IBM Server Group

IBM eServer zSeries z/OS
The Flagship Operating System

z/OS 1.5, z/OS 1.6 and z/OS 1.7 Preview

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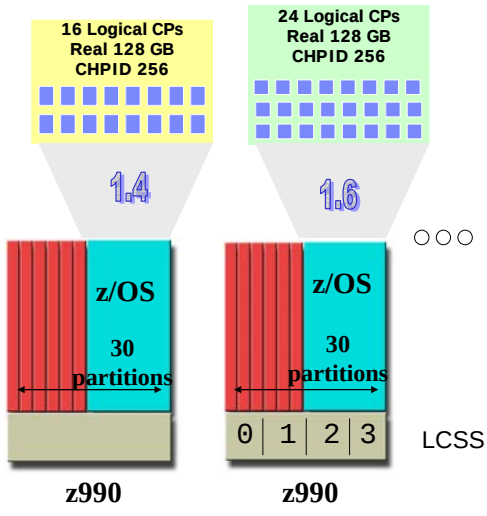
z/OS 1.5 Summary

- Introducing Multilevel Security
  - Single z/OS image for hosting users and applications with different security levels
  - Single DB2 database with different security levels (with DB2 Universal Database™ for z/OS V8)
- More security enhancements
  - Performance and manageability enhancements to Public Key Infrastructure (PKI) support
  - Enhanced Intrusion Detection Services
- Self-optimizing
  - Simplified WLM control for WebSphere
- Performance
  - Fast replication of DB2 storage groups with DFSMShsm™ Fast Replication
  - Performance enhancements for DFSORT® using 64-bit virtual storage
- e-business
  - Simplified enterprise wide management of print jobs and printers with Infoprint® Central, a new front-end for InfoPrint
- Availability
  - Console message architecture improved for higher availability in multi-system environments
- Simplification
  - Enhanced internet access to z/OS library with Library Center for z/OS
  - Simplify the customization of RMF™, DB2 UDB for z/OS V8, FTP and ISPF using msys for Setup

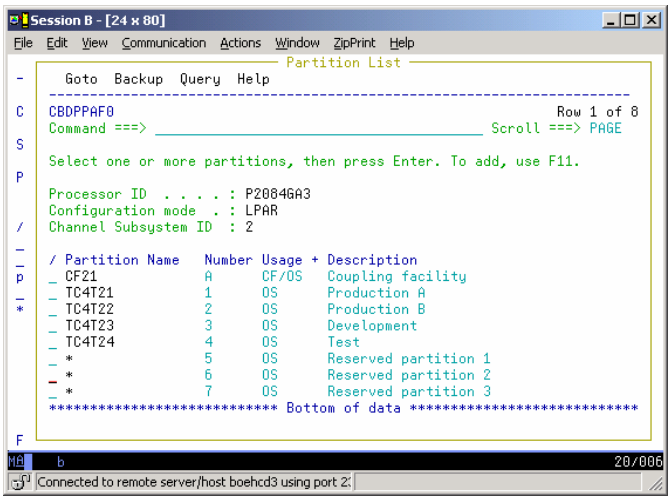
General availability: 3/03 End of ordering: 9/04 End of service: 3/07

z/OS 1.6 – Scaling to new Heights

- **Scale up**
- **Up to 24 processors in a single z/OS image**
  - Total of 24 general purpose and zAAP processors
  - Prior to z/OS 1.6, max processors per z/OS image is 16
  - IBM plans to support 32 engines in a single LPAR in 2005
- **Scale out**
- **Up to 30 partitions in a single zSeries server**
- **Support for 4 Logical Channel SubSystems (LCSS)**
- **Scale out with higher availability**
- **Up to 32 images in a zSeries Parallel Sysplex®**



Dynamic LPAR Support



- A reserved partition is defined with partition name placeholder ' * '.
- A dynamic partition must be reserved in the IOCDS used for POR.
- It has a MIF ID (partition number) and a usage type assigned. It may contain a description.
- Reserved partitions can not be assigned to access or candidate lists of channel paths or devices.
- z/OS 1.6 dynamic I/O can name a reserved LPAR or change a named LPAR to ' * '.

IBM eServer zSeries (z890 and z990) Application Assist Processor* (zAAP)

- **A new zSeries Application Assist Processor (zAAP)**
  - zAAPs are designed for Java™ code execution
  - z/OS JVMs assist with the execution of code from standard processors to zAAPs
  - JVM executes Java code on zAAPs
  - Calls (JNIs) to DB subsystems (e.g., DB2®) switch back to standard processors
  - DB returns (JNIs) to Java switch back to zAAPs
- **Designed to provide a Single Tier integrated application and database serving environment**
  - Can provide advanced performance and QoS over typical 2-tier front-end application server TCP/IP connected back-end data server platforms
- **When configured with general purpose engines in logical partitions running z/OS, zAAPs may help increase general purpose processors' productivity**
- **Requires z/OS 1.6**

*For customers planning to run WebSphere Application Server V5 under z/OS on an IBM eServer zSeries 890 (z890) or 990 (z990) server, you may be eligible to take advantage of some of the benefits that the zSeries Application Assist Processor (zAAP) provides for a limited time on your z890 or z990 prior to migrating to z/OS 1.6. Contact your local IBM or authorized Business Partner hardware sales specialist for more information.

zAAP Characteristics

- **The zAAP only executes Java code**
- **zAAPs are designed so that users can manage the use of CPs such that Java code runs only on a CP, only on a zAAP, or on both**
- **Subsystems that will exploit zAAPs include:**
  - WebSphere® Application Server (WAS) 5.1
  - CICS®/TS 2.3
  - DB2 V7 and V8
  - IMS™ V7, V8 and V9
  - WebSphere WBI for z/OS
- **Other Software**
  - z/OS 1.6*
  - SDK 1.4 (5655-156) with UQ88783
  - IBM, Vendor and Customer Java applications are expected to run

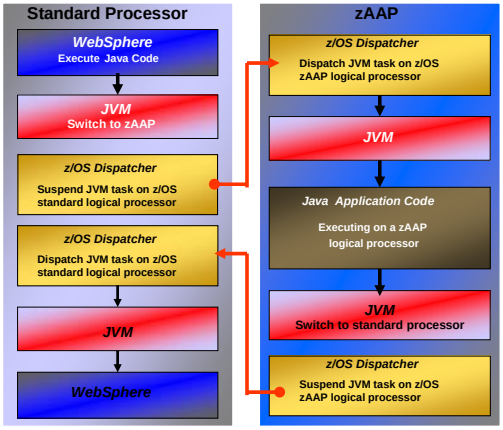
* Prerequisites

zAAP Design

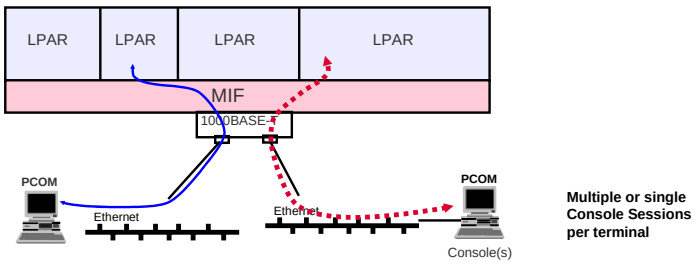
- **The IBM JVM is the only authorized zAAP user**
  - The IBM JVM requests zAAP switch authorization on initial entry
    - zAAP Authorization: A JVM usage check is performed
    - Other programs attempting zAAP authorization would be rejected
- **The Switch interface will ignore (perform a no-op) of any switch request if the program is not zAAP authorized**
- **STSI does not report zAAP capacity**
- **Getting started with zAAP planning, configuration etc.**
  - **ibm.com**/servers/eserver/zseries/zaap/gettingstarted/

zAAP Architecture and Workflow: Executing Java under the IBM JVM Control

- IBM JVM, parts of LE runtime, and z/OS Supervisor needed to support JVM execution on zAAPs
- IBM JVM communicates with z/OS dispatcher when Java code is to be executed
- When Java is to be executed, the work unit is "eligible" to be dispatched on a zAAP
- z/OS dispatcher attempts to dispatch zAAP eligible work on a zAAP (when present)
  - zAAP ineligible work dispatched on standard processors
- If there is insufficient zAAP capacity available, or standard processors are idle, the dispatcher may dispatch zAAP eligible work on a standard processor
  - Installation controls limit the use of standard processors to execute zAAP eligible work (see Java code execution options)

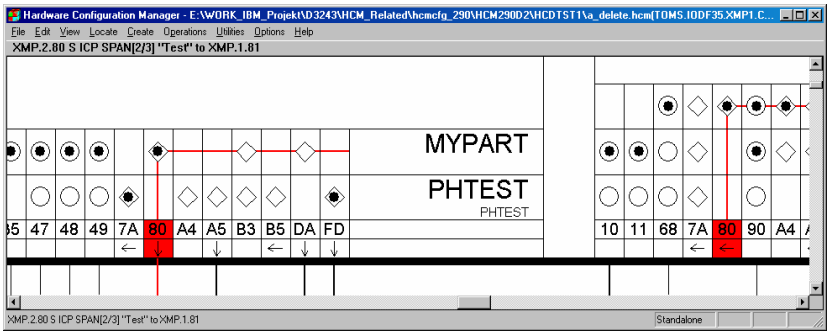


OSA-Integrated Console Controller Support Single System with Alternate Sessions



- New CHPID Type OSC provides 2074 console control unit functions in an OSA-Express channel
- Up to one hundred twenty (120) sessions per port across multiple Logical Partitions
  - MIF capable
  - Can run multiple sessions on a single workstation
- For increased console session availability, plan for separate consoles, on separate LANs, on separate ports, on separate OSA-Express features
  - Manual, disruptive console session switch possible
- Helps reduce total cost of computing

Hardware Configuration Manager: Updates: z/OS 1.6 Enhanced Configuration Diagram



Arrows below spanned CHPIDs indicate the direction that you have to go in the diagram to find the physical connection that starts at the spanned CHPID (in case the spanned CHPID is connected)

z/OS 1.6 C/C++ Enhancements

- The main objective of this compiler release is to generate programs that will exploit the 64-bit architecture.
- The 64-bit capability can benefit programs that need to process a large amount of data as internal arrays. The data can be read into working buffer and manipulated in memory without using temporary files, simplifying program logic. Debug information is also enhanced to handle 64-bit programs.
- New features in the C/C++ compilers include:
  - 64-bit instructions generation
  - New architecture suboptions ARCH(6) and TUNE(6)
  - New keyword in variable declaration to specify alignment
  - New compiler invocation commands
  - 64-bit debug information
  - Enhanced DSECT utility to handle 64-bit data types

High Level Assembler Dynamic Link Library (DLL) Support

- **High level Assembler is powerful and flexible for application development but it was difficult to integrate Assembler code and DLL usage.**
- **With the Assembler DLL support, Assembler applications can use DLLs directly.**
- **Requires High Level Assembler Release 5 (shipped with z/OS 1.6).**
  - Object files must be link-edited using the z/OS 1.6 Binder.
  - Executables must reside in either a PDSE or the UNIX® file system.
  - There are no changes to the Language Environment® run-time for the Assembler DLL support.

WLM DB2 Stored Procedure Enhancement

- **WLM DB2 Stored Procedure Enhancements Support**
  - Addresses DB2 problems with STP / UDF timeouts and abends
  - Can Increase throughput of certain types of DB2 workloads
  - DB2 informs WLM about dependent Stored Procedures / UDFs
  - WLM is designed to give dependent requests priority over other request
  - WLM attempts to start server regions more aggressively if dependent requests have to wait
  - As long as sufficient system resources are available
  - Currently DB2 is the only exploiter

WLM 64-bit Virtual Storage Support

- **A first subset of WLM services is converted to support 64-bit programs**
- **The new 64-bit services**
  - Can be used by 31-bit as well as by 64-bit applications
  - May specify parameter data above and below 2 GB
  - Support the same keywords as the 31-bit services
  - Exception: PLISTVER may not be higher than 0
  - Have a similar name as the corresponding 31-bit services
    - e.g. IWM4CON replaces IWMCONN
- **The old 31-bit services will not be enhanced in future releases**

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WLM 64-bit Virtual Storage Support

- **All WLM C services are enabled to support 64-bit applications**
- **The 64-bit support is expected to be transparent to application programs, but**
  - Recompilation is required
  - 64-bit support is provided through changed header files
  - Conditional logic is based on C Compiler AMODE option
  - Some new modules in the CSSLIB

Unicode Performance Improvements

- **Improve pathlength associated with Unicode Conversion Services, especially when converting from EBCDIC to Unicode and vice versa.**
  - Exploit new hardware instructions provided with z/Architecture™.
  - Restructured module flow for EBCDIC ==> UTF and UTF ==> EBCDIC conversions.
  - Improvement is with EBCDIC->UTF8 and UTF8->EBCDIC conversions that use an intermediate conversion to CCSID 1200 today, hence being treated as "any-to-any" conversions.
  - The "any-to-any" conversion involves many external module calls which increase pathlength. When certain new requirements are met, we will no longer consider EBCDIC <-> UTF8 conversions as "any-to-any" and use a new and shorter code path.
  - In addition, we take advantage of specific hardware instructions intended for to EBCDIC<-> UTF8 conversion.

Unicode: Loading of Pre-built Image

- **Enables the Unicode environment during system IPL**
  - Ships a pre-built image with all DB2-supported codepage conversion tables
  - Contains all the ASCII to/from UTF8 and EBCDIC to/from UTF8 conversion tables with ER technique
  - Automatically loads the pre-built image into the Unicode environment **when:**
    - An empty Unicode environment is present,
    - an IPL was done without specifying UNI=xx,
    - and the requestor of the conversion is PSW Key 7 in Task mode

Resource Recovery Services (RRS) Enhancements

- **Restart Enhancements**
- **Allow resource managers to be restarted on a different system within the same RRS logging group without canceling RRS**
- **RRS can manage any outstanding transactions across the multiple system internally**
- **Resource managers do not necessarily have to make any code changes to request this support**

SMS Volume Selection Based on PAV

- **Parallel Access Volume (PAV) is an optional feature of the IBM TotalStorage® Enterprise Storage Server® (ESS) that allows multiple data sets on the same volume to be accessed concurrently**
- **This new support is intended to give the user additional control over the Volume Selection process for a SMS-managed data set depending on whether a base volume has a PAV or PAVs associated with it.**
  - Allows allocations to be automatically allocated to high performance devices.
    - PAVs allow concurrent access to a device helping to reduce the IOSQ time.
- **New field named PAV Capability provided in Storage Class definition.**
- **Changes made to volume selection algorithm to take PAV into consideration.**
- **ISMF and NaviQuest updated to support the new function.**

DFSMShsm™ – Secondary Space Management (SSM) Today

- **Statistics cleanup**
  - Restart tape copy
  - DSR and VSR records that expired and require cleanup from MCDS
- **Migration level cleanup**
  - Performs several scans starting from where it previously left
    - Deletion of expired migrated data sets
      - MCD records that are expired or recalled and require cleanup
      - MCD records that require ML1-to-ML2 data set movement
      - MCA and MCO records that are expired
    - One scan of the OCDS
      - TCN records that require TAPECOPY restart
      - Performed before DSR/VSR scan in MCDS
- **Moves migration copies from ML1 to ML2**
- **Expired ML1 and ML2 processing**
- **Runs as a single task**

DFSMShsm – SSM Multitasking Enhancements

- **Multiple threaded migration from ML1 to ML2**
  - Up to 15
    - Still only one task for ML1-to-ML2 DASD data movement
- **Multiple threaded cleanup functions**
  - Up to 15 to:
    - Expiration of migrated data sets
    - Deletion of MCDS records that are no longer needed
    - Deletion of SDSP records that are no longer needed
    - Deletion of DSR, VSR, and TCN records
  - Number of tasks determined by new SETSYS MAXSSMTASKS command

DFSMSrmm

- **DFSMSrmm™ Client/Server support**
  - DFSMSrmm can now run on a system which does not have direct access to the DASD containing the DFSMSrmm CDS
    - I/O requests to the CDS are handled over the TCP/IP network
    - Allows multiple sysplexes to have a single tape inventory
- **An object-oriented interface written for the C/C++ languages is now available for the DFSMSrmm API**

DFSMSdss™– REPLACEUnconditional

- **New function that allows users to rename a data set using the existing RENAME or RENAMEU keywords and replace an existing data set with the new name if that data set exists on the target volume**
- **REPLACEU is intended to be used in conjunction with RENAMEU and if applicable RENAME but can be specified by itself**
  - If specified by itself, it will have the same behavior as the REPLACE keyword
    - Will look for a preallocated data set with the source data set name and if found will be replaced
    - If not found, a data set with the source data set name will be allocated
- **The behavior of DFSMSdss when specifying RENAME (new name) and REPLACEU will be the same as specifying REPLACE (of the old name)**

DFSMSdss Logical Data Set Copy and RESTORE

- **Specifying the REPLACEU with RENAMEU means that even if a data set with the new name exists (usable preallocated target) the data set will be overwritten with the source data set**
  - Usable preallocated data sets have the same attributes as the source
  - Unusable new name preallocated data sets will be scratched under the following conditions
    - Any of the following source and target data set attributes do not match:
      - CI size
      - IMBED
      - REPLICATE
      - Different key length
      - Different record length
      - SPANNED
    - The target data set is not large enough to contain all of the source data
    - The data set was not defined as reusable and the high used RBA of a target VSAM KSDS is not 0

Multiple Level Security Label in ACS Routines

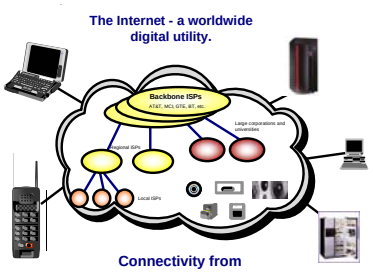
- **The Security Label (SECLABEL) is a name used to represent the association between a particular security level and a set of security categories**
- **An installation can define its own security labels representing the association between a particular security level and a set of zero or more security categories**
- **Some installations wish to segregate data of specific classifications on specific sets of volume**
- **New ACS read only variable & SECLABEL can now be used to make allocation decisions rather than using an allocation exit**

PDSE Restartable Address Space

- **Prior to this support, it was necessary to re-IPL a system if a hang condition, deadlock condition, or an out-of-storage condition occurred because of PDSE address space**
- **This support will help improve PDSE reliability and availability**
- **In z/OS 1.6, DFSMSdfp™ will have two PDSE address spaces**
  - SMSPDSE and SMSPDSE1
- **The PDSE address space restart feature will allow you under certain conditions to recover from a PDSE problem without having to re-IPL a system or systems**
- **No changes are required to JCL or programs in order to utilize this new function**

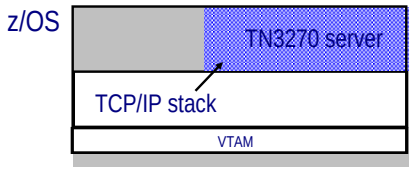
The Journey to IPv6 for z/OS Continues

- **IPv6 Development Phases**
  - The first phase (z/OS 1.4)
    - Stack support for IPv6 base functions -
    - (APIs, Protocol layers)
    - Resolver
    - High speed attach (OSA-Express QDIO)
    - Service tools (Trace, Dump, etc.)
    - Configuration and netstat, ping, traceroute, SMF
    - Static Routing
    - FTP, otelnetd,unix rexec, unix rshd/rexecd
  - The second phase (z/OS1.5)
    - Network Management
      - Applications and DPI
      - Version-neutral TCP/IP Standard MIBs
      - Additional SMF records
    - Applications/Clients/APIs
      - TN3270 server, CICS sockets, sendmail,ntp,dcas, rxserve,rsh client
    - Enterprise Extender
    - Point-to-Point - type DLCS
    - Dynamic Routing Protocol w/ OMPROUTE (only RIPng)
  - The third phase (z/OS 1.6)
    - Sysplex Exploitation (Dynamic VIPA, Sysplex Distributor functions)
    - Dynamic Routing Protocol w/ OMPROUTE (OSPFv3)
    - Additional Network Management MIBs



TN3270 Server – A Separate Address Space Option

- **Currently TN3270 Server runs as a subtask of the IBM TCP/IP stack address space**
- **In z/OS 1.6, you are provided with options:**
  - Run the TN3270 server as a separately started address space from TCP/IP
  - Continue to run TN3270 server as a subtask of the TCP/IP address space
- **Benefits to running TN3270 as a separate address space**
  - Allows for prioritization of TCP/IP address space vs. TN3270 server
  - Much less likely for TN3270 server failure to cause a total TCP/IP failure
  - Allow for easier problem diagnosis for both TCP/IP and TN3270
  - Easier controls for starting and stopping the server



FTP Enhancements

- **FTP Client API support will provide a callable API that will allow the z/OS FTP client to be invoked from applications written in Assembler, COBOL or PL/I**
- **Current FTP support for Double Byte Character Set (DBCS) is not based upon the latest z/OS character conversion technology**
  - Done via LOADDBCSTABLES statement in TCPIP.DATA dataset
  - z/OS 1.4 provides MBCS encoding support only for Chinese codepage GB18030
    - Network codepage is IBM-5488 and filesystem codepage supported is IBM-1388 or UTF-8
    - SBCS conversions are supported too
  - z/OS 1.6 enhances MBCS to include the DBCS code pages currently supported by existing LOADDBCSTABLES statement
    - Some conversion parameters are not supported with the new method
    - The data type for transfers must be ASCII
  - Original codepage support for DBCS using LOADDBCSTABLES is still supported

Security Server (RACF) Improvements

- **RACF® Class Descriptor Table (CDT) is a table of all general resource classes defined to RACF, e.g. TERMINAL, DASDVOL**
- **RACF uses the CDT for resource authorization checking and authentication of users**
- **RACF updates the IBM supplied class list with new releases and sometimes in service stream**
  - ISV vendor products may require you to add classes to CDT
  - Optionally, you add classes when adding new CICS regions or new DB2 subsystems
  - Customer applications can use SAF calls which reference CDT

Security Server (RACF) Improvements …

- **To update the RACF class descriptor table and router table, the installation must:**
  - Write assembler code
  - Assemble and link edit modules
  - IPL the system
    - Will affect Availability problem if running 24x7 production
- **z/OS 1.6 provides:**
  - Dynamic Class Descriptor Table
  - Router Table must be updated only for exceptions

Integrated Security Services – LDAP Improvements

- **DB2 Restart/Recovery**
  - It will help improve LDAP RAS (Reliability, Availability and Serviceability) characteristics by removing the requirement to stop and restart the LDAP server each time DB2 is restarted
    - LDAP server availability is expected to be enhanced
    - LDAP server designed to have self-healing capabilities for DB2 failure
- **Enhanced Schema Support**
  - Updating schema between releases or for service is not a trivial task
  - Cannot just modify using latest schema file, modify 'add' fails due to duplicate values and modify 'replace' removes all extra values added by customer
  - Enhance schema modification to support replacing specific schema values
  - Can update schema using newest version of schema file. This can Simplify LDAP service and migration

Integrated Security Services – LDAP Improvements …

- **Change Log Support**
  - Will provide a log of changes made to entries in the directory including RACF user password changes
  - Allow the log to be searched by a client
  - Enable metadirectory products like IBM Directory Integrator that work from a change log to work with the z/OS LDAP server
- **64-bit Client Support**
  - Enhance the LDAP Client APIs to support 64-bit addressing
  - Allow LDAP C/C++ applications running on z/OS 1.6 to exploit 64-bit addressing
- **IPv6 Support**
  - IPv6 support will enhance the LDAP server, LDAP operational utilities, and Client APIs to support IPv6 communication

Secure Sockets Layer (SSL) Enhancements

- **System SSL was introduced in OS/390® V2.7 as part of the Cryptographic Services element**
  - Support for establishing secure socket connections (SSL) C/C++ suite of APIs
  - Certificate Management through the gskkyman utility
- **z/OS 1.4 provided improved performance, serviceability and enhanced functionality**
- **z/OS 1.6 provides following System SSL functionality**
  - Enhanced certificate management through gskkyman utility
  - Diffie-Hellman support for SSL handshakes and certificates
  - Enhanced Server certificate validation
  - Exploit hardware cryptography on z990 processor
  - 64-bit enablement (previously presented)
- **System SSL can make use of the S/390® Cryptographic Coprocessor feature or PCI Cryptographic Coprocessor if installed and ICSF is active**
- **On a z990 processor, System SSL will use the CP Assist functions as well as PCICA and PCIXCC adapters if installed and ICSF is active**

z/OS 1.6 EIM Enhancements

- **Policies**
  - Administrators can define policies which act a default mapping
    - Many source user IDs to one target user ID
  - Policies can be based on certificates filters, a registry, or a domain providing simplified administration for large numbers of users who require the same target user ID
- **Digital Certificate Registries**
  - Administrators can create X509 type registries
  - APIs to assist with extracting the SDN/IDN from a certificate
  - Includes certificate filtering policies for X.509 registries
    - Benefit: can simplify administration for certificate mappings

Distributed File Services

- New performance statistics available with zfsadm command
  - A new zfsadm query command displays zFS performance statistics counters and timers.
  - Corresponding pfsctl APIs are also provided to retrieve these performance statistics programatically
- IOEFSPRM in PARMLIB
  - As an alternative to the IOEZPRM DDNAME, you can now specify the IOEFSPRM member as a true PARMLIB member. The member has the name IOEPRMxx, where xx is specified in the PARMLIB member list
  - IOEFSPRMxx suffix is specified on the PARM subparameter of the FILESYSTYPE statement in BPXPRMxx

New z/OS UNIX Functions in z/OS 1.6

- **UNIX® support for 64-bit virtual addressing**
  - UNIX services can be used by 64-bit programs and handle data that can reside above the current restriction of 2 gigabytes
  - Users of shared memory services, currently limited to memory object size of 2 GB, can now obtain and manipulate memory objects located above the Bar
  - SHELL utilities are enhanced to support the creation and use of 64-bit applications
- **Automount enhancements**
  - You can use a single automount policy to manage both HFS and zFS file systems
  - The master and map files can reside in MVS™ data sets. Prior to this support, these files are required to be in filesystem
  - The automount policy being loaded will be appended to the existing policy and will not replace it

New z/OS UNIX Functions in z/OS 1.6

- Byte-range Lock Manager (BRLM)
  - File systems that are mounted in a sysplex can be moved from one member of the sysplex to another member, even when locks are held in that file system. Distributed BRLM is now the only supported byte range locking method when all systems are at z/OS 1.6
- ISHELL enhancements
  - Various enhancements were made to ISHELL to help increase end-user and UNIX Administrator productivity
    - Wildcard support on the directory list
    - Option to display permission bits in **rwxrwxrwx** format
    - Support for autouid/autogid
    - Option to allow executed SHELL commands to output in line mode as they are running
    - Option to preserve extended attributes on a copy

New z/OS UNIX Shell Command

- **A new command to clear the screen**
  - Useful in shell scripts
    - Sometimes found in ported scripts
  - OMVS (3270) session
  - Non-3270 (telnet / rlogin)
    - Uses terminfo database for TERM type
- **Previously available as an unsupported download**
  - From the “Tools & Toys” Web site
- New command to display how long the system has been IPLed

New z/OS UNIX Shell Command – superkill

- **Using SUPERKILL, you can**
  - Cancel hung USS processes using UNIX semantics
  - Cancel your own hung processes from the shell
  - Use the enhanced console support to give operators and automated console applications additional flexibility
- **kill –K *process_id***
  - Terminates processes that are not receiving SIGKILL
- **Advantages:**
  - Overrides current restrictions of signal delivery
  - Provides PID versus ASID targeting
  - Avoids MVS operator intervention

OpenSSH

- **A suite of network connectivity tools that provide secure encrypted communications between two "untrusted" hosts over an insecure network**
  - Included in IBM Ported Tools for z/OS (5655-M23**)**
- **Provides authentication (both client and server) through:**
  - Public key cryptography
  - Existing login passwords
  - Trusted hosts authentication
- **Data Privacy – through encryption**
- **Data Integrity – designed so that data traveling over the network is unaltered**
- **Authorization – regulates access control to accounts**
- **Forwarding (a.k.a. tunneling) – encryption of other TCP/IP-based sessions**
- **More information is available**
  - **ibm.com**/servers/eserver/zseries/zos/unix/port_tools.html

z/OS 1.6 RAS Enhancements

- **z/OS 1.6 will include several serviceability enhancements that will**
  - Allow to activate an additional GTF trace specification when others have already been active
- **The size of the SMF buffer will be user controlled**
  - Controls will be via PARMLIB specification
  - Up to 1 GB can be used to cache SMF records prior to writing to SMF data sets
- **Execute Channel Program (EXCP) and EXCPVR VSCR**
  - Many of the control blocks are moving above the line
  - Help reduce outages caused by storage shortages when large number of requests are active concurrently
- **Reduction in IPL time**
  - Can Significantly reduce the system restart time for planned/unplanned outages
  - IOS will execute device initialization in parallel
- **z/OS 1.6 will allow XCF Couple Data Sets to be formatted for up to 2,047 members per XCF Group**

z/OS 1.6 Service Aids Enhancements

- **Service Aids enhancements can help a systems programmer in problem diagnosis**:
  - Use IPCS FINDSWA subcommand to locate a Scheduler Work Area (SWA) control block in a dump
  - Activate multiple instances of GTF simultaneously
  - Specify the value for buffers through the SIZE parameter on the GTF Start command
  - Generate reports about the IPL process and options using the EPTRACE command

zSeries Architectural Level Set for z/OS 1.6

- **z/OS 1.6 will require z/Architecture**
  - z/OS 1.6 planned availability is September 2004
- **Only zSeries Servers (or comparable) are planned to be supported:**
  - z990 or comparable server
  - z900 or comparable server
  - z890 or comparable server
  - z800 or comparable server
- **The following servers do not support z/Architecture and will not be able to run z/OS 1.6**
  - S/390 Parallel Enterprise Server™ - Generation 5 (G5) and Generation 6 (G6) models or comparable server
  - All models of the Multiprise® 3000 Enterprise Server or comparable server
- **z/OS 1.5 is the last release that is planned to run on G5/G6/MP3000 Servers**
  - End of Service for z/OS 1.5 is planned for March 2007

z/OS Operating Systems Support

z/OS 1.1

OS/390 2.10
z/OS 1.2
z/OS 1.3
z/OS 1.4*
z/OS 1.5*

*z890/z990 for Exploitation

z/OS.e 1.3
z/OS.e 1.4
z/OS.e 1.5

z/OS 1.6
(z/Architecture only)

z890/z990 for Exploitation

- z/OS 1.2 service is withdrawn in October 2004

z/OS Support Summary Dates

		G3-G4	G5/G6 Multiprise 3000	z800	z890	z900	z990	End of Service	Coexists with z/OS...	Planned Ship Date
OS/390	2.8	x	x	x		x		9/02	1.2	
	2.9	x	x	x		x		9/03	1.3	
	2.10	x	x	x	x^C	x	x^C	9/04	1.4	
z/OS	1.1		x	x		x		3/04	1.4	
	1.2		x	x	x^C	x	x^C	10/04	1.5	
	1.3		x	x	x^C	x	x^C	3/05	1.6	
	1.4		x	x	x	x	x	3/07	1.7	9/02
	1.5		x	x	x	x	x	3/07*	1.8	3/04
	1.6			x	x	x	x	9/07*	TBD	9/04

x^C - Compatibility support - does not exploit new z990 features: 30 Logical Partitions and muliple Logical Channel SubSystems
IBM Bimodal Accommodation Offering is available for z/OS 1.2, 1.3, and 1.4 (not z/OS.e). It will not be provided for z/OS 1.5
z/OS 1.4 will remain orderable until Sept 9, 2004
z/OS 1.5 will be orderable between March13 and Sept. 9, 2004
*planned date

z/OS.e Support Summary Dates

		z800	z890	End of Service	Coexistence Migration Policy	Planned Ship Date
z/OS.e	1.3	x	x^C	3/05	1.6	
	1.4	x	x	3/07	1.7	9/02
	1.5	x	x	3/07*	1.8	3/04
	1.6	x	x	9/07*	TBD	9/04

z/OS.e 1.4 and 1.5 will remain orderable until Sept. 9, 2004
Bimodal Accommodation offering is not available for z/OS.e

X^C - Compatibility support – does not exploit z890 features: 30 LPARs, 2 LCSS

IBM Systems & Technology Group

z/OS and z/OS.e 1.7 Preview
Planned Availability 3Q2005

z/OS and z/OS.e V1.7 Highlights

- **Application Integration**
  - zFS can be used as any file system in the hierarchy
- **Security**
  - Integrated IP Security support
  - RACF (Security Server) improvements
- **Scale**
  - SAM and EXCP data sets greater than 64k tracks
  - Constraint relief of 255 extents per VSAM component
- **Availability**
  - TCP/IP Sysplex Autonomics
    - Sysplex support for Server-Specific Workload Management
    - Sysplex Distributor support for unresponsive target
    - Sysplex Autonomic Takeover
    - z/OS Load Balancing Advisor
  - TCP/IP Sysplex operational enhancements
  - z/OS UNIX System Services dynamic refresh

Planned Availability: 3Q2005

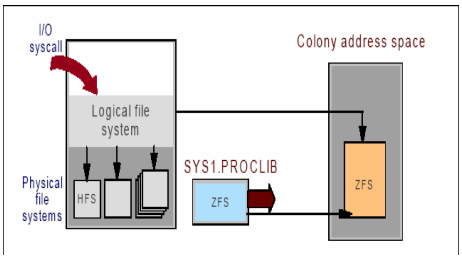
z/OS and z/OS.e 1.7 Highlights

- **Optimization**
  - Virtualization Engine support
  - Workload Manager enhancements
  - XRC and GDPS enhancements
  - CICS sockets enhancements
- **Ease of Use**
  - IBM HealthChecker for z/OS and Sysplex integrate new base element
    - SDSF will support

Planned Availability: 3Q2005

zFS Enhancements

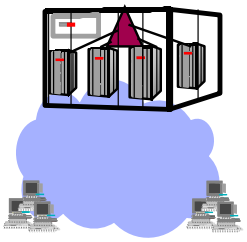
- **zFS can now be used as the root filesystem**
- **zFS recovery feature provided now for application End of Memory problems**
  - zFS aggregate data set names can now contain national characters (same as HFS data set names)
  - An operator command to unquiesce a quiesced zFS aggregate data set
  - **zfsadm** command forwarding in a sysplex
  - Tools provided to migrate HFS data to zFS



Planned Availability: 3Q2005

Sysplex Networking and Load Balancing

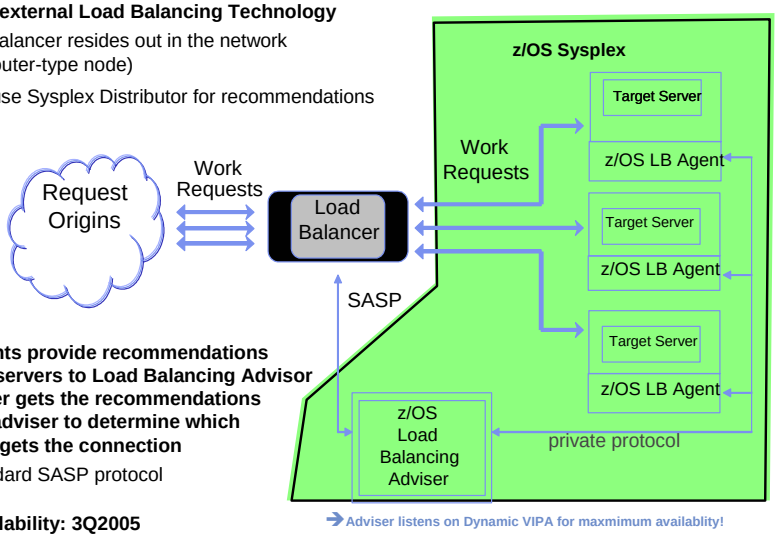
- **High availability and Workload Balancing with:**
  - Dynamic Virtual IP Address (DVIPA)
    - Presents single IP endpoint for cluster
    - Provides high availability allowing backup to take over
  - Sysplex Distributor
    - Workload balancing for servers bound to DVIPA
  - Support new external Load Balancing Technologies



Planned Availability: 3Q2005

z/OS Load Balancing Adviser

- **Support new external Load Balancing Technology**
  - The load balancer resides out in the network (typically router-type node)
  - Does not use Sysplex Distributor for recommendations

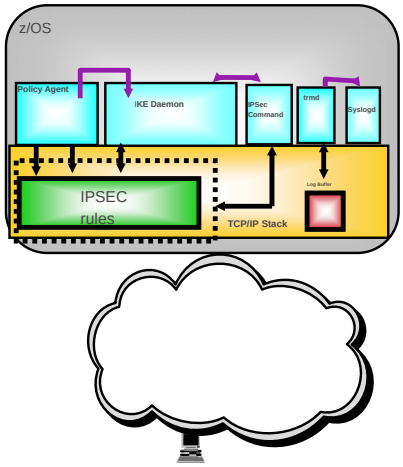


- **z/OS LB Agents provide recommendations about target servers to Load Balancing Advisor**
- **Load Balancer gets the recommendations from the LB adviser to determine which target server gets the connection**
  - Uses standard SASP protocol

Planned Availability: 3Q2005

Network Security

- **New and improved configuration and operations compared to existing Firewall Technologies which is deprecated as of z/OS 1.7**
  - Now configure IPSEC using policy agent
  - Policy agent installs into TCP/IP Stack and IKE Daemon where they are enforced
  - New IPSec command for operations and displays
  - Events logged for analysis by trmd
  - Improved diagnostic traces
  - New GUI for defining configuration

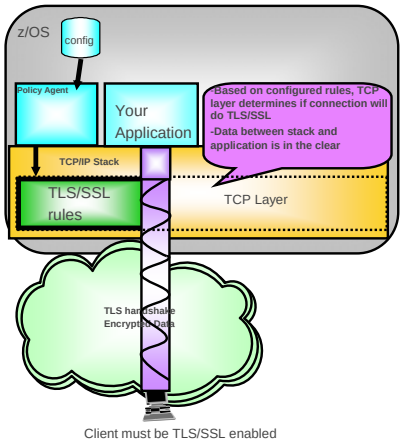


New IPSEC GUI

Planned Availability: 3Q2005

Value for Application Middleware

- **Application Transparent TLS/SSL**
  - Configure TCP/IP stack to perform TLS/SSL on behalf of applications
  - Configure using Policy Agent application to provide rule/action-based configuration

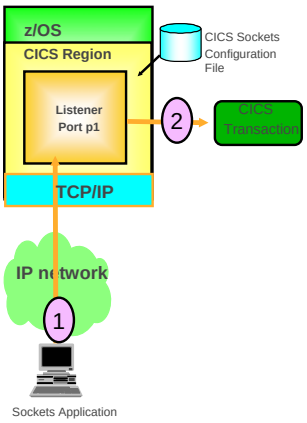


Client must be TLS/SSL enabled

Planned Availability: 3Q2005

Value for Application Middleware

- **CICS Sockets Enhancements**
  - General Performance improvements
  - Take advantage of CICS Open Transaction Environment (OTE)
    - Can reduce number of task switches
  - Leverage the Application Transparent TLS/SSL function provided in z/OS 1.7
    - Some CICS transactions may need SSL application awareness
- **Enhance FTP Client API (first offered in V1R6)**
  - Provide support to aid in use of C/C++



Planned Availability: 3Q2005

IBM HealthChecker for z/OS and Sysplex

- **Planned to be <u>included</u> as a new z/OS base element**
- **Two components**
  - **Framework** is a started task
  - **Checks** are provided as discrete deliverables
- **z/OS 1.7 SDSF support**
  - New Check (CK) panel allows:
    - Display checks
    - Alter checks
    - Browse checks
    - Print checks
- **Today provided as a no-charge Web download**
  - Runs on all supported z/OS releases
  - Best practices tool
  - Checks against active settings
  - Notifies when exceptions are found

Planned Availability: 3Q2005

XRC and GDPS

- **Allow replication of log data managed by the System Logger at a remote site**
  - Can Improve recovery time
  - Can Improve reduction of data loss
- **Currently, when data is written to staging data sets by Logger, the caller waits for the I/O to complete. This synchronous processing assures**
  - Data was hardened before returning to the caller
  - All records were written in order.
- **XRC+ allows asynchronous processing. The operation can be completed as far as the caller is concerned while the data is buffered and written to the staging volumes later. When SDM subsequently copies the data to the secondary GDPS site, the records are put in order if necessary.**
- **Added benefit of XRC+ is that the performance of the primary site is not impacted by I/O waits. This makes it practical to support IMS and CICS logging. Previously, their logging data rates could not be supported using XRC with acceptable transaction response time.**

Planned Availability: 3Q2005

z/OS UNIX System Services Dynamic Service Activation

- **New keywords in BPXPRMxx parmlib member, will allow customers to identify service libraries for LINKLIB and LPALIB**
- **Upon OMVS RESTART, loadmodules will be loaded from the service libraries**
  - For example BPXINPVT and BPXINLPA
- **Background:**
  - In z/OS 1.3, we allow the OMVS address space to be RESTARTed.
  - However, the modules used to build the OMVS address are not "*redriven*" to re-establish the OMVS address space
  - Dynamic linklist and Dynamic lpalist does not affect the restart process.

Planned Availability: 3Q2005

Security Server Improvements
RACF

- **RACF plans to support mixed-case passwords**
  - The FTP server will support mixed case passwords for user logon

Planned Availability: 3Q2005

Workload Manager Enhancements

- **Sub Capacity report Tool (SCRT) Extended for Dedicated CPUs**
  - 4-hour rolling average to include real consumed time without wait time
- **System Resource Manager (SRM) to react to nondisruptive processor speed changes to support CPU capacity on demand**

Planned Availability: 3Q2005

Scalability Enhancements

- **Support for greater than 64K tracks**
  - Sequential Access Method (SAM) and EXCP data sets
- **Relief for 255 extents per VSAM component**

Additional Information

- **z/OS Web site**
  - **ibm.com**/servers/eserver/zseries/zos
  - **ibm.com**/servers/eserver/zseries/zose
- **z/OS Migration and Installation Web pages**
  - **ibm.com**/servers/eserver/zseries/zos/installation/zos_migration.html
- **Order z/OS online**
  - **ibm.com**/software/ShopzSeries/
- **z/OS Hot Topics Magazine**
  - **ibm.com**/servers/s390/os390/bkserv/hot_topics.html
- **The Washington Systems Center flashes**
  - **ibm.com**/support/techdocs/