection includes documents for multiple releases of software products that run on z/OS. The documents are provided in BookManager format and, when available, in PDF format as well.

The IBM System z Redbooks Collection contains IBM Redbooks, in PDF format, related to z/OS and other System z products. IBM Redbooks, which are produced by the International Technical Support Organization, include timely technical information based on realistic scenarios and are created by IBM experts, customers, and Business Partners from around the world.

The IBM Redbooks are also available for viewing or downloading on the following Web site

http://www.ibm.com/redbooks/

To find Redbooks that apply to z/OS, enter z/OS in the search field at the top of the Web page.

The z/OS Security Server RACF Collection includes unlicensed softcopy documents, in BookManager format, for numerous software product libraries that reference z/OS Security Server RACF. It also includes education course listings, Web sites to access sample code on the Internet, and Portable Document Format (PDF) files for the z/OS Security Server manuals and softcopy tools. Using this collection, the customer has easy access to all the Security Server RACF-related information without handling individual sets of documents and libraries on many CD-ROMs.

The z/OS Version 1 Release 9 and Software Products DVD Collection (SK3T-4271) includes softcopy tools, libraries for z/OS Version 1 Release 9 (the element and feature libraries), the libraries for multiple releases of z/OS software products, and selected IBM System z Redbooks. Both BookManager and PDF formats, when available, are included on this single DVD. This comprehensive z/OS collection is essentially the z/OS Version 1 Release 9 Collection (SK3T-4269) and the z/OS Software Products Collection (SK3T-4270) combined with selected IBM Redbooks from the IBM System z Redbooks Collection (SK3T-7876) and delivered on the higher-density DVD technology. The contents of the popular zFavorites for zSeries mini-CD are also included on the DVD collection. This collection requires a DVD drive that can read discs in DVD-9 (single-sided, dual-layer) format.

Optional licensed publications: Effective with z/OS V1.7, there are no longer any licensed publications, which previously required a separate key code to access on ResourceLink.

z/OS V1.8 features withdrawn

The following z/OS V1.8 features are withdrawn from marketing effective October 22, 2007:

z/OS V1.8 orderable supply ID	z/OS V1.8 feature description
S012HK3	z/OS V1.8 Base
S012HK8	z/OS V1.8 BDT FTF
S012HK6	z/OS V1.8 BDT SNA NJE
S012HK9	z/OS V1.8 BookManager Build
S012HKL	z/OS V1.8 C/C++ without Debug
S012HL7	z/OS V1.8 DFSMSdss,hsm
S012HM2	z/OS V1.8 DFSMSrmm
S012HL1	z/OS V1.8 DFSMSdss
S012HK7	z/OS V1.8 DFSMStvs
S012HM4	z/OS V1.8 DFSORT
S012HL8	z/OS V1.8 GDDM-PGF
S012HKG	z/OS V1.8 GDDM-REXX
S012HLS	z/OS V1.8 HCM
S012HJX	z/OS V1.8 HLASM Toolkit
S012HLT	z/OS V1.8 Infoprint Server
S012HKN	z/OS V1.8 JES3
S012HLW	z/OS V1.8 RMF
S012HKJ	z/OS V1.8 SDSF
S012HKD	z/OS V1.8 Security Server
S012HLM	z/OS V1.8 Communications Server Security Level 3
S012HK4	z/OS V1.8 z/OS Security Level 3
S012HL4	z/OS V1.8 SK3T-4272 z/OS Security Server RACF Collection
S012HL5	z/OS V1.8 SK3T-4270 z/OS Software Products Collection
S012HK2	z/OS V1.8 SK3T-7876 IBM z/OS V1 zSeries Redbook Collection
S012HLR	z/OS V1.8 SK3T-4271 z/OS V1R8 and Software Products DVD Collection
S012HLZ	z/OS V1.8 Braz Port Base (PTB)
S012HKS	z/OS V1.8 Braz Port BookMgr Build
S012HKH	z/OS V1.8 Can Fren Base (FRC)
S012HKX	z/OS V1.8 Can Fren BookMgr Build
S012HLL	z/OS V1.8 Danish Base (DAN)
S012HKF	z/OS V1.8 Dutch Base (NLD)
S012HK5	z/OS V1.8 French Base (FRA)
S012HKV	z/OS V1.8 French BookMgr Build
S012HL9	z/OS V1.8 Germ Base (DEU)
S012HJS	z/OS V1.8 Germ BookMgr Build
S012HLD	z/OS V1.8 Ital Base (ITA)
S012HKZ	z/OS V1.8 JPN Base
S012HM3	z/OS V1.8 JPN C/C++ Without Debug
S012HLP	z/OS V1.8 JPN DFSORT
S012HLG	z/OS V1.8 JPN Infoprint Server
S012HK0	z/OS V1.8 JPN RMF
S012HKC	z/OS V1.8 JPN SDSF
S012HL2	z/OS V1.8 JPN Security Server
S012HKR	z/OS V1.8 Upper Case English Base (ENP)
S012HJT	z/OS V1.8 Kor Base (KOR)
S012HJZ	z/OS V1.8 Norw Base (NOR)

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S012HL3           z/OS V1.8 Span Base (ESP)
S012HLF           z/OS V1.8 Span BookMgr Build
S012HLX           z/OS V1.8 Swed Base (SVE)
S012HKW           z/OS V1.8 Swiss Germ Base(DES)
S012HJW           z/OS V1.8 Simp Chin Base (CHS)
S012HJV           z/OS V1.8 Trad Chin Base (CHT)
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Customized Offerings

Product deliverables are shipped only via Customized Offerings (for example, CBPDO, ServerPac, SystemPac).

ServerPac, CBPDO, and SystemPac are offered for electronic delivery, where ShopzSeries product ordering is available. Internet delivery of ServerPac may help improve automation and software delivery time. For more details on Internet delivery, refer to the ShopzSeries help information at

http://www.software.ibm.com/ShopzSeries

Media type for this software product is chosen during the customized offerings ordering process. Based on your customer environment, it is recommended that the highest possible density tape media is selected. Currently offered media types are:

- CBPDOs — 3480, 3480 Compressed, 3490E, 3590, 3592[5]
- ServerPacs — 3480, 3480 Compressed, 3490E, 3590, 3592[5]
- SystemPacs — 3480, 3480 Compressed, 3490E, 3590, 3592[5]

[5] 3592 is highest density media. Selecting 3592 will ship the fewest number of media.

Once a product becomes generally available, it will be included in the next ServerPac and SystemPac monthly update.

Production of software product orders will begin on the planned general availability date.

- CBPDO shipments will begin one week after general availability.
- ServerPac shipments will begin two weeks after inclusion in ServerPac.
- SystemPac shipments will begin four weeks after inclusion in SystemPac due to additional customization, and data input verification.

Terms and conditions

The terms and conditions of z/OS Version 1 (5694-A01) are unaffected by this announcement. For more information, refer to Software Announcement 200-352, dated October 3, 2000.

IBM Operational Support Services — SupportLine: Yes

Prices

Prices are available upon request.

Order now

To order, contact the Americas Call Centers or your local IBM representative.

To identify your local IBM representative, call 800-IBM-4YOU (426-4968).

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Phone:      800-IBM-CALL (426-2255)
Fax:        800-2IBM-FAX (242-6329)
Internet:   callserv@ca.ibm.com
Mail:       IBM Americas Call Centers
            Dept. Teleweb Customer Support, 9th floor
            105 Moatfield Drive
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North York, Ontario
Canada M3B 3R1

Reference: LE001

The Americas Call Centers, our national direct marketing organization, can add your name to the mailing list for catalogs of IBM products.

Note: Shipments will begin after the planned availability date.

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