

Plan your migration to z/OS V1.9!

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Plan your migration to z/OS V.9!

In this teleconference, we will discuss:

- Features that are removed in V1.9, along with features that will be removed in the future.
- Ordering and delivery options
- Coexistence, migration, fall-back and service policies
- Driving and target system requirements for both software and hardware
- BCP, Distributed File Service (DFS), DFSMS, ISPF, Language Environment, TSO/E, and z/OS UNIX.

The general availability date for z/OS V1 R9 was September 28, 2007.



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DB2*	Parallel Sysplex	PR/SM	System z10	z/Architecture
DFSMS	HiperSockets	RACF*	System z9*	z/OS*
DFSMSdss	HyperSwap	Rational*	SystemPac*	z/VM*
DFSMShsm	IBM*	REXX	Tivoli*	zSeries*
DFSMSmm	IBM logo*	RMF	TotalStorage*	
DFSORT*	IMS	System Storage		
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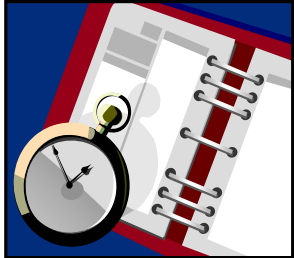
Notes:
 Performance is in Internal Throughput Rate (ITR) ratio based on measurements and projections using standard IBM benchmarks in a controlled environment. The actual throughput that any user will experience will vary depending upon considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve throughput improvements equivalent to the performance ratios stated here.
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Plan your migration to z/OS V1.9! Telecon

- **Introduction**
Gita Berg, z/OS Marketing Manager
- **Plan your migration to z/OS V1.9**
Marna WALLE, IBM z/OS System Build and Install
- **Questions and Answers**



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z/OS V1.9 – tight integration with the IBM System z10 Enterprise Class

Supporting System z innovation, raising the IT bar, and taking System z to the next level of...

... scalability and performance

- HiperDispatch for intelligent dispatching of work for optimized performance¹
- Up to 1 TB of real memory² and 64 processors (zIIPs, zAAPs, and CPs)³ per LPAR
- Large (1 MB) pages expected to reduce memory management overhead for exploiting applications³
- Support for Hardware Decimal Floating Point enables high performance computing for your commercial workloads³
- Support for InfiniBand Coupling Links¹

...availability

- Support for Basic HyperSwap – for high availability disk*,³
- Continued Parallel Sysplex enhancements

... networking and connectivity

- Policy-based networking helps create a network responsive to your application needs

... simplified operations and development

- Capacity Provisioning Manager – Dynamically allocate/ deallocate resources on System z10³
- z/OS Management Facility (SOD) - a single, modern, Web-browser based management console for z/OS, intended to simplify day-to-day operations and administration of a z/OS system*.
- System REXX, METAL C, improved integration with IBM Rational Developer for System z
- Improved message handling and SMF data collection

...improved economics

- Additional XML exploitation of specialty engines
- zIIP assisted z/OS Global Mirror (XRC)³

(1) available with z/OS V1.7 with appropriate maintenance

(2) available with z/OS V1.8 and appropriate maintenance, 1TB memory on z10 E56 and E64 only

(3) available with z/OS V1.9 and appropriate maintenance

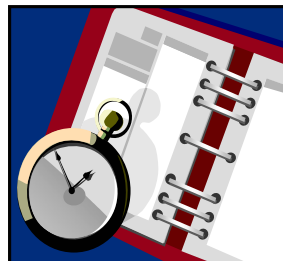
* Statements regarding IBM future direction and intent are subject to change or withdrawal, and represents goals and objectives only.

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Plan your migration to z/OS V1.9! Agenda

- ▶ **z/OS Withdrawn Functions**
- ▶ **z/OS Ordering and Deliverables**
- ▶ **z/OS Coexistence-Migration-Fallback**
- ▶ **Positioning for z/OS R9:**
 - Ensuring System Requirements are Satisfied – Driving and Target
 - Coexistence System Requirements
 - Tools to help: EPSPT, and IBM Migration Checker for z/OS
- ▶ **Migration Actions for selected elements:**
 - BCP
 - ISPF
 - DFSMS
 - zFS
 - Language Environment
 - TSO/E
 - z/OS UNIX



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Related Publications:


- z/OS and z/OS.e Planning for Installation (GA22-7504)*
- z/OS Introduction and Release Guide (GA22-7502)*
- z/OS Program Directory (n/a)*
- zSeries Platform Test Report for z/OS and Linux Virtual Servers (formerly, the z/OS Parallel Sysplex Test Report)*
- z/OS License Program Specifications (GA22-7503)*
- z/OS Migration (GA22-7499)*
- z/OS Summary of Interface and Message Changes (SA22-7505)*
- z/OS MVS Planning: Operation (SA22-7601)*
- z/OS MVS Initialization and Tuning Reference (SA22-7592)*
- z/OS UNIX System Services Planning (GA22-7800)*
- ServerPac: Installing Your Order (no order number; custom-built to your order)*
- ServerPac: Using the Installation Dialog, (SA22-7815)*

URL	DESCRIPTION
http://www.ibm.com/servers/eserver/zseries/zos	IBM z/OS home page
http://publib.boulder.ibm.com/infocenter/ieduasst/stgv1r0/index.jsp	IBM Education Assistant
http://www.ibm.com/servers/eserver/zseries/zos/servicetst/	Consolidated Service Test (CST) home page
http://www.ibm.com/servers/eserver/zseries/zos/installation/	z/OS Installation
http://www.ibm.com/servers/eserver/zseries/zos/support/zos_eos_dates.html	End of Service dates for z/OS releases
http://www.ibm.com/servers/eserver/zseries/zos/integtst/	zSeries Platform Test web page
http://www.ibm.com/servers/eserver/zseries/zos/bkserv/	z/OS Library web page
http://www.redbooks.ibm.com/	IBM Redbooks web page
http://www.ibm.com/support/techdocs/atmastr.nsf/Web/Flashes	IBM Systems Center Flashes
http://www.ibm.com/servers/eserver/zseries/zos/support/	z/OS Technical Support
http://www.ibm.com/servers/eserver/zseries/zos/wizards/	z/OS Wizards
http://www.ibm.com/ibmlink	IBMLink web page
http://service.boulder.ibm.com/390holddata.html	Enhanced HOLDDATA web page
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https://www.ibm.com/services/ca/en/custompac/	CustomPac web page
http://www.ibm.com/software/shopzseries	ShopzSeries home page
http://www.ibm.com/support/operations/us/order_delivery/order_delivery.shtml	IBM Order Status homepage
http://www.ibm.com/servers/eserver/zseries/zos/software/isv19.html	Software Dev. Supporting z/OS V1.9
http://www.ibm.com/servers/eserver/zseries/swprice/	IBM System z Software Pricing: home
http://www.ibm.com/servers/eserver/zseries/swprice/zna1c.html	IBM System z Software Pricing: zNALC
http://www.ibm.com/servers/eserver/zseries/zos/zos_sods.html	z/OS statements of direction web page
http://www.ibm.com/software/network/commserver/zos/	z/OS Communications Server web page
http://www.ibm.com/servers/eserver/zseries/zos/hchecker/check_table.html	z/OS Health Checker Checks web page
http://www.ibm.com/s390/java	z/OS Java web page

IBM Education:

IBM courses are available for z/OS. For schedules and enrollment on the world wide web, IBM Global Campus URL: <http://www.ibm.com/services/learning/> .

Element and Functions Withdrawn from z/OS R8		
zFS multi-file system aggregate shared across a sysplex (from Distributed File Service)	Base Element - zFS compatibility mode aggregates (which have a single file system per data set) will continue to be supported in all environments.	as of z/OS R8
Firewall Technologies (from Integrated Security Services)	Base Element - Many Firewall Technologies functions have been long stabilized and can be replaced w/ Comm Server functions (IPSecurity). Some functions won't have replacements.	as of z/OS R8
Some Communications Server functions	Base Element - TCP/IP Configuration profile block definitions, PAGTSNMP subagent, EE TGs definition by specifying multiple SAP addr, and AnyNet 	as of z/OS R8
Any remaining one-byte console ID support (from BCP)	Base Element - Use console names instead of one-byte console IDs	 as of z/OS R8
Certain plug-ins for msys for Setup: TCP/IP Services, z/OS UNIX System Services, Language Environment, Parallel Sysplex, ISPF, and RMF	Base Element - TCP/IP plug-in available from web and won't require msys for Setup. Improvements for setup and configuration are planned in the future.	as of z/OS R8
msys for Operations	Base Element - IBM plans to transition many of the current msys for Operations functions to a new user interface and infrastructure in a future release of z/OS.	Planned for release after R7

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Withdrawn in z/OS R8 (last delivered in z/OS R7)

This section lists items that were withdrawn in z/OS R8. You should take this into account as you plan your migration through z/OS R8. The removal of these functions may have migration actions which you can perform now, in preparation for z/OS R8 or z/OS R9.




- z/OS R7 was the last release to allow mounting zFS file systems contained in 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. Attempts to mount zFS file systems contained in multi-file system aggregates will fail in a z/OS UNIX shared file system environment. Mounting zFS compatibility mode aggregates, which have a single file system per data set, will continue to be supported in all environments.
- z/OS R7 was the last release to include the Firewall Technologies component of the Integrated Security Services element. Many Firewall Technologies functions have been stabilized for some time and can be replaced using comparable or better functions provided by or planned for Communications Server, notably, IPSecurity. In addition, a functionally rich downloadable tool is planned to replace the IPSecurity and IP Filtering configuration GUI support. The following functions will be removed without replacement:
 - FTP Proxy services
 - Socks V4 services
 - Network Address Translation (NAT)
 - RealAudio (TM) support
- z/OS R7 was the last release in which z/OS Communications Server will support the following functions, after which they will be removed from the product:
 - TCP/IP configuration profile block definition statements:
 - ASSORTEDPARMS
 - ENDASSORTEDPARMS
 - KEEPALIVEOPTIONS,


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- ENDKEEPALIVEOPTIONS

Equivalent capability is provided for the ASSORTEDPARMS statements by the GLOBALCONFIG, IPCONFIG, TCPCONFIG, and UDPCONFIG statements. Equivalent capability is provided for the KEEPALIVEOPTIONS statements by INTERVAL and SENDGARBAGE on the TCPCONFIG statement. For information on TCP profile and configuration statements, refer to *z/OS Communications Server IP Configuration Reference*.

- The SNMP Service Level Agreement (SLA) Version 1 MIB and the PAGTSNMP subagent. In z/OS V1.5, Communications Server provided a new SNMP SLA Version 2 MIB and NSLAPM2 subagent. IBM recommends that you migrate to the new Version 2 MIB and NSLAPM2.
- The option of defining parallel Enterprise Extender TGs by specifying multiple SAP addresses. Beginning in z/OS V1.5, parallel EE TGs may be defined by using different EE VIPAs on one (or both) of the endpoints.
- AnyNet. You may implement other IBM solutions such as Enterprise Extender (EE) as a replacement for AnyNet.
- In z/OS R8, the remaining support for one-byte console IDs was removed from control blocks CIB, CSCB, ORE, WQE, XSA. This completes the removal of one-byte console IDs in z/OS. Instead of using one-byte console IDs, console names should be used.
- Support for the following plug-ins for msys for Setup was withdrawn in z/OS R8: TCP/IP Services, z/OS UNIX System Services, Language Environment, Parallel Sysplex, ISPF, and RMF. You will not be able to use msys for Setup for function enablement, setup, or configuration of these areas of z/OS. The DB2 V8 msys for Setup plug-in is unaffected and remains available for setup and configuration of DB2. The TCP/IP plug-in will continue to be available for download via the Web and will no longer require msys for Setup. IBM intends to continue to deliver improvements to help with z/OS setup and configuration in the future.
- z/OS R7 is the last release to support the z/OS msys for Operations element. msys for Operations has been removed from z/OS V1.8. IBM plans to transition many of the current msys for Operations functions to a new user interface and infrastructure in a future release of z/OS.

Element and Functions Withdrawn from z/OS R9		
Host communication between HCM and HCD with APPC (from HCM)	Priced Feature - Only TCP/IP for host communication between HCM and HCD will be allowed. (Currently both TCP/IP and APPC are supported.)	as of R9
In-stack version of TN3270 Server (from Communications Server)	Base Element - use standalone TN3270 Server instead (introduced in z/OS R6)	as of R9 
APPC Application Suite in Communications Server	Base Element - more full-featured alternative applications exist in modern integrated SNA/IP networks. (APPC itself remains an integral part of SNA functions, and no plans to remove APPC from z/OS.)	as of R9
Run-time support for applications that use the C/C++ IBM Open Class (IOC) Dynamic Link Libraries (DLLs).	Priced Feature - Any application code that uses the IOC Library should migrate to use the Standard C++ Library	as of R9 

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Withdrawn in z/OS R9 (last delivered in z/OS R8)

This section lists items that were withdrawn in z/OS R9. You should take this into account as you plan your migration to z/OS R9. The removal of these functions may have migration actions which you can perform now, in preparation for z/OS R9.

- In z/OS V1R8 and prior releases, host communication between HCM and HCD is performed using either TCP/IP or Advanced Program to Program Communication (APPC). Starting with z/OS V1R9, host communication using APPC is discontinued. Host communication is now done exclusively using TCP/IP.
- Before z/OS V1R9, the TN3270E Telnet server could run as part of the TCP/IP stack or in its own separate address space. Starting in z/OS V1R9, the TN3270E Telnet server is no longer available to run as part of the TCP/IP stack. You must run the TN3270E Telnet server in its own separate address space. The TN3270E Telnet server has been able to run in its own address space since z/OS V1R6. This enhancement provides visibility and control over the TN3270E function separate from the TCP/IP stack. For example, users can run the TN3270E Telnet server at a different priority than the TCP/IP stack. This enhancement also provides the ability to stop and restart the TN3270E Telnet server without stopping the TCP/IP stack. This makes it easier to reset the server or install maintenance. Overall, problem diagnosis is easier and better when the TN3270E Telnet server and the TCP/IP stack are separate.
- The APPC Application Suite is a set of common applications originally designed to enhance the value of SNA networks for end users. Because more full-featured alternative applications exist in modern integrated SNA/IP networks, z/OS V1R8 is the last release that includes the APPC Application Suite. As of z/OS V1R9, the APPC Application Suite is no longer shipped with the product and is not supported. But note that APPC itself remains an integral part of z/OS. Consider the following alternatives to the APPC Application Suite:
 - For A3270, consider migrating to TN3270. TN3270 provides a much richer capability assuming IP connectivity exists between the client and server.
 - For APING, use the DISPLAY APING command that has been provided as a native VTAM command for many years.

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- A number of other IBM and vendor products provide SNA file transfer capability (such as NetView FTP) and can be used to replace AFTP. TCP/IP's FTP capability is also a good alternative if an IP infrastructure is in place between the client and server.
- In z/OS V1R5, development support for the C/C++ IBM Open Class® Library, specifically, the Application Support Class and Collection Class libraries, was removed. From z/OS V1R5 to z/OS V1R8, only run-time support was provided for the C/C++ IBM Open Class Library. Now, with z/OS V1R9, the run-time support is also removed. If you have applications that depend on the C/C++ IBM Open Class Library run-time support, they will not run in z/OS V1R9.

Functions Planned to be Withdrawn in R10 and the release after z/OS R10...





Assignment of CPU affinity to a logical processor from BCP	Base Element –CPU affinity has long been obsolete for z/OS partitions operating under PR/SM. Future releases will ignore any attempt to assign CPU affinity	Planned for R10
RMF LDAP replacement (from RMF)	Priced Feature - RMF LDAP interface is planned to be replaced with a CIM Monitoring Interface	Planned for R10
English and Japanese panels from DFSORT	Priced Feature - no replacement offered	Planned for R10
BIND DNS 4.9.3 from CS	Base Element - implement BIND 9.2.0 as a replacement (available since z/OS R4)	Planned for release after R10
Network Database (NDB) function from CS	Base Element - investigate the distributed data facility (DDF) provided by z/OS DB2, and the DB2 Run-Time Client	Planned for release after R10
DHCP server function from Communications Server	Base Element - investigate using a DHCP server on Linux for System z	Planned for release after R10

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Functions Planned to be Withdrawn after z/OS R10 and in the future...



Boot Information Negotiation Layer (BINL) function from CS	Base Element - investigate the use of IBM Tivoli Provisioning Manager for OS Deployment for network based operating system installation services	Planned for release after R10
Integrated Security Services LDAP Server	Base Element - implement IBM Tivoli Directory Server for z/OS (available since z/OS R8)	Planned for release after R10 
zFS multi-file system aggregates (from Distributed File Service)	Base Element - zFS compatibility mode aggregates will still be supported	Future
Support for VSAM data sets with IMBED and REPLICATE (not KEYRANGE) attributes from DFSMS	Base Element - plan to redefine any affected VSAM data sets. Use tool to assist in identifying affected VSAM data sets. (KEYRANGE removed from this statement as of z/OS R9 GA Announce.)	Future 

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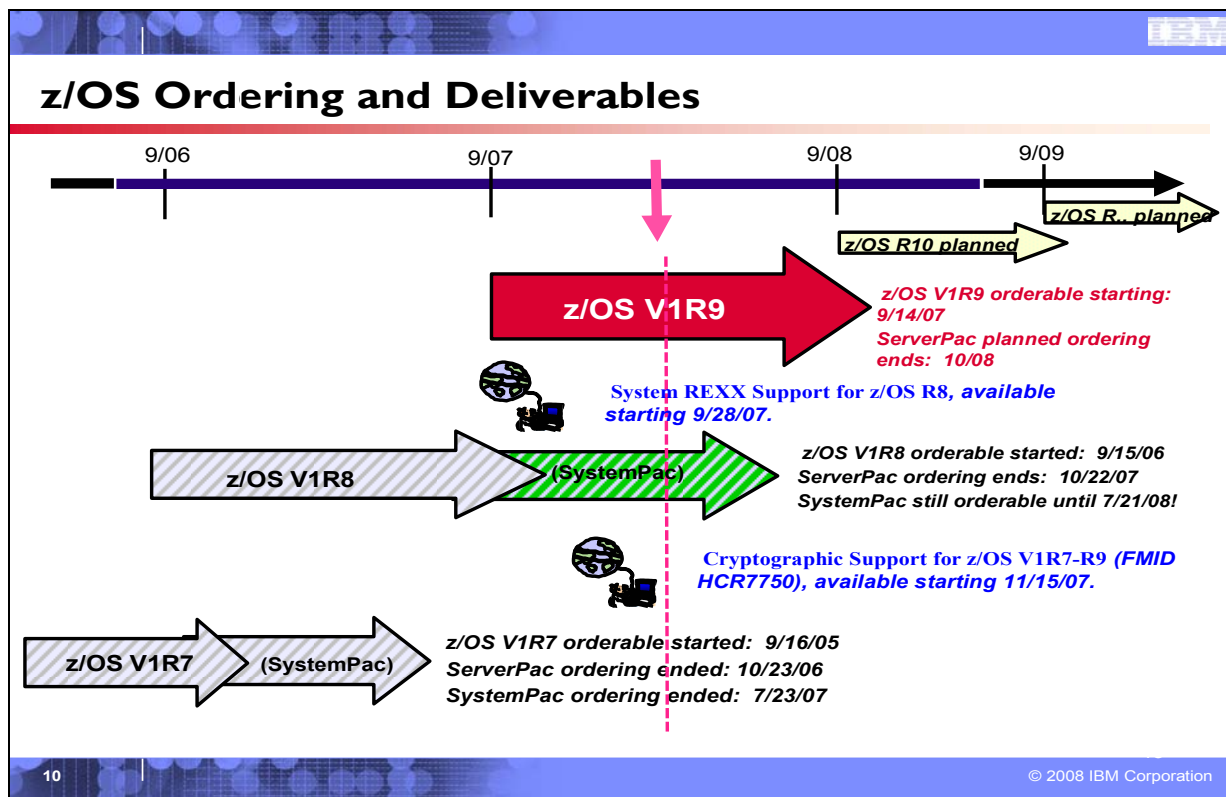
Planned for removal in a future z/OS release

This section lists items that IBM has announced it intends to remove in a future z/OS release. You are encouraged to consider these removals when making your plans for system upgrades. These statements represent IBM's current intentions. IBM development plans are subject to change or withdrawal without further notice.

- IBM intends to remove support for CPU affinity. CPU affinity originally provided support for assigning work to the same CP. However, this predates PR/SM, which introduced logical processors. CPU affinity has long been obsolete for z/OS partitions operating under PR/SM, which makes the CP on which a piece of work executes unpredictable. z/OS V1.9 is planned to be the last release to provide support for the assignment of CPU affinity to a logical processor. Future releases will ignore any attempt to assign CPU affinity. For example, specifications for assigning a program to a specific logical processor or processors using the Program Properties Table (PPT) or a SCHEDxx member of parmlib will be ignored.
- The DFSORT ISPF panels are used to generate and execute DFSORT jobs, and are available in both English and Japanese. z/OS V1R9 is planned to be the last release that supports these panels. No replacement is planned for this limited-function interactive facility. All other previously supported methods for invoking DFSORT are planned to still be supported.
- The RMF LDAP backend, ERB6LBCK, allows access to RMF performance data from application programs. IBM plans to remove this interface from z/OS V1.10. In its place you can use the Common Information Model (CIM) monitoring interface, which has been provided since z/OS V1R7.
- Network Database (NDB) function: z/OS V1.10 is planned to be the last release in which z/OS Communications Server will support the Network Database (NDB) function. After z/OS V1.10, the function will be removed from the product. Customers who currently use or plan to use the NDB function should investigate the distributed data facility (DDF) provided by z/OS DB2, and the DB2 Run-Time Client. DDF allows client applications running in an environment that supports DRDA(R) to access data at DB2(R) servers.
- BIND DNS 4.9.3: z/OS V1.10 is planned to be the last release in which z/OS Communications Server will support BIND DNS 4.9.3. After z/OS V1.10, the function will be removed from the product. BIND DNS 9.2.0 has been available since z/OS V1.4, and customers should implement this version as a replacement for BIND DNS 4.9.3. Customers that use the load balancing Connection Optimization (DNS/Workload Manager) feature of BIND DNS 4.9.3 should investigate Sysplex Distributor, the Load Balancing Advisor, Automated Domain Name Registration (ADNR), or other solutions.
- Boot Information Negotiation Layer (BINL): z/OS V1.10 is planned to be the last release in which z/OS Communications Server will support the Boot Information Negotiation Layer (BINL). After z/OS V1.10, the function will be removed from the product. Customers using this function should investigate the use of IBM Tivoli Provisioning Manager for OS Deployment for network based operating system installation services.
- DHCP server: z/OS V1.10 is planned to be the last release in which z/OS Communications Server will support the DHCP server function. After z/OS V1.10, the function will be removed from the product. Customers who currently use or plan to use the z/OS DHCP server should investigate using a DHCP server on Linux for System z.
- Integrated Security Services LDAP Server: z/OS V1.10 is planned to be the last release of z/OS which will support the Integrated Security Services LDAP Server. A new optimized LDAP server, called IBM Tivoli(R) Directory Server for z/OS was delivered for z/OS 1.8. Customers who are currently using the Integrated Security Services LDAP Server, should investigate migrating to the Tivoli(R) Directory Server for z/OS, which was designed to allow greater consolidation of LDAP directories on z/OS to help simplify enterprise management and disaster recovery.
- 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.)
- Support for the VSAM KEYRANGE attribute will not be withdrawn as stated in announcement IBM z/OS 1.6: Integrating new applications and Preview: z/OS V1.7, 204-180, dated August 10, 2004. No supported release of z/OS allows you to define new VSAM data sets with the KEYRANGE attribute. On modern storage devices, KEYRANGE is generally detrimental to performance. For this reason, IBM recommends that you minimize or eliminate your use of KEYRANGE. Striped data sets are expected to provide better performance than KEYRANGE, and can be viewed as a good replacement for KEYRANGE data sets. To detect the KEYRANGE attribute on existing data sets, refer to INFO APAR II13894 or use the DFSMSHsm ARCTOOLS (FINDKRDS) to detect this attribute for data sets migrated with DFSMSHsm(TM). Details on how to use this tool is in the DFSMSHsm Implementation and Customization Guide (SC35-0418).

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In a future release of z/OS, when DFSMSHsm or DFSMSdss recalls or restores a VSAM data set with either IMBED or REPLICATE attribute or both, the attributes will be removed. No supported release of z/OS allows you to define new VSAM data sets or catalogs with the IMBED or REPLICATE attributes, and using them for existing data sets can waste DASD space and can often degrade performance. IBM recommends that you stop using these attributes. For information about how to detect IMBED and REPLICATE attributes on existing data sets and catalogs, refer to INFO APAR II13894.



z/OS Ordering and Deliverable Key Dates

Key Dates for z/OS R8 and z/OS R9 ordering:

- **September 14, 2007:** First date for ordering z/OS V1.9 ServerPac, SystemPac, CBPDO using CFSW configuration support, or ShopzSeries, the Internet ordering tool. Note that most z/OS media (executable code) is shipped only through Customized Offerings (ServerPac, SystemPac, and CBPDO).
- **September 28, 2007:** z/OS V1.9 general availability via ServerPac, CBPDO and SystemPac.
- **September 28, 2007:** General availability of System REXX Support for z/OS V1.8 and z/OS.e V1.8 Web deliverable. This Web deliverable will support z/OS V1.8 and z/OS.e V1.8.
- **October 9, 2007:** Recommended last date for submitting z/OS V1.8 orders via the entitled Customized Offerings (ServerPac and CBPDO).
- **October 22, 2007:** Last date for ordering z/OS V1.8 via ServerPac and CBPDO.
- **November 15, 2007:** General availability of Cryptographic Support for z/OS V1R7-R9 & z/OS.e V1R7-R8 Web deliverable (FMID HCR7750). This Web deliverable supports z/OS V1.7 through z/OS V1.9 and z/OS.e V1.7 through z/OS.e V1.8.
- **June 23, 2008:** Recommended last date for submitting z/OS V1.8 orders via the fee Customized Offering SystemPac. This date will allow for adequate order processing time.
- **July 21, 2008:** Last date for ordering z/OS V1.8 via SystemPac.
- **October 2008:** Planned last date for ordering z/OS V1.9 via ServerPac and CBPDO.

Web deliverables

Sometimes enhancements are provided as Web deliverables, and not integrated in your ServerPac, CBPDO, or SystemPac deliverable. For example, some of the ICSF enhancements are available this way. z/OS Web deliverables

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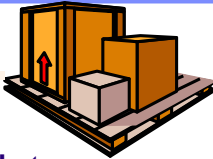
are available from <http://www.ibm.com/eserver/zseries/zos/downloads/>. They are packaged as two files that you download:

- A **readme** file, which contains a sample job to uncompress the second file, transform it into a format that SMP/E can process, and invoke SMP/E to RECEIVE the file. This file must be downloaded as text.
- A **pax.z** file, which contains an archive (compressed copy) of the FMIDs to be installed. This file needs to be downloaded to a workstation and then uploaded to a host as a binary file.

For Web downloads, you must perform the following tasks:


1. Allocate a R/W HFS or zFS directory on the z/OS driving system where the package will be staged (optional).
2. Download both parts of the package from the download zone:
<http://www.ibm.com/eserver/zseries/zos/downloads/>
3. Run the sample job provided in the README.TXT file. The job will invoke the GIMUNZIP service routine to extract the original data from the packages.
4. Obtain and install service for the target system. Service is not included in Web deliverables. You can obtain service for Web deliverables through your regular preventive service deliverables that you use for z/OS.
5. Install (SMP/E APPLY) the downloaded FMIDs.

z/OS V1R9 Ordering



► **Program Number: 5694-A01**

- Ensure you order the optional priced and unpriced features that you were using before!
- Especially remember your export controlled features, if you desire. Here's the complete list:
 - z/OS Security Level 3
 - Communications Server Security Level 3
- Ordering consideration for:
 - **ICSF**: since ICSF is integrated into z/OS R9 is **not** the highest level available after November 15, 2007. You may want to add the Web deliverable to your z/OS system.
 - Order z/OS V1R9 electronically via ShopzSeries!
 - When you do this, you can choose to have an electronic ServerPac!
 - Notice there is: "z/OS V1 Base" and "z/OS V1 Alternate Base" - pick the right one!



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z/OS V1R9 Ordering

The program number for z/OS Version 1 Release 9 is **5694-A01**. When ordering this program number, remember to order all the optional features that you were licensed for in previous releases of z/OS.

In z/OS V1R9 there are only two export controlled unpriced features: **z/OS Security Level 3**, and **Communications Server Security Level 3**. z/OS Security Level 3 contains the sub-elements: IBM Tivoli Directory Server for z/OS Security Level 3, Network Authentication Service Level 3, OCSF Security Level 3, and System Secure Sockets Layer (SSL) Security Level 3,

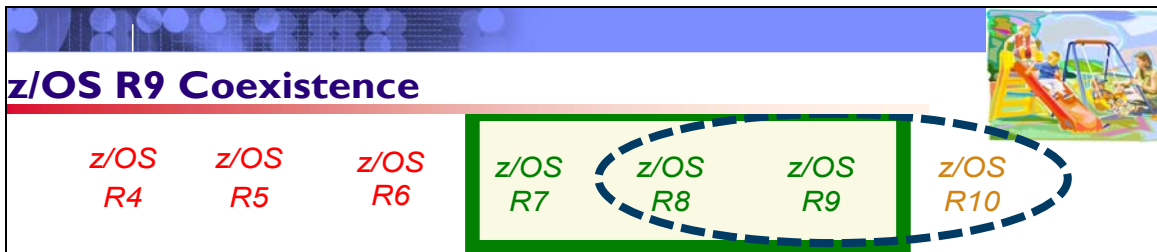
Typically, when one new z/OS release becomes orderable in ServerPac and CBPDO, the previous release is orderable for only a month. Due to this short overlap, it is very important that you order the z/OS release you need for migration and coexistence while it's still available for ordering. Typically, a z/OS release remains orderable in the fee'd deliverable SystemPac longer than in ServerPac.

Ordering and Installing z/OS R9 Electronically!

In many countries you may order z/OS electronically through ShopzSeries. ShopzSeries provides customers a self-service capability for planning and ordering S/390 software (and service) upgrades over the Web. It is the strategic worldwide self-service ordering system for zSeries software. You can order products through ShopzSeries and have them delivered electronically in some countries.

In most countries, ShopzSeries provides electronic ordering and electronic delivery support for z/OS Service. You can access it directly off the ShopzSeries web site at: <http://www.ibm.com/software/shopzseries>. When you order the z/OS product on ServerPac from ShopzSeries, you can choose to have it electronically delivered to you! This electronic ability was made generally available on January 10, 2005.

z/OS R9 Coexistence



- **Starting with z/OS R6, IBM has aligned the coexistence, fallback, and migration policy with the service policy.**
- **z/OS R7, z/OS R8, and z/OS R9** are supported for coexistence, migration, and fallback
 - **If you are on z/OS R7 your planning for migration to z/OS R9 should be starting!**
- **Only JES2/JES3 that can coexist with the shipped JES can be "staged" on z/OS. This is enforced in z/OS V1 R9. That means:**
 - z/OS R7 JES2 and z/OS R8 JES2 are supported for coexistence, migration, and fallback
 - z/OS R7 JES3 and z/OS R8 JES3 are supported for coexistence, migration, and fallback
 - At z/OS R9, SDSF must be staged with JES2! So, on z/OS R9 with
 - z/OS R8 JES2 has z/OS R8 SDSF. z/OS R7 JES2 has either z/OS R8 SDSF or R7 SDSF.

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Understanding Coexistence

Coexistence occurs when two or more systems at different software levels share resources. The resources could be shared at the same time by different systems in a multisystem configuration, or they could be shared over a period of time by the same system in a single-system configuration. Examples of coexistence are two different JES releases sharing a spool, two different service levels of DFSMSdfp sharing catalogs, multiple levels of SMP/E processing SYSMODs packaged to exploit the latest enhancements, or an older level of the system using the updated system control files of a newer level (even if new function has been exploited in the newer level).

The sharing of resources is inherent in multisystem configurations that involve Parallel Sysplex implementations. But other types of configurations can have resource sharing too. Examples of configurations where resource sharing can occur are:

- A single processor that is time-sliced to run different levels of the system, such as during different times of the day
- A single processor running multiple images by means of logical partitions (LPARs)
- Multiple images running on several different processors
- Parallel Sysplex or non-Parallel Sysplex configurations

Note: The term coexistence does not refer to z/OS residing on a single system along with VSE/ESA, VM/ESA, or z/VM in an LPAR or as a VM guest.

z/OS systems can coexist with specific prior releases. This is important because it gives you flexibility to migrate systems in a multisystem configuration using rolling IPLs rather than requiring a systems-wide IPL. The way in which you make it possible for earlier-level systems to coexist with z/OS is to install coexistence service (PTFs) on the earlier-level systems.

You should complete the migration of all earlier-level coexisting systems as soon as you can. Keep in mind that the objective of coexistence PTFs is to allow existing functions to continue to be used on the earlier-level systems when run

in a mixed environment that contains later-level systems. Coexistence PTFs are not aimed at allowing new functions provided in later releases to work on earlier-level systems.

Rolling z/OS across a multisystem configuration

A *rolling IPL* is the IPL of one system at a time in a multisystem configuration. You might stage the IPLs over a few hours or a few weeks. The use of rolling IPLs allows you to migrate each z/OS system to a later release, one at a time, while allowing for continuous application availability. For example, data sharing applications offer continuous availability in a Parallel Sysplex configuration by treating each z/OS system as a resource for processing the workload. The use of rolling IPLs allows z/OS systems running these applications to be IPLed one at a time, to migrate to a new release of z/OS, while the applications continue to be processed by the other z/OS systems that support the workload. By using LPAR technology, you can use rolling IPLs to upgrade your systems without losing either availability or capacity.

You can use rolling IPLs when both of the following are true:

- The release to which you're migrating falls is supported for coexistence, fallback, and migration with the releases running on the other systems.
- The appropriate coexistence PTFs have been installed on the other systems in the multisystem configuration.

Even when you're using applications that do not support data sharing, rolling IPLs often make it easier to schedule z/OS software upgrades. It can be very difficult to schedule a time when all applications running on all the systems in a multisystem configuration can be taken down to allow for a complex-wide or Parallel Sysplex-wide IPL. The use of rolling IPLs not only enables continuous availability from an end-user application point of view, but it also eliminates the work associated with migrating all z/OS systems in a multisystem configuration at the same time.

Understanding fallback

Fallback (backout) is a return to the prior level of a system. Fallback can be appropriate if you migrate to z/OS R9 and, during testing, encounter severe problems that can be resolved by backing out the new release. By applying fallback PTFs to the "old" system before you migrate, the old system can tolerate changes that were made by the new system during testing.

Fallback is relevant in all types of configurations, that is, single-system or multisystem, with or without resource sharing. As an example of fallback, consider a single system that shares data or data structures, such as user catalogs, as you shift the system image from production (on the "old" release) to test (on the new release) and back again (to the old release). The later-level test release might make changes that are incompatible with the earlier-level production release. Fallback PTFs on the earlier-level release can allow it to tolerate changes made by the later-level release.

As a general reminder, always plan to have a backout path when installing new software by identifying and installing any service required to support backout.

Fallback is at a system level, rather than an element or feature level, except for z/OS JES2 and z/OS JES3. That is, except for z/OS JES2 and z/OS JES3, you can't back out an element or feature; you can only back out the entire z/OS product. z/OS JES2 and z/OS JES3 fallback can be done separately as long as the level of JES is supported with the release of z/OS and any necessary fallback PTFs are installed.

Fallback and coexistence are alike in that the PTFs that ensure coexistence are the same ones that ensure fallback.

Note: Keep in mind that new functions can require that all systems be at z/OS V1R9 level before the new functions can be used. Therefore, be careful not to exploit new functions until you are fairly confident that you will not need to back out your z/OS V1R9 systems, as fallback maintenance is not available in these cases. You should consult the appropriate element or feature documentation to determine the requirements for using a particular new function.

Which releases are supported for coexistence, fallback, and migration?

Starting with z/OS R6, IBM has aligned the coexistence, fallback, and migration policy with the service policy.

IBM intends to continue with 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. This change to the coexistence, fallback, and migration policy is effective starting with z/OS R6 (that is, the first release of the new annual release cycle). **As a general rule, this means that three releases will be supported**

Plan your migration to z/OS V1.9!

for coexistence, fallback, and migration over a period of three years. This represents an increase of one year over the two-year period provided by the current coexistence, fallback, and migration policy of four releases under a six-month release cycle. The intention of this policy change is to simplify and provide greater predictability to aid in release migrations.

Exceptions are:

- In some cases, more than three releases may be coexistence, fallback, and migration supported if IBM at its sole discretion chooses to provide service support for greater than three years for a release.
- Any z/OS release having three or fewer months of service remaining at general availability of a new release will not be coexistence, fallback, or migration supported with the new release.

Thus, except for JES2 and JES3, **z/OS V1R9 is coexistence, fallback, and migration supported with the following two z/OS releases: V1R8 and V1R7.** This means that:

- Coexistence of a V1R9 system with a V1R8 or V1R7 system is supported.
- Fallback *from* V1R9 to V1R8 or V1R7 is supported.
- Migration *to* V1R9 *from* V1R8 or V1R7 is supported.

For JES2 and JES3, the way in which three consecutive releases is determined is different than for the rest of the operating system. If a JES2 or JES3 release is functionally equivalent to its predecessor (that is, its FMID is the same), then the release is considered to be the same JES release. Thus, **z/OS V1R9 JES2 and JES3 are coexistence, fallback, and migration supported with the following JES releases: V1R9, V1R8, and V1R7.**

As of z/OS V1R2, compliance to the coexistence, fallback, and migration policy for JES2 and JES3 is enforced. A migration to a JES2 or JES3 release level that is not supported by the policy results in the following:

- For JES2: If the JES2 release level for a system that is initializing is not compatible with the other active systems in the JES2 MAS, message HASP710 is issued and the JES2 address space for the initializing system is terminated.
- For JES3: If the JES3 release level for a local is not compatible with the global in a JES3 multisystem complex, message IAT2640 is issued and the JES3 local is not allowed to connect to the global.

The z/OS coexistence, fallback, and migration policy applies to the elements and features of z/OS, not to customer-developed applications, vendor-developed applications, or IBM products that run on z/OS. IBM performs integration testing and will provide service as necessary to support the z/OS coexistence, fallback, and migration policy.

See the table below for a summary of current and planned coexistence, fallback, and migration support. These statements represent IBM's current intentions. IBM reserves the right to change or alter the coexistence, fallback, and migration policy in the future or to exclude certain releases beyond those stated. IBM development plans are subject to change or withdrawal without further notice. Any reliance on this statement of direction is at the relying party's sole risk and does not create any liability or obligation for IBM.

Releases that are coexistence, fallback, and migration supported with z/OS V1R6 and beyond

z/OS release (see note 1)	Releases that are coexistence, fallback, and migration supported with the release in column one (see note 1)	Explanation (see note 2)
R6	R6, R5, R4, R3	The new policy starts. General availability of R6 was September 2004. R2 would be the oldest service-supported release at that time and therefore the oldest release that is coexistence, fallback, and migration supported. However, its end-of-service date (October

Plan your migration to z/OS V1.9!


		2004) is within three months of R6 general availability (September 2004), so R3 becomes the oldest release that is coexistence, fallback, and migration supported with R6.
R7	R7, R6, R5, R4	General availability of R7 was September 30, 2005. R4 is the oldest release that is service supported at that time and therefore the oldest release that is coexistence, fallback, and migration supported with R7.
R8	R8, R7, R6, R5	General availability of R8 was September 29, 2006. R4 is the oldest release that is service supported at that time because its end-of-service date was extended by 18 months to 31 March 2007. However, R4 is not coexistence, fallback, and migration supported with R8. Therefore, R5 is oldest release that is coexistence, fallback, and migration supported with R8.
R9	R9, R8, R7	General availability of R9 was September 28, 2007. R7 is the oldest release that is service supported at that time and therefore the oldest release that is coexistence, fallback, and migration supported with R9.
R10	R10, R9, R8	Planned general availability of R10 is planned for September 2008. R8 is planned to be the oldest release that is service supported at that time and therefore the oldest release that is coexistence, fallback, and migration supported with R10.

Notes:

For readability, the version numbers have been omitted from the releases shown. Also, release numbering of future releases (later than R7) is for illustrative purposes and is not a guarantee of actual release numbers.

Future general availability (GA) dates are projections based on the annual release cycle. Future end of service (EOS) dates are projections based on the 3-year service policy.

z/OS Service Policy



- ▶ Release serviceable for three years following GA
- ▶ Service on last release of a version might be extended
- ▶ At least 12 months notice before withdrawing service
- ▶ Handy website:
http://www.ibm.com/servers/eserver/zseries/zos/support/zos_eos_dates.html

	General Availability	Service Expiration
z/OS V1R4	27 September 2002	Occurred on 31 March 2007
z/OS V1R5	26 March 2004	Occurred on 31 March 2007
z/OS V1R6	24 September 2004	Occurred on 30 September 2007
z/OS V1R7	30 September 2005	Announced to be 30 September 2008
z/OS V1R8	29 September 2006	Planned to be September 2009
z/OS V1R9	28 September 2007	Planned to be September 2010

LOOK!

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Service Policy

IBM's current policy is to provide maintenance (service) for each release of z/OS for three years following their general availability (GA) date. However, service on the last release of a version might be extended beyond the intended three-year period. Prior to withdrawing service for any version or release of z/OS, IBM intends to provide at least 12 months notice. The service policy for z/OS also applies to any enhancements (including but not limited to web deliverables), such as the zIIP support enhancements that were provided for z/OS R6 and R7 via web deliverables.



See the table below for expiration dates for service support. Planned EOS dates are based on the 3-year service policy.

Version and release	General availability (GA)	End of service (EOS)
OS/390 V2R8	24 September 1999	Occurred 30 September 2002
OS/390 V2R9	31 March 2000	Occurred 31 March 2003
OS/390 V2R10	29 September 2000	Occurred 30 September 2004
z/OS V1R1	30 March 2001	Occurred 31 March 2004
z/OS V1R2	26 October 2001	Occurred 31 October 2004
z/OS V1R3	29 March 2002	Occurred 31 March 2005
z/OS V1R4	27 September 2002	Occurred on 31 March 2007
z/OS V1R5	26 March 2004	Occurred on 31 March 2007
z/OS V1R6	24 September 2004	Occurred on 30 September 2007
z/OS V1R7	30 September 2005	30 September 2008 (announced)
z/OS V1R8	29 September 2006	September 2009 (planned)
z/OS V1R9	28 September 2007	September 2010 (planned)

Positioning for z/OS R9



- ▶ **Read Documentation and PSP buckets**
 - *z/OS Migration* and *z/OS and z/OS.e Planning for Installation*
 - Software PSP buckets: ZOSVIRx: ZOSGEN, SERVERPAC, ...
 - Hardware PSP buckets: 2094DEVICE, 2096DEVICE, 2084DEVICE, 2086DEVICE, 2064DEVICE, 2066DEVICE. Use the Technical Help Database for PSP buckets!
 - PSP buckets no longer shipped in ServerPac or CBPDO! Use web site!
- ▶ **DASD Storage Requirements for z/OS R9:**

	z/OS R7	z/OS R8	z/OS R9	
Target	5,375	5,456	6,400	Approaching 3390-6 limit of 6678 cylinders !!! 
DLIB	7,455	7,362	8,900	
File System	2,800	2,800	2,900	Approaching 3390-3 limit of 3339 cylinders !!! 

sizes in 3390 cylinders

- ▶ **Ensuring System Requirements Are Satisfied**
 - Driving System Requirements
 - Target System Requirements
 - Hardware and Software
 - Coexistence System Requirements
- ▶ **Migration Actions You Can Do NOW**

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z/OS Documentation: Where to Start

To gain an overview of z/OS and plan for the installation, review:

- *z/OS V1 R9.0 Introduction and Release Guide (GA22-7502)*
- *z/OS V1R9 Planning for Installation (GA22-7504)*
- *zSeries Platform Test Report for z/OS and Linux Virtual Servers* (formerly, the *z/OS Parallel Sysplex Test Report*)

To install z/OS, review Preventive Service Planning (PSP) Buckets:

- ServerPac (if using ServerPac to install)
- z/OS and individual elements (including ZOSGEN, which is handy for coexistence service as mentioned later in this presentation)
- Hardware

In addition, to install z/OS using ServerPac, review:

- *ServerPac: Using the Installation Dialog (SC28-1244)*
- The custom-built installation guide, *ServerPac: Installing Your Order*

To install z/OS using CBPDO, review the *z/OS Program Directory*.

PSP Buckets

z/OS, and most products that run on it, provide files containing information that became available after the product documents were printed. Kept on IBM's RETAIN system and also available using IBMLink, these files are called preventive service planning (PSP) "buckets", or just "PSPs". PSP buckets are identified by an *upgrade* identifier, and specific parts of them are called *subsets*. Each upgrade contains information about a product. Subsets contain information about specific parts of a product. For example, the z/OS PSP bucket has subsets for the BCP, JES2, ServerPac, and others.

For software upgrades for ServerPac and CBPDO installations, refer to *z/OS Program Directory*. For software upgrades for SystemPac installations, the upgrade is CUSTOMPAC and the subsets are SYSPAC/FVD (for full volume dump format) and SYSPAC/DBD (for dump-by-data-set format).

At the beginning of each PSP bucket is a change index. For each subset, the change index identifies the date of the latest entries in each section. You can quickly determine whether there are new entries you need to read by checking the change index. Since z/OS V1R7, the contents of PSP buckets are no longer shipped with CBPDO and ServerPac orders. Instead of the actual PSP information, you now receive the names of relevant upgrades and subsets, and you're

directed to the PSP Web site (<https://techsupport.services.ibm.com/server/390.psp390>) for the contents of the buckets. This ensures that you see the latest PSP information, as the PSP information that was provided with an order was current only on the day the order was created.

The upgrade for the z/OS R9 PSP bucket is ZOSV1R9. Recognizing that there are many PSP buckets to review, z/OS uses descriptive element names, instead of FMIDs for the subsets. This reduces the number of PSP buckets that must be reviewed, since most elements are composed of multiple FMIDs. There are subsets in the ZOSV1R9 upgrade for general topics (ZOSGEN), and for the ServerPac deliverable (SERVERPAC) that should be reviewed also. DFSMS is consolidated into one subset. All PSP upgrades and subset IDs are listed in the *z/OS Program Directory*. However, the non-exclusive elements' stand-alone product upgrade and subsets are used.

Hardware PSP upgrade identifiers

Hardware PSP bucket upgrade IDs are in the form xxxxDEVICE and contain the latest software dependencies for the hardware, and recommended PTFs and APARs required for specific processor models. The PSP hardware upgrade identifiers are:

- 2097DEVICE for the z10 EC server
- 2094DEVICE for the z9 EC server
- 2096DEVICE for the z9 BC server
- 2084DEVICE for the z990 server
- 2086DEVICE for the z890 server
- 2064DEVICE for the z900 server
- 2066DEVICE for the z800 server

Tip: To simplify finding the appropriate PSP bucket and identifying which PTFs listed in the PSP bucket need to be installed on your system, you can use the Technical Help Database for Mainframe Preventive Service Planning Buckets (<http://www14.software.ibm.com/webapp/set2/psp/srchBroker>) and the Enhanced PSP Tool (EPSPT). The Web site provides a search capability as well as pull down lists for types of PSP buckets. The types supported include Processors, z/OS, and Functions. So you can simply select the processor you are preparing for and click **Go**.

DASD Storage Requirements

If you are migrating to z/OS R9 from z/OS R7 or you will have a different product set than your previous release, you will see increased need for DASD. How much more depends on what levels of products you are running. Keep in mind the DASD required for your z/OS system includes (per the z/OS Policy). That is, it includes ALL elements, ALL features that support dynamic enablement, regardless of your order, and ALL unpriced features that you ordered. This storage is in addition to the storage required by other products you might have installed. All sizes include 15% freespace to accommodate the installation of maintenance.

The total storage required for z/OS data sets is listed in the space table in the *z/OS Program Directory*.

For z/OS R9:

- The total storage required for all the target data sets is 6,400 cylinders on a 3390 device. (SCEERUN2 is significantly increased in z/OS R9.) **It is strong recommended that review the size of your existing target volumes and plan for the required target volume storage for z/OS R9.**
- The total storage required for all the distribution data sets listed in the space table is 8,900 cylinders on a 3390 device.
- The total file system (HFS or zFS) storage is 2,900 cylinders on a 3390 device for the ROOT and 50 cylinders for the /etc file system. For the CIM element, the space required for the /var VARWBEM file system is 50 cylinders. **It is strong recommended that you put your file system ROOT data set on multiple 3390-3 volumes (a multi-volume data set) or on a volume larger than a 3390-3.**
- The total storage required for the SMP/E SMPLTS is 0 3390 cylinders (there are no load modules in z/OS R9 that are both cross-zone and use CALLLIBs, thus the SMPLTS is not needed for permanent storage for the z/OS product itself).

Driving System Requirements - ServerPac via Tape



► Minimum to Install z/OS R9 ServerPac via tape:

1. Either of the following:
 - **z/OS R7 with APAR OA20599** .
 - Customized Offerings Driver (subset of z/OS R7, with SMP/E V3.4)
2. Activated OMVS address space with UNIX kernel services operating in full function mode for unloading the HFS via the *pax* utility
3. Install from a user id that is permitted to the system resources defined in ServerPac job RACFDRV. You can install from a superuser (UID=0), or be a member of the facility class resource BPX.SUPERUSER
4. Do not specify these LE run-time options as nonoverridable (NONOVR) in the CEEDOPT CSECT: ALL3I, ANYHEAP, BELOWHEAP, DEPTHCONDLIMIT, ERRCOUNT, HEAP, HEAPCHK, INTERRUPT, LIBSTACK, PLITASKCOUNT, STACK, ...

► Minimum to Service the New Target System:

- See subsequent foil (includes shipped levels of **program binder**, SMP/E, and HLASM, and UNIX System Services requirements)
- If you order a product with your z/OS ServerPac that uses ++JARUPD, you'll need Java 2 Technology Edition (5655-D35). *z/OS itself does **NOT** need Java as a driving system requirement!*

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Driving System Requirements - Electronic ServerPac



► Electronic delivery is available for those locations that can order z/OS products via ShopzSeries.

- Can choose between tape and electronic delivery
- Must be ordered from ShopzSeries to obtain electronic delivery

► Minimum to Install z/OS R9 ServerPac via electronic delivery:

- Must meet the tape requirements (on the previous foil)
- And to verify integrity of the data within the package SHA-1 hash values are used, must have either:
 - **SMP/E V3R3 (level 33.05 at least) and ICSF** configured and active
 - **-or- SMP/E V3R4 -and- Java 2 Technology Edition VIR4** (ICSF is not necessary in this case!).

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z/OS Driving System Requirements

The *driving system* is the system image (hardware and software) that you use to install the target system. The *target system* is the system software libraries and other data sets that you are installing. You log on to the driving system and run jobs there to create or update the target system. Once the target system is built, it can be IPLed on the same hardware (same LPAR or same processor) or different hardware than that used for the driving system.

If your driving system will share resources with your target system after the target system has been IPLed, *be sure to install applicable coexistence service* on the driving system before you IPL the target system. If you don't install the coexistence service, you will probably experience problems due to incompatible data structures (such as incompatible data sets, VTOCs, catalog records, GRS tokens, or APPC bind mappings).

Customized Offerings Driver (5665-M12)

The Customized Offerings Driver V2.3.1 (5665-M12) is an entitled driving system you can use if:

- you don't have an existing system to use as a driving system, or
- your existing system does not meet driving system requirements and you don't want to upgrade it to meet those requirements.

At z/OS R9 GA, this driver is a subset of a z/OS R7 system, with the level of SMP/E at V3R4.

The Customized Offerings Driver is in DFSMSdss dump/restore format and supports 3380 and 3390 triple-density or higher DASD devices. The Customized Offerings Driver requires a locally attached non-SNA terminal and a system console from the IBM (or equivalent) family of supported terminal types: 317x, 327x, 319x, or 348x. An IBM (or equivalent) supported tape drive is also required to restore the driver.

The Customized Offerings Driver is intended to run in single-system image and monoplex modes only. Its use in multisystem configurations is not supported. The Customized Offerings Driver is intended to be used only to install new levels of z/OS using ServerPac or CBPDO, and to install service on the new software until a copy (clone) of the new system can be made. The use of the Customized Offerings Driver for other purposes is not supported.

The Customized Offerings Driver includes an HFS and the necessary function to use Communications Server (IP Services), Security Server, and the system-managed storage (SMS) facility of DFSMSdftp, but these items are not customized. However, existing environments can be connected to, and used from, the Customized Offerings Driver system.

Identifying Driving System Software Requirements for ServerPac for z/OS R9

Driving system requirements for installing z/OS R9 by way of ServerPac or dump-by-data-set SystemPac are:

- *An operating system:* Use either of the following:
 - z/OS V1R7 with APAR OA20599 (which is PTF UA34952 for z/OS R7 and UA34953 for z/OS R8).
 - The Customized Offerings Driver (5665-M12).
- *A terminal:* A locally-attached or network-attached terminal that can be used to establish a TSO/E session on the IPLed system is required.
- *Proper authority:* Use the RACFDRV installation job as a sample of the security system definitions required so that you can perform the installation tasks.
- Proper security:
 - In order for you to install into the zFS, the user ID you use must have read access to the SUPERUSER.FILESYS.PFSCTL resource in the RACF FACILITY class.

Plan your migration to z/OS V1.9!

- In order for you to install the z/OS UNIX files, the following is required:
 - The user ID you use must be a superuser (UID=0) or have read access to the BPX.SUPERUSER resource in the RACF facility class.
 - The user ID you use must have read access to facility class resources BPX.FILEATTR.APF, BPX.FILEATTR.PROGCTL, and BPX.FILEATTR.SHARELIB (or BPX.FILEATTR.* if you choose to use a generic name for these resources). The commands to define these facility class resources are in SYS1.SAMPLIB member BPXISEC1 and in the z/OS UNIX Customization Wizard (<http://www.ibm.com/eserver/zseries/zos/wizards/>).
 - Group IDs uucpg and TTY, and user ID uucp, must be defined in your security database. These IDs must contain OMVS segments with a GID value for each group and a UID value for the user ID. (For ease of use and manageability, define the names in uppercase.)
 - The group ID and user ID values assigned to these IDs cannot be used by any other IDs. They must be unique.
 - You must duplicate the required user ID and group names in each security database, including the same user ID and group ID values in the OMVS segment. This makes it easier to transport the HFS data sets from test systems to production systems. For example, the group name TTY on System 1 must have the same group ID value on System 2 and System 3. If it is not possible to synchronize your databases you will need to continue running the FOMISCHO job against each system after z/OS UNIX is installed.


If names such as uucp, uucpg, and TTY are not allowed on your system, or if they conflict with existing names, you can create and activate a user ID alias table. For information about defining these group and user IDs to RACF and about creating a user ID alias table (USERIDALIASTABLE), see *z/OS UNIX System Services Planning*. Another source of information is SYS1.SAMPLIB member BPXISEC1. RACFDRV installation job as a sample of the security system definitions required to perform the installation tasks.

- *Language Environment run-time options:* As of z/OS R7, ServerPac requires that the following Language Environment run-time options are **not** specified as nonoverrideable (NONOVR) in the CEEDOPT CSECT: ALL31, ANYHEAP, BELOWHEAP, DEPTHCONDLIMIT, ERRCOUNT, HEAP, HEAPCHK, HEAPPOOLS, INTERRUPT, LIBSTACK, PLITASKCOUNT, STACK, STORAGE, THREADHEAP, and THREADSTACK.
- *Language Environment:* The CustomPac Installation Dialog uses the Language Environment run-time library SCEERUN. If SCEERUN is not in the link list on the driving system, you must edit the ServerPac installation jobs to add it to the JOBLIB or STEPLIB DD statements.
 - *OMVS address space active:* For ServerPac only (not SystemPac), an activated OMVS address space with z/OS UNIX kernel services operating in full function mode is required.
 - *SMS active:* The Storage Management Subsystem (SMS) must be active to allocate HFS and PDSE data sets, whether they are SMS-managed or non-SMS-managed. Also, the use of HFS data sets is supported only when SMS is active in at least a null configuration, even when the data sets are not SMS-managed. Do either of the following:
 - To allocate non-SMS-managed HFS and PDSE data sets, you must activate SMS on the driving system in at least a null configuration. You must also activate SMS on the target system.
 - To allocate SMS-managed HFS and PDSE data sets, you must activate SMS on the driving system in at least a minimal configuration. Then you must define a storage group, create SMS-managed volumes, and write, translate, and activate a storage class ACS routine that allows the allocation of PDSE and HFS data sets with the names in the ALLOCDS job. You must also activate SMS on the target system.
- *SMP/E ++JARUPD Support:* If your ServerPac order contains any product that uses the ++JARUPD support introduced in SMP/E V3R2, then your driving system will require IBM Developer Kit for OS/390, Java 2 Technology Edition (5655-D35). z/OS V1R9 itself does not use the ++JARUPD support.
- *zFS configuration requirements (optional):* If you will specify that you will use a zFS for ServerPac installation, then you must be sure that the zFS has been installed and configured, as described in *z/OS Distributed File Service zSeries File System Administration*.
- *Electronic delivery requirements (optional):* If you intend to receive your ServerPac order by way of the Internet, you need either of the following:
 - SMP/E V3R3 (level 33.05) **and** Cryptographic Services ICSF set up and activated
 - -or- SMP/E V3R4 **and** Java 2 Technology Edition V1R4 (in this case ICSF isn't necessary).

Plan your migration to z/OS V1.9!

- Proper level for service: In order for you to install service on the target system that you're building, your driving system must minimally meet the driving system requirements for CBPDO Wave 1 (which is that you must have the current (latest) levels of the program management binder, SMP/E, and HLASM). The service jobs generated by the CustomPac Installation Dialog use the target system's (and therefore current) level of the binder, SMP/E, and HLASM. If you choose to use your own jobs, model them after the jobs provided by ServerPac or dump-by-data-set SystemPac by adding STEPLIB DD statements to access MIGLIB (for the binder and SMP/E) and SASMMOD1 (for HLASM). Be sure that the SASMMOD1 and SYS1.MIGLIB data sets are APF authorized. Another way to install service is from a copy of your target system.

Target System Requirements for z/OS R9



- ▶ **Software Requirements**
 - Coexistence Software (on Other Target Systems)
 - Correct Levels of IBM Non-z/OS and Non-IBM Products
 - *z/OS V1R9 Planning for Installation Appendix is different.*
 - Functional Requirements
 - Some functions may need specific SW or HW levels.
 - LPAR Name Restrictions for z/OS R9 (from z/OS.e R9 removal):
 - As “z/OS” (default) license: cannot be named ZNALxxxx
 - As “zNALC” license: can either be LPAR name of ZNALxxx ~~–or-~~ LICENSE=ZNALC with any LPAR name.
 - May want to rename your ZOSExxx LPAR names, if you were using z/OS.e previously.
- ▶ **Hardware Requirements**
 - Processor Requirements:
 - **an IBM System z server: z9 EC, z9 BC, z990, z890, z900, or z800**
 - Coupling Facility: see <http://www.ibm.com/eserver/zseries/psocftable.html>

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Choosing IBM Products That You Want to Run with z/OS

The functional and minimal requirements are found in the *z/OS and z/OS.e Planning for Installation* which is available on the Internet from <http://www.ibm.com/servers/eserver/zseries/zos/bkserv/>.

For a list of products available for ordering with z/OS, you can use the self-service Internet application ShopzSeries: <http://www.ibm.com/software/shopzseries>.

The IBM software products that run with z/OS, and which are documented in *z/OS V1R9 Planning for Installation Appendix*, are documented slightly different for this release. Only the IBM software products levels **above the minimum service-supported level, or which need specific APARs or PTFs are documented**. Other IBM software products not documented in this Appendix, if they are still service-supported, are supported with z/OS R9.

Many of these products can be ordered as part of your z/OS ServerPac order, z/OS SystemPac order, separate CBPDO order, or separate ProductPac order.

If you're migrating to z/OS V1R9, you can find out which products have new levels by using ShopzSeries or by using the SMP/E base element's Planning and Migration Assistant. Both tools use data found on your system as well as the latest IBM software product catalog.

Choosing ISV products that you want to run with z/OS

For a list of independent software vendors (ISVs) that support z/OS, as well as announcements, testimonials, and other information, see http://www.ibm.com/servers/eserver/zseries/zos/zos_products.html

For a directory of IBM and IBM Business partners that provide z/OS applications, tools, and services, see the Global Solutions Directory: <http://www.ibm.com/software/solutions/isv>

LPAR Name Considerations

Plan your migration to z/OS V1.9!

Depending on the license type (z/OS or ZNALC), you may want to review your LPAR names. Since z/OS.e is not available on z/OS R9, you may want to consider renaming any LPARs that were previously called ZOSExxxx.

To identify the z/OS LPAR as “zNALC”, you may do it in either of the following ways:

1. Specify system parameter LICENSE=ZNALC (with any LPAR name).
2. Specify ZNALxxxx as the LPAR name, along with one of the following:
 - No system parameter specified for LICENSE (which will allow the default of Z/OS)
 - System parameter LICENSE=Z/OS
 - System parameter LICENSE=ZNALC (which is available on z/OS V1R6 and later with APAR OA20314)

Note that to identify the z/OS LPAR as “z/OS”, you cannot IPL it under any LPAR named ZNALxxx.

Target System Hardware Requirements

The minimal hardware requirements for z/OS, as well as additional hardware needed by specific z/OS elements and features is documented in *z/OS and z/OS.e Planning for Installation*. Remember, z/OS V1R9 runs only in z/Architecture mode, and only on z10 EC, z9 EC , z9 BC, z990, z890, z900 or z800 servers.

Identifying Processor Requirements

z/OS V1R9 runs on the following IBM System z or their equivalents:

- IBM System z10 Enterprise Class (z10 EC)
- IBM System z9 Enterprise Class (z9 EC), formerly the IBM System z9 109 (z9-109)
- IBM System z9 Business Class (z9 BC)
- IBM eServer zSeries 990 (z990)
- IBM eServer zSeries 890 (z890)
- IBM eServer zSeries 900 (z900)
- IBM eServer zSeries 800 (z800)

Identifying Coupling Facility Requirements

There are hardware and software requirements related to coupling facility levels (CFLEVELs). See <http://www.ibm.com/eserver/zseries/ps0/cftable.html>.

Some IBM SW Target System Requirements for z/OS R9



product name	minimum supported level
CICS TS	V2 R3 + PTFs (end of service: 9/30/09) (V2R2 is end of Service: 4/30/08) •for zAAP exploitation, minimum level is V2 R3.
DB2	V7 R1 with PTFs (end of service: 6/30/08) •for determining zAAP execution potential and exploitation, minimum level is V7 R1 •for zIIP exploitation, minimum level is V8 plus PTFs
IMS	V8 R1 with PTFs (end of service: 11/5/08) (V7 R1 was end of Service: 11/8/05) •for determining zAAP execution potential and exploitation, minimum level was V7 R1
WebSphere Application Server	V5 R1 + PTFs (end of service: 9/26/08) (V5 R0 was end of service 9/30/06) •for determining zAAP execution potential, can use V5.02 •for zAAP exploitation, minimum level is V5 R1.
Tivoli OMEGAMON XE	V3 or later + PTFs (V2 is not supported on z/OS R9)

→ **zAAP** exploitation requires the IBM Solution Developers Kit (SDK) for z/OS, Java 2 Technology Edition, V1.4 with PTF (or later) for APAR PQ86689

→ **zIIP** requires PTFs. See **zIIP** functional PSP bucket.

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Selected IBM Subsystem Products that will run on z/OS R9 (and levels for zAAP and zIIP)

For the list of the minimum release of IBM software products that run on z/OS R9 (above minimum service-supported levels, or those with specific PTF requirements), refer to the Appendix of *z/OS Planning for Installation* and PSP buckets.

zAAP

If you are interested in exploiting (or doing capacity planning for) zAAPs, then there are minimum software levels required. In order to exploit a zAAP, the operating system must be migrated to at least z/OS 1.6 (or z/OS.e 1.6), the IBM Solution Developers Kit (SDK) for z/OS, Java 2 Technology Edition, V1.4 with PTF (or later) for APAR PQ86689 must be used.


zIIP

Install the service which is recommended in the zIIP functional PSP bucket, as well as service identified in the ZOSV1R9 BCP PSP bucket. IBM DB2 UDB for z/OS V8 with PTFs, is also required for exploitation for portions of eligible workloads. The zIIP support has been incorporated into z/OS R8 and higher.

z/OS R9 Communications Server allows IPsec processing to take advantage of IBM System z9 Integrated Information Processors (zIIPs). In effect, the zIIP may be used as a high-speed encryption engine that is designed to provide better price performance for eligible IPsec workload. The new zIIP Assisted IPsec function is designed to move most of the IPsec processing from general-purpose processors to the zIIPs. In addition to performing eligible encryption processing, the zIIP will also handle cryptographic validation of message integrity, and IPsec header processing. This is designed to allow you to take advantage of the cost saving benefits of the zIIP when you implement IPsec to help secure your valuable business transactions and bulk data movement and to protect your host. The z/OS Communications Server is designed to interact with z/OS Workload Manager to have all of z/OS Communications Server's IPsec enclave Service Request Block (SRB) work made eligible to run on the zIIP. IBM plans to make the zIIP-assisted IPsec function available in August 2007 on z/OS V1.8 with APAR PK40178.

Coexistence System Requirements for z/OS R9

- ▶ Documented in *z/OS Migration*
- ▶ Programmatic assistance is now available!
- ▶ From **z/OS R8** Coexistence PTFs for z/OS R9:
 - ◆ **BCP** - Program Binder and Loader, XCF, UNIX
 - ◆ **DFSMS** – oam, rmm
 - ◆ **Distributed File Service** - zFS
 - ◆ **Integrated Security Services** - for LDAP support
 - ◆ **ISPF** – edit recovery
 - ◆ **JES2** - for MAS support
 - ◆ **JES3** - for fallback support
 - ◆ **Language Environment** - downward compatibility
 - ◆ **NFS** – BUFSIZE parameter toleration
 - ◆ **Security Server RACF** – Kerberos AES key toleration
 - ◆ **SDSF** – mixed release support
- ◆ From **z/OS R7** Coexistence PTFs for z/OS R9:
 - ◆ Found in the Appendix of your handout...



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Coexistence Service Requirements for z/OS Release 9

To understand the Coexistence-Fallback-Migration policy for z/OS, and which releases are supported with z/OS V1 R9, see the Coexistence section of this presentation. Listed below are the coexistence and fallback service, for installation on an z/OS V1R8 system for z/OS V1R9. For a list of the coexistence service on z/OS V1R7 for z/OS V1R9, see Appendix B of this presentation.

Apply on z/OS V1R8, the coexistence and fallback service (PTFs) listed in the table below:

Element or feature, and function provided by PTFs	z/OS V1R8 PTFs (and corresponding APARs)
BCP: Enables a pre-z/OS V1R9 system to recognize the module map section built by the z/OS V1R9 program management binder and discard it during rebind on a pre-z/OS V1R9 system.	UA32213 (APAR OA17827)
BCP: Allows the z/OS V1R7 program management loader to properly handle module aliases produced by the S/360 ^(TM) linkage editor.	UA29485 (APAR OA17662)
BCP: In z/OS V1R9, an enhancement allows a coupling facility to be placed into a new state called <i>maintenance mode</i> . When a coupling facility is in this state, it cannot be used to allocate any new coupling facility structures. Although pre-z/OS V1R9 systems cannot place a coupling facility into maintenance mode, in a mixed sysplex it is possible for a pre-z/OS V1R9 system to share a coupling facility with a z/OS V1R9 system and for the z/OS V1R9 system to place the coupling facility into maintenance mode. The PTF allows pre-z/OS V1R9 systems to "understand" when maintenance mode is the reason that a coupling facility is ineligible for structure allocation, and enables messages to include this specific reason.	UA32766 and, if Japanese, UA32769 (APAR OA17685)

Plan your migration to z/OS V1.9!

<p>If the PTF is not installed, the effect depends on whether the coupling facility is placed into maintenance mode. If the coupling facility is never placed into maintenance mode, there is no impact. But if the coupling facility <i>is</i> placed into maintenance mode (from a z/OS V1R9 system), and maintenance mode is the reason that the coupling facility is ineligible for structure allocation, messages will state this specific reason rather than stating that the reason is unknown.</p>	
<p>BCP: If a locally-mounted non-owner z/OS V1R9 system removes or renames a file, the earlier-level systems are not informed and can have bad library lookaside (LLA) entries. This could cause local users to see incorrect information. The PTF disables LLA on all systems for a mount if LLA is disabled on the owner.</p>	UA32495 (APAR OA16265)
<p>DFSMSdfp: z/OS V1R9 introduces Tape Sublevel 2 (TSL2) into the object access method (OAM) storage hierarchy. The PTF allows OAM members on pre-z/OS V1R9 systems to coexist in an OAMplex with OAM members on a z/OS V1R9 system. Specifically, the PTF enables pre-z/OS V1R9 systems to recognize and fail attempts to access objects residing on the new TSL2 media. It also modifies pre-z/OS V1R9 OAM members so that they mark tape media to which they write as TSL1.</p>	UA32910 (APAR OA17812)
<p>DFSMSrmm^(TM): Allows a z/OS V1R8 system to tolerate the new serialization ENQ name used for the control data set (CDS) in z/OS V1R9. The new serialization is enabled automatically the first time z/OS V1R9 DFSMSrmm is started.</p>	UA31621 (APAR OA17965)
<p>DFSMSrmm: Provides coexistence support for the D/T3592 Model E05 encryption support in z/OS V1R9.</p>	UA29141 (APAR OA16523)
<p>Distributed File Service: Prevents an abend on a z/OS V1R8 client system when a certain zFS mount sequence occurs.</p>	UA29661 (APAR OA16908)
<p>Distributed File Service:</p> <ul style="list-style-type: none"> • Allows the MOUNT command to work on a z/OS V1R8 system that is in a sysplex with a z/OS V1R9 system after a MOUNT command with the new zFS AGGRMOVE parameter has been issued on the z/OS V1R9 system. • Prevents an abend on a z/OS V1R8 system that is in a sysplex with a z/OS V1R9 system on which a zFS clone operation occurs. • Ensures that a z/OS V1R8 system that is in a sysplex with a z/OS V1R9 system that has failed is made aware of any zFS aggregates that another z/OS V1R9 system has taken ownership of from the failed z/OS V1R9 system. • Allows zFS to handle mounts properly when certain timing situations occur because of failed systems. 	UA31328 (APARs OA18139, OA17645, OA18494, and OA19034, respectively)
<p>Integrated Security Services: When an LDAP search is used to display a RACF user, the PTF causes the LDAP Server to return the contents of the RACF user. Without the PTF, the LDAP Server returns an LDAP operations error return code.</p>	UA29386 (APAR OA17710)
<p>ISPF: Enables ISPF edit recovery tables and ISPF edit recovery backup data sets from a z/OS V1R9 system to be used on a pre-z/OS V1R9 system.</p>	UA33244 (APAR OA20207)
<p>JES2: Allows z/OS V1R8 JES2 to run with z/OS V1R9 JES2 in a multi-access spool (MAS).</p>	UA90374 (APAR OA17226)
<p>JES3: Removes a job from output service during fallback to z/OS V1R8 JES3 from z/OS V1R9 if more than 65 536 OSE buffers were created for that job</p>	UA32620 (APAR OA16731)

<p>while on z/OS V1R9 JES3. The PTF also provides support to rebuild that job at the lower release by dumping it and restoring it using the dump job (DJ) DSP.</p>	
<p>Language Environment^(R): Causes a meaningful message to be issued when a new z/OS V1R9 Language Environment run-time option is encountered by an earlier release. The message states that the option is ignored. If the PTF is not installed, the option is still ignored but a less meaningful message, or no message at all, is issued.</p>	<p>UK22385 (APAR PK29028)</p>
<p>NFS: In z/OS V1R9, the BUFSIZE parameter was added to parmlib member CTINFSxx to specify the size of the NFS server component trace (ctrace) buffer. The PTF enables a z/OS V1R8 system to tolerate the new parameter. If the PTF is not installed, NFS server ctrace initialization fails and the NFS server reverts to using the log data sets for recording diagnostics. Note that failing to install the PTF does not prevent the NFS server from starting; it only affects the debug message recording location.</p>	<p>UA29618 (APAR OA18325)</p>
<p>SDSF: The SDSF CK panel shows information from IBM Health Checker for z/OS. Without the PTF installed, the CK panel displays blank lines.</p>	<p>UK26754 (APAR PK46929)</p>
<p>SDSF: Missing records or ABEND 0C4, or both, will occur when browsing spool records created by z/OS V1R9 JES2, from z/OS V1R8 SDSF or earlier. This APAR is in support of running z/OS V1R8 SDSF and earlier in a MAS that includes z/OS V1R9 JES2 or in which any spool records were created by a z/OS V1R9 JES2 system.</p>	<p>UK90009 (APAR PK39852)</p>
<p>Security Server: Allows RACF running on a z/OS V1R8 system to tolerate the presence of Kerberos AES keys in RACF profiles, when sharing the RACF database with a z/OS V1R9 system. If the PTF is not installed, z/OS Network Authentication Service failures will occur on the z/OS V1R8 system if the z/OS Network Authentication Service has been configured to use RACF as its SAF registry and the SETROPTS KERBLVL(1) command has been issued to enable use of DES3 and DESD keys.</p>	<p>UA33766 (APAR OA20304)</p>

EPSPT Programmatic Help With Coexistence PTFs


► **Continuing for z/OS R9! Some programmatic assistance to help you determine that you've got all the Coexistence PTFs installed for a z/OS migration!**

► This solution uses the existing Enhanced PSP Tool (EPSPT).

- "Extract files" are produced from the ZOSGEN PSP bucket that contain the Coexistence PTFs.
- You should use the Extract file for the z/OS release you are migrating **FROM**.
–For instance, the ZOSV1R8 ZOSGEN Extract file contains the PTFs that you need to coexist with z/OS R9.

► The Coexistence PTFs from the z/OS Migration book, along with any subsequently defined coexistence PTFs are included, for a complete Coexistence PTF list!

► EPSPT available from
<http://www14.software.ibm.com/webapp/set2/sas/f/psp/download.html>



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Programmatic Help with Coexistence PTFs for z/OS Release 9

You may use the Enhanced PSP Tool (EPSPT) to assist in programmatically determining which coexistence PTFs you must install on your current system in preparation for migration to a later z/OS release. When you retrieve the extract file from the ZOSGEN PSP bucket subset that is used as input to EPSPT, the file will contain the current list of coexistence PTFs for migrating to a later z/OS release. Coexistence PTFs are identified in the "Cross Product Dependencies" section of the ZOSGEN PSP bucket subset.

The steps to take to programmatically determine whether your current system has the complete list of required Coexistence PTFs for migration are:

1. Download and install the latest EPSPT level, available from <http://www14.software.ibm.com/webapp/set2/sas/f/psp/download.html>.
2. Download the extract file from your current release's ZOSGEN PSP bucket subset. The list of "to" release coexistence PTFs is found in the "from" release ZOSGEN PSP bucket subset!
3. Using the extract file from your current release's ZOSGEN PSP bucket subset, run the EPSPT.
4. Resolve any outstanding discrepancies that the EPSPT has identified.

From time to time, you may want to download the extract file from your current release's ZOSGEN PSP bucket subset, and rerun EPSPT to ensure that any newly added coexistence PTFs are verified.

An example of the beginning of the ZOSGEN PSP extract file (from the ZOSV1R8 upgrade) is:

```
/* Preventive Service Planning */  
/* UPGRADE: ZOSV1R8, SUBSET: ZOSGEN */  
/* Updates also available at ftp site: */  
/* ftp site = ftp://ftp.software.ibm.com/s390/pspapartool/ */  
/* ftp file = ZOSV1R8_ZOSGEN.txt */  
/* Last Extract: */  
/* Time = 20:01:48 */
```



Plan your migration to z/OS V1.9!

/* Date = 08/10/2007 */


APAR(AA17827) FMID(HPM7730) FIX(UA32213) UPG(ZOSV1R8) SUB(ZOSGEN).
APAR(AA17662) FMID(HBB7730) FIX(UA29485) UPG(ZOSV1R8) SUB(ZOSGEN).
APAR(AA17685) FMID(HBB7730) FIX(UA32766) UPG(ZOSV1R8) SUB(ZOSGEN).
APAR(BA17685) FMID(JBB773J) FIX(UA32769) UPG(ZOSV1R8) SUB(ZOSGEN).
APAR(AA16265) FMID(HBB7730) FIX(UA32495) UPG(ZOSV1R8) SUB(ZOSGEN).
APAR(AA17812) FMID(HDZ1180) FIX(UA32910) UPG(ZOSV1R8) SUB(ZOSGEN).
APAR(AA17965) FMID(HDZ1180) FIX(UA31621) UPG(ZOSV1R8) SUB(ZOSGEN).
APAR(AA16908) FMID(HZFS380) FIX(UA29661) UPG(ZOSV1R8) SUB(ZOSGEN).
APAR(AA18139) FMID(HZFS380) FIX(UA31328) UPG(ZOSV1R8) SUB(ZOSGEN).
APAR(AA17645) FMID(HZFS380) FIX(UA31328) UPG(ZOSV1R8) SUB(ZOSGEN).
APAR(AA18494) FMID(HZFS380) FIX(UA31328) UPG(ZOSV1R8) SUB(ZOSGEN).
APAR(AA19034) FMID(HZFS380) FIX(UA31328) UPG(ZOSV1R8) SUB(ZOSGEN).
APAR(AA17710) FMID(JRSL38A) FIX(UA29386) UPG(ZOSV1R8) SUB(ZOSGEN).
APAR(AA20207) FMID(HIF5G02) FIX(UA33244) UPG(ZOSV1R8) SUB(ZOSGEN).
APAR(AA17226) FMID(HJE7730) FIX(UA90374) UPG(ZOSV1R8) SUB(ZOSGEN).
APAR(AA16731) FMID(HJS7730) FIX(UA32620) UPG(ZOSV1R8) SUB(ZOSGEN).

.....

IBM Migration Checker for z/OS



- **Some Common Migration Problems:**
 - We have many migration actions required for each release.
 - Applicability of migration actions can be difficult to determine.
 - Determination of the applicability is (in many cases) manual, when it could be programmatic.
 - When programmatic, disparate solutions have been used.
 - Hard to verify if a migration action has been done, especially when deploying to subsequent systems.
 - Would like some way of checking pre-install and post-install “migration health” of a system.
- **An "As Is" Tool That May Help - IBM Migration Checker for z/OS**
 - From the z/OS Download website:
 - Introduced for z/OS R8, **and enhanced for z/OS R9!** Approximately 30 programs!
 - This tool can:
 - Alert you to some migration actions that you should plan for in the future
 - Detect some migration actions that you can do now to ease your migration to z/OS V1R9
 - Verify that you've done some migration actions correctly when you're running z/OS V1R9

 means that the IBM Migration Checker for z/OS can help with this migration action.

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IBM Migration Checker for z/OS

The IBM Migration Checker for z/OS is a tool that checks the applicability of certain migration actions on the currently running system. It was introduced for z/OS R8, and has been enhanced for z/OS R9. It does not **perform** migration actions on your system. Instead, the tool **reports** which migration actions you have to perform. The tool is best used to assist you in creating your migration plan in conjunction with the *z/OS Migration* book.

A selection of migration actions for this tool can assist you in your migration from **z/OS V1R7 to z/OS V1R8 and to z/OS V1R9**. However, if you're not on the z/OS V1R7 to z/OS V1R8 or V1R9 migration path, most of the programs in the tool can also provide value on other migration paths such as z/OS V1R6 to z/OS V1R8, and even z/OS V1R4 to z/OS V1R7. The output reports produced from running the tool will tell you whether the tool was able to do any analysis on the currently running system, so running it outside the intended migration path does no harm, and in many cases is helpful.

The IBM Migration Checker for z/OS is an “as is” download tool available from the z/OS download Web page at <http://www.ibm.com/servers/eserver/zseries/zos/downloads/>. It's composed of several batch programs that can be run either independently or serially in one job to check the applicability of certain migration actions on the currently running system. The user who runs the programs must have the authority to issue the **TSO/E CONSOLE** command and have an OMVS segment defined.

You can run the tool as often as you like. Before you've even ordered z/OS V1R9, after installing z/OS V1R9, and after each z/OS V1R9 image is deployed on your enterprise. Because the tool does not make any changes to your system and is aware of the level of the system on which it is running, it can:

- Alert you to migration actions that you should plan for in the future
- Detect migration actions that you can do now to clear the way to z/OS V1R9
- Verify that you've done the migration actions correctly when you're running z/OS V1R9.

Plan your migration to z/OS V1.9!

As configurations change, rerun the tool. For example, if your enterprise has multiple TCP/IP stacks, and activates and deactivates those stacks at different times, it is beneficial to run the tool multiple times to analyze each active TCP/IP stack.

You can dynamically change many of the items that the tool checks for on your currently running system. You can set up your automation to submit IBM Migration Checker for z/OS jobs on a regular schedule that fits your needs or you can manually submit the jobs. The frequencies is your choice, but keep in mind that only the latest report will be in the output data set. If you see a need to save the output from previous runs, you can include that in your automation steps too.

The IBM Service organization does not officially support this tool, but rather operates on a best-can-do basis. Please report any bugs, suggestions, or comments to the “IBM Migration Checker for z/OS” forum on IBM Customer Connect. For access to the forums, send an email to zosmig@us.ibm.com.

You must still review the migration actions in *z/OS Migration* that are not covered by the programs in the IBM Migration Checker for z/OS tool.


Elements with Migration Actions for z/OS R9

► Documented in *z/OS V1R9 Migration (updated on 1/31/08!)*

- For complete migration tasks for z/OS R9, see this book!
 - from R7 to R9, and R8 to R9, customized books
 - "When behaviors aren't the same anymore, migration actions are called for."

► From z/OS R8 to z/OS R9:

<ul style="list-style-type: none"> ➢ BCP ▪ CIM ▪ Communications Server ▪ Cryptographic Services - PKI ➢ DFSMS ▪ DFSORT ➢ Distributed File Service - zFS ▪ HCM ◆ Infoprint Server ◆ Integrated Security Services - LDAP ➢ ISPF 	<ul style="list-style-type: none"> ▪ JES2 ▪ JES3 ➢ Language Environment ◆ Library Server ◆ msys for Setup ◆ NFS ◆ RMF ◆ SDSF ◆ Security Server (RACF) ➢ TSO/E ▪ XL C/C++ ➢ z/OS UNIX System Services
--	--



➢ means some of the element migration actions follow within this presentation and the next one

- If coming from z/OS R7 to R9, there are additional elements that have migration actions

► Migration Actions that follow are divided by :

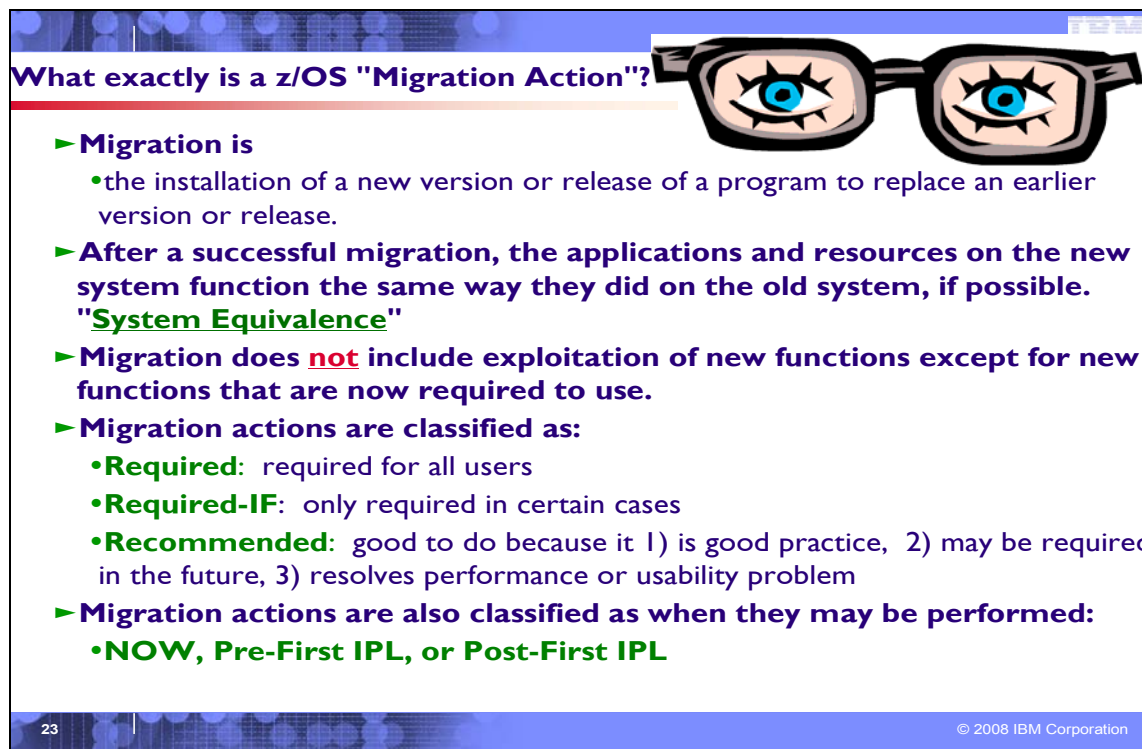
- ◆ ELEMENT, and then
- ◆ WHEN you can do the action: Now, Pre-First IPL, or Post-First IPL

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Migration Actions for Elements Between z/OS R8 and z/OS R9

When migrating from z/OS R8 to z/OS R9, the specified elements in the foil above have required migration actions. Refer to *z/OS Migration* for complete information on the required migration actions for all elements. Selected elements with new z/OS R9 migration actions follow in this presentation, however, also included for these selected elements are migration actions which were introduced in z/OS R8. This will show a more complete picture for any migration to z/OS R9.

If you are migrating from z/OS R7 to R9, there are other elements that have migration actions. For a complete list of migration actions which is applicable, refer to *z/OS V1R9 Migration*.



What exactly is a z/OS "Migration Action"?

- ▶ **Migration is**
 - the installation of a new version or release of a program to replace an earlier version or release.
- ▶ **After a successful migration, the applications and resources on the new system function the same way they did on the old system, if possible. "System Equivalence"**
- ▶ **Migration does not include exploitation of new functions except for new functions that are now required to use.**
- ▶ **Migration actions are classified as:**
 - **Required:** required for all users
 - **Required-IF:** only required in certain cases
 - **Recommended:** good to do because it 1) is good practice, 2) may be required in the future, 3) resolves performance or usability problem
- ▶ **Migration actions are also classified as when they may be performed:**
 - **NOW, Pre-First IPL, or Post-First IPL**

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Migration Definitions and Classifications

Migration is the first of two stages in upgrading to a new release of z/OS. The two stages are:

- **Stage 1: Migration.** During this stage you install your new system with the objective of making it functionally compatible with the previous system. After a successful migration, the applications and resources on the new system function the same way (or similar to the way) they did on the old system or, if that is not possible, in a way that accommodates the new system differences so that existing workloads can continue to run. Migration does not include exploitation of new functions except for new functions that are now required.
- **Stage 2: Exploitation.** During this stage you do whatever customizing and programming are necessary to take advantage of (exploit) the enhancements available in the new release. Exploitation follows migration.

Migration Requirement Classification and Timing

The migration actions are classified as to their requirement status:

- **Required.** The migration action is required in all cases.
- **Required-IF.** The migration action is required only in a certain case. Most of the migration actions in this presentation are in this category.
- **Recommended.** The migration action is not required but is recommended because it is a good programming practice, because it will be required in the future, or because it resolves unacceptable system behavior (such as poor usability or poor performance) even though resolution might require a change in behavior.

To identify the timing of migration actions, this presentation uses three types of headings:

- **Now.** These are migration actions that you perform on your current system, either because they require the current system or because they are possible on the current system. You don't need the z/OS V1R9 level of code to make these changes, and the changes don't require the z/OS V1R9 level of code to run once they are made. Examples are installing coexistence and fallback PTFs on your current system, discontinuing use of hardware or software that will no longer be supported, and starting to use existing functions that were optional on prior releases but required in z/OS V1R9.
- **Pre-First IPL.** These are migration actions that you perform after you've installed z/OS V1R9 but before the first time you IPL. These actions require the z/OS V1R9 level of code to be installed but don't require it to be active. That is, you need the z/OS V1R9 programs, utilities, and samples in order to perform the migration actions, but the z/OS

Plan your migration to z/OS V1.9!

V1R9 system does not have to be IPLed in order for the programs to run. Examples are running sysplex utilities and updating the RACF database template.

It is possible to perform some of the migration actions in this category even earlier. If you prepare a system on which you will install z/OS V1R9 by making a clone of your old system, you can perform migration actions that involve customization data on this newly prepared system before installing z/OS V1R9 on it. Examples of such migration actions are updating configuration files and updating automation scripts.

- **Post-First IPL.** These are migration actions that you can perform only after you've IPLed z/OS V1R9. You need a running z/OS V1R9 system to perform these actions. An example is issuing RACF commands related to new functions. Note that the term "first IPL" does not mean that you have to perform these actions after the very first IPL, but rather that you need z/OS V1R9 to be active to perform the task. You might perform the task quite a while after the first IPL.

Icons used in the subsequent foils:



means that you shouldn't overlook this migration action.




means that the IBM Migration Checker for z/OS can help you with this migration action.

General Migration Actions for z/OS R9 from z/OS R7

Migration Actions Pre-First IPL:

- **Back virtual storage with real and auxiliary storage (Required)**
 - Review real storage concentration indicators, and evaluate if additional real or aux storage needed
- ✓ **Remove references to deleted data sets and path (Required)**
 - CS APPC Appl Suite removes data sets TCPIP.AAPP* and TCPIP.SAPP*, and OCSF.
- ✓ **Add references to new data sets and paths (Required)**
 - New in R9, System Rexx data sets SYSI.AAXR* and SYSI.SAXR*
 - Metal C Runtime Library, PKI, SDSF, BCP Capacity Provisioning, ICSF data sets
 - Alternate Library for REXX data sets REXX.AEAG* and REXX.SEAG*.
- **Accommodate new address spaces (Recommended)**
 - New in R9: **AXR** (for SysREXX). Automatically started, can be manually restarted.
 - New in R9: **CEA**, to deliver z/OS events to C-language clients, such as the z/OS CIM server, it automatically started and does not terminate.
 - New in R9: **ARCnXXXX**: One of these DFSMSdss address spaces is started automatically by DFSMShsm whenever a dump, restore, migration, backup, recover, or CDS backup function is invoked. Terminates when hsm terminates.
 - New in R8: **DSSFRDSR**: The purpose of this DFSMSdss address space is to recover up to 64 data sets concurrently from one or more copy pool backup versions.
 - Notify anyone who might like to be kept aware of changes to the system that there are new address spaces.



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General Migration Actions for z/OS R9 from z/OS R7

Migration Actions Pre-First IPL:

- **Rework and install user modifications (Required-IF)**
 - For one less use LE CEEPRMxx parmlib member!
- **Reconnect subsystems and non-IBM products (Required-IF)**
- **Update operational and other procedures (Required)**
- **Accommodate new SCOPE=COMMON data spaces in IEASYSxx MAXCAD (Required-IF)**
 - In R9: One data space used by common event adapter (CEA) to process messages. This data space is created during CEA initialization..
 - In R8: None
 - **IBM Health Checker for z/OS can help you determine what to specify for the MAXCAD value!**

➤ Migration Actions Post-First IPL:

- <none>



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General Migration Actions Between z/OS V1 R7 and z/OS V1 R9

These migration actions were taken from *z/OS Migration*. Some descriptions and actions have been shortened for inclusion in this presentation. For the complete descriptions and actions, refer to *z/OS Migration*.

General Migration Actions You Can Do Now

Apply coexistence and fallback fixes (Required)

Migration action: Install coexistence and fallback PTFs on your systems to allow those systems to coexist with z/OS V1R9 systems during your migration, and allow backout from z/OS V1R9 if necessary. See *z/OS Migration* or the back of this handout for a list of required coexistence PTFs, Take a look at using EPSPT to make this action even easier!

Use SOFTCAP to identify the effect of capacity changes (Recommended)

Not required, but is recommended to help in assessing processor capacity and available resources when migrating to new software levels, and when migrating to z/Architecture.

Migration action:

- Download SoftCap from one of the following Web sites:
 - Customers: <http://www.ibm.com/support/techdocs/atmastr.nsf/WebIndex/PRS268>
 - Business partners: <http://www.ibm.com/partnerworld/sales/systems>
- Run SoftCap to determine your expected increase in CPU utilization (if any) and to identify your storage requirements, such as how much storage is needed to IPL.

Reference information: *SoftCap User's Guide*, which is provided with the tool.



Migrate from z/OS.e to z/OS (Required-IF)

Required if you use z/OS.e.

zNALC is replacing New Application License Charges (NALC) and z/OS.e, and is intended to be IBM's strategic z/OS offering for new workloads.

Migration action:

1. **Determine whether your application qualifies for zNALC pricing.**
2. **Decide whether you will implement full-capacity zNALC pricing or subcapacity zNALC pricing.**
3. **Decide which servers and LPARs will be used to run z/OS with zNALC pricing.**
4. **If you will use subcapacity zNALC pricing, submit to IBM an initial subcapacity report containing z/OS zNALC MSUs.**
5. **If you currently run z/OS.e V1R7 or V1R8 and want to run that same level, but with z/OS zNALC pricing, do the following:**
 - a) Obtain your z/OS license with zNALC pricing. Ensure that you order the same optional priced features under z/OS with zNALC pricing that you had with z/OS.e.
 - b) Shut down your z/OS.e system.
 - c) Modify the z/OS.e customization for your system as follows:
 - In parmlib member IFAPRDxx, convert all the enabled z/OS.e statements for ID 5655-G52 to z/OS statements for ID 5694-A01. For example, change all statements like this:

```
PRODUCT OWNER('IBM CORP')
NAME('z/OS')
ID(5655-G52)
VERSION(*) RELEASE(*) MOD(*)
FEATURENAME('z/OS')
STATE(ENABLED)
```

to this:

```
PRODUCT OWNER('IBM CORP')
NAME('z/OS')
ID(5694-A01)
VERSION(*) RELEASE(*) MOD(*)
FEATURENAME('z/OS')
STATE(ENABLED)
```
 - Make the change to identify the z/OS LPAR as zNALC in either of the following ways:

Plan your migration to z/OS V1.9!

- Specify system parameter LICENSE=ZNALC (with any LPAR name).
 - Specify ZNALxxxx as the LPAR name, along with one of the following:
 - No system parameter specified for LICENSE (which will allow the default of Z/OS)
 - System parameter LICENSE=Z/OS
 - System parameter LICENSE=ZNALC (which is available on z/OS V1R6 and later with APAR OA20314)
- d) IPL your z/OS system with zNALC pricing.
7. **If you currently run z/OS.e V1R7 or V1R8 and want to change to z/OS with zNALC pricing when migrating to z/OS V1R9, do the following:**
- a. When ordering your z/OS V1R9 system, specify that you want zNALC pricing. Ensure that you order the same optional priced features under z/OS with zNALC pricing that you had with z/OS.e.
 - b. If sharing parmlib members between your z/OS.e and z/OS zNALC systems, ensure that you are using correct values for both your z/OS.e system and your z/OS zNALC system:
 - In parmlib member IFAPRDxx, your z/OS zNALC system should have statements for ID 5694-A01. There should be no usage of ID 5655-G52, which is for z/OS.e. (**Tip:** If you use the IFAPRDxx sample parmlib member that is shipped with your z/OS V1R9 ServerPac or CBPDO, this will be done for you.) You cannot share your z/OS R9 parmlib with lower level systems, if you still need the z/OS.e specifications. Your z/OS zNALC LPAR should have statements similar to the following:

```
PRODUCT OWNER('IBM CORP')
NAME('z/OS')
ID(5694-A01)
VERSION(*) RELEASE(*) MOD(*)
FEATURENAME('z/OS')
STATE(ENABLED)
```
 - Make the change to identify the z/OS LPAR as zNALC in either of the following ways:
 - Specify system parameter LICENSE=ZNALC (with any LPAR name).
 - Specify ZNALxxxx as the LPAR name, along with one of the following:
 - No system parameter specified for LICENSE (which will allow the default of Z/OS)
 - System parameter LICENSE=Z/OS
 - System parameter LICENSE=ZNALC (which is available on z/OS V1R6 and later with APAR OA20314)
- c. IPL your z/OS system with zNALC pricing.

Upgrade Windows 2000, 95, 98, and NT clients (Required-IF)

Required if you have clients running Windows 2000, 95, Windows 98, or Windows NT Workstation.

z/OS no longer supports service for client operating systems whose service is withdrawn by the operating system manufacturer. As a result, IBM no longer supports service for clients running Windows 2000, Windows 95, Windows 98, or Windows NT Workstation 4.xx.

Migration action: Use a supported follow-on to Windows 2000, Windows 95, Windows 98, or Windows NT Workstation 4.xx..

Reference information: For client software supported with z/OS, see *z/OS and z/OS.e Planning for Installation*.

Use the new default for your program management binder COMPAT specification (Req-IF, as of R8)

Required if you invoke the program management binder specifying a compatibility value other than the default (COMPAT=MIN)

Since z/OS V1R3, the program management binder default for specifying the compatibility level has been MIN, meaning that the lowest level that supports the features used is selected for the current bind. In z/OS V1R8, a new COMPAT level, PO5, was introduced. If you invoke the program management binder on z/OS V1R8 and override the default of COMPAT=MIN (such as specifying COMPAT=CURRENT, which was the default before z/OS V1R3), you might have program objects produced that are at a higher format than you intended and that cannot be executed on systems earlier than z/OS V1R8.

Migration action: Make sure that any program management binder parameters you specify use the default for the COMPAT statement. This ensures that program objects can be executed from the most environments. A common place

where the COMPAT statement may be specified is in your SMP/E GLOBAL zone UTILITY entry for the program management binder.

Verify that you have enough XCF groups in your CDS and enough XCF members in your XCF group (Required-IF, as of R8)

Required if you have an inadequate number of XCF groups and members formatted in your sysplex couple data sets, and functions that you are using need additional XCF groups or members.

Over time, as various z/OS functions and applications exploit XCF services, you must ensure that there is enough space in the sysplex couple data set for all the XCF groups and members that are to be defined by the exploiters. It is possible that your sysplex couple data set could contain an inadequate number of XCF groups or members.

Migration action:

- Issue the DISPLAY XCF,COUPLE command on your current system. Notice the values of MAXGROUP and PEAK for your sysplex couple data sets. These values show you the maximum number of XCF groups that the couple data sets can support, and the peak number of XCF groups ever in use in the sysplex. Also notice the values of MAXMEMBER and PEAK for your sysplex couple data sets. These values show you the maximum number of members that the couple data set can support in one group, and the greatest number of members ever in use in the largest group in the sysplex.
- In z/OS V1R8, one additional XCF group is used; its name is SYSXCF and it is used by base element BCP for XCF support. If you do not have enough groups formatted to support this additional XCF group, reformat your sysplex data sets with a larger number of groups.
- If your peak member value is close to the maximum member value, you might want to reformat your sysplex couple data sets to support a larger maximum number of members to be used by any one group.

Reference information: For information about formatting sysplex couple data sets with the MAXGROUP and MAXMEMBER parameters, see *z/OS MVS Setting Up a Sysplex*. For information about the DISPLAY XCF command, see *z/OS MVS System Commands*.

Add or change volumes to keep your z/OS root file system in a single data set (Recommended)

Recommended for ease of management if your z/OS root (or subsystem) file system resides on a 3390-3 volume (or another DASD volume that is close to the 3390-3 limit of 3339 cylinders).

Because of enhancements and PTF service, the z/OS root file system (or “version root file system”) and subsystem file systems continue to grow in size from release to release. As of z/OS V1R9, the size of the z/OS root file system, whether HFS or zFS, was approximately 2900 3390 cylinders. This is approaching the 3390-3 size limit of 3339 cylinders. It is advisable to have the z/OS root file system and subsystem file systems within a single data set for ease of management.

Migration action: To keep the z/OS root file system or subsystem file system in a single data set, do one of the following:

- Move your file system to a larger DASD volume geometry.
- Use multiple volumes for the z/OS root file system data set.

General Migration Actions Pre-First IPL

Set up your IPCS environment (Required)

Migration action: Set up an IPCS environment. For guidance, use the documents listed in the reference information below. During setup, ensure that your logon procedure points to the target system’s level of IPCS data sets, which are shown in *z/OS Migration*.

Reference information: For more information about IPCS, see *z/OS MVS IPCS Customization*. For more information about the correct logon procedure updates, see the *z/OS Program Directory*. For information about setting up the JES2 IPCS environment, see *z/OS JES2 Diagnosis*. For information about setting up the JES3 IPCS environment, see *z/OS JES3 Diagnosis*.

Use IBM-supplied PARMLIB and PROCLIB (Required)

Migration action: For parmlib, add the data set pointed to by the z/OS V1R9 PARMLIB DDDEF to your parmlib concatenation. The data set should generally be added last in the concatenation, and you should make sure that the other data sets in the concatenation don’t have members with the same names as IBM-supplied members. If you place

the data set on the system residence volume and use an indirect catalog entry, future migrations won't require this particular migration step.

- For proclib:
 - Ensure that the default proclib members have been copied to your default proclib to pick up the new and changed members.
 - Update individual sample members provided and ensure they are accessible to the system, as shown in the table of proclib member updates in *z/OS Program Directory*.
 - Ensure that the procedure libraries listed in the table of libraries to be added to the proclib concatenation in *z/OS Program Directory* have been placed in the necessary procedure library concatenations and are available to the system.

Reference information: For lists of parmlib and proclib members that are shipped, see *z/OS Program Directory*.



Migrate /etc and /var system control files (Required)

Migration action: The /etc and /var directories contain system control files: the /etc directory contains customization data that you maintain and the /var directory contains customization data that IBM maintains. During installation, subdirectories of /etc and /var are created. If you install z/OS using ServerPac, some files are loaded into /etc and /var due to the customization performed in ServerPac. You have to merge the files in /etc and /var with those on your previous system. If you install z/OS using CBPDO, you should copy the files from your old system to the z/OS V1R9 /etc and /var subdirectories.

Copy files from your old system to the z/OS V1R9 /etc and /var subdirectories, and then modify the files as necessary to reflect z/OS V1R9 requirements. If you have other files under your existing /var directory, then you will have to merge the old and new files under /var. The easiest way to do this is to create a copy of your current /var HFS and then copy the new /var files into the copy.

The following z/OS V1R9 elements and features use /etc:

- Communications Server – IP
- Cryptographic Services – PKI Services and System SSL
- DCE Base Services
- Distributed File Service. The SMB server uses /etc/dfs.
- IBM HTTP Server
- IBM Tivoli Directory Server
- Infoprint Server uses /etc/Printsrv.
- Integrated Security Services - Firewall Technologies, LDAP Server, and Network Authentication Service
- Library Server
- z/OS UNIX System Services

The following z/OS V1R9 elements and features use /var:

- CIM
- Cryptographic Services – OCSF
- IBM Tivoli Directory Server
- Infoprint Server
- Integrated Security Services - Network Authentication Service uses /var/skrb.

Reference information: For information about copying your existing /etc and /var directories, see *z/OS Migration*.

Update items affected by changed interfaces (Required-IF)

Required if any of the interface changes impact your installation.

Interfaces in z/OS are parts of the system that allow people, application programs, execs, or procedures to interact with the system. Examples of interfaces are commands, macros, panels, exit routines, callable services, data areas, the parameter library (SYS1.PARMLIB), the procedure library (SYS1.PROCLIB), the sample library (SYS1.SAMPLIB), configuration files, and environment variables. Various changes have been made to interfaces since z/OS R7.

In order for your application programs and resources to work the same way on your new system as they did on your old one, you'll probably have to make updates due to the interface changes. In addition, you'll probably have to notify people such as operators and end users about interface changes that affect tasks that they perform.

Migration action: Review the book *z/OS Summary or Interface and Message Changes* and *z/OS MVS Init and Tuning Reference*. Update application programs, execs, procedures, and system parameters (in parmlib) appropriately.

Verify that virtual storage (MEMLIMIT) is set properly (Required)

Migration action: Determine how much virtual storage use to allow above the 2 GB bar. While there is no practical limit to the number of virtual addresses an address space can request above the bar, the system can limit the amount of virtual storage above the bar that an address space is allowed to use. The amount of virtual storage above the bar is determined as follows. The MEMLIMIT parameter in parmlib member SMFPRMxx sets the default system-wide limit, which defaults to zero (nothing) if it is not specified. However, the system-wide default MEMLIMIT can be overridden by specifying REGION=0M or MEMLIMIT on JOB or EXEC statements in JCL. To set a limit on the use of virtual storage above the bar, use the SMF exit IEFUSI. For more information, see the topic about limiting the use of memory objects in *z/OS MVS Programming: Extended Addressability Guide*.

If you want to control the use of virtual storage above the 2 GB bar, do one or more of the following:

- For MEMLIMIT, you must specify a nonzero MEMLIMIT in an active SMFPRMxx member of parmlib to establish a system default other than zero for available virtual storage above 2 GB. (The default MEMLIMIT is zero.)
- You can specify MEMLIMIT explicitly in JCL to override the system default that was set (or allowed to default) in SMFPRMxx.
- You can specify REGION=0M on the job statement in JCL to implicitly set MEMLIMIT to NOLIMIT, which also overrides the system default (from SMFPRMxx).
- You can use IEFUSI both to establish a system default MEMLIMIT for different classes of work (for example, job, TSO, STC) and limit the amount of virtual storage that can be used above the bar, provided that an explicit or implicit nonzero MEMLIMIT is in effect from JCL or SMFPRMxx.

Tip: Use IBM Health Checker for z/OS to help determine whether your virtual storage limits are set properly. The check RSM_MEMLIMIT checks the current setting for the MEMLIMIT parameter in SMFPRMxx, which affects the amount of virtual storage above the 2 GB bar that is available to jobs.

Reference information: Information about how to evaluate the central storage configuration can be found in the Washington Systems Center white paper *z/OS Performance: Managing Processor Storage in a 64-bit Environment - V1* at <http://www.ibm.com/support/techdocs> (Search for "WP100269".)

Back virtual storage with real and auxiliary storage (Required)

Migration action: As you exploit additional virtual storage by defining additional address spaces or by exploiting memory objects, ensure that you have defined sufficient real and auxiliary storage. Review real storage concentration indicators via an RMF report to evaluate if additional real or auxiliary storage is needed:

- Check UIC and average available frames.
- Check demand page rates.
- Check the percentage of auxiliary slots in use.

Reference information: For more information about memory objects, see *z/OS MVS Programming: Extended Addressability Guide* and Washington Systems Center flash 10165 at <http://www.ibm.com/support/techdocs>. (Search for "flash10165".)



Remove references to deleted data sets and path (Required)

Migration action: Using the table in *z/OS Migration*, "Data sets and paths deleted from z/OS V1R8, and R9" as a guide, remove references to data sets and paths that no longer exist. Remove the references from the following places:

- Parmlib
- Proclib

- Logon procedures
- Catalogs
- Security definitions, including program control definitions
- DFSMS ACS routines
- /etc/profile
- SMP/E DDDEF entry
- Backup and recovery procedures, as well as any references to them In the table, the high-level qualifiers in the data set names are the default qualifiers.

Note: Do not remove any data sets, paths, or references that are needed by earlier-level systems until those systems no longer need them, and you are sure you won't need them for fallback.

Note: Especially noteworthy is DDDEF **CNMLINK**, which was used by the msys for Operations base element. Even though msys for Operations was withdrawn from z/OS V1R8, the installation of OSA/SF (FMID H0GI400) PTFs still requires DDDEF CNMLINK to be defined in the target zone. The DDDEF for CNMLINK must point to an empty data set when the Tivoli NetView product is not installed. (Part of Tivoli NetView for OS/390 V1R4, as well as part of System Automation for z/OS V2R3, was included in msys for Operations.) Removing the DDDEF for CNMLINK will result in failures when installing OSA/SF PTFs.

Reference information: *z/OS Migration* contains the list of all removed data sets and paths in z/OS R8 and R9.



Add references to new data sets (Required)

Migration action: Using the lists that are found in *z/OS Migration* as a guide, add references in the following places for data sets that have been added to z/OS:

- Parmlib
- Proclib
- Logon procedures
- Catalogs
- Security definitions, including program control definitions
- DFSMS ACS routines
- Any backup and recovery procedures.

Of special note is data set:

- **REXX.SEAGALT** (for Alternate Library for REXX). This data set should be added to your link list (or to your lpa list) if you are not using the IBM Library for REXX. The IBM Library for REXX provides data set REXX.SEAGLPA, which should be put into the lpa list. If REXX.SEAGLPA is put into the lpa list, then REXX.SEAGALT does not need to be added to the link list or lpa list.

Reference information: *z/OS Migration* contains the list of all new data sets and paths in z/OS R8 and R9.

Accommodate new address spaces (Recommended)

Not required, but recommended to keep interested personnel aware of changes in the system.

The following address spaces are new in z/OS R9:

- **AXR (for BCP):** This address space is used by the System REXX for z/OS Base component of the BCP. The address space contains the server infrastructure necessary to run REXX execs. REXX work requests originate either from the program interface (AXREXX) or from the operator console (MODIFY AXR). A group of subtasks within the AXR address space processes TSO=N requests; TSO=Y requests are processed in separate address spaces (AXR00-AXR07). The AXR address space is started automatically during z/OS initialization and can be manually restarted. However, before the address space can be started, it must be added to the installation's designated RACF group for system address spaces. For information about how to add it, see *z/OS MVS Authorized Assembler Services Guide*.
- **CEA (for BCP):** The common event adapter (CEA) provides the ability to deliver z/OS events to C-language clients, such as the z/OS CIM server. The CEA address space is started automatically during z/OS initialization and does not terminate.
- **ARCnXXXX (for DFSMSdsm):** One of these DFSMSdss address spaces is started automatically by DFSMSdsm whenever a dump, restore, migration, backup, recover, or CDS backup function is invoked. (A DFSMSdss address space is not started for recall tasks.) These DFSMSdss address spaces can reduce the storage used in the DFSMSdsm address space, enabling more tasks to be started within the DFSMSdsm address space.

Plan your migration to z/OS V1.9!

When DFSMShsm invokes DFSMSdss through the DFSMSdss cross-memory application interface, DFSMShsm requests that DFSMSdss use a unique address space identifier for each unique DFSMShsm function and host ID. The address space identifier for each function is in the form `ARCnXXXX`, where *n* is a unique DFSMShsm host ID and `XXXX` is an abbreviation of a DFSMShsm function. The abbreviations and corresponding functions are:

- DUMP for dump
- REST for restore
- MIGR for migration
- BACK for backup
- RCVR for recover
- CDSB for CDS backup

For instance, migration for DFSMShsm host ID 1 would result in a generated address space identifier of `ARC1MIGR`. The address space terminates automatically when DFSMShsm terminates.

Note: When z/OS V1R9 DFSMShsm invokes DFSMSdss through the cross-memory interface (ADRXMAIA) so that DFSMSdss can run in its own address space, the DFSMSdss large block interface (LBI) function, introduced by APAR OA13742, is not supported. If you prefer to have the DFSMSdss LBI function rather than the cross-memory function, you can disable DFSMShsm's use of the cross-memory function with the following patch in the `ARCCMDxx` member of `SYS1.PROCLIB`: `PATCH .MCVT.+433 X'00'`. Also, if `ARCCMDxx` includes the patch `PATCH .MCVT.+432 BITS(XX.....)`, where *X* is a 0 or 1, remove the patch.

The following address space was new in z/OS V1R8:

- **DSSFRDSR (for DFSMSdss):** The purpose of this DFSMSdss address space is to recover up to 64 data sets concurrently from one or more copy pool backup versions. The address space is started automatically by DFSMShsm whenever a data set is recovered from DASD using the `FRRECOV DSNAME` command. The address space terminates automatically when DFSMShsm terminates.

There is nothing for you to do to start, manage, or stop these new address spaces. However, if you have any personnel who like to be kept aware of changes to the system, you should notify them that these address spaces exist.

Note: TN3270E Telnet Server was a new address space added in z/OS V1R6, that is required as of z/OS R9. See migration action "Migration to the TN3270E Telnet server that runs in its own address space".

Rework and install user modifications (Required-IF)

Required if you have made any user modifications that necessitate changes.

Migration action: Use the z/OS SMP/E Planning Migration Assistant to help determine which user modifications need to be reworked and which just have to be reinstalled. The Top or New Intermediate Product Migration Changes Report uses data found on your system, combined with IBM-supplied information from the Software Information Base, to show you the current levels of products available as well as product migration and functional changes using a comparison of FMIDs. You can use this report to determine the product migration impacts by reviewing the "changed" FMIDs. This can help you assess how many user modifications have to be reworked if you issued the `LIST SYSMOD USERMOD FORFMID` (listing the "changed" FMIDs) command. All other user modifications can be reinstalled without having to be reworked.

Note: IBM recommends using exit routines for any user modifications where possible, and installing the exit routines with SMP/E. By using SMP/E, it is easier to bring forward desired modifications to the z/OS release you are installing.

Several elements and features have their default options set by assembling and link editing one or more modules.

These include:

- XL C/C++
- DFSORT
- HLASM
- Language Environment. Investigate using `CEEROPT`, which can be used to specify run-time options for CICS, IMS LRR, and other LRR users. Even better, consider using the function added in z/OS R7 to eliminate your assembler language run-time option modules in `CEEPRMxx parmlib` member!

Reference information: For information about C/C++ customization, see *z/OS C/C++ Compiler and Run-Time Migration Guide*. For information about DFSORT customization, see *DFSORT Installation and Customization Guide*. For information about HLASM customization, see *HLASM Installation and Customization Guide*. For information about Language Environment customization, see *z/OS Language Environment Customization*.

Reconnect subsystems and non-IBM products (Required-IF)

Required if you use any ISV products and need to reconnect them after performing a ServerPac installation, or if you intend to use any subsystems with your z/OS system.

Migration action: Follow the instructions for each ISV product that you use to reconnect it to your z/OS V1R9 ServerPac.

Ensure that any required service is installed prior to using the subsystem with the new z/OS V1R9 system, as well as any required SVCs, system modifications, parmlib setup, and proclib setup. Follow the instructions for the subsystem that you need to reconnect.

Reference information: For a list of independent software vendors (ISVs) that support z/OS, as well as announcements, testimonials, and other information, see <http://www.ibm.com/eserver/zseries/solutions/s390da/>. For a directory of ISV products that support z/OS, see the Global Solutions Directory at <http://www.ibm.com/software/solutions/isv>.

Update operational and other procedures (Required)

Migration action: Review your operation, automation, administration, security, backup, and recovery procedures, and make any necessary changes depending on how you installed and which functions you plan to exploit. Some possible changes are:

- Allowing applicable users access to new high-level qualifiers that you may have. There is a new default high-level qualifier introduced in z/OS R9 with new target data sets – REXX - for Alternate Library for REXX.
- Updating and testing your backup and recovery procedures to accommodate the new target system.
- Updating and testing any disaster recovery procedures.
- Updating and testing any automation procedures to take advantage of new functions.
- Updating security system definitions, such as defining new users and resources, permitting users to use new resources, and defining new profiles in the RACF FACILITY class.

Reference information: For information about the new functions incorporated into z/OS V1R9, see *z/OS Introduction and Release Guide*.

Accommodate new SCOPE=COMMON data spaces (Required-IF)

Required if you use the MAXCAD parameter of parmlib member IEASYSxx and the value you specified is inadequate for your z/OS R9 system.

The MAXCAD parameter of parmlib member IEASYSxx specifies the maximum number of SCOPE=COMMON data spaces to be allowed during an IPL. The new SCOPE=COMMON data spaces are:

- Added in z/OS V1R9: One data space used by common event adapter (CEA) to process messages. This data space is created during CEA initialization.
- Added in z/OS V1R8: None.

Your MAXCAD setting must be adequate to accommodate this new data space..

Migration Action: Increase the limit for the number of SCOPE=COMMON data spaces defined on the MAXCAD parameter if your specification is not adequate to cover the new data spaces that have been added. Note that in z/OS V1R6, the MAXCAD default was increased from 25 to 50. If this default is acceptable for your environment, you might want to remove your MAXCAD specification and allow it to default.

Tip: The IBM Health Checker for z/OS can help you determine what to specify for the MAXCAD value. Use the check IBMRSR,RSM_MAXCADS. This check is available as of z/OS V1R7 and also in APAR OA09366 back to z/OS V1R4. By running this check, you can find out:


- The MAXCAD value you specified during IPL
- The number of SCOPE=COMMON data spaces currently in use
- The high water mark, which is the highest usage of SCOPE=COMMON data spaces used during this IPL

Use this information to help you set your MAXCAD specification in IEASYSxx.

General Migration Actions Post-First IPL

<none>

BCP Migration Actions for z/OS R9 from z/OS R7



► **Migration Actions Pre-First IPL:**

- **Modify JCL to be consistent with a new coding rule for the system symbols (Required-IF, as of R9)**
 - When using symbols in a dsn immediately preceding the relative generation number, and doesn't use a + or -, can change to use + or -, or include a period.
- **Update automation that handles message IOS5511 (Required-IF as of R9 with rollback in OAI9445)**


➤ **Use new default for VSM ALLOWUSERKEYCSA in DIAGxx (Recommended)**

- **Changed to NO in R9. Investigate any changes to software needed.**


- **Accommodate the changed DAE interval for suppressing duplicate dumps (Required-IF, as of R9 with OA20972)**
 - Changed from 180 days to 60 days in R3, however ADYUPDAT CLEANUP nnn edit macro was not changed at that time. (nnn remained at 180).
 - As of OA20872, ADYUPDAT CLEANUP default now matches DAE interval of 60 days.
- **Ensure that CLOCKxx is specified properly for LOCAL timing mode (Required as of R9, and via OAI3344)**
 - Only in LOCAL timing mode (ETRMODE NO or YES w/o a Sysplex Timer): if you do not want to reply to the IEA888A clock prompt at each IPL, override STPMODE to NO explicitly in CLOCKxx.

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BCP Migration Actions for z/OS R9 from z/OS R7



► **Migration Actions Pre-First IPL:**

 **Accommodate the removal of 1-byte console IDs (Required as of R8)**


- R8 completes the 1-byte console ID removal. 1-byte console IDs might still continue to be accepted, but they will be treated differently, so programs that use them will probably behave unexpectedly.
- Console ID Tracking Facility is still incorporated into z/OS R9. Use it!
- New routing attribute in R8, UNKNIDS. Any consoles that request this attribute receive messages directed to 1-byte console IDs.

 **Accommodate the removal of the master console (Required-IF, as of R8)**

- Before R8: one op console within the sysplex was req to be designated as the master console.
- As of R8: master console is removed, and functions that were unique to the master console have been made available to other consoles. Can still define multiple consoles with master authority. System enforces that the system console has master authority and LOGON(OPTIONAL).
 - Remove the NOCCGRP keyword from CONSOLxx and "MSTCON" keyword from the CNGRPxx. (Can keep if you share parmlib with <R8 systems, R8 warns but continues.)
 - Following commands are no longer supported: VARY ...,MSTCONS and DISPLAY C,MONLY
 - Add INTIDS keyword to console definitions in CONSOLxx. This is a new R8 routing attribute. Any consoles that request this attribute receive messages directed to console ID zero (which used to represent the master console).
 - Got COM='MN JOB NAMES,T' in COMMNDxx? Use SETCON MONITOR command instead.

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BCP Migration Actions for z/OS R9 from z/OS R7



Migration Actions Pre-First IPL:


- Put a blank in column 19 of NLS skeleton lines (**Required-IF, as of R8**)
 - Before**, column 19 was not an intended programming interface, but the message service compiler didn't enforce that it was blank. **Now**, the compiler will use column 19 for a specific purpose when the value is 1. Will validate that column 19 is either blank or 1 - anything else will result in a non-0 completion code from the compiler.
 - If you have anything but a blank in column 19 of any NLS skeleton, change it to be a blank.

➔ **Add more real storage if needed (Required-IF, as of R8)**

- As of R8, z/OS supports up to 4 TB of real storage on single z/OS image.
- z/OS R8 no longer supports the physical swapping of address spaces. (Physical swapping is the process of moving all of the virtual storage of the addr space to aux or paging storage.)
- Elimination of physical swapping means that a portion of the address space must remain in real storage. Therefore, may have performance implication if real storage is in very short supply or the paging rate increases or both.
- Pre-R8:** Analyze RMF reports from your pre-R8 system to see if a large number of physical swaps occurred. If RMF STORF report shows address spaces fixing a lot of frames, consider increasing the amount of real storage.
- On R8/R9:** use RMF to monitor your use of real storage by examining the Unreferenced Interval Count (UIC) value. The UIC values have changed in R8: higher the UIC, less contention in system. The new maximum (65535) means there's ample frames available in the system. Low UICs means system is storage constrained.
- May update automation** on msg: **IRA205I 50% AUXILIARY STORAGE ALLOCATED**, to add IBM Corporation additional page data sets before a critical shortage occurs.

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BCP Migration Actions for z/OS R9 from z/OS R7



Migration Actions Post-First IPL:

- Accommodate the change of directory information for PDSE program objects with authorization code zero angle in how vary offline requests wait for SYSIEFSD.Q4 (**Required-IF, as of OA21759 on R9/R8/R7**)
 - Before APAR**, for program objects if no auth code is set (or is 0), directory entry indicates that no auth code is present. This wasn't consistent with load modules (PDS) processing; IEHLIST LISTPDS command shows inconsistency in AuthReq column:
 - PDS: NO**, for 0 or unspec, **PDSE: blank**, unless non-0 was specified
 - With APAR**, binder always sets a valid auth code in the directory for a program object (PDSE) with the value on the AC option or SETCODE, or default. AuthReq may be **NO** (meaning AC=00) now.

➔ **Find callers of CNZMXURF that do not hold appropriate serialization (Recommended)**

- CNZMXURF** macros locates the console control block, **UCME**, that contains a specific console ID. After R9, it's important that serialization is held while using **CNZMXURF** and accessing the **UCME** that it returns.
- Tracking Facility** can detect this inappropriate serialization! Look for **"UCME-CMS"**.
- Will be a requirement** in a future release.

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BCP Migration Actions Between z/OS R7 and z/OS R9

These migration actions were taken from *z/OS Migration*. Some descriptions and actions have been shortened for inclusion in this presentation. For the complete descriptions and actions, refer to *z/OS Migration*.

BCP Migration Actions You Can Do Now

Evaluate your stand-alone dump data set allocations and your IPCS processing of them

(Recommended)

Not required, but recommended because of changes to stand-alone dump processing (that reorder dump records with the intent of recording more important data early), and especially recommended if you deploy any LPARs with significantly more main storage than previously used.

In z/OS V1R6, support was introduced for extended-format sequential data sets, a form of data set that is SMS-managed and can occupy more than 64 K tracks per volume. In z/OS V1R7, this support was supplemented with support for large format sequential data sets (DSNTYPE=LARGE), a form of data set that is essentially the same as conventional sequential data sets except that more than 64 K tracks may be spanned per volume. If your stand-alone dump data sets are spread over more volumes than you want, both types of support can help you gain better control over the number of volumes used for each stand-alone dump data set.

Migration action:

- Use multi-volume stand-alone dump data sets. Adjust the number of volumes and their separation to achieve tolerable stand-alone dump capture times.
- Use extended-format sequential data sets or large format sequential data sets. Copy their contents to an extended format, compressed, striped data set using the IPCS COPYDUMP subcommand prior to analysis. Use the same or a larger striping factor than you used for your stand-alone dump data sets. Dump data sets to which stand-alone dump can write may be neither compressed nor striped, but both attributes are advantageous for the target of the copy operation.
- Use a large CISIZE and striping for IPCS dump directories, and blocking, striping, and compression for the stand-alone dump data set. Very large stand-alone dumps might require that you define your directory with the extended addressing attribute, allowing it to hold more than 4 GB.

Stop using CPU affinity (Recommended)

Not required, but recommended if you use CPU affinity because the migration action is planned to be a requirement in the release following z/OS V1R9.

IBM intends to remove support for CPU affinity. CPU affinity originally provided support for assigning work to the same CP. However, this predates Processor Resource/Systems Manager (PR/SM), which introduced logical processors. CPU affinity has long been obsolete for z/OS partitions operating under PR/SM, which makes the CP on which a piece of work executes unpredictable. z/OS V1R9 is planned to be the last release to provide support for the assignment of CPU affinity to a logical processor. Future releases will ignore any attempt to assign CPU affinity. For example, specifications for assigning a program to a specific logical processor or processors using the Program Properties Table (PPT) or a SCHEDxx member of parmlib will be ignored.

Migration action:

1. In parmlib member SCHEDxx, look for AFF(xxx) in the PPT section and either remove it or update it to AFF(NONE). Also, update the specified executable program so that it does not have any dependencies on affinity.
2. In programs, look for use of the SCHEDULE macro where the SRBCPAFF field is set to any value other than 0 or X'FFFF', and use of the IEAMSCHD macro with the CPUMASK keyword with an operand other than 0 or X'FFFF'. Change your programs so that they do not require a specific processor on which to run.
3. In programs, look for use of the IWMCPAFN service. Change your programs so that they do not require a specific program on which to run, which has the effect of removing the programs' use of IWMCPAFN.

Migrate from the prelinker to the program management binder (Recommended)

Not required, but recommended because the prelinker is not planned to be enhanced. Enhancements will only be made to the program management binder..

Migration action: Follow the instructions for migrating from the prelinker to binder in *z/OS MVS Program Management: User's Guide and Reference*.

Check for bind jobs that override output record format (Required-IF, as of R9)

Required if you direct the output of the program management binder (SYSLMOD) to a PDS that is not RECFM=U (or explicitly override the record format with RECFM=U).

Before z/OS V1R9, the program management binder (and the linkage editor before it) forced RECFM=U when writing to a PDS. This sometimes caused problems for users when SYSLMOD was accidentally directed to a data set not intended to hold programs.

Beginning with z/OS V1R9, in an attempt to address these problems, the program management binder rejects a request to write to a PDS that already has a record format other than U, unless RECFM=U is provided as an explicit override.

As part of this change, any explicitly specified RECFM other than U also causes the program management binder to reject the request. With either rejection, the following occurs:

- For the batch and interactive interfaces, existing message IEW2735S is issued. (The message text is OUTPUT DATA SET FOR DDNAME xxxxxxxx HAS INVALID RECORD FORMAT. RECFM=U IS REQUIRED.) processing stops for the current control statement but the program management binder processes any subsequent control statements. The return code at the end of processing is 12.
- For applications calling the program management binder through its API, existing reason code 83000418 is returned from the SAVE request. The program management binder continues to process subsequent requests from the calling application.

Note that the change is only for PDSs, and the new behavior for PDSs matches the current behavior for PDSEs. An equivalent rule has always been in place for PDSEs (DSNTYPE=LIBRARY). Another way of stating the rule, which now applies to both PDSs and PDSEs, is that the program management binder will only write the program if the merge of data set and JCL information has either no record format at all or record format U. The merge is done with JCL information overriding data set information.

Migration action:

- If Check for jobs that specify a RECFM other than U for SYSLMOD. Either remove the RECFM parameter or change it to U. If the same data sets are used to contain data in other record formats, store the data in separate data sets.
- Check for jobs that allocate SYSLMOD to a suspicious destination, such as a maclib or proclib. Modify the destination data set to something more appropriate.

Modify programs that use the program management binder fast data access service (Required-IF, as of R9)

Required if (1) you run any programs that do not use variable length parameter lists for the fast data access service or (2) your system does not make available to your program enough above-the-bar storage for the fast data access service to hold program objects for processing.

The fast data access service of the program management binder has been rewritten for z/OS V1R9. The service is functionally compatible with previous releases except for the following:

- The service now uses 64-bit storage rather than a data space. If MEMLIMIT is zero or very small, the service might display a message in the job log and return error code 12 to the caller.
- The documentation has always indicated that variable length parameter lists must be used, with the high bit being set in the last parameter. However, the program management binder code in z/OS V1R5 through V1R8 did not enforce this requirement for the request code call interface introduced in z/OS V1R5. The requirement is now enforced by default. (You can override the default.)

For most processing, the fast data access service must be able to create a 64-bit memory object large enough to hold the program object as stored on DASD. Program objects could in theory be up to 2 GB in size, though they rarely exceed 100 MB and most are smaller than 1 MB. If the program cannot obtain the 64-bit memory it requires, it displays the following message in the job log (WTO ROUTCODE=11): IEW2091S IEWBFDAT UNABLE TO GET *nnnn* MB OF 64-BIT STORAGE, IARV64 CODE *xxxx*.

If the fast data access service is called to obtain information about a program object in a system data set (normally one in the SYS1.LINKLIB or SYS1.SVCLIB concatenation), it might now be forced to obtain space to hold the program object in 31-bit storage within the caller's address space. Previously, this space would have been obtained by creating a data space. This change could cause a storage constraint if very large program objects are in the SYS1.LINKLIB or SYS1.SVCLIB concatenation, and if the fast data access service is called to provide information about them.

Migration action:

- Assume that some applications might need to use 64-bit storage. Code the IEFUSI installation exit to allow such usage.

Plan your migration to z/OS V1.9!

- Consider changing SMF defaults to permit storage above the 2 GB bar. If the SMF default is not changed, ensure that a MEMLIMIT parameter is added in jobs that use the fast data access service.
- If locally developed programs use the fast data access service, ask the developers to verify their parameter list format.
- Use the IEWBQHOB bypass temporarily, if needed, to avoid disruption.
- Make sure that ISV software that you are using has been tested with z/OS V1R9. The fast data access service might be used internally by these products. Typical products that use it are debuggers, performance analyzers, and compliance analysis programs.

BCP Migration Actions Pre-First IPL

Create IPL text (Required)

Migration action: Update and run the IPLTEXT job to write a new copy of the IPL text. If you install z/OS V1R7 with a ServerPac, an installation dialog job is provided to perform this action. If you install z/OS V1R7 with a CBPDO, instructions to perform this action are provided in *z/OS Program Directory*.

Reference information: For a sample IPLTEXT job, see *z/OS Program Directory*. ServerPac provides a similar job for accomplishing this task; see *ServerPac: Installing Your Order*.

Reassemble the stand-alone dump program (Required)

Migration action: Reassemble the stand-alone dump program. If you install z/OS V1R9 with a ServerPac, an installation dialog job is provided to perform this action. If you install z/OS V1R9 with a CBPDO, instructions to perform this action are provided in *z/OS Program Directory*. Once the stand-alone dump program is properly created on a DASD residence volume, it resides in the SYS1.PAGEDUMP.Vvolser data set.

Reference information: *ServerPac: Installing Your Order*, *z/OS Program Directory*, and *z/OS MVS Diagnosis: Tools and Service Aids*

Modify JCL to be consistent with a new coding rule for the system symbols (Required-IF as of R9)

Required if you depend on JCL coding that is affected.

You can use system symbols in started task JCL (for both jobs and procedures) and in TSO logon procedures. As of z/OS V1R9, support was expanded to allow substringing of system symbols. However, regardless of implementing the new substringing functionality, if you code a system symbol in a data set name with a relative generation number, and the system symbol immediately precedes the generation number and the generation number is not preceded by a plus or minus sign, you might need to change the JCL. For example:

- Case 1: DD DSN=TSOUSER.EREP&SYSNAME(+0),DISP=SHR
- Case 2: DD DSN=TSOUSER.EREP&SYSNAME(0),DISP=SHR

In Case 1, JCL substitution continues to be successful even in z/OS V1R9. On the other hand, in Case 2, resolution to an expected data set name will not occur, resulting in a JCL error.

Migration action: For coding a system symbol in a data set name with a relative generation number, if the system symbol immediately precedes the generation number and the generation number is not preceded by a plus or minus sign, place a period between the system symbol and the generation number. For example, if &SYSNAME were to resolve to SY1, code DSN=PROD.&SYSNAME(0) when the desired data set name is PROD.SY1(0). The period is optional if a plus or minus sign is included: DSN=PROD.&SYSNAME(+0) or DSN=PROD.&SYSNAME(-0).

Update automation that handles message IOS551I (Required-IF as of R9, and rollback via OA19445)

Required if you have automation that examines the message text.

If a VARY dddd,ONLINE command is issued on one system while the device is reserved on another system, the VARY command fails and the following commands are issued:

```
IEE103I UNIT dddd NOT BROUGHT ONLINE
IEE763I NAME= IECVIOPM CODE= 0000000400000000
IOS551I NO PATHS PHYSICALLY AVAILABLE
IEE764I END OF IEE103I RELATED MESSAGES
```

Message IOS551I can be misleading because it suggests there is something physically wrong with the device or paths. As of z/OS V1R9, and APAR OA19445 on z/OS V1R8 and z/OS V1R7, path validation processing is changed to issue

the following message instead of IOS555I if all paths fail and at least one path failure was caused by I/O timeout:
IOS558I FUNCTION NOT PERFORMED, I/O TIMED OUT.

Migration action: Change your automation to expect the new message text. Also, tell operators about the improved message text. **Note:** One possible cause for message IOS558I is that the device is shared and is reserved by a system other than the processing system. As an operator response, look for a reserve held on the device by a sharing system. If one exists, wait for the reserve to be released on the sharing system before trying the VARY command again.

Accommodate the changed DAE interval for suppressing duplicate dumps (Required-IF as of R9 with OA20972)

Required if you want to retain the historical information recorded in the SYS1.DAE data set for 180 days, which was the previous default.

The dump analysis and elimination (DAE) interval for suppressing duplicate dumps was changed from 180 days to 60 days to improve first failure data capture. This allows duplicate dumps for recurring problems to be suppressed within that interval, and allows another dump to be taken if the problem persists or if a different problem occurs. The change of interval was introduced by APAR OW51284 in 2001 and was integrated in z/OS V1R3. However, the command ADYUPDAT CLEANUP *nnn*, which could be used to delete entries older than some period, was not changed, and its default value (*nnn*) remained at 180 days. APAR OA20972 on z/OS V1R9 changes the default value for DAE CLIST ADYUPDAT to 60 days to match the DAE interval.

Migration action: The default value in the ADYUPDAT CLEANUP CLIST does not need to match the DAE interval after which entries are ignored. So, you might want to retain the historical information recorded in the SYS1.DAE data set for longer than 60 days (new default). In such a situation, if you would like to continue using the previous default value (180 days), you need to specify it explicitly, as follows: ADYUPDAT CLEANUP 180.

Ensure that CLOCKxx is specified properly for LOCAL timing mode (Required-IF as of R9 and via OA13344)

Required if you are running in LOCAL timing mode, that is, ETRMODE NO or ETRMODE YES but a Sysplex Timer is not available.

A hardware feature of z9, z990, and z890 servers known as Server Time Protocol (STP), a follow-on to the Sysplex Timer (9037-002), can be enabled using the new STPMODE parameter in the CLOCKxx member of parmlib. APAR OA13344 on z/OS V1R8 and V1R7 enables the STP functionality, with a default value of STPMODE YES. Systems for which ETRMODE NO is specified, without an explicit specification of STPMODE, receive the default of STPMODE YES. Because the server is not in STP timing mode but in LOCAL timing mode in this case, messages IEA888A and IEA381I are issued during system initialization. (IEA381I is THE STP FACILITY IS NOT USABLE. SYSTEM CONTINUES IN LOCAL TIMING MODE.) Note that operator prompt IEA888A is issued regardless of whether OPERATOR PROMPT or NOPROMPT is specified in CLOCKxx.

Migration action: If you are not using STP timing mode, that is, if you are running in LOCAL timing mode (which means ETRMODE NO or ETRMODE YES but a Sysplex Timer is not available), and you do not want to reply to the clock prompt (IEA888A) at each IPL, specify STPMODE NO explicitly in the CLOCKxx parmlib member. This action applies to z/OS systems running on servers that are not STP-capable (z900 and z800) and also servers that are STP-capable (z9EC, z9BC, z990, and z890) but not STP configured.

Note: If the z/OS system image is running with SIMETRID in the CLOCKxx parmlib member, this migration action is not relevant because ETRMODE and STPMODE are ignored when SIMETRID is specified.

Modify applications to accommodate the changed MEMLIMIT value (Required-IF as of R9 and rolled back in OA14391)

Required if you use IEFUSI and set REGION but not MEMLIMIT, and have applications that are affected by the way MEMLIMIT is now set.

Before APAR OA14391 for z/OS V1R8 and V1R7, if a job specified MEMLIMIT and REGION=0 in the JCL, and if IEFUSI was used to limit REGION but not MEMLIMIT, the MEMLIMIT value specified in the JCL was not used. Instead, the MEMLIMIT for the job was set equal to the REGION size. Beginning with z/OS V1R9 (and z/OS V1R8 and V1R7 with APAR OA14391), this scenario results in a setting of MEMLIMIT equal to the value specified in the JOB or EXEC statement of the job's JCL.

Migration action: Examine applications that depend on the MEMLIMIT setting and, if the new behavior is unacceptable, code an appropriate MEMLIMIT value for these applications, either in your JCL for the job or in your IEFUSI exit.

Note: If no explicit value for MEMLIMIT is specified in the JCL but REGION=0 is specified, and if IEFUSI is subsequently used to limit REGION but not establish a MEMLIMIT, both of the following occur:

- The MEMLIMIT for the job is set equal to the IEFUSI-specified REGION value. (This behavior has been in effect since z/OS V1R7.)
- A system SMF-specified value for MEMLIMIT is ignored and, if the PTF for APAR OA14391 is applied, SMF30MES (the source of MEMLIMIT in the SMF30 record) is set to X'0A'.



Ensure that the GRS ISV-oriented exit routines run in a cross-memory environment (Required-IF, as of R9)

Required if your software or any of your ISV software uses the ISGNQXITBATCH, ISGNQXITBATCHCND, ISGNQXITPREBATCH, or ISGNQXITQUEUEU1 installation exit.

Before z/OS V1R9, the global resource serialization exit routines ISGNQXITBATCH, ISGNQXITBATCHCND, ISGNQXITPREBATCH, and ISGNQXITQUEUEU1, used by independent software vendors (ISVs), were not invoked in cross-memory mode. Starting in z/OS V1R9, these exit routines are invoked in cross-memory mode. If your installation uses any of these exit routines or if any of your ISV software uses these exit routines, you must ensure that the exit routines can run in a cross-memory environment prior to implementing z/OS V1R9. A failure in any of these exit routines could cause a data integrity problem or system failure.

Migration action: Determine whether any of the affected exit routines are currently in use on your system by using the DISPLAY PROG,EXIT command. The target module names can help identify who the exploiters are.

If you are using any of the affected exit routines, do the following:

- If any of the exit routines are owned by ISVs that you did not contact for new z/OS V1R9 support, contact those ISVs to ensure that you have the latest updates.
- If any of the exit routines are owned by your installation, ensure that these exit routines have been modified to enable execution in a cross-memory environment.

Use the new default for the VSM ALLOWUSERKEYCSA parameter of DIAGxx (Recommended)

Not required, but recommended for better security.

The VSM ALLOWUSERKEYCSA parameter of parmlib member DIAGxx prevents (NO) or allows (YES) the allocation of user key common storage area (CSA). Before z/OS V1R9, the default value was YES. Beginning with z/OS V1R9, the default value is NO. Specifying or defaulting to NO is recommended. YES allows user key CSA to be allocated, which can be a security risk because any unauthorized program can modify it.

When VSM ALLOWUSERKEYCSA is NO, any attempt to obtain user key from a CSA subpool (through GETMAIN or STORAGE OBTAIN) will result in a failure with a B04-5C, B0A-5C, or B78-5C abend.

Migration action:

1. If you use the default value for the VSM ALLOWUSERKEYCSA parameter, accept the new default value of NO because it prevents unauthorized programs from modifying user key CSA. However, if you prefer the previous default value of YES, specify it on VSM ALLOWUSERKEYCSA in parmlib member DIAGxx.
2. If you use IBM Health Checker for z/OS, install PTF UA36271 (for APAR OA22166) on z/OS V1R9. This makes the VSM_ALLOWUSERKEYCSA check active, allowing the check to be consistent with the new default value of NO for the parmlib parameter.
3. Investigate any required software updates on your target system to support the default value of NO.

Use the new default for the SRM invocation interval (RMPTTOM) with very fast processors (Recommended, as of R9 and in OA18452)

Not required, but recommended so that SRM timed algorithms are not called more often than necessary on systems with a uniprocessor speed of greater than 100 MIPS.

The RMPTTOM parameter in parmlib member IEAOPTxx specifies the system resources manager (SRM) invocation interval. Before z/OS V1R9 (and APAR OA18452 on prior releases), the RMPTTOM default value was 1000 (milliseconds) for all processors. Beginning with z/OS V1R9 (or V1R8 and V1R7 with APAR OA18452), the default value depends on processor speed. For systems with a uniprocessor speed of 100 MIPS or less, the default value remains 1000. But for systems with a uniprocessor speed of greater than 100 MIPS, the default value is now 3000.

The default value of 3000 with very fast processors is more reasonable than the previous default value of 1000. 1000 could cause some SRM timed algorithms to be called more often than necessary. For example, determining the mean time to wait and the resulting dispatching priority of an address space on the order of every 1000 milliseconds has little value compared to doing the same every 3000 milliseconds.

Migration action: If you use the default value for the RMPTTOM parameter, and your processor speed is greater than 100 MIPS, accept the new default value of 3000 because it is more reasonable with very fast processors. However, if you prefer the previous default value of 1000 (or any other value), specify it on RMPTTOM in parmlib member IEAOPTxx.



Discontinue use of the DIAGxx ISGERQA parameter (Required)

Before z/OS V1R9, ISGERQA was a parameter of parmlib member DIAGxx that could be used under the direction of IBM Service to change the amount of private virtual storage below the 2 GB bar that global resource serialization would reserve for the extended resource queue area (ERQA). The ERQA was used mostly for ENQ-related control blocks and it still exists in z/OS V1R9.

Beginning with z/OS V1R9, ISGERQA is not to be used anymore because of the enhanced ENQ capacity of global resource serialization. Most of the storage that was in the ERQA is now above the 2 GB bar in the global resource serialization private area and is not controlled by the ISGERQA parameter. z/OS V1R9 can place higher demands on other parts of global resource serialization private storage below the 2 GB bar, and having an unnecessarily high ERQA can reduce the amount of storage available to it.

Migration action: Do not use the ISGERQA parameter of parmlib member DIAGxx.



Accommodate the removal of 1-byte console IDs (Required)

In z/OS V1R7, support for 1-byte console IDs and migration console IDs was removed from z/OS macros and commands. In z/OS V1R8, the removal of 1-byte console IDs was complete. In z/OS V1R8 and later, some services contain toleration support for programs that were assembled before z/OS V1R7, but the services treat the IDs differently, so programs that use 1-byte console IDs might behave unexpectedly. The Console ID Tracking Facility is still available to help identify 1-byte console ID usage.

Migration action:

- Obtain the latest product and service levels for IBM and vendor products that used 1-byte console IDs.
- Consider adding the UNKNIDS keyword to console definitions specified in your CONSOLxx parmlib member. z/OS V1R8 has a new routing attribute, UNKNIDS, and any consoles that request this attribute receive messages directed to 1-byte console IDs.
- Because some control blocks and macros have been changed to remove 1-byte console ID support, avoid using 1-byte console ID fields when referencing these control blocks. For a list of changed control blocks and macros, see "**Modify programs that reference unsupported console functions**".



Accommodate the removal of the master console (Required-IF, as of R8)

Required if you have operational procedures that are dependent on the master console.

Before z/OS V1R8, one operator console within a sysplex was required to be designated as the master console. As of z/OS V1R8, the concept of the master console is removed and functions that were unique to the master console have been made available to other consoles. You can still define multiple consoles as having master authority. With the removal of the master console, the system console takes on more significance. z/OS V1R8 enforces that the system console has master authority and LOGON(OPTIONAL).

When the first z/OS V1R8 system joins a sysplex consisting of z/OS V1R7 (or earlier) systems, support for the master console is removed for all systems in the sysplex. When the last z/OS V1R8 system leaves the sysplex, a master console may again be selected.

Migration action:

- Remove the NOCCGRP keyword from the CONSOLxx parmlib member and the *MSTCON* keyword from the CNGRPxx parmlib member. You can keep these keywords if you plan to share these members with z/OS levels

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earlier than V1R8. z/OS V1R8 issues warning messages about unsupported keywords but the system continues with no errors.

- Notify operators that the following commands are no longer supported:
 - – VARY ...,MSTCONS
 - – DISPLAY C,MCONLY
- Examine your automation procedures for commands, functions, and messages that no longer exist, and make appropriate changes. Also, determine whether any new messages warrant automation. With the master console eliminated, there is no longer a default target console in a sysplex with which to associate the MONITOR command. Therefore, a MONITOR command that specifies the JOBNAME, STATUS, or SESS parameter issued from a COMMNDxx member in parmlib that does not specify a target console name will fail. This command will fail on any system in a Sysplex that contains a z/OS V1R8 or later system.

At z/OS V1R8 or later, a MONITOR command that specifies JOBNAME, STATUS, or SESS in COMMNDxx without a target console name will result in message CNZ0005I MONITOR REJECTED. REASON=CONSOLE ID ZERO NOT SUPPORTED. At z/OS V1R7 or earlier, no error message is issued but the command is rejected.

If you use the MONITOR JOBNAME, MONITOR STATUS, or MONITOR SESS commands in COMMNDxx, at z/OS V1R7 or later, you should replace them with the SETCON MONITOR command.
- Because some control blocks and macros have been changed to remove master console support, avoid using master console fields when referencing these control blocks. For a list of changed control blocks and macros, see **“Modify programs that reference unsupported console functions”**.
- Consider adding the INTIDS keyword to console definitions in your CONSOLxx member of parmlib. z/OS V1R8 (and later) has a new routing attribute, INTIDS, and any consoles that request this attribute receive messages directed to console ID zero. (Messages targeted to console ID zero used to be routed to the master console.)
- Determine if your operational procedures refer to the use of the external interrupt key. If so, update your procedures accordingly. Use of the external interrupt key to switch the master console is no longer supported.
- Examine your automation procedures for the no-master-console and no-consoles conditions, and make appropriate changes. These conditions no longer exist.

Accommodate the removal of the console switching (Required-IF, as of R8)

Required if you have automation or operational procedures that process console failures.

Before z/OS V1R8, when a console failed, z/OS would attempt to switch the console's function to an alternate console. This facility was originally designed to ensure that a master console was always active. As of z/OS V1R8, this console switching function is removed, and console failures no longer cause a console switch. Operators cannot issue the SWITCH CN command to switch consoles. In addition, use of ALTGRP to specify an alternate console is no longer possible, and the VARY CN(...),ALTGRP command is removed.

When a z/OS V1R8 system joins a sysplex consisting of z/OS V1R7 (or earlier) systems, support for console switching is removed for all systems in the sysplex. When the last z/OS V1R8 system leaves the sysplex, console switching becomes operative.

Migration action:

- Explicitly configure backup consoles because console switching is not supported.
- Notify operators that the SWITCH CN and VARY CN(...),ALTGRP commands cannot be issued.
- Modify any automated procedures to eliminate use of SWITCH CN and VARY CN(...),ALTGRP commands.
- Remove the ALTGRP keyword from the CONSOLxx parmlib member. You can, however, keep the ALTGRP keyword if you plan to share CONSOLxx members with z/OS levels earlier than V1R8. z/OS V1R8 issues warning messages about unsupported keywords but the system continues with no errors.
- Because some control blocks and macros have been changed to remove console switching support, avoid using console switching fields when referencing these control blocks. For a list of changed control blocks and macros, see **“Modify programs that reference unsupported console functions”**.

Discontinue use of the MSGRT command (Required-IF, as of R8)

Required if you have operational procedures that suggest using the MSGRT command.

Before z/OS V1R8, the MSGRT command was used to establish and change message routing instructions for certain options of DISPLAY, CONFIG, CONTROL, MONITOR, and STOPMN commands. As of z/OS V1R8, the MSGRT command is removed. The MSGRT command was originally developed for OS/360 and, over the years, has lost its usefulness.

Migration action:

- Notify operators that the MSGRT command can no longer be used.
- Modify any automated procedures to eliminate the use of the MSGRT command. If you want, update the commands (with the L= operand) that MSGRT was going to process.
- Remove the MSGRT keyword from the CONSOLxx parmlib member. You can, however, keep the MSGRT keyword if you plan to share the CONSOLxx member with z/OS levels earlier than V1R8. z/OS V1R8 issues warning messages about unsupported keywords but the system continues with no errors.

Update the hardcopy medium definition (Required-IF, as of R8)

Required if you require that a hardcopy medium always be active.

Before z/OS V1R8, if the specified hardcopy medium (SYSLOG or OPERLOG) failed, the system would attempt to switch hardcopy processing to the other log. As of z/OS V1R8, hardcopy switching is no longer supported. Therefore, if only one hardcopy medium is defined and fails, the system suspends hardcopy processing. To avoid this problem, define both SYSLOG and OPERLOG as the hardcopy medium.

Migration action: To reduce the likelihood of losing hardcopy, define both SYSLOG and OPERLOG as the hardcopy medium. In your CONSOLxx parmlib member, specify `HARDCOPY DEVNUM (SYSLOG,OPERLOG)`. The default is `HARDCOPY DEVNUM (SYSLOG)`. When specifying OPERLOG, ensure that you have set up DASD-only or coupling facility log streams.

Modify programs that reference unsupported console functions (Required)

As of z/OS V1R8, many control blocks have been changed to remove the support for 1-byte console IDs, console switching, and master consoles. Examine your programs that reference these control blocks and ensure that the programs continue to work with the z/OS V1R8 changes.

Migration action: Examine programs that reference the control blocks below and ensure that the programs continue to work now that 1-byte console ID support has been removed from the control blocks. Because the 1-byte fields have been removed, a clean assembly or compilation will assure you that you were successful in removing all references to 1-byte fields.

Control block	Mapping macro
MDB	IEAVM105
CSCB	IEECHAIN
UCM	IEECUCM
XSA	IEEXSA
CMPL	IEEZB810
PLIBAREA	IEEZB822
VDRSARR	IEEZB834
ECDM	IEEZB887
CIB	IEZCIB
CXSA	IEZVD002 and IHACTM
SCSR	IEZVG100
MCSOPPRM	IEZVG111
CONV	IEZVG200
CTXT	IEZVX100
CMDX	IEZVX101
CXSA	IHACTM and IEZVD002
ORE	IHAORE
WQE	IHAWQE



Accommodate the subsystem console service interface change (Required-IF, as of R8)

Required if you have applications that use subsystem consoles.

Callers allocate, release, query, and modify subsystem consoles by invoking module IEAVG700 with an SCSR parameter list (mapped by IEZVG100). As of z/OS V1R8, the parameter list for IEAVG700 has been changed, resulting in different subsystem console interface behavior. If a subsystem console request requires a console ID as input or output, a 4-byte ID field (SCSCONID) must be provided. A demand select request (SCSDEMSEL) must now request only a subsystem console, and IEAVG700 can no longer be used to change an MCS console into a subsystem console. IEAVG700 no longer supports the changing of a subsystem console's routing codes.

Migration action: Modify IEAVG700 as follows:

- Reassemble it with the current length and version level. The parameter list's version level must also be at or above a level (z/OS V1R6 or later) that supports the 4-byte console ID field.
- Make sure that the demand select request field (SCSDEMSEL) is being used only for a subsystem console. If the unit name is specified, remove the request to change an MCS console.
- If the SCRTCDF field is being set, remove the request for the routing code service.

Use GRSCNFxx to specify the maximum number of concurrent ENQ requests (Required-IF, as of R8 and rolled back to R7 in OA11382)

Required if you have any programs that use the GVTCREQA or GVTCREQ field of the GVT.

Before z/OS V1R8, you could zap the GVTCREQA and GVTCREQ fields of the global resource serialization vector table (GVT) to increase the authorized and unauthorized maximums of concurrent ENQ requests. Starting with z/OS

V1R8, and rolled back to V1R7 by APAR OA11382, you cannot use this method. Instead, achieve the same system-wide updates using the new ENQMAXA and ENQMAXU keywords in the GRSCNFxx parmlib member.

Migration action:

- 1) Remove any zaps that update GVTCREQ and GVTCREQA and make corresponding updates to the ENQMAXU and ENQMAXA keywords of GRSCNFxx before the next IPL. Note that if you zapped GVTCREQ to 16 384 or less, you do not need to update ENQMAXU because the default for ENQMAXU is 16 384. Likewise, if you zapped GVTCREQA to 250 000 or less, you do not need to update ENQMAXA because the default for ENQMAXA is 250 000.
- 2) Determine which subsystems and applications require greater authorized or unauthorized maximums than the defaults. To help in this investigation, use ISGQUERY REQINFO=ENQSTATS to query address space peaks.
- 3) Ensure that these programs use the new ISGADMIN REQUEST=SETENQMAX service to set address space specific maximums so that lower system-wide maximums can be maintained, providing better reliability, availability, and serviceability (RAS).
- 4) Once all the necessary programs exploit ISGADMIN appropriately, reset the ENQMAXU and ENQMAXA keywords to their default values by using the new SETGRS command support. This command improves reliability, availability, and serviceability because global resource serialization can better detect “ENQ runaways” (address spaces that loop on ENQ requests). Make corresponding updates to GRSCNFxx for future IPLs.
- 5) Consider using automation to catch the following messages to help you avoid an ABEND 538:
 - ISG368E THE CONCURRENT {AUTHORIZED|UNAUTHORIZED} REQUEST COUNT FOR ASID *asid* HAS EXCEEDED THE *percentage* PERCENT THRESHOLD OF THE {ADDRESS SPACE|SYSTEM-WIDE} MAXIMUM, *maximum*.
 - ISG369I THE CONCURRENT {AUTHORIZED|UNAUTHORIZED} REQUEST COUNT FOR ASID *asid* HAS DROPPED BELOW THE *percentage* PERCENT THRESHOLD OF ITS MAXIMUM.

Update the GRSQ setting in GRSCNFxx **Required, as of R8**

The GRSQ keyword was added to the GRSCNFxx parmlib member in z/OS V1R7 (and rolled back to z/OS V1R4 by APAR OA07975), where it was applicable to all global resource serialization modes (STAR, RING, and NONE) and its default was ALL. Starting in z/OS V1R8 (and rolled back to z/OS V1R7 by APAR OA11382), the GRSQ keyword is only applicable to STAR mode and its default is CONTENTION.

Migration action:

- If global resource serialization **is not** running in STAR mode, ensure that the GRSQ parameter is not in parmlib member GRSCNFxx.
 - If global resource serialization **is** running in STAR mode and you still want GRSQ set to ALL (rather than the new default, CONTENTION), specify GRSQ(ALL) in parmlib member GRSCNFxx. GRSQ(ALL) causes GRSQ processing to collect all ENQ resources from all systems in the entire GRS complex. GRSQ(CONTENTION) causes GRSQ processing to collect all ENQ resources on the local system, and only collect information about global resources in contention in the rest of the GRS complex.

Tip: Use IBM Health Checker for z/OS to examine the system's GRSQ setting. The check GRS_GRSQ_SETTING generates an exception if the GRSQ setting is not set to CONTENTION in a GRS=STAR mode environment. This is a onetime check that is also run during a migration from GRS=RING to GRS=STAR.

Ensure that GRSCNFxx is used properly for GRS=NONE (**Required-IF, as of R8 and back in OA11382**)

Required if you use global resource serialization in NONE mode.

Before z/OS V1R8, the GRSCNFxx parmlib member was not processed when global resource serialization was operating in NONE mode. Starting with z/OS V1R8, GRSCNFxx is parsed when IEASYSxx keyword GRS is set to NONE. If you specify GRS=NONE and a GRSCNFxx member, the GRSCNFxx member must now be syntactically correct. In addition, the following keywords are now relevant for all modes including GRS=NONE:

- SYNCHRES
- CTRACE
- ENQMAXA
- ENQMAXU

Migration action: To avoid warning messages and to ensure proper function in GRS=NONE mode, ensure that the GRSCNFxx member is accessible and contains the correct configuration parameters for a GRS=NONE mode system. If global resource serialization is not active and GRSCNFxx is not accessible, the following messages can be issued:

- The system issues message ISG313I when mode-irrelevant keywords are found in GRSCNFxx parsing.

- The system issues WTOR message ISG163D when GRSCNFxx cannot be accessed. If you press Enter for this WTOR message, the system continues to issue message ISG372E to indicate that the GRSDEF defaults are used.

Note: GRSCNF00 is the parmlib member selected if you do not specify GRSCNF=xx in parmlib member IEASYSxx. A copy of GRSCNF00 is shipped with the system but it might need customizing.

Modify programs to properly handle the new ASCBIOSC maximum value (Required-IF, as of R8 and rolled back to R7 in OA14340)

Required if you have any programs that treat ASCBIOSC, SMF30TEP, SMF32EXP, or SMF33EXP as signed integers. The ASCBIOSC field in the ASCB data area contains an ongoing I/O count. The field is 4 bytes in length and is updated by the SMFIOCNT service. The ASCBIOSC count is propagated to SMF record type 30 (field SMF30TEP), SMF record type 32 (field SMF32EXP), and SMF record type 33 (field SMF33EXP).

The maximum ASCBIOSC value has been increased. In z/OS V1R7 without the PTF for APAR OA14340 installed, z/OS V1R6 without the PTF for APAR OA14340 installed, and z/OS V1R5, the maximum ASCBIOSC value is 2 147 483 647 (2 GB, or X'7FFFFFFF'). In z/OS V1R8, z/OS V1R7 with the PTF for APAR OA14340 installed, and z/OS V1R6 with the PTF for APAR OA14340 installed, the maximum ASCBIOSC value is 4 294 967 294 (4 GB, or X'FFFFFFFF'). Because of the new maximum ASCBIOSC value, when ASCBIOSC has reached its maximum capacity, the SMF fields to which ASCBIOSC is propagated (SMF30TEP, SMF32EXP, and SMF33EXP) are now cleared, and new bit indicators are set to identify that the fields are invalid. The new bits are defined in fields SMF30DCF, SMF32DSF, and SMF33DSF. The ASCBIOSC field and the SMF fields to which it is propagated are now unsigned 4-byte fields, and must be treated as unsigned by any programs that use them.

Migration action: Modify programs so that they treat the ASCBIOSC field and the SMF fields to which it is propagated (SMF30TEP, SMF32EXP, and SMF33EXP) as *unsigned* fields. Use logical instructions when using these fields for arithmetic. If the values of these fields are displayed, be aware that the high-order bits might be on, which does *not* indicate a negative value.

Modify programs so that they check the new bits SMF30TEF in SMF30DCF, SMF32EXF in SMF32DSF, and SMF33EXF in SMF33DSF before using the corresponding SMF30TEP, SMF32EXP, and SMF33EXP fields because these fields will be cleared and invalid once the ASCBIOSC has reached its maximum capacity.

Modify installation exits to ignore new or unknown C/I text units (Required-IF, as of R8)

Required if you have any installation exits that are not coded to ignore new or unknown C/I text units.

Before z/OS V1R8, converter/interpreter (C/I) text unit key X'14' was not defined. In z/OS V1R8, C/I text unit key X'14' is introduced to be used by JES2 and JES3 to associate SYSIN data with the correct file when a SYSIN statement is coded as an override to a DD statement that is in a procedure. If you have any IEFUJV or other exit routines that process C/I data, you might have to change them if they are not coded to ignore new or unknown text units.

Migration action: Verify that your installation exits that process C/I data are coded to ignore new or unknown text units. If they are not, make the appropriate modifications to the exit routines.

Check for reserved console names INTERNAL and INSTREAM (Required-IF, as of R8)

Required if you depend on the CONVCON service returning RC=x'8', RSN=x'C' for console names of INTERNAL or INSTREAM.

Before z/OS V1R8, the CONVCON service returned RC=X'8' (invalid console name) and RSN=X'C' (console name reserved) for a console name of INTERNAL or INSTREAM. As of z/OS V1R8, CONVCON returns RC=X'0' with the appropriate value in the 4-byte console ID field (CONVID). Therefore, if you depend on CONVCON returning RC=X'8' and RSN=X'C', you must make appropriate changes to your code.

Migration action:

- Verify that your code does not depend on the CONVCON service returning RC=X'8' (invalid console name) and RSN=X'C' (console name reserved) for console names of INTERNAL and INSTREAM. If it does, update your code to check for these console names and take appropriate action.
- Verify that your code can handle receiving a CONVID of X'00000000' for a console name INTERNAL and X'00000080' for a console name INSTREAM. If it does not, make appropriate changes to your code.

Put a blank character in column 19 of NLS skeleton lines (Required-IF, as of R8)

Required if you have any NLS skeleton lines, other than comment lines, that contain a non-blank character in column 19.

Before z/OS V1R8, column 19 of national language support (NLS) skeletons was documented as “not part of the intended programming interface”, but the message services compiler did not enforce that it contained a blank. As of

z/OS V1R8, the message services compiler uses column 19 for a specific purpose when the value is 1. The compiler is changed to validate that column 19 is either blank or 1. Any other value results in a nonzero completion code from the NLS skeleton compile process. Therefore, if you have a nonblank character in column 19, you need to change it to a blank. Note that column 19 in a comment line can contain any value, including nonblank.

Migration action: Verify that column 19 in NLS skeleton lines contains a blank character. If it does not, modify the skeleton line so that column 19 contains a blank.

Use the changed defaults for HOTIO in IECIOSxx (Recommended, as of R8)

Not required, but recommended unless the installation can properly deal with responding to messages issued using DCCF.

Before z/OS V1R8, the defaults for the DFLT112 and SDFT112 parameters of the HOTIO statement in the IECIOSxx parmlib member were: DFLT112=(CHPK,OPER) and SDFT112=(CUK,OPER).

These defaults allowed the operator to specify the recovery action. As of z/OS V1R8, the DFLT112 and SDFT112 defaults are changed as follows: DFLT112=(CHPK,BOX) and SDFT112=(CUK,BOX).

These defaults specify that the device is to be forced offline without operator intervention. There are conditions when the message issued to prompt the operator might be done using the Disabled Console Communication Facility (DCCF). IBM recommends that operator involvement not be requested for HOTIO actions.

Migration action: Use the new HOTIO defaults if your installation cannot properly deal with responding to messages issued using DCCF.

Ensure that IXGWRITE in unauthorized programs correctly handles reason code x'0867' (Required-IF, as of R8 and rolled back in OA14125)

Required if you issue the IXGWRITE macro in unauthorized programs.

The IXGWRITE macro allows a program to write a log block to a log stream. IXGWRITE returns a unique identifier for each log block written to the log stream.

Before z/OS V1R8, IXGWRITE reason code X'0867' indicated that available local buffer space for the system logger address space was full. With z/OS V1R8, the X'0867' reason code is updated to indicate also that the IXGWRITE request is rejected when an unauthorized caller attempts to write log data while the outstanding asynchronous write activity for this log stream connection is considered too high. Therefore, ensure that the X'0867' reason code is handled appropriately.

Migration action:

- Review the use of IXGWRITE in unauthorized programs.
- Ensure that the existing X'0867' reason code is managed appropriately. In the IXGANSAA answer area, Ansaas_Diag1 contains 1 for this error and Ansaas_Diag2 contains the total number of outstanding asynchronous write requests for this connection. The unauthorized writer should consider waiting for a short interval and then reissue the IXGWRITE request. If subsequent write attempts continue to fail for an unacceptable period, consider notifying operations or disconnecting from the log stream.

Limit the number of browse sessions initiated by IXGBRWSE in unauthorized programs (Required-IF, as of R8 and rolled back in OA08661)

Required if you use IXGBRWSE in unauthorized programs.

The IXGBRWSE macro is used to read and browse a log stream for log block information.

Before z/OS V1R8, the number of browse sessions initiated by IXGBRWSE REQUEST=START was not limited. As of z/OS V1R8, IXGBRWSE REQUEST=START can be rejected if an unauthorized caller attempts to start a browse session when 100 or more browse sessions already exist for this connection, or if more than 20 consecutive unused browse sessions are detected for this connection. Therefore, you should review your use of IXGBRWSE in unauthorized programs to determine whether it is possible that your programs use too many browse sessions.

Migration action: Review the use of IXGBRWSE in unauthorized programs to determine whether it is possible that your programs use too many browse sessions, and modify your programs if necessary. Reason code X'0845' for IXGBRWSE REQUEST=START now indicates that the request can be rejected if an unauthorized caller attempts to start a browse session when 100 or more browse sessions already exist for this connection, or if more than 20 consecutive unused

browse sessions are detected for this connection. Field ANSAA_BROWSESTARTSLIMITED in answer area IXGANSAA indicates to users of IXGCONN REQUEST=CONNECT whether IXGBRWSE REQUEST=START requests are limited for unauthorized users.

Add more real storage if needed (Required-IF, as of R8)

Plan your migration to z/OS V1.9!

Required if insufficient real storage is configured to support the workload without physical swapping.

Before z/OS V1R8, the amount of real storage that z/OS allowed to be configured to a single z/OS image was 128 GB (where GB equals 1 073 741 824 bytes). The IBM hardware systems that are now available, however, support more than 128 GB. As of z/OS V1R8, z/OS supports up to 4 TB (where TB equals 1 099 511 627 776 bytes) of real storage to be configured to a single z/OS image.

With this support, z/OS no longer supports the physical swapping of address spaces. Physical swap is the process of moving all of the virtual storage of the address space to auxiliary or paging storage. Elimination of physical swap means that a portion of the address space must remain in real storage. There can be performance implications for some systems if real storage is in very short supply or the paging rate increases, or both.

In some systems, physical swapping releases real storage that will no longer be released because physical swapping is no longer supported. Examination with RMF can determine the average number of physically swapped address spaces and the average number of pages in the swap working set. All of the pages of the physically swapped address space working set will not be backed in real storage; generally, one third to one half will reside in real storage, with the remaining paged to auxiliary storage. If the total is significant, the paging rate may increase. If the increased paging is not advisable, you can increase the real storage to the logical partition.

Currently, the hardware supports the following maximum amounts of real storage for a z/OS image (where GB equals 1 073 741 824 bytes): z9 EC: 512 GB , z9 BC: 64 GB , z990: 256 GB , z890: 32 GB , z900: 64 GB , z800: 32 GB .

Migration action:

- Analyze RMF reports from your pre-z/OS V1R8 system to determine whether a large number of physical swaps occurred. (Physical swaps to auxiliary storage have been eliminated in V1R8. Therefore, you need to increase the amount of real storage to accommodate the fixed frames owned by an address space.) The RMF CPU Activity Report specifies how many physical swaps have occurred in the OUT READY and OUT WAIT Queue Type fields. If the report shows address spaces on the OUT READY or OUT WAIT queue, consider increasing the amount of real storage for the system. The RMF STORF Report shows how many frames are fixed by an address space. If address spaces fix a lot of storage, consider increasing the amount of real storage.
- After migrating to z/OS V1R8 or higher, use RMF to monitor your use of real storage by examining the Unreferenced Interval Count (UIC) value. The UIC values have changed in V1R8, in that the maximum value has increased from 2540 to 65535. The higher the UIC value, the less contention there is for storage in the system. A UIC value of 65535 indicates that ample frames are available in the system. The lower the UIC value, the more contention there is for storage in the system. A very low UIC value indicates that the system is storage constrained. Changes to the UIC value appear in both RMF reports and SMF records. The “old” UIC values are maintained for compatibility by RMF Monitor I in SMF record type 71. Additional fields are added to SMF record type 71 to contain the “new” UIC values. RMF replaces the “old” UIC value with the “new” UIC value in Monitor II and Monitor III reports, as well as in SMF record type 79 subtype 3 (storage/processor data) and subtype 4 (paging activity data) fields.
 - Update automation for message IRA205I 50% AUXILIARY STORAGE ALLOCATED. This message is issued when more than 50 percent of the auxiliary storage slots are in use. This allows an automation program to add additional page data sets before a critical shortage occurs. The message is repeated every two hours as long as the auxiliary slot usage is above 50 percent.

Tip: Use IBM Health Checker for z/OS to help determine whether additional real storage is needed. The following checks are relevant:

- **ASM_NUMBER_LOCAL_DATASETS:** Checks on the number of usable local page data sets. The check generates an exception if the number is below a recommended value (3 by default). This is a onetime check that is also run whenever a page data set is dynamically added or deleted.
- **ASM_PAGE_ADD:** Checks on the ability to dynamically add additional paging data sets via the PAGEADD command. The check generates an exception if the number of paging data sets that can be added is at or below a warning value (2 by default). This is a onetime check that is also run whenever a page data set is dynamically added or deleted.
- **ASM_PLPA_COMMON_USAGE:** Looks at the slot usage of the PLPA and common page data sets. The check generates an exception if the combined usage of both data sets meets or exceeds a certain percentage (80% by default).
- **ASM_LOCAL_SLOT_USAGE:** Looks at the slot usage of each local page data set. The check generates an exception if the usage of any data set meets or exceeds a certain percentage (30% by default).

Remove CUNUNlxx parmlib members (Required as of R7 with APARs OA14231 and OA16037)

Required to catalog the new data sets. CUNUNlxx is not required, but is recommended to help avoid confusion in the future by anyone who encounters Unicode parmlib members and is unaware that they are no longer necessary.

As of z/OS V1R7, enhancements made to z/OS support for the Unicode Standard no longer require you to run the image generator program to create a conversion image and to customize the CUNUNlxx parmlib members with that conversion image name. This enhancement is colloquially known as "Unicode On Demand". Initially, the z/OS V1R7 enhancements were only for callers that run in TCB mode. APAR OA14231 (which was made available on z/OS V1R7 and integrated in z/OS V1R8) has added function for SRB mode callers. Now callers of Unicode Services that run in either TCB mode or SRB mode will have their conversion tables loaded when needed.

All tables needed for character conversion, case conversion, normalization, and collation services are now loaded automatically when they are required and not already present in storage. The only failure that will occur is when an invalid or unsupported conversion or service is specified. "Unicode On Demand" requires the SYS1.SCUNTLB and SYS1.SCUNLOCL data sets to be cataloged. (The SYS1.SCUNLOCL data set is introduced by APAR OA16037 - which was made available on z/OS V1R7 and integrated in z/OS V1R8). The names of these data sets cannot be changed, that is the HLQ needs to be SYS1. The conversion image generator program, CUNMIUTL, is still being shipped, and existing and new conversion images are still supported. If you want to continue to specify CUNUNlxx parmlib members, the conversion images will still be loaded into storage. The prebuilt conversion image that was added for DB2 support when Unicode services had not been set up, CUNIDHC2, is still loaded under the same conditions that it was before z/OS V1R7.

Migration action: It is required to catalog data sets SYS1.SCUNTLB and SYS1.SCUNLOCL (introduced via APAR OA16037). These data set names cannot be changed and must use the high level qualifier of SYS1.

You no longer need to provide parmlib members CUNUNlxx. You can delete them. Remember also to remove your UNI= references in any IEASYSxx parmlib members. New operator commands (SETUNI ADD, SETUNI DELETE, SETUNI REPLACE, and SETUNI REALSTORAGE) are provided to manipulate conversion images and Unicode settings.

Manage zAAP dispatching with IFAHONORPRIORITY, not IFACROSSOVER, in IEAOPTxx (Required-IF, as of the Web Deliverable for zIIP, and integrated into R8)

Required if you use zAAPs.

Before z/OS V1R8, the IEAOPTxx parmlib member contained the IFACROSSOVER=YES|NO parameter. This parameter was introduced in support of the System z9 and zSeries Application Assist Processors (zAAPs). It specified whether work eligible for zAAPs should be examined by standard processors when the standard processors would otherwise enter a wait state. The default was YES. A related parameter, IFAHONORPRIORITY=YES|NO, was made available at the same time as IFACROSSOVER. As of z/OS V1R8 (and the IBM zIIP Support for z/OS and z/OS.e V1R6/R7 Web deliverable), the IFACROSSOVER parameter is no longer honored because of a general lack of interest and the increased complexity it caused. Now, only the IFAHONORPRIORITY parameter is available to manage the zAAP dispatching algorithms. The default is YES, which specifies that zAAP-eligible work should run on standard central processors (CPs) only when the zAAP is "overloaded". This scheme is designed to use the speciality engine fully while not significantly impacting overall response time. If z/OS determines that response time is being impacted, zAAP work flows back to standard CPs, if they are available, at the priority assigned to the unit of work. If you explicitly specify NO, zAAP-eligible work never overflows to a standard CP. In this case, the overall response time might be impacted if not enough zAAPs are defined to the configuration. Note that the setting of the IFAHONORPRIORITY parameter has no effect on System z9 Integrated Information Processor (zIIP) speciality engines. zIIPs always have the equivalent of IFAHONORPRIORITY=YES processing.

Migration action: Make sure that the IFAHONORPRIORITY parameter is set to YES (or allowed to default to YES) if you want zAAP work to flow back to standard CPs whenever the zAAPs are fully utilized. Remove the IFACROSSOVER parameter from IEAOPTxx. If you do not remove it, it is ignored and no error message is generated. Nevertheless, removing it can help avoid confusing anyone who encounters it in the future and is unaware that it is no longer functional.

Accommodate the need for more IARPFT dump space (Required-IF, as of R8)

Required if you need the IARPFT space to be dumped in an environment with more than 64 GB real storage.

Before z/OS V1R8, the maximum size of IARPFT space for a page frame table entry (PFTE) was 2 GB. In z/Architecture mode, the size of each PFTE has grown to 64 bytes (from 32 bytes in ESA/390 mode). Thus, a 2 GB IARPFT space can hold enough PFTEs to map up to 128 GB of real storage. z/OS V1R8 was designed to support up to

4 TB of real storage and as part of that support, the maximum amount of IARPFT space was also increased to 4 TB. Even though the IARPFT space is very similar to a dataspace, RSM handles this space differently than user dataspace.

In z/OS V1R8, the IARPFT is dumped in the following ways:

- If the NUC or ALLNUC option is specified on SDATA when taking a dump, the IARPFT space is also dumped if the system that is being dumped has 64 GB of real storage or less. The IARPFT space is always dumped when RASP is also included in the dump.
- If the system being dumped is configured with more than 64 GB of real storage, the IARPFT space gets dumped only when also dumping the RSM address space (RASP).

Migration action: Usually, the IARPFT space is needed when trying to debug RSM problems. It might make debugging other problems easier, but it should not be needed unless debugging an RSM problem. However, if you still need the IARPFT space to be dumped in an environment of more than 64 GB of real storage, you must also include the RASP address space in the dump. **Note:** When RSM is having a problem that is causing the dump, RSM recovery includes both RASP and the IARPFT space in the dump.

Correct duplicate volume serial number specifications on the VOLUME parameter in JCL (Required-IF, as of R8)

Required if have JCL that specifies a duplication volume serial number.

Duplicate volume serial numbers should not be specified in a SER subparameter. Each volume must have a unique volume serial number, regardless of whether it is a tape or disk volume. A duplicate volume serial number in the SER subparameter can result in a loop processing the number.

For example, in VOL=SER=(A,B,C,B,E), when the fourth volume serial number is needed, B would be selected. The fifth volume serial number selected would be C. B would be selected again for the sixth volume serial number. If these volume serial numbers represented an output data set, volumes B and C would continue to be overwritten until the data was exhausted. If these volume serial numbers represented an input data set, volumes B and C would continue to be read alternately.

Before z/OS V1R8, when a duplicate volume serial number was detected in the volume list for a tape or DASD multivolume data set, the following warning message was issued: IEC708I ddd,volser,jjj,sss,ddn {-#} DUP VOLSEQ: nnnn AND: nnnn. As of z/OS V1R8, z/OS has been enhanced to detect such a situation for a tape or DASD multivolume data set and end the job with the following error message: IEFC035I DUPLICATE VOLUME SERIAL volser FOUND.

Migration action: To prevent the JCL error with new message IEFC035I, remove or correct the duplicate volume serial number specification.

Notes: 1. When using the DYNALLOC with DALVLSER (key '0010') in z/OS V1R9, specification of a duplicate volume serial number results in rc035C ("Invalid PARM specified in text unit. The accompanying message IKJ56231I identifies the text unit in error.").

2. The detection of a duplicate volume serial number depends on whether the volume serial number is used at execution. Therefore, even if you did not receive warning message IEC708I before your migration, you might still receive the new JCL error with message IEFC035I in z/OS V1R8 or later because the JCL specification is verified before execution.

3. You need to install the PTF for APAR OA21815 if a procedure contains a DD statement with duplicate volume serial numbers and the VOL=SER parameter is overridden with nonduplicate volume serial numbers. Without the PTF, you will receive JCL error message IEFC035I in such a situation.

BCP Migration Actions Post-First IPL

Accommodate the change of directory information for PDSE program objects with authorization code zero (Required-IF, as of OA12579 on R7/R8/R9)

Required if you use IEHLIST LISTPDS output or examine the directory entries to determine the authorization requirement of PDSE program objects.

If the authorization code for a program object (PDSE) is not specified or is specified as zero during bind, the program management binder builds a directory entry with the bit set indicating that the authorization code is not present. However, this is not consistent with load module (PDS) processing and the IEHLIST LISTPDS command shows inconsistent information for PDS modules and PDSE program objects where the authorization code is either not

specified or is specified as zero (using the binder AC option or SETCODE control statement). For PDSEs, the information is blank unless a nonzero authorization code is specified. For PDSs, the Auth Req column contains NO if the authorization code is zero or unspecified. As of z/OS V1R9 and APAR OA21759, the binder always sets a valid authorization code in the directory for a program object (PDSE) with the value specified by the user on the AC option or SETCODE control statement, or the default value if none is specified.

Migration action: Ensure that the change of directory information for the PDSE program object with authorization code zero does not affect your existing processing. For example, if your program reads the Auth Req column listed by the IEHLIST LISTPDS command for the PDSE program object, it needs to be adjusted to handle the new display of NO, which means AC=00.

Notes: 1. To update the directory information and achieve the improved IEHLIST LISTPDS command output (new display of NO), existing program objects in PDSE data sets must be relinked with the program management binder after the PTF for APAR OA21759 is installed.

2. If there is no APF code stored in the directory entry for a program object, ISPF displays 00 in the APF authorization code column on the member list panel. This functionality was introduced by ISPF APAR OW52063, which was integrated in z/OS V1R5 and does not depend on this enhancement to the program management binder.



Find callers of CNZMXURF that do not hold appropriate serialization (Recommended)

Not required, but recommended because in a future z/OS release it will be important to hold serialization.

The CNZMXURF macro locates the console control block (UCME) that contains a specific console ID. In the release following z/OS V1R9, it will be important that serialization is held while using CNZMXURF and accessing the UCME that CNZMXURF returns. With APAR OA19948 on z/OS V1R9 (and prior releases), the Tracking Facility has been enhanced so that it reports callers of the CNZMXURF service that do not hold appropriate serialization. You should run the Tracking Facility to find those callers.

Migration action:

1. Install PTF UA36125 (APAR OA19948) on z/OS V1R9.
2. Obtain the Tracking Facility exclusion list at <http://www.ibm.com/eserver/zseries/zos/downloads/>.
3. Activate the Tracking Facility. Use the exclusion list you obtained in the previous step.
4. Periodically issue the DISPLAY OPDATA,TRACKING command to obtain the results of the tracking.
5. Forward the output to consoles@us.ibm.com so that the exclusion list can be updated for future users.

Adjust to a change in how vary offline requests wait for SYSIEFSD.Q4 (Required-IF, as of R7 w/ OA12454)

Required if you use the VARY OFFLINE command or the IEEVARYD offline service to obtain the SYSIEFSD.Q4 resource.

In z/OS V1R7 without the PTFs for APAR OA12454 installed, the VARY OFFLINE command and the IEEVARYD offline service attempted to obtain the SYSIEFSD.Q4 resource exclusively. If SYSIEFSD.Q4 were not immediately available, the system waited until it was obtained, which effectively blocked all future allocations from proceeding. This situation was most likely to occur when a job entered recovery allocation and was waiting for a response to the MSGIEF238D WTOR; SYSIEFSD.Q4 was held while waiting for the WTOR reply.

Starting with z/OS V1R7 and APAR OA12454 (and integrated in z/OS V1R8 and later), the VARY OFFLINE command waits for five seconds for the SYSIEFSD.Q4 resource to be obtained. If it is not obtained within five seconds, the request for the resource is canceled to allow stalled allocations to proceed and new message MSGCNZ0010A is issued to indicate that the command is delayed. VARY then requests SYSIEFSD.Q4 again, and the wait-cancel-reobtain processing is repeated until the resource is finally obtained.


The IEEVARYD offline service is also changed in the same way as the VARY OFFLINE command. However, for IEEVARYD callers that cannot tolerate a delayed return from the service, a new flag,

VDEV_DO_NOT_WAIT_FOR_ENQ, can be set so that the IEEVARYD service returns to the caller if the SYSIEFSD.Q4

resource cannot be obtained within five seconds. In this case, register 15 contains a new return code, RC0C, on return from the IEEVARYD service. The caller of the service can choose to retry the IEEVARYD request if appropriate.

Migration action: Update any operator procedures affected by the change in VARY OFFLINE command processing, and modify any application programs affected by the change in IEEVARYD processing. **Note:** When you encounter message CNZ0010A, you might be required to check the pending WTOR IEF238D message.

ISPF Migration Actions for z/OS R9 from z/OS R7



► **Migration Actions You Can Do NOW:** <None>

► **Migration Actions Pre-First IPL:**

► **Accommodate the removal of the alternate Primary Option Menu panel (Required, as of R9)**

- Previously, two versions of the Primary panel were shipped – ISR@PRIM and ISR@390. ISR@390 had two additional options – 12 (z/OS sysprog applications) and 13 (z/OS user applications).
- As of R9, ISR@390 isn't provided. The two additional options are on ISR@PRIM.

- **Modify exit 16 routines to recognize new file types (Required-IF, as of R9)**
 - Exit 16 is the log, list, and temp ds allocation exit. Suffix-type parameter is a fullword of bit flags that indicate the ds type. Previously, bits 0-4 indicated the five supported ds types. Bits 5-31 were reserved.
 - As of R9, bits 5-7 are supported. If you have an exit routine that assumes all valid ds have suffix-type that is less than 5, problems will occur. Change exit to recognize whether a value is specified in the additional bits.
- Use LE C run-time libraries instead of SAS/C libraries (Required-IF, as of R8)

► **Migration Actions Post-First IPL:**

► **Modify ds allocation exit routines to accommodate z/OS UNIX files (Required-IF, as of R9)**

–As of R9, ISPF can edit, view, and browse z/OS UNIX files (as well as MVS ds). This affects existing ds allocation exit routines. They now need to be aware that they might receive a pointer to an SVC 99 parm list containing new keys used to allocate a z/OS UNIX file to a DD.

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ISPF Migration Actions Between z/OS R7 and z/OS R9

These migration actions were taken from *z/OS Migration*. Many descriptions and actions have been shortened for inclusion in this presentation. For the complete descriptions and actions, refer to *z/OS Migration*.

ISPF Migration Actions You Can Do Now

<none>

ISPF Migration Actions Pre-First IPL

Accommodate the removal of the alternate Primary Option Menu panel (Required-IF, as of R9)

Required if use the ISPF-provided primary option menu panel.

Previous releases of ISPF have shipped with two versions of the ISPF Primary Option Menu panel. The standard panel is ISR@PRIM. The alternate panel is ISR@390. The alternate panel includes two additional options—12 and 13. Option 12, when selected, displays a menu of z/OS system programmer applications, and option 13, when selected, displays a menu of z/OS user applications.

Beginning with z/OS V1R9, the alternate panel (ISR@390) is not provided. Rather, the additional two options are provided in the standard panel (ISR@PRIM).

Migration action:

- If your current installation uses the **standard** panel, you might want to tell users that they will see a change in the panel, namely, that options 12 and 13 are now provided.
- If your current installation supports the **alternate** panel, remove this support. In particular, if you provide the support through a usermod, make sure that you no longer install the usermod.

Modify exit 16 routines to recognize new file types (Required-IF, as of R9)

Required if you have an ISPF exit 16 routine that assumes all valid data sets have a suffix-type that is less than 5.

Exit 16 is the log, list, and temporary data set allocation exit. It is invoked when allocating temporary data sets. The suffix-type parameter is a fullword of bit flags that indicate the data set type. Previously, bits 0-4 indicated the five

supported data set types. Bits 5-31 were unused and were documented as reserved. In z/OS V1R9, three new types (bits 5-7) are supported. If you have an exit routine that assumes all valid data sets have a suffix-type that is less than 5, problems will occur the first time one of the new data set types is processed.

Migration action: Change the exit routine to recognize whether a value is specified in the additional bits:

5 1 = ISPVCALL trace data set

6 1 = ISDPTRC trace data set

7 1 = ISPFTRC trace data set

Use Language Environment C run-time libraries instead of SAS/C libraries (Required-IF, as of R8)

Required if you run the ISPF Client/Server feature.

The ISPF Client/Server enables users to run ISPF in GUI mode and to transfer files between their workstation and the host. Before z/OS V1R8, the ISPF Client/Server used the SAS/C run-time library. Starting in z/OS V1R8, the SAS/C run-time library is no longer shipped, and ISPF now uses the Language Environment C run-time library. Therefore, if your site runs the ISPF Client/Server, make sure that it uses the Language Environment C run-time library.

Migration action: Either set up the system link list to refer to the Language Environment run-time libraries (SCEERUN and SCEERUN2) or include a STEPLIB DD statement referencing these libraries in your TSO logon procedure.

ISPF Migration Actions Post-First IPL

Modify data set allocation exit routines to accommodate z/OS UNIX files (Required-IF, as of R9)

Required if you have specified any data set allocation exit routines with custom processing for the allocate operation.

The data set allocation exit point is triggered when ISPF is used for several operations: create, delete, allocate, deallocate, and concatenate. ISPF passes to the exit routine a pointer to an SVC 99 parameter list. This contains a list of parameters (such as data set name and status) that the exit routine can use. Which parameters are in the list depends on which operation is being performed. The exit routine can be coded to do extra processing only for selected operations and to do nothing for others.

In z/OS V1R9, ISPF users will be able to edit, view, and browse z/OS UNIX files as well as MVS data sets. This will affect existing data set allocation exit routines. They now need to be aware that they might receive a pointer to an SVC 99 parameter list containing new keys used to allocate a z/OS UNIX file to a DD.

Migration action:

- If you have specified a data set allocation exit routine with custom processing for the allocate operation, you will need to change the exit routine to recognize the new keys in the SVC 99 parameter list. Otherwise, the first time a user tries to edit a z/OS UNIX file, ISPF will call the exit routine and pass a pointer to the parameter list including one of the new keys for allocating z/OS UNIX files to a DD. If the exit routine does not recognize the new key, it might fail or simply return to ISPF.
- If you have not specified a data set allocation exit routine, take no action.
- If you have specified a data set allocation exit routine, but it does not do any allocate processing (for example, if you have only customized the create and concatenate operations), take no action.

Accommodate the changed ISPF listing layout generated by the P and SAVE commands (Required-IF, as of R9 and rolled back via OA19560)

Required if you depend on the layout of the listing generated by the ISPF P or SAVE command.

On the ISPF OPT3.4 Dataset List Option panel (ISRUDLP), you can issue the P command to get the list of data sets in the ISPF list data set (prefix.SPFn.LIST). Also, you can get the same listing by issuing the SAVE command on the OPT3.4 Dataset List panel (ISRUDSL0).

In z/OS V1R7, the large format sequential data set enhancement (more than 65535 tracks on a single volume) increased the length of the TRKS column in the ISPF listing data set generated by the P and SAVE commands. With this change, to get the whole listing record on a single line, the LRECL for the ISPF list data set must be at least 127 (fixed) or 131 (variable). If you continue to use the default attribute (RECFM=FBA,LRECL=121) for the ISPF list data set, the listing records are wrapped.

As of APAR OA19560 in z/OS V1R8 and z/OS V1R7, ISPF was changed to compress the listing so that it fits within the default value of 121 bytes (fixed) or 125 bytes (variable).

Migration action: Examine whether processes dependent on the changed output should be adjusted for the new column alignment of records.

Accommodate changed VSAM support (Edit/View/Browse) (Required-IF, as of R8)

Required if you use the ISPF VSAM Edit/View/Browse support and you do not use the product File Manager for z/OS V8 (5655-S14).

Plan your migration to z/OS V1.9!

When you enable VSAM support (Edit/View/Browse), the ISPF Edit/View/Browse operation invokes the command specified in the configuration table as VSAM_EDIT_COMMAND, VSAM_VIEW_COMMAND, or VSAM_BROWSE_COMMAND field for any VSAM data sets unless restricted.

Before z/OS V1R8, the default value for VSAM_EDIT_COMMAND was DITTO VE /, and the default value for VSAM_VIEW_COMMAND and VSAM_BROWSE_COMMAND was DITTO VB /. These defaults required the product Data Interfile Transfer, Testing, and Operations Utility (DITTO) (5655-103).

As of z/OS V1R8, VSAM support by default was changed to make use of the File Manager for z/OS product instead of the DITTO product. As a result, the new default value for VSAM_EDIT_COMMAND is FMNMAIN DSE /, and the new default value for VSAM_VIEW_COMMAND and VSAM_BROWSE_COMMAND is FMNMAIN DSB /.

Migration action: Do one of the following:

- Obtain and use the product File Manager for z/OS.
- Override the changed defaults in the configuration table to specify DITTO, as follows:
 - VSAM_EDIT_COMMAND: change FMNMAIN DSE to DITTO VE.
 - VSAM_VIEW_COMMAND: change FMNMAIN DSB to DITTO VB.
 - VSAM_BROWSE_COMMAND: change FMNMAIN DSB to DITTO VB.

Note: When the new default command is in effect and File Manager is not available, error message IKJ56500I COMMAND FMNMAIN NOT FOUND is issued.

DFSMS Migration Actions for z/OS R9 from z/OS R7



Migration Actions You Can Do NOW:

- **Redefine existing VSAM data sets that contain the IMBED and REPLICATE and KEYRANGE attributes (Recommended)**
 - Support for the VSAM KEYRANGE attribute will not be withdrawn, as originally announced. However, IBM recommended you eliminate or minimize your use of KEYRANGE. Striped data sets provide much better performance than KEYRANGE, and should be viewed as a candidate for any existing KEYRANGE data sets.
 - Determine which VSAM data sets were allocated with IMBED, REPLICATE, or KEYRANGE by using tool IMBDSHIP.JCL.TRSD.
 - Schedule a time for the VSAM data sets to be unavailable, and redefine them.
 - When support for IMBED and REPLICATE is removed and data sets are recalled or restored by DFSMSshm or DFSMSdss, these attributes will be removed during the recall or restore and the data set will be in a usable state.
- **Specify a DFSMSrmm control data set id (Required-IF, as of R9)**
 - Prior to R8, a control data set ID was optional. As of R9, it's required – if not specified DFSMSrmm will not start!
 - Define it using the CDSID operand of the OPTION command in EDGRMMxx. Set it using the EDGUTIL utility or restarting DFSMSrmm.

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DFSMS Migration Actions for z/OS R9 from z/OS R7



Migration Actions You Can Do NOW:

- **Install OA22738 so that dynamic volume count (data class attribute) can exceed 1 when allocating SMS-managed data sets with partitioned organization (Recommended)**
 - **Pre-R8:** could allocate an SMS partition organize ds assigned to a data class attribute that specified a dynamic volume count greater than 1.
 - **On R9 and R8:** the dynamic volume count could not be greater than 1.
 - **With OA22738:** back to Pre-R8 behavior.
 - Was not applicable to non-SMS ds, because dynamic volume count attribute only applies to SMS-managed ds.
- Define the DFSMSshm BCDS with a maximum record size of 6544 for the FRBACKUP command (**Required-IF, as of R9**)
 - On R9, if the BCDS maximum record size is less than 6544, then hsm will fail FRBACKUP commands with message ARCI843I.

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DFSMS Migration Actions for z/OS R9 from z/OS R7



Migration Actions Pre-First IPL:

- Create or update VRSEs for DFSMSrmm data set names with lowercase or mixed case letters (Recommended, as of R9)
 - Pre-R9, dsn using lower- or mixedcased characters were correctly recorded, however DFSMSrmm TSO subcommands did not support the listing, changing, or deleting of the ds that didn't follow MVS ds naming conventions. Also, had limited capability to retain such ds through Vital Record Specification.
 - As of R9, can fully record and manage all dsn that can be specified in job control statements.
 - You may have to create new VRSEs or change existing VRSEs.
- Migrate from VRSEL(OLD) to VRSEL(NEW) in EDGRMMxx (Recommended, as of R8)
 - VRSEL(OLD) is planned to be removed in a future release. If used will produce a warning message and RC=4 each time VRSEL(OLD) processing is done. Move to VRSEL(NEW).
- Migrate from JOBNAME(OPEN) or (ABEND) to (OPEN*) or (ABEND*) in data set name vital record specifications (Required-IF, as of R8)
 - If you have real job names of OPEN or ABEND and you want to continue to use existing vital record specifications to match real job names of either OPEN or ABEND, change to user OPEN* or ABEND*.
 - If you do not do this, DFSMSrmm uses the existing vital record specifications for OPEN and ABEND retention policies.

- Define new security profiles for DFSMShsm fast replication support (Required-IF, as of R8)
 - FACILITY class resource names have been shortened for fast replication commands, so you can specify the full names of copy pools. **If you don't have the new profiles, hsm commands fail!!!**
 - STGADMIN.ARC.FRBACKUP.* -> STGADMIN.ARC.FB.* , for instance
 - Coex consideration: mixed releases in an HSMplex need to have both older and newer policies. Don't convert on pre-R8 to newer policies until all systems are running R8, to allow you to recover indiv ds from any copy pool backup version made on any system in HSMplex.


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DFSMS Migration Actions for z/OS R9 from z/OS R7



Migration Actions Post-First IPL:

- Increase dump space in a sysplex for VSAM RLS abends (Required-IF, as of R9)
 - Pre-R9, a VSAM RLS an abend dump was taken only on the originating system where abend occurred.
 - As of R9, new sysplex-wide dumping support causes other systems running VSAM RLS in the sysplex to take dumps as well as the originating system. More dump space may be needed on a given system, if dump space is currently limited.
 - You may use DAE to suppress dumps if needed.
- 
 Avoid issuing commands against a copy pool from a pre-R8 system after the copy pool has been converted to R8 format (Required, as of R8)
 - In R8, you can dump to tape copy pool versions residing on DASD. This enh changes DFSMShsm control ds records automatically first time you issue an FRBACKUP command against a copy pool on R8. **But from then on, the only FR command that can be successfully issued against a copy pool from a pre-R8 system is FRRECOV from DASD.**
 - Ensure you longer need to back up copy pools from any pre-R8 system before issuing an FRBACKUP command against a copy pool on R8.
- Rename existing copy pools (Required-IF, as of R8)
 - In R8, new copy pool names are limited to 23 chars. Prior to R8, names could be up to 30 chars. R8 still supports the longer (30 char) names for your existing copy pools!
 - If you plan to use the new FACILITY class resource names to protect indiv copy pool names, then your migration action will depend on how much additional target DASD storage you have.

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DFSMS Migration Actions Between z/OS R7 and z/OS R9

These migration actions were taken from *z/OS Migration*. Some descriptions and actions have been shortened for inclusion in this presentation. For the complete descriptions and actions, refer to *z/OS Migration*.

DFSMS Migration Actions You Can Do Now



Redefine existing VSAM data sets that contain the IMBED, REPLICATE, and KEYRANGE attributes (Recommended)

Recommended because it will become a requirement in a future release.

No supported release of z/OS honors the IMBED, REPLICATE, and KEYRANGE attributes for new VSAM data sets. In fact, using these attributes can waste DASD space and often degrades performance. Servicing these VSAM data sets has become increasingly difficult. In some cases, unplanned outages have occurred. To provide an environment in which outages are less likely, IBM has announced the removal of the support in existing VSAM data sets for the IMBED and REPLICATE attributes. IMBED and REPLICATE were intended as performance improvements and have been obsoleted by newer, cached DASD devices.

Striped data sets provide much better performance than KEYRANGE and should be viewed as a candidate for any existing KEYRANGE data sets. For this reason, IBM recommends that you minimize or eliminate your use of KEYRANGE. *Support for the VSAM KEYRANGE attribute will not be withdrawn as stated in announcement IBM z/OS V1.6: Integrating new applications and Preview: z/OS V1.7, 204-180, dated August 10, 2004.*

Migration action:

- 1) Determine which VSAM data sets were defined with the IMBED, REPLICATE, or KEYRANGE attribute. To help you perform this task, you can get a tool that reads existing VSAM data sets and reports which ones have these attributes. The tool is available from the software server (<ftp://software.ibm.com>) in the `s390/mvs/tools` directory as `IMBDSHIP.JCL.TRSD`. Download the file in binary format and uncompress it on your z/OS system using `TRSMMAIN`. Instructions for using the tool are included in the downloaded JCL. See APAR I113894 for additional information.

Important note: The tool only checks data sets that are on DASD. Data sets that were migrated by DFSMSshm or backed up by DFSMSdss will continue to retain their IMBED, REPLICATE, and KEYRANGE attributes when recalled or restored. When support for IMBED and REPLICATE is removed and data sets are recalled or restored by DFSMSshm or DFSMSdss, the IMBED and REPLICATE attributes will be removed during the recall or restore and the data sets will be in a usable state. Because the data sets will be in a usable state, there is no need for a tool to identify data sets that were backed up or migrated at a time when the data sets had the IMBED or REPLICATE attribute and support for IMBED and REPLICATE still existed.

- 2) Schedule a time for the affected VSAM data sets to be unavailable, and redefine them.

Please note that while no announcement has been made of the specific date or release that data sets with these attributes will no longer be able to be opened, it would be prudent to use this tool to identify the data sets in your installation and begin converting them to versions that do NOT contain these attributes.



Specify a DFSMSrmm control data set ID (Required, as of R9)

Before z/OS V1R9, a control data set ID was optional. Starting with z/OS V1R9, it is required. You must define it using the `CDSID` operand of the `OPTION` command in parmlib member `EDGRMMxx`, and then set it in the control data set either by using the `EDGUTIL` utility or by restarting `DFSMSrmm`. If you do not define a control data set ID, you cannot start `DFSMSrmm`, and warning message `EDG0237E MISSING IDENTIFIER FOR THE CONTROL DATA SET` is issued.

Migration action:

1. If you have entries in `GRSRNLxx` for `QNAME(SYSZRMM)` `RNAME(MASTER.RESERVE)`, update this information based on your control data set ID and any other existing entries. Do this on each system before implementing a control data set ID and before starting `DFSMSrmm` on z/OS V1R9. For additional details, see the topic about updating `GRSRNLxx` in *z/OS DFSMSrmm Implementation and Customization Guide*.

2. Define a control data set ID in parmlib member EDGRMMxx by using the CDSID operand of the OPTION command. Do this on each system in the RMMplex. Use a different CDSID for each control data set.
3. Set the control data set ID in the control data set by using the EDGUTIL utility or by restarting DFSMSrmm on one system.



Back up SMS control data sets (Recommended)

Not required, but recommended to ensure data integrity.

In a multisystem Storage Management Subsystem (SMS) complex, operating systems share a common set of SMS classes, groups, ACS routines, and a configuration base, which make up the storage management policy for the complex. This storage management policy is maintained in a source control data set (SCDS). When this policy is activated for SMS, the bound policy is maintained in processor storage and on DASD in an active control data set (ACDS). Systems in the complex communicate SMS information through a common communications data set (COMMDS).

IBM recommends that to successfully share SMS control data sets in a multisystem environment where there are mixed levels of DFSMS, you update, translate, validate, and activate SMS policies on the system with the latest level of DFSMS. When an earlier control data set is to be updated or activated, the control data set is formatted by the later-level system. The shared SMS control blocks reflect the new, rather than the previous, lengths and control information. For fallback, IBM recommends restoring SMS control data sets from backups taken on the fallback release.

Editing a policy on an earlier system could invalidate unused control information and prevent the control data set from being accessed by a later system. A warning message is provided before a policy can be changed on an earlier system. ACS routines may need to be updated and translated so to not reference policy items not known to the earlier system. Remember, you risk policy activation failures if SCDS changes are not validated using the latest-level system in a sysplex.

Define the BCDS with a maximum record size of 6544 for the FRBACKUP command (Required-IF, as of R9)

Required if you plan to issue an FRBACKUP command.

DFSMSshm control data set records created for the FRBACKUP function can be up to 6544 bytes in length. In order for an FRBACKUP command to complete successfully, the maximum record size of the BCDS must be defined as 6544. While an FRBACKUP command that processes only a limited number of volumes may process successfully with a smaller record size, this environment is not recommended. In z/OS V1R9, if the BCDS maximum record size is less than 6544, DFSMSshm will fail FRBACKUP commands with message ARC1843I FAST REPLICATION BACKUP FUNCTIONS WILL NOT BE PERFORMED. BCDS MAXIMUM RECORD SIZE MUST BE 6544.

Migration action: Follow the standard procedures for reorganizing the DFSMSshm BCDS. Define all BCDS clusters with RECORDSIZE(334 6544) and CISIZE(12288).

Install a PTF so that the dynamic volume count (data class attribute) can exceed 1 when allocating SMS-managed data sets with partitioned organization (Required-IF, as of R8, and then with OA22738)

Not required, but recommended to avoid a different problem (described in OA22738).

Before z/OS V1R8, when allocating an SMS-managed data set with partitioned organization, you could assign to it a data class that specified a dynamic volume count greater than 1. Then, in z/OS V1R8 and V1R9, the base code was changed so that the dynamic volume count could not be greater than 1. Now, APAR OA22738 on z/OS V1R8 and V1R9 restores the original situation, that is, the dynamic volume count can be greater than 1.

This migration action is not relevant to non-SMS data sets because the dynamic volume attribute only applies to SMS-managed data sets.

Migration action: Install the PTF for APAR OA22738.

If you do not install the PTF, you must ensure that ACS routines do not select a data class with a dynamic volume count greater than 1 for SMS-managed data sets with partitioned organization. You must also ensure that the data class specified by JCL does not violate this rule. Violating the rule results in the following message: IGD17295I DATA SET dsn HAS PARTITIONED ORGANIZATION AND CANNOT HAVE A DATA CLASS WITH A DYNAMIC VOLUME COUNT GREATER THAN ONE, ALLOCATION FAILED.

DFSMS Migration Actions Pre-First IPL

Ensure that the Language Environment run-time library is available for DLLs (Required-IF)

Required if your installation builds or references DLLs.

Language Environment provides common services and language-specific routines in a single run-time environment. You can use Language Environment to build and use dynamic link libraries (DLLs) for applications.

Migration action: If your installation builds or references DLLs, either you must set up the system link list to refer to the Language Environment run-time libraries (SCEERUN and SCEERUN2), or each job that creates or uses a DLL must include a STEPLIB DD statement referencing these libraries.

Build the IPLable stand-alone DFSMSdss image (Required-IF)

Required if you intend to use the Stand-Alone Services provided by DFSMSdss.

If you intend to use the Stand-Alone Services provided by DFSMSdss, you must use the DFSMSdss BUILD_SA function to create the Stand-Alone Services IPL-capable core image

Migration action:

1. Prepare for Stand-Alone Services by creating a Stand-Alone Services IPL-able core image with the BUILD_SA command. With the BUILD_SA command you can specify the device (card reader, tape drive, or DASD volume) from which Stand-Alone Services will be IPLed. You can also specify the operator console to be used for Stand-Alone Services. The BUILD_SA function builds the IPL-able core image under the current operating system and determines a record size based on whether the IPL is from card, tape, or DASD.
2. Use RACF or another external security system to protect the SYS1.ADR.SAIPLD.Vvolser data set and the Stand-Alone Services modules.
3. If you haven't done so already, make a backup copy of your system that can be restored by this function. For information about backing up volumes, see *z/OS DFSMSdss Storage Administration Guide*.

Ensure your SYS1.IMAGELIB is customized for your printing environment (Required-IF)

Required if you are not using your old SYS1.IMAGELIB, you are installing with ServerPac or SystemPac, and you are using line mode printers such as the 3800 or 3900.

If you use line mode printers such as the IBM 3800 or the IBM 3900 running in line mode (not page mode), you must install library character sets, graphic character modification modules, and character arrangement tables in SYS1.IMAGELIB. This migration action does not apply if you are using IBM 3900 printers that are driven by PSF.

Migration action:

1. Run the LCSBLD1 job from the samplib data set to create character sets, graphic character modification modules, and character arrangement tables in SYS1.IMAGELIB.
2. Copy customized or locally-written FCBs and UCS images from your old system's SYS1.IMAGELIB data set to the new system's SYS1.IMAGELIB data set.

Create or update VRSEs for DFSMSrmm data set names with lowercase or mixed case letters (Recommended)

Recommended to ensure that existing data sets with lowercase or mixed case letters are correctly VRS-retained.

Before z/OS V1R9, data set names using lowercase letters, mixed case letters, or special characters were correctly recorded when created, but the DFSMSrmm TSO subcommands did not support the listing, changing, or deleting of data sets that did not follow MVS data set naming conventions. In addition, you had limited capability to retain such data sets through vital record specifications (VRSEs).

Starting with z/OS V1R9, you can use DFSMSrmm to fully record and manage all data set names that can be specified in job control statements, including those with lowercase or mixed case letters. You can also use all of the DFSMSrmm TSO subcommands and create VRS data set name masks that allow data sets with lowercase or mixed case letters to be VRS-retained.

Migration action: Following the instructions in *z/OS Migration*:

1. Check whether you have any lowercase or mixed case data set names that are on volumes that are VRS-retained.
2. If you have lowercase or mixed case data set names on volumes that are VRS-retained, identify the VRSEs that retain the data set.
3. If any of the matching DSNAME VRSEs contain uppercase letters that match the lowercase or mixed case letters in the data set names, the VRSEs will no longer match the data set names in z/OS V1R9. You must create new VRSEs or change the existing VRSEs for the data sets.

Data sets that match generic characters in the VRS data set name masks are not affected. While you run VRSEL vital record processing on releases below z/OS V1R9, you should not delete any VRSEs that retain data sets with lowercase or mixed case letters, or you might lose data.

Migrate from VRSEL(OLD) to VRSEL(NEW) in parmlib member EDGRMMxx (Recommended, as of R8)

Not required, but recommended because it will become a requirement in a future release and also because the EDGHSKP return code changes from 0 to 4.

The VRSEL(OLD) or VRSEL(NEW) operand of the OPTION command in DFSMSrmm parmlib member EDGRMMxx specifies the type of vital record processing you want performed. In a future release, VRSEL(OLD) is planned to be removed. Starting in z/OS V1R8, a warning message is issued when you run VRSEL(OLD) processing. If you do not migrate from VRSEL(OLD) to VRSEL(NEW) before moving to z/OS V1R8, you will receive warning message EDG2317E each time VRSEL is run and EDGHSKP processing will end with job step return code 4.

Migration action: To migrate from VRSEL(OLD) to VRSEL(NEW), follow the steps in the topic about migrating to using VRSEL(NEW) in *z/OS DFSMSrmm Guide and Reference*.

Migrate from JOBNAME(OPEN) or JOBNAME(ABEND) to JOBNAME(OPEN*) or JOBNAME(ABEND*) in data set name vital record specifications (Required-IF, as of R8)

Required if you have real job names of OPEN or ABEND and you want to continue to use existing vital record specifications to match real job names of either OPEN or ABEND.

Starting in z/OS V1R8, any vital record specification that includes JOBNAME(OPEN) or JOBNAME(ABEND) in its data set name vital record specification is used as a policy for retaining data sets that are either OPEN or have been closed by ABEND processing. You must change the vital record specification to use JOBNAME(OPEN*) or JOBNAME(ABEND*) if you want to continue to use existing vital record specifications to match real job names of either OPEN or ABEND. If you do not do this, DFSMSrmm uses the existing vital record specifications for OPEN and ABEND retention policies.

Migration action: To migrate from JOBNAME(OPEN) or JOBNAME(ABEND) to JOBNAME(OPEN*) or JOBNAME(ABEND*), follow the steps in Special ABEND and OPEN retention in *z/OS DFSMSrmm Guide and Reference*.

Stop using the patch to bypass duplex alternate tape SYNCDEV operations (Recommended, as of R8)

Not required, but recommended because the patch is no longer beneficial.

Description: Before z/OS V1R8, the following patch was suggested as a method to potentially decrease elapsed recycle processing time during duplex alternate tape SYNCDEV operations:

```
PATCH .YGCB.+C8 BITS(.....1.)
```

Beginning in z/OS V1R8, this patch is no longer beneficial and no longer recommended. If you are using it, you should turn it off. If this patch is issued when SETSYS DUPLEX(MIGRATION(Y ERRORALTERNATE(MARKFULL))) is in effect, the patch is ignored and message ARC0824I is issued.

Migration action: Turn off the patch with the following command: `PATCH .YGCB.+C8 BITS(.....0.)`

Define new security profiles for fast replication commands (Required-IF, as of R8)

Required if you use DFSMSHsm fast replication commands.

z/OS V1R8 changes the FACILITY class resource names for DFSMSHsm fast replication commands. The names are shortened to allow you to specify the full names of copy pools (the static portions of the class names are shortened by six characters to allow you to specify the entire copy pool name). Along with this change, the maximum length of copy pool names is decreased in z/OS V1R8 from 30 characters to 23.

In mixed releases of z/OS in an HSMplex, you will need to define both the older profiles and the newer profiles. In z/OS V1R8, DFSMSHsm checks for the newer profiles, but your pre-z/OS V1R8 systems will continue to use the older profiles. For pre-z/OS V1R8 systems in an HSMplex, do not actually convert your existing FACILITY class profiles until you have migrated all such systems to z/OS V1R8. Instead, retain the older profiles until all of your systems are at the z/OS V1R8 level. Saving this task until after the migration will allow you to recover individual data sets from any copy pool backup version made on any supported system in the HSMplex (z/OS V1R5 and later).

Migration action: To define new security profiles for the fast replication commands, do the following:

1. Define the profiles shown in the table below:

Command name	New resource name (z/OS V1R8 and later)	Old resource name (pre-V1R8 systems)
FRBACKUP	STGADMIN.ARC.FB.cpname	STGADMIN.ARC.FRBACKUP.cpname
FRRECOV	STGADMIN.ARC.FR.cpname	STGADMIN.ARC.FRRECOV.cpname
FRDELETE	STGADMIN.ARC.FD.cpname	STGADMIN.ARC.FRDELETE.cpname

2. Activate the FACILITY class before starting DFSMSHsm. (If your FACILITY class is RACLISTed it may be refreshed with the SETR RACLIST(FACILITY) REFRESH command.) When started, DFSMSHsm checks to determine whether the FACILITY class is active. If you have not defined the new profiles, the DFSMSHsm commands fail.

Recompile your user interaction module (Required-IF, as of R8)

Required if you invoke DFSMSdss through the API and use EIOPTION 20.

The data area mapped by EIREC20 has changed in z/OS V1R8. If you invoke DFSMSdss through the application programming interface (API) and use the Volume Notification exit option (EIOPTION 20), you must recompile your user interaction module (UIM).

Migration action: Recompile and link-edit your UIM using the z/OS V1R8 macro libraries.

Replace the INDD and INDYNAM keywords in COPY DATASET and DUMP DATASET jobs (Recommended)

Recommended if your jobs issue the COPY DATASET or DUMP DATASET commands and you do not want to receive informational messages stating that DFSMSdss has replaced INDD and INDYNAM with the correct keywords.

The INDD or INDYNAM keyword on a COPY DATASET or DUMP DATASET command is used to perform either a logical data set copy or a physical data set dump, depending on the command.

Starting in z/OS V1R8, the INDD and INDYNAM keywords are being replaced as follows:

- For uses of the COPY DATASET command, the INDD and INDYNAM keywords are replaced with the LOGINDD and LOGINDYNAM keywords, respectively.
- For uses of the DUMP DATASET command, the INDD and INDYNAM keywords are replaced with the PHYSINDD and PHYSINDYNAM keywords, respectively.

You can still use INDD and INDYNAM on z/OS V1R8 and higher. However, if you do, you will receive an informational message stating that DFSMSdss has replaced INDD or INDYNAM with the correct keywords. To avoid receiving such messages, review and update any DFSMSdss jobs that issue these commands to use the correct keywords.

Note: If the PTF for APAR OA20242 (for R8 and R9) is not installed, message ADR146I is not issued for COPY DATASET with INDD, COPY DATASET with INDYNAM, or DUMP DATASET with INDYNAM. (The PTF does not affect DUMP DATASET with INDD.)

Migration action: Check your DFSMSdss jobs for usage of the COPY DATASET and DUMP DATASET commands. Update the JCL, as follows:

- For uses of the COPY DATASET command, replace any occurrences of the INDD or INDYNAM keywords with the LOGINDD or LOGINDYNAM keywords, respectively.
- For uses of the DUMP DATASET command, replace any occurrences of the INDD or INDYNAM keywords with the PHYSINDD or PHYSINDYNAM keywords, respectively.

Update automation that handles messages ARC1801I, ARC1820I and ARC1821I (Required-IF, as of R9)

Required if you have automation routines that examine the message text.

The text for messages ARC1801I, ARC1820I, and ARC1821I has changed.

Before z/OS V1R8, the message text was as follows:

- ARC1801I FAST REPLICATION {BACKUP | BACKUP DUMP | BACKUP DUMPONLY | PREPARE | RECOVERY | RECOVERY FROM DUMP | DATA SET RECOVERY} IS STARTING FOR {COPY POOL cpname | VOLUME volser | DATA SET dsname}, AT time ON date
- ARC1820I THE FOLLOWING VOLUMES IN COPY POOL cpname ARE IN AN ACTIVE FLASHCOPY RELATIONSHIP ARC1821I NONE OF THE VOLUMES IN COPY POOL cpname ARE IN AN ACTIVE FLASHCOPY RELATIONSHIP

Starting with z/OS V1R8, the message text is as follows:

- ARC1801I FAST REPLICATION {BACKUP | BACKUP DUMP | BACKUP DUMPONLY | PREPARE | RECOVERY | RECOVERY FROM DUMP | DATA SET RECOVERY} IS STARTING FOR {COPY POOL cpname | VOLUME volser | DATA SET dsname}, AT time ON date[, TOKEN='token']

Plan your migration to z/OS V1.9!

- ARC1820I THE FOLLOWING VOLUMES IN COPY POOL *cpname*, VERSION *vernum*, HAVE AN ACTIVE FLASHCOPY BACKGROUND COPY
- ARC1821I NONE OF THE VOLUMES IN COPY POOL *cpname*, VERSION *vernum*, HAVE AN ACTIVE FLASHCOPY BACKGROUND COPY

If you are automating on the message text (not the message number), your automation might be affected.

Migration action: Change your automation to expect the new message text format.

For message ARC1801I, TOKEN='token' is appended to the message whenever the TOKEN keyword has been specified on the FRBACKUP command.

Message ARC1820I or ARC1821I will be issued for each DASD backup version that exists for the copy pool. Before z/OS V1R8, these messages were only issued for the most recent DASD backup version.

Update automation for changed multiline WTO messages (Required-IF, as of R9)

Required if you have automation which examines the message text of messages described.

Before z/OS V1R9, some DFSMSdfp IEAXxxx messages were formatted using multiple single-line WTO messages when the length of the message required more than one line. The second WTO message included the text "[CONTINUATION OF IEAXXXX]", followed by the text "SNS=xxxxxxxxxxxxx". Starting with z/OS V1R9, the complete message is formatted using a single multi-line WTO message and the text "SENSE=xxxx xxxx ...", if applicable, is included as part of the multi-line message. The text "[CONTINUATION OF IEAXXXX]" is no longer provided.

Example before z/OS V1R9:

```
IEA442E dev REPORTS DISABLED INTERFACE ON nn -- FAULT CODE = cccc --  
NOTIFY CE
```

```
[CONTINUATION OF IEA442E  
SNS=sense]
```

Example in z/OS V1R9:

```
IEA442E dev REPORTS DISABLED INTERFACE ON nn -- FAULT CODE = cccc --  
NOTIFY CE,SENSE=xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx
```

The specific messages affected are: IEA442E, IEA448I, IEA449A, IEA451I, IEA452I, IEA453I, IEA454E, IEA455E, IEA457I, IEA458I, IEA459I, IEA468I, IEA469E, IEA473I, IEA474E, IEA475E, IEA476E, IEA477I, IEA478E, IEA479E, IEA480E, IEA481I, IEA482I, IEA484I, IEA491E, IEA494I, IEA497I, IEA498I.

Migration action: Change your automation to expect the new message text format.



Use the new default for BLOCKTOKENSIZE in IGDSMSxx (Recommended, as of R8)

Not required, but recommended in order to exploit large format sequential data sets in applications without having to explicitly specify in IGDSMSxx the ability to use them. By using the system default BLOCKTOKENSIZE of NOREQUIRE, it is easier for applications to exploit large format sequential data sets.

When large format sequential data sets were introduced in z/OS V1R7, the BLOCKTOKENSIZE parameter in the IGDSMSxx parmlib member was introduced. The IBM-supplied member contains no setting of this parameter, so the system assumes the default value of REQUIRE. This value requires applications that use certain system functions to code BLOCKTOKENSIZE=LARGE on the DCBE macro before using large format data sets.

Starting in z/OS V1R8, the BLOCKTOKENSIZE default in IGDSMSxx is changed to NOREQUIRE, meaning applications do not need to code BLOCKTOKENSIZE=LARGE on the DCBE macro in most cases. Because the default has changed, if you were using the default (REQUIRE) value in z/OS V1R7 and want to continue using that value in V1R8, you must explicitly code BLOCKTOKENSIZE(REQUIRE) in the IGDSMSxx member of SYS1.PARMLIB.

Migration action: To use the new default value, which is BLOCKTOKENSIZE(NOREQUIRE), do nothing. But if you want to use the value that was the default in z/OS V1R7, which is BLOCKTOKENSIZE(REQUIRE), code this value in parmlib member IGDSMSxx. If you do specify REQUIRE, remember that programs will have to have BLOCKTOKENSIZE=LARGE explicitly coded on the DCBE macro in most cases to exploit large format sequential data sets.

Note that if you want to change the BLOCKTOKENSIZE value after you have IPLed z/OS V1R8, you can do so by modifying IGDSMSxx and issuing the SET SMS=xx command. If the parmlib member contains no setting of the BLOCKTOKENSIZE parameter, the system does not change the current value in effect.

Update DFSMSrmm report extract processing for larger fields (Required-IF, as of R8)

Required if tape volume error counts larger than 9999 can be expected.

As a result of incorporated APAR OA14254, new, larger, temporary and permanent error count fields are created in the volume and extended extract records. The original fields still exist but are renamed, and are still maintained as before. New, larger fields are added that can now contain values up to five characters.

Before z/OS V1R8, DFSMSrmm report extract processing converted the error counts into fields of four characters despite a possible maximum value of 32767.

Starting in z/OS V1R8, report extract processing converts the error counts into new fields of five characters but also maintains the old fields to minimize the impact on report extract record processing. In the volume record, the field names are RVTRERR, RVTWERR, RVPRERR, and RVPWERR. In the extended record, the field names are XVTRERR, XVTWERR, XVPRERR, and XVPWERR. The original fields are renamed to RVTRERR_OLD, RVTWERR_OLD, RVPRERR_OLD, RVPWERR_OLD, XVTRERR_OLD, XVTWERR_OLD, XVPRERR_OLD, and XVPWERR_OLD.

Migration action:

- If you process the extract records with assembler code, a reassembly will use the new fields, but make sure that the new length is handled correctly.
- If you process the extract records using DFSORT EDGEXTSY symbols, no change should be needed because DFSORT should use the new longer field when the latest symbols file is used.
- If you process the records with DFSORT, DFSORT's ICETOOL, or any other method such as Rexx, where the explicit position and length needs to be known, you must update the DFSORT statements/Rexx to use the new fields.

This change can be made to your existing z/OS V1R8 and later systems

Customize tape unit names to ensure automatic CBRUXVNL processing (Required-IF, as of R7 with OA13102 and later altered with OA19374)

Required for DFSMSrmm.

Starting with z/OS V1R8, you must customize the list of tape unit names to ensure that DFSMSrmm CBRUXVNL processing is provided automatically for tape data sets. There are two cases:

- Without the PTF for APAR OA19374: If you do not customize the list of tape unit names, and no match is found in the hardcoded tape unit name table, DFSMSrmm ignores the CBRUXVNL processing and your uncataloged tape data set jobs fail.
- With the PTF for APAR OA19374: If you do not enable the new tape unit name support for uncataloged tape data sets, you do not get the benefit of the new unit names passed to CBRUXVNL. This could mean that DFSMSrmm processing is used for data known to be on DASD. DFSMSrmm always treats uncataloged data sets as potentially on tape.

Migration action:

- If the PTF for APAR OA19374 is installed: Customize the processing by (1) turning on the new code by changing the setting &TAPEDEC SETC to YES and (2) customizing the hardcoded list of tape unit names to include your unit names for uncataloged tape data sets. If you take no action, the benefit of the device type/unit name being passed to CBRUXVNL is not available for uncataloged tape data sets. The exit will function as with earlier releases except that cataloged data sets automatically get the benefit. In addition, the decision to issue message EDG8197I for non-RMM managed volumes is made selectable by an option flag in the EDGLCSUP parameter list. The CBRUXVNL exit shipped by DFSMSrmm APAR OA19374 sets this option flag to B'1' only when either (1) it is a cataloged tape data set or (2) the &TAPEDEC is set to YES and there is a match on a tape unit name. To change this decision, customize the CBRUXVNL source code.

- If the PTF for APAR OA19374 is **not** installed (but we recommend that you install it): Customize the processing by either (1) turning off the new code by changing the setting &TAPEDEC SETC to NO or (2) customizing the hardcoded list of tape unit names to include your uncataloged tape data sets. The tape unit names are listed in the shipped table called TAPEUNITS. In addition, the decision to issue message EDG8197I for non-RMM managed volumes is made selectable by an option flag in the EDGLCSUP parameter list. The CBRUXVNL exit shipped by DFSMSrmm sets this option flag to B'1' by default. To change this decision, customize the CBRUXVNL source code.

DFSMS Migration Actions Post-First IPL

Run OAM DB2 BIND jobs (Required-IF)

Required if you use OAM object support.

When migrating to any new release of z/OS, you must run OAM DB2 BIND jobs if you are using OAM for object support. The BIND jobs update DB2 with new OAM DB2 code.

Migration action: Run the BIND jobs appropriate to your installation. The BIND jobs always include CBRPBIND and typically include CBRHBIND and CBRABIND. To determine which BIND jobs to run, see the topic “Migrating, Installing, and Customizing OAM” in *z/OS DFSMS OAM Planning, Installation, and Storage Administration Guide for Object Support*.

Note: The BIND jobs must be run *after* you have run any required OAM migration jobs (such as CBRSMR18 or CBRSMR19) that are listed in *z/OS DFSMS OAM Planning, Installation, and Storage Administration Guide for Object Support*.

Increase dump space in a Sysplex for VSAM RLS abends (Required-IF as of R9)

Required if the existing dump space is not large enough to accommodate additional dumps.

Before z/OS V1R9, when a VSAM RLS abend occurred, an abend dump was taken only on the originating system where the abend occurred. In z/OS V1R9, new sysplex-wide dumping support causes other systems running VSAM RLS in the sysplex to take dumps as well as the originating system. This change, might result in more dump space being needed on a given system, if dump space is currently limited.

Migration action: If more space for RLS abend dumps is needed, use the same procedures you currently do to increase dump data set size, but be aware that this might need to be done more frequently than in the past. In addition, you can use DAE to suppress dumps if needed.



Replace DFSMSrmm CIM providers and CIM classes (Required-IF as of R9)

Required if you previously (before R9) set up a CIM server and agent for DFSMSrmm and registered the DFSMSrmm CIM classes.

CIM providers and CIM classes have changed from pre-z/OS V1R9 releases. You must unregister the previous CIM providers and CIM classes, and register the z/OS V1R9 CIM providers and CIM classes.

Migration action:

1. Using the rmmutil.sh tool, unregister all the z/OS V1R8 and earlier CIM providers, and unload all the z/OS V1R8 and earlier CIM classes.
2. Using the same rmmutil.sh tool, register the complete set of z/OS V1R9 CIM providers and load the z/OS V1R9 CIM classes.

Add column SUBLEVEL to the DB2 TAPEVOL table for OAM (Required-IF as of R9)

Required if you use OAM.

Before z/OS V1R9, the OAM storage hierarchy consisted of three levels: disk, optical, and tape. In z/OS V1R9, two sublevels are introduced into the tape level, effectively expanding the OAM storage hierarchy into four levels: disk, optical, tape sublevel 1 (TSL1), and tape sublevel 2 (TSL2). You must modify and run the CBRSMR19 migration job to add the new SUBLEVEL column to the DB2 TAPEVOL table, whether you intend to exploit the new function or not.

Migration action:

- If your installation's DB2 TAPEVOL table does *not* contain a SUBLEVEL column, edit the sample job CBRSMR19 to make the changes specified in the comments section, and then run the job. The job adds the new TSL SUBLEVEL column to the DB2 TAPEVOL table and primes it with default values.

Plan your migration to z/OS V1.9!

- If you are migrating from z/OS V1R7, and if your installation's DB2 object directory tables do *not* contain an ODLOBFL column, edit the sample job CBRSMR18 to make the changes specified in the comments section, and then run the job. The job adds the ODLOBFL column to the object directory tables, and drops and re-creates the object directory table views.
- Run OAM DB2 BIND and GRANT jobs. To determine which BIND and GRANT jobs you need to run, see z/OS DFSMS OAM *Planning, Installation, and Storage Administration Guide for Object Support*.

Accommodate the change of IDCAMS DEFINE for RECORDS involving VSAM linear data sets (Required-IF, as of R9 with OA21369)

Required if you define a linear data set with CISIZE greater than 4096 bytes and specify the RECORDS parameter. Previously, when space for linear data sets was calculated in response to an AMS DEFINE command with the RECORDS parameter, an implied control interval size of 4096 was used when the control interval size was larger than 4096. As of z/OS V1R9 with APAR OA21369, in the same scenario, the actual (larger) control interval size is used instead of 4096.

Migration action: Consider adjusting the value of the RECORDS specification when a linear data set is defined with CISIZE greater than 4096 bytes. If you continue to use the same IDCAMS DEFINE CLUSTER job in such a situation, the allocated space will be larger than in z/OS V1R8 or V1R7 because the actual CISIZE (instead of 4096 bytes) has an influence on the amount of space allocated to the data set. You need to decrease the value of the RECORDS specification to achieve an allocation amount similar to before migration.

Notes: 1. DB2 allocates VSAM linear data sets using the RECORDS parameter, so DB2 allocations would be affected by this change when CISIZE greater than 4 KB is used. To avoid this side effect, apply the PTF for DB2 APAR PK42840. With this PTF, the define and extend code in DB2 has been changed to use KB when issuing the IDCAMS DEFINE command.

2. In z/OS V1R8, SMS added a new code to validate the space quantity for volume selection. The space calculation is based on the number of records multiplied by the actual CISIZE instead of the 4 KB record size. If SMS fails the allocation because the primary quantity requested is larger than the total capacity of the largest available volume, the following error message is issued: IGD17279I (n) VOLUMES WERE REJECTED BECAUSE OF INSUFF TOTAL SPACE

Accommodate the changed condition code form an IDCAMS DIAGNOSE command against the ICF catalog (Required-IF, as of R9, and on R8 with OA19984)

Required if you depend on the condition code from the IDCAMS DIAGNOSE command.

When using the IDCAMS DIAGNOSE command against an ICF catalog, you might receive the following messages:
IDC11374I THESE ADDITIONAL CATALOG REFERENCED VOLUMES WERE ENCOUNTERED: volume-serial-numbers

IDC0001I FUNCTION COMPLETED, HIGHEST CONDITION CODE WAS 4

In this situation, the listed volume serial numbers are referenced by catalog entries but these volume serial numbers were not found as VVDS entries. This could indicate that entries are referencing volumes for which the catalog has no record. Although there is no impact on processing, DIAGNOSE considers this an attention condition and issues a warning message with processing continued.

As of z/OS V1R8 with APAR OA19984, message IDC11374I has been removed from IDCAMS DIAGNOSE command processing in the above situation. The condition code returned from this message is now zero.

Migration action: Change procedures that depend on the condition code from the IDCAMS DIAGNOSE command against the ICF catalog. The situation previously reported by warning message IDC11374I is no longer detected and condition code 4 is not set for this reason.

Notes: 1. There should be a "SYS1.VVDS.Vvolser" entry for each volume referenced by VSAM entries in the ICF catalog, except where the "SYS1.VVDS.Vvolser" is created by EOVS processing.

2. Message IDC11374I was an attention and might signal entries that are missing or damaged. To add an entry for the missing VVDS to the catalog, use IDCAMS DEFINE RECATALOG on the VVDS. If a VSAM data set incorrectly references the volume, remove the reference from the data set entry with IDCAMS ALTER REMOVEVOLUMES.

Remove the dependency on the order in which GDSs are listed in IDCAMS LISTCAT LEVEL(gdg) output (Required-IF, as of R8)

Plan your migration to z/OS V1.9!

Required if you depend on the listing generated by the IDCAMS LISTCAT LEVEL command.

The IDCAMS LISTCAT command has been enhanced to improve the output display of catalog entries.

Before z/OS V1R8, generation data sets (GDSs) were listed by generation number. In z/OS V1R8 and later releases, this is not always the case. A LISTCAT LEVEL command against a generation data group (GDG) might not return the GDSs associated with the GDG in generation number sequence. For example, G0003V00 might come before G0002V00 in the listing. All GDSs are listed but the sequence in which they are returned can vary if the GDS was updated. An example of an update that can cause this to occur is the migration or recall of a GDS.

If you have applications (Assembler, COBOL, PL/I, C/C++, or REXX) that process LISTCAT LEVEL output, you should review them to ensure there is no dependency on the order that GDSs are listed in the LISTCAT output.

Migration action: If your applications depend on the order in which GDSs are returned, the applications will need to be updated to remove the dependency. This could take some time to accomplish. Several means are available to have LISTCAT LEVEL return GDSs in generation number order:

- Add EXPIRATION(9999) to the LISTCAT LEVEL command.
- Add CREATION(0) to the LISTCAT LEVEL command.
- If running under TSO/E, use TSO PROFILE PREFIX(*value*). Note that it does not matter what the value is, only that the TSO PREFIX is set.
- After application of PTFs for APAR OA20472, change your JCL from //STEP01 EXEC PGM=IDCAMS to //STEP01 EXEC PGM=IDCNOGFL. Or, change applications that invoke IDCAMS to invoke the entry point IDCNOGFL rather than IDCAMS.

Notes: 1. With any of the above options, the performance enhancements and constraint removal in z/OS V1R8 will not be in effect.

2. The use of the last item above (specifying EXEC PGM=IDCNOGFL rather than EXEC PGM=IDCAMS) should be considered a temporary solution for the issue of GDSs being returned in an order other than generation number order. This option was provided to ease the migration to z/OS V1R8 and later releases and is currently intended to be removed in a future release. To help ease migration, the PTF for APAR OA22078 will provide the new entry point IDCNOGFL on z/OS V1R7.

Add column ODLOBFL to OAM object directory tables (Required-IF, as of R8)

Required if you have any OAM object directory tables. (The minimum level of DB2 required by z/OS V1R8 OAM is DB2 V6R1. However, because DB2 V6 is no longer service supported, you should use DB2 V7 or later.)

In z/OS V1R8, object access method (OAM) DB2 binary large object support enables objects larger than 32 KB (32640 bytes) to be stored using DB2's large object (LOB) support and the binary large object (BLOB) data type.

Before z/OS V1R8, for each object storage group, there was an object directory table and an object storage table hierarchy consisting of a 4 KB and a 32 KB table. With the new support in z/OS V1R8, a LOB storage structure is added to the object storage table hierarchy, consisting of a LOB base table and a LOB auxiliary table. A new column, ODLOBFL, is needed in the object directory table to track whether the object resides in a LOB storage structure. Even if you do not take advantage of the large object support enhancement, you must add the new ODLOBFL column to the OAM object directory tables.

Migration action:

- If your installation's DB2 object directory tables do *not* contain an ODLOBFL column, edit the sample job CBRSMR18 in SYS1.SAMPLIB to make the changes specified in the comments section, and then run the job. The job adds the ODLOBFL column to the object directory tables, and drops and re-creates the object directory table views.
- Run OAM DB2 BIND and GRANT jobs. To determine which BIND and GRANT jobs you need to run, see z/OS DFSMS OAM Planning, Installation, and Storage Administration Guide for Object Support.



Avoid issuing commands against a copy pool from a pre-R8 system after the copy pool has been converted to the R8 format (Required, as of R8).

In DFSMSHsm, a *copy pool* represents one or more storage groups that are copied collectively and can be recovered at the copy pool or volume level. Starting in z/OS V1R8, you can dump to tape copy pool versions residing on DASD. This enhancement changes DFSMSHsm control data set (CDS) records. The records are converted to the new, z/OS V1R8 format automatically the first time you issue an FRBACKUP command against a copy pool. But from then on, the only fast replication (FR) command you can issue successfully against a copy pool from a pre-z/OS V1R8 system is FRRECOV from DASD. Therefore, before issuing an FRBACKUP command against a copy pool on z/OS V1R8, ensure that your installation no longer needs FRBACKUP processing for copy pools from any pre-z/OS V1R8 systems.

Migration action: Ensure that your installation no longer needs to back up copy pools from any pre-z/OS V1R8 systems before issuing an FRBACKUP command against a copy pool on z/OS V1R8. Notify operations personnel that after an FRBACKUP command has been issued against a copy pool, the only FR command that can be successfully issued against a copy pool from a pre-z/OS V1R8 system is FRRECOV from DASD.

Rename existing copy pools (Required-IF, as of R8)

Required if you plan to use the new FACILITY class resource names to protect individual copy pools names.

z/OS V1R8 restricts the names of new copy pools to a maximum of 23 characters. Before z/OS V1R8, copy pool names could be up to 30 characters in length. The shorter names will allow security administrators to specify full names of copy pools in the new FACILITY class resource names introduced in z/OS V1R8 (also see migration action “Define new security profiles for fast replication commands”).

z/OS V1R8 continues to support the use of longer names (up to 30 characters) for your existing copy pools.

Migration action: Your actions to rename existing copy pools will depend on whether your installation has enough additional target DASD storage available to create a new copy pool backup version without using your existing target DASD storage.

If you have enough additional target DASD storage available, do the following:

1. Define the new copy pool with the same characteristics as the copy pool to be replaced.
2. Add enough additional target DASD storage to the copy pool backup storage group to create one additional version.
3. Enter the command FRBACKUP COPYPOOL(*new_cpname*) for the new copy pool to create a backup version.
4. Enter the command FRDELETE COPYPOOL(*old_cpname*) VER(*oldvernum*) for the oldest version of the existing copy pool to be replaced. This step will free enough target DASD storage to create the subsequent backup version for the new copy pool name.
5. Repeat Steps 3 and 4 until you have replaced all of the versions for the existing copy pool.
6. You can now remove the extra DASD storage from the copy pool backup storage group.

If your installation must use its existing target DASD storage to create a new copy pool backup version, do the following:

1. Define the new copy pool with the same characteristics as the copy pool to be replaced.
2. Enter the command FRDELETE COPYPOOL(*old_cpname*) VER(*oldvernum*) for the oldest version of the existing copy pool to be replaced. This step will free enough target DASD storage to create the subsequent backup version for the new copy pool name.
3. Enter the command FRBACKUP COPYPOOL(*new_cpname*) for the new copy pool to create a backup version.
4. Repeat Steps 2 and 3 until all of the versions for the existing copy pool have been replaced.

Modify programs and JCL that use the LRECL of the DFMSrmm extract data set (Req-IF, as of R7 OA11710)

Required if you have programs or JCL that depend on the LRECL of the extract data set generated by DFSMSrmm inventory management.

Using the DFSMSrmm inventory management utility (EDGHSKP) with the RPTEXT parameter, you can generate a report extract data set (using the REPTTEXT DD statement) or extended report extract data set (using the XREPTTEXT DD statement), which is a point-in-time copy of the DFSMSrmm control data set (CDS).

Before z/OS V1R8, z/OS V1R7 with the PTF for APAR OA11710 installed, or z/OS V1R6 and V1R5 with the PTF for APAR OA11597 installed, the LRECL value assigned to these extract data sets depended on the maximum length record within the data set. Starting in z/OS V1R8 (and in z/OS V1R7, V1R6, and V1R5 with the PTFs installed), the value is fixed at 7004.

Migration action:


- In your programs, remove the hardcoded LRECL value and instead use the value from the DSCB. Also, if your programs are written in COBOL, change the FILE SECTION, FD entry to indicate the current LRECL size of the

Plan your migration to z/OS V1.9!


extract file as follows: RECORD IS VARYING FROM 4 TO 7000 CHARACTERS. Failure to change your COBOL source code can result in error message IGZ0201W (file attribute mismatch error). For more information, see the HOLD information for APAR OA11597.

- If you use the IEBGENER utility to mark an EOF in the extract data set, with SYSUT1 specifying DUMMY and SYSUT2 specifying the extract data set, use the new DCB LRECL value of 7004 on SYSUT1. Otherwise you will receive error message IEB311I CONFLICTING DCB PARAMETERS (RC=12).

DFS Migration Actions for z/OS R9 from z/OS R7



► Migration Actions You Can Do NOW:



Discontinue use of multi-file system aggregates (Required-IF, as of R8)

- In z/OS R8, cannot mount any zFS file systems contained in multi-file system aggregates shared in a sysplex. Will result in a failure, with msg IOEZ00522E.
- Convert to zFS compatibility mode system aggregates.

► Migration Actions Pre-First IPL:

- **Accommodate the removal of the allow_duplicate_filesystems option from IOEFSPRM (Required-IF, as of R9)**
 - Before z/OS V1R9, zFS file system names had to be unique across all attached aggregates on a system unless you enabled the **allow_duplicate_filesystems** option in the IOEFSPRM file. When the default, **allow_duplicate_filesystems=off**, was in effect, any attempts to create a file system with duplicate names were denied.
 - z/OS V1R9 condition is always **allow_duplicate_filesystems=on**.
 - Various updates: configuration, automation, commands, ...

► Migration Actions Post-First IPL:

- **Use the new zFS directory buffer cache default in IOEFSPRM (Recommended, as of R9)**
 - **dir_cache_size** option was 2M default, new default is 32M.
- **Use the F OMVS command to stop the zFS physical file system (Required-IF, as of R8)**
 - Before: to gracefully stop the zFS physical file system was STOP ZFS.
 - Now: use F OMVS,STOPPFS=ZFS. STOP ZFS has been removed.

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Distributed File Service Migration Actions Between z/OS R7 and z/OS R9

These migration actions were taken from *z/OS Migration*. Some descriptions and actions have been shortened for inclusion in this presentation. For the complete descriptions and actions, refer to *z/OS Migration*.

DFS Migration Actions You Can Do Now



Discontinue use of multi-file system aggregates (Required-IF, as of R8)

Required if you are using zFS multi-file system aggregates.

Beginning in z/OS V1R8, you can no longer mount zFS file systems contained in multi-file system aggregates that are shared across systems in a sysplex. IBM has previously recommended that these multi-file system aggregates not be shared in a sysplex environment. Any attempts to mount zFS file systems contained in multi-file system aggregates will fail in a z/OS UNIX shared file system environment with message IOEZ00522E. Mounting zFS compatibility mode aggregates, which have a single file system per data set, will continue to be supported in all environments.

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.)

Migration action: Determine if you are using zFS multi-file system aggregates. You can determine this by scanning your zFS IOEFSPRM configuration options file for `define_aggr` statements. You should also scan your `/etc/rc` file for any `zfsadm attach` commands. If you are using zFS multi-file system aggregates, you should copy the data from each file system into its own zFS compatibility mode aggregate.

DFS Migration Actions Pre-First IPL

Accommodate the removal of the allow_duplicate_filesystems options from IOEFSPRM (Req, as of R9)

Before z/OS V1R9, zFS file system names had to be unique across all attached aggregates on a system unless you enabled the **allow_duplicate_filesystems** option in the IOEFSPRM file. When the default,

allow_duplicate_filesystems=off, was in effect, any attempts to create a file system with duplicate names were denied.

In z/OS V1R9, to improve performance, the **allow_duplicate_filesystems** option has been removed from z/OS, and zFS duplicate file system names are always allowed, regardless of whether you are in a shared file system environment. (In other words, the z/OS V1R9 condition is always “**allow_duplicate_filesystems=on**”.) In addition, the zfsadm configquery option **-allow_dup_fs** and the zfsadm config option **-allow_dup_fs** are removed.

Migration action:

- If the zFS configuration option **allow_duplicate_filesystems** is in your IOEFSPRM file, remove it. If it is specified it is ignored, but removing it can prevent confusion for anyone who does not know that it is no longer valid.
- Discontinue using the zfsadm configquery option **-allow_dup_fs** and the zfsadm config option **-allow_dup_fs**, which are no longer valid.
- If you now have duplicate zFS file system names and you want to mount one of the duplicate file systems, you must specify the MOUNT PARM AGGREGATE and FILESYSTEM parameters. Note that, in z/OS V1R8, support was removed for mounting a zFS file system contained in a multi-file system aggregate in a shared file system environment.
- Update any automation that might be affected by these message changes:
 - The following message is no longer displayed: IOEZ00319E The file system *Filesystem* will not be attached.
 - Instead, when using multi-file system aggregates, the following message is displayed: IOEZ00315I There are now 2 file systems with the name *Filesystem* in use.If there are different values for different sysplex members because at least one of them is at a prior release, the system will act as it did before z/OS V1R9.

DFS Migration Actions Post-First IPL

Use the new zFS directory buffer cache default in IOEFSPRM (Recommended, as of R9)

*Not required, but recommended if you use a default for **dir_cache_size** and you want optimal zFS performance.*

The **dir_cache_size** option specifies the size of the directory buffer cache in IOEFSPRM, the zFS configuration data set. Before z/OS V1R9, the default value for **dir_cache_size** was 2M. Beginning with z/OS V1R9, the default value is 32M. A value of 32M is likely to provide better performance than a value of 2M.

Migration action: If you use the default for the **dir_cache_size** option, accept the new default value of 32M to get better performance. However, if you prefer the previous default value of 2M (or a value in the range of 2M to 512M), specify it on **dir_cache_size** in configuration data set IOEFSPRM.

Note: The increased cache size will use more virtual storage, so there is a potential that more paging may be done.

Use the F OMVS command to stop the zFS physical file system (Required-IF, as of R8)


Required if you need to stop the zFS physical file system.

Before z/OS V1R8, the command to stop the zFS physical file system gracefully was STOP ZFS. In z/OS V1R8, z/OS UNIX introduced a new F OMVS operator command to be used for stopping physical file systems: F OMVS,STOPPFS=*pfsname*. Use this new command to stop the zFS physical file system gracefully (with *pfsname* = ZFS).

Migration action: To stop the zFS physical file system gracefully, use the following command:

```
f omvs,stoppfs=zfs
```

Discontinue using the previously recommended command, stop zfs, because it has been removed from z/OS.



LE Migration Actions for z/OS R9 from z/OS R7

► **Migration Actions You Can Do NOW:** <none>


► **Migration Actions Pre-First IPL:**

- Update the CICS system definition file based on the newest CEECCSD sample **(Required)**
 - In each release, load modules are added/deleted to this file.
- Review Language Environment load modules in LPA **(Required-IF)**

► Determine the impact of added and changed run-time options **(Required-IF, as of R9)**

- R9: CEEDUMP is a newly added option. Does not change default behavior.
- R8: DYNDUMP is a newly added option.
- No suboptions were added, and no default changes were made to existing run-time options in R8 or R9.
- If you are using assembler modules to specify your installation-wide run-time options (for CEEDOPT, CEECOPT, or CELQDOPT), then you must change them for the new CEEDUMP and DYNDUMP options.
- If you are using CEEPRMxx (introduced in z/OS R7) and the default specification for the newly added CEEDUMP and DYNDUMP options are acceptable to you, then no migration action is required!

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LE Migration Actions for z/OS R9 from z/OS R7

► **Migration Actions Pre-First IPL:**

► Determine the impact of the DYNDUMP run-time option **(Required, as of R8)**

- New option adds the ability to write IPCS-readable dumps automatically. Default supplied by IBM does not affect the behavior when an application error results in a U4039 abend. However, the supplied default affects all other U40xx abends.
- Before:** a system dump was only written for the U40xx abends when a SYSUDUMP, SYSABEND, or SYSMDUMP ds was allocated.
- As of R8:** regardless of whether a SYSUDUMP, SYSABEND, or SYSMDUMP data set is allocated, a dump is written to the hlq specified in the DYNDUMP run-time option. You can turn off this new first failure data capture behavior by specifying NOTDUMP (whereas TDUMP is the default) as the value for the third suboption of DYNDUMP. The default hlq (*USERID) might also need to be adjusted for your installation.
- Applicable to CEEDOPT and CELQDOPT only (ignored in CICS environment).

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Language Environment Migration Actions Between z/OS R5 and z/OS R8

These migration actions were taken from *z/OS Migration*. Some descriptions and actions have been shortened for inclusion in this presentation. For the complete descriptions and actions, refer to *z/OS Migration*.

Language Environment Migration Actions You Can Do Now

<none>

Language Environment Migration Actions Pre-First IPL

Update the CICS CSD based on the newest CEECCSD sample (Required)

Each release, Language Environment adds or deletes load modules in the CICS system definition (CSD) file. Thus, you should update the file each release using the program definitions found in member CEECCSD and, if using CICS Transaction Server (TS) for z/OS V3 (5655-M15), in member CEECCSDX.

For example, in z/OS V1R2, the CLER CICS^(R) transaction was added to display run-time options under CICS and alter a subset of options. Therefore, you must define the CLER transaction in the CICS CSD. The CEECCSD sample job in the *hlq.SCEESAMP* data set has been updated to include the CSD entries for the CLER transaction.

Migration action: Update the CSD file using the program definitions in member CEECCSD (and member CEECCSDX if using CICS TS V3) found in the *hlq.SCEESAMP* data set.

Note: The group containing the LE run time routines must be in the group list used during CICS startup.

Review Language Environment load modules in LPA (Required-IF)

Required if you need to make modules accessible through the link pack area (LPA).

Each release you must update the Language Environment load modules that you make accessible through the link pack area (LPA). In addition, each release you should review your list of load modules in the LPA to determine if it's still suitable.

Migration action: Review Language Environment load modules in the LPA.

- To move load modules into the LPA, use sample members are provided in the CEE.SCEESAMP data set.
- To see which modules are eligible for the LPA, refer to *z/OS Language Environment Customization*. The modules listed there can be put in the LPA or extended LPA (ELPA) depending on their RMODE value:
- If you are considering placing the modules listed in z/OS Language Environment Customization in the LPA or the ELPA, then IBM highly recommends that you place the SCEELPA data set in the LPA list (LPALST xx). SCEELPA contains Language Environment load modules that are reentrant, that reside above the 16 MB line, and that are heavily used by z/OS.
- In *z/OS Language Environment Customization* you will also see tables of modules eligible for the LPA and the ELPA above and beyond what is found in the SCEELPA data set. You will need to use the dynamic LPA or MLPA approach to move these modules into the LPA or ELPA. You do not need to include recommended modules if they contain functions your installation does not use. Language Environment modules not listed in these tables can be moved into the LPA or ELPA at your discretion.

Determine the impact of added and changed run-time options (Required-IF, as of R9)

Required if you are using assembler modules to specify your installation-wide run-time options (CEEDOPT, CEECOPT, or CELQDOPT). If you are using CEEPRMxx (introduced in z/OS V1R7) and the default specification for the newly added option is acceptable to you, then no migration action is required.

Periodically, Language Environment introduces new run-time options, adds new suboptions to existing run-time options, and changes the defaults of run-time options.

In z/OS V1R9:

- One run-time option, CEEDUMP, was added. CEEDUMP is used to specify options to control the processing of the Language Environment dump report CEEDUMP.
- No suboptions were added and no default changes were made to existing run-time options.

In z/OS V1R8:

- One run-time option, DYNDUMP, was added. DYNDUMP controls whether certain dumps are automatically produced.
- No suboptions were added and no default changes were made to existing run-time options.

Because of these changes, you might have to perform migration actions.]

Migration action:

- If you are using CEEPRMxx to specify your installation-wide run-time options:
 - The new z/OS V1R9 CEEDUMP run-time option does not change the default behavior. You have no migration action.
 - The new z/OS V1R8 DYNDUMP run-time option changes the default behavior. If the default change is not desirable, update your CEEPRMxx parmlib member accordingly. If the default DYNDUMP behavior is acceptable, you have no migration action.
- If you are using the assembler modules to specify your installation-wide run-time options, compare your existing source for the installation-wide run-time options CSECT, CEEDOPT (non-CICS environment), CEECOPT (CICS environment), or CELQDOPT (AMODE 64) with the new samples in *hlq.SCEESAMP* to determine whether you need to change the defaults. Then, update (and reinstall) your usermods with the following new options:
 - The new z/OS V1R9 CEEDUMP run-time option.
 - The new z/OS V1R8 DYNDUMP run-time option. This option changes the default behavior.

Determine the impact of the DYNDUMP run-time option (Required, as of R8)

Required if you updated the installation-wide run-time option CSECT (CEEDOPT or CEECOPT) in a previous release.

In z/OS V1R8, Language Environment, to assist with first failure data capture, added the ability to write an IPCS readable dump without requiring you to supply a SYSMDUMP DD statement. This activity is controlled by the new DYNDUMP run-time option.

The default supplied by IBM does not affect the behavior when an application error results in a U4039 abend. However, the supplied default affects all other U40xx abends. Before this support, a system dump was only written for the U40xx abends when a SYSUDUMP, SYSABEND, or SYSMDUMP data set was allocated. With this support, regardless of whether a SYSUDUMP, SYSABEND, or SYSMDUMP data set is allocated, a dump is written to the high-level qualifier specified in the DYNDUMP run-time option. You can turn off this new first failure data capture behavior by specifying NOTDUMP as the value for the third suboption of DYNDUMP. The default high-level qualifier might also need to be adjusted for your Installation.

Note: LE's DYNDUMP uses the IATDUMP service in the BCP, and will produce *no* symptoms for those dumps, so they will not be eligible for suppression by DAE

Migration action:

- Understand the new DYNDUMP run-time option and its default suboption values.
- Determine whether the default values supplied by IBM are acceptable for your installation, and adjust if needed.
Note: For U40xx abends (other than U4039), IBM service usually requests an IPCS-readable system dump to assist with problem determination. Therefore, the third suboption of the DYNDUMP run-time option is set to TDUMP by default.

Reference information: For details about specifying the DYNDUMP run-time option, see *z/OS Language Environment Customization*.


Language Environment Migration Actions Post-First IPL

<none>

TSO/E Migration Actions for z/OS R9 from z/OS R7

Migration Actions Pre-First IPL:

- **Modify exit routines that depend on the INMSIZE or INMTYPE text unit (Required-IF, as of R9)**
 - TRANSMIT and RECEIVE now support DSNTYPE=LARGE.
 - When the ds is 2GB or more, INMLSIZE is used instead of INMSIZE to hold the file size in bytes. INMTYPE is also updated.
- **Accommodate TSO/E changes for data sets allocated from the RECEIVE command (Required-IF, as of R9)**
 - Allocations done during RECEIVE processing will now use AVGREC parameter. This usage makes ISPF show data set information in bytes (instead of blocks or tracks, as it did without the AVGREC parameter).
 - LISTDSI function in REXX or CLIST will still return the size in blocks or tracks, and data sets that are pre-allocated (that is, those not allocated by RECEIVE command processing) are not affected by this change.



- **Accommodate TSO/E default change for the compiler programming table (Required-IF, as of R9)**
 - IRXCMPTM default now contains values for the Alternate Library for REXX.
 - You may be able to eliminate a usermod to IRXCMPTM, or putting SEAGALT in the lpa list, if the new defaults are acceptable to you.

- Use the REXX FTP client API from customized TSO/E REXX modules (Req-IF, as of R8)

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TSO/E Migration Actions Between z/OS R7 and z/OS R9

These migration actions were taken from *z/OS Migration*. Some descriptions and actions have been shortened for inclusion in this presentation. For the complete descriptions and actions, refer to *z/OS Migration*.

TSO/E Migration Actions You Can Do Now <none>

TSO/E Migration Actions Pre-First IPL

Modify exit routines that depend on the INMSIZE or INMTYPE text unit (Required-IF, as of R9)

Required if you have any TSO/E TRANSMIT or RECEIVE exit routines that depend on the INMSIZE or INMTYPE text unit.

In releases before z/OS V1R9, the TSO/E TRANSMIT and RECEIVE commands cannot handle large format data sets (DSNTYPE=LARGE) because the four-byte INMSIZE text unit (key X'102C'), which holds the file size in bytes, is limited to 2 GB. In z/OS V1R9, a four-byte text unit called INMLSIZE (key X'8018') is introduced to hold the size of TRANSMIT and RECEIVE operations in MB (up to 4096 TB). If the size of a data set being transmitted is 2 GB or more, INMLSIZE is used instead of INMSIZE.

The INMTYPE text unit (key X'8012') has also been updated. In addition to X'80' for data libraries or X'40' for program libraries, the 1-byte field is now set to X'01' for large format sequential data sets or X'04' for extended-format sequential data sets. These changes can affect exit routines that perform TRANSMIT and RECEIVE operations.

Migration action: Check any exit routines that process TSO/E TRANSMIT or RECEIVE data. Look for code that refers to text units INMSIZE or INMTYPE, which are defined by the INMTEXTU macro. See whether there is a dependency on the pre-z/OS V1R9 value of either INMSIZE or INMTYPE. Make any necessary changes to allow for the new INMLSIZE text unit and the new settings of the INMTYPE text unit.

Accommodate TSO/E changes for data sets allocated from the RECEIVE command (Required-IF, as of R9)

Required if you have users that expect to see data set allocation information in blocks or tracks in ISPF for data sets allocated during TSO/E RECEIVE processing.

Before z/OS V1R9, TSO/E would allocate a data set during RECEIVE command processing without using the AVGREC option. As of z/OS V1R9, TSO/E allocates a data set during RECEIVE command processing using the AVGREC option.

Plan your migration to z/OS V1.9!

As a result, the ISPF data set information panel displays the size of the data set in bytes; before z/OS V1R9, the size of the data set was displayed in blocks or tracks.

The LISTDSI function in REXX or CLIST still returns the size in blocks or tracks, and data sets that are preallocated (that is, not allocated by RECEIVE command processing) are not affected by the change.

Migration action: Notify users that ISPF shows the size of data sets in bytes if the data sets are allocated by TSO/E RECEIVE command processing. To avoid the changed behavior of data set sizes being displayed in bytes (in addition to preallocating data sets before RECEIVE), enter ? in reply to the prompt from RECEIVE to see the size and block size, and then specify your own SPACE and BLOCKS, TRACKS, or CYLINDERS parameters.

Accommodate TSO/E default change for the compiler programming table (Required-IF, as of R9)

Required if you modify the TSO/E-provided IRXCMPTM or provide an override to TSO/E's SYS1.LINKLIB(IRXCMPTM).

When TSO/E REXX initializes the first language processor environment in the address space, TSO/E REXX loads module IRXCMPTM as the compiler programming table. After the compiler programming table is loaded, it is used for all compiled execs in the current and any subsequent language processor environments.

Before z/OS V1R9, the IRXCMPTM module that TSO/E provided in LINKLIB contained no entries, which indicated to TSO/E that a compiler runtime processor was not installed. It was the responsibility of the system programmer to provide a compiler programmer table for TSO/E to use for compiled execs, if desired. The system programmer most likely used a TSO/E-provided sample usermod, or overrode SYS1.LINKLIB(IRXCMPTM) with an LPA list specification of IRXCMPTM from either REXX.SEAGALT (from the Alternate Library for REXX) or REXX.SEAGLPA (from the REXX Library for z/OS).

As of z/OS V1R9 and the integration of the Alternate Library for REXX into z/OS V1R9, TSO/E has changed the IRXCMPTM default to specify the Alternate Library for REXX values. Specifically, these values are the new default in TSO/E's IRXCMPTM:

FIRST_ENTRY_RTPROC	DC	C 'EAGRTPRC'
FIRST_ENTRY_COMPINIT	DC	C 'EAGRTXIN'
FIRST_ENTRY_COMPTERM	DC	C 'EAGRTXTR'
FIRST_ENTRY_COMPLOAD	DC	C 'EAGRTXLD'
FIRST_ENTRY_COMPVAR	DC	C 'EAGRTXVH'

Because of the changed default values, you might have to modify your IRXCMPTM.

Migration action:

- If the z/OS V1R9 TSO/E IRXCMPTM default is acceptable to you:
 1. You no longer need to modify IRXCMPTM. Do not install any usermods to IRXCMPTM.
 2. You no longer need to override SYS1.LINKLIB(IRXCMPTM) with an LPA list entry for REXX.SEAGALT (Alternate Library for REXX's load library, which provides a customized IRXCMPTM). Alternate Library for REXX's REXX.SEAGALT(IRXCMPTM) matches the TSO/E changed default. (Note: If you use the REXX Library for z/OS product, you still must specify, in the LPA list, the REXX.SEAGLPA data set provided with that product. REXX.SEAGLPA(IRXCMPTM) values also match the TSO/E changed default.)
- If the z/OS V1R9 default is not acceptable to you, continue to modify IRXCMPTM with your specific values on each release upgrade.

Use the REXX FTP client API from customized TSO/E REXX modules (Required-IF, as of R8)


Required if you customized the TSO/E REXX parameter modules in a previous release and you now want to use the new REXX FTP client.

Before z/OS V1R8, the default TSO/E REXX parameter modules did not include the REXX FTP client API. Starting in z/OS V1R8, the modules provide the REXX FTP client API. If you customized any of the following modules, you must also customize the z/OS V1R8 versions: IRXTSPRM, IRXISPRM, IRXPARRMS.


Migration action: Migrate your customizations to the z/OS V1R9 level.

TSO/E Migration Actions Post-First IPL <none>

z/OS UNIX Migration Actions for z/OS R9 from z/OS R7




► **Migration Actions You Can Do NOW:**


- 
Migrate from HFS to zFS (Recommended)
 - At R7, zFS is allowed in all levels of file system hierarchy (including root!).
 - Support for the HFS file system has been stabilized and you are encouraged to migrate to the zFS file system for better performance, but IBM has not announced removal of support for the HFS file system.
 - Use the handy ISPF-based tool, BPXWH2Z, available as of R7.
- Use the new default of 10 minutes for the automount delay keyword (Rec, as of R9)
 - Before, default was 0. New default is Best Practice (HC: USS_AUTOMOUNT_DELAY)
 - Update BPXPRMxx if more than 50 MKDIR keywords are specified (Req-IF, as of R9)
 - New maximum is 50 on the ROOT or MOUNT statements. More gives syntax errors.
- Use new COMPAT default with binding with c89 (Recommended, as of R8)
 - As of R8, c89 will no longer override the binder's COMPAT default! (btw, z/OS R8 introduces PM5 level, PM4 was introduced back in z/OS R3. Programs created with a lower COMPAT level can run in more environments.)
 - Add to /etc/profile c89 section: export \${_CMP}_OPTIONS="-W1,compat=unspec"
 - Update BPXBATCH jobs that specify MVS data sets (Required-IF, as of R8 and back OAI1699)
 - Before: only UNIX files could be used for STDOUT/STDERR DD - no failures given!
 - As of R8: MVS data sets can be used for STDOUT/STDERR DD. Ensure that any MVS ds are intended to be used for STDOUT/STDERR.

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z/OS UNIX Migration Actions for z/OS R9 from z/OS R7



► **Migration Actions Post-First IPL:**

- Update the date and time of book files used for man pages (Required-IF as of R9)
 - man pages for the previous release remain in the cache directory.
 - Update date and time of book files using the touch command.
- Increase dump space to accommodate dumps of the zFS address space (Req-IF as of R9)
 - Pre-R9, system dumps didn't include dumps from an active zFS address space.
 - As of R9, system dumps now capture data from an active zFS address space.
 - Determine if you need to increase your dump data sets to include the additional space needed for data dumped from the zFS address space. Amount needed depends on the amount of zFS activity and the configuration parameters.
 - Use the new default of 64000 for MAXFILEPROC in BPXPRMxx (Recommended, as of R9)
 - Default in R9 is 64000, was 256 pre-R9. Use check USS_MAXSOCKETS_MAXFILEPROC.
- Update awk invocations to accommodate changes made to the awk utility (Req-IF as of R9)
 - awk conforms to SUSv3. You may have to change your invocation of awk, or awk programs.
 - Update automation and operational procedures for file systems in a shared file system configuration (Required-IF as of R9)
 - On R9, conversion of AUTOMOVE(YES) will not occur for sysplex-aware file systems.
 - Instead the AUTOMOVE setting (UNMOUNT,NOAUTOMOVE, AUTOMOVE, or system list) will be honored by R9 systems, independent of the sysplex-aware or sysplex-unaware capabilities for the mount mode.
 - Update BPXPRMxx because SHRLIBMAXPAGES no longer supported (Recommended, at R8)
 - Ignored, if specified.
- 
Install books and a bookshelf for the OHELP command (Required-IF)

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z/OS UNIX System Services Migration Actions Between z/OS R7 and z/OS R9

These migration actions were taken from *z/OS Migration*. Some descriptions and actions have been shortened for inclusion in this presentation. For the complete descriptions and actions, refer to *z/OS Migration*.

z/OS UNIX System Services Migration Actions You Can Do Now



Migrate from HFS file systems to zFS file systems (Recommended)

Not required, recommended. Support for the HFS file system has been stabilized and you are encouraged to migrate to the zFS file system for better performance, but IBM has not announced removal of support for the HFS file system.

Before z/OS V1R7, the HFS file system was the primary hierarchical file system. As of z/OS V1R7, you can use any combination of HFS and zFS file systems. Because zFS has higher performance characteristics than HFS and is the strategic file system, HFS might no longer be supported in future releases and you will have to migrate the remaining HFS file systems to zFS.

The HFS and zFS file system types in mount statements and command operands are now generic file system types that can mean either HFS or zFS. Based on the data set type, the system will determine which is appropriate.

Migration action:

1. Before beginning the migration, follow these steps:
 - a. Establish backout procedures.
 - b. Decide on naming conventions.
 - c. Decide on unavailability.
1. Perform the conversion from an HFS to zFS file system.
 - **Tip:** Use the BPXWH2Z tool to perform the conversion. (Sample JCL is below.) It is an ISPF-based tool that migrates HFS file systems to zFS file systems. It has a panel interface that enables you to alter the space allocation, placement, SMS classes, and data set names. A HELP panel is provided. With this tool, you can:
 - i. Migrate HFS file systems (both mounted and unmounted) to zFS file systems. If the HFS being migrated is mounted, the tool automatically unmounts it and then mounts the new zFS file system on its current mount point.
 - ii. Define zFS aggregates by default to be approximately the same size as the HFS. The new allocation size can also be increased or decreased. v Have the migration run in TSO foreground or UNIX background.
 - BPXWH2Z is located in partitioned data set SBPXEXEC (usually called SYS1.SBPXEXEC). When you run the BPXWH2Z tool on your z/OS V1R9 system, it uses the z/OS V1R9 level of the **pax** command. This level was enhanced in z/OS V1R7 for sparse file support and other characteristics that are of concern when migrating from an HFS to zFS file system. You can manually migrate from an HFS to zFS file system without using the tool. However, you would need to allocate and format the target zFS file systems.
 - **Requirement:** The BPXWH2Z tool requires the zFS address space to be operational. Therefore, before attempting to migrate existing HFS to zFS file systems using BPXWH2Z, make sure that the zFS address space has been successfully configured and initialized. 3. Change policies and scripts, and so forth, to reflect the change from the HFS file system to zFS file system. **Tip:** Use the RMF Monitor III option to report on zFS activity.

The following is sample JCL to run the BPXWH2Z conversion tool as an ISPF batch job. Before you run the job, be sure to read the Notes section:

```
*****  
*** Licensed Materials - Property of IBM *  
*** 5694-A01 *  
*** (C) Copyright IBM Corp. 2002, 2006 *  
*** *  
*** This JCL will run the BPXWH2Z(HFS to zFS migration) *  
*** conversion tool as an ISPF Batch Job. *  
*** CAUTION: This is neither a JCL procedure nor a complete *  
*** job. Before using this job step, please inspect it *  
*** carefully for any changes that are necessary to make it *  
*** fit for your installation's needs. *  
*** *  
*** Notes: *
```

Plan your migration to z/OS V1.9!

```
*** *
*** 1. Add the job parameters to meet your system *
*** requirements. *
*** *
*** 2. Run only the steps that are applicable to your *
*** installation. *
*** *
*** 3. This job will complete with a completion code 0 if *
*** successful, or with a completion code 8 if it *
*** encounters any error while running the tool for *
*** single HFS data set migration. *
*** *
*** 4. For multiple HFS data set migrations, this job will *
*** complete with a completion code 0 if successful, or *
*** with a completion code 8 if no migrations were *
*** successful, or with a completion code 4 if one or *
*** more migration is successful, but atleast one failed.*
*** *
*** 5. Check the job output for execution information *
*** including error details. *
*** *
*** 6. The zFS data sets cannot be pre-allocated when ISPF *
*** batch job method is used for BPXWH2Z conversion tool.*
*** *
*** 7. SYSEXEC DD specifies the BPXWH2Z REXX EXEC location. *
*** *
*** 8. SYSTSPRT DD specifies the output log. *
*** *
*** 9. SYSTSIN DD specifies the ISPSTART cmd with parms. *
*****
//ISPBTCH EXEC PGM=IKJEFT1B,
// DYNAMNBR=40,TIME=1440
//SYSTSIN DD *
        ISPSTART CMD(BPXWH2Z -VC /HFS/ZFS/ OMVS.MYHFS)
//SYSTSPRT DD SYSOUT=*
//ISPLIST DD SYSOUT=*,DCB=(LRECL=121,BLKSIZE=1210,RECFM=FBA)
//ISPLOG DD SYSOUT=*,DCB=(LRECL=125,BLKSIZE=129,RECFM=VA)
//SYSEXEC DD DSN=SYS1.SBPXEXEC,DISP=SHR
//*
//ISPPLIB DD DSN=ISP.SISPPENU,DISP=SHR
//ISPMLIB DD DSN=ISP.SISPMENU,DISP=SHR
//ISPPLIB DD DSN=ISP.SISPSENU,DISP=SHR
//ISPTLIB DD DSN=SYS1.SBPXTENU,DISP=SHR
// DD DSN=ISP.SISPTENU,DISP=SHR
//ISPPROF DD DISP=NEW,UNIT=SYSALLDA,SPACE=(CYL,(1,1,5)),
// DCB=(RECFM=FB,LRECL=80,BLKSIZE=3120)
```

Use the new default of 10 for the automount delay keyword (Recommended, as of R9)

Recommended to prevent the system from hanging as it continually tries to unmount file systems and fails.

Before z/OS V1R9, the default for the delay keyword for the **automount** shell command was 0. In z/OS V1R9, the default has been changed to 10. This change brings the default in line with the already-established best practice. A delay value lower than 10 minutes can cause the system to hang as it continually tries to unmount file systems and fails.

Migration action: If you are using the default of 0 on your pre-z/OS V1R9 system, determine whether the default of 10 is acceptable on your z/OS V1R9 system. If it is, you do not need to update the delay field in the MapName file.

However, if the default of 10 is not acceptable, you can override the value by changing the 10 to 0.

Tip: If your system has IBM Health Checker for z/OS set up, the USS_AUTOMOUNT_DELAY check looks at the delay configuration values in a sysplex to ensure they are at least 10 minutes.

Update BPXPRMxx if more than 50 MKDIR keywords are specified (Required-IF, as of R9)

Required if more than 50 MKDIR keywords are specified on a ROOT or MOUNT statement in BPXPRMxx.

Before z/OS V1R9, you could specify more than 50 MKDIR keywords on each ROOT or MOUNT statement in the BPXPRMxx member of SYS1.PARMLIB. In z/OS V1R9, the maximum number of MKDIR keywords allowed for each ROOT or MOUNT statement is 50. If you specify more than 50, syntax errors occur and initialization stops when parsing completes. The syntax error message that is issued is BPXI0751 ERROR IN PARMLIB MEMBER=member ON LINE xxxx. TOO MANY MKDIR STATEMENTS.

Migration action: Make sure that no more than 50 MKDIR keywords are specified on ROOT and MOUNT statements in BPXPRMxx



Use the new COMPAT default when binding with c89 (Recommended, as of R8)

Not required, but recommended because using the program management binder option COMPAT=MIN allows programs to be executable on more systems than COMPAT=CURRENT does.

The c89 utility can be used to invoke the program management binder. The c89 utility will no longer override the program management binder default value for the COMPAT option. This change affects the following values:

- COMPAT=CURRENT, which specifies that the output is to be as defined for the current level of the program management binder.
- COMPAT=MIN, which specifies that the program management binder should select the minimum level that supports the features actually in use for the current bind. Programs built with COMPAT=MIN can run on any system that has a program management binder that can do the following: produce a program at the PROGRAM OBJECT level that the binder has selected as the minimum. For example, if the program management binder selects PROGRAM OBJECT(FORMAT 4) as the minimum, the programs can run on z/OS V1R3 and all later levels of z/OS.

Before z/OS V1R3, the COMPAT default for both the program management binder and c89 was COMPAT=CURRENT. In z/OS V1R3, the program management binder default was changed to COMPAT=MIN but the c89 default was left unchanged, that is, COMPAT=CURRENT. (The c89 value would override the program management binder value if they were different.) With z/OS V1R8, the c89 COMPAT option specification has been removed, allowing the program management binder default to always be COMPAT=MIN.

You will see some changes in program management binder LIST output in z/OS V1R8. In the PROCESSING OPTIONS section, you will see the COMPAT option with the value UNSPECIFIED, whereas COMPAT=CURRENT with the z/OS V1R8 program management binder would have shown the value PM5. In the SAVE OPERATION SUMMARY section, you will see the PROGRAM TYPE with the level of program management binder object that the binder determines to be the minimum required (perhaps PROGRAM OBJECT(FORMAT 3), whereas COMPAT=CURRENT with the z/OS V1R8 program management binder would have shown PROGRAM OBJECT(FORMAT 5 OS COMPAT LEVEL z/OS V1R8). The benefit of the new default is that programs created with a lower COMPAT level can run in more environments. You are encouraged to start using the new default on your pre-z/OS V1R8 system.

In order that program objects with the latest format can be viewed and copied on earlier releases, install the following coexistence PTFs if you have not already done so: UA25784 and UA22351 on z/OS V1R7, UA25783 and UA22350 on z/OS V1R6, and UA25782 and UA22349 on z/OS V1R5.

Restrictions: The coexistence support for earlier z/OS releases does not include support for execution of the higher COMPAT level programs.

Migration action: There is nothing for you to do to use the new c89/cc/c++ default on your z/OS V1R8 system.

However, to start using it on your pre-z/OS V1R8 system, update the "c89/cc/c++ customization" of /etc/profile, and within the "for" loop add the statement:

```
export ${_CMP}_OPTIONS="-Wl,compat=unspec"
```

This method of customization is chosen because of the way in which the change is implemented. Instead of c89 specifying COMPAT=MIN, c89 picks up the binder default, which is shipped as MIN. This allows c89 to pick up the installation-defined default, which could be different than the IBM-defined default.

Update BPXBATCH jobs that specify MVS data sets (Required-IF, as of R8 and rolled back to R5 with OA11699)

Required if any BPXBATCH jobs specify an MVS data set for the STDOUT or STDERR DD statement.

Before z/OS V1R8 and APAR OA11699, only z/OS UNIX files could be used on the STDOUT and STDERR DD statements for BPXBATCH jobs. If MVS data sets were specified, a failure message was not sent. Instead, the output would go to /dev/null. Starting in z/OS V1R8 or with the application of APAR OA11699, the BPXBATCH utility allows for the use of MVS data sets to be specified for BPXBATCH jobs.

With this new support, BPXBATCH attempts to write to an MVS data set specified on STDOUT or STDERR, if it is a supported type and is accessible to the job. If you do not update those BPXBATCH jobs, output may be written to the specified data sets or an unrecoverable I/O error may occur because the data sets are not accessible and the

BPXBATCH job could fail. If the MVS data sets are not intended to be written to, you should update those BPXBATCH jobs that specify MVS data sets for the STDOUT or STDERR DDs to not specify STDOUT and/or STDERR Dds.

Migration action: Ensure that all your BPXBATCH jobs that specify MVS data sets for STDOUT and STDERR are data sets that are intended to receive output.

z/OS UNIX System Services Migration Actions Pre-First IPL



Update z/OS UNIX configuration files changed by IBM (Required)

Some utilities provided by z/OS UNIX require the use of certain configuration files. You are responsible for providing these files if you expect to use the utilities. IBM provides default configuration files as samples in the /samples directory. Before the first use of any of these utilities, you must copy these IBM-provided samples to the /etc directory (in most cases). You can further customize these files to include installation-dependent information. An example is setting up the /etc/rc file by copying the sample file from /samples/rc to /etc/rc and then customizing it for the installation.

Whenever IBM ships a changed sample configuration file, you must copy the changed sample to its target location and, if you customized the previous version of the sample, incorporate the customization into the new version.

Migration action: For each of the files listed in the table below, copy the IBM-provided sample file to the listed target location. If you added installation-dependent customization to any of the IBM-provided files, make the same changes in the new versions of the files.

Utility	IBM-provided sample file	Target location	What changed and when
file	/samples/magic	/etc/magic	In z/OS V1R9, the system default magic file was changed to support the SUSv3 format. The V1R9 file command supports old format magic files without change. The new /samples/magic file has been changed to comply with SUSv3.
sh	/samples/profile	/etc/profile	Before z/OS V1R8, exec sh -L was used to rerun the shell in the current address space with the environment variables that were just defined. Starting in z/OS V1R8, exec -a \$0 \$SHELL is used instead to allow alternate shells to work with the same /etc/profile. This change must be done within an if statement to prevent looping and so that the exec is only run when needed. Follow the example in the /samples/profile file: <pre>if [-z *\$STEPLIB*] && tty -s; then export STEPLIB=none exec -a \$0 \$SHELL fi</pre>
OHELP	/samples/ohelp.ENU	/etc/ohelp.ENU	Every release, bookshelf and book data set names are updated. See



Ensure that UNIX03 is not set in system profiles (Required-IF, as of R9)

Required if you want shell commands to maintain compatibility with prior releases.

Before z/OS V1R9, the _UNIX03 variable may have been set in system profiles. The variable was introduced in z/OS V1R8 as a means of controlling whether certain shell commands conform to Single UNIX Specification, Version 3 (SUSv3). _UNIX03=YES is only needed when an option or behavior conflicts with an existing z/OS implementation, and the SUSv3 behavior is desired. In z/OS V1R9, additional shell commands have behavior conflicts controlled by the

`_UNIX03` variable. If `_UNIX03` is not set (or is set to “NO”), then the z/OS V1R9 commands will maintain compatibility with prior releases.

Migration action: To maintain shell command compatibility with prior releases, ensure that the `_UNIX03` variable is not set (or is set to “NO”) in system-wide profiles or setup scripts, including the following:

- `/etc/profile`
- `/etc/csh.cshrc`
- `/etc/csh.login`
- `/etc/rc`

If you have set `_UNIX03=YES` in a system profile, then changing that setting may affect users. If users want behavior that conforms to SUSv3, they can set `_UNIX03=YES` in their profile files or in specific scripts or command invocations where it is needed.

z/OS UNIX System Services Migration Actions Post-First IPL



Install books and a bookshelf for the OHELP command (Required-IF)

Required if you use the OHELP command.

The TSO/E OHELP command uses the BookManager READ base element to display online reference information about shell commands, TSO/E commands, C functions, callable services, and messages issued by the shell and dbx. Before this online help facility can be used, you must set it up by installing books and a bookshelf.

Migration action: Copy the IBM-supplied sample file `/samples/ohelp.ENU` to `/etc/ohelp.ENU`. If you choose not to use the IBM-supplied default file, you can create your own file called `/etc/ohelp.language_id`, where `language_id` is the TSO/E user's primary language code.

Update the date and time of book files used for man pages (Required-IF, as of R9)

Required if you man pages.

When installations migrate to a new release, man pages for the previous release remain in the cache directory. As a result, some man pages from the prior release may be displayed unless you update the date and time of the book files used for the man pages.

Migration action: Before you begin, ensure that the file system containing `/usr/man/C/man1` is mounted read/write and that you have superuser authority. To update the date and time of book files within the current directory, issue:

```
cd /usr/man/C/man1/  
for F in *.book; do; [[ ! -L $F ]] && touch $F; done
```

This command does not follow symbolic links because they refer to licensed product book files, which are usually installed on a different schedule than the z/OS release.

If you have installed translated books, repeat the commands for each directory where the books are installed. For example, if you have Japanese book files:

```
cd /usr/man/Ja_JP/man1/  
for F in *.book; do; [[ ! -L $F ]] && touch $F; done
```

Update automation and operational procedures for file systems in a shared file system configuration (Required-IF, as of R9)

Required if you have automation or operational procedures that use MOUNT statements that specify NOAUTOMOVE, UNMOUNT, or a system list.

Before z/OS V1R9, if you mounted a file system in a sysplex-aware mount mode with the NOAUTOMOVE setting, the NOAUTOMOVE setting was changed to AUTOMOVE(YES) and message BPXF234I was issued. Starting in z/OS V1R9, the conversion to AUTOMOVE(YES) will not occur for sysplex-aware file systems. Instead, the AUTOMOVE setting (UNMOUNT, NOAUTOMOVE, AUTOMOVE, or a system list) is now honored by z/OS V1R9 systems, independent of the sysplex-aware or sysplex-unaware capabilities for the mount mode. (The mount mode can be either read-only or read/write.)

Plan your migration to z/OS V1.9!

The changes to the AUTOMOVE processing affect z/OS V1R9 systems only. If you have a mixed-release configuration, you may see the original behavior on systems prior to z/OS V1R9. For example:

- Before z/OS V1R9, if you mounted a file system in a sysplex-aware mount mode with the NOAUTOMOVE setting, the NOAUTOMOVE setting was changed to AUTOMOVE(YES) and message BPXF234I was issued. On a z/OS V1R9 system, if you mount a file system in a sysplex-aware mount mode with NOAUTOMOVE, that setting is honored. However, if the file system ownership is moved to a system earlier than z/OS V1R9, the NOAUTOMOVE setting is changed to AUTOMOVE(YES). File systems that are mounted with a system list are also changed to AUTOMOVE(YES).
- If you mount a file system in a sysplex-aware mount mode with the NOAUTOMOVE setting, all z/OS V1R9 systems will honor the setting but systems earlier than z/OS V1R9 will not. For example, if a z/OS V1R9 owner system fails and there is a z/OS V1R8 system in the shared file system configuration, the z/OS V1R8 system will attempt to take over the file system and become the new owner.

Migration action: Review MOUNT statements that specify NOAUTOMOVE, UNMOUNT, or a system list and determine whether they should be updated. Notify operators about the changed mount behavior, if needed.

Tip: To find out if the file system is sysplex-aware, use the D OMVS,F command to display each mounted file system.

- Those file systems for which this system is not the owner, and for which it says Client=N, are *sysplex-aware*. They are not clients and are locally mounted to the PFS.
- Those file systems for which this system is not the owner, and for which it says Client=Y, are *sysplex-unaware*.

Increase dump space to accommodate dumps of the zFS address space (Required-IF, as of R9)

Required if the existing dump data space is not large enough to accommodate additional dumps.

Before z/OS V1R9, system dumps did not include dumps from an active zFS address space. In z/OS V1R9, system dumps now capture data from an active zFS address space.

Migration action: Determine if you need to increase your dump data sets to include the additional space needed for data dumped from the zFS address space. The amount of increase depends on the amount of zFS activity and the configuration parameters. For example, the trace_table_size parameter specification may greatly affect the amount of storage that needs to be captured in the dump data set.

Update awk invocations to accommodate changes made to the awk utility (Required-IF, as of R9)

Required if either (or both) of the following situations is present:

- If **awk** invocations use command-line arguments that have an "=" but do not follow the rules for a variable name. For example, `./x=y`.
- An **awk** program contains a break or continue statement outside a loop.

Before z/OS V1R9, the **awk** utility did not comply with Single UNIX Specification, Version 3 (SUSv3). In z/OS V1R9, the **awk** utility has been enhanced to conform with SUSv3.

- Certain arguments that were treated as variable assignments are now interpreted as path names. Prior to z/OS V1R9, **awk** recognized command-line arguments with an "=" character as a variable assignment. Starting in z/OS V1R9, **awk** will only recognize an argument as a variable assignment if it consists of the following characters (in the order listed):

1. An underscore or alphabetic character
2. A sequence of underscores, digits, and alphabetic characters
3. The "=" character

If the argument does not follow that format, **awk** interprets it as a path name. Most **awk** commands will not have arguments that break the variable name rules.

- If a break or continue statement occurs outside a loop, **awk** either exits with an error message or, with the PTF for APAR OA22253 installed, displays a warning message, exits the current pattern or function, and continues processing. Previously, **awk** exited the current pattern or function without an error message and continued processing. Most **awk** programs will not have a break or continue statement that occurs outside a loop.

Migration action: Modify any **awk** invocations (for example, in shell scripts) that have command-line arguments with an "=" but break the rules for a variable name.

If you have an **awk** program that contains a break or continue statement outside a loop (which is reported by an error message or, with the PTF for APAR OA22253 installed, a warning message from **awk**), correct the program.

Use the new default of 64000 for the MAXFILEPROC statement (Recommended, as of R9)

Not required, but recommended if you use IBM Health Checker for z/OS to check whether the value of MAXFILEPROC is too low. (The check is USS_MAXSOCKETS_MAXFILEPROC.) If the value is 256, an exception message will be issued.

Before z/OS V1R9, the default for the MAXFILEPROC statement in the BPXPRMxx parmlib member was 256. In z/OS V1R9, the default is 64000.

Migration action: The recommended value is 64000 or higher for the MAXFILEPROC statement in BPXPRMxx. Either use the default of 64000 or specify a higher number.

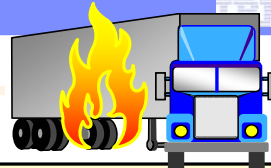
Update BPXPRMxx because SHRLIBMAXPAGES is no longer supported (Recommended, as of R8)

Recommended to avoid confusion.

Before z/OS V1R8, user-shared library objects were supported. Starting in V1R8, user-shared library objects are not supported. As a result, the SHRLIBMAXPAGES parameter is no longer used to limit the maximum number of pages that the system can use when user-shared library modules are loaded.

Migration action: Consider taking out the SHRLIBMAXPAGES parameter in the BPXPRMXX member. If you do not take it out, the parameter that you specified is accepted but it has no impact on the system. The value that you specify will never be reached because user-shared library objects are no longer supported.

"Big Migs" for z/OS R9 from z/OS R7



► Migration Actions You Should NOT Overlook:

- ✓ **• BCP 1-byte Console ID support removal (R8)**
 - Still use the Console ID Tracking Facility!
 - Change programs that reference unsupported console functions.
- ✓ **• Remove your run-time dependency on the C/C++ IBM Open Class Libraries (R9)**
 - Use the Standard C++ Library instead, use IOCCHK now to verify usage!
- ✓ **• Run the TN3270E Telnet server as a separate address address space (R9)**
 - Must do this before R9, to keep Telnet functions
- ✓ **• DFSMSshm copy pool R8-format coexistence (R8)**
 - FRBACKUP against a copy pool converts to R8-format, then, only fast replication command on pre-R8 system is FRRECOV from DASD.
- ✓ **• JES2 - Some Exit Changes (R9) – see z/OS Migration book**
 - A lot less than R7, though! Exits 8, 31, 42, 45, and any exits using JCTID.

Migration to z/OS R9 Part 3 of 3 - GCJ

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Future "Big Migs" AFTER z/OS R9



► Future "Big Migs" You Can Mitigate NOW:

- ✓ **• DFSMS Imbed and Replicate removal in a future release. (Also remove usage of KEYRANGE.)**
 - Use the IMBDSHIP tool.
- ✓ **• Start your conversion from HFS to zFS**
 - Use z/OS tool, BPXWH2Z to help.
- ✓ **• Find callers of CNZMXURF that do not hold appropriate serialization**
 - Use Console ID Tracking Facility, look for instances that start with "UCME-CMS".

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Some Additional Resources

- **All IBM System z10 Enterprise Class capabilities available with z/OS V1.9**
- **z/OS V1.7 goes out of service September 2008, order z/OS V1.9 today**
- **Information on migration:**
 - **Feb 2008 z/OS Hot Topics article**
publibz.boulder.ibm.com/epubs/pdf/e0z2n181.pdf
 - **IBM Education Assistant modules**
publib.boulder.ibm.com/infocenter/ieduasst/stgvlr0/index.jsp?topic=/com.ibm.iea.zos/zos/1.9/InstallationAndMigration.html
 - **z/OS Migration publications**
ibm.com/systems/z/os/zos/installation/
 - **IBM Migration Checker for z/OS**
ibm.com/systems/z/os/zos/downloads/#mchecker
 - **IBM Global Services and IBM Business Partner Services**
See your representative

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Thank you!

Plan your migration to z/OS V1.9! Questions and Answers

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Appendix A: List of Base Elements and Optional Features for z/OS V1R9

The following table lists the base elements and optional features in z/OS V1R9. The following table headings are used:

Name

What this document calls the element or feature. (To help you distinguish elements from features, element names in this column are highlighted.)

Function level

The most recent release in which the element or feature changed. ("Change" means that one or more of the element's or feature's FMIDs [function modification identifiers] was changed, or that the element or feature was added to the system. New function added in program temporary fixes [PTFs] is not considered change.) Also, for nonexclusive elements and features, the equivalent level of the separate product is listed in parentheses.

Note:

The function level is expressed as a z/OS function level. Do not confuse the function level with the product level. All elements and features are at the V1R9 product level but they are at various function levels. For example, the product level of z/OS BookManager READ is z/OS V1R9 but its function level is OS/390 V1R1 because OS/390 V1R1 was the last release in which it changed.

Type and description

- "Type" means the following:
 - Whether it's a base element or optional feature
 - Whether the base element or optional feature is exclusive (existing only within z/OS) or nonexclusive (also available as a separate product)
 - If an optional feature, whether it's priced or unpriced
 - If an optional feature, whether it supports dynamic enablement (note that all the priced features support dynamic enablement)

"Description" is a brief description of the element or feature, and miscellaneous facts about it.

Name	Last time changed (and equivalent product if nonexclusive)	Type and description
Alternate Library for REXX	z/OS V1R9 (see description about equivalent programs)	Type: base element, nonexclusive. Alternate Library for REXX enables users to run compiled REXX programs. This base element is nonexclusive to z/OS because the following programs provide equivalent functions: <ul style="list-style-type: none"> • The Alternate Library portion of the priced product IBM Library for REXX on zSeries V1R4 (5695-014). The Alternate Library consists of FMIDs HWJ9143 (ENU) and JWJ9144 (JPN). These are the same FMIDs that are now in the z/OS base element. • The no-fee Web download Alternate Library for REXX on z/OS. This base element is new in z/OS V1R9. Including it as a base element in z/OS is intended to make it easier to use than the functionally equivalent programs listed above.
BCP	z/OS V1R9	Type: base element, exclusive.

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		<p>The Base Control Program (BCP) provides essential operating system services. The BCP includes the I/O configuration program (IOCP), the workload manager (WLM), system management facilities (SMF), the z/OS UNIX System Services (z/OS UNIX) kernel, the program management binder, and support for the Unicode^(TM) Standard. As of z/OS V1R8, the BCP also includes z/OS XML System Services (z/OS XML). As of z/OS V1R9, the BCP also includes Capacity Provisioning (FMID HPV7740) and System REXX for z/OS Base.</p> <p>IBM Health Checker for z/OS is also part of the BCP. This tool helps improve availability by reporting on active z/OS and sysplex settings that are different than IBM recommended best practices or customer-defined settings. It was initially available by PTF and download for z/OS V1R4, was integrated in base element msys for Operations in z/OS V1R5, was moved to the BCP in z/OS V1R7 (keeping its own FMID), and was merged into the BCP base FMID in z/OS V1R8 (losing its own FMID).</p>
BDT	OS/390 V1R2	<p>Type: base element, exclusive.</p> <p>Bulk Data Transfer (BDT) provides the base services that the optional BDT features (BDT File-to-File and BDT SNA NJE) need to transfer data from one computer system to another.</p> <p>You cannot activate any BDT functions until one or both of the optional BDT features is enabled.</p>
BDT File-to-File	OS/390 V1R2	<p>Type: optional feature, exclusive, priced, can be dynamically enabled.</p> <p>BDT File-to-File allows users at one z/OS system in a SNA network to copy data sets to or from another z/OS system in the network. This feature is related to the element BDT.</p>
BDT SNA NJE	OS/390 V1R2	<p>Type: optional feature, exclusive, priced, can be dynamically enabled.</p> <p>BDT SNA NJE allows JES3 users to transmit jobs, output, commands, and messages from one computer system to another within a SNA network. This feature is related to the element BDT and the feature JES3.</p>
BookManager BUILD	OS/390 V1R1 (BookManager BUILD/MVS V1R3, 5695-045)	<p>Type: optional feature, nonexclusive, priced, can be dynamically enabled.</p> <p>BookManager BUILD creates softcopy documents that can be used by any of the BookManager products, such as BookManager READ or Library Server.</p>
BookManager READ	OS/390 V1R1 (BookManager READ/MVS V1R3, 5695-046)	<p>Type: base element, nonexclusive.</p> <p>BookManager READ is used to display, search, and manage online documents and bookshelves. A related optional feature is BookManager BUILD.</p>
C/C++ without Debug Tool	z/OS V1R9	<p>Type: optional feature, exclusive, priced, can be dynamically enabled.</p> <p>C/C++ without Debug Tool consists of:</p> <ul style="list-style-type: none"> • XL C/C++ compiler • C/C++ application development utilities.

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		As of z/OS V1R7, the OS/390 V2R10 level of the C/C++ compiler is withdrawn. The XL C/C++ compiler remains. For information about migrating from the former to the latter, see <i>z/OS XL C/C++ Compiler and Run-Time Migration Guide for the Application Programmer</i> .
CIM	z/OS V1R9	<p>Type: base element, exclusive.</p> <p>Common Information Model (CIM) is a standard data model for describing and accessing systems management data in heterogeneous environments. It allows system administrators to write applications that measure system resources in a network with different operating systems and hardware. To enable z/OS for cross platform management, a subset of resources and metrics of a z/OS system are mapped into the CIM standard data model.</p> <p>CIM was new in z/OS V1R7. In z/OS V1R9, a new FMID, JPG290B, was added to CIM. JPG290B contains a Java^(TM) programming interface for CIM client applications.</p> <p>Transport layer security (TLS) encryption is performed for CIM by base element Communications Server. CIM does not implement any of its own encryption algorithms.</p>
Communications Server	z/OS V1R9	<p>Type: base element, exclusive, can be dynamically enabled.</p> <p>Communications Server (also known as CS z/OS) supports secure TCP/IP, SNA, and UNIX networking throughout an enterprise. It gives you the ability to connect subsystems and applications to each other, and to connect network devices (such as terminals and printers) to the system.</p> <p>Communications Server consists of two components: IP Services and SNA Services.</p> <p>A related optional feature is Communications Server Security Level 3.</p> <p>For encryption, IP Services uses the SNMPv3 DES 56-bit and IP Sec DES 56-bit algorithms. IP Services also uses the System SSL component of Cryptographic Services for encryption services. SNA Services uses the limited DES algorithm for encryption.</p> <p>AnyNet^(R) function was removed from Communications Server (SNA Services) in V1R8 of z/OS. AnyNet has not been enhanced in many years and has been supplanted by Enterprise Extender, which has superior function and performance.</p> <p>z/OS V1R9 Communications Server discontinues support of the APPC Application Suite. For most of the functions provided by the APPC Application Suite, more full-featured alternative applications exist in modern integrated SNA/IP networks.</p>
Communications Server Security Level 3	z/OS V1R9	<p>Type: optional feature, exclusive, unpriced, cannot be dynamically enabled.</p> <p>This feature works in conjunction with the Communications Server base</p>

		<p>element to provide stronger encryption (greater than 64 bits) than that available without this feature. This feature uses the TDES and AES algorithms for encryption. The actual level of encryption that takes place with this feature installed can be configured to be less than the maximum level enabled by this feature.</p> <p>This feature is worldwide exportable subject to U.S. export regulations.</p>
Cryptographic Services	z/OS V1R9	<p>Type: base element, exclusive.</p> <p>Cryptography is the transformation of data to conceal its meaning. In z/OS, the base element Cryptographic Services provides the following base cryptographic functions: data secrecy, data integrity, personal identification, digital signatures, and the management of cryptographic keys. Keys as long as 56 bits are supported by this base element. (Keys longer than 56 bits are supported by the optional feature z/OS Security Level 3.)</p> <p>Cryptographic Services consists of the following components:</p> <ul style="list-style-type: none"> • Integrated Cryptographic Service Facility (ICSF), which was last changed in z/OS V1R9. • Open Cryptographic Services Facility (OCSF), which was last changed in z/OS V1R9. • PKI Services, which was last changed in z/OS V1R9. • System Secure Sockets Layer (SSL), which was last changed in z/OS V1R9. <p>For encryption:</p> <ul style="list-style-type: none"> • OCSF uses the RC2/RC4/RC5 40-56 bit and DES 56-bit algorithms. • PKI Services uses the RACF^(R) component of optional feature Security Server, and the ICSF, OCSF, and System SSL components of base element Cryptographic Services. PKI Services uses the RSA, DSA, and DES 56-bit algorithms. • System SSL uses the RC2/RC4, DES through 56-bit, Diffie-Hellman, RSA, and DSA algorithms.
DCE Base Services	OS/390 V2R9	<p>Type: base element, exclusive.</p> <p>DCE Base Services provides services for developing and running client/server applications, including remote procedure call, directory, security, and distributed time services. This element is at the Open Group Open Software Foundation (OSF) DCE 1.1 level.</p> <p>DCE Base Services uses the limited DES algorithm for encryption.</p>
DFSMSdfp^(TM)	z/OS V1R9	<p>Type: base element, exclusive.</p> <p>DFSMSdfp provides storage, data, program, and device management functions. Related optional features are DFSMSrmm^(TM), DFSMSdss^(TM),</p>

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		<p>DFSMSHsm^(TM), and DFSMStvs.</p> <p>In z/OS V1R9, the FMID for the English panels has been eliminated and the panels have been merged into the base FMID, which is HDZ1190.</p>
DFSMSdss	z/OS V1R9	<p>Type: optional feature, exclusive, priced, can be dynamically enabled.</p> <p>DFSMSdss copies and moves data for backup and recovery, and to reduce free-space fragmentation.</p>
DFSMSHsm (and DFSMSdss)	z/OS V1R9	<p>Type: optional feature, exclusive, priced, can be dynamically enabled.</p> <p>DFSMSHsm provides automated DASD storage management, including space management for low and inactive data, and availability management for accidental data loss caused by local and site disasters. DFSMSHsm also lets you make effective use of tape media.</p> <p>DFSMSHsm requires DFSMSdss. For this reason, DFSMSHsm is not available by itself. If you want to use DFSMSHsm, you must order the DFSMSHsm/DFSMSdss combination. (DFSMSdss is also available by itself for those who do not want DFSMSHsm.)</p>
DFSMSrmm	z/OS V1R9	<p>Type: optional feature, exclusive, priced, can be dynamically enabled.</p> <p>DFSMSrmm helps you manage your removable media as one enterprise-wide library across systems that can share DASD.</p>
DFSMSStvs	z/OS V1R9	<p>Type: optional feature, exclusive, priced, can be dynamically enabled.</p> <p>DFSMS Transactional VSAM Services (DFSMSStvs) enables batch jobs and CICS^(R) online transactions to update shared VSAM data sets concurrently.</p>
DFSORT ^(TM)	z/OS V1R5	<p>Type: optional feature, exclusive, priced, can be dynamically enabled.</p> <p>DFSORT provides fast and easy sorting, merging, copying, reporting, and analysis of your business information, as well as versatile data handling at the record, field, and bit level. DFSORT also includes the high-performance ICEGENER facility, the versatile ICETOOL utility, Symbols, and multiple output capability with the powerful OUTFIL feature.</p>
Distributed File Service	z/OS V1R9	<p>Type: base element, exclusive.</p> <p>Distributed File Service provides:</p> <ul style="list-style-type: none"> • The DCE file serving (DFS^(TM)) component of the Open Group Open Software Foundation (OSF) DCE. The file serving support (the DFS client and server) is at the OSF 1.2.2 level. • The zSeries File System (zFS). The zFS is a UNIX file system that can be used in addition to the hierarchical file system (HFS). zFS file systems contain files and directories that can be accessed with the z/OS hierarchical file system file APIs. zFS file systems can be mounted into the z/OS UNIX hierarchy along with other local (or remote) file system types (such as HFS, TFS, AUTOMNT, and NFS). The zFS does not replace the HFS; it is complementary to the HFS. As of z/OS V1R7, you can use any combination of HFS and zFS file systems. zFS can be used for

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		<p>the root file system. Because zFS has higher performance characteristics than HFS and is the strategic file system, HFS might no longer be supported in future releases and you will have to migrate the remaining HFS file systems to zFS.</p> <p>The zFS provides significant performance gains in most environments requiring files 8 KB in size or greater that are frequently accessed and updated. The access performance of smaller files is equivalent to that of the HFS. For all files, the zFS provides a reduced exposure to loss of updates. The zFS is a logging file system with a write pattern to disk that reduces the points of failure after a system outage. For additional information about the zFS, including how to migrate data from the HFS to the zFS, see <i>z/OS Distributed File Service zSeries File System Administration</i>.</p> <p>The zFS component has its own FMID starting with z/OS V1R5.</p> <ul style="list-style-type: none"> • Server message block (SMB) file/print serving support. The SMB support is based on the X/Open PC Interworking: SMB, Version 2. Included in the support is access to HFS, sequential, PDS, PDSE, and VSAM data sets from Windows XP Professional, Windows Terminal Server on Windows 2003, SUSE Linux with Samba, and Redhat Linux with Samba. Windows workstation users can also exploit z/OS printer capabilities using the SMB file/print server interface to the z/OS Infoprint Server feature. <p>For the software necessary to use the DFS or SMB file/print serving support, as well as the other Distributed File Service functions, see Appendix B, Software requirements for running z/OS V1R9.</p> <p>The DFS and SMB support use the DES 56-bit algorithm for encryption.</p>
EREP	OS/390 V1R1 (EREP MVS ^(TM) V3R5, 5658-260)	Type: base element, nonexclusive. The Environmental Record Editing and Printing Program (EREP) edits and prints reports for the records placed in the error recording data set (ERDS), helping IBM service representatives fix problems.
ESCON^(R) Director Support	OS/390 V1R1	Type: base element, exclusive. ESCON Director Support enables the reporting of ESCON director device errors to z/OS.
FFST^(TM)	OS/390 V1R2	Type: base element, exclusive. First Failure Support Technology ^(TM) (FFST) provides immediate notification and first failure data capture for software events.
GDDM^(R)	OS/390 V1R2 (GDDM/MVS V3R2, 5695-167)	Type: base element, nonexclusive. GDDM provides presentation services and device-driving capability. It includes PCLK and REXX code. Related optional features are GDDM-Presentation Graphics Feature and GDDM-REXX. Other GDDM-associated products (IVU, GKS, IMD) are not in z/OS, but are separately

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		orderable with z/OS.
GDDM-PGF	OS/390 V1R2 (GDDM/PGF V2R1.3, 5668-812)	Type: optional feature, nonexclusive, priced, can be dynamically enabled. GDDM-Presentation Graphics Feature (PGF) is a set of programs for creating presentation material in a variety of styles. This feature is related to the base element GDDM.
GDDM-REXX	OS/390 V1R2 (GDDM-REXX/MVS V3R2, 5664-336)	Type: optional feature, nonexclusive, priced, can be dynamically enabled. GDDM-REXX is a productivity tool that enables programmers to prototype GDDM applications and to create small routines and utility programs quickly and easily. This feature is related to the base element GDDM.
HCD	z/OS V1R9	Type: base element, exclusive. Hardware Configuration Definition (HCD) defines both the operating system configuration and the processor hardware configuration for a system. A related optional feature is HCM.
HCM	z/OS V1R9	Type: optional feature, exclusive, priced, can be dynamically enabled. Hardware Configuration Manager (HCM) is a workstation-based client/server interface to the base element HCD.
HLASM	z/OS V1R6 (HLASM for z/OS and z/VM and z/VSE ^(TM) V1R5, 5696-234)	Type: base element, nonexclusive. High Level Assembler (HLASM) integrates almost all functions of past assemblers and provides extensions and improvements. A related optional feature is the HLASM Toolkit.
HLASM Toolkit	z/OS V1R6 (Toolkit feature of HLASM for z/OS and z/VM and z/VSE V1R5, 5696-234)	Type: optional feature, nonexclusive, priced, can be dynamically enabled. HLASM Toolkit provides tools to improve application development, debugging, and recovery. It is related to the base element HLASM.
IBM HTTP Server	OS/390 V2R10 (but see description)	Type: base element, exclusive. IBM HTTP Server is the Web server for z/OS. It provides scalable, high performance Web serving for critical e-business applications. It supports Secure Sockets Layer (SSL) secure connections, dynamic caching using the Fast Response Cache Accelerator, multiple IP addresses, proxy authentication, and double-byte character set characters. IBM HTTP Server NA Secure is now a component of IBM HTTP Server. Before V1R6, it was an optional feature of z/OS. This packaging change was the only change to IBM HTTP Server in V1R6; there was no functional change.
IBM Tivoli^(R) Directory Server for z/OS	z/OS V1R8	Type: base element, exclusive. IBM Tivoli Directory Server for z/OS provides client access to an LDAP server. It consists of a rewritten LDAP server (available by PTFs for z/OS

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		<p>V1R8 and V1R9); an LDAP client; and LDAP client utilities. The LDAP client and LDAP client utilities can be used with the Integrated Security Services LDAP Server or the new IBM Tivoli Directory Server for z/OS LDAP server.</p> <p>For encryption, IBM Tivoli Directory Server for z/OS uses the AES, DES (56-bit, 112-bit, and 168-bit), SHA, MD5, and crypt algorithms.</p> <p>This base element was new in z/OS V1R8.</p>
ICKDSF	<p>z/OS V1R4 z990 Compatibility Support feature</p> <p>(ICKDSF for z/OS, z/OS.e, and OS/390 R17, 5655-257)</p>	<p>Type: base element, nonexclusive.</p> <p>The Device Support Facility (ICKDSF) enables you to perform functions needed for the installation and use of IBM DASD.</p> <p>ICKDSF was last changed in the z/OS V1R4 z990 Compatibility Support feature. This level was carried forward to the z/OS V1R4 z990 Exploitation Support feature and then to z/OS V1R5 and later, and is functionally equivalent to the R17 level of the ICKDSF product.</p>
Infoprint Server	z/OS V1R8	<p>Type: optional feature, exclusive, priced, can be dynamically enabled.</p> <p>Infoprint Server allows you to print files on z/OS printers from any workstation that has TCP/IP access. This feature consists of the following components:</p> <ul style="list-style-type: none"> • IP PrintWay^(TM). This component has its roots in the IP PrintWay feature of PSF/MVS V2R2 and the IP PrintWay/NetSpool feature of OS/390 V1R3. In z/OS V1R5, IP PrintWay extended mode was introduced. • NetSpool^(TM). This component has its roots in the NetSpool feature of PSF/MVS V2R2 and the IP PrintWay/NetSpool feature of OS/390 V1R3. • Print Interface, new in OS/390 V2R5. • Printer Inventory Manager, new in OS/390 V2R8. • Transform Interface, new in OS/390 V2R8. • z/OS Infoprint Central, new in z/OS V1R5. <p>IBM recommends that you use the Infoprint Server feature's IP PrintWay component rather than the Communications Server base element's Network Print Facility (NPF) to reroute print data to an IP network. IP PrintWay provides improved function, capacity, performance, and usability over NPF.</p>
Integrated Security Services	z/OS V1R9	<p>Type: base element, exclusive.</p> <p>Integrated Security Services provides base security functions for z/OS. Its components are:</p> <ul style="list-style-type: none"> • DCE Security Server, which was last changed in OS/390 V2R9. This component is at the OSF DCE 1.2.2 level. This component uses the limited DES algorithm for encryption. • Enterprise Identity Mapping (EIM), which was last changed in z/OS V1R8. This component allows you to map a user's identity on one system to the user's identity on another system.

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		<ul style="list-style-type: none"> • LDAP Server, which was last changed in z/OS V1R8. LDAP Server uses the System SSL component of base element Cryptographic Services for encryption. <p>A new base element, IBM Tivoli Directory Server for z/OS, was introduced in z/OS V1R8. It contains a rewritten LDAP server; an LDAP client; and LDAP client utilities. The LDAP server in Integrated Security Services continues to exist in V1R8 and later. However, the LDAP client and LDAP client utilities do not; in V1R8 and later, they are only in IBM Tivoli Directory Server for z/OS.</p> <ul style="list-style-type: none"> • Network Authentication Service, which was last changed in z/OS V1R9. Network Authentication Service uses the DES algorithm for encryption. Before z/OS V1R2, this component was named Network Authentication and Privacy Service. • Open Cryptographic Enhanced Plug-ins (OCEP), which was last changed in z/OS V1R9. <p>The IBM Firewall Technologies component has been removed from the system effective with z/OS V1R8. It was a Security Server component before V1R5, then an Integrated Security Services component in V1R6 and V1R7.</p>
ISPF	z/OS V1R9	<p>Type: base element, exclusive.</p> <p>ISPF provides facilities for all aspects of host-based software development. ISPF has four major components:</p> <ul style="list-style-type: none"> • Dialog Manager (DM). The Dialog Manager provides services to dialogs and end users. These services include display, variable services, input and output, user and application profiles, table management, system interface services, and dialog testing and debugging aids. • Program Development Facility (PDF). PDF provides services to assist dialog or application developers. These include edit and browse functions, a wide range of foreground and batch compilers, data set and catalog utilities, TSO command interfaces, and data set search and compare functions. • Software Configuration and Library Manager (SCLM). SCLM is a tool that controls, maintains, and tracks all of the software components of the application throughout the development cycle. • Client/Server component. The Client/Server component provides users who have a workstation running Windows or UNIX with a graphical user interface to ISPF application panels.
JES2	z/OS V1R9	<p>Type: base element, exclusive.</p> <p>JES2 accepts the submission of work for the BCP. JES2 exercises independent control over its job processing functions, whereas JES3 exercises centralized control.</p>

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		A prior release of JES2 can be used with z/OS V1R9. See Table 9 .
JES3	z/OS V1R9	Type: optional feature, exclusive, priced, can be dynamically enabled. JES3 accepts the submission of work for the BCP. JES3 exercises centralized control over its job processing functions, whereas JES2 exercises independent control. A prior release of JES3 can be used with z/OS V1R9. See Table 10 .
Language Environment^(R)	z/OS V1R9	Type: base element, exclusive. Language Environment provides the run-time environment for programs generated with C, C++, COBOL, Fortran, and PL/I. Inclusion of Language Environment as a base element in z/OS does not replace the need for separate compilers. Language Environment uses the limited DES algorithm for encryption.
Library Server	z/OS V1R9	Type: base element, exclusive. Library Server converts BookManager documents to HTML for display through a web browser.
Metal C Runtime Library	z/OS V1R9	Type: base element, exclusive. The Metal C Runtime Library is a set of LPA-resident C functions that can be called from a C program created using the z/OS XL C compiler METAL option. This base element is new in z/OS V1R9.
MICR/OCR	OS/390 V1R1	Type: base element, exclusive. This element provides the device support code for various magnetic and optical devices.
msys for Setup	z/OS V1R4 (but see description)	Type: base element, exclusive. Managed System Infrastructure for Setup (msys for Setup) was introduced in z/OS V1R1 to provide a graphical user interface for configuring z/OS and products that run on z/OS. With z/OS V1R8, much of the function has been removed from msys for Setup. Of the seven plug-ins that supported the framework, six have been removed. The six plug-ins removed in z/OS V1R8 are: <ul style="list-style-type: none"> • IP Services • ISPF • Language Environment • Parallel Sysplex^(R) • RMF^(TM) • z/OS UNIX The only remaining plug-in, the DB2 ^(R) V8 plug-in, is unaffected and remains available for enablement, setup, and configuration of DB2. Also

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		<p>remaining are the framework and DFSMS support.</p> <p>If you've been using any of the plug-ins that are no longer available, see <i>z/OS Migration</i>.</p>
NFS	z/OS V1R9	<p>Type: base element, exclusive.</p> <p>Network File System (NFS) acts as a file server to workstations, personal computers, or other authorized systems in a TCP/IP network. It consists of a client and a server. It supports Berkeley sockets but not TCP/IP sockets.</p> <p>NFS uses the Network Authentication Service component of Integrated Security Services for encryption.</p> <p>NFS is always enabled, even when the alternate base configuration is ordered.</p> <p>In z/OS V1R8, the NFS server and client FMIDs were merged into one FMID.</p>
OSA/SF	z/OS V1R4 z990 Compatibility Support feature	<p>Type: base element, exclusive.</p> <p>Open Systems Adapter/Support Facility (OSA/SF) provides a user-friendly interface for monitoring and controlling the zSeries Open Systems Adapter feature, which provides network connectivity directly to local area networks (LANs) and wide area networks (WANs) that support IP and SNA protocols. OSA/SF supports Gigabit, Token Ring, Fast Ethernet, 1000Base-T Ethernet, 10 Gigabit Ethernet, and ATM features depending on the server on which z/OS runs. For details, see <i>System z9 and zSeries OSA-Express Customer's Guide and Reference</i>, SA22-7935.</p> <p>OSA/SF was last changed in the z/OS V1R4 z990 Compatibility Support feature. This level was carried forward to the z/OS V1R4 z990 Exploitation Support feature and then to z/OS V1R5 and later.</p> <p>OSA/SF became exclusive with the introduction of the z/OS V1R4 z990 Compatibility Support feature.</p>
RMF	z/OS V1R9	<p>Type: optional feature, exclusive, priced, can be dynamically enabled.</p> <p>Resource Measurement Facility (RMF) gathers data about z/OS resource usage and provides reports at any system in a sysplex.</p>
Run-Time Library Extensions	z/OS V1R9	<p>Type: base element, exclusive.</p> <p>Run-Time Library Extensions extends the run-time support provided by the Language Environment base element. It consists of :</p> <ul style="list-style-type: none"> • Common Debug Architecture (CDA) libraries and utilities • UNIX System Laboratories (USL) I/O Stream Library and USL Complex Mathematics Library, previously included in the base element C/C++ IBM Open Class^(R) Library <p>Note:</p>

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		As of z/OS V1R9, the IBM Open Class (IOC) dynamic link libraries (DLLs) are withdrawn. For information about migrating from these libraries, see <i>z/OS XL C/C++ Compiler and Run-Time Migration Guide for the Application Programmer</i> .
SDSF	z/OS V1R9	Type: optional feature, exclusive, priced, can be dynamically enabled. System Display and Search Facility (SDSF) provides you with information to monitor, manage, and control your z/OS system. If you use a prior release of JES2 with z/OS V1R9, you must use the same prior release of SDSF with z/OS V1R9.
Security Server	z/OS V1R9	Type: optional feature, exclusive, priced, can be dynamically enabled. Security Server lets you control access to protected resources. Security Server contains one component, RACF. Security Server uses the limited DES, CDMF, RC 40-bit, RSA, and DSA algorithms for encryption.
SMP/E	z/OS V1R7 (SMP/E for z/OS V3R4, 5655-G44)	Type: base element, nonexclusive. SMP/E is a tool for installing and maintaining software, and for managing the inventory of software that has been installed. Before z/OS V1R2, SMP/E was an exclusive base element. Beginning with z/OS V1R2, SMP/E is nonexclusive because of the introduction of the SMP/E product. The SMP/E product allows customers who are currently licensed for an earlier level of z/OS to order and install the latest level of SMP/E without having to upgrade their entire operating system. This allows products that run on z/OS to exploit the packaging and installation enhancements of SMP/E without requiring a later level of the operating system. This also allows customers to exploit new electronic delivery and installation technologies in SMP/E sooner. The SMP/E product is available at no additional charge to customers. The Planning and Migration Assistant (PMA), a component of SMP/E, can help you maintain, plan for, and order new releases of z/OS and other products. It provides reports that use IBM-supplied data, your SMP/E consolidated software inventory (CSI) data set, and a CustomPac inventory file. The PMA Web site is http://www.ibm.com/eserver/zseries/zos/smpe/pma/ .
TIOC	OS/390 V1R1	Type: base element, exclusive. TIOC allows console services and TSO/E to communicate with the terminal hardware.
TSO/E	z/OS V1R9	Type: base element, exclusive. Time Sharing Option/Extensions (TSO/E) provides an interactive terminal interface. As in prior releases of TSO/E, this element includes CLISTS and REXX, but does not include a REXX compiler.
z/OS Security Level 3	z/OS V1R9	Type: optional feature, exclusive, unpriced, cannot be dynamically

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		<p>enabled.</p> <p>z/OS Security Level 3 provides strong encryption for z/OS.</p> <p>The components in this feature are:</p> <ul style="list-style-type: none"> • IBM Tivoli Directory Server for z/OS Security Level 3, which was new in z/OS V1R8. This component works in conjunction with the IBM Tivoli Directory Server for z/OS base element, and with the LDAP Server component of the Integrated Security Services base element, to provide stronger encryption (greater than 64 bits) than that available without the z/OS Security Level 3 feature. This component uses the RC4, TDES, and Advanced Encryption Standard (AES) algorithms for encryption. <p>This component replaces LDAP Security Level 3, which was added in z/OS V1R6.</p> <ul style="list-style-type: none"> • Network Authentication Service Level 3, which was last changed in z/OS V1R9. This component works in conjunction with the Network Authentication Service component of the Integrated Security Services base element to provide stronger encryption (greater than 64 bits) than that available without the z/OS Security Level 3 feature. This component uses the TDES and AES algorithms for encryption. • OCSF Security Level 3, which was last changed in z/OS V1R9. This component works in conjunction with the OCSF component of the Cryptographic Services base element to provide stronger encryption (greater than 64 bits) than that available without the z/OS Security Level 3 feature. This component uses the TDES, DES, and RC2/RC4/RC5 algorithms for encryption. • System Secure Sockets Layer (SSL) Security Level 3, which was last changed in z/OS V1R9. This component works in conjunction with the System SSL component of the Cryptographic Services base element to provide stronger encryption (greater than 64 bits) than that available without the z/OS Security Level 3 feature. This component uses the RC2/RC4, TDES, and AES algorithms for encryption. <p>This feature is worldwide exportable subject to U.S. export regulations.</p>
<p>z/OS UNIX</p>	<p>z/OS V1R9</p>	<p>Type: base element, exclusive.</p> <p>z/OS UNIX System Services (z/OS UNIX) provides the standard command interface familiar to interactive UNIX users. This base element is made up of four components:</p> <ul style="list-style-type: none"> • Application Services, which was last changed in z/OS V1R9. This component includes the Shell and Utilities, Debugger, and Parallel Environment. • Connection Manager, which was last changed in OS/390 V2R7. • Integrated Call Level Interface (ICLI), which was last changed in z/OS V1R6.

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		<ul style="list-style-type: none">• Process Manager, which was last changed in OS/390 V2R7.
3270 PC File Transfer Program	OS/390 V1R2 (3270 PC File Transfer Program V1R1.1, 5665-311)	Type: base element, nonexclusive. 3270 PC File Transfer Program transfers files from the host to the workstation for offline data manipulation, updating, or correction or for the transfer and storage of local data in the host system.

Appendix B: Coexistence Service for z/OS V1R9 on z/OS V1R7

Coexistence and fallback PTFs installed on back-level systems allow those systems to coexist with z/OS V1R9 systems during your migration, and allow backout from z/OS V1R9 to the back-level systems if necessary. Coexistence and fallback are important because they allow you to migrate systems in a multisystem configuration to z/OS V1R9 using rolling IPLs (one system at a time), allowing for continuous application availability.

This table is for coexistence and fallback service on z/OS V1R7 for z/OS V1R9. (For coexistence and fallback service on z/OS V1R8 for z/OS V1R9, see the body of this presentation.)

Element or feature, and function provided by PTFs	z/OS V1R7 PTFs (and corresponding APARs)
<p>BCP: If an application developer compiles or assembles with the z/OS V1R8 or later program management binder version 6 API invocation macros, or codes to the new STARTD API interface, and the resulting program is run on an earlier release of z/OS, the binder STARTD API will fail with return code 12, invalid parameter list, message IEW2132S 0064 INCORRECT NUMBER OF PARAMETERS PASSED FOR CALL. The PTF allows such a calling program to execute successfully.</p>	<p>UA24437 (APAR OA10018)</p>
<p>BCP: If an application developer uses the z/OS V1R8 or later program management binder to create a program object with the latest format in a PDSE, the PTF is needed so that an ISPF user can browse the PDSE on z/OS V1R7.</p>	<p>UA25784 (APAR OA13294)</p>
<p>BCP: Enables a pre-z/OS V1R9 system to recognize classes built by the z/OS V1R9 program management binder and discard them during rebind on a pre-z/OS V1R9 system.</p>	<p>UA32212 (APAR OA17827)</p>
<p>BCP: Allows the z/OS V1R7 program management loader to properly handle module aliases produced by the S/360 linkage editor.</p>	<p>UA29484 (APAR OA17662)</p>
<p>BCP: In z/OS V1R9, an enhancement allows a coupling facility to be placed into a new state called <i>maintenance mode</i>. When a coupling facility is in this state, it cannot be used to allocate any new coupling facility structures. Although pre-z/OS V1R9 systems cannot place a coupling facility into maintenance mode, in a mixed sysplex it is possible for a pre-z/OS V1R9 system to share a coupling facility with a z/OS V1R9 system and for the z/OS V1R9 system to place the coupling facility into maintenance mode.</p> <p>The PTF allows pre-z/OS V1R9 systems to "understand" when maintenance mode is the reason that a coupling facility is ineligible for structure allocation, and enables messages to include this specific reason.</p> <p>If the PTF is not installed, the effect depends on whether the coupling facility is placed into maintenance mode. If the coupling facility is never placed into maintenance mode, there is no impact. But if the coupling facility <i>is</i> placed into maintenance mode (from a z/OS V1R9 system), and maintenance mode is the reason that the coupling facility is ineligible for structure allocation, messages will state this specific reason rather than stating that the reason is unknown.</p>	<p>UA32765 and if Japanese, UA32768 (APAR OA17685)</p>
<p>BCP: Ensures that pre-z/OS V1R8 systems tolerate the new format of the z/OS V1R8 (and later) WLM service definition and service policy in the WLM couple data set. Moreover, the PTF ensures the toleration of changed WLM LPAR management and JES initiator management information that is exchanged in a mixed-release (z/OS V1R8 and later, and pre-z/OS V1R8) sysplex.</p> <p>If the WLM service policy in the couple data set has been activated by a z/OS</p>	<p>UA90269 if you do not have FMID JBB772S installed or UA90270 if you do have FMID JBB772S installed (APAR OA13837)</p>

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<p>V1R8 or later system, a pre-z/OS V1R8 system without the PTF will not be able to activate the policy and might fail during IPL with a wait state 064. If LPAR management is being used in a mixed-release sysplex and the PTF is not installed, you might experience abends and see message IWM054I FAILURE IN LPAR CPU MANAGEMENT, PROCESSING DISABLED.</p>	
<p>BCP: In z/OS V1R8 and later, SYSIN DD * override statements are no longer required to reside in the job stream in the same order as the corresponding DD statements appear in the procedure. Because new text units are introduced for each SYSIN DD * statement, the PTF allows jobs to ignore the new text units when they run in a JES2 environment and convert on a z/OS V1R8 or later system but interpret on an earlier system.</p>	<p>UA24560 (APAR OA13438)</p>
<p>BCP: In z/OS V1R8 and later, the console restructure enhancement eliminates the master console and the console switch function. The PTFs allow earlier systems to tolerate the enhancement.</p>	<p>UA26398 and, if Japanese is desired, UA26402 (APAR OA10632). Also UA33020 (APAR OA19950).</p>
<p>BCP: Allows a z/OS V1R7 system to tolerate the z/OS V1R8 and later logger log stream GROUP designation and renamed log streams.</p>	<p>UA24159 (APAR OA14009), UA25588 (APAR OA15835)</p>
<p>BCP: Allows a z/OS V1R7 system to tolerate changes made to resource recovery services (RRS) display and ATRQUERY functions in z/OS V1R8 and later.</p>	<p>UA27072 (APAR OA15144)</p>
<p>BCP: If a locally-mounted non-owner z/OS V1R9 system removes or renames a file, the earlier-level systems are not informed and can have bad library lookaside (LLA) entries. This could cause local users to see incorrect information. The PTF disables LLA on all systems for a mount if LLA is disabled on the owner.</p>	<p>UA32494 (APAR OA16265)</p>
<p>DFSMSdfp: Program object format 5 (PO5 format) is new in z/OS V1R8 (and later). The PTF allows PDSE program libraries that contain PO5 program objects to be processed by IEBCOPY on z/OS V1R7 systems.</p>	<p>UA22351 (APAR OA13525)</p>
<p>DFSMSdfp: An enhancement in the z/OS V1R8 (and later) object access method (OAM) component introduced a new ODLOBFL column in the object directory to exploit DB2^(R) binary large object (BLOB) support. The PTF enables pre-z/OS V1R8 OAMs to coexist in an OAMplex with OAMs at the z/OS V1R8 or later level.</p>	<p>UA24413 (APAR OA12683)</p>
<p>DFSMSdfp: z/OS V1R9 introduces Tape Sublevel 2 (TSL2) into the object access method (OAM) storage hierarchy. The PTF allows OAM members on pre-z/OS V1R9 systems to coexist in an OAMplex with OAM members on a z/OS V1R9 system. Specifically, the PTF enables pre-z/OS V1R9 systems to recognize and fail attempts to access objects residing on the new TSL2 media. It also modifies pre-z/OS V1R9 OAM members so that they mark tape media to which they write as TSL1.</p>	<p>UA32909 (APAR OA17812)</p>
<p>DFSMSdfp: In z/OS V1R8 (and later), the D SMS,SMSVSAM,DIAG(CONTENTION) command is introduced to display internal VSAM RLS contention. The PTF allows a z/OS V1R7 system that receives the new DIAG CONTENTION command to tolerate the command by issuing a message analogous to IGW495I D SMS,SMSVSAM,DIAG COMMAND FUNCTION HAS FOUND THE DIAG TABLE HAS NO ENTRIES. If the PTF is not installed, the z/OS V1R7 system receiving the new command treats it as an irrelevant and confusing console message.</p>	<p>UA24374 (APAR OA14568)</p>
<p>DFSMSdfp: In z/OS V1R8 (and later), a performance improvement to VSAM RLS causes XES lock table cleanup to be skipped when the SMSVSAM address space is terminated, as documented in APAR OA11708. This PTF allows a z/OS V1R7 system to tolerate the enhancement.</p>	<p>UA21542 (APAR OA13332)</p>

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DFSMSshsm^(TM) : Allows a z/OS V1R7 system to tolerate the changes made by the fast replication tape support enhancement in z/OS V1R8 (and later).	UA25405 (APAR OA13177)
DFSMSshsm : In z/OS V1R8 (and later), dump volume (DVL) and dump class (DCL) control data set records were enlarged as part of the DFSMSshsm dump encryption enhancement. The PTF allows a z/OS V1R7 system to tolerate the increase in record size.	UA22716 (APAR OA13687)
DFSMSrmm : Allows a pre-z/OS V1R8 system in a client/server environment to participate in an RMMplex in which a z/OS V1R8 or later system has been started. Optionally, you can specify UTC(YES) with the EDGUTIL utility on z/OS V1R8 or later to enable DFSMSrmm common time support.	UA25145 (APAR OA15786) if not using client/server DFSMSrmm, or both UA25145 and UA00015 (APAR OA15873) if using client/server DFSMSrmm
DFSMSrmm : Allows a pre-z/OS V1R8 system to participate in an RMMplex in which a z/OS V1R8 or later system has been started. In particular, the PTF enables VRSEL processing to recognize the use of the special ABEND and OPEN vital record specifications and to correctly handle COUNT(0). It also prevents the continued use of the unsupported options STARTNUMBER and LOCATION(BOTH).	UA22045 (APAR OA13355)
DFSMSrmm : Allows a z/OS V1R7 system to tolerate the new serialization ENQ name used for the control data set (CDS) in z/OS V1R9. The new serialization is enabled automatically the first time z/OS V1R9 DFSMSrmm is started.	UA31620 (APAR OA17965)
DFSMSrmm : Provides coexistence support for the D/T3592 Model E05 encryption support in z/OS V1R9.	UA29140 (APAR OA16523)
Distributed File Service : Allows z/OS V1R7 zFS to maintain the zFS namespace across all members of a sysplex (implemented in APAR OA18494).	UA24209 (APARs OA13619, OA14100, OA14109, OA14379, OA14615, OA15231)
Distributed File Service : Prevents an abend on a z/OS V1R7 client system when a certain zFS mount sequence occurs.	UA29660 (APAR OA16908)
Distributed File Service : <ul style="list-style-type: none"> • Allows the MOUNT command to work on a z/OS V1R7 system that is in a sysplex with a z/OS V1R9 system after a MOUNT command with the new zFS AGGRMOVE parameter has been issued on the z/OS V1R9 system. • Prevents an abend on a z/OS V1R7 system that is in a sysplex with a z/OS V1R9 system on which a zFS clone operation occurs. • Ensures that a z/OS V1R7 system that is in a sysplex with a z/OS V1R9 system that has failed is made aware of any zFS aggregates that another z/OS V1R9 system has taken ownership of from the failed z/OS V1R9 system. • Allows zFS to handle mounts properly when certain timing situations occur because of failed systems. 	UA31327 (APARs OA18139, OA17645, OA18494, and OA19034, respectively)
HCD : Allows z/OS V1R8 and later HCM to exploit z/OS V1R7 HCD functionality to enable new z/OS V1R8 (and later) HCM functions.	UA90273 and, if Japanese is desired, UA90274 (APAR OA14334)
Integrated Security Services : When an LDAP search is used to display a RACF user, the PTF causes the LDAP Server to return the contents of the RACF user. Without the PTF, the LDAP Server returns an LDAP operations error return code.	UA29385 (APAR OA17710)
ISPF : Enables ISPF edit recovery tables and ISPF edit recovery backup data	UA33243 (APAR OA20207)

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sets from a z/OS V1R9 system to be used on a pre-z/OS V1R9 system.	
JES2: Allows z/OS V1R7 JES2 to run with z/OS V1R9 JES2 in a multi-access spool (MAS).	UA24984 (APAR OA12922), UA90373 (APAR OA17226)
JES3: Removes a job from output service during fallback to z/OS V1R7 JES3 from z/OS V1R9 if more than 65 536 OSE buffers were created for that job while on z/OS V1R9 JES3. The PTF also provides support to rebuild that job at the earlier release by dumping it and restoring it using the dump job (DJ) DSP.	UA32619 (APAR OA16731)
JES3: Allows z/OS V1R7 JES3 to tolerate the removal of various symbols from the IHAWQE macro , which was done as part of the console improvements made in z/OS V1R8.	UA24990 (APAR OA15426)
Language Environment: Causes a meaningful message to be issued when a new z/OS V1R8 (and later) Language Environment run-time option is encountered by an earlier release. The message states that the option is ignored. If the PTF is not installed, the option is still ignored but a less meaningful message, or no message at all, is issued.	UK12452 (APAR PK12073) and UK22384 (APAR PK29028)
NFS: In z/OS V1R9, the BUFSIZE parameter was added to parmlib member CTINFSxx to specify the size of the NFS server component trace (ctrace) buffer. The PTF enables a z/OS V1R7 system to tolerate the new parameter. If the PTF is not installed, NFS server ctrace initialization fails and the NFS server reverts to using the log data sets for recording diagnostics. Note that failing to install the PTF does not prevent the NFS server from starting; it only affects the debug message recording location.	UA29617 (APAR OA18325)
NFS: Allows a z/OS V1R7 system to read the new NFS export file format generated by a z/OS V1R8 or later system.	UA25099 (APARs OA14907, OA15814)
RMF^(TM): Ensures the toleration of new z/OS V1R8 (and later) functionality for sysplex-wide RMF reporting in earlier releases.	UA26170 (APAR OA14931)
SDSF: The SDSF CK panel shows information from IBM Health Checker for z/OS. Without the PTF installed, the CK panel displays blank lines.	UK26753 (APAR PK46929)
SDSF: Missing records or ABEND 0C4, or both, will occur when browsing spool records created by z/OS V1R9 JES2, from z/OS V1R8 SDSF or earlier. This APAR is in support of running z/OS V1R8 SDSF and earlier in a MAS that includes z/OS V1R9 JES2 or in which any spool records were created by a z/OS V1R9 JES2 system.	UK90010 (APAR PK39852)
Security Server: Allows RACF running on a z/OS V1R7 system to tolerate the presence of Kerberos AES keys in RACF profiles, when sharing the RACF database with a z/OS V1R9 system. If the PTF is not installed, z/OS Network Authentication Service failures will occur on the z/OS V1R7 system if the z/OS Network Authentication Service has been configured to use RACF as its SAF registry and the SETROPTS KERBLVL(1) command has been issued to enable use of DES3 and DESD keys.	UA33765 (APAR OA20304)
Security Server: In z/OS V1R8 (and later), the structure of the RACF database was changed to allow a template block to be continued into another block. The PTF allows a z/OS V1R7 system to process templates that extend into another block. If you share a RACF database between z/OS V1R8 (or later) and z/OS V1R7, you need to install the PTF on the z/OS V1R7 system.	UA24980 (APAR OA12443)