IBM z/OS V1.10 offers new scalability, performance, availability, economics, and solutions for enterprise information

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At a glance

Today IBM® announces z/OS® V1.10. This release of the z/OS operating system builds on leadership capabilities, enhances time-tested technologies, and leverages deep synergies with the IBM System z10 Enterprise Class (z10 EC) and IBM System Storage™ family of products. z/OS V1.10 supports new capabilities designed to provide:

- Storage scalability. Extended Address Volumes (EAVs) enable you to define volumes as large as 223 GB to relieve storage constraints and help you simplify storage management by providing the ability to manage fewer, large volumes as opposed to many small volumes.
- Application and data serving scalability. Up to 64 engines, up to 1.5 TB per server with up to 1.0 TB of real memory per LPAR, and support for large (1 MB) pages on the z10 EC can help provide scale and performance for your critical workloads.
- Intelligent and optimized dispatching of workloads. HiperDispatch can help provide increased scalability and performance of higher n-way z10 EC systems by improving the way workload is dispatched within the server.
- Low-cost, high-availability disk solution. The Basic HyperSwap™ capability (enabled by TotalStorage® Productivity Center for Replication Basic Edition for System z™) provides a low-cost, single-site, high-availability disk solution which allows the configuration of disk-replication services using an intuitive browser-based graphical user interface (GUI) served from z/OS.
- Improved total cost of ownership. zIIP-Assisted HiperSockets™ for Large Messages, IBM Scalable Architecture for Financial Reporting enabled for zIIP (a service offering of IBM Global Business Services), zIIP-assisted z/OS Global Mirror (XRC), and additional z/OS XML System Services exploitation of zIIP and zAAP help make these workloads more attractive on System z.
- Improved management of temporary processor capacity. A new Capacity Provisioning Manager available on z/OS V1.10, and available on z/OS V1.9 with PTF UA39307, can monitor z/OS systems on z10 EC servers. Activation and deactivation of temporary capacity can be suggested or performed automatically based on user-defined schedules and workload criteria. RMF™ or equivalent function is required to use the Capacity Provisioning Manager.
- Improved network security. z/OS Communications Server introduces new defensive filtering capability. Defensive filters are evaluated ahead of configured IP filters, and can be created dynamically, which can provide added protection and minimal disruption of services in the event of an attack.

    z/OS V1.10 also supports RSA key, ISO Format-3 PIN block, 13-Digit through 19-Digit PAN data, and SHA algorithms.

- Improved productivity. z/OS V1.10 provides improvements in or new capabilities for: simplifying diagnosis and problem determination; expanded Health Check Services; network and security management; automatic dump and re-IPL capability; as well as overall z/OS, I/O configuration, sysplex, and storage operations.

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For ordering, contact your IBM representative, an IBM Business Partner, or IBM Americas Call
Centers at 800-IBM-CALL (Reference: LE001).

Overview

Today, Information Technology (IT) is woven into almost everything we do. The demands on IT
solutions are greater than ever often requiring the delivery of more service, value, or capabilities,
in less time, or with fewer resources. Accomplishing "more with less" can be achieved by
adopting a platform solution that is designed to drive efficiencies and economies of scale;
accommodate business needs through flexible, virtual, and autonomic capabilities; help reduce
the risk of lost productivity, downtime, or security breaches; and enable business innovation
through the extension of existing investments and adoption of newer technologies.

Get the most of your IT investment with z/OS. The marriage of z/OS and the System z platform
delivers advanced scalability, resiliency, security, workload management, and autonomic
capabilities to help you, while minimizing excesses and waste of system resources and
operations. System z and z/OS redefine investment protection by going to great lengths to
keep applications and data available, system resources secure, server utilization high, and
programming environments adaptable.

Today IBM announces z/OS Version 1 Release 10. In this release of the z/OS operating
system, IBM delivers a platform that is designed to drive efficiencies and economies of scale;
accommodate business needs through flexible, virtual, and autonomic capabilities; help reduce
the risk of lost productivity, downtime, or security breaches; and enable business innovation
through the extension of existing investments and adoption of newer technologies.

z/OS V1.10 and the new IBM System z/10 Enterprise Class (z10 EC) server together are
designed to deliver tremendous economies of scale and adaptability of resources and this
can help with consolidating enterprise data stores, co-locating applications close to the data,
and reducing the incidence of siloed data in the enterprise. With support for up to 64[1] engines
in a single logical partition (also available on z/OS V1.9) and up to 1.0 terabyte (TB) of real
memory per LPAR (also available on z/OS V1.8 and later), your application and data serving
requirements may not have to be partitioned on unnatural boundaries. In z/OS V1.10 (and
available with z/OS V1.9), the memory architecture is extended to support large (1 MB) pages
in addition to the existing 4 KB page size, which is expected to reduce memory management
overhead for exploiting applications. System scalability, by itself, is not enough. The system must
also perform well. With z/OS V1.10 and the z10 server is a new function, HiperDispatch (also
available on z/OS V1.7 and later), that is designed to dispatch z/OS workloads intelligently and
help improve performance for higher n-way systems. The new Capacity Provisioning Manager,
also available on z/OS V1.9 with PTF UA39307, can monitor z/OS systems on z10 servers, and
activate and deactivate temporary capacity automatically or by user input.

This release of z/OS and the IBM System Storage family of products together are designed to
deliver improvements to data storage scalability, availability, and productivity. Extended Address
Volumes (EAV), a capability available only with z/OS V1.10 and IBM System Storage DS8000™
Release 4.0, enables you to define volumes as large as 223 GB to relieve storage constraints
and help you simplify storage management by providing the ability to manage fewer, large
volumes as opposed to many small volumes. In future releases, the EAV will continue to expand
on this strategy.[2] A new Basic HyperSwap capability (enabled by TotalStorage Productivity
Center for Replication for System z (5698-TPC) or IBM TotalStorage Productivity Center for
Replication Basic Edition for System z V3.4 (5698-TRB)), provides a low-cost, single-site, high-
availability disk solution which allows the configuration of disk-replication services using an
intuitive graphical user interface (GUI) from z/OS. The total cost of ownership (TCO) for the
platform can be improved with more eligible exploiters for specialty engines. The world-class
z/OS Global Mirror disaster recovery solution is enabled to exploit the IBM System z10 and
System z9® Integrated Information Processor (zIIP) specialty engine. The zIIP essentially
becomes a z/OS data mirroring engine that can provide better price performance and improved
utilization of resources at the mirrored site. With z/OS V1.10, z/OS XML System Services now
exploits both zAAPs and zIIPs. The zIIP-Assisted HiperSockets for Large Messages capability
helps lower processor utilization for handling of large outbound messages, and helps make new
workload traffic from XML, JAVA, and other languages, as well as general bulk data transfers
more attractive on the platform. The new IBM Scalable Architecture for Financial Reporting (a
service offering of IBM Global Business Services) can be enabled for the zIIP. This service offers

customer architects an efficient and scalable business intelligence reporting solution on z/OS and uses your operational data store to create timely reports for critical decision making.

System z availability is legendary. With this release of z/OS IBM continues to refine its error checking, fault tolerance, isolation, error recovery, and diagnostic capabilities. These new capabilities include improved console processing, JES2 dynamic exit capability, automatic dump and re-IPL, new IBM Health Checker for z/OS services, automatic restart for JES2 NJE connections, identification of users of large amounts of fixed storage, and improvements in Parallel Sysplex® function.

z/OS V1.10 not only can help you reduce the risk of downtime, but can help reduce the risk of security breaches as well. z/OS System Integrity -- IBM's long-term commitment to protecting key z/OS system resources together with enhancements to z/OS Security Server (RACF®), SSL, Public Key Infrastructure (PKI) Services, and cryptography, including support for RFA key, ISO Format-3 PIN block, 13-Digit through 19-Digit PAN data, and SHA algorithms, make z/OS a highly secure hub for your data and applications. With z/OS V1.10, the z/OS Communications Server takes network security to the next level providing improvements to policy-based networking components of NSS, IPSec, and AT-TLS. Building on its history of Intrusion Detection Services (IDS), the z/OS Communications Server also introduces new defensive filtering capability. Defensive filters are evaluated ahead of configured IP filters, and can be created dynamically, designed to give added protection and minimal disruption of services in the event of an attack.

Productivity can be improved with simplified administration. z/OS V1.10 provides improvements in the areas of simplifying diagnosis, problem determination, and migration; network and security management; as well as overall z/OS, I/O configuration, sysplex, and storage operations. Improvements include: the IBM Configuration Assistant for z/OS Communications Server adds file import capabilities and support for IP address group definition to make the Configuration Assistant more responsive to networking needs; IBM Health Checker for z/OS provides not only more checks, but also support for log browse and saving data across IPLs (both of which can help improve analysis and problem determination), as well as support for the new Migration Health Checks; Hardware Configuration Manager now includes support for configuration packages and importing and exporting I/O configuration data in a manner similar to that of HCD, as well as improved named views. In z/OS V1.10, SMP/E helps simplify the task of installing new hardware and software by helping you identify required PTFs quickly without having to use the lists contained in Preventive Service Planning (PSP) buckets. IBM middleware plans to support simplified application development technologies as well. IBM CICS® Explorer, the new face of CICS (see Software Announcement 208-248, dated August 05, 2008)[2] is intended to help speed deployment of new CICS-based business applications on z/OS.

Viewing the individual functional enhancements of z/OS over the years does not reflect the full scope of the holistic nature of the platform. Taken together, the improvements provided by z/OS V1.10, the z10, and DS8000 can mean significant scalability, resiliency, security, workload management, and price performance capabilities for your data serving, transaction processing, as well as Business Intelligence (BI) Applications and Data Warehouse (DW) workloads. For example, DB2® for z/OS and IMS™ workloads can gain benefit from improvements from many of the following: hashed DSAB searches; EAVs; Basic HyperSwap; HiperDispatch; IBM System Storage DS8000 AMP (Adaptive Multi-stream Prefetching); and the z10 server's processors, memory, I/O and network bandwidth. IBM DB2 V9.1 for z/OS (DB2 9) workloads can benefit from z/OS V1.10's additional XML exploitation of the zIIP specialty processor, and the z10 server's hardware implementation of decimal floating point functions. Of course, other applications and subsystems can benefit from the deep synergy of the System z platform too.

With the addition of Business Intelligence (BI), Data Warehousing solutions (DW), and reporting tools to z/OS V1.10, this platform, widely recognized for robust OLTP, also offers a solid foundation for Operational Business Intelligence (OPBI). There are many BI/DW solutions and tools available on System z today including DataQuant, Alphablox, as well as the newly announced IBM Scalable Architecture for Financial Reporting. With this host of solutions, BI/DW applications on System z can benefit from many of the platform's advantages to deliver faster access to data on z/OS while offering a consolidated view of the data with DW, BI, and OLTP on the same platform. By leveraging z/OS and System z availablity, security, and resiliency characteristics, BI/DW applications can help to meet the operational requirements of business while offering potential for TCO improvements through the exploitation of speciality engines.

z/OS V1.10 is the next step in the evolution of IBM's flagship System z mainframe operating system. It raises the bar on scalability, performance, availability, and economics for the platform. It provides control over system resources, flexibility and autonomics for unforeseen demands, world-class security and availability, and deep synergies within the platform. z/OS provides a solid foundation for extending existing applications, expanding access to core data, and adopting new technologies.

[1] The total number of processors defined in a z/OS logical partition is the sum of general-purpose processors (CPs) plus System z9 Application Assist Processors (zAAPs), and IBM System z9 Integrated Information Processors (zIIPs), or System z10 Application Assist Processors (zAAPs) and IBM System z10 Integrated Information Processors (zIIPs). This support is also available on z/OS V1.9.

[2] All statements regarding IBM' future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only.

Key prerequisites

z/OS V1.10 will run on these IBM System z servers:

- z10 EC
- z9™ BC
- z9 EC
- z900
- z990
- z800
- z890

For a complete description of z/OS V1.10 software prerequisites, refer to *z/OS Planning for Installation* (GA22-7504), when available.

Planned availability date

September 26, 2008

Description

Ease of use

IBM has embarked on a long-term commitment to simplify the z/OS platform. The past several releases of z/OS delivered improvements in the areas of simplifying diagnosis and problem determination, network and security management, and also 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. Updates for z/OS V1.10 include:

- The IBM Configuration Assistant for z/OS Communications Server (a downloadable tool) is designed to simplify network and security management. For z/OS V1.10 the IBM Configuration Assistant for z/OS Communications Server adds file import capabilities and support for IP address group definition to make the IBM Configuration Assistant more responsive to networking needs.
- IBM Health Checker for z/OS (in the base of z/OS) is intended to help you avoid problems. In z/OS V1.10, IBM Health Checker for z/OS provides not only more checks for RACF, z/OS UNIX® System Services, XCF/XES, and CINET, but also provides support for log browse and saving data across IPLs, both of which can help you improve analysis and problem determination.

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- The IBM Health Checker for z/OS infrastructure is now used to help with z/OS V1.10 migration, which is expected to reduce the skill level and time needed. Migration Health Checks are provided in ICSF, RACF, and Communications Server. In addition, new associated Health Checks which can assist with z/OS migration are provided in SDSF and Language Environment®.
- Hardware Configuration Manager (HCM) is intended to help simplify z/OS I/O configuration. For z/OS V1.10, HCM is updated to include support for configuration packages, importing and exporting I/O configuration data in a manner more similar to how it can be done using HCD, and improved saved views.
- Hardware Configuration Definition (HCD) has been updated to allow multiple HCD users to display and update the same IODF at the same time.
- In z/OS V1.10, IBM introduces the Capacity Provisioning Control Center, a tool for managing capacity provisioning for System z10 servers. It is designed to manage provisioning policies and domain configurations. Provisioning policies specify the criteria for capacity increases and decreases, while domain configurations specify systems to be observed and servers to be managed.

  The Capacity Provisioning Control Center (CPCC) is available on z/OS V1.9 with PTF for APAR OA20824 (only on System z10 servers made available February 26, 2008) and z/OS V1.10, when available. Initial support provides a policy definition application which requires a workstation running Microsoft® Windows® XP.

  Specifically, the Capacity Provisioning Control Center provides the following functions:

  - Create and edit Capacity Provisioning policies
  - Create and edit Capacity Provisioning domain configurations
  - Connect to the Provisioning Manager; Display the status of the Provisioning Managers
  - Install Capacity Provisioning policies and domain configurations into the Provisioning Manager
- In z/OS V1.10 SMP/E is updated with enhancements to help simplify the task of verifying, selecting, and installing required software fixes.
- Additional ease-of-use enhancements are available for system logger, DFSMSrmm™, DFSMShsm™, PDSE, ISPF, the VARY command, and Language Environment.

Details on the ease-of-use enhancements intended for z/OS V1.10:

- SDSF now provides job and output management for JES3, including display and control of jobs and spool data sets. All SDSF functions not specific to JES2 or JES3 are available in the JES3 environment, including support for REXX™ functions and variables, IBM Health Checker for z/OS, WLM, and operator log display. SAF-based security is provided for JES3 SDSF functions. This new support is designed to allow you to use SDSF in both JES3 and JES2 environments.
- z/OS Communications Server provides enhancements aimed at improving the user experience with installation, configuration, and operations:
  - IBM Configuration Assistant: Policy Configuration File Import. The IBM Configuration Assistant (CA) for z/OS Communications Server can help simplify the definition of IP security policies and provides a graphical user interface (GUI) for policy definition management. The CA exports those policy definitions to z/OS systems in the form of text configuration files which z/OS Policy Agent reads and installs into the stack. z/OS Communications Server and the CA are being enhanced for V1.10 to allow the CA to import existing policy text files into the GUI. This allows the CA to learn of and absorb manual changes that the system administrator may have made to the policy configuration text files since the last time they were exported.
  - IBM Configuration Assistant: IP Address Groups. The z/OS Communications Server policy definitions include the specification of the IP addresses to which specific rules apply. IP Address Group definitions are used to define rules which apply to more than a single address. CA support for IP Address Groups is being expanded in V1.10 to support IP Address Group specifications for additional perspectives (for example, AT-TLS, IPSec). Also, the KeyExchangeRule is being enhanced for both the CA and the z/OS Policy Agent to support specification of an IP Address Group.
- The following are IBM Health Checker for z/OS enhancements:
  - An SDSF check intended to identify whether ISFPARMS is being used. This check is also associated with migration actions and should be used for migration assistance.

- A Language Environment check to verify that you are using the CEEPRMxx parmlib member. Using CEEPRMxx can help reduce migration effort.

- In z/OS V1.10, XCF and XES extend and enhance their existing health checks to provide new and improved checks to detect single points of failure for all types of couple data sets using the new IOSSPOF service, check for appropriate separation of different types of couple data sets, and check XCF signaling paths and structure sizes. Improved CF structure and duplexing checks help you avoid sysplex-related problems. New checks for Sysplex Failure Manager action specifications help you improve sysplex availability.

- Two new health checks are also available for z/OS UNIX. One is designed to detect and report on file systems specified in BPXPRMxx members used at IPL time that are not mounted. The other is intended to identify file systems for which performance could be improved if they were mounted on the local system.

- A new RACF health check is designed to detect potential exposures caused by the misuse of the RACF authorized caller table, ICHAUTAB. Also, the RACF_SENSITIVE_RESOURCES health check is enhanced to allow you to specify RACF resources you want to have checked.

- A health check is added for CINET environments to confirm whether the port range defined for use by the OMVS address space has been reserved in the TCP/IP stack definitions.

- The following are Infrastructure Changes in IBM Health Checker for z/OS:

  - A new log browse service designed to enable an application to extract historical data from health check output written to a log stream. This is expected to be useful in helping an application establish historical views of values returned by various health checks.

  - Allow checks to save data across IPLs in a data set so it can be accessible to instances of the checks running later, even after IPL. This support is designed to benefit those check writers who need persistent check-related information to be saved across system IPLs.

  - IBM Health Checker for z/OS has been redesigned to exploit 64-bit addressing and to use storage above the 2 GB bar. This is expected to provide enough storage to accommodate the number of health checks anticipated in the future.

- Migration Health Checks are designed to help you determine whether you are affected by migration actions and if so whether they have been performed or remain to be done. Rollback is planned via APARs for appropriate checks. This is expected to help reduce the skill level and time required to migrate to new z/OS releases.

  Specific checks available are:

  - An ICSF check designed to detect the existence of retained RSA private keys on a PCICC or PCIXCC/CEX2C cryptographic card. This check was made available via the PTF for APAR OA24221 and is also included in z/OS V1.10.

  - Another ICSF check designed to detect that the currently active PKDS can accommodate the larger record sizes needed to support z/OS V1.6 and higher ICSF, and let you know when a PKDS reallocation action is necessary. This check was made available via the PTF for APAR OA24221.

  - A RACF check to help you detect RACF profile configurations that will cause password enveloping to automatically become active when migrating to z/OS V1.9 or higher.

  - Communications Server checks to help detect if these functions are in use (as they will be removed in a future z/OS release):

    -- Boot Information Negotiation Layer (BINL)

    -- Berkeley Internet Name Domain (BIND) 4.9.3

    -- Dynamic Host Configuration Protocol (DHCP)

    -- Network Database (NDB)

- IBM provides a new JES3 Spool Data Set Browse (SDSB) application programming interface that can be used instead of the SYSOUT Application Programming Interface (SAPI). This new function is designed to allow more than one program to read a data set at one time; to read data sets that are still being created by active address spaces; and, for address spaces running on the same system, to display buffered data that has not yet been written to spool.

- The "DISPLAY TCPIP,,NETSTAT" command now supports the ALL keyword, and will display up to 65,534 lines of output for any combination of options you specify.

- Language Environment support is available to help you verify the syntax of CEEPRMxx members. Batch support to check one or more members is available using a new CEEPRMCC program. Support for a new CEEPRMCK CLIST is also available. Syntax

checking is expected to help you prevent errors from being made in CEEPRMxx parmlib members.

- DFSMSrmm provides improved parmlib support for tape library and tape volume partitioning, improved reporting for DFSMShsm activity, and support for new media end-of-life management policies based on media errors, volume usage, and age. These new functions are intended to make tape management easier and improve administrator productivity.

- DFSMShsm provides support for a NEWNAME parameter for data set backup. This new function is intended to allow you to create a backup version of the specified data set and make it look like a backup of the data set specified with the NEWNAME keyword. This simplifies the process used to convert backups of an online data set to DFSMShsm backups while preserving the availability of the original data set.

- These DFSMShsm functions intend to make tape management easier and improve administrator productivity:

  – Tape Copy Enhancement When a Tape Copy is generated due to a tape duplex failure, the Tape Copy will use the unit name that was used by the failing function instead of the generic unit name.
  – LIST TTOC SELECT -- A parameter, RESUMEAUDIT, is being added to the SELECT keyword of LIST TTOC command. When RESUMEAUDIT is specified, only those tapes that are eligible for an AUDIT MEDIACONTROLS command to resume are to be listed.
  – ARCBDEXT Enhancement Today, the data set backup installation exit, ARCBDEXT, is invoked during volume backup processing. Support is added to also call the exit during individual data set backup command processing and when migrated data sets are backed up.

- DFSMS™ provides an enhanced DISPLAY SMS command with new options to display point-in-time PDSE cache information in real time (as opposed to SMF Records) and help you determine the overall effectiveness of PDSE caching. DFSMS will also display PDSE caching statistics at the data set level. PDSE members can be cached in Hiperspace™ to provide enhanced performance for those PDSE data sets that are considered important in a critical performance path. The new command and its displays are designed to help you determine whether changes to cache settings might improve system performance.

- HCD usability improvements include support for multiuser update access to IODFs. This multiuser access capability is designed to allow you to specify that work IODFs be shared and provide serialization to allow different parts of them to be updated by different people using concurrent HCD sessions.

- HCM usability improvements include:

  – Support for configuration packages similar to those supported by HCD, to allow a subset of a configuration to be created. For example, this support is designed to allow you to create and send a configuration package for a sysplex or a single site to another location.
  – Support for importing and exporting I/O configuration data, similar to that provided by HCD. This function is designed to allow you to create I/O configuration statements for processor, switch, or operating system configurations of an IODF, and to migrate existing data sets containing I/O configuration statements into an IODF.
  – Enhancements to the Named Views capability of HCM to save lists of selected objects, the current zoom factor, and the scrolling positions. This is designed to allow the same part of a diagram to be displayed when restoring a view as it appeared when saved.

- Other miscellaneous usability improvements in HCD/HCM:

  – The control unit address (CUADD) value is included in the control unit list dialogs of HCD and HCM.
  – When spanning a channel path with connected control units and devices to a new CSS, HCD invokes a dialog asking whether the control units should also be reachable from the new CSS.

- In z/OS V1.10, IBM introduces the Capacity Provisioning Control Center, a tool for managing capacity provisioning for System z10 servers. It is designed to manage provisioning policies and domain configurations. Provisioning policies specify the criteria for capacity increases and decreases, while domain configurations specify systems to be observed and servers to be managed.

  The Capacity Provisioning Control Center (CPCC) is available on z/OS V1.10 and on z/OS V1.9 with PTF UA39307, and requires a System z10 server. Initial support is available for a policy definition application which requires a workstation running Windows XP.

  Specifically, the Capacity Provisioning Control Center provides the following functions:

- Create and edit Capacity Provisioning policies
- Create and edit Capacity Provisioning domain configurations
- Connect to the Provisioning Manager; display the status of the Provisioning Managers
- Install Capacity Provisioning policies and domain configurations into the Provisioning Manager

- In z/OS V1.10, IBM provides these enhancements for CIM:
  - An upgrade to the z/OS CIM component to OpenPegasus 2.7, DMTF CIM Schema 2.13, and CIM Client for Java™ version 2.
  - Support for modifying CIM Server configurations using the MODIFY command, in addition to using shell commands under z/OS UNIX System Services.
  - Support designed to enable the CIM Server to write audit log messages using SMF records.
  - Support for logging on to the CIM Server using PassTickets, in addition to the existing support for logging on using passwords. The CIM Server exploits new support for having custom PassTickets for z/OS UNIX applications generated using the CIM Server's application ID (APPLID) rather than OMVSAPPL. An APPLID can be used within RACF to validate PassTickets and make authorization decisions.

- These ease-of-use functions are available for ISPF:
  - The ability to specify multiple targets for the ISPF EDIT move and copy line commands. This can help you eliminate repetitive use of these commands when copying or moving lines that will have multiple destinations.
  - A new z/OS UNIX interface to ISPF and TSO/E commands to allow them to be issued from the z/OS UNIX shell.
  - A new ISPF service, DIRLIST, to display z/OS UNIX directory. Also, a new ISPF command, UDLIST, allows a directory to be listed.
  - Enhanced Screen Swapping. When using more than two logical screens, navigation among the screens can be supplemented by Point and Shoot fields at bottom of the screen. This new support is intended to make it easier to navigate within an ISPF session and to supplement the existing SWAP LIST and SWAP NEXT support.
  - The ISPF Data Set List panel (Option 3.4) is enhanced to support block commands. This is intended to allow you to act on multiple data sets using fewer line commands; for example, using paired "DD" commands will specify that a block of data sets is to be deleted.

- The VARY command is enhanced to support a new device attribute, UNAVAILABLE, for tape devices. This support, which supplements the OFFLINE status that can already be set for any device, allows you to specify that UNAVAILABLE devices be excluded from Recovery Allocation processing and from message IEF877E, which lists eligible devices that might be used to satisfy an allocation request.

- In z/OS V1.10, SMP/E can help simplify the task of verifying required software fixes identified in Preventive Service Planning (PSP) buckets. PSP buckets identify required software fixes for new hardware devices, toleration and coexistence of new software releases, and enabling new functions. More specifically, IBM will consolidate the lists of required fixes from PSP buckets and produce SMP/E-consumable metadata in the form of HOLDDATA to identify those fixes. This HOLDDATA is planned to be available fourth quarter 2008. SMP/E will use the new HOLDDATA to identify what fixes are missing in a current software environment. In addition, SMP/E can help to simplify the task of selecting and installing the required fixes identified by the HOLDDATA. Existing customers using SMP/E V3.3 or SMP/E V3.4 will need the following SMP/E coexistence PTFs to continue to RECEIVE HOLDDATA, once the new HOLDDATA becomes available.

  If you are using z/OS V1.6 or z/OS V1.7 (SMP/E V3.3 or SMP/E V3.4), you will need to install the following SMP/E coexistence PTFs to continue to RECEIVE HOLDDATA, once the new HOLDDATA becomes available, and you should plan to install them before the end of September 2008:

  - z/OS Release Coexistence PTF
  - z/OS V1.6 (SMP/E V3.3) PTF UO00700
  - z/OS V1.7 (SMP/E V3.4) PTF UO00701
  - z/OS V1.7 JPN (SMP/E V3.4 JPN) PTF UO00702

- Additional ease-of-use functions for SMP/E include:

- Allowing definition side deck files residing as z/OS UNIX files to be easily included during link-edit operations.
- Helping to simplify the review of SMP/E operations by consolidating and reducing the HOLDDATA report output, and by reducing the number of warning conditions that must be investigated.

- A new GRS ENQ Monitor REQTYPE=NCRESERVE filter is added to allow the monitor to report only on unconverted hardware reserves (those which have not been converted to global ENQs). This is intended to make it easier for you to eliminate or reduce hardware reserves by helping identify candidates for reserve conversion.

- Improvements are available for the system logger administrative data utility to help you set up system logger resources and in problem determination involving log stream data sets including providing information about when a log stream was defined, the amount of space used in each offload data set (high-used RBA), and the oldest timestamp in each offload data set. Also, it is possible to continue execution of the utility after specification errors have been encountered, so that subsequent problems may also be seen and corrected, and to allow duplexing-related parameters created by list output to be specified for DASD-only log streams.

- The SMB server is now designed to validate the syntax of the SMB environment variables when it starts. This can help you avoid errors and ensure that SMB uses the configuration options you intend.

- A new environment variable, _IOE_SMB_TRANSPORTS, enables SMB clients to specify which port will handle SMB calls. The server is designed to respond on the enabled ports; the client software can chose to attempt one protocol prior to the other or both in parallel.

- z/OS DFSORT™ V1.10 is available to:

  - Allow you to specify DFSORT installation options in new ICEPRMxx members of the parmlib concatenation. A new START ICEOPT command can be used to specify up to ten ICEPRMxx members to be used. Each member can contain overrides for any of the DFSORT installation options in any of the eight environments (JCL, INV, TSO, TSOINV, TD1, TD2, TD3, and TD4). This new function is intended to simplify the specification of DFSORT installation options.
  - Provide additional diagnostic information intended to help you diagnose out-of-space conditions.
  - Provide specific reason codes and associated documentation for selected DFSORT messages to aid in diagnosing and correcting errors.
  - Remove the DFSORT English and Japanese ISPF Panels, and the ISMF Sort operator. These facilities are no longer available.

Scalability and performance

z/OS and its subsystems provide for scalability not only based on chip speeds, but on a single image, clustering, storage and data handling basis as well. This holistic and balanced approach to scalability means your System z environment is capable of handling the growth of your user base, applications, business processes, and data processing needs.

Scalability improvements for z/OS V1.10 include:

- Up to 64 processors per logical partition, and up to 60 LPARs per server are supported for z/OS V1.10 and System z10. With up to 64 processors per logical partition and as many as 32 z/OS logical partitions able to be configured in a Parallel Sysplex cluster, up to 2,048 engines' worth of processing capacity is available to application workloads. This support is also available on z/OS V1.9. In addition, z/OS V1.10 adds support to allow you to add a new processor to an LPAR running a z/OS image without an IPL.

- Support for up to 4 TB of real memory on a single z/OS image (z/OS V1.8). This will allow for up to 1 TB of real memory on a single z/OS image for the z10 EC server, up to 512 GB of real memory on a single z/OS image on IBM System z9 servers, and up to 256 GB on z990 servers.

- Memory architecture is extended to support large (1 MB) pages. When large pages are used in addition to the existing 4 KB page size, they are expected to reduce memory management overhead for exploiting applications. This capability is also available to unauthorized programs using an interface provided by the PTF for APAR OA25482 when users have access to the IARRSM.LRGPAGES profile in the FACILITY class.

- A new architectural limit of approximately 228 TB per DASD volume, up from the current limit of about 54 GB per volume. Called Extended Address Volume (EAV), this function

initially supports 223 GB per volume on z/OS V1.10 and IBM System Storage DS8000, when available.

System scalability, by itself, is not enough. The system must also perform well. z/OS V1.10 with System z10 supports HiperDispatch, a capability that can provide intelligent dispatching of z/OS workloads, to help improve the performance for higher n-way systems.

Many individual component enhancements intended to provide increased scalability, improved performance, and constraint relief are available for z/OS V1.10, including improvements in DFSMShsm, IOS, Virtual Storage Management (VSM), Allocation, OAM, and XES/XCF.

Details on the scalability improvements intended for z/OS V1.10:

- Up to 64 processors are supported in a single logical partition on z10 EC servers. This support is also available on z/OS V1.9.

  Note: The total number of processors defined in a z/OS logical partition is the sum of general-purpose processors (CPs) plus System z9 Application Assist Processors (zAAPs), and System z9 Integrated Information Processors (zIIPs), or System z10 Application Assist Processors (zAAPs) and IBM System z10 Integrated Information Processors (zIIPs).

- System z10 servers provide support for dynamically adding processors to LPARs without power-on-reset. In z/OS V1.10, support is added to allow you to add a new CPU to a z/OS image without an IPL.
- A new function, HiperDispatch, can help provide increased scalability and performance of higher n-way System z10 servers by improving the way workload is dispatched within the server. HiperDispatch is designed to accomplish this by recognizing the physical processor topology, tracking where units of work have run, and attempting to redispatch them as close to the same physical processors as possible. This intelligent dispatching can help reduce the effects of memory latency to improve performance and reduce CPU time. HiperDispatch is available with new z10 EC and z/OS (z/OS V1.7 with the IBM zIIP Support for z/OS and z/OS.e V1R6/R7 Web deliverable and PTFs, z/OS V1.8 or V1.9 with PTFs, or z/OS V1.10). For more information, see the Preventive Service Planning bucket (PSP) for z10 EC, 2097DEVICE.
- In z/OS V1.10, IBM introduces significant extensions to ECKD™ DASD architecture. Called Extended Address Volumes, with an initial size of 223 GB (223,257,293,280 bytes) in z/OS V1.10, these extensions raise the architectural limit of ECKD using a 28-bit cylinder address to support volumes up to 228 TB in size. Initially implemented for VSAM data sets, the new larger volume sizes are intended both to simplify disk administration by reducing the number of volumes that must be managed, and to decisively relieve disk storage constraints over time. Related functions include IBM System Storage DS8000 Dynamic Volume Expansion Function, which can help improve data availability, and HyperPAV, which you can use to have the system manage the bandwidth needed dynamically in place of doing granular, by-volume PAV alias management.

  Exploiting the capabilities of a new 3390 device model on IBM System Storage DS8000 storage subsystems, EAV is designed to provide:

  – A new architectural limit of approximately 228 TB per DASD volume, up from the current limit of about 54 GB per volume. z/OS V1.10 will support a maximum volume size of 223 GB (262,668 cylinders per volume).
  – Fully compatible access to data residing on cylinders below 65,520. Also, the existing 3390 device geometry (the track length and number of tracks per cylinder) is maintained on EAV.
  – Support for SMS and non-SMS managed VSAM data sets (ESDS, KSDS, RRDS, and LDS) at any location on an extended address volume. Non-VSAM data sets, catalogs, page data sets, and VSAM data sets with the KEYRANGE or IMBED attribute are restricted to the first 65,520 cylinders. With this initial support, space after the first 65,520 cylinders is intended to provide constraint relief for applications using large VSAM data sets, such as those used by DB2, CICS, zFS file systems, SMP/E CSI data sets, and NFS mounted data sets.
  – A new IBM System Storage DS8000 Dynamic Volume Expansion Function designed to eliminate the need to copy volumes to increase their size.

This new function is expected to provide substantial, immediate constraint relief for installations with a large number of large VSAM data sets. This is also expected to help improve storage management administration over time, as a relatively small number of large volumes are thought to be simpler to manage than a larger number of smaller ones. IBM

recommends the IBM HyperPAV licensed function on the IBM System Storage DS8000 series be leveraged to help manage the number of paths to devices defined as EAV.

In the future, IBM plans to expand support for EAV with larger volume sizes and support for additional data set types and access methods. Refer to the z/OS V1.10 Preview Software Announcement 208-042, dated February 26, 2008.

- IOS is redesigned to allow Metro Mirror secondary devices to be defined in Subchannel Set One. This can in turn allow subchannels in Subchannel Set Zero previously used for this purpose to be reused to define additional devices. This supplements the support for defining PAV aliases in Subchannel Set One that was in z/OS V1.7 on z9 EC servers. This is intended to help alleviate the constraint due to the 64K device limit.
- Support is available for common storage above the 2 GB bar. A new virtual storage area, the High Common Storage Area (HCSA), is defined. Storage Management services and RMF support for HCSA are also available. This new support provides the infrastructure required for many users of CSA and ECSA storage to move data above the Bar. This is expected to lead to virtual storage constraint relief (VSCR) over time. In z/OS V1.10 the IOS UCB extension (UCBX) control block is moved to HCSA.
- PAUSE/RELEASE services now support AMODE 64 callers. This new function is designed to reduce application storage requirements below the 2 GB Bar.
- A new CELLSHARE option is added to the CPOOL service. This new option allows multi-header CPOOL free cells on one processor to be shared by neighboring processors, and is intended to help reduce the storage demands for exploiting applications.
- With z/OS V1.10, Language Environment is designed to reduce contention between threads when heap pool cells are allocated by providing the ability to configure multiple cell pools of the same size. Threads will be assigned a pool when they are created from which to allocate cells.
- With z/OS DFSORT V1.10:
  - The channel programs associated with DFSORT's input, output, and work data sets reside above 16 megabytes virtual. This change provides virtual storage constraint relief for DFSORT.
  - Sort applications that use DFSORT's INREC, OUTREC, or SUM function are eligible for memory object sorting, providing a new capability for these applications to sort more than 32 GB of data entirely in memory without need for I/O to DASD sort work files. No change to the sort applications is required. DFSORT is designed to determine when use of memory object sorting is optimal based on available resources.
  - Output data sets are allocated with zero tracks if you specify 0 primary track allocation, perform a sort, do not specify an E35, and no records are written to the output data set. This change can help you avoid the disk fragmentation that can occur from doing unnecessary single track allocations.
  - Existing EXPMAX, EXPOLD, and EXPRES installation options now apply to dataspace sorting as well as to memory object sorting and Hipersorting.
  - The IBM-supplied default for IOMAXBF has been changed from 33554432 (32 MB) to 35651584 (34 MB).
- z/OS Communications Server provides virtual storage constraint relief by changing the inbound data path to no longer use ECSA to hold inbound data for processing, or when queueing the data to the application. The TN3270 Server will also be changed to reduce its ECSA usage for mapping of active sessions.
- z/OS Communications Server code path length has been reduced in TCP/IP. This is expected to be beneficial for request/response transaction workload performance.
- z/OS Communications Server IPSec has been redesigned to call the CP Assist for Cryptographic Functions (CPACF) directly for a subset of the algorithms supported by CPACF. This change is intended to reduce system overhead and improve performance for IPSec.
- Allocation is now designed to create a hash table for use by the GETDSAB service. This is expected to substantially improve the retrieval time for Data Set Access Blocks (DSABs) when a large number of data sets have been allocated by a single address space.
- OAM is enhanced to provide support for objects larger than the current maximum of 256M (268,435,456 bytes). The new maximum object size is 2000M (2,097,152,000 bytes), and it is stored, in parts, sequentially to the DASD level of the OAM storage hierarchy only. This is expected to reduce the need to separate large binary strings into multiple objects and to simplify the application interface as the application does not have to materialize the entire object first before it can be stored.

- In z/OS V1.10, improvements are made to the way CF locking requests are handled. With this support, Coupling Facility locking operations are queued when I/O resources are not immediately available. This is designed to reduce processor utilization for locking-intensive workloads in CF link- and subchannel-constrained environments.
- DFSMShsm control data set (CDS) backup processing is enhanced to reduce the delay for starting CDS backup due to the concurrent processing of other DFSMShsm functions. Reducing the delay for starting CDS backup can improve the availability of other DFSMShsm functions.
- In z/OS V1.10, DFSMS supports a new Virtual Concurrent Copy (VCC) function. VCC is designed to use a FlashCopy® relationship rather than a combination of storage control cache and z/OS dataspaces, and to perform point-in-time backup processing for large amounts of frequently updated data while using less cache and memory resources. This new function is supported during DUMP and COPY operations on DS8000, ESS 800, and other storage controllers that support FlashCopy at a data set level.
- DFSMSdss™ DEFRAG processing has been redesigned to improve performance. This is expected to reduce the time it takes to run this function for fragmented volumes, and is intended to keep DEFRAG times reasonable on larger volumes.
- In z/OS V1.10 DFSMS, the design of OPEN processing for unlabeled (NL) tape positioning performance has been significantly improved. When opening NL tape files using 3590 or later tape drives, OPEN will use a new high-speed positioning algorithm. This is expected to make tape positioning faster, especially when a large number of files are spaced over.
- In z/OS V1.10, the maximum size of individual page data sets is increased to 65,520 cylinders, or about 44.9 GB per page data set. In addition, the maximum total size of all page data sets on a single system is increased to 11 TB. The new maximum page data set size is also available on z/OS V1.8 with PTF UA40555 and on z/OS V1.9 with PTF UA40556. On z/OS V1.8 and z/OS V1.9, these PTFs also increase the maximum total size of all page data sets on a single system to 8 TB. This new support is expected to allow you to better exploit larger volumes while providing a substantial increase in the maximum amount of auxiliary storage available for z/OS systems.

Application integration

Like other operating systems, z/OS provides support for current application enablement technologies, but what sets z/OS apart is the ability to operate both new and existing applications within the same system, and in close proximity to the corporate data residing on z/OS. WebSphere® applications can run on the same z/OS system as the DB2 database, which can enable tight, security-rich local connections ideal for high volume transactional throughput. Current CICS or IMS transactions can be extended with these new technologies intended to deliver value in new and innovative ways, without incurring the substantial cost required to rip and replace current core assets.

The z/OS platform supports many new application development technologies, such as Java, Perl, PHP, XML, Unicode, HTML, SOAP, and other Web services. But z/OS continues to update its traditional application development tools too, with recent enhancements including the System REXX facility, METAL C facility, support for z10 EC hardware decimal floating-point, and an ISO standard-based XL C/C++ compiler. IBM middleware is supporting new applications development technologies as well. For example, the IBM CICS Explorer, the new face of CICS (see Software Announcement 208-248, dated August 05, 2008) is intended to help speed deployment of new CICS-based business applications on z/OS.

z/OS V1.10 has enabled additional XML processing to be made eligible for the zIIP and zAAP specialty processors. IBM middleware and other products can benefit from this new functionality in addition to taking advantage of the z/OS XML System Services capabilities available today. These enhancements are expected to help improve the price performance of XML processing on z/OS and ultimately may help facilitate the decision to develop more XML-based applications on z/OS.

z/OS V1.10 provides application development and application integration improvements and updates for the following: Program Management Binder; dbx debugger; XL C/C++, HLASM, NFS Server and Client.

Details on the application development improvements intended for z/OS V1.10:

- IBM plans to introduce a new user interface, the IBM CICS Explorer, that will increase the productivity of highly skilled CICS technical users, as well as providing an intuitive entry-

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point for broadly skilled staff, by integrating powerful tools into a single Eclipse-based user interface. The CICS Explorer will give architects, developers, system programmers, and administrators a common tooling environment, with integrated access to a wide range of data and control capabilities delivered by CICS Transaction Server for z/OS (CICS TS), CICS tools, and CICS connectors. It is anticipated that this new user-friendly and intuitive interface to CICS will facilitate team building from a far wider skill pool, to help speed the development and deployment of new business applications on z/OS, while contributing to reduced total cost of ownership (TCO) for CICS systems. The CICS Explorer will enable users to create customizable, task-oriented views. These will be extensive by IBM, customers, and independent software vendors (including IBM Business Partners). IBM plans that the CICS Explorer will be available from fourth quarter 2008 for current and future releases of CICS Transaction Server (TS) as a flagship point of integration between the run-time and the CICS tools. For more information see the direction in IBM Software Announcement 208-248, dated August 05, 2008.

- A new service, IARST64, can be used to obtain 64-bit common storage (HCSA) and private storage. It is designed to be an easy replacement for GETMAIN and STORAGE OBTAIN. Exploitation of HCSA in place of CSA and ECSA and of 64-bit private storage are expected to provide virtual storage constraint relief below the 2 GB bar and the 16 MB line as they are exploited. Another new service, IARCP64, is introduced to provide CPOOL storage services for common and private storage above the 2 GB bar. Both services can also be used to avoid some lock serialization overhead.

- z/OS V1.10 has enabled additional XML processing to be made eligible for the zIIP and zAAP specialty processors. Enhancements in z/OS XML System Services and the XML Toolkit for z/OS (5655-J51) increase the amount of XML workload eligible for the zAAP and zIIP specialty engines.

  – In z/OS V1.10, IBM adds these functions in z/OS XML System Services:

    -- Additional zIIP exploitation. z/OS XML System Services included additional zIIP exploitation, specifically enabling all z/OS XML parsing in enclave SRB mode to be eligible for zIIP. For example, with respect to DB2, z/OS XML processing may be partially directed to zIIPs when utilized as part of a distributed request (like DB2 DRDA®) today. This enhancement can help further benefit DB2 pureXML™ workloads by optionally directing all z/OS XML System Services parsing that is executed in enclave SRBs to the zIIP. This function is available on z/OS V1.8 and V1.9 with PTF for APAR OA23828. Delivery of this function satisfies the direction in Hardware Announcement 107-190, dated April 18, 2007, and Software Announcement 207-175, dated August 07, 2007.

    -- Support for validating parsing. Validation support is designed to allow a program to determine whether an XML document meets the requirements expressed in an XML Schema Definition (XSD). z/OS XML System Services adds validating parsing. z/OS XML System Services validating parsing workload is eligible for zIIP and zAAP as well. Delivery of this function satisfies the directions in Hardware Announcement 107-190, dated April 18, 2007, and Software Announcement 207-175, dated August 07, 2007.

    -- Support for 19 additional code pages. This extends XML System Services processing to accommodate the character sets used in many additional languages. This function is also available on z/OS V1.7, V1.8, and V1.9 with PTF for APAR OA22777.

    -- Source offset support. This is designed to make it easier to locate or extract specific data from within an XML document.

  – IBM has enhanced the XML Toolkit for z/OS (5655-J51) so eligible workloads can use z/OS XML System Services. This allows eligible XML Toolkit processing for nonvalidating parse requests to exploit the zAAP. This function was made available on the XML Toolkit for z/OS V1.9 with PTFs UA40707 and UA40708 in May 2008.

    Delivery of this function satisfies the direction in Hardware Announcement 107-190, dated April 18, 2007, and Software Announcement 207-175, dated August 07, 2007.

    XML Toolkit support for processing validating parse requests using z/OS XML System Services with the appropriate workload eligibility for zAAP is planned at a future date.[2]

  – Additionally, Enterprise COBOL V4.1 (5655-S71) provides support for a new XMLPARSE compiler option to allow COBOL's built-in XML parsing support to provide additional functionality and take advantage of zAAP specialty processors by utilizing XML System Services for XML processing. For more information see Software Announcement 207-339, dated December 11, 2007.

- The following enhancements are made to the application development stack in z/OS V1.10, including the Program Management Binder; Loader; dbx debugger; and the XL C/C++ compiler, runtime, and libraries:

  - IEATDUMP allows you to specify a new &DX symbol. When this symbol is present, IEATDUMP bypasses dump capture (limit of 2G) and will create multiple dump data sets to contain the full dump. Supports 64-bit Java environments with large heaps.

  - Two new socket API options are introduced in this release that allow applications to indicate how long receive and send type socket API calls should block waiting for their operations to complete, to prevent indefinite blocking inside TCP/IP for these types of socket API calls. The socket options, SO_RCVTIMEO and SO_SNDTIMEO, are defined in the POSIX standards, and are included in the Single UNIX Specification (SUS) V3.

  - In z/OS V1.10, dbx supports source-level debugging for High Level Assembler. This is expected to help you debug applications that include High-Level Assembler source parts.

  - Several enhancements to the AMBLIST program to allow it to be more easily used and to provide additional information for diagnosing problems with program objects using the LISTLOAD control statement:

    -- The DLL Import/Export information from the B_IMPEXP class (information built by the binder in section IEWBCIE) is formatted with MODLIST output. This new format displays the symbols, their attributes, and the DLLs they belong to, which can help you determine dynamic bind problems that were not recognized when the module was initially built. (The information contained in this section is the same information Language Environment uses to complete dynamic linking at run-time.)

    -- The information contained in the binder built module-level section X'0001', is written with MODLIST output. This provides information about symbols which are referenced but are not used to update text, IDRU records (created by the user via the binder APIs), and the contents of the B_MAP class which contains general information about all the symbols within the module.

    -- The XREF output cross-reference information (both numerical and alphabetical) is completely redesigned. This new design aligns more closely with binder XREF output, and presents the data in a much simplified, more intuitive format.

  - The binder GETD API and fast data GD API are designed to work consistently. This is intended to help simplify conversion of applications to fast data APIs.

  - Binder includes the implementation of a new RLD type, the QY-con to enable the long displacement of RXY instructions to be updated at bind or load time with the offset of the location of a particular external variable.

- A new Java class is provided to allow Java programs to invoke the z/OS Communications Server FTP Client. This API support extends the existing z/OS Communications Server FTP Client API to support the Java programming language, and includes a sample Java program.

- In z/OS V1.10, the functions provided for Language Environment options by the CEEROPT module are extended to batch and AMODE 64 processing, in addition to the CICS and IMS environments.

- Changes have been made to Language Environment designs that are intended to improve performance for:

  - I/O performance for multi-threaded C/C++ programs that use a single thread for I/O operations to any particular file.

  - HEAPPOOLS support for applications using 31-bit memory allocation (__malloc31) services in an AMODE 64 environment. This enhancement is being made available on z/OS V1.7, V1.8 and V1.9 with the PTF for APAR PK41618 or PK47298 (already available), or the PTF for PK49427 (already available).

  - Additional decimal floating point support for the new hardware-based instruction processing on System z10 servers. This support is available on z/OS V1.8 and later releases with the PTF for APAR PK54438 and its prerequisites.

  Also, Language Environment includes new support for application IDs to login, password, and pthread security functions.

- XL C/C++ has made the following enhancements intended to improve performance and usability for z/OS V1.10:

  - Mixed AMODE across function calls is now supported by the METAL compiler option of the XL C compiler. This new capability allows for the creation of METAL C programs that require AMODE switching between functions

- The Standard C++ Library includes enhancements based on the ISO document ISO/IEC TR 19768-Technical Report on C++ Library Extension, for improved portability of source code from other platforms.
- A new dbgld utility is now included with the z/OS XL C/C++ compiler to create a module-based debug side file. Demand load APIs are available in the Run-Time Extension Library to access information from the module-based debug side file. Debuggers making use of demand load APIs can gain faster access to debug information.
- The new Saved Option String feature provides a compact representation of compiler options used for each source file and creates the saved options string in the executable for each compilation unit. The compiler will also record version information for all compiler components that were active during the compilation. This new feature can help you in diagnosing runtime problems.
- SQL co-processor enhancements include support of decimal floating-point (DFP) type host variables. This allows you to write XL C/C++ applications containing DFP data with embedded SQL statements for DB2. Also added this release are function-like macros intended to facilitate easier initialization of SQL structures and improved portability from other platforms and operating systems.
- Source listings generated by the XL C/C++ compiler have been enhanced to add the starting offset of each function to the listings. The starting offset of each function is expected to be helpful for debugging purposes.
- Designs intended to improve performance have been implemented to take advantage of new instructions in the hardware architecture. Additional built-in functions are provided to help programs use selected hardware instructions directly.
- These functions are intended to improve performance:
    -- New Prefetch Built-in Functions
    -- Performance improvements to Standard C++ Library particularly with global placement new operators and the implementation of vector template class
    -- Reduced Debugger bring-up time
- The value of storing data in Unicode comes from the ability to store data in any language using the same data server. It enables database consolidation and better interoperability with other platforms and with Microsoft and Java applications. In z/OS V1.10, Unicode provides:
- Support for Extended Translation Facility 3 (ETF-3), which provides hardware instructions to handle UTF-32 and provides an API to describe every supported CCSID.
- A programming interface designed to provide detailed information on conversion tables including their existence, description of CCSIDs, and conversion techniques supported between two CCSIDs.
- z/OS V1.10 ISPF adds a new TSO/ISPF Client Gateway. The TSO/ISPF Client Gateway is an interface you can use to invoke TSO and ISPF commands and applications. This z/OS UNIX based gateway allows client applications to use Web-based communication services such as HTTP to invoke TSO and ISPF commands. The interface is designed to provide support for multiple TSO and ISPF sessions and allows these sessions to maintain state between command invocations.
- In z/OS V1.10, z/OS UNIX System Services provides new shell commands.
    - The **submit** command is designed to accept input from a data set, file, or stdin, and is expected to make it easier to initiate batch processing from within z/OS UNIX.
    - A new z/OS UNIX command, **amblist**, is designed to provide the ability to invoke the AMBLIST program from the z/OS UNIX shell.
- New support allows a program object stored in the file system to be loaded to a specified location in common storage (this function is often referred to as a "directed load").
- The Network File System (NFS) is a distributed file system designed to provide transparent processing capability for data and information on worldwide and heterogeneous networks. The z/OS Network File System (NFS) provides the implementation that allows the z/OS platform to participate in these networks. In z/OS V1.10, NFS is designed to provide these interoperability, continued NFS V4 support, constraint relief, and serviceability enhancements which build on previous support delivered in z/OS V1.7, V1.8, and V1.9:
    - Expanded platform support for z/OS NFS Clients and Servers to interoperate with Linux® on System z NFS Servers and Clients.
    - Continued NFS Server and Client support for the NFS V4 standard (RFC3530):

- -- NFS Client support for stronger authentication and network transmission protection for NFS data via the use of the RPCSEC_GSS security authentication flavor. NFS Client pthread conversion is included.
  - -- NFS Client and Server support for byte-range file locking using services provided by z/OS UNIX System Services for z/OS UNIX file systems. The NFS V4 locking protocol provides some improvements over NFS V2 and V3 as it incorporates the locking operations into the same protocol as other file access operations (open, close, read, write) and allows for files, file systems, or servers to be defined to use advisory locking rules.
  - -- NFS Client and Server support for remotely managing ACLs via the NFS V4 protocol to display and modify ACL values via the ACL attribute. The NFS Server will map ACL requests between the z/OS UNIX ACL definition and the NFS V4 protocol definition. The NFS Client will use UNIX APIs to manage ACLs on remote NFS servers via the NFS V4 protocol and will map ACL requests between the z/OS UNIX ACL definition and the NFS V4 protocol definition.
  - -- Local NFS V4 name mapping (mapping names to numeric user IDs and vice versa on the base of local z/OS user database) is supported.
- – Improved storage constraint relief, via 64-bit support, for the NFS client enabling utilities (mvslogin, mvslogout, showattr) on other platforms (AIX®, Sun, Linux on POWER5™, Linux on System z).
- – Enhanced NFS Server message support with Japanese National Language Support (NLS).
- – NFS CTRACE Filters are planned to be provided to enhance serviceability.

Security

Security is a word that many professional associate with the mainframe. The combination of time-tested z/OS technologies and z/OS system integrity -- IBM's long term commitment to protecting key z/OS system resources means z/OS is a natural choice if you want a platform that can help keep enterprise-wide data and transactions secure. Longstanding z/OS technologies, such as RACF to manage authorization and access to z/OS resources, Public Key Infrastructure (PKI) to provide low cost Certificate Authority life-cycle management on z/OS, and DB2 use of z/OS multilevel security (MLS), are designed to help you meet the stringent security requirements of multi-agency access to data, and are constantly being updated to address and often exceed clients' needs.

For z/OS V1.10, the following security updates are available: z/OS exploitation for RACF password phrases, additional RACF integration with IBM Tivoli® Directory Server for z/OS (LDAP), improved RACF administration, and new cryptographic support.

z/OS security capabilities do not stop at the server, but extend into the network as well. For z/OS V1.10 the z/OS Communications Server provides improvements to its policy-based networking components, NSS, IPSec, and AT-TLS. Building on its history of Intrusion Detection Services (IDS), the z/OS Communications Server also introduces new defensive filtering capability. Defensive filters are evaluated ahead of configured IP filters, and can be created dynamically, designed for added protection and minimal disruption of services in the event of an attack.

Details on security enhancements in z/OS V1.10:

- In z/OS V1.8, RACF Password Phrase support was introduced, with infrastructure to support password phrases from 14 to 100 characters in length in addition to the long-supported 1-8 character passwords. In z/OS V1.9, the RACF support was extended to include 9-13 character password phrases when an ICHPWX11 user exit is in use (and to provide a REXX-based sample), eliminating the gap between password length and password phrase length. In z/OS V1.10, IBM provides support for password change logging and enveloping functions for password phrases, to provide password expiration warning for password phrases as is done for passwords, and to exploit password phrases when they have been enabled in RACF user profiles. These exploiting functions include:
  - – TSO/E logon
  - – z/OS UNIX System Services
  - – z/OS UNIX Shell and Utilities **su** and **passwd** commands
  - – C run-time functions login(), __passwd(), pthread_security_np() and getpass()

- Network Authentication Service support for Kerberos
- IBM Tivoli Directory Server (LDAP) for z/OS SDBM backend support for RACF password phrase envelope search capability and RACF password phrase change logging. With this enhancement, you can start to implement enterprise-wide password synchronization (using, for example, IBM Tivoli Directory Integrator) where RACF users can now effectively have longer passwords with fewer character restrictions, such as can currently exist on Windows and UNIX systems.
- The OpenSSH function of IBM Ported Tools for z/OS (5655-M23) when used on z/OS V1.10

- Custom fields can now be added for RACF USER and GROUP profiles, with corresponding administration support using RACF commands, ISPF panels and LDAP. This support is designed to allow you to add fields using a new RACF CFIELD class to define the new fields to be added to USER or GROUP profiles and the labels you want to use for them. These fields are added to a new CSDATA segment of USER and GROUP profiles. Once the fields have been defined, the RACF commands used for user and group administration and the corresponding LDAP administration support can be used.
- RACF password administration design allows more selective authority for resetting passwords to be granted. This support is designed to allow you to grant individuals the capability to reset passwords for one or more users or the users that are members of one or more groups without having the system-wide RACF SPECIAL attribute or access to the system-wide IRR.PASSWORD.RESET profile in the FACILITY class. New RACF support adds the required control to enable the target users of password resets to be scoped by the owner of the RACF user or users that are within a selected group tree. This support is expected to provide you better controls for allowing help desk personnel to do password resets without granting them additional authorizations.
- RACF allow messages ICH70001I and ICH70002I to be returned to a RACROUTE REQUEST=VERIFY/X application which specifies MSGRTRN=YES and ACEE=. This relaxes a restriction from earlier releases, and allows exploiting applications to return information about last access and password expiration dates to users.
- RACDCERT and PKI Services are now designed to generate and display the IPv6 type Internet Protocol address (IP address), in addition to the IPv4 format, in the certificate Subject Alternate Name extension.
- The RACF RACDCERT command processor is modified to replace the BSAFE crypto provider that is presently imbedded in the command with the IBM Crypto Library in C (CLiC). The BSAFE crypto provider is not capable of supporting RSA key lengths greater than 1024 bits in length. With CLiC, RACDCERT can generate 4096 bit RSA keys through software, in addition to the hardware capability of generating keys with such length. The software support requires strong encryption (TDES) to be enabled on the machine. The hardware support exploits the 4096-bit RSA key generation function available on System z servers with 4096-bit RSA signature generation and verification support available with feature 0863 installed, and the Crypto Express2 Coprocessor with microcode level MCL006-MCL009 on these servers:
  - z/10 EC
  - z9 EC
  - z9 BC

  Refer to ICSF enhancements for details on the hardware support. All RACDCERT functions can support this key size except PKCS#11 token related functions.

- PKI Services supports additional characters from the UTF8 character set for certificates. This adds to the similar support made available in RACF in z/OS V1.9. Both are intended to improve interoperability with certificates created by other certificate authorities (CAs).
- PKI Services supports three additional Distinguished Name attribute types: Domain Component, Distinguished Name Qualifier, and User ID.

In z/OS V1.10, IBM updates the z/OS Cryptographic Services Integrated Cryptographic Services Facility (ICSF) with the functionality introduced in the Cryptographic Support for z/OS V1.7-V1.9 and z/OS.e V1.7-V1.8 Web deliverable.

The highlights of the ICSF enhancements to z/OS are:

- 4096-bit RSA key support. IBM provides 4096-bit RSA support on System z servers. The servers must have the 4096-bit RSA signature generation and verification support available

with feature 0863 installed, and the Crypto Express2 Coprocessor with microcode level MCL006-MCL009 on these servers:

- z10 EC
- z9 EC
- z9 BC

- Additional SHA hash algorithms available: SHA-224, SHA-384, and SHA-512. SHA-224 is supported on all hardware supported by z/OS V1.10. SHA-384 and SHA-512 are available only with System z10 servers.
- Additional clear AES key algorithms available: AES-192 and AES-256. These algorithms are available only with System z10 servers.
- ISO Format-3 PIN Block support intended to meet the ISO 9564-1 Banking standard. Feature 0863 must be installed, and the Crypto Express2 Coprocessor with microcode level MCL006-MCL009 on these servers:

- z10 EC
- z9 EC
- z9 BC

- Long random number callable service. The service is designed to create random numbers that are up to 8192 bytes in length. This service is available on all hardware versions supported by z/OS V1.10. Optimum performance is expected when feature 0863 is installed and the Crypto Express2 Coprocessor with microcode level MCL006-MCL009 on these servers:

- z10 EC
- z9 EC
- z9 BC

- Audit information required by Payment Card Industry (PCI) Data Security Standard (DSS) is now provided for each event, including: user identification, type of event, date and time, success or failure indication, origination of event, and identity or name of affected system component or resource.

In z/OS V1.10, support for these functional enhancements to System SSL is available:

- Use of hardware support for 4096-bit RSA digital signature generation and verification and 4096-bit RSA encryption and decryption. This function is available on System z servers with 4096-bit RSA signature generation and verification support available with feature 0863 installed and the Crypto Express2 Coprocessor with microcode level MCL006-MCL009.

  Refer to ICSF enhancements for details on the hardware support. This new function is available on z/OS V1.8 with PTF UA40503 and z/OS V1.9 with PTF UA40524.

- List command support in the command line version of gskkyman to help you to determine when certificates in key data base (kdb) files are due to expire and to obtain other information about the set of certificates in a key data base.
- Completion of the SHA-256 support, along with support for SHA-224, SHA-384, and SHA-512. This support is designed to extend the prior Secure Hashing Algorithm certificate support.

  Full gskkyman support exists for certificates utilizing SHA-224, SHA-256, SHA-384, and SHA-512 hashing signatures. These certificates can now be utilized during the SSL handshake by either a server or client.

  This new function is available on z/OS V1.8 with PTF UA40108 and z/OS V1.9 with PTF UA40110.

In z/OS V1.10, IBM provides an additional IBM Tivoli Directory Server for z/OS extended operation remote service to support group access checking in addition to user access checking. This new function is available on z/OS V1.8 and z/OS V1.9 with the PTF for APAR OA23078.

In z/OS V1.10, the IBM Tivoli Directory Server for z/OS provides enhancements for IBM Tivoli Directory Server compatibility and support of new z/OS Security Server RACF function.

- The following enhancements provide additional compatibility with IBM Tivoli Directory Server:

- Plug-in support. Configured plug-ins can be used to extend the capabilities of the IBM Tivoli Directory Server for z/OS. Pre-operation, post-operation, and client operation plug-ins are supported. HCD exploits this plug-in support for reading/updating IODF data.
- Improved handling of SHA and MD5 based user password attributes for better interoperability with IBM Tivoli Directory Server.

- The following enhancements provide support of z/OS Security Server RACF function:

  - The IBM Tivoli Directory Server for z/OS SDBM backend support for the RACF custom user and group fields of the RACF CSDATA segment.
  - z/OS Security Server RACF password phrase:

    -- Support for specifying a RACF password phrase for a simple bind for both native authentication and authentication to an IBM Tivoli Directory Server for z/OS SDBM backend. The SDBM backend supports the RACF password phrase in the RACF Kerberos (KERB) segment.
    -- Enhanced support in the IBM Tivoli Directory Server for z/OS SDBM backend has been provided for RACF password phrase envelope search capability and RACF password phrase change logging.

  - The Tivoli Directory Server for z/OS SASL EXTERNAL bind support has been enhanced to optionally validate that a public key certificate is associated with a RACF user. This means SDBM operations can now be performed after a SASL bind using a public key certificate.

- The IBM Tivoli Directory Server for z/OS is updated to hold search data and recognize search patterns to allow you to monitor search activity in real time.

These network security enhancements are available for z/OS Communications Server:

- WebSphere DataPower® integration: In z/OS V1.10, the Network Security Services (NSS) function is being extended to allow a z/OS NSS Server to provide centralized security services to attached WebSphere DataPower SOA appliance clients. These clients are able to access SAF services at the z/OS system acting as the NSS Server to perform SAF based user ID authentication and access control checks without having to define the user IDs and access control rules in the appliance.

- Defensive Filtering support is designed to provide a mechanism for users to block detected attacks by dynamically installing defensive filters in a TCP/IP stack. Defensive filters are a new kind of deny filter that are always placed in front of IP security filters. The defensive filters can be installed autonomically by an external security information and event manager, or manually by an authorized user.

- IPSec RFC Currency: This line item implements a number of industry standards (RFCs 4301-4305, 4308) that are required by the U.S. Department of Defense (DoD) for IPv6 certification, and by the National Institute of Standards and Technology (NIST) for general US government use. For more information see Statements of direction.

- AT-TLS enablement for Load Balancing Advisor: The z/OS Load Balancing Advisor and Agent are enhanced to allow users to exploit the AT-TLS feature to secure connections that carry SASP flows. This will optionally allow you to control authentication, access control, and encryption for the load balancing protocols, using AT-TLS policies.

- Additional application security controls are provided to let you restrict the use of listening ports and ephemeral ports to only those applications that have the appropriate authority, via SAF resource definitions. Also, new controls restrict the ability of applications to perform rpcbind registration and deregistration.

In z/OS V1.10, IBM provides the ability for unauthorized applications to use Subsystem Interface (SSI) functions for SSI function codes 11, 75, 79, and 80 when used with JES3. These functions are intended to allow programs to be written for user destination validation, sending messages to other users over the network, using the SYSOUT Application Programming Interface (SAPI), and obtaining detailed status information about jobs and SYSOUT in the JES queue. This function in JES3 is in addition to existing similar function in JES2.

Effective November 21, 2008, Cryptographic Support for z/OS V1.8 through z/OS V1.10 and z/OS.e V1.8 Web deliverable (ICSF) will become available. To obtain this Web deliverable, visit

http://www.ibm.com/systems/z/os/zos/downloads/

This Web deliverable supports z/OS V1.8 through z/OS V1.10 and z/OS.e V1.8 and contains:

Support for 13-Digit through 19-Digit PAN data

Credit card companies sometimes perform card security code computations based on Personal Account Number (PAN) data. Currently, ICSF callable services CSNBCSV (VISA CVV Service Verify) and CSNBCSG (VISA CVV Service Generate) are used to verify and to generate a VISA Card Verification Value (CVV) or a MasterCard Card Verification Code (CVC). The ICSF callable services currently support 13, 16, and 19-digit PAN data. To provide additional flexibility, new keywords PAN-14, PAN-15, PAN-17, and PAN-18 are implemented in the rule array for both CSNBCSG and CSNBCSV to indicate that the PAN data is composed of 14, 15, 17, or 18 PAN digits, respectively.

New Crypto Query Service

The ICSF Web deliverable includes a new callable service, ICSF Query Algorithms, which retrieves information about the cryptographic and hash algorithms that are available based on hardware options and software installed on System z.

Enhanced SAF Checking

The ICSF Web deliverable introduces Key Token Policies to augment the existing security controls of symmetric and asymmetric keys stored in the CKDS and PKDS. The Key Token Policy provides a set control points for the management of keys stored in an ICSF key data set. The policy control points are designed to:

Enable Key Token Checking
Enable Default Key Label Checking
Identify and prevent duplicate keys tokens from being stored in the ICSF key data sets.

As part of the Key Token Policy support, ICSF is replacing the PKDS cache with an in-storage copy of the PKDS similar to the in-storage copies of the CKDS and the TKDS. In addition, the in-storage copies are designed to be kept current in a sysplex environment where the PKDS is shared through the use of sysplex messaging.

Availability

There is more to "availability" than just the server being up -- the application and the data must be available with good performance as well. For the System z platform this means hardware, connectivity, operating system, subsystem, database, and application availability too. z/OS, System z servers, and System Storage disk working together can provide outstanding availability:

- System z servers are designed to reduce planned and unplanned outages through the use of self-healing capabilities, redundant componentry, dynamic sparing, and the ability for concurrent upgrades and microcode changes. The z10 EC server provides additional microcode driver enhancements, and dynamic segment sparing for memory as well as a fixed Hardware System Area (HSA).
- With every release, z/OS continues to refine its error checking, fault tolerance, isolation, error recovery, and diagnostic capabilities. z/OS V1.10 availability enhancements include designs for improved console processing, reduced need for JES2 restarts with JES2 Dynamic exit capability, support for automatic stand-alone dump and IPL, and new health check services and checks.

z/OS also advances availability even beyond the z/OS image to include network and storage:

- In this release, z/OS network availability design is improved as well. Enhancements include z/OS ability to restart JES2 NJE connections automatically and the introduction of a new TCP/IP health check.
- IBM TotalStorage Productivity Center for Replication for System z V3.4 and IBM Total Storage Productivity Center for Replication Basic Edition for System z V3.4 enable the new Basic HyperSwap capability. Basic HyperSwap helps provide a low-cost, single-site, high-availability disk solution which allows the administration and configuration of disk-replication services using an intuitive GUI served from z/OS.
- The System Data Mover (SDM) is the z/OS component used for z Global Mirror (zGM) that is enabled to exploit the zIIP speciality engine. The zIIP essentially becomes a z/OS

data mirroring engine that can provide better price performance and improved utilization of resources at the mirrored site.

Beyond single system availability are z/OS Parallel Sysplex clustering and GDPS® disaster recovery. Parallel Sysplex is designed to provide your data sharing applications and data with not only continuous availability for both planned and unplanned outages, but also near-linear scalability and read/write access to shared data across all systems in the Parallel Sysplex for data sharing applications. z/OS V1.10 includes enhancements in support of Parallel Sysplex: Load Balancing Advisor support of subplexes, XCF improvements, RACF improved data integrity, and more. This release of z/OS and all other supported releases support updated GDPS V3.5 as well.

Details on availability improvements for z/OS V1.10:

- Integrated in the base of z/OS V1.10 (and available with z/OS V1.9 with the PTFs for APARs OA20658 and OA22963) is a new Basic HyperSwap capability that can help provide a low-cost, single-site, high-availability disk solution by means of the configuration of disk-replication services using an intuitive GUI. This Basic HyperSwap and GUI capability is enabled by IBM TotalStorage Productivity Center for Replication for System z V3.4 (5698-TPC) or IBM TotalStorage Productivity Center for Replication Basic Edition for System z V3.4 (5698-TRB, a new product under the TotalStorage Productivity Center for Replication for System z family of products). Basic HyperSwap function is designed to enable nondisruptive swapping between primary and secondary disk volumes in the event of planned and unplanned outages such as hardware maintenance, testing, or device failure.

  Basic HyperSwap is intended to help you eliminate disk failures as a source of application outages by allowing you to specify storage volumes to be synchronously mirrored. For example, in the event of a permanent I/O error, I/O requests can be automatically switched to the secondary copy thereby masking the failure from the application and minimizing the need to restart the application (or system) after the failure. You can also initiate a planned failover to a secondary for the purpose of initiating hardware maintenance on primary storage controllers, or simply to periodically test the function. You can switch back to your preferred configuration via the GUI or operator commands.

  IBM TotalStorage Productivity Center for Replication Basic Edition for System z is for enabling Basic HyperSwap on z/OS only. TotalStorage Productivity Center for Replication for System z V3.4 is a full-function disk-replication product designed to provide the functions of the base TPC for Replication Two Site and Three Site products, packaged to run on System z.

  For more information on IBM TotalStorage Productivity Center for Replication Basic Edition for System z V3.4 (this is the product that enables Basic HyperSwap only) or on IBM TotalStorage Productivity Center for Replication for System z V3.4 (the full-function replication product) and their prerequisites, refer to Software Announcement 208-076, dated April 08, 2008.

  GDPS/PPRC HyperSwap Manager (GDPS/PPRC HM) provides a robust continuous availability disk management solution, as well as an entry level disaster recovery solution when used across multiple sites. Basic HyperSwap is not a replacement of GDPS/PPRC HyperSwap Manager. Customers desiring the comprehensive high-availability, multi-site, disaster-recovery capabilities of GDPS are still recommended to investigate one of the GDPS solutions.

- z/OS Global Mirror (formally known as Extended Remote Copy, XRC) is now enabled to exploit the zIIP specialty engine. The zIIP-assisted z/OS Global Mirror function is designed to make most of the z/OS DFSMS System Data Mover (SDM) processing eligible to exploit the zIIP specialty engine. This capability is available with any disk storage subsystem that supports z/OS Global Mirror and is available via PTF (for APAR OA23174) for z/OS V1.8 and V1.9 and is included in z/OS V1.10.

  With zIIP-assisted z/OS Global Mirror, the zIIP essentially becomes a z/OS data mirroring engine that can provide better price performance and improved utilization of resources at the recovery site. Most DFSMS system data mover (SDM) processing is eligible to be redirected to a zIIP processor, which can help lower server utilization at the recovery site, or create server "white space" to be used for other projects.

  z/OS Global Mirror provides an asynchronous, multi-site remote mirror solution across intercontinental distances for z/OS and Linux on System z data, and is one of the technologies

that GDPS is based on. z/OS Global Mirror protects data consistency across all volumes that have been defined for mirroring and the volumes can reside on several different storage units. z/OS Global Mirror is also flexible, accommodating variable data volumes and network bandwidths, thus minimizing the possibility of data de-synchronization. Customers currently using z/OS Global Mirror or some other long-distance remote copy solution should consider zIIP-assisted z/OS Global Mirror.

- The first stage of a comprehensive overhaul for system message processing was made available as a feature for z/OS V1.4, and integrated in z/OS V1.5 and later releases. The overall objective of the Consoles Enhancements improvements is to improve system availability by enhancing the capacity and reliability of message delivery. To accomplish this, major changes to the message production and consumption flow help reduce the possibility of bottlenecks which can cause a backlog of undelivered messages. In z/OS V1.7, the next phase of Consoles Enhancements was made available, including support for deleting unused EMCS consoles, a new AMRF/ORE service routine, disassociating MONITOR messages from particular consoles, and support for enhanced recovery. In z/OS V1.8, the master console and console switch functions were removed, eliminating them as potential points of failure.

  In z/OS V1.10, IBM delivers the final phase of Consoles Enhancements. In this phase, consoles processing has been redesigned to reduce serialization contention by reducing the scope of serialization for many operations from a console class to an individual console. Additionally, support is provided to increase the maximum number of MCS, SMCS, and subsystem consoles in a sysplex from 99 per sysplex to 99 active consoles per system; also, defining up to 250 consoles per system is supported (of which up to 99 may be concurrently active), and wildcard support is added for the DISPLAY CONSOLES command along with improved command response messages.

- In z/OS V1.10, JES2 designs intended to improve availability include:

  - New function supporting JES2 Dynamic Exits is provided with a new $T EXIT command. Additional commands intended to support refreshing JES2 load modules are also available. The new $ADD LOADmod, $DEL LOADmod, and $T LOADmod,REFRESH commands are intended to refresh tables within a specified load module, existing exit points, and the list of routines associated with exit points without an IPL or JES2 restart.

  - New initialization parameters and updated commands allow you to specify that NJE connections that terminate unexpectedly should be restarted after a specified interval. This new support is intended to help you improve availability for these connections by automating their recovery.

- In July 2007, WLM exploitation of XCF signaling was changed in APAR OA20484 for z/OS V1.6-V1.9 in the following ways:

  - For asynchronous messages the sender no longer holds the sender latch.

  - The monitoring task and some other communication functions are able to detect long waits of asynchronous senders and are able to terminate these waits.

  - WLM is now able to actively find out that another system no longer communicates and is able to initiate recovery for it.

  This function is integrated in z/OS V1.10.

- WebSphere for z/OS (5655-N01) 64-bit users have the capability to define very large heaps. Current processing dumps the heap ahead of the system and Language Environment thread stacks needed to debug. Now, 64-bit storage is assigned a dump priority which allows the stacks to be dumped ahead of the heap.

- In z/OS V1.10, RACF design is changed to help you preserve RACF database data integrity. When a new system IPLs, goes into data sharing mode with an RVARY DATASHARE, or activates a database with RVARY ACTIVE, RACF will check for indications of data sharing mode and non-data sharing mode systems using the same database concurrently, and for multiple sysplexes in data sharing mode, using the same database. If a mismatch is detected, an operator message is issued, asking for direction (for IPL, either FAILSOFT, CONTINUE, or NODATASHARE, for RVARY either CANCEL or CONTINUE). This is designed to help improve availability by eliminating potential causes of database corruption.

- The Language Environment IPCS formatter is enhanced to format additional C run-time control blocks.

- Previously, file system lock recording was done at a module level. In z/OS V1.10, IBM provides the ability to perform file system lock recording at a thread level.

- A z/OS UNIX System Services function is designed to allow you to change sysplex root data sets dynamically, without a sysplex-wide IPL. This new MODIFY OMVS,NEWROOT command is expected to eliminate a cause for planned outages and to facilitate migration of sysplex roots from HFS to zFS.
- The System Diagnostic Work Area (SDWA) is moved into 31-bit storage above the 16 MB line for AMODE(64) Functional Recovery Routines (FRRs) in z/OS V1.10. SQA storage shortages can cause FRRs to be skipped when the SDWA is below the line. Moving them above the line is designed to help avoid one cause of abnormal address space termination.
- System Trace buffers have been moved to 64-bit storage, allowing for significantly increased system trace capacity.
- A new function provides a migration path from a GRSRNL=EXCLUDE environment to full RNLs without requiring a sysplex-wide outage for certain environments. It will require that only one STAR mode system remains in the sysplex before the function can be used. GRSRNL=EXCLUDE is a special mode where GRS excludes most SYSTEMS (global) level ENQs to SYSTEM (local) level scope.
- To help verify optimal dump reading configuration, IPCS issues additional messages when a dump is initialized, checking both the control interval size and available space of the dump directory in use.

  Additionally, IPCS reports on the amount of time taken by the stand-alone dump process.

- In z/OS V1.10, the IPCS COPYDUMP command supports the specification of address spaces by name, in addition to specifying them by ASID. This is designed to allow you to specify which address spaces should be copied when making a copy of a dump without having to know the ASID numbers for restartable address spaces in advance, and to provide a more natural way to specify which address spaces should be included in the copy of the dump.
- An EASYCOPY option is added to IPCS COPYDUMP, designed to quickly generate a subset dump useful for screening most system problems.
- New filtering options are available for the IPCS VERBX GRSTRACE command, to help reduce the amount of output that results.
- IPCS dump formatting routines for SAF and RACF have been improved to help speed diagnosis.
- SVC Dump processing has been redesigned to detect and recover from some situations that might cause it to stall, including those involving dump data set allocation, cataloging, and writing to dump data sets.
- Auto-IPL support provides the capability to request that the system automatically IPL stand-alone dump, z/OS, or both when a disabled wait state is requested by a system component. This function is designed to be under the control of new parmlib parameters and a new Wait State Action Table (WSAT); together, they specify the actions, if any, to be taken for various disabled wait states. Also, new options on the VARY XCF operator command allow you to request a SADMP, z/OS IPL, or both after the indicated system has been removed from the sysplex. This new Auto-IPL capability is intended to help you achieve faster failure data capture and recovery after system failures in single-system and monoplex sysplex configurations, and in multi-system capable sysplex configurations where Sysplex Failure Manager (SFM) is not active. The use of Auto-IPL is not supported in multi-system capable sysplex configurations where SFM is active. When Auto-IPL is enabled in multi-system capable sysplex configurations where SFM is active, the automatic IPL actions will not be performed.
- In z/OS V1.10, IOS provides a new IOSSPOF service designed to detect and report single points of failure in the I/O configuration for a single device or common points of failure between a pair of devices. The service is designed to be usable both by functions to perform such checks in real time, and by health checks. A new XCF health check uses this new service.
- GRS display support is available for latch contention, to provide information intended to make it easier to see how long a latch has been held, how long contention has existed for it, and which units of work own or are waiting for a latch. This is expected to make it easier to diagnose latch contention problems on a running system.
- In z/OS V1.9, limited support was added for reusing the ASIDs of address spaces with cross-memory connections when they end, so the ASIDs remain available for the system to assign to new address spaces. ASID reuse is intended to help you prevent planned and unplanned outages by avoiding exhaustion of usable address space slots on the system.

  To enable the use of this new function, specify REUSASID(YES) in an active DIAGxx member of parmlib. This will allow it to be used when certain options are specified on the START command or the ASCRE (address space create) macro for supported address spaces.

Previously, only these z/OS address spaces supported ASID reuse: CATALOG, LLA, and VLF. In z/OS V1.10, the z/OS UNIX RESOLVER address space, the TCP/IP address spaces, the DFSMSrmm address space, and the TN3270 address spaces now support ASID reuse. Before enabling ASID reuse on a production system, IBM recommends you first enable it on a test system. For more information about enabling ASID reuse, see *z/OS MVS™ Extended Addressability Guide* (SA22-7614).

- In z/OS V1.10, RRS is designed to improve availability by allowing an application to request that RRS syncpoint processing be ended without completion. A new FORGET request is supported by the ATRSRV function to allow another resource manager on any system in the sysplex to instruct RRS to discard an SDSRM's interest in a transaction. This is intended to allow the transaction to proceed to completion once other interests have been satisfied, which in turn can help you avoid SDSRM restarts.
- RRS is designed to write to an optional archive log stream when a transaction is completed. To improve RRS performance, some installations disable the archive log. In z/OS V1.10, a new SETRRS ARCHIVELOGGING command is designed to allow you to specify whether the archive log is to be used dynamically, without an RRS restart. This helps you avoid planned outages for subsystems and applications that use RRS services.
- IBM provides increased availability of system logger log streams by allowing updates to duplexing attributes to be put into effect without noticeable disruption to the log stream exploiters.
- In z/OS V1.10, the Load Balancing Advisor and Load Balancing Agent functions enhance support for the subplex functions introduced in z/OS V1.8. You can configure one Load Balancing Advisor per subplex, and each stack in the subplex will have a load balancing agent for that subplex. This allows load balancing for applications in one subplex to be independent of load balancing for applications in other subplexes, within a single sysplex.
- SMF generates EXCP sections in the SMF Type 30 records, which are created at regular intervals as well as at job and step start and end times. The EXCP sections contain the I/O information for a specific DD Name/Device number pair for each address space. When you define many volumes to storage groups, these candidate lists can be very long, and therefore SMF will generate a multitude of dummy EXCP sections. In z/OS V1.10, a new SMFPRMxx parmlib option allows you to specify that the dummy sections be omitted from SMF Type 30 records. This is intended to help reduce SMF data volume and processing time for SMF Type 30 records.
- The system now dynamically detects changes in the tape configuration in support of system-managed tape drives managed by JES3, keeping drive allocation synchronized with configuration changes.

Optimization and management capabilities

With the ability to intelligently manage workloads, reprioritize work, and dynamically reallocate system resources between applications quickly and efficiently, z/OS and System z are designed to handle unexpected workload spikes, and to improve your system's efficiency and availability while meeting your application and business priorities.

z/OS Workload Manager (WLM) is a leader in the industry in delivering the management of mixed diverse workloads according to business goals, including response time goals. The scope of the Workload Manager and its exploiters extends from managing the incoming TCP/IP and SNA traffic to managing requests for I/O. z/OS middleware like DB2, CICS, IMS, WebSphere MQ, and other WebSphere products can take advantage of WLM to manage the priority and execution of transaction requests across z/OS systems. z/OS V1.10 WLM provides the following: enhanced contention management, improved management of zIIP workloads, the ability to manage selected components in service class SYSTEM, and new Performance Block delay states.

Data Facility Storage Management Subsystem (DFSMS) is a software suite that is designed to automatically manage data from creation to expiration. z/OS V1.10 provides many optimization and management capability enhancements for DFSMSrmm and DFSMShsm. These functions provide monitoring and management capabilities that are intended to improve storage administrator productivity and simplify the storage management in a z/OS environment. DFSMSrmm improvements include: interaction with IBM TotalStorage Productivity Center and a better interaction with IBM Integrated Removable Media Manager; enhanced reporting capabilities; and new policies for tape scratch pool, retention, and expiration management.

Details on optimization and management enhancements for z/OS V1.10 include:

- WLM enhancements:
  - Contention Management Phase 3: WLM Contention Management has been redesigned for z/OS V1.10 to help addresses chronic or long-lasting contention situations. Previously, WLM contention management could promote units of work that held resources requested by waiting units of work for short periods. WLM is now designed to promote units of work identified by exploiters for longer periods of time, and promote them to the priority of the highest-priority units of work waiting for a resource they are holding. This new support is expected to help prevent low-priority work from blocking higher-priority work while still managing the overall system in a way that is consistent with the goals you specify in the WLM policy. RMF support for this function is to provide information about the service times for workloads that were promoted, contention, and delay states, in the RMF Postprocessor Workload activity report.
  - CPU Management of zIIPs: Before z/OS V1.10, WLM algorithms for adjusting the dispatching priorities of work in each service class considered CPs and zAAPs. To meet the needs of growing zIIP workloads, this processing is extended to include zIIP processors in z/OS V1.10. This is expected to provide better management for those workloads.
  - Better protection of z/OS against high consumers of fixed and auxiliary storage: To help prevent critical real and auxiliary storage shortages, new WLM function is available in z/OS V1.10. New detection functions have been designed to track sudden growth in fixed and pageable storage and react quickly to help you avoid system outages. This new function is intended to identify fixed and auxiliary storage shortages, identify address spaces with the greatest growth in storage consumption, and issue new messages to identify them. This can help you use automation to terminate address spaces consuming unacceptable amounts of fixed and pageable storage. The system will also be designed to logically swap such address spaces and set nonswappable address spaces nondispatchable to avoid further storage consumption. Also, support for an ENF signal can allow exploiters to react to these situations.
  - Manage selected components in service class SYSTEM: To prevent the inadvertent misclassification of system address spaces, in z/OS V1.10 WLM is designed to manage these address spaces in the SYSTEM service class even if they are differently defined in the WLM policy: XCFAS, GRS, SMSPDSE, SMSPDSE1, CONSOLE, IEFSCHAS, IXGLOGR, SMF, and CATALOG; this is in addition to the *MASTER* and WLM address spaces that were already automatically classified in the SYSTEM service class. This is intended to prevent system problems from occurring during periods of high system utilization.
  - New PB Delays: WLM provides Performance Blocks for use in application state (or phase) reporting. In z/OS V1.10, support for representing 10 additional delay states with Performance Blocks is available, bringing the number that can be used for reporting to 15. Also, WLM is designed to allow applications to specify the delay state names, replacing the default names. These functions are intended to make it easier to determine which application phases are causing the greatest delays.
  - Transaction management for Application Response Management (ARM) instrumented applications: This function extends WLM transaction management to include applications instrumented with ARM C services. The function will allow application programmers to associate ARM transactions (arm_start_transaction() - arm_stop_transaction()) with z/OS enclaves so that those work requests can be individually managed by WLM as single transactions.
- WLM supports extracting the WLM service definition in XML format as well as installing and activating a WLM service definition in XML format via a CIM Server. Also, WLM supports providing information about the status of a z/OS system using a CIM Server.
- In z/OS V1.10, SMS supports new DATACLAS overrides for certain space parameters specified in JCL and in IDCAMS DEFINE commands. These new data class attributes are intended to allow you to specify that the units to be used to allocate primary and secondary space quantities (for example, tracks, cylinders, blocks, or bytes) be set from the attributes you set in the applicable data class. The allocation units and the secondary space quantity will also be made available to ACS routines to allow them to make more intelligent decisions. Another new data class attribute will allow you to specify that the system determine the block size for data sets, thereby overriding any user-provided block size. This new function is expected to help you better manage space in SMS-managed DASD storage while making it unnecessary to change a large number of batch jobs to achieve the same result.
- In z/OS V1.10, the RMF enhancements available are:

- RMF Monitor III provides new reports about spin and suspend locks. The Suspend Lock report is designed to display the address spaces which hold locks and which are suspended. The Spin Lock report displays how often global locks are held and who is spinning. Reporting of lock statistics is intended to help you analyze lock contention in the system.
  - The RMF Distributed Data Server is designed to support IPv6 connections from clients requesting RMF Monitor III performance data.
  - RMF is designed to save the actual device capacity in SMF 74 subtype 1 Device Activity records, including records involving Extended Address Volumes (EAVs).
- DFSMSrmm optimization and management capability items include:
  - Exploitation of the SMI-S Storage Media Library profile by the DFSMSrmm CIM Agent which is designed to enable client systems to more easily connect to the DFSMSrmm CIM Agent and also allows IBM TotalStorage Productivity Center to report on volumes managed by DFSMSrmm.
  - Enhancements to DFSMSrmm CLI better enable IBM's Integrated Removable Media Manager for the Enterprise on System z (IRMM) (5655-S57) to integrate for enterprise-wide tape management. In addition you no longer require WebSphere Application Server to host the DFSMSrmm Web service. These enhancements that are delivered with z/OS V1.10 DFSMSrmm are also available for supported z/OS releases with APAR OA23266.
  - Enhancements to allow the use of DFSMSdss copy services and exploitation of Fast Replication services provided by DASD subsystems. This is designed to enable almost instantaneous copies of the control data set to be created, reducing recovery time objective.
  - Enhancements to allow forward recovery of the DFSMSrmm CDS from the DFSMSrmm audit SMF records when no journal backups are available.
  - Enhanced reporting capability with updates to the DFSMSrmm Report Generator to support keywords for assembler macros from which report types are derived and to add new built-in extract steps. This is in support of new SMF record types from DFSMSrmm and for DFSMShsm and DCOLLECT reporting.
  - New run-time options to select which DFSMSrmm records are extracted for reporting, which should help reduce the resources required for tape reporting.
  - Support for optional policies to enable tape data sets deleted via normal disposition processing to be fast tracked back to the scratch pool.
  - New policies to DFSMSrmm which set expected levels of retention and expiration for tape data sets to help avoid accidental loss of data.
- Global Resource Serialization (GRS) is designed to improve performance in both GRS Latch and ENQ processing. GRS Latch performance is expected to be improved for reduced code path and improved hardware cache alignment. ENQ performance and resource consumption improvements are expected to be available through CMSEQDQ lock contention reduction as well as reduced code path lengths for GQSCAN, ISGQUERY, and ENF 51 (contention monitoring) processing.
- Global Resource Serialization (GRS) allows you to specify 32 bytes of 'userdata' that is associated with an ENQ via the ISGENQ service. This allows ISGENQ exploiters to provide more details about the ENQ and, via new ISGQUERY support, enables them to more easily find ENQs related to those details.
- Configuration packages with HCM are a subset of a centrally maintained master IODF which is extracted from the master IODF and distributed for activation at specified target systems.

  In z/OS V1.10, HCM implements the concept of configuration packages, as it is currently available in HCD. New dialogs are intended to help HCM users to define, edit, transmit, and delete configuration packages, corresponding to the existing HCD functionality.

- HCM has new dialogs you can use for the following tasks:
  - Export/build IOCP input data set
  - Export/build I/O configuration statements
  - Import/migrate IOCP input data or I/O configuration statements into an IODF
  - You can specify where exported data is to be stored, and specify the source of data to be imported, on either the z/OS host or workstation.
- DFSMShsm provides the following enhancements:
  - DFSMShsm: CDS backup improvements: In z/OS V1.10, long-running DFSMShsm functions on systems in a sysplex with XCF capabilities are suspended to allow a CDS

backup to proceed, and restarted afterward. This is expected to reduce the time required to complete a CDS backup.

- DFSMShsm: NEWNAME parameter for data set backup: The DFSMShsm data set backup commands are enhanced to allow you to specify certain attributes to be used when creating a backup version of a data set. The new keywords NEWNAME, DATE, and TIME are added to the command to allow you to specify the data set name, date, and timestamp to be used for the backup data set when it is created. This can allow you to create multiple backup versions of the same data set using different names, dates, and timestamps.

- DFSMSrmm/DFSMShsm: Reporting Improvements: DFSMSrmm and DFSMShsm have enhanced the DFSMSrmm Report Generator to include the ability to generate reports of DFSMShsm processing. See the DFSMSrmm enhancements listed above for more details.

- In z/OS V1.10, DFSMS RLS Multiple Lock Structures allow the use of multiple secondary DFSMS VSAM/RLS coupling facility lock structures. A new storage class attribute called 'Lock Set' is introduced. 'Lock Set' allows you to specify an additional Coupling Facility DFSMS Lock Structure to be associated with a single SMS storage Class. SMS allows up to 256 Lock Sets. Each Lock Set can contain a single lock structure name.

- The RMF Monitor III VSAM RLS Activity Report is enhanced to display the Lock Set and Lock Structure Name.

Networking

The z/OS Communications Server supports highly secure TCP/IP, SNA, and UNIX networking throughout an enterprise. It provides Application Programming Interfaces (APIs) and networking protocol support to enable SNA and TCP/IP applications running on z/OS to communicate with partner applications or users on the same system, on other systems within a single data center, or in distant locations. The z/OS Communications Server not only maintains and improves on existing communication, but also pushes z/OS into the forefront of networking technologies, by introducing such concepts as Application-transparent TLS, policy-based networking, and centralized configuration of TCP/IP nodes.

z/OS Communications Server designs for z/OS V1.10 include:

- Network TCP/IP stack performance improvements in multiple areas, including designs intended to reduce CPU consumption, cache line contention, and common storage utilization

- New support to help you coordinate LU name assignments among TN3270 servers in sysplex

- Enhancements to SNA networking functions

- Several enhancements to the z/OS FTP Server and Client

- New functions for network management and improvements to the network management APIs

- zIIP-Assisted HiperSockets for Large Messaging targeting Web services and bulk data workloads

Note: For more z/OS Communications Server enhancements, see the Security and Availability sections.

Details on networking enhancements in z/OS V1.10:

- Improved Network Stack Performance: z/OS Communications Server has focused on TCP/IP stack performance improvements in multiple areas, with designs intended to reduce CPU consumption and memory access latency, and improve throughput for all TCP/IP workloads.

- Virtual Storage Constraint Relief: To provide virtual storage constraint relief, z/OS Communications Server has changed the inbound data path to no longer use ECSA to hold inbound data for processing or when queueing the data to the application. The TN3270 Server has also been changed to reduce its ECSA usage for mapping of active sessions.

- Multiple VLAN Support: z/OS Communications Server allows you to configure multiple Virtual Local Area Networks (VLANs) from the same TCP/IP stack for a single OSA-Express QDIO port. Each TCP/IP stack supports a maximum of 8 VLANs per OSA per IP version. This eases OSA port consolidation; for example, multiple 1G ports can be consolidated onto a single 10G port, without having to redesign the VLAN definitions in the IP network.

- In z/OS V1.9 HiperSockets was enhanced with a new function, the HiperSockets Multiple Write Facility, with the PTFs for APARs OA24882 and PK64880. This new Multiple Write Facility is designed to allow messages which span multiple output buffers to be transferred with a single write operation from the source LPAR. This enhancement can help improve the performance of HiperSockets by reducing the number of I/O interrupts and supporting

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more data per I/O interrupt. Because the overhead of large message sends can be reduced, Multiple Write Facility can also help lower the utilization of processors associated with the processing of transferring large messages from the source to the target LPAR. HiperSockets Multiple Write Facility is available with System z10 only.

In z/OS V1.10 HiperSockets has been enhanced for zIIP exploitation. Specifically, the z/OS Communications Server allows the HiperSockets Multiple Write Facility processing for outbound large messages originating from z/OS to be performed on a zIIP. The combination of HiperSockets Multiple Write Facility and zIIP enablement is described as "zIIP-Assisted HiperSockets for large messages." zIIP-Assisted HiperSockets can help make highly secure, available, virtual HiperSockets networking a more attractive option. z/OS application workloads based on XML, HTTP, SOAP, Java, and so on, as well as traditional file transfer, can benefit from zIIP enablement by helping to lower general-purpose processor utilization for such TCP/IP traffic.

Only outbound z/OS TCP large messages which originate within a z/OS host are eligible for HiperSockets zIIP-Assisted processing. Other types of network traffic such as IP forwarding, Sysplex Distributor, inbound processing, small messages, or other non-TCP network protocols (for example, UDP) are not eligible for zIIP-Assisted HiperSockets. When the workload is eligible, then the TCP/IP HiperSockets device driver layer (write) processing is redirected to a zIIP, which will unblock the sending application. zIIP-Assisted Hipersockets for large messages is available with z/OS V1.10 (with PTF UK37306) and System z10 only.

- TN3270E Telnet Server is available to provide shared LU name management among a group of servers running on the same system or within the same Telnet sysplex or subplex. Prior to this enhancement, LU names had to be manually partitioned among the TN3270E Telnet Servers to prevent concurrent assignment of the same LU name to clients connected to different servers. With this enhancement, one TN3270E Telnet Server in the group acts as an LU Name Server and allocates shared LU names to other TN3270E Telnet Servers within the group. This can allow load balancing across multiple TN3270E Telnet Servers with consistent configurations. High availability capability of the LU Name Server service is provided with automated takeover and recovery.
- Path MTU discovery for Enterprise Extender (EE) allows VTAM® to dynamically learn of any Maximum Transmission Unit (MTU) size changes that occur in the underlying IP network associated with IPv4 and IPv6 EE connections. With this knowledge, VTAM can segment the data to the appropriate size and avoid IP packet fragmentation.
- APPN Extended Border Node (EBN) support is enhanced to let you restrict the searching capability of adjacent non-native nodes without having to code a directory services management exit. The AUTHNETS value on the ADJCP statement specifies the list of authorized NETIDs for the adjacent control point. Searches received from that control point are rejected if the destination LU's NETID is not in the authorized NETID list.
- VTAM terminates the control point-to-control point (CP-CP) session to an adjacent CP if the number of queued requests plus the number of queued replies to the adjacent CP reaches the threshold based on MAXLOCAT and a minimum time interval based on IOPURGE has been exceeded.
- A new CSDUMP start option allows a specified VTAM message or sense code to trigger a dump of the current address space, the VTAM Internal Trace dataspace, and optionally a TCP/IP address space. This start option is intended to improve serviceability by performing the same function as the existing MODIFY CSDUMP command, but allowing the triggers to be effective at VTAM initialization without manual entry of a command.
- z/OS Communications Server introduces a new High Performance Routing start option (HPRSESLM) that allows you to specify a limit for the number of sessions that are placed on each Rapid Transport Protocol (RTP) pipe. Once an RTP pipe reaches the specified session limit, another RTP pipe is chosen or created for new sessions. Limiting the number of sessions on a single RTP pipe can result in improved performance on multiprocessor systems by allowing concurrent traffic on multiple RTP pipes.
- A new modifiable VTAM start option (HPRSTALL) allows you to specify the amount of time an RTP pipe may remain continuously stalled. If that limit is exceeded, VTAM will automatically terminate the RTP pipe and convey notification of the timeout by a new unsolicited VTAM message.
- A number of functional enhancements to z/OS FTP support are available for z/OS V1.10:

  - The FTP Daemon, Server and Client will all provide APPLDATA for the TCP connections they use. This can allow you to easily distinguish the TCP connections used by FTP from those used by other applications. APPLDATA is displayed in NETSTAT output, available in SMF records, and passed across the Network Management Interface (NMI).

- The FTP Server support of Implicit Secure FTP is enhanced to allow the system administrator to decide which protocol to use to establish the implicit secure connection: the z/OS default protocol, or the de facto industry standard protocol. Using the de facto industry standard protocol for Implicit Secure FTP connection activation can result in compatibility with a greater variety of FTP clients.
  - FTP Server is enhanced to give the administrator greater control over which users can log in to the FTP Server. A new keyword can be specified to allow the FTP server to verify if the user has READ authority to the SERVAUTH profile EZB.FTP.systemname.ftpdaemonname.PORTxxxx. If the new keyword is specified, and the user is not authorized, then the user's login fails.
  - The design for FTP Server and Client handling of data set contention is improved to issue messages that help you identify the contention and automatically retry the transfer to allow you to resolve the contention before failing the FTP attempt.
  - The FTP Server is enhanced to restrict the amount of time it spends retrying activation of the data connection to the FTP client. In addition, keepalives are supported on the data connection to allow it to remain active even during times of inactivity that can occur when using FTP for long-running DB2 queries or jobs.
- z/OS Communications Server generates SMF records for IPSec events such as secure tunnel activation, deactivation, and refresh for IKE tunnels, dynamic tunnels, and manual tunnels. These SMF events are reported over the real-time SMF interface of the Network Management Interface (NMI), as well as over the MVS SMF Exit interface. These unsolicited notifications of key security events can be used in conjunction with the polling NMI for security.
- z/OS Communications Server is designed to be compliant with RFC 4293, RFC 4292, RFC 4022, and RFC 4133 for the SNMP version-neutral MIBs. These are the MIBs that represent IPv4 and IPv6 objects. Additionally, Communications Server enhances the SNMP generic LinkUp and LinkDown traps as described by RFC 2863 to include the ifName of the interface in the trap.
- In z/OS V1.10, the configuration of Traffic Regulation (TR) policy as part of the Quality of Service discipline will no longer be supported. All TR functionality will need to be configured under Intrusion Detection Services (IDS) policy, which was first made available in z/OS V1.8. This change applies only to the TR policy configuration. The TR functions themselves remain unaffected.

Product positioning

The many enhancements in z/OS V1.10 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 many 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.

The culmination of over four decades of cooperation, coordination, and integration between z/OS and System z servers, 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

z/OS V1.10 is planned to be the last release that includes IPCS Problem Management Subcommands. If you currently use the IPCS problem management subcommands to report and track problems, consider using IBM Tivoli Information Management for z/OS V7 (5698-A08) or a similar product. IBM plans to continue to enhance the dump and trace analysis and display facilities of IPCS.

IBM plans to discontinue delivery of software on 3480, 3480 Compressed (3480C), and 3490E tape media. IBM recommends using Internet delivery when ordering your z/OS products or service, which eliminates tape handling. If you must use physical delivery, you may continue to choose 3590 or 3592 tape media. Internet delivery is IBM's flagship delivery method; therefore, future software delivery enhancements will be focused on Internet delivery.

In a future release of z/OS, IBM plans to make RFC4301 compliance mandatory. RFC4301 "Security Architecture for the Internet Protocol" specifies the base architecture for IPSec-compliant systems, including restrictions on the routing of fragmented packets. In z/OS V1R10 RFC4301 compliance enforcement is an optional setting in z/OS IPSec policy. Changing an IPSec policy from being noncompliant to compliant may require minor changes to IP filters for IP traffic that is routed through z/OS. The IBM Configuration Assistant for z/OS Communications Server includes functions to assist with identifying and making such changes.

IBM plans to pursue an evaluation to the Federal Information Processing Standard (FIPS) 140-2 using National Institute of Standards and Technology's (NIST) Cryptographic Module Validation Program (CMVP) for the System SSL component of the Cryptographic Services element of z/OS. The scope of this evaluation will include algorithms provided by the CP Assist for Cryptographic Functions (CPACF) that are utilized by System SSL. This is intended to help satisfy the need for FIPS 140-2 validated cryptographic functions when using z/OS Communications Server capabilities such as AT-TLS and protocols such as TN3270 and FTP when secured using AT-TLS.

z/OS V1.10 is planned to be the last release to allow attaching zSeries® File System (zFS) multi-file system aggregates that are to be shared across systems in a sysplex. IBM has previously recommended that these multi-file system aggregates not be shared in a sysplex environment. Once this support has been removed, attempts to attach zFS multi-file system aggregates will fail in a z/OS UNIX System Services shared file system environment.

In a future release, IBM plans to withdraw support for zFS multi-file system aggregates. When this support is withdrawn, only zFS compatibility mode aggregates will be supported. (A zFS compatibility mode aggregate has a single file system per data set.)

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

Hardware and software support services

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 208-248, dated August 05, 2008 (CICS)

Software Announcement 208-042, dated February 26, 2008 (IBM z/OS V1.10)

Software Announcement 207-175, dated August 07, 2007 (IBM z/OS V1.9 delivers a highly secure infrastructure you need for your demanding data serving requirements)

Software Announcement 207-018, dated February 06, 2007 (IBM z/OS V1.9 advanced infrastructure solutions for your business needs)

Software Announcement 206-190, dated August 08, 2006 (IBM z/OS V1.8 -- Extending the enterprise-wide role)

Software Announcement 206-191, dated August 08, 2006 (IBM z/OS.e V1.8 -- Affordability for mainframe enterprise and Web-based applications)

Program number

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Program                          Program
number                           name

5694-A01                         z/OS Version 1 Release 10
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Services

IBM provides many services that can help analyze, maintain, deploy, and/or optimize your z/OS environment. Here are some new services from IBM:

IBM Scalable Architecture for Financial Reporting

Today, IBM announces a new Business Intelligence and Data Warehousing reporting solution for z/OS which can be enabled for the zIIP specialty processor. The IBM Scalable Architecture for Financial Reporting (SAFR) is a solution from IBM Global Business Services (GBS) that is designed to deal with the problem of efficiently reporting on large volumes of transactional data. It is based on a set of software components and embedded patented technology which may be customized for use with new or existing data extraction and reporting applications. SAFR's ability to report directly from operational data means that it can rapidly produce accurate, consistent, and transparent outputs. It is highly scalable, and can be easily updated to accommodate changing business needs. The SAFR solution may also be a low-cost solution, when evaluated on a cost-per-report basis. The reporting from SAFR can help support key corporate flagship decision-making, such as: high-performance analysis of account activity, determining product pricing, detecting fraud, analyzing sales revenue, as well as enhancing existing enterprise applications. It is often used when high-volume table scan and join processes create workloads that are difficult to handle through SQL or other standard techniques or tools. SAFR employs a number of techniques to reduce run-time and resource utilization, including the generation of machine code highly optimized for System z, and exploits the zIIP specialty processor.

IBM GBS can architect SAFR to exploit the zIIP specialty processor. Specifically, the processing of data extract phase of the SAFR Performance Engine (that which pulls data from multiple data sources, joins with data looked up from internal tables, performs transformations, and outputs the data to extract files) may be eligible for the zIIP. Other restrictions to zIIP-enablement may apply.

The Scalable Architecture for Financial Reporting requires: z/OS V1.8 or later (with zIIP-enabling PTF), DB2 Universal Database™ for z/OS or for Linux, UNIX, and Windows Version 8 or later (used as data source and metadata repository), DFSORT or equivalent, System z9 or z10 with or without zIIP(s), and IBM Global Business Services. For more information on the IBM Scalable Architecture for Financial Reporting from IBM Global Business Services, see

http://www.ibm.com/systems/zbi

IBM Extended Address Volume (EAV)

IBM offers an optional Extended Address Volume (EAV)-enablement service to help you adapt your storage environment to more quickly and efficiently take advantage of EAV capability. IBM storage specialists, certified in data migration best practices and IBM's nondisruptive data migration software, Softek zDMF and Softek TDMF™ z/OS, will work with you, to plan and execute the storage rearrangement and consolidation necessary to achieve optimal EAV benefits. These specialists will help with the assessment, planning, moving, validating, and

management of the data that will be moved onto the larger extended address volumes. For more information on this EAV-enablement data migration service, contact your local IBM GTS representative or Niraj Desai at desain@us.ibm.com.

IBM Rapid Deployment

Increasing business demands have companies rethinking their approach to quickly delivering a responsive and secure environment. To facilitate this with the installation and implementation of z/OS and DB2, IBM Systems and Technology Group (STG) Lab Services introduces the IBM Rapid Deployment of z/OS and DB2 services offering.

This new service is intended for customers new to z/OS who want a predefined, preintegrated, preconfigured, and pretested z/OS and DB2 environment and who want this environment deployed quickly. IBM STG Lab Services can have a new mainframe system operational and optimized for use as a data server within days. The data serving environment is defined using IBM best practices and is configured for high availability and high scalability.

The IBM Rapid Deployment service delivers an environment designed to support business workloads ranging from transactional to SAP and data warehousing. The result is a simplified, complete system for deploying your applications that incorporates enhanced features such as data sharing on IBM hardware in a pretested configuration.

IBM Implementation Services for Parallel Sysplex Middleware - DB2 data sharing, CICS enablement and WebSphere Application enablement

To assist with the assessment, design, planning, implementation, testing, and backup and recovery of System z Sysplex Middleware, IBM Global Technology Services announced and made available the IBM Implementation Services for Parallel Sysplex Middleware Service offering which is designed for clients who want to:

1. Enhance the availability of their data
2. Enable applications to take full utilization of all servers' resources
3. Share application system resources in order to meet business goals
4. Manage multiple systems as a single system from a single point of control
5. Respond to unpredicted growth by quickly adding computing power to match business requirements without disrupting their business
6. Build on the current investments in hardware, software, applications, and skills while potentially reducing computing costs

The IBM Implementation Services for Parallel Sysplex Middleware - DB2 data sharing offering consists of six selectable modules; each is a stand-alone module that can be individually acquired. The first module is an infrastructure assessment module, followed by five modules which address the following DB2 data sharing disciplines:

1. DB2 data sharing Planning
2. DB2 data sharing Implementation
3. Adding Additional data sharing Members
4. DB2 data sharing Testing
5. DB2 data sharing Backup and Recovery

The IBM Implementation Services for Parallel Sysplex Middleware - CICS enablement offering consists of five selectable modules. The first module is a CICS application review module, followed by four modules which address the following CICS disciplines:

1. z/OS CICS infrastructure Review
2. CICS Implementation
3. CICS application migration
4. CICS health check

The IBM Implementation Services for Parallel Sysplex Middleware - WebSphere Application Server enablement offering consists of three selectable modules. The first module is a

WebSphere Application Server network deployment Planning and Design module, followed by two modules which address the following WebSphere Application Server disciplines:

1. WebSphere Application Server network deployment Implementation
2. WebSphere Application Server health check

For more information on this offering, you may visit the Web site below or contact your IBM representative.

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

IBM Data Mobility Services

In order to be flexible and adaptive to changing business needs, you need the freedom to move data easily -- regardless of how and why it is moved. Whether you need to move data for storage or server consolidation, infrastructure optimization, technology refresh, or data center relocation, you need the flexibility to perform all of these activities with minimal disruption to your 24/7 applications and business operations.

IBM provides a wide range of data mobility solutions. Storage infrastructure discovery, assessment, design, planning, implementation, and validation services are available for all of your data migration projects from simple to complex utilizing the Softek suite of data mobility products.

- Softek z/OS Dataset Mobility Facility (zDMF) is host-based software that enables you to migrate data sets with minimal disruption and supports all major hardware vendors and different disk capacities, including support for Extended Address Volumes (EAV). Softek zDMF can move data sets online to immediately address performance issues. Softek zDMF can help improve storage efficiencies and lower the total cost of ownership by reducing lease overlap and speeding adoption and redeployment of storage. Softek zDMF also reduces the risk of migrating data sets through its automated migration process.
- Softek Transparent Data Migration Facility (TDMF) z/OS is host-based software that enables continuous application availability during data migrations through its Dynamic Swap capability. Softek TDMF z/OS is an industry-leading software solution that works with storage hardware in heterogeneous storage environments. Softek TDMF z/OS helps reduce risk by ensuring data integrity through fallback capability and a standard migration methodology.
- Softek Data Mobility Console for z/OS (DMCzOS) offers assessment, planning, activation, and validation capabilities needed to help automate and streamline data migration. Designed to support the IBM z/OS environment, DMCzOS provides centralized management across complex storage environments such as large IBM Parallel Sysplex or IBM GDPS.
  - Assess the migration environment by showing data inventory, location, and classification to support efficient migration decisions
  - Plan data migrations by allowing you to create a custom migration process from the centralized console
  - Move data quickly and accurately via automatic interface to Softek TDMF z/OS
  - Validate data integrity by enabling command automation with Softek TDMF z/OS
  - Manage data migrations via a centralized console with reporting capability for greater visibility and control across multiple systems

The Softek Data Mobility suite can help you reduce costs, lower risk, and increase control in z/OS environments by moving data nondisruptively on-line at either the volume or data set level.

For more information on these services, contact your IBM representative.

GDPS V3.5 enhancements

The automation in GDPS can give your disaster recovery (DR) solution the added peace of mind of always being ready. Many companies practice disaster recovery testing, but a real disaster is not a test. Procedures may not be current or key people may be unavailable. Recovery from an actual disaster may take significantly longer than planned, which may affect bottom-line revenue for the business. GDPS helps remove these concerns by managing and monitoring remote copy disk when properly configured, combined with features designed to automate the recovery

actions. In addition, GDPS provides automation capabilities for planned data center activities. This helps to remove people as a single point of failure.

As of March 31, 2008, GDPS V3.5 is designed to enhance heterogeneous data management, expand GDPS/XRC availability and scalability, and help improve usability. This can be achieved through new functions such as:

- GDPS integration with Veritas Cluster Server (VCS) and Geographically Dispersed Open Clusters (GDOC). This is designed to provide coordinated disaster recovery across System z and non-System z servers if Veritas Cluster Server is already installed. Initial support is for GDPS/PPRC and GDPS/XRC.
- GDPS integration with IBM Tivoli System Automation Application Manager (AppMan). This is designed to provide coordinated disaster recover across System z and non-System z servers if AppMan is installed. Initial support is for GDPS/PPRC.
- Enhanced GDPS/GM and GDPS/PPRC HM system management with a graphical user interface. The graphical user interface has been available since March 2007 for GDPS/PPRC with GDPS V3.4.
- Greater disk efficiency with support for Space Efficient FlashCopy.
- Improved scalability with z/OS Global Mirror Multiple Reader.
- Increased availability with GDPS/MzGM Incremental Resync available in 2008.

More detailed information on the GDPS service offerings is available at

http://www.ibm.com/systems/z/gdps

IBM Software Services for WebSphere

IBM Software Services for WebSphere (ISSW) has the breadth, depth, and reach to manage your services needs. You can leverage the deep technical skills of our lab-based Software Services team and the business consulting, project management, and infrastructure expertise of our IBM Global Services team. Also, we extend our IBM Software Services reach through IBM Business Partners to provide an extensive portfolio of capabilities. Together, we provide the global reach, intellectual capital, industry insight, and technology leadership to support a wide range of critical business needs.

ISSW is adept at building effective teams consisting of your staff and IBM Global Business Services personnel, or with a global systems integrator of your choice to support the successful deployment of WebSphere Transformation Extender. ISSW brings product, technology, and best-practices expertise that can make any implementation team more effective. As specialists in WebSphere products, IBM has the collective experience of hundreds of live customer implementations and hundreds of consultants globally to help ensure success.

ISSW professionals complement the project delivery team by providing deep insight into product technology and architecture as well as linkages back to the software development organization. ISSW services offerings are tailored to your individual needs, with services that range from a full outsourced deployment to focused specialist services packages that enable a project team or client to address specific challenges.

ISSW can also assist you with upgrading from earlier versions of WebSphere products. Any migration of applications involves proper planning, estimation, and timed execution. ISSW can assist by precisely assessing and evaluating your existing infrastructure and support system. ISSW has extensive, proven experience in successful product migrations.

Our ISSW consultants:

- Are missioned to help make WebSphere products successful.
- Minimize your migration risks. We've harnessed years of field experiences into a migration services program to help you successfully migrate your applications.
- Provide extensive technical skills on WebSphere and WebSphere process integration products.
- Bring tried-and-true best practices expertise to every engagement.

Packaged and custom service offerings are available, including specific predefined services offerings to get you off to a running start with WebSphere process integration products.

ISSW offers technical, product-specific services for WebSphere software products in each of these four categories:

- Assess
  - Technical architecture sizing and planning
  - Enterprise process integration strategy
  - Mentoring and team augmentation
- Design
  - Design Workshop
  - Design Review
  - Mentoring and team augmentation
- Develop and deploy
  - External code reviews
  - Go-Live Support
  - Off-site development
  - Mentoring and team augmentation
  - Performance tuning
  - Quality Assurance Reviews
- Maintain
  - Maintenance, enhancement, and operation support of the production environment Go-Live Support
  - Migration service
  - Full operational review

Visit the Web sites below to learn more about IBM Software Services for WebSphere capabilities, and how to contact your ISSW sales specialist for specific information about services offerings for WebSphere integration products.

For more information, visit

   http://www.ibm.com/developerworks/websphere/services/services.html#wbi

Your ISSW sales specialist may be found at

   http://www.ibm.com/WebSphere/developer/services/contacts.html

To learn more about IBM Software Services or to contact a Software Services sales specialist, visit

   http://www.ibm.com/software/sw-services/

Installation and customization

Effective with z/OS V1.10, the entitled Customized Offerings will provide the following enhancements:

- The integration of service into ServerPac orders is changed to APPLY & ACCEPT service up to the latest RSU level. All applicable HIPER and PRP service available at time of manufacturing the ServerPac order will only be APPLYed, allowing for backout capability. Unintegrated service will continue to be delivered in RECEIVEd status.
- The Customized Offerings Driver (COD) is a prebuilt stand-alone driving system that can be used to drive the installation of z/OS using CBPDO or ServerPac if you do not have a driving system or your driving system does not meet the minimum driving system requirements. Effective fourth quarter 2008, the Customized Offerings Driver V2.4.1 (5655-M12) will be service updated. The Customized Offerings Driver contains a subset of z/OS V1.8 and

supports the System z10 EC and the minimum driving system requirements for installing z/OS V1.10.

Fee-based software services offerings

IODF by host FTP now available

To send your I/O Definition File (IODF) for your SystemPac® order, you had to use your workstation Internet connection. Now, you can submit an IODF directly from your z/OS host using the CustomPac FTP utility. Sending an IODF using the host FTP option not only provides you with an alternate path to send your IODF files to IBM in case you can't connect to the IBM FTP server with your workstation, but does not require Java applets with your browsers.

For more information on CustomPac go to

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

Important Web sites

- z/OS Web site

    http://www.ibm.com/systems/z/os/zos/
- General Q & A

    http://www.ibm.com/systems/z/faq/
- Previously announced directions

    http://www.ibm.com/systems/z/os/zos/zos_sods.html
- z/OS Internet Library

    http://www.ibm.com/systems/z/os/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/systems/z/os/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/

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)
- Advanced Parallel Sysplex Operations and Recovery (ES902)
- DB2 for z/OS and Data Sharing Implementation (CF311)

- DB2 for z/OS Data Sharing Recovery/Restart (CF320)
- GDPS/XRC Concepts and Implementation (GDPS2)
- IMS Parallel Sysplex Workshop (CM621)
- IMS Shared Queues (CM611)
- Parallel Sysplex Implementation Workshop (ES420)
- Parallel Sysplex Operations and Recovery (MV900)
- zSeries Parallel Sysplex Operations (H4041)

In the U.S. and Canada, call 1-800-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 V1.10 runs on the following IBM servers:

- z10 EC
- 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/

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 the 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 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 V1.10.

Coexistence-supported releases

```
Release           Coexistence-supported with release in Column 1

z/OS V1.8 (4) or  z/OS V1.5 (1), z/OS V1.6 (2), z/OS V1.7 (3),
                  z/OS V1.8,
z/OS.e V1.8 (5)   z/OS.e V1.5, z/OS.e V1.6, z/OS.e V1.7, z/OS.e V1.8

z/OS V1.9 (6)     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        z/OS V1.8, z/OS V1.9, z/OS V1.10,
                  z/OS.e V1.8

z/OS V1.11 (7)    z/OS V1.9, z/OS V1.10, z/OS V1.11
z/OS V1.12 (7)    z/OS V1.10, z/OS V1.11, z/OS V1.12
```

Notes:

1. 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 was September 2007.

3. z/OS V1.7 and z/OS.e V1.7 end of service will be September 2008.

4. z/OS V1.8 and z/OS.e V1.8 end of service will be September 2009.

5. 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.

6. z/OS V1.9 end of service is planned to be September 2010.

7. Operating system levels beyond z/OS V1.10 represent current intentions of IBM.

To address our customer requirements for defect support, IBM plans to announce a special extended lifecycle accommodation exclusively for z/OS V1.7. This accommodation is planned to provide a fee-based, corrective service (a fix, bypass, or restriction to a problem) beyond the withdrawal of service date of September 30, 2008, for z/OS V1.7 (5694-A01). This extended support is planned to be available for a period up to 2 years beyond the September 30, 2008, z/OS V1.7 discontinuance of service and is intended to provide users with more time to complete their migration to z/OS V1.8 or z/OS V1.9, while continuing to receive corrective service for z/OS V1.7. This support is not intended to change coexistence, migration, and fallback policies for z/OS.

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 V1.10 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/

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 SoftwareXcel enterprise edition 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 V1.10 so that you can stage your migration to z/OS V1.10 JES2 or JES3 (that is, migrate your JES2 or JES3 later). If you stage your migration to z/OS V1.10 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/

Performance considerations

Additional information on z/OS V1.10 performance will be published at general availability. Contact an IBM representative at or after general availability.

User group requirements

z/OS V1.10 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/systems/z/os/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 202-036, dated February 19, 2002
- Software Announcement 202-105, dated April 30, 2002
- Software Announcement 203-131, dated May 13, 2003
- Software Announcement 204-056, dated April 07, 2004
- Software Announcement 205-167, dated July 27, 2005
- Software Announcement 207-006, dated January 09, 2007
- Withdrawal Announcement 907-245, dated December 04, 2007

Key dates

- **August 5, 2008**: z/OS V1.10 CFSW configurator support for stand-alone path (5694-A01) and price proposal support.
- **September 12, 2008**: First date for ordering z/OS V1.10 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 26, 2008**: z/OS V1.10 general availability via ServerPac, CBPDO, and SystemPac.
- **October 14, 2008**: Recommended last date for submitting z/OS V1.9 orders via the entitled Customized Offerings (ServerPac and CBPDO). This date will allow for adequate order processing time.
- **October 27, 2008**: Last date for processing orders for z/OS V1.9 via ServerPac and CBPDO.
- **November 21, 2008**: general availability of Cryptographic Support for z/OS V1R8-R10 & z/OS.e V1R8 Web deliverable. This Web deliverable will support z/OS V1.8 through z/OS V1.10 and z/OS.e V1.8.
- **June 29, 2009**: Recommended last date for submitting z/OS V1.9 orders via the fee Customized Offering SystemPac. This date will allow for adequate order processing time.
- **July 27, 2009**: Last date for processing orders for z/OS V1.9 via SystemPac.
- **September 30, 2009**: End of service for z/OS V1.8 (5694-A01) and z/OS.e V1.8 (5655-G52).

To obtain the Web deliverable listed above, visit

http://www.ibm.com/systems/z/os/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 V1.9 will remain orderable.

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

Please refer to the ShopzSeries Web site for product catalogs for the Customized Offerings

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

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 V1.10 by ordering the release through the Customized Offerings (ServerPac, SystemPac, CBPDO) as they have done in the past.

For more details, refer to New licensees of z/OS V1.10.

New licensees of z/OS V1.10

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 V1.10 orders will begin on the planned general availability date, **September 26, 2008**. 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 V1.10 program number 5694-A01. Proceed to select the features listed which are required and then select any optional features.

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 V1.10 and can be ordered effective **August 5, 2008**. These no-charge media features have pricing/billing features associated with them. It is those associated pricing/billing features where the charges are listed and not the media features listed below. See **Notes** below for details on past announcements for this information.

```
z/OS V1.10                      z/OS V1.10
feature description             orderable supply ID


Base                            S014MN7
```

Notes:

IBM is a registered trademark of International Business Machines Corporation

- The billing features and pricing information for the above feature descriptions remain unchanged and are provided in:
  - Software Announcement 202-036, dated February 19, 2002
  - Software Announcement 202-105, dated April 30, 2002
  - Software Announcement 203-131, dated May 13, 2003
  - Software Announcement 204-056, dated April 07, 2004
  - Software Announcement 205-167, dated July 27, 2005
  - Software Announcement 207-006, dated January 09, 2007
  - Withdrawal Announcement 907-245, dated December 04, 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/systems/z/os/zos/bkserv/

Basic unlicensed softcopy publications

Title	Order number
z/OS Version 1 Release 10 Collection	SK3T-4269

For a fee, the customer can order the softcopy collections or any z/OS V1.10 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. Verify whether this option is available in the user's country.

For other publications ordering options, visit

http://www.ibm.com/systems/z/os/zos/bkserv/order_books.html

z/OS Version 1 Release 10 Collection (BookManager and PDF)

z/OS Version 1 Release 10 Collection contains the z/OS V1.10 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 V1.10 licensees.

By general availability, the z/OS V1.10 books will be available at

http://www.ibm.com/systems/z/os/zos/bkserv/

For creating softcopy repositories, SoftCopy Librarian is the flagship 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

Optional unpriced features - z/OS V1.10

The following optional features, offered at no additional charge, are added to z/OS V1.10 and can be ordered effective **August 5, 2008**.

```
z/OS V1.10                                      z/OS V1.10
feature description                             orderable supply ID


Communications Server Security Level 3             S014MMV
z/OS Security Level 3                               S014MNM
```

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 V1.10 and can be ordered effective **August 5, 2008**. These optional no-charge media features have pricing/billing features associated with them. It is those associated pricing/billing features where the charges are listed and not the media features listed below. See **Notes** below for details on past announcements for this information.

```
z/OS V1.10                        z/OS V1.10
feature description               orderable supply ID


BDT FTF                              S014MNL
BDT SNA NJE                          S014MM6
BookManager Build                    S014MM9
C/C++ without Debug                  S014MMN
DFSMS dss,hsm                        S014MMK
DFSMS rmm                            S014MMB
DFSMS dss                            S014MN1
DFSMStvs                             S014MNX
DFSORT                               S014MN9
GDDM-PGF                             S014MNG
GDDM-REXX                            S014MNV
HCM                                  S014MNP
HLASM Toolkit                        S014MMT
Infoprint Server                     S014MP1
JES3                                 S014MND
RMF                                  S014MN5
SDSF                                 S014MNJ
Security Server                      S014MNW
```

Notes:

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

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

- Software Announcement 202-105, dated April 30, 2002

- Software Announcement 203-131, dated May 13, 2003

- Software Announcement 204-056, dated April 07, 2004

- Software Announcement 205-167, dated July 27, 2005

- Software Announcement 207-006, dated January 09, 2007

- Withdrawal Announcement 907-245, dated December 04, 2007

2. 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.

3. 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 *z/OS Licensed Program Specifications* (GA22-7503). The customer must notify IBM when an optional feature is enabled that was shipped disabled from IBM.

4. 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.

5. The DFSMS dss feature cannot be ordered with the DFSMS dss,hsm feature. Likewise, the DFSMS dss,hsm feature cannot be ordered with the DFSMS dss feature.

Optional unpriced National Language Version (NLV) features

The z/OS V1.10 NLV support features will become generally available on the same date the release becomes available.

z/OS V1.10 provides support in the languages listed below. However, not all elements within z/OS V1.10 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/

The following optional features, offered at no additional charge, are added to z/OS V1.10 and can be ordered effective **August 5, 2008**.

The NLV features for z/OS V1.10 are:

```
z/OS V1.10                          z/OS V1.10
NLV feature description             orderable supply ID


Brazilian Portuguese Base (PTB)     S014MM5
Brazilian Portuguese BookMgr        S014MMR
Build
Canadian French Base (FRC)          S014MM7
Canadian French BookMgr Build       S014MMJ
Danish Base (DAN)                   S014MP6
Dutch Base (NLD)                    S014MMW
French Base (FRA)                   S014MP5
French BookMgr Build                S014MPD
German Base (DEU)                   S014MP7
German BookMgr Build                S014MMP
Italian Base (ITA)                  S014MP3
JPN Base                            S014MP2
JPN C/C++ Without Debug             S014MNF
JPN Infoprint® Server               S014MMZ
JPN RMF                             S014MNN
JPN SDSF                            S014MN6
JPN Security Server                 S014MNB
Upper Case English Base (ENP)       S014MM4
Korean Base (KOR)                   S014MN2
Norwegian Base (NOR)                S014MN3
Spanish Base (ESP)                  S014MNS
Spanish BookMgr Build               S014MN4
Swedish Base (SVE)                  S014MN0
Swiss German Base (DES)             S014MN8
Simplified Chinese Base (CHS)       S014MP8
```

```
Traditional Chinese Base (CHT)        S014MNC
```

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.

Unlicensed documentation

Features not offered in z/OS V1.10

All features offered in z/OS V1.9 are offered in z/OS V1.10 except for the following:

```
z/OS optional NLV feature


JPN DFSORT

Note: The DFSORT English and Japanese panels have been removed
effective with z/OS V1.10.
```

Optional unlicensed publications

Optional unlicensed softcopy publications

The following optional one-time charge features are added to z/OS V1.10 and can be ordered effective **August 5, 2008**.

Subscriptions to the following softcopy collections may be ordered for a fee by specifying the one-time charge feature numbers listed below:

```
        Title                      Order        Orderable
                                   number       supply ID


z/OS Software Products             SK3T-4270    S014MM3
Collection

IBM System z                       SK3T-7876    S014MPB
Redbooks Collection

z/OS Security Server               SK3T-4272    S014MP9
RACF Collection

z/OS Version 1 Release 10          SK3T-4271    S014MP0
and Software Products DVD
Collection
```

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 V1.10 is available October 3, 2008.
- The feature descriptions listed above are the same offered in z/OS V1.9.
- When the above softcopy collections are ordered as features of z/OS V1.10, 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 1,925 unlicensed online documents for more than 400 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.redbooks.ibm.com/

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 10 and Software Products DVD Collection* (SK3T-4271) includes softcopy tools, libraries for z/OS Version 1 Release 10 (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 10 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 V1.9 features withdrawn

The following z/OS V1.9 features are withdrawn from marketing effective October 27, 2008:

```
z/OS V1.9            z/OS V1.9
 orderable supply ID    feature description

  S013TF8              z/OS V1.9 Base
  S013TDC              z/OS V1.9 BDT FTF
  S013TF7              z/OS V1.9 BDT SNA NJE
  S013TFD              z/OS V1.9 BookManager Build
  S013TFZ              z/OS V1.9 C/C++ without Debug
  S013TDH              z/OS V1.9 DFSMS dss,hsm
  S013TCP              z/OS V1.9 DFSMS rmm
  S013TFM              z/OS V1.9 DFSMS dss
  S013TDL              z/OS V1.9 DFSMStvs
  S013TD6              z/OS V1.9 DFSORT
  S013TCT              z/OS V1.9 GDDM-PGF
  S013TF5              z/OS V1.9 GDDM-REXX
  S013TCZ              z/OS V1.9 HCM
  S013TFX              z/OS V1.9 HLASM Toolkit
  S013TG0              z/OS V1.9 Infoprint Server
  S013TFJ              z/OS V1.9 JES3
  S013TDJ              z/OS V1.9 RMF
  S013TG2              z/OS V1.9 SDSF
  S013TFC              z/OS V1.9 Security Server
  S013TFT              z/OS V1.9 Communications Server Security Level 3
  S013TD8              z/OS V1.9 z/OS Security Level 3
  S013TDT              z/OS V1.9 SK3T-4272 z/OS Security Server
                                 RACF Collection
  S013TDD              z/OS V1.9 SK3T-4270 z/OS Software
                                 Products Collection
  S013TFB              z/OS V1.9 SK3T-7876 IBM z/OS V1 System z
```

```
                          Redbook Collection
    S013TFS             z/OS V1.9 SK3T-4271 z/OS V1R9 and
                                  Software Products DVD Collection
    S013TFG             z/OS V1.9 Braz Port Base (PTB)
    S013TF9             z/OS V1.9 Braz Port BookMgr Build
    S013TD1             z/OS V1.9 Can Fren Base (FRC)
    S013TD4             z/OS V1.9 Can Fren BookMgr Build
    S013TDZ             z/OS V1.9 Danish Base (DAN)
    S013TCV             z/OS V1.9 Dutch Base (NLD)
    S013TCR             z/OS V1.9 French Base (FRA)
    S013TDM             z/OS V1.9 French BookMgr Build
    S013TDK             z/OS V1.9 Germ Base (DEU)
    S013TDB             z/OS V1.9 Germ BookMgr Build
    S013TFV             z/OS V1.9 Ital Base (ITA)
    S013TCW             z/OS V1.9 JPN Base
    S013TF4             z/OS V1.9 JPN C/C++ Without Debug
    S013TD7             z/OS V1.9 JPN DFSORT
    S013TDS             z/OS V1.9 JPN Infoprint Server
    S013TFH             z/OS V1.9 JPN RMF
    S013TD3             z/OS V1.9 JPN SDSF
    S013TDW             z/OS V1.9 JPN Security Server
    S013TDX             z/OS V1.9 Upper Case English Base (ENP)
    S013TDV             z/OS V1.9 Kor Base (KOR)
    S013TFN             z/OS V1.9 Norw Base (NOR)
    S013TCS             z/OS V1.9 Span Base (ESP)
    S013TFK             z/OS V1.9 Span BookMgr Build
    S013TF3             z/OS V1.9 Swed Base (SVE)
    S013TD9             z/OS V1.9 Swiss Germ Base(DES)
    S013TDN             z/OS V1.9 Simp Chin Base (CHS)
    S013TD5             z/OS V1.9 Trad Chin Base (CHT)
```

Customized Offerings

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

CBPDO and ServerPac are offered for Internet 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*

- ServerPacs - 3480, 3480 Compressed, 3490E, 3590, 3592*

- SystemPacs - 3480, 3480 Compressed, 3490E, 3590, 3592*

*3592 is highest density media. Selecting 3592 will ship the fewest number of media.

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.

IBM Operational Support Services - SupportLine

Yes

Prices

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

Identify your local IBM representative or IBM Business Partner, call 800-IBM-4YOU (426-4968).

```
Phone:      800-IBM-CALL (426-2255)
Fax:        800-2IBM-FAX (242-6329)
Internet:   callserv@ca.ibm.com
Mail:       IBM Teleweb Customer Support
            ibm.com® Sales Execution Center, Americas North
            3500 Steeles Ave. East, Tower 3/4
            Markham, Ontario
            Canada
            L3R 2Z1
```

Reference: LE001

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Note: Shipments will begin after the planned availability date.

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Corrections

(Corrected on August 27, 2008)

In the At a Glance and Overview sections, "secure key AES" was deleted.

(Corrected on October 8, 2008)

In the Description section, the text describing auto-IPL support was revised.