

# MIGRATING TO Z/OS V2.3: PART 1 OF 2 PLANNING

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### Abstract:

This is the planning part of a two-part session for system programmers and their managers who are planning on migrating to z/OS V2.3. In part one, the focus is on preparing your current system for migration to either release. The system requirements to run and how to prepare your system for the migration are discussed. Part two covers the only migration details for migrating to z/OS V2.3 from either V2.1 or V2.2. It is strongly recommended that you attend both sessions for a migration picture for z/OS V2.3.

The general availability planned date for z/OS V2.3 is September 2017.

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## Migrating to z/OS V2.3: Part 1 of 2 Agenda



- **Content of z/OS V2R3**
  - Added, Changed, and Withdrawn Elements and Features
- **z/OS Ordering and Deliverables**
  - Products Related to z/OS
- **z/OS Policies**
  - z/OS End of Service dates
  - z/OS Coexistence-Migration-Fallback
- **Planning for z/OS V2R3 and higher:**
  - Ensuring System Requirements are Satisfied
    - Driving and Target System Requirements
  - Coexistence System Requirements
  - Some Migration Actions You Can Do NOW
  - Programmatic Verification of Migration Actions for z/OS V2R3 and higher
  - Using z/OSMF Workflow for z/OS Migration
  - ServerPac Migration Actions



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## Scope



- **Focus on z/OS migration, not HW migration.**
- If migrating to a new server level, see:
  - for zEC12 and zBC12: migration action in z/OS Migration *“Migrate to an IBM zEnterprise zEC12 or zBC12 server”*
  - for z13 and z13s: z/OSMF Workflow ( or migration action in z/OS Migration) for *“Migrate to an IBM zEnterprise zEC12 or zBC12 server”*
  - **for z14: z/OSMF Workflow ( or migration action in z/OS Migration) for “Migrate to an IBM z14 server”,**
  - **Or attend session “z/OS Software Support for the z14 Server”.**



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### Related Publications:

- IBM Publication Center zipped PDFs **with index** publications number for z/OS V2.2: **SC27-8430**
- ResourceLink: IBM zipped PDF **with index** publications number for z/OS V2.3: see link below.
- z/OS Planning for Installation
- z/OS Migration
- z/OS Introduction and Release Guide
- z/OS Program Directory (n/a)
- System z Platform Test Report for z/OS and Linux Virtual Servers (available from <http://www.ibm.com/servers/eserver/zseries/zos/integtst/>)
- z/OS Summary of Interface and Message Changes
- z/OS MVS Initialization and Tuning Reference
- z/OS UNIX System Services Planning
- ServerPac: Installing Your Order (no order number; custom-built to your order)
- ServerPac: Using the Installation Dialog,

URL	DESCRIPTION
<a href="http://www.ibm.com/systems/z/os/zos/">http://www.ibm.com/systems/z/os/zos/</a>	IBM z/OS home page
<a href="http://www.ibm.com/systems/z/os/zos/bkserv/v2r1pdf/">http://www.ibm.com/systems/z/os/zos/bkserv/v2r1pdf/</a> <a href="http://www.ibm.com/systems/z/os/zos/library/bkserv/v2r2pdf/index.html">http://www.ibm.com/systems/z/os/zos/library/bkserv/v2r2pdf/index.html</a>	z/OS V2R1 and V2R2 Elements and Features PDF downloads
<a href="http://www.elink.ibm.link.ibm.com/public/applications/publications/cgibin/pbi.cgi">http://www.elink.ibm.link.ibm.com/public/applications/publications/cgibin/pbi.cgi</a>	IBM Publications Center
<a href="http://www.redbooks.ibm.com/redbooks.nsf/pages/IBMIEAV22">http://www.redbooks.ibm.com/redbooks.nsf/pages/IBMIEAV22</a>	IBM Education Assistant for z/OS V2R2
<a href="http://www.redbooks.ibm.com/redbooks.nsf/pages/IBMIEAV21">http://www.redbooks.ibm.com/redbooks.nsf/pages/IBMIEAV21</a>	IBM Education Assistant for z/OS V2R1
<a href="http://www.ibm.com/servers/eserver/zseries/zos/servicetst/">http://www.ibm.com/servers/eserver/zseries/zos/servicetst/</a>	Consolidated Service Test (CST) home page
<a href="http://www.ibm.com/servers/eserver/zseries/zos/installation/">http://www.ibm.com/servers/eserver/zseries/zos/installation/</a>	z/OS Installation
<a href="http://www.ibm.com/software/support/lifecycle/index_a_z.html">http://www.ibm.com/software/support/lifecycle/index_a_z.html</a>	End of Service dates for IBM Software
<a href="http://www.ibm.com/servers/eserver/zseries/zos/integtst/">http://www.ibm.com/servers/eserver/zseries/zos/integtst/</a>	zSeries Platform Test web page
<a href="http://www.redbooks.ibm.com/">http://www.redbooks.ibm.com/</a>	IBM Redbooks web page
<a href="http://www.ibm.com/support/techdocs/atsmastr.nsf/Web/Flashes">http://www.ibm.com/support/techdocs/atsmastr.nsf/Web/Flashes</a>	IBM Systems Center Flashes
<a href="http://www.ibm.com/servers/eserver/zseries/zos/support/">http://www.ibm.com/servers/eserver/zseries/zos/support/</a>	z/OS Technical Support
<a href="http://www.ibm.link.ibm.com/">http://www.ibm.link.ibm.com/</a>	IBMLink web page
<a href="http://www.ibm.com/systems/z/advantages/pso/cftable.html">http://www.ibm.com/systems/z/advantages/pso/cftable.html</a>	Coupling Facility Level (CFLEVEL)

## Migrating z/OS V2.3: Part 1 of 2

	Considerations web page
<a href="http://service.boulder.ibm.com/390holddata.html">http://service.boulder.ibm.com/390holddata.html</a>	Enhanced HOLDDATA web page
<a href="http://www14.software.ibm.com/webapp/set2/psp/srchBroker">http://www14.software.ibm.com/webapp/set2/psp/srchBroker</a>	PSP buckets web page
<a href="http://www.ibm.com/software/shopzseries">http://www.ibm.com/software/shopzseries</a>	Shopz home page
<a href="http://www.ibm.com/systems/z/os/zos/features/software/isv210.html">http://www.ibm.com/systems/z/os/zos/features/software/isv210.html</a>	ISVs Supporting z/OS V2.1
<a href="http://www.ibm.com/systems/z/os/zos/features/software/isv220.html">http://www.ibm.com/systems/z/os/zos/features/software/isv220.html</a>	ISVs Supporting z/OS V2.2
<a href="http://www.ibm.com/servers/eserver/zseries/swprice/">http://www.ibm.com/servers/eserver/zseries/swprice/</a>	IBM System z Software Pricing
<a href="http://www.ibm.com/systems/z/os/zos/support/zos_eos_dates.html">http://www.ibm.com/systems/z/os/zos/support/zos_eos_dates.html</a>	z/OS marketing and service announce, availability, and withdrawal dates
<a href="http://www.ibm.com/systems/z/os/zos/features/unix/bpxa1ty1.html">http://www.ibm.com/systems/z/os/zos/features/unix/bpxa1ty1.html</a>	Some ported programs for z/OS web page
<a href="https://www.ibm.com/systems/z/os/zos/installation/zosnfapars.html">https://www.ibm.com/systems/z/os/zos/installation/zosnfapars.html</a>	z/OS Platform New Function APARs

### 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/> .

### z/OS V2.3 Performance Information

At z/OS V2.3 GA, the SOFTCAP tool can be downloaded from the web site:

<http://w3.ibm.com/support/americas/wsc/cpsproducts.html> . This tool provides more specific capacity planning information for the migration to z/OS V2.3.

## z/OS V2R3 Elements (changing in z/OS V2R2 and **V2R3**) IBM

<ul style="list-style-type: none"> <li>→ <b>BCP</b></li> <li>→ <b>Common Information Model (CIM)</b></li> <li>→ <b>Communications Server</b></li> <li>→ <b>Communications Server Security Level 3</b></li> <li>→ <b>Cryptographic Services:</b> <ul style="list-style-type: none"> <li>→ <b>ICSF (FMID HCR77C0)</b></li> <li>→ <b>PKI Services</b></li> <li>→ <b>System SSL</b></li> </ul> </li> <li>→ <b>DFSMSdftp</b></li> <li>→ <b>DFSMSdss</b></li> <li>→ <b>DFSMSHsm</b></li> <li>→ <b>DFSMSrmm</b></li> <li>→ <b>DFSMSStvs</b></li> <li>→ <b>DFSORT</b></li> <li>→ <b>Distributed File Service</b></li> <li>→ <b>HCD</b></li> <li>→ <b>HCM</b></li> <li>→ <b>IBM HTTP Server powered by Apache (IHSA)</b></li> <li>→ <b>IBM Knowledge Center for z/OS</b></li> </ul>	<ul style="list-style-type: none"> <li>→ <b>IBM Tivoli Directory Server</b></li> <li>→ <b>IBM z/OS Liberty Embedded</b></li> <li>→ <b>IBM z/OS Management Facility</b></li> <li>→ <b>Infoprint Server</b></li> <li>→ <b>Integrated Security Services:</b> <ul style="list-style-type: none"> <li>→ <b>Network Authentication Service</b></li> </ul> </li> <li>→ <b>ISPF</b></li> <li>→ <b>JES2</b></li> <li>→ <b>JES3</b></li> <li>→ <b>Language Environment</b></li> <li>→ <b>Network File System</b></li> <li>→ <b>RMF</b></li> <li>→ <b>Run-Time Library Extensions</b></li> </ul>	<ul style="list-style-type: none"> <li>→ <b>SDSF</b></li> <li>→ <b>Security Server - RACF</b></li> <li>→ <b>TSO/E</b></li> <li>→ <b>XL C/C++</b></li> <li>→ <b>z/OS Font Collection</b></li> <li>→ <b>z/OS OpenSSH</b></li> <li>→ <b>z/OS Security Level 3:</b> <ul style="list-style-type: none"> <li>→ <b>IBM Tivoli Directory Server Security Level 3</b></li> <li>→ <b>Network Authentication Service Level 3</b></li> <li>→ <b>SSL Level 3</b></li> </ul> </li> <li>→ <b>z/OS UNIX</b></li> </ul>
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**KEY:**  
 Black (in bold) are base elements  
 Green (also in bold) are optional priced features  
 Brown (also in *italics*) are optional unpriced features with export controls  
 → This element changed in z/OS V2R2, This element changed in z/OS V2R3  
 All other elements not listed have not changed since z/OS V2.1.  
 New in V2R2: IBM HTTP Server powered by Apache, IBM Knowledge Center for z/OS, z/OSMF, and z/OS OpenSSH.  
 New in V2R3: IBM z/OS Liberty Embedded.

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## An important reminder about two features...

- **Communications Server Security Level 3**
- **z/OS Security Level 3:**
  - **IBM Tivoli Directory Server Security Level 3**
  - **Network Authentication Service Level 3**
  - **SSL Level 3**



**KEY:**  
*Brown* (also in *italics*) are optional unpriced features with export controls

**Do not forget to order these export controlled features if you need them!**

**z/OS V2.2 Security Level 3 features are no longer orderable after Jan 29, 2018!**

**If you need them after your z/OS release is no longer orderable, you will be having to do extra installation work.**

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### z/OS Elements and Features

z/OS consists of base elements and optional features:

- The base elements (or simply elements) deliver essential operating system functions. When you order z/OS, you receive all of the base elements.
- The optional features (or simply features) are orderable with z/OS and provide additional operating system functions. Optional features are unpriced or priced:
  - ☐ Unpriced features are shipped to you only if you order them. If you plan to use any unpriced features, IBM recommends that you order them when you order your base elements. You must not wait until the next release becomes available. Once a release's base elements are no longer orderable, usually neither are its unpriced features.
  - ☐ Priced features are always shipped to you. When IBM packages your order, we enable the priced features that you ordered. These features are ready to use after you install z/OS (and customize them as needed). We disable the priced features that you did not order. Although they are installed on your system, you cannot use them. Later on, if you decide to use them, you notify IBM and you enable them dynamically (which is known as dynamic enablement). You dynamically enable by updating parmlib member IFAPRDxx and you notify IBM by contacting your IBM representative.

Elements and features may be exclusive or nonexclusive:

- An element or feature is called exclusive to z/OS if it exists only within z/OS (not also as a separately orderable, or stand-alone, product) and if future functional enhancements will occur only within z/OS.
- An element or feature is called nonexclusive if it exists both (1) within z/OS and (2) as a stand-alone product.

Listed in the foil above are the changing elements within z/OS V2R3 since z/OS V2R1.



## New base element in z/OS V2.3: IBM z/OS Liberty Embedded

### IBM z/OS Liberty Embedded:

- IBM z/OS Liberty Embedded provides a copy of the IBM Liberty server stack for sharing between IBM z/OS elements.
  - FMID is HWLPPEM0.
- Also, from the License Program Specifications (LPS): *Licensee may use this Supporting Program for purposes independent of the Principal Program without obtaining additional entitlements. Such use is Nonsupported and limited to Non-Production purposes.*
- Found at /usr/lpp/liberty\_zos/
  - Is a separate file system, OMVS.SBBLZFS



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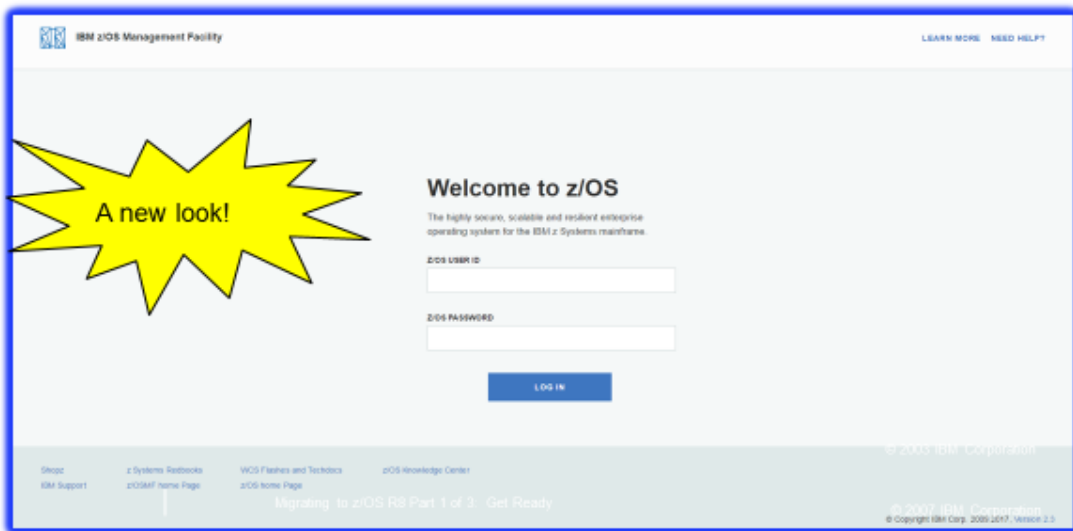
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## New base element in z/OS V2.2: z/OSMF



### IBM z/OS Management Facility:

- Provides a web-based interface that allows you to manage various aspects of your z/OS systems through a browser at any time, from any location.
- Previously, its own program product number (at no cost).
- z/OSMF V2.3 use requires IBM SDK **64-bit Java V8**, which is not included in z/OS.



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## New base element in z/OS V2.2: z/OS OpenSSH



### Overview:

- OpenSSH provides secure encryption for both remote login and file transfer. Some of the utilities that it includes are:
  - **ssh**, a z/OS client program for logging into a z/OS shell. It can also be used to log into other platform's UNIX shells. It is an alternative to **rlogin**.
  - **sftp** for file transfers over an encrypted **ssh** transport. It is an interactive file transfer program similar to **ftp**.
- Level in z/OS V2.3 is OpenSSH 6.4p1 (same as V2.2).
  - This level was also provided in IBM Ported Tools V1.3, base feature, which is no longer orderable.
  - Previously ported level was 5.0p1 in prior releases.
- There are possible migration actions between 5.0p1 and 6.4p1 due to open source changes.



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## New base element in z/OS V2.2: IBM Knowledge Center



### Overview:

- Knowledge Center for z/OS is a web application that provides IBM product publication content to web browser clients from the z/OS server system.
  - It is a Java web application deployed by the WebSphere® Liberty Profile packaged with the z/OSMF base element.
  - (z/OS V2.3 PKI Services is planned to support WebSphere Liberty Profile to host the web pages interface.)
- Designed to provide enhanced search technology similar to that used for Information Centers.
- Designed to enable you to create your own local repositories and tailor the content presented from them.
- z/OS V2.3 ServerPac will help you complete the necessary setup tasks .



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## New base element in z/OS V2.2: IHSA



### IBM HTTP Server Powered by Apache Overview:

- Replaces the IBM HTTP Server Powered by Domino
- z/OS V2.2 and V2.3 level is V9 = Apache HTTP Server 2.4.
- A base exclusive element.

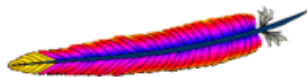


### z/OS V2.1 to V2.3 migraters:

- If you use IBM HTTP Server Powered by Domino, move to IBM HTTP Server Powered by Apache.

### z/OS V2.2 to V2.3 migraters:

- Nothing to do.



Apache

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## Some important thoughts about IBM HTTP Server



A **strongly** suggested migration path if you are using IBM HTTP Server powered by Domino.

1. Are you affected? Use the latest (18 Sept 2015) "as is" health check from [http://www-03.ibm.com/systems/z/os/zos/installation/HTTP\\_Health\\_Checker.html](http://www-03.ibm.com/systems/z/os/zos/installation/HTTP_Health_Checker.html)
  - This check will simply tell you if you are using IBM HTTP Server powered by Domino.
2. While on z/OS V2.1:
  - Install IBM Ported Tools for z/OS HTTP Server (level 8.5.5, Apache level 2.2).
  - Migrate from IBM HTTP Server Powered by Domino to the HTTP Server 8.5.5.
    - Use Redbook: IBM HTTP Server for z/OS: Migrating from Domino-powered to Apache-powered (REDP-4987)
    - Use developerWorks: <http://www.ibm.com/developerWorks/>
    - Use z/OS UNIX Tools and Toys ihsCMT (<http://www-03.ibm.com/systems/z/os/zos/features/unix/bpxa1ty2.html>) tool generates an approximation of an equivalent httpd configuration file for IHSA.
    - You can run the Domino and Apache servers side by side on z/OS V2.1.
      - z/OS Infoprint Server still needs the Domino server prior to z/OS V2.2!
3. When installing z/OS V2.2 or V2.3:
  - Migrate to IBM HTTP Server 9.0 (in the z/OS V2.2 base, Apache level 2.4).
    - Use "Upgrading to 2.4 from 2.2" <http://publib.boulder.ibm.com/htpserv/manual24/upgrading.html>
    - Refer to [http://www-01.ibm.com/support/knowledgecenter/SSEQTJ\\_8.5.5/com.ibm.websphere.ihs.doc/ihs/cihs\\_upgrading2.html](http://www-01.ibm.com/support/knowledgecenter/SSEQTJ_8.5.5/com.ibm.websphere.ihs.doc/ihs/cihs_upgrading2.html) for the general process on how to move from 8.5.5 to 9.0 (although the documentation does not yet discuss z/OS or 9.0).
  - Configure z/OS Infoprint Server (Infoprint Central), PKI, and Library Server to use the new z/OS V2.2 HTTP Server.
  - Take advantage of the migration accommodation for "dual" IHSA (8.5.5 and 9.0), if necessary. Use Infoprint Server APAR OA48654. Refer WSC Techdoc (FLASH10857) for important usage details.








IBM Ported Tools V1.3 is no longer orderable.

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Here are the web links from the above slide:

- Health check: [Health check link](http://www-03.ibm.com/systems/z/os/zos/installation/HTTP_Health_Checker.html)
- developerWorks: [developerWorks link](http://www.ibm.com/developerWorks/)
- z/OS UNIX tool: [z/OS UNIX tool link](http://www-03.ibm.com/systems/z/os/zos/features/unix/bpxa1ty2.html)
- Upgrading from Apache 2.2 to 2.4: [Apache 2.2 to 2.4 link](http://publib.boulder.ibm.com/htpserv/manual24/upgrading.html)
- Apache general upgrade: [General Apache upgrade process link](http://www-01.ibm.com/support/knowledgecenter/SSEQTJ_8.5.5/com.ibm.websphere.ihs.doc/ihs/cihs_upgrading2.html)

Element and Functions Withdrawn from z/OS V2R2 		
TSO/E-based DNET function, a diagnostic tool for VTAM dump analysis (from Communications Server)	Base Element support – use similar functions available in IPCS for VTAM diagnosis instead.	z/OS V2.2
BookManager Build	Optional Feature.	z/OS V2.2
Simple Network Management Protocol (SNMP) subagent	Optional Feature – Infoprint Server. As an alternative to using a network management system to monitor PSF-controlled printers, you can use Infoprint Central	z/OS V2.2
IBM HTTP Server powered by Domino  	Base Element. Use the IBM HTTP Server Powered by Apache. Use Redbook for assistance.	z/OS V2.2
Version 1 of the Standards Based Linux Instrumentation for Manageability (SBLIM) CIM client for Java	Base Element support. Convert to Version 2, which is included in z/OS V1R13.	z/OS V2.2
Several TCP/IP device drivers: Async Transfer Mode (ATM), Common Link Access to Workstation (CLAW), HYPERChannel, Channel Data Link Control (CDLC), SNALNK (both LU0 and LU6.2), and X.25. 	Base Element support – migrate to more recent device types such as OSA Express QDIO and Hipersockets. <i>Support for SNA device drivers is not affected.</i>	z/OS V2.2
JES2 z2 checkpoint level 	Base Element support – migrate to z11 checkpoint level (in R11)	z/OS V2.2

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### Withdrawn in z/OS V2R2 (last delivered in z/OS V2R1)

This section lists items that were withdrawn in z/OS V2R2. You should take this into account if you are migrating from z/OS V2.1 to z/OS V2.3. The removal of these functions may have migration actions which you can perform now, in preparation for z/OS V2.3.

- z/OS V2.1 Communications Server was the last release to include the **TSO/E-based DNET function**, one diagnostic tool for use in VTAM dump analysis. IBM recommends that you use similar functions available in IPCS for VTAM diagnosis instead.
- z/OS V2.1 was the last release to include **Version 1 of the Standards Based Linux Instrumentation for Manageability (SBLIM) CIM client** for Java. Version 1 support for the SourceForge open source project was sunset in 2010. Version 2 of the SBLIM client, which is designed to be a JSR48-compliant implementation, is included in z/OS V2.1. IBM recommends that users of SBLIM Version 1 convert to Version 2.
- z/OS V2.1 was the last release to include the **Simple Network Management Protocol (SNMP) subagent provided with Infoprint Server**, so you must take steps to stop using it. The SNMP subagent lets network management systems (such as Ricoh Network Printer Manager for the web) communicate with PSF-controlled printers that do not have internal SNMP agents. However, because most newer printers contain internal SNMP agents, network management systems can communicate directly with these printers. As an alternative to using a network management system to monitor PSF-controlled printers, you can use Infoprint Central, a web-based print management system. Infoprint Central can display the status of all your PSF-controlled printers. In addition, Infoprint Central lets you stop and start the printers, change printer work-selection criteria, and turn TCP/IP-connected printers online and offline.
  - You are using the SNMP subagent if the `start-daemons={snmpd}` attribute is specified in the Infoprint Server configuration file. The configuration file's default location is `/etc/Printsrv/aopd.conf`. However, you might have specified a different location in environment variable `AOPCONF` in the `aopstart EXEC`.
- z/OS V2.1 was the last release to include **the IBM HTTP Server Powered by Domino** (IHS powered by Domino). IBM recommends you use the IBM HTTP Server Powered by Apache, which is available in z/OS

Ported Tools as a replacement. IHS powered by Apache supports IPv6, 64-bit execution, and includes security authentication and authorization capabilities similar to those provided in IHS powered by Domino. Use the Redbook, *IBM HTTP Server on z/OS Migrating from Domino-powered to Apache-powered* (<http://www.redbooks.ibm.com/redpapers/pdfs/redp4987.pdf>), for assistance in migration to IBM HTTP Server Powered by Apache.

- z/OS V2.1 was the last release to support the **z/OS BookManager Build** optional feature.
- z/OS V2.1 was the last release in which JES2 will support the **z2 level for checkpoint** data sets. z11 mode was introduced in z/OS V1.11. IBM recommends you migrate to z11 mode if you have not already done so.
- z/OS V2.1 was last z/OS release to provide software support for **several TCP/IP device drivers**. IBM recommends that customers using any of these devices migrate to more recent device types, such as OSA Express QDIO and Hipersockets. The TCP/IP device drivers planned to be removed are: Asynchronous Transfer Mode (ATM), Common Link Access To Workstation (CLAW), HYPERChannel, Channel Data Link Control (CDLC), SNALINK (both LU0 and LU6.2), and X.25. Note: Support for SNA device drivers is not affected.

Element and Functions Withdrawn from z/OS V2R3			
Simple Mail Transport Protocol Network Job Entry (SMTPD NJE) Mail Gateway and Sendmail mail transports	Base Element support: See presentation notes for recent replacement suggestions.	z/OS V2.3	
Trivial File Transfer Protocol Daemon (TFTPD) function (from Communications Server)	Base Element support	z/OS V2.3	
TCP/IP legacy device drivers for FDDI and Token Ring (LCS with LINKs FDDI and IBMTR), Token Ring (MPCIPA with LINK IPAQTR), and ENet and FDDI (MPCOSA with LINKs OSAENET and OSAFDDI).	Base Element support – migrate to more recent device types such as OSA Express QDIO and Hipersockets. <i>Support for SNA device drivers is not affected.</i>	z/OS V2.3	
Consoles shared mode (from the BCP)	Base Element support: migrate to distributed mode (in R10)	z/OS V2.3	
System Logger DRXRC log stream duplex staging data set option (BCP)	Base Element support – remove the logstream DUPLEXMODE(DRXRC) specification. Other available mirroring options are IBM z/OS Global Mirror (zGM), also known as Extended Remote Copy (XRC), or Geographically Dispersed Parallel Sysplex (GDPS).	z/OS V2.3	

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### Withdrawn in z/OS V2R3 (last delivered in z/OS V2R2)




This section lists items that were withdrawn in z/OS V2R3. You should take this into account if you are migrating from z/OS V2.1 or V2.2, to z/OS V2.3. The removal of these functions may have migration actions which you can perform now, in preparation for z/OS V2.3.

- z/OS V2.3 is the last release in which the consoles component supports shared mode. Migrate to distributed mode, which was introduced in z/OS V1.10. A "best practices" health check was added in z/OS V1.13 to help you identify systems on which shared mode is in use. Distributed mode is designed to improve operations in sysplex environments by helping reduce the time required to IPL and for systems to join a sysplex, improve availability, and allow more MCS, SMCS, and subsystem consoles to be configured.
- z/OS V2.3 is the last release to include the Trivial File Transfer Protocol Daemon (TFTPD) function in z/OS Communications Server.
- z/OS V2.3 is the last release to include the TCP/IP legacy device drivers for FDDI and Token Ring (LCS with LINKs FDDI and IBMTR), Token Ring (MPCIPA with LINK IPAQTR), and ENet and FDDI (MPCOSA with LINKs OSAENET and OSAFDDI). If you are using any of these devices, migrate to newer devices such as OSA Express QDIO and Hipersockets. Note that this withdrawal is only for TCP/IP device types, and not for any of the SNA device drivers.
- z/OS V2.3 is the last release to include the Simple Mail Transport Protocol Network Job Entry (SMTPD NJE) Mail Gateway and Sendmail mail transports. If you use the SMTPD NJE Gateway to send mail, use the existing CSSMTP SMTP NJE Mail Gateway instead. IBM had announced plans to provide a replacement program for the Sendmail client that would not require programming changes. Those plans have changed, and IBM plans to provide a compatible subset of functions for Sendmail in the replacement program and to announce those functions in the future. Programming changes or alternative solutions to currently provided Sendmail functions might be required. No replacement function is planned in z/OS Communications Server to support using SMTPD or Sendmail as a (SMTP) server for receiving mail for delivery to local TSO/E or z/OS UNIX System Services user mailboxes, or for forwarding mail to other destinations.
- z/OS V2.3 is the last release to provide support in the Common Information Model (CIM) component for the Java Managed Provider Interface (JMPI).

- z/OS V2.3 is the last release to support the DFSMSrmm CIM Provider.
- Starting in z/OS V2.3, z/OS system logger will no longer support the log stream DRXRC duplex mode option. z/OS V2.2 was announced as being the last release for system logger to support the DRXRC log stream duplex staging data set option. See the statement of direction in US Software Announcement 215-006, dated January 14, 2015. Also refer to the logger migration health check ZOSMIGV2R2\_NEXT\_IXG\_REMOVE\_DRXRC), provided in the PTFs for APAR OA49507, to aid in identifying whether any log stream is defined in the sysplex with the DUPLEXMODE(DRXRC) attribute.
- IBM previously announced in Software Announcement [215-267](#), dated July 28, 2015, that z/OS V2.2 would be the last release to include a number of System Data Mover (SDM) TSO/E commands. Based on client feedback, IBM now intends to continue to support these commands in the future, including the query and XSET commands. However, IBM plans no future enhancements for them. IBM recommends you use the equivalent REXX versions of these commands instead, which are intended to be updated as needed to support any new functions in the future. For more information about using the REXX commands, see z/OS *DFSMS Advanced Copy Services*.

## Functions Planned to be Withdrawn in the releases after z/OS V2R3...





HFS  	Base Element support: Use zFS instead. Use z/OS utilities to help with the conversion of the entire file system hierarchy.	In the release after, the release after z/OS V2.3 (2021)
Server-Requester Programming Interface (SRPI) (TSO/E)	Base Element support: Introduced in 1980s for a programming interfaces between workstations and the mainframe. Use TCP/IP instead.	In the release after z/OS V2.3
Default change to enable dynamic configuration (Infoprint Server)	Priced feature support: dynamic configuration support is irreversible and mandatory. Benefits exist for using dynamic configuration support!	In the release after z/OS V2.3
Withdrawal of <u>tape</u> feature for z/OS product and service orders 	Product delivery support: IBM recommends you download software using electronic support. Or, if you need physical delivery, use DVD.	In the future

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## Functions Planned to be Withdrawn in the releases after z/OS V2R3...



BookManager READ and Library Server 	Base Element support: Use IBM Knowledge Center for z/OS instead.	In the release after z/OS V2.3
National Language Translation, other than Japanese, for messages and panels	Base Element and Priced Feature support for: Chinese (Simplified and Traditional), Danish, Dutch (Netherlands), French (including Canadian French), German (including Swiss German), Italian, Korean, Norwegian, Portuguese (Brazilian), Spanish, and Swedish.	In the release after z/OS V2.3
<ul style="list-style-type: none"> <li>Removal of support of YES setting for VSM ALLOWUSERKEYCSA DIAGxx parmlib</li> <li>Removal of support for obtaining user key CSA/ECSA storage</li> <li>Removal of support for changing ESQA storage to user key</li> <li>Removal of support for creating SCOPE=COMMON data spaces in user key</li> </ul>	Base Element support – ensure your software will not require this capability.	In the release after z/OS V2.3

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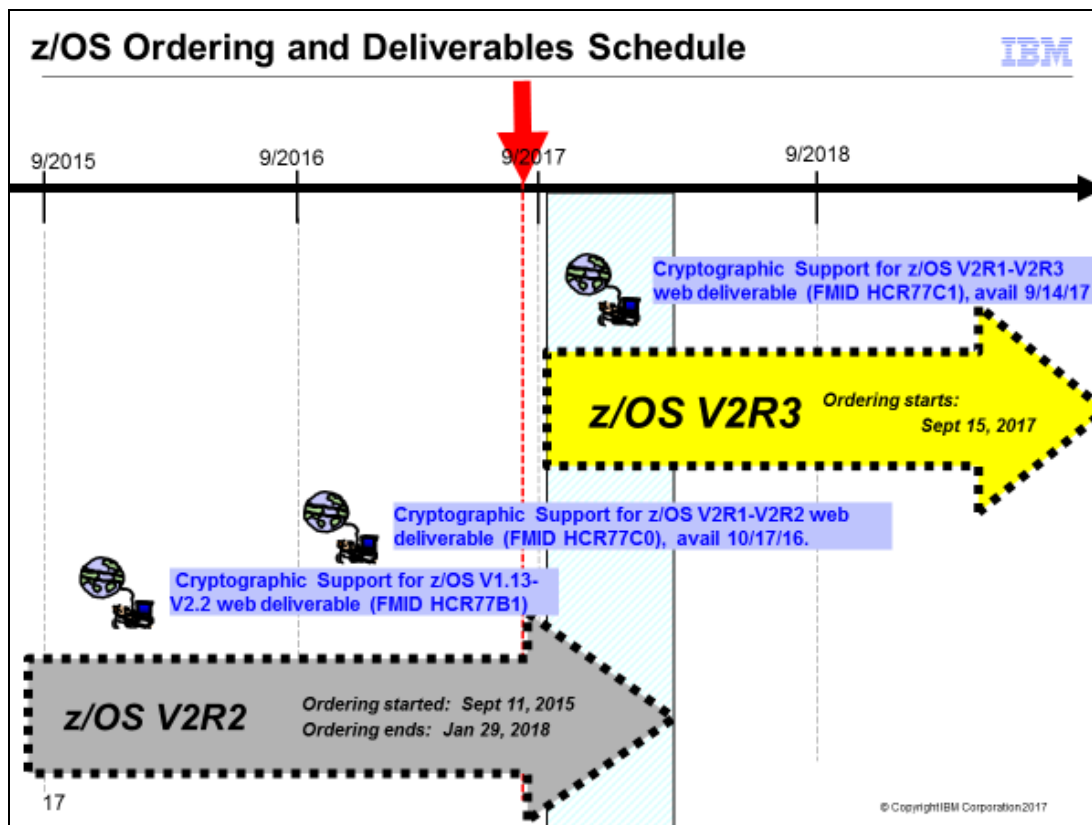
### Planned for removal in the releases following z/OS V2R3

This section lists items that IBM has announced it intends to remove in the releases after z/OS V2R3. 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.

- The release after /OS V2.3 is planned to be the last release of the operating system to support the HFS (Hierarchical File System) data structure used by the z/OS UNIX environment. IBM has provided equivalent if not superior functionality with the z/OS File System (zFS). Customers should migrate from HFS to zFS using the utilities provided in the operating system to convert their entire file system hierarchy.
- z/OS V2.3 will be the last release of z/OS to support the Server-Requester Programming Interface (SRPI). SRPI was introduced in TSO/E in the 1980s to provide a programming interface that enhances the environment of IBM workstations communicating with IBM mainframes running z/OS. Customers with applications using SRPI should start using TCP/ IP for z/OS to provide similar function. Documentation for SRPI is available in *TSO/E Guide to the Server-Requester Programming Interface*, SA22-7785, and this publication as well as documentation for SRPI-related functions, such as the MVSSERV command, will be removed.
- This is a statement of direction to notify Infoprint Server clients of a planned change in default behavior in a future release. IBM intends to enable dynamic configuration as the default behavior. This change in default behavior will be mandatory and not reversible. You can disregard this statement if you already enabled dynamic configuration. See the Infoprint Server Customization publication (SA38-0691) for details on how to enable and the advantages of enabling dynamic configuration. Some advantages of enabling dynamic configuration include:
  - Authorized administrators can use the Infoprint Server ISPF panels or the Printer Inventory Definition Utility (PIDU) to view and change the dynamic attributes rather than editing the `/etc./Printsrv/aopd.conf` file.
  - If you change an attribute in the system configuration definition, with a few exceptions, you do not need to stop and restart Infoprint Server for the change to take effect.
  - You can configure Infoprint Server to start and stop individual daemons.
  - You can benefit from new functions in Infoprint Server that require dynamic configuration. For example, you can use the MVS system logger function.
- z/OS V2R3 is planned to be the last release to support z/OS Batch Runtime. This component provides a framework for interoperability between PL/I, COBOL, and Java applications that run on z/OS. It is designed to provide a managed environment that enables shared access to a DB2 connection by PL/I, COBOL, and Java programs. It is recommended that you use IBM WebSphere® Application Server JSR 352 instead. Doing so might require you to modify and test your programs in a JSR 352 compliant batch container.
- IBM intends to discontinue delivery of z/OS platform products and service on magnetic tape in the future. IBM recommends downloading products and service. However, if you have a requirement for physical media, products and service are also available on DVD.
- z/OS V2.3 is planned to be the last release of the operating system to provide national language translation in languages other than Japanese. As such, the handful of z/OS elements that provide message and panel translation to Chinese (Simplified and Traditional), Danish, Dutch (Netherlands), French (including Canadian French), German (including Swiss German), Italian, Korean, Norwegian, Portuguese (Brazilian), Spanish, and Swedish today, will no longer provide translations into these languages in the release after z/OS V2.3.
- z/OS V2.3 is planned as the last release to include the z/OS BookManager READ and Library Server base elements, the latter of which includes the BookRead API. Over time, IBM's platform for delivering product documentation to customers has evolved to IBM Knowledge Center technology, and production of documentation formats that are supported by BookManager Read and Library Server has greatly diminished. IBM recommends now using IBM Knowledge Center for z/OS (KC4z), which was introduced as a base element of z/OS in version 2.2, to maintain local repositories of product documentation and serve content.
- z/OS V2.3 will be the last release of z/OS to support the YES setting for the VSM ALLOWUSERKEYCSA DIAGxx parmlib parameter. If you run any software that requires the setting of this parameter to YES, the software will need to be changed to no longer require the setting of this parameter to YES. All IBM provided software should not require this setting. If you have any other non-IBM provided software that requires this setting, contact the owner of the software regarding this usage.
- z/OS V2.3 will be the last release of z/OS to support the usage of the GETMAIN, CPOOL, and STORAGE OBTAIN interfaces to obtain user key (8-15) CSA/ECSA storage. If you have any software that obtains user key CSA/ECSA storage, the software will need to be changed to no longer require this capability.

## Migrating z/OS V2.3: Part 1 of 2

- z/OS V2.3 will be the last release of z/OS to support the usage of the CHANGKEY interface to change ESQA storage to user key (8-15). If you have any software that changes ESQA storage to user key, the software will need to be changed to no longer require this capability.
- z/OS V2.3 will be the last release of z/OS to support the usage of the DSPSERV CREATE interface to create a SCOPE=COMMON data space in user key (8-15). If you have any software that creates a SCOPE=COMMON data space in user key, the software will need to be changed to no longer require this capability.



### z/OS Ordering and Deliverable Key Dates

Key dates for recent z/OS releases and functions:

- **September 30, 2015:** z/OS V2R2 general availability
- **November 2015:** Availability date for the Cryptographic Support for the z/OS V1R13-V2R2 web deliverable. (The FMID is HCR77B1.)
- **October 17, 2016:** Availability date for the Cryptographic Support for the z/OS V2R1-V2R2 web deliverable. (The FMID is HCR77C0.)
- **September 14, 2017:** Availability date for the Cryptographic Support for the z/OS V2R1-V2R3 web deliverable. (The FMID is HCR77C1.)
- **September 15, 2017:** Ordering starts for z/OS V2.3
- **September 29, 2017:** z/OS V2.3 general availability.
- **January 29, 2018:** All ordering of z/OS V2.2 is completed.



### Web deliverables

Sometimes enhancements are provided as Web deliverables, **and not integrated in your ServerPac or CBPDO deliverable**. For example, some of the ICSF enhancements are available this way. z/OS Web deliverables 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 perform the SMP/E installation work yourself.

**Cryptographic Support for z/OS V1R13-V2R2 Web deliverable** (ICSF FMID HCR77B1) was available November 2015. This web deliverable supports z/OS V1.13 through z/OS V2.2. This download provides ICSF support which is designed to:

Improve ICSF's ease of use by providing new operator commands with Parallel Sysplex wide scope, if needed, that can be used to perform certain cryptographic administrative functions. These functions include activating, deactivating, and restarting cryptographic coprocessors. This support can also be used to display status for available cryptographic devices and information about active key data sets (KDSs). Also included in this download is the support from the following enhancement APARs:

- OA46466 provided additional Common Cryptographic Architecture (CCA) support for German Banking Industry defined PIN processing functions. These functions include three types of AES key derivation as well as AES Secure Messaging Keys, which can be used in AES-based EMV transactions. This support requires a minimum microcode level (MCL) for Crypto Express4S and Crypto Express5S coprocessors on EC12 and later processors.
- OA47016 provided new ICSF callable services intended to simplify EMV payment processing.
- OA47781 provided additional Common Cryptographic Architecture (CCA) support for generation of a single key for the CIPHER, DATAC, and DATAM key types. Support was included for RSA-OAEP block formatting for both SHA-1 and SHA-256 hashing in the PKA Encrypt (CSNDPKE) and PKA Decrypt (CSNDPKD) callable services. ICSF will format returned data using the RSAES-OAEP encryption/decryption scheme defined in the RSA PKCS #1 v2.0 standard. This support requires a minimum MCL for Crypto Express4S and Crypto Express5S coprocessors on EC12 and later processors.

**Cryptographic Support for z/OS V2R1-V2R2 Web deliverable** (ICSF FMID HCR77C0) was available October 17, 2016. This web deliverable supports z/OS V2.1 and z/OS V2.2. ICSF enhancements for the Crypto Express5S updates are intended to include support to exploit new algorithm support and to extend existing support for asymmetric algorithms. This support also requires Firmware/MCL updates to both the TKE and the z13 processor. These are considered co-requisites. See the [Driver-27 Exception Letter](#) for the latest MCL bundle requirements for this announcement.

- The Digital Signature Generate (CSNDDSG), Digital Signature Verify (CSNDDSV), and PKA Key Token Build (CSNDPKB) callable services are planned to add support for RSA-PSS Signatures to provide for higher assurance and stronger signature support.
- The PKA Key Generate (CSNDPKG) and PKA Key Token Build (CSNDPKB) callable services are planned to be expanded to support selectable public exponents in the generation of RSA private/public key pairs.

**z13 Exploitation Support for z/OS V2.1 XL C/C++ Web deliverable** (and superseded and deleted into z/OS V2.2) z/OS XL C/C++ supports the z13 processor, with ARCH(11) and TUNE(11) parameters designed to take advantage of the new instructions to better optimize your generated code. XL C/C++ will also be designed to support the single instruction, multiple data (SIMD) instructions provided with the z13 vector extension facility and corresponding vector programming language extensions, and the IBM MASS (Mathematical Accelerator Subsystem) and ATLAS (Automatically Tuned Linear Algebra Software) libraries.

The MASS library is intended for accelerated execution of elementary mathematical functions that serves as a higher-performance alternative to the standard math library that is part of the z/OS XL C/C++ Runtime. The ATLAS library is designed to provide linear algebra function support for BLAS (Basic Linear Algebra Subprograms) and LAPACK (Linear Algebra PACKage) functions routinely used in Business Analytics and Optimization solutions. These two libraries provide a powerful framework for development of new Business Analytics workloads, porting math-intensive workloads from other platforms, and accelerating Business Analytics workloads on z13.

**Cryptographic Support for z/OS V2.1-V2.3 Web deliverable** (ICSF FMID HCR77C1). This web deliverable supports z/OS V2.1, V2.2, and V2.3. This Web deliverable contains support for Crypto Express6S coprocessors available on z14 processors. These updates are intended to help clients meet standards and provide better cryptographic security. ICSF enhancements for the Crypto Express6S updates are intended to include support for a PCI HSM ("Payment Card Industry Hardware Security Module") configured CCA coprocessor. This Web deliverable also contains other enhancements.

## Crypto Support in z/OS Releases

Your ICSF migration actions depend on where you are coming from,  
and where you are going...



### Release Level Integrated and Available

z/OS V2R3	ICSF FMID HCR77C0 is incorporated. <ul style="list-style-type: none"> <li>Cryptographic Support for z/OS V2R1-V2R3 Web deliverable (FMID HCR77C1) available 9/2017.</li> </ul>
z/OS V2R2	ICSF FMID HCR77B0 is incorporated. <ul style="list-style-type: none"> <li>Cryptographic Support for z/OS V2R1-V2R3 Web deliverable (FMID HCR77C1) available 9/2017.</li> <li>Cryptographic Support for z/OS V2R1-V2R2 Web deliverable (FMID HCR77C0) available 10/2016.</li> <li>Cryptographic Support for z/OS V1R13-V2R2 Web deliverable (FMID HCR77B1) available 11/2015.</li> </ul>
z/OS V2R1	ICSF FMID HCR77A0 is incorporated. <ul style="list-style-type: none"> <li>Cryptographic Support for z/OS V2R1-V2R3 Web deliverable (FMID HCR77C1) available 9/2017.</li> <li>Cryptographic Support for z/OS V2R1-V2R2 Web deliverable (FMID HCR77C0) available 10/2016.</li> <li>Cryptographic Support for z/OS V1R13-V2R2 Web deliverable (FMID HCR77B1) available 11/2015.</li> <li>Enhanced Cryptographic Support for z/OS V1.13-V2.1 Web deliverable (FMID HCR77B0).</li> <li>Cryptographic Support for z/OS V1R13-V2R1 Web deliverable (FMID HCR77A1) available on 9/20/13.</li> </ul>

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### z/OS ICSF Release Levels

The support for cryptography (z/OS base element ICSF) has been delivered via Web deliverables and release incorporations over the years.

z/OS Releases and Crypto Web Deliverables		
Deliverable	General availability	Delivery method
<b>z/OS V2R1, FMID HCR77A0 Incorporated</b>	September 30, 2013	New release of products
Cryptographic Support for z/OS V1R13-V2R1 (FMID HCR77A1)	September 20, 2013	Web deliverable
Enhanced Cryptographic Support for z/OS V1.13-V2.1 (FMID HCR77B0)	February 2015	Web deliverable
Cryptographic Support for z/OS V1R13-V2R2 (FMID HCR77B1)	November 2015	Web deliverable
Cryptographic Support for z/OS V2R1-V2R2 (FMID HCR77C0)	October 2016	Web deliverable
Cryptographic Support for z/OS V2R1-V2R3 (FMID HCR77C1)	September 2017	Web deliverable
<b>z/OS V2R2, FMID HCR77B0 Incorporated</b>	September 30, 2015	New release of products
Cryptographic Support for z/OS V1R13-V2R2 (FMID HCR77B1)	November 2015	Web deliverable
Cryptographic Support for z/OS V2R1-V2R2 (FMID HCR77C0)	October 2016	Web deliverable
Cryptographic Support for z/OS V2R1-V2R3 (FMID HCR77C1)	September 2017	Web deliverable
<b>z/OS V2R3, FMID HCR77C0 Incorporated</b>	September 29, 2017	New release of products
Cryptographic Support for z/OS V2R1-V2R3 (FMID HCR77C1)	September 2017	Web deliverable

Refer to this technote: <http://www.ibm.com/support/techdocs/atsmastr.nsf/WebIndex/TD103782> for a complete history of ICSF deliverables, and functions contained in those deliverables.

## Some orderable no-charge products (with z/OS V2.3, 5650-ZOS)



- [XML Toolkit for z/OS V1 R10 \(5655-J51, 5655-I30\)](#)
- [IBM 64-bit SDK for z/OS, Java 2 Tech Ed, V7 \(5655-W44 , 5655-I48\)](#)
- [IBM 31-bit SDK for z/OS, Java 2 Tech Ed, V7 \(5655-W43, 5655-I48\)](#)
- [IBM 64-bit SDK for z/OS, Java 2 Tech Ed, V7.1 \(5655-W44 , 5655-I48\)](#)
- [IBM 31-bit SDK for z/OS, Java 2 Tech Ed, V7.1 \(5655-W43, 5655-I48\)](#)
- [IBM 64-bit SDK for z/OS, Java 2 Tech Ed, V8 \(5655-DGH , 5655-I48\)\\*\\*](#)
- [IBM 31-bit SDK for z/OS, Java 2 Tech Ed, V8 \(5655-DGG, 5655-I48\)](#)

EOS: 9/19

EOS: 9/19

EOS: 9/19

EOS: 9/19

\*\* **prereq for z/OS V2.2 z/OSMF**

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### XML Toolkit for z/OS Version 1 Release 10 (5655-J51, 5655-I30)

The XML Parser, C++ Edition has been updated with the following support:

- Ability to optionally utilize z/OS XML System Services (z/OS XML) as an underlying parsing technology when performing DOM (Document Object Model) and SAX2 (Simple API for XML) based parsing operations. Support is provided for both non-validating parsing as well as validating parsing utilizing schema based on the W3C Schema recommendation. This enhancement is provided by way of a set of new z/OS-specific parser C++ classes that are similar in name to and closely mimic the existing DOM and SAX2 interfaces. Utilizing z/OS XML provides redirection to zAAP specialty processors of the portion of the XML parsing operation performed by z/OS XML and may result in significant improved raw performance as well.
- A new feature that supports importing multiple schemas with the same namespace.
- Improved source offset support, enhancing the ability to obtain information that correlates parsed output with the associated data in the input document being parsed. This new support is included in the new z/OS-specific

### IBM 31-bit SDK for z/OS, Java 2 Technology Edition, V7.0 (5655-W33, 5655-I48) ), EOS 9/2019

The 31-bit SDK for z/OS, Java Technology Edition Version 7 Release 0 has been enhanced to:

- Use the Java SE 7 APIs
- Enable your Java applications to exploit the zEC12 instruction set
- Exploit the capabilities available with z/OS V2.1, zEC12, and zBC12
- Improve application throughput without changes to application code
- Improve support for processing native data records and types directly from Java code
- Utilize enhanced monitoring and diagnostics
- Use enhanced z/OS Java unique security and JZOS functionality
- Have Java exploit added z196 instructions

### IBM 64-bit SDK for z/OS, Java 2 Technology Edition, V7.0 (5655-W44, 5655-I48) ), EOS 9/2019

The 64-bit SDK for z/OS, Java Technology Edition Version 7 Release 0 has been enhanced to:

- Use the Java SE 7 APIs
- Enable your Java applications to exploit the zEC12 instruction set
- Exploit the capabilities available with z/OS V2.1, zEC12, and zBC12
- Improve application throughput without changes to application code



- Improve support for processing native data records and types directly from Java code
- Utilize enhanced monitoring and diagnostics
- Use enhanced z/OS Java unique security and JZOS functionality
- Have Java exploit added z196 instructions

### **IBM 31-bit SDK for z/OS, Java 2 Technology Edition, V7.1 (5655-W33, 5655-I48) ), EOS 9/2019**

The 31-bit SDK for z/OS, Java Technology Edition Version 7 Release 1 has been enhanced to exploit the capabilities available with z/OS V2.1, zEC12, and zBC12, such as:

- Java exploitation of Transactional Execution
- Support of 2 GB pages
- zEnterprise Data Compression (zEDC)
- Shared Memory Communications over Remote Direct Memory Access (SMC-R)

### **IBM 64-bit SDK for z/OS, Java 2 Technology Edition, V7.1 (5655-W44, 5655-I48) ), EOS 9/2019**

The 64-bit SDK for z/OS, Java Technology Edition Version 7 Release 1 has been enhanced to exploit the capabilities available with z/OS V2.1, zEC12, and zBC12, such as:

- Java exploitation of Transactional Execution
- Support of 2 GB pages
- zEnterprise Data Compression (zEDC)
- Shared Memory Communications over Remote Direct Memory Access (SMC-R)

### **IBM 31-bit SDK for z/OS, Java 2 Technology Edition, V8 (5655-DFH, 5655-I48) available March 6, 2015**

The 31-bit SDK for z/OS, Java Technology Edition Version 8 has been enhanced to:

- Deliver a comprehensive Java SDK at the SE level 8 for the IBM<sup>(R)</sup> z/OS platform
- Include the enhancements to z/OS Java unique security and JZOS functionality
- Exploit new capabilities available with z/OS V2.1 and V2.2, as announced in Software Announcement [215-006](#), dated January 14, 2015, and IBM z Systems<sup>TM</sup> z13<sup>TM</sup>, as announced in Hardware Announcement [115-001](#), dated January 14, 2015.
- Provide improved performance using the Data Access Accelerator API for processing native data records and types directly from Java code
- Provide enhanced monitoring and diagnostics
- Contain the JZOS and z/OS unique security enhancements of previous z/OS Java SDK products.

### **IBM 64-bit SDK for z/OS, Java 2 Technology Edition, V8 (5655-DGG, 5655-I48) available March 3, 2015**

The 64-bit SDK for z/OS, Java Technology Edition, Version 8 has been enhanced to (similar to the 31-bit SDK V8):

- Deliver a comprehensive Java SDK at the SE 8 level for the IBM<sup>(R)</sup> z/OS platform
- Include the enhancements to z/OS Java unique security and JZOS functionality
- Exploit new capabilities available with z/OS V2.1 and V2.2, as announced in Software Announcement 215-006, dated January 14, 2015, and IBM z Systems z13, as announced in Hardware Announcement 115-001, dated January 14, 2015.
- Provide improved performance using the Data Access Accelerator API for processing native data records and types directly from Java code
- Provide enhanced monitoring and diagnostics
- Contain the JZOS and z/OS unique security enhancements of previous z/OS Java SDK products.


### **End of Service Dates for Older IBM XML and Java SDK levels:**

- **XML V1R9** was out of service on September 30, 2013.
- **IBM 64-bit SDK for z/OS, Java 2 Technology Edition, V1 Release 4 (5655-I56):** was out of service as of September 30, 2008.
- **IBM 31-bit SDK for z/OS, Java 2 Technology Edition, V1 Release 4 (5655-M30):** was out of service as of September 30, 2011. z/OS R11 was the last release for which IBM SDK V1R4 support was available.


- **IBM 64-bit SDK for z/OS, Java 2 Technology Edition, V5 Release 0 (5655-N99):** was out of service as of September 30, 2013.
- **IBM 31-bit SDK for z/OS, Java 2 Technology Edition, V5 Release 0 (5655-N98):** was out of service as of September 30, 2013.
- **IBM 64-bit SDK for z/OS, Java 2 Technology Edition, V6 Release 0 (5655-R32):** has announced to be end of service as of September 30, 2018.
- **IBM 31-bit SDK for z/OS, Java 2 Technology Edition, V6 Release 0 (5655-R31):** has announced to be end of service as of September 30, 2018.
- **IBM 64-bit SDK for z/OS, Java 2 Technology Edition, V7 Release 0 (5655-W44):** has announced to be end of service as of September 30, 2019.
- **IBM 31-bit SDK for z/OS, Java 2 Technology Edition, V7 Release 0 (5655-W43):** has announced to be end of service as of September 30, 2019.
- **IBM 64-bit SDK for z/OS, Java 2 Technology Edition, V7 Release 1 (5655-W44):** has announced to be end of service as of September 30, 2019.
- **IBM 31-bit SDK for z/OS, Java 2 Technology Edition, V7 Release 1 (5655-W43):** has announced to be end of service as of September 30, 2019.

## z/OS Service Policy

- **Priced service extensions available for older releases:**
  - R13: Contact your IBM rep.
- **With the V2 release cycle, IBM plans to provide 5 years of z/OS support, with 3 years of optional extended service (5+3).**



	GA Date	End of Service Date
z/OS V1R13	30 Sept 2011	Occurred on 30 Sept 2016 <b>Contact your IBM rep.</b>
z/OS V2R1	30 Sept 2013	Announced to be Sept 2018 (5 years!)
z/OS V2R2	30 Sept 2015	Planned to be Sept 2020 (5 years!)
z/OS V2R3	29 Sept 2017	Planned to be Sept 2022 (5 years!)



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### Service Policy

With the two-year z/OS release frequency, the z/OS support policy is five years of z/OS support, with three years of optional extended service (5+3).

Beginning with z/OS V1.12, IBM Software Support Services replaces the IBM Lifecycle Extension for z/OS offering with a service extension for extended support coverage, IBM Software Support Services. (The z/OS Lifecycle Extension had been offered, which would allow you to purchase up to two additional years of correction service.) Going forward, when support for a z/OS release is withdrawn, IBM Software Support Services intends to provide service extension support for the given z/OS release for up to three years. The intention is to provide an accommodation where additional time is needed to migrate to a newer z/OS release within the service support period. This does not alter the z/OS coexistence, migration, fallback, or service policy.

z/OS V1R13 support has been increased from three years to five years. Thus, support for V1R13 is planned to be extended from September 30, 2014, to September 30, 2016. This extension allows for some time (12 months) to migrate from z/OS V1R13 to V2R2.

Prior to withdrawing service for any version or release of z/OS or z/OSMF, 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 RSM Enablement Offering for z/OS R13 which was provided for z/OS R13.

See the table below for expiration dates for service support.

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	Occurred on 30 September 2008 * *The “z/OS V1.7 Lifecycle Extended Service” offering expired on 30 September 2010. If you require support for defects for z/OS V1R7 beyond September 2010, contact an IBM representative for a special bid.
z/OS V1R8	29 September 2006	Occurred 30 September 2009 * *The “z/OS V1.8 Lifecycle Extended Service” offering expired on 30 September 2011. If you require support for defects for z/OS V1R8 beyond September 2011, contact an IBM representative for a special bid.
z/OS V1R9	28 September 2007	Occurred 30 September 2010 * *The “z/OS V1.9 Lifecycle Extended Service” offering expired on 30 September 2012. If you require support for defects for z/OS V1R9 beyond September 2012, contact an IBM representative for a special bid.
z/OS V1R10	26 September 2008	Occurred 30 September 2011 * *The “z/OS V1.10 Lifecycle Extended Service” offering expired on 30 September 2013. If you require support for defects for z/OS V1R10 beyond September 2013, contact an IBM representative for a special bid.
z/OS V1R11	25 September 2009	Occurred 30 September 2012 * *See “z/OS V1.11 Lifecycle Extended Service” below for a fee-based accommodation, through 30 September 2014. *See “IBM Software Support Services for z/OS V1.11” below for a fee-based accommodation, through 30 September 2016.
z/OS V1R12	24 September 2010	Occurred 30 September 2014 *See “IBM Software Support Services for z/OS V1.12” below for a fee-based accommodation, through 30 September 2017
z/OS V1R13	30 September 2011	Occurred 30 September 2016
z/OS V2R1	30 September 2013	Announced to be 28 September 2018
z/OS V2R2	30 September 2015	Planned for September 2020
z/OS V2R3	29 September 2017	Planned for September 2020

## IBM Software Support Services for z/OS V1.12 - through September 30, 2017


Starting October 1, 2014, IBM will offer a fee-based, corrective service extension for up to a three-year period following the z/OS V1.12 discontinuance of program services (September 30, 2014).


Service extension support for V1.12 requires a minimum three month purchase and offers flexibility in support of your individual migration plans, either for single machines or for machines configured within a Parallel Sysplex. When purchased, the service extension must be ordered for all machines running V1.12 at a given physical location, either for individual IBM z/Architecture machines or for one or more IBM z/Architecture machines within a qualified Parallel Sysplex.

## IBM Software Support Services for z/OS V1.13 – starting October 1, 2016

If you wish to purchase extended service on z/OS V1R13, contact your IBM representative.

### z/OS V2R3 Coexistence





- **With two year release frequency, three consecutive releases for coexistence remains.**
- **z/OS V2R1, z/OS V2R2, and z/OS V2R3 are supported for coexistence, migration, and fallback.**
  - If you are running z/OS V2R1 and would like coexistence support, plan for a migration to z/OS V2R3.

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### z/OS V2R3 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 V2R2 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.

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 V2R3 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 V2R3 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?

- IBM plans to continue to support an n-2 (three consecutive release) coexistence, fallback, and migration policy.
- Do note that with the two-year release cycle that z/OS support is intended for five years with three optional extended service years (5+3). You should plan on completing your migration plans during the period of time while your older z/OS release is still in service.
- **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 coexistence, fallback, and migration support for those releases which are still in support. **As a general rule, this means that three z/OS and z/OSMF releases will be supported for coexistence, fallback, and migration over a period of five years.**



Thus, **z/OS V2R3 is coexistence, fallback, and migration supported with the following two z/OS releases: V2R1 and V2R2.** This means that:

- Coexistence of a V2R3 system with a V2R1 or V2R2 system is supported.
- Fallback *from* V2R3 to V2R1 or V2R2 is supported.
- Migration *to* V2R3 *from* V2R1 or V2R2 is supported

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 as of z/OS R10





<b>z/OS release</b>	<b>Releases that are coexistence, fallback, and migration supported with the release in column</b>	<b>Explanation</b>
R10	R10, R9, R8	General availability of R10 was September 26, 2008. R8 is the oldest release that is service supported at that time and therefore the oldest release that is coexistence, fallback, and migration supported with R10.
R11	R11, R10, R9	General availability of R11 was September 25, 2009. R9 is the oldest release that is service supported at that time and therefore the oldest release that is coexistence, fallback, and migration supported with R11.
R12	R12, R11, R10	General availability of R12 was September 24, 2010. R10 is the oldest release that is service supported at that time and therefore the oldest release that is coexistence, fallback, and migration supported with R12.
R13	R13, R12, R11	General availability for R13 was September 30, 2011. R11 is the oldest release that is service supported at that time and therefore the oldest release that is coexistence, fallback, and migration supported with R13.
V2R1	V2R1, R13, R12	General availability for V2R1 was September 30, 2013. R12 is the oldest release that is service supported at that time and therefore the oldest release that is coexistence, fallback, and migration supported with V2R1.
V2R2	V2R2, V2R1, R13	General availability for V2R2 was September 30, 2015. R13 is the oldest release that is service supported at that time and therefore the oldest release that is coexistence, fallback, and migration supported with V2R2.
V2R3	V2R3, V2R2, V2R1	General availability for V2R3 is September 29, 2017. V2R1 is the oldest release that is service supported at that time and therefore the oldest release that is coexistence, fallback, and migration supported with V2R3.

## Positioning for z/OS V2.3

- Read Documentation and PSP buckets
  - *z/OS V2.3 Migration Workflow* and *z/OS V2.3 Planning for Installation*
  - Software PSP buckets: ZOSV2R3: ZOSGEN, SERVERPAC, ...



- Approximate **DASD Storage Requirements for z/OS V2.3 only:**

 sizes in 3390 cylinders	z/OS V2R1	z/OS V2R2	z/OS V2R3
<b>Target libraries (PDS and PDSE)</b>	11,051 <small>3390-9 capacity is 10,017 cylinders.</small>	11,169	11,572
<b>DLIB</b>	17,960	16,746	16,949
<b>Root file system</b> 	3,300 (HFS ) 3,319 (zFS)	5,200 (HFS ) 5,219 (zFS) 	5,120 (HFS) 5,132 (zFS)
<b>Font file system</b>	2,048 (HFS or zFS)	2,048 (HFS or zFS)	2,342 (HFS or zFS)
<b>Liberty file system</b>	n/a	n/a	2,400 (HFS or zFS) 

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## Positioning for z/OS V2.3

- **Ensuring System Requirements Are Satisfied**



- Driving System Requirements
  - Requirements to install z/OS V2.3
  - Old news: A coexisting system level suffices!
  - **Still doing physical delivery?**
- Target System Requirements
  - Product requirements for running on z/OS V2.3
  - Hardware and Software
- Coexistence System Requirements
  - Allows z/OS V2.3 to coexist with other z/OS systems



- **Migration Actions You Can Do NOW**
- **Using Programmatic Assistance – Health Checks and Workflow**

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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 V2R3 Migration Workflow* (of the *z/OS V2.3 Migration* book)
- *z/OS V2R3 Planning for Installation*
- *zSeries Platform Test Report for z/OS and Linux Virtual Servers* (formerly, the *z/OS Parallel Sysplex Test Report*)
- *z/OS V2 R3 Introduction and Release Guide* - great for finding new functions in a release to exploit!

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

- ServerPac (if using ServerPac to install)
- z/OS and individual elements (including ZOSGEN, which helps you with general z/OS level information)
- Hardware, if you will be using specific HW functions or upgrading your server

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

(<http://www14.software.ibm.com/webapp/set2/psearch/search?domain=psp>) 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 V2.3 PSP bucket is ZOSV2R3. 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 ZOSV2R3 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:

- 2964DEVICE for the z14 server.
  - The FIXCAT names are IBM.Device.Server.z14-3906.RequiredService, IBM.Device.Server.z14-3906.Exploitation, and IBM.Device.Server.z14-3906.RecommendedService.
- 2965DEVICE for the z13s server.
  - The FIXCAT names are IBM.Device.Server.z13S-2965.RequiredService, IBM.Device.Server.z13s-2965.Exploitation, and IBM.Device.Server.z13s-2966.RecommendedService.
- 2964DEVICE for the z13 server.
  - The FIXCAT names are IBM.Device.Server.z13-2964.RequiredService, IBM.Device.Server.z13-2964.Exploitation, and IBM.Device.Server.z13-2964.RecommendedService.

- 2828DEVICE for the zBC12 server.
  - The FIXCAT name is IBM.Device.Server.zBC12-2828.
- 2827DEVICE for the zEC12 server.
  - The FIXCAT name is IBM.Device.Server.zEC12-2827.

Specific functions for each server also have corresponding FIXCATs.

### Verifying the PTFs in the PSP buckets are installed

- To simplify finding the appropriate PSP bucket and identifying which PTFs listed in the PSP bucket need to be installed on your system, use the SMP/E REPORT MISSINGFIX command in conjunction with the FIXCAT type of HOLDDATA. For complete information about the REPORT MISSINGFIX command, see *SMP/E Commands*. For a description of what FIXCATs are available, go to <http://www.ibm.com/systems/z/os/zos/smpe/> and click on “Guide to fix category values and descriptions”.

### DASD Storage Requirements

Keep in mind the DASD required for your z/OS system includes all z/OS elements (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 estimated total storage required for z/OS V2.3 data sets is provided below. If you add other products to your z/OS V2.3 ServerPac, you will need additional space for those other products.

For z/OS V2R3:

- The total storage required for all the target data sets is approximately 11,572 cylinders on a 3390 device. **It is strongly recommended that you review the size of your existing target volumes and plan for the required target volume storage for z/OS V2R3. This total size exceeds the space on a 3390-9.**
- The total storage required for all the distribution data sets is approximately 16,949 cylinders on a 3390 device.
- The total executable root file system storage is approximately at 5,120 cylinders on a 3390 device when it is an HFS and 5,132 when it is a zFS. Use IBM Health Checker for z/OS check ZOSMIGREC\_ROOT\_FS\_SIZE to determine whether a volume has enough space for the z/OS version root file system, available back to z/OS R9 in APARs OA28684 and OA28631.



- For configuration and execution, additional file system space is needed:
  - You will need 50 cylinders for the /etc file system (either HFS or zFS).
  - For the CIM element, the space required for the /var VARWBEM file system is 94 cylinders primary, 10 cylinders secondary (either HFS or zFS).
  - For Predictive Failure analysis, a separate file system, either HFS or zFS, is created and mounted at mountpoint the /var/pfa. The total space required for zFS or HFS is 300 cylinders primary; 50 cylinders secondary.
  - For z/OSMF additional file system space is needed. Refer to your ServerPac installation or sample jobs provided.
- z/OS V2.1 introduced the z/OS Font Collection base element. This element installs into a separate file system (the “font file system”). You may choose to merge the font file system and root file system if you desire. ServerPac will provide you this file system. The total font file system storage is estimated at 2,342 cylinders on a 3390 device when it is an HFS or a zFS.
- z/OS V2.3 introduces the IBM z/OS Liberty Embedded base element. This element installs into a separate file system (the “Liberty file system”). IBM recommends that you keep the Liberty file system separate from other file systems in case of space fluctuations. ServerPac will provide you this file system. The total Liberty file system storage is estimated at 2,400 cylinders on a 3390 device when it is an HFS or a zFS.

### 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 (5751-COD)

The Customized Offerings Driver V3.1 (5751-COD) 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.

This driver is currently a subset of a z/OS V2R2 system (with the level of SMP/E at V3R6).

The Customized Offerings Driver requires three DASD volumes configured as 3390-9, or larger; a non-Systems Network Architecture (SNA) terminal used for a z/OS MVS™ system console; and a locally attached SNA terminal for a Time Sharing Option Extended (TSO/E) session. Also, if you select tape media, a tape drive that can read 3590 or 3592 tape is required. The Customized Offerings Driver can also be ordered on DVDs, which removes the requirement for a tape drive.

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.

As of z/OS V2R2, the Customized Offerings Driver Installation Guide is no longer shipped in hardcopy format. Instead, this publication is shipped in PDF format on a separate DVD.

The Customized Offerings Driver includes a zFS file system and the necessary function to use Communications Server (IP Services), Security Server, and the system-managed storage (SMS) facility of DFSMSdfp, 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 V2R3

Driving system requirements for installing z/OS V2R3 by way of ServerPac or dump-by-data-set SystemPac are:

- *An operating system:* Use either of the following:
  - A supported z/OS release (V2R1 or later), or
  - The Customized Offerings Driver V3 (5751-COD).
- *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.PFSCCTL resource in the RACF FACILITY class.
  - ☐ 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.

- 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*. Other sources of information are SYS1.SAMPLIB member BPXISEC1. (**Note:** You can use the 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.
- Note that ServerPac supports extended format and extended addressability for zFS data sets. For any zFS data sets that exceed the 4 GB size limit, you must define an SMS Data Class with extended format and extended addressability. Doing so will require that you specify an SMS Data Class name (defined with extended format and extended addressability) in the CustomPac Installation dialog. For information about providing the Data Class information, see *ServerPac: Using the Installation Dialog*.
- *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 SDK for z/OS, Java 2 Technology Edition. z/OS V2R3 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*.

### If you intend to receive your order using Secure FTP (FTPS):

- SMP/E V3R6 or higher
- ICSF configured and active or IBM 31-bit SDK for z/OS, Java Technology Edition V6.0 (5655-R31), or IBM 64-bit SDK for z/OS, Java Technology Edition V6.0 (5655-R32), or higher installed, which enables SMP/E to



calculate SHA-1 hash values to verify the integrity of data being transmitted. If ICSF is not configured and active, SMP/E will use its Java application class instead for calculating the SHA-1 hash values. IBM recommends the ICSF method because it is likely to perform better than the SMP/E method. (To find out how to configure and activate ICSF, see *z/OS Cryptographic Services ICSF System Programmer's Guide*).

- A download file system. Your order is provided in a compressed format and is saved in a download file system. The size of this file system should be approximately twice the compressed size of your order to accommodate the order and workspace to process it.
- Firewall configuration. If your enterprise requires specific commands to allow the download of your order through a local firewall, you must identify these commands for later use in the CustomPac Installation Dialog, which manages the download of your order.
- Ensure that the Root 2 - GeoTrust Global CA Certificate is connected to your security manager keyring and trusted on your system, and that the user ID that executes SMP/E is authorized to use the keyring.
- Ensure that your FTP.DATA data set statements used in the RECEIVE job are set appropriately for your environment. For example, an FTPKEEPALIVE statement with a value of 0 (the default) can cause an FTP control connection to time out in some environments. Also, the security manager keyring file specified by the KEYRING statement in the FTP.DATA file might require certificates to be added. For details about specifying FTP.DATA statements, see *z/OS Network File System Guide and Reference*.

### **If you intend to download your order using HTTP Secure (HTTPS):**

- SMP/E V3R6 with PTFs UO01693 (Base), UO01695 (Japanese), and UO01741 (Base) or higher
  - SMP/E uses the services of IBM 31-bit SDK for z/OS Java Technology Edition V6.0 (5655-R31), or IBM 64-bit SDK for z/OS Java Technology Edition V6.0 (5655-R32) or higher.
- A download file system. Your order is provided in a compressed format and is saved in a download file system. The size of this file system should be approximately twice the compressed size of your order to accommodate the order and workspace to process it.
- Proper level of CustomPac Installation Dialog to support HTTPS downloads. The CustomPac Installation Dialog must be at a level of 26.20.00 or higher. For further details see "Updating Your Dialogs" and "required migration step" in *ServerPac: Using the Installation Dialog*.
- HTTP or SOCKS Proxy Server configuration. If your enterprise requires specific commands to allow the download of your order through an HTTP or SOCKS Proxy Server, you must identify these commands for later use in the CustomPac Installation Dialog, which manages the download of your order.
- Ensure that the Root 2 - GeoTrust Global CA Certificate is connected to your security manager keyring or stored in your default Java keystore file and trusted on your system, and that the user ID that executes SMP/E is authorized to use the keyring or default Java keystore file.
- For instructions on how to set up and verify that your system can connect to the IBM download servers, see the Connectivity Test for SW Download Readiness web site.
- For more information about how to set up FTPS or HTTPS, see *SMP/E for z/OS User's Guide*.

### **If you intend to receive your order by way of DVD, you need the following:**

- Order available on z/OS host system. To make the order available on your z/OS host system, upload the order to the z/OS host from the DVD(s). Refer to readme.pdf on the first DVD to find the various methods for making your order available on your z/OS host system.
- Space requirements on z/OS. Ensure you have the required space on your z/OS host system. To get the actual size of the order, refer to dialog.txt on the first DVD.
- Space requirements on a workstation. If you chose to copy your order from the DVD(s) to a workstation before uploading the contents to your z/OS host system, ensure you have the required space available on your workstation.
- 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 and 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.

## Product Delivery Statement of Direction\*



As announced on February 21, 2017, RFA 72287:

"IBM intends to discontinue delivery of z/OS platform products and service on magnetic tape in the future. IBM recommends downloading products and service. However, if you have a requirement for physical media, products and service are also available on DVD."\*

Are you ready for all electronic delivery, or do you need to use the DVD delivery?

\*IBM's statements regarding its plans, directions, and intent are subject to change or withdrawal without notice at IBM's sole discretion.

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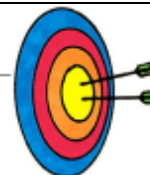
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### Electronic Delivery for Secure z/OS Software Delivery

IBM removed support for unsecured FTP connections used for z/OS software and service delivery in the 1Q2016 timeframe. At that time, new z/OS software (products and service) direct-to-host downloads required the use of FTPS (File Transfer Protocol, supporting the Transport Layer Security (TLS) and Secure Sockets Layer (SSL) cryptographic protocols) or HTTPS (Hypertext Transfer Protocol Secure, supporting the TLS and SSL cryptographic protocols).

If you plan to use FTPS or HTTPS, IBM recommends that you visit the Connectivity Test website to verify your system setup well in advance. No change is required to use Download Director with encryption to download packages to a workstation and transfer them to z/OS later; however, you can also verify Download Director with the Connectivity Test. The Connectivity Test can be found at [https://www14.software.ibm.com/webapp/iwm/web/preLogin.do?lang=en\\_US&source=cbct](https://www14.software.ibm.com/webapp/iwm/web/preLogin.do?lang=en_US&source=cbct)

## Target System HW Requirements for z/OS V2R3



### • Hardware Requirements

#### • Processor Requirements for z/OS V2R3:

- IBM System z server: **z14, z13, z13s, zEC12, and zBC12.**

#### • Minimum Memory Requirements for z/OS V2R3 on z14:



- z/OS V2.3 on z14 “native”: **8 GB** of memory
  - < 8GB : WTOR in which your reply indicates you know that running less than the minimum might impact availability.
- z/OS V2.3 on z14 “guest” or with zPDT: **2 GB** of memory
  - < 2GB : WTOR in which your reply indicates you know that running less than the minimum might impact availability.
- Health Check on V2.1+ to warn you that the minimum hasn’t been met today.
- WTOR is **IAR057D LESS THAN 8 GB OF REAL STORAGE IMPACTS SYSTEM AVAILABILITY – ADD STORAGE OR REPLY C TO CONTINUE.**

#### • Coupling Facility: see

<http://www.ibm.com/systems/z/advantages/psocftable.html>

- z14 initially ships with CFCC level 22.
- Larger CF structure sizes may be necessary when changing CFCC levels.
- As it has been since CFCC 17, ensure that the CF LPAR has at least 512MB of storage.

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## Target System Hardware Requirements

The minimal hardware requirements for z/OS, as well as additional hardware needed by specific z/OS elements and features, are documented in *z/OS Planning for Installation*.

### Identifying Processor Requirements

**z/OS V2R3** supports these System z server models:

- IBM z14
- IBM z13 and z13s
- IBM zEnterprise zBC12 and zEC12

The following IBM System z servers, and earlier servers, are not supported with **z/OS V2R3** and later releases:

- IBM zEnterprise 196 (z196) and IBM zEnterprise 114 (z114)
- IBM System z10 EC and System z10 BC

**Important:** If you IPL z/OS on a server that it does not support, you might receive wait state 07B-1E (decimal 30). The number of IEA434I messages is limited to 32 during IPL/NIP to avoid exhausting initial ESQA. An IEA444I message will be reported one time during IPL/NIP to indicate that additional IEA434I messages have been suppressed: IEA444I NUMBER OF IEA434I MESSAGES EXCEEDS NIP MAXIMUM .

### Identifying Minimum Storage Requirements

IBM z/OS V2.3 with IBM z14 will require a minimum of 8 GB of memory. When running as a z/VM guest or on a IBM System z Personal Development Tool, a minimum of 2 GB will be required for z/OS V2.3. If the minimum is not met, a warning WTOR will be issued at IPL. Continuing with less than the minimum memory could impact availability. A migration health check is planned to be introduced for z/OS V2.2 and z/OS V2.1 with PTFs to warn you when an LPAR on a z14 system has been configured with less than 8 GB.

### Identifying Coupling Facility Requirements

There are hardware and software requirements related to coupling facility levels (CFLEVELs). See <http://www.ibm.com/systems/z/advantages/psocftable.html>

When you change coupling facility control code (CFCC) levels, your coupling facility structure sizes might change. If, as part of your migration to a z14 server, you change CFCC levels, you might have larger structure sizes than you did previously. If your CFCC levels are identical, structure sizes are not expected to change when you migrate from a previous server to a newer generation server.

In addition, similar to CF Level 17 and later, ensure that the CF LPAR has at least 512MB of storage.

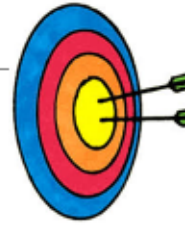
CFCC Level 22, introduced on the z14, supports the Coupling Facility use of Large Memory to improve availability for larger CF cache structures and data sharing performance with larger DB2 Group Buffer Pools (GBP) with no DB2 supporting code required. This support removes inhibitors to using large CF cache structures, enabling use of Large Memory to appropriately scale to larger DB2 Local Buffer Pools (LBP) and Group Buffer Pools (GBP) in data sharing environments. If you are moving your coupling facilities and the coupling facility structures will be on higher CFCC levels than they were previously, run the Coupling Facility Structure Sizer (CFSIZER) tool to find out if you have to increase coupling facility structure sizes. Prepare to make the necessary changes to the CFCC level as indicated by the tool.

You can download the CFSIZER tool at Coupling Facility sizer (<http://www.ibm.com/systems/support/z/cfsizer/>).

**Note:** After you make a coupling facility available on the new hardware, you can run the Sizer utility, an authorized z/OS program, to evaluate structure size changes. The Sizer utility is distinct from CFSizer, and should be run after the new hardware (CFLEVEL) is installed, but before any CF LPAR on the new hardware is populated with structures. You can download the Sizer utility at <http://www.ibm.com/systems/support/z/cfsizer/altsize.html>.

- IBM z14 servers initially ship with CFCC level 22.
- IBM z13s servers initially ship with CFCC level 21.
- IBM z13 servers initially ship with CFCC level 20.
- IBM zEnterprise zEC12 servers initially shipped with CFCC level 18. After Sept 2013, the zEC12 and zBC12 ship at CFCC level 19.

## Software Requirements for z/OS V2R3



- **Software Requirements:**
  - **Coexistence Software** (on other z/OS systems)
  - **Target Software** (correct levels of IBM non-z/OS and non-IBM products on the z/OS system)
    - *Generally, you may use the product levels on z/OS V2R3 from your prior system, as long as those product levels are still service-supported.*
    - *Note, however, that if you are using any of the functions in z/OS V2R3 Planning for Installation, Appendix B, verify that those functional requirements are satisfied.*
    - *z/OS V2R3 has an overall dependency on IBM 64-bit SDK for z/OS, Java Technology Edition, V8 and IBM 31-bit SDK for z/OS, Java Technology Edition, V8.*
      - *For the specific Java dependencies for each element, see z/OS V2R3 Planning for Installation, Appendix B.*

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### Choosing ISV products that you want to run with z/OS V2.3

For a list of independent software vendors (ISVs) that support z/OS V2.3, a link will be provided from this anticipated website <http://www.ibm.com/systems/z/os/zos/features/software/isv230.html>.

For a list of independent software vendors (ISVs) that support z/OS V2.2, a link is provided from this website <http://www.ibm.com/systems/z/os/zos/features/software/isv220.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>

## Selected z/OS V2R3 SW Functional Requirements



Function	Minimum functional dependency
z/OSMF	IBM 64-bit SDK for z/OS, Java Technology Edition, V8 (5655-DGH)
BCP Predictive Failure Analysis (PFA)	IBM 31-bit SDK for z/OS, Java 2 Technology Edition, V8 (5655-DGG)
BCP Capacity Provisioning	IBM 31-Bit SDK for z/OS, Java 2 Technology Edition V8 (5655-DGG)
Knowledge Center for z/OS	IBM 64-bit SDK for z/OS, Java Technology Edition, V8 (5655-DGH)
IBM Application Performance Analyzer for z/OS	14.1 level at a minimum. Earlier levels of this product are not supported for use with z/OS V2R3
IBM Security zSecure™ products: <ul style="list-style-type: none"> <li>• zSecure Admin (5655-N16)</li> <li>• zSecure Visual (5655-N20)</li> <li>• zSecure Audit (5655-N17). A subset of the zSecure Audit functions is contained in Adapters for QRadar® SIEM (5655-AD8).</li> <li>• zSecure Alert (5655-N21)</li> <li>• zSecure Command Verifier (5655-N19)</li> <li>• zSecure CICS Toolkit (5655-N18), which is installed on CICS.</li> </ul>	2.3.0 level at a minimum. Earlier levels of this product are not supported for use with z/OS V2R3.

→ Use FIXCAT IBM.TargetSystem-RequiredService.z/OS.V2R3

→ Website <http://www-306.ibm.com/software/support/lifecycle/> can be helpful.

→ Better! Use z/OSMF's Software Management report to help identify installed products that are approaching or are at EOS.



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

You must determine the minimum product release levels and release levels for functional requirements. IBM middleware and application products require a specific level (version, release, or PTF) so that the products will run on z/OS V2R3. You cannot use the FIXCAT support to determine these release levels. Instead, you can refer to *z/OS V2.3 Planning for Installation*, Appendix B, for the functions of z/OS that require specific z/OS optional features, IBM middleware products, or IBM application products.

**If you are upgrading from z/OS V2R1 or z/OS V2R2, you may generally use the product levels on z/OS V2R3 that you used on your prior z/OS release, as long as the product levels are still service-supported.**

Note, however, that if you are using any of the functions in *z/OS V2.3 Planning for Installation*, Appendix B, and those functions have dependencies on IBM middleware or application products, you must use the product levels shown (or later).

Many of these products can be ordered as part of your z/OS ServerPac order. Note that there may be differences between what is minimally service supported, what is minimally supported with z/OS V2R3, and what is currently orderable.

If you're migrating to z/OS V2R3, you can find out which products have new levels by using Shopz 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.

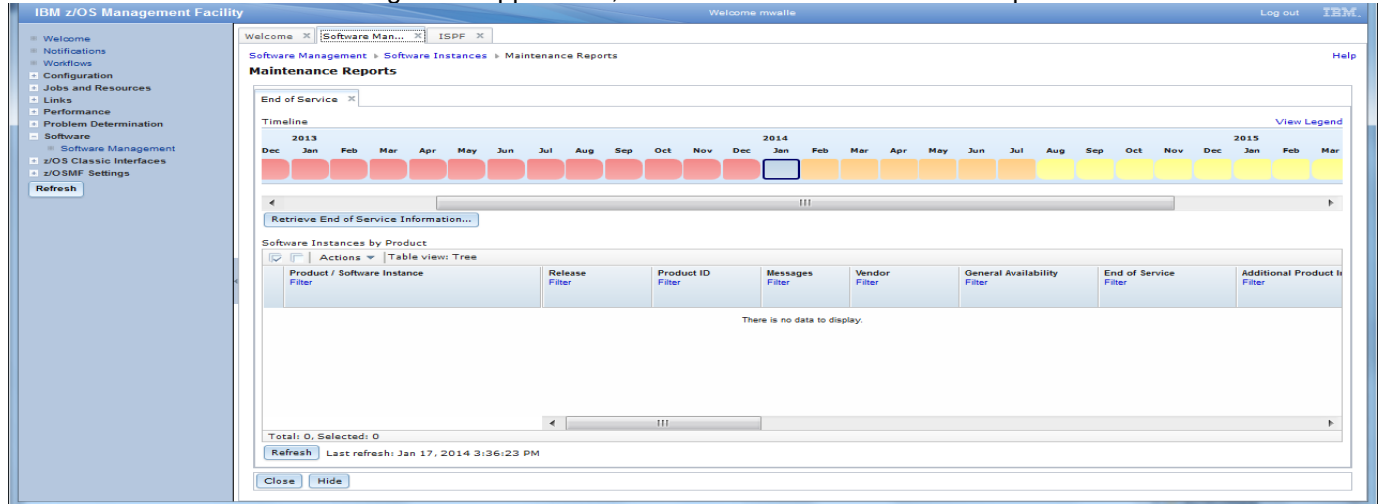


### Finding End of Service Dates for IBM Products

A handy website for finding end of service dates for IBM products is

<http://www.ibm.com/software/support/lifecycle/>.

An especially useful way of identifying if any of the products you are approaching or have met end of service is to use the z/OSMF Software Management application, and look at the End of Service report!



## Target System PTF Verification for z/OS V2R3



1. **RECEIVE** the latest HOLDDATA. (If you pull HOLDDATA from the ftp website, make sure you use FULL!)
  - HOLDDATA is produced to associate a particular PTF with a minimum or functional level for z/OS V2R3.

```
++HOLD(HLO1221) FIXCAT FMID(HLO1221) REASON(AQ22974)
RESOLVER(UQ27746) CATEGORY(IBM.TargetSystem-
RequiredService.z/OS.V2R3) DATE(17054) .
```

2. Run the **REPORT MISSINGFIX** command to see what is needed, but not yet installed.

```
SET BDY(GLOBAL) .      /* Your IBM APL2 FOR MVS V2.2 global */
REPORT MISSINGFIX ZONES(APL2TGT)
FIXCAT(IBM.TargetSystem-RequiredService.z/OS.V2R3) .
```

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### Programmatic Help with Target System PTF Verification for z/OS V2.3

The IBM PTFs needed to support z/OS V2.3 are identified with a FIXCAT called **IBM.TargetSystem-RequiredService.z/OS.V2R3**, in Enhanced HOLDDATA. You must use the SMP/E **REPORT MISSINGFIX** command to help identify those PTFs on your current system which would be needed for your upgrade to z/OS V2R3. It is a good idea to periodically re-run the **REPORT MISSINGFIX** command to determine if any new PTFs have been identified that you are missing.

**Coexistence System PTF Verification for z/OS V2R3**

IBM

1. **RECEIVE the latest HOLDDATA.** (If you pull HOLDDATA from the ftp website, make sure you use FULL!)
  - **HOLDDATA is produced to associate a particular PTF as coexistence between z/OS V2R1 or V2R2, with z/OS V2R3.**



```
++HOLD(HDZ2220) FIXCAT FMID(HDZ2220) REASON(AA50220)
RESOLVER(UA82763) CATEGORY(IBM.Coexistence.z/OS.V2R3)
```

2. **Run the REPORT MISSINGFIX command to see what is needed, but not yet installed.**

```
SET BDY(GLOBAL). /* Your z/OS V2R2 global */
REPORT MISSINGFIX ZONES(ZOS22T)
FIXCAT(IBM.Coexistence.z/OS.V2R3,
      IBM.Function.HealthChecker).
```

For the migration  
health checks ☺!



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**Using FIXCAT for coexistence PTFs for z/OS V2R3**

For coexistence verification for z/OS V2R3, the fix category of interest is **IBM.Coexistence.z/OS.V2R3**. You can use the FIXCAT of ++HOLD statement to identify APARs, their fix categories, and the PTF that resolves the APAR. Another fix category that is helpful when doing the coexistence verification is **IBM.Function.HealthChecker**, for verifying that you've got the latest migration IBM Health Checks for z/OS installed on your coexisting system.

When FIXCAT HOLDDATA statements are received into a global zone, SMP/E assigns the fix category values as sourceids to the PTFs that resolve the APARs. These sourceids then simplify selecting and installing required fixes. During APPLY and ACCEPT command processing you can specify the assigned sourceids on the SOURCEID and EXSRCID operands to select the SYSMODs associated with a particular fix category.

In addition, for the APPLY and ACCEPT commands you can specify which Fix Categories are of interest using the new FIXCAT operand. This tells SMP/E to process only FIXCAT HOLDDATA for the categories you specify, and all others are ignored.

Finally, SMP/E uses the FIXCAT HOLDDATA to identify what required fixes are missing. The REPORT MISSINGFIX command analyzes the FIXCAT HOLDDATA and determine which fixes (APARs) identified by the HOLDDATA are not yet installed. Only the fixes associated with the fix categories of interest to you, specified by you, are analyzed and identified. For example, you can identify only the missing fixes associated with a particular hardware device or coexistence for a specific new software release.

Note that you can use wildcards in the FIXCAT name in the REPORT MISSINGFIX command. For example, if you wanted to verify coexistence for z/OS V2R2 as well as z/OS V2R3 on your z/OS V2R1 system, your command could be:

```
REPORT MISSINGFIX ZONES(ZOSR21T) FIXCAT(IBM.Coexistence.z/OS.V2R*,
                                         IBM.Function.HealthChecker).
```

Do notice though, that z/OS V2.2 coexistence fixes have also been "backmarked" for z/OS V2.3 coexistence, so it is no necessary to specify interim z/OS releases for coexistence verification.

## Some Migration Tasks You Can Do NOW








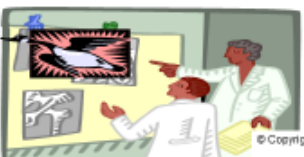
1. **Transition off of removed functions and elements:**
  - In V2.2: IBM HTTP Server Domino->Apache 🔥, JES2 z2, ...
  - In V2.3: Consoles shared mode, TCP/IP legacy devices, ...
  - Beyond V2.3: HFS 🔥, physical tapes, ...
2. **Prepare for z/OSMF V2.3 starting at IPL – more in Part 2.** 🔥
3. **Prepare Driving and Target Systems:**
  - Driving systems – a supported z/OS system is required
  - Target systems -
    - HW: zEC12 or higher. Memory on z14: 8GB “native”. 🔥
    - SW: Java V8, other products
    - DASD storage for z/OS V2R3 – new Liberty file system
    - IBM product level research: FIXCAT **IBM.TargetSystem-RequiredService.z/OS.V2R3**
    - ISV research for z/OS V2R3
  - Coexisting systems - FIXCAT **IBM.Coexistence.z/OS.V2R3**
4. **Use IBM Health Checker for z/OS** FIXCAT **IBM.Function.HealthChecker**
  - Activate the Migration Health Checks (they are shipped INACTIVE).
5. **If you have z/OSMF V2.1, use the z/OS V2.3 Migration Workflow!**
6. **Perform z/OS V2R3 migration actions you can do NOW.**

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### Prepare for your migration to z/OS V2.3!

In this presentation you've seen many things you can do right now, on your current z/OS release to help make your z/OS V2R3 migration smooth. Listed above are a recap of the things that were shown in this presentation, but make sure you review the migration actions (and look at the z/OS Migration Workflow or the *z/OS Migration* book) so that you know a more complete migration picture.

IBM Health Checker for z/OS Checks for Migration		IBM
1. ZOSMIGREC_ROOT_FS_SIZE	17. ZOSMIGV2R2_Next_CS_SMTPDDAEMON	
2. XCF_SYSPLEX_CDS_CAPACITY	18. ZOSMIGV2R2_Next_CS_SMTPDMTA	
3. RSM_MEMLIMIT	19. ZOSMIGV2R2_Next_CS_SENDMAILDAEMN	
4. ZOSMIGV2R3_RSM_Minimum_Real (and RSM_Minimum_Real)	20. ZOSMIGV2R2_Next_CS_SENDMAILCLIEN	
5. IOS_FABRIC_MONITOR	21. ZOSMIGV2R2_Next_CS_SENDMAILMTA	
6. SUP_HiperDispatchCPUConfig	22. ZOSMIGV2R2_Next_CS_SENDMAILMSA	
7. CNZ_CONSOLE_OPERATING_MODE	23. DMO_REFUCB	
8. RSM_Include1MAFC	24. JES2_Z11_Upgrade_CK_JES2	
9. RSM_REAL	25. JES3_DATASET_INTEGRITY	
10. VSM_ALLOWUSERKEYCSA	26. SDSF_ISFPARMS_IN_USE	
11. ZOSMIGV2R2_Next_IXG_Remove_DRXRC	27. USS_HFS_DETECTED	
12. ZOSMIGV2R2_NEXT_CS_TFTP	28. RACF_ENCRYPTION_ALGORITHM	
13. CSVTAM_VIT_OPT_STDOPTS	29. TSOE_OPERSEWAIT_SETTING	
14. VSAM_CA_RECLAIM	30. ICSFMIG77A1_CCA_COPROCESSOR_ACTIVE	
15. ZOSMIGV2R1_CS_LEGACYDEVICE	31. ICSFMIG77A1_TKDS_OBJECT	
16. ZOSMIGV2R1_CS_GATEWAY	32. ZOSMIG_HTTP_SERVER_DOMINO	
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### Using IBM Health Checker for z/OS for migration purposes

Starting in z/OS V1R10, the Health Checker infrastructure is exploited for migration purposes. Health Checks that are helpful for determining migration action applicability are provided. These checks ("Migration Health Checks") should be used prior to your migration to the new z/OS release to assist with your migration planning, and re-run after your migration to verify that the migration action was successfully performed. As with any Health Check, no updates are performed to the system. Migration Health Checks only report on the applicability of a specific migration action on a system; and only report on the currently active system.

Details on how to run the Migration Health Checks are provided in beginning of the *z/OS Migration* book.

### System REXX health check considerations

All exploiters of the System REXX support in z/OS require that the System REXX customization be performed. Using the IBM Health Checker for z/OS health checks is one example of possible System REXX exploitation. In particular, any compiled REXX execs must have the proper runtime support available from the Alternate Library for REXX (available in z/OS since V1R9) or from the IBM Library for REXX on zSeries (5695-014). Several IBM Health Checker for z/OS migration health checks have been written in compiled System REXX. These health checks rely upon the System REXX customization and runtime activities being completed. If System REXX (and the security environment that System REXX requires) have not been properly customized, then System REXX health checks will not execute successfully.

- For System REXX customization activities, refer to "System REXX" in *z/OS MVS Programming: Authorized Assembler Services Guide*.
- For compiled REXX exec runtime availability, see "Alternate Library for REXX Customization Considerations" in *z/OS Program Directory*, or refer to product documentation accompanying IBM Library for REXX on zSeries.

### Migration Health Checks and Best Practice Health Checks

Migration Health Checks are not different from other Health Checks, but they do have some characteristics which allow them to be uniquely identified.

For z/OS, the convention is **ZOSMIGVvRr***\_component\_program\_name*. The names of migration checks begin with the characters **ZOSMIG**. Following this prefix is a value to help you plan the timing of the migration action, as follows:

- **ZOSMIGVvRr\_Next** : Migration action is recommended, but will become a required migration action in the release after VvRr.
- **ZOSMIGVvRr\_Next2** : Migration action is recommended, but will become a required migration action two releases after VvRr.
- **ZOSMIGVvRr** : Migration action is required in the release indicated by VvRr.
- **ZOSMIGREC** : Migration action is recommended for the foreseeable future. The migration action might never be required.
- **ZOSMIGREQ** : Migration action that is recommended now, but will be required in a future release.

For the ICSF element, the convention is **ICSMIGnnnn***\_component\_program\_name* ).

Migration checks have a status of **INACTIVE** by default. Because you may not want to know about migration actions during non-migration periods, Migration Health Checks will not automatically be active.

There are Best Practice Health Checks that can help with migration actions, and yet they do not have the Migration Health Check naming convention. That is because the component owners felt that the practice is recommended for reasons above and beyond migration purposes. All Health Checks (whether they are Migration Health Checks or Best Practice Health Checks) will be cross-referenced in the *z/OS Migration* book when they can assist with a specific migration action. *Be aware, your migration assistance is not just limited to the checks that follow the Migration Health Check naming convention!*

For description of the health checks above, which release they run on, and their severity refer to the *Health Checker User's Guide*.



## Using z/OSMF Workflow for z/OS V2.3 migration!



A z/OS Web site contains z/OSMF Workflow files which are derived from the z/OS V2.3 Migration book.

- ✓ Workflows are kept in sync with the latest Migration book level!
- ✓ Do **not** use the z/OS V2.3 Migration book, if you have z/OSMF!

### ▪ New features in the z/OS V2.3 Migration Workflow!

- Discovery of used priced features, and some functions
  - This skips steps right away, that you don't need.
- Invocation of health checks to determine migration applicability.
  - A health check exception will mark the workflow step as failed, until re-run as successful.
- Ability to optionally provide feedback on your migration experience.
  - Provide feedback on every migration action, and on the migration as a whole, if you desire.

▪ Minimally requires: z/OSMF V2.1 with PTF UI43847 (Jan 2017)



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## z/OS V2.3 Migration Workflow



First step...Discover features in use

The screenshot shows the IBM z/OS Management Facility (z/OSMF) interface. The main heading is "ESP Copy - Customer Level V2.2 to V2.3". Below this, there are details about the workflow, including a progress bar showing 6% completion. The "Workflow Steps" section lists several steps, with the first step, "Discover z/OS features in use", highlighted in yellow. A yellow callout box points to this step with the text "Skips unused features". The table below shows the following steps:

State	No.	Title
Complete	1	Discover z/OS features in use
In Progress	2	Chapter 1. Migration: Introduction
In Progress	3	Chapter 2. General migration actions for everyone migrating to z/OS V2R3
In Progress	4	Chapter 3. Migration from z/OS V2R2
In Progress	4.1	BCP migration actions
In Progress	4.15	ICKDSF (Device Support Facility)
Skipped	4.16	Infoprint Server migration actions
In Progress	4.17	Integrated Security Services migration actions
In Progress	4.18	JES2 migration actions
Skipped	4.19	JES3 migration actions

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## z/OS V2.3 Migration Workflow

IBM

For a migration action associated with a health check:

Workflows > ESP Copy - Customer Level V2.2 to V2.3 > 4.1.1.1. Ensure that your sysplex uses the distributed mode of console operation

Properties for Workflow Step 4.1.1.1. Ensure that your sysplex uses the distributed mode of console operation

General
Details
Dependencies
Notes
Perform
Status
Input Variables
Feedback

**Review Instructions**

Create JOB statement

Review JCL

Submit and Save JCL

**Review Instructions**

To proceed with the guided path through creating and submitting the JCL on SHARPLEX.LOCAL, click **Next**. Or, you can choose to bypass this step. If so, first review and confirm that the instructions below are complete. Then, click **Finish** to mark the step complete.

Instructions:

This portion of the Workflow will guide you to submit a job to run an IBM Health Check for z/OS associated with this migration action.

**IBMCNZ,CNZ\_CONSOLE\_OPERATING\_MODE**

This check will be activated if it is not already active. If the check is activated, it will be deactivated at the end of the job, so that it remains in the same state as it was found.

If the health check runs with no exception, this step will be marked "Complete" indicating that this migration action requires no more activity.

If the health check fails, an exception will be raised and the job will be marked as "Failed". This failure can be resolved by reviewing the instructions and ensuring they are complete.

Back
Next >
Save
Finish
Cancel

Follow instructions to run the health check.

☒ Complete
4.1.1.1
Ensure that your sysplex uses the distributed mode of console operation

34 Check succeeds = step completed.

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## z/OS V2.3 Migration Workflow

IBM

Optional feedback is built in:

Workflows > ESP Copy - Customer Level V2.2 to V2.3 > 4.1.1.1. Ensure that your sysplex uses the distributed mode of console operation

Properties for Workflow Step 4.1.1.1. Ensure that your sysplex uses the distributed mode of console operation

General
Details
Dependencies
Notes
Perform
Status
Input Variables
Feedback

Please provide feedback for this workflow step by answering the question below.

1. Did you complete this step?

☐ Yes.

☐ No, not applicable. Skip to Comments.

☐ No, don't know if needed. Skip to comments.

☐ No, will defer to later. Skip to Comments.

☐ other:

2. How difficult was performing this migration action?

☐ Easier than expected

☐ More difficult than expected

☐ About what was expected

**save submit**

Your opinion of the migration action.

### Continuing the advancement in z/OS migration assistance!

We have copied the z/OS Migration book into two z/OS Management Facility (z/OSMF) z/OS Migration Workflows. (One for the V2R1 to V2.3 path, one for the V2.2 to V2.3. path.) Using the z/OSMF workflow, you can go through a z/OS V2.3 migration as an interactive, step-by-step process. Depending on your z/OS V2.3 migration path, you select the files you will need. If you do not download all necessary files, your workflow cannot be created.

The Workflow XML documents are identical to the z/OS Migration book (GA32-0889), meaning the book contains identical information to the Workflow XML documents. However, in z/OS V2.3 (continuing what was introduced in V2.2) the z/OS Migration Workflow has the capability to invoke IBM Health Checker for z/OS health checks directly from the step, and also provides the optional capability to give feedback on your migration experience.

A new addition to the z/OS V2.3 Migration Workflow is the ability to discover used z/OS priced features, and some other features, on your system. This is very helpful, because if you are not using a certain feature, then why have to manually skip those steps yourself? The z/OSMF Workflow can identify many features that you might not be using, and automatically skip them in the Workflow for you, giving you less steps to perform.

This tool is not supported by the IBM Service organization but rather by the tool owner on a best-can-do basis. Please report any problems, suggestions, or comments to [zosmig@us.ibm.com](mailto:zosmig@us.ibm.com).

If you would like to see a short demo on using the z/OS V2.1 migration workflow, visit [IBM® z/OSMF V2.1 Migration Workflow Demo on YouTube](#).

**z/OS V2.3 Migration Workflow level:** You can easily see which book level your workflow corresponds to by selecting the “Chapter 1: Migration: Introduction” step in the workflow. Look on the General tab in the Description to see which level of the book that that z/OS Migration Workflow corresponds to. . As the z/OS V2.3 Migration book is updated, the corresponding z/OSMF Workflow files are planned to be updated. Check the level of the Workflow document to see what the corresponding level of the book is.

[Workflows](#) > [ESP Copy - Customer Level V2.2 to V2.3](#) > 2. Chapter 1: Migration: Introduction

**Properties for Workflow Step 2. Chapter 1. Migration: Introduction**

**General**

Details

Dependencies

Notes

Perform

Status

Input Variables

Feedback

Title:  
Chapter 1. Migration: Introduction

Description:  

This z/OSMF Workflow was derived from the *Migration from z/OS V2R2 and z/OS V2R1 to z/OS V2R3*, GA32-0889-30.

**Summary of changes**

This information includes terminology, maintenance, and editorial changes. Technical changes or additions to the text and illustrations for the current edition are indicated by a vertical line to the left of the change.

### Migration Workflow Tips

1. To be consistent with the book, the workflows include some migration actions shown as "None" for components that do not have any migration action. "None." still counts as a workflow sub-task to complete, even though there is no migration action to perform. To complete the sub-task, mark the migration action sub-tasks with an "Override-complete" to have them designated as complete.
2. The URL links to the documentation in the workflow cannot go to an anchor in the web page. The URLs will just bring you to the web page, not content that may be further down in the page. You may have to scroll down on the web page to find the information that you need.
3. Some migration actions have associated health checks. For those steps, the health check will be invoked to determine if the migration action is applicable to your system. Read the instructions carefully on the Perform tab before running the health check, as important information is provided for each check.
4. For each migration action and for the entire migration, you can optionally provide your feedback to IBM. Just follow the instructions you see in z/OSMF. You do not need to provide feedback to complete each step of the workflow.

## ServerPac Migration Actions



- **Ensure that ServerPac dialog is updated**
  - Check the level of your dialog, it must minimally be:
    - **FTP over SSL (FTPS):** level 27.12.00 or higher.
    - **HTTPS:** level 27.20.00 or higher
  - If the dialog is not the required minimum, the RECEIVE job failures.
- **ServerPac new JOB LIMIT= update**
  - Dialog JOB default at 27.20.00 has LINES=(999999,WARNING).
    - The LINES parameter indicates the maximum amount of output, in thousands of lines, that a job can print to its SYSOUT data set.
  - You can update your own JOB with this, or use the new default.

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## ServerPac Migration Actions

### Ensure that the CustomPac Installation Dialog is updated

As of May 22, 2016, you can no longer download orders from IBM download servers by using standard FTP. To download your ServerPac or dump-by-data-set SystemPac order securely, you require a sufficient level of the RECEIVE job that is provided in the CustomPac Installation Dialog. The specific level that is required depends on the download method to be used, as follows:

**FTP over SSL (FTPS):** To download your order securely by using FTP over SSL (FTPS), you require the updated RECEIVE job that is provided in the CustomPac Installation Dialog level 27.12.00 or higher.

**HTTPS:** To download your order securely by using HTTPS, you require the updated RECEIVE job that is provided in the CustomPac Installation Dialog level 27.20.00 or higher. To determine the current level of the CustomPac Installation Dialog in use on your system, check the primary panel CPPPPOLI.

To prepare for downloading an order, IBM recommends that you begin by visiting the Connectivity Test website to verify your system setup. No change is required for using Download Director with encryption; however, you can also verify Download Director with the Connectivity Test. The Connectivity Test can be found at Connectivity Test for SW Download Readiness ([www.ibm.com/marketing/iwm/iwm/web/preLogin.do?lang=en\\_US&source=cbct](http://www.ibm.com/marketing/iwm/iwm/web/preLogin.do?lang=en_US&source=cbct)).

**Migration action:** Update your dialog with the provided job for the minimum you require.

### Consider using the new JOB statement for the CustomPac installation dialog

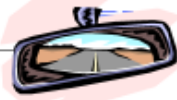
A new default JOB statement with the LINES parameter is provided with CustomPac dialog level 27.20.00. If you want to use the new default JOB statement, ensure that the CPP@JOB member is not present in data set *userid.ISPF.ISPPROF* before you start the installation dialog. However, if you want to continue to use your existing JOB statement for the RECEIVE job and installation jobs, do nothing.

The LINES parameter indicates the maximum amount of output, in thousands of lines, that a job can print to its SYSOUT data set. The LINES parameter also specifies the action that the system is to take if this maximum is exceeded. In CustomPac dialog level 27.20.00, the LINES parameter in the default JOB statement is set to the following specification: LINES=(999999,WARNING). As a result, the CustomPac jobs can print up to 999999 lines of output before the system issues a warning to the system operator.

**Migration action:** Follow these steps:

1. If your installation uses a customized JOB statement with the RECEIVE and installation jobs, determine whether to use the default JOB statement instead. The JOB statement is contained in the CPP@JOB member in data set *userid.ISPF.ISPPROF*.
2. To use the new JOB statement, remove the CPP@JOB member from data set *userid.ISPF.ISPPROF* before you start the installation dialog. Otherwise, do nothing; the CustomPac jobs continue to use your existing JOB statement values.

## Migrating to z/OS V2.3: Planning Summary



- **Changing content of z/OS V2R3**
    - New z/OS V2.3 content: IBM z/OS Liberty Embedded
    - New z/OS V2.2 content: z/OSMF, **IBM HTTP Server Apache**, OpenSSH, KC.
    - Prepare now for future removed content: **HFS, BookManager READ**,...
  - **Get onto z/OSMF right now (V2R1 or V2R2). Plan for z/OSMF auto-starting in V2.3.**
  - **Timeline of z/OS ordering and deliverables:** associated products to consider
  - **z/OS Policies**
    - Three consecutive releases (V2.1 → V2.3) for coex, mig, fallback.
  - **Ensuring System Requirements are Satisfied**
    - Driving, Target SW, Target HW, and Coexisting System Requirements
      - z/OS V2.3 is requires **zEC12** or later
      - z/OS V2.3 **on z14** requires **8 GB** "native", or 2 GB zPDT or zVM of memory
      - Target system requirements: general Java SDK V8 functional requirement.
      - Prepare for physical tape removal in the future.
      - Use FIXCATs `IBM.TargetSystem-RequiredService.z/OS.V2R3`, `IBM.Coexistence.z/OS.V2R3`, `IBM.Function.HealthChecker`, ...
  - **Use IBM Health Checker for Migration Actions:** Install and activate checks
  - **Use z/OSMF Workflow for z/OS V2.3 Migration:** Goodbye, book!
  - **ServerPac migration actions:** min. dialog level, LIMIT= default changed
- ...Next will be the specific migration actions for z/OS V2.3...

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