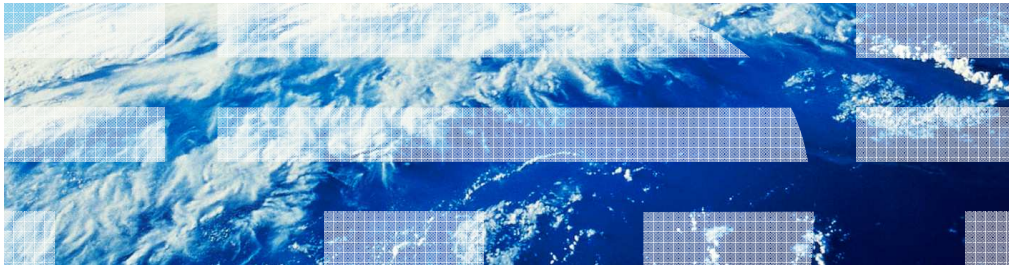


Migrating to z/OS R13 - Part 3 of 3



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If you have never installed a ServerPac before, or it has been a long time since you have, this is the session for you. The speaker will cover the basic concepts of a ServerPac install, and go through at a high level what the tasks are. Some of the more recent important enhancements will be covered, to help you get the most out of your ServerPac install.

Grateful acknowledgement to Lucy Miller, Senior IT Architect for Customized Offerings, for providing the basis for this presentation.

- **Migration Actions for z/OS R11 and R12:**

- Distributed File Service
- JES2
- JES3
- Language Environment
- z/OS UNIX



- **SMP/E and ServerPac Enhancements for Install**
- **Some Helpful z/OS R13 Sysprog Enhancements!**
- **Summary**

Structure of *Migrating to z/OS R13* Presentations



• Session Part 1 of 3

- Content of z/OS R13: changing and withdrawn elements and functions
- Ordering and Deliverables
- z/OS Policies: coexistence support between z/OS R11, R12, and R13
- Planning for z/OS R13: system requirements for hardware and software
- Programmatic Verification of Migration Actions
- Positioning for sharing IEASYSxx, if desired

• Session Part 2 of 3

- Migrations actions for z/OS R13 and R12 from selected elements:
 - General
 - BCP
 - Communications Server
 - DFSMS
 - Infoprint Server
 - Cryptographic Services System SSL
 - TSO/E



• Session Part 3 of 3

- Content is what you just saw on the prior foil

Definition of “Migration Action”:



- **Upgrading to a new z/OS release is a two step process:**
 1. **Migration:** the installation of a new version or release of a program to replace an earlier version or release.
 2. **Exploitation:** usage of new enhancements available in the new release. Not covered in this presentation.
- **After a successful migration, the applications and resources on the new system function the same way they did on the old system, if possible.**
- **Migration actions are classified as:**
 - **Required:** required for all users
 - **Required-IF:** only required in certain cases
 - **Recommended:** good to do because it 1) may be required in the future, 2) resolves performance or usability problem 3) improves migration workload.
- **Migration actions are also classified as when they may be performed:**
 - **NOW, Pre-First IPL, or Post-First IPL**

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Means “don’t overlook!”



Means some programmatic assistance is available

Elements with Migration Actions for z/OS R13



- **Documented in z/OS V1R13 Migration (GA22-7499-19)**

- For complete migration tasks for z/OS R13, see this book!
 - **Planned: from R11 to R13, and R12 to R13, customized books on z/OS Installation and Migration webpage.**

- **From z/OS R11 to z/OS R13:**

- BCP
- Communications Server
- Crypto Services – ICSF, SSL, OCSF, and PKI
- DFSMS
 - DFSORT
- Distributed File Service – zFS
- Infoprint Server
- JES2
- JES3
- Language Environment
 - RMF
 - SDSF
 - Security Server (RACF)
 - SMP/E (covered in Part 1)
- TSO/E
 - XL C/C++
- z/OS UNIX

➤ means that some of that element's migration actions will be discussed in these presentations

▪ means that you need to look for that element's migration actions in the z/OS R13 Migration book

DFS Migration Actions for z/OS R13 from z/OS R11



Migration Actions you can do NOW:

- **Verify virtual storage usage for zFS (Required, as of R11 APAR OA33451)**



• This APAR fixes a performance problem of too many storage obtains and releases in zFS. However, the resolution obtains approx 60 MB more storage at zFS initialization.

- Use **MODIFY ZFS,QUERY,STORAGE** to compare the limit and amount allocated:

```
USS/External Storage Access Limit: 1875902464 (1831936K) (1789M)  
Total Bytes Allocated (Stack+Heap+OS): 245559296 (239804K) (234M)
```

- If usage becomes close, you can decrease your cache size dynamically using `zfsadm config` command. If zFS doesn't initialize, then decrease some IOEFSPRM settings.

DFS Migration Actions for z/OS R13 from z/OS R11



Migration Actions you can do NOW:

- **Accommodate new DASD space requirements for zFS file systems (Required, as of R13)**



- As of R13, zFS stores data inline (file is less than 53 bytes), or in 8K blocks. zFS R13 no longer will store data in 1K fragments.
- zFS R13 can read data stored in 1K fragments, but when it is updated, it is moved to 8K blocks.
- zFS R13 may need more DASD space than was required on previous releases to store the same amount of data.
- To assist with this migration action, the default value for the IOEFSPRM option aggrgrow is changed from Off to On.
 - Meaning a R/W mounted file system will attempt to dynamically extend when it runs out of space if a secondary allocation size is specified and there is space on the volume.
- You may scan for small files now, to estimate how many files will need more storage. To look at small (1K) files:
 - `find <mountpoint> -size -3 -type f -xdev| wc -l`

DFS Migration Actions for z/OS R13 from z/OS R11



• Migration Actions You Can Do NOW:

- Ensure that `sysplex=filesys` is available on all systems in shared file system environment



(Required-IF, as of R13)

- Before starting R13 zFS you **MUST** specify this level in your IOEFSPRM file on your R11 and R12 zFS systems, otherwise zFS R13 will **not** initialize.



- Ensure OA32925 on R11 is installed first. No PTF for R12.

• Then:

- If `sysplex=off`, go to `sysplex=filesys` (in which case `sysplex_filesys_sharemode` will be `norwshare`, the default)
- If `sysplex=on`, go to `sysplex=filesys` and `sysplex_filesys_sharemode=rwshare`

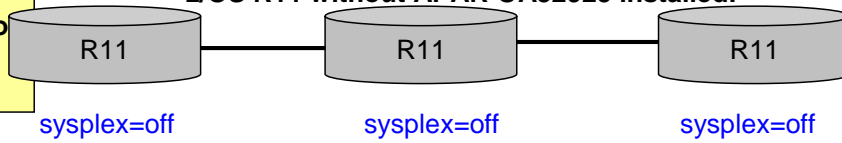
- Use migration health check, or modify `zfs,query,level` to see the `sysplex` setting.

DFS Migration Actions for z/OS R13 from z/OS R11



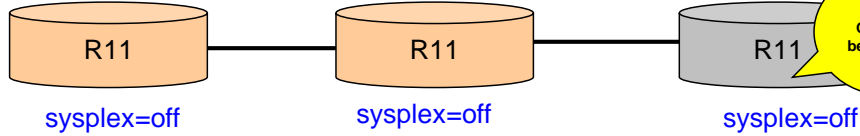
One scenario (of many):

z/OS R11 without APAR OA32925 installed:



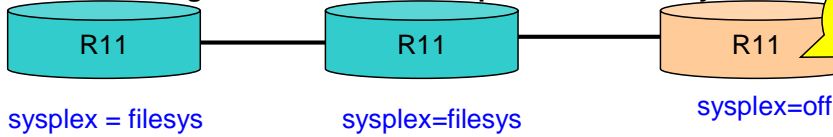
May be combined: OA32935 provides "enhanced connect" support necessary for z/OS R13

Rolling IPL #1: roll APAR OA32925 to all R11 systems:



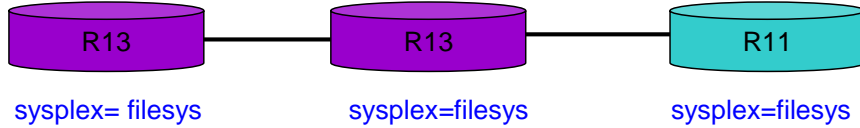
Must contain OA32925 before R13!

Rolling IPL #2: IOEFSPRM update to all R11 systems:



Must be moved to sysplex=file sys before R13 is introduced!

Rolling IPL with z/OS R13 introduced:



JES2 Migration Actions for z/OS R13 from z/OS R11

TPM



Migration Actions Pre-First IPL:

- **Update code remove references to PDBLENG**
(Required-IF, as of R12)
 - As of R12, variable size PDDBs. Exits need to use a runtime length field (PDBSIZE), not compile time length. Compile time length equate PDBLENG has been deleted.

Migration Actions Post-First IPL:

- **Migrate to z11 mode (Recommended, as of R11)**
 1. Determine your z11 checkpoint activation readiness with the \$D ACTIVATE command. This command indicates if activation to z11 mode will succeed:
 - Review your current utilization of BERT data to determine if there are sufficient BERTS. Additional BERTs are needed for each SYSOUT data set that has transaction data associated with it.
 - Activation of LARGEDS is required.
 - You may need additional 4K records for your checkpoint data set.
 2. Run the JES2 \$ACTIVATE command to activate z11 mode following the considerations for this command found in *z/OS JES2 Commands*.
 3. You may fallback to z2 mode, if necessary.



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Migrating to z/OS R13 - Part 3 of 3

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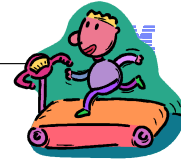


Migration Actions Pre-First IPL:

Avoid redundant *S main,FLUSH command in response to XCF messages (Recommended as of R13)

- Before R13, an IXC102A DOWN response (**XCF IS WAITING FOR SYSTEM *sysname* DEACTIVATION. REPLY DOWN WHEN MVS ON *sysname* HAS BEEN SYSTEM RESET**) required operations to enter the *S main,FLUSH command. Without that command, jobs on the local were held up until the local processor was reconnected.
- As of R13, JES3 automatically flushes the active jobs on the local processor as soon as the operator responds to IXC102A. This reduces the time gap between the local processor being removed from the sysplex, and job recovery actions.
- If you still enter the *S main,FLUSH command, there will be no effect because affected jobs will have already been flushed by the new automatic processing.

LE Migration Actions for z/OS R13 from z/OS R11



Non-existent Migration Actions ☺ :

- Determine the impact of added and changed runtime options
 - In R12: none.
 - In R13: none.

Migration Actions You Can Do Now:

- Convert to CEEPRMxx to set system-level default runtime options
(Recommended, **will be Required after R13**)
 - Move from assembler usermods to CEEPRMxx.

Migration Actions Pre-First IPL:

- Examine programs that read output when a D CEE command is issued
(Required-IF, as of R12)
 - Command response is changed: only suboptions specified with a parmlib member or SETCEE command (not those not explicitly set, as before) are displayed. Commas are now displayed for suboptions not explicitly set.
SETCEE CEEDOPT,ALL31,ANYHEAP(4K),FILETAG(,AUTOTAG)
a subsequent D CEE,CEEDOPT command displays the following:
CEE3745I 09.32.13 DISPLAY CEEDOPT
NO MEMBERS SPECIFIED
LAST WHERE SET OPTION

SETCEE command ALL31()
SETCEE command ANYHEAP(4096,,)
SETCEE command FILETAG(,AUTOTAG)

z/OS UNIX Migration Actions for z/OS R13 from z/OS R11



Migration Actions You Can Do Now:

- **Update invocations of /usr/sbin/mount commands (Required-IF, as of R13)**
 - Before R13: when using the shell mount command with `-o fsoptions` option, that option was ignored for zFS if the `-t` option was not used to specify the file system type.
 - As of R13: it will not be ignored in the same situation, which may lead to a mount failure or the file system mounted with unintended results.
 - Use the `-t` option if you want to keep the `-o fsoptions`. If the file system is zFS, make sure the `-o fsoptions` is valid for zFS.
- **Update invocations of /usr/sbin/unmount commands (Required-IF, as of R13)**
 - Before R13: if a path name was specified when using the shell unmount command, the path name could be a) any file or directory in the file system, or, b) the mount point of a file system.
 - As of R13: when this command is issued, only the mount point can be specified for the path name.
 - Change to only specify a mount point for the path name, or use `-m` for "classic" behavior.

z/OS UNIX Migration Actions for z/OS R13 from z/OS R11



Migration Actions Pre-First IPL:

- **Update invocations of MOUNT statements in BPXPRMxx (Required-IF, as of R13)**
 - Before R13: if a MOUNT in BPXPRMxx was first processed by a system other than the specified target owner, the MOUNT processing was function-shipped to the target owner.
 - As of R13: if the MOUNT statement specifies a SYSNAME() and if the SYSNAME() value specifies a different target owner system, it is ignored. Mount processing in this case is also ignored during F BPXOINIT,FILESYS=REINIT.
 - The file system would be mounted locally after MOUNT processing is done on the target system.
 - SET OMVS and SETOMVS command processing remains unchanged. Meaning that the MOUNT will be function-shipped to the specified SYSNAME().
 - Verify any used BPXPRMxx with MOUNT and SYSNAME() that:
 - That BPXPRMxx member is also specified as a parmlib member to be used for the specified target system, or,
 - Move the MOUNT statement from that BPXPRMxx to another BPXPRMxx member to be used by the target owner system.



- *Note that MOUNT SYSNAME(&SYSNAME) always resolves to the local system, and is not ignored!*

Migrating to z/OS R13 - Part 3 of 3

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z/OS UNIX Migration Actions for z/OS R13 from z/OS R11



Migration Actions Pre-First IPL:

– **Accommodate changes to support read-only z/OS root for the cron, mail, and uucp utilities (Required-IF, as of R13)**



- Before R13: certain post-installation customization had to be done every release for the cron, mail, and uucp utilities for the root to be mounted read-only.
- As of R13: the /usr/lib/cron, /usr/mail, and /usr/spool directories are provided as symbolic links under the /var directory. /usr/lib/uucp directories will be symbolic linked under the /var directory. This positions the root to be mounted read-only “out of the box”, and may remove every release customization.
- Note that previous documentation had suggested use of /etc, we have decided that /var is more appropriate, and the documentation (and the delivery of z/OS R13) uses /var.
- Ensure you have enough room under the appropriate /var directory for usage of these utilities: create new file systems, change mount location of individual existing files system, or enlarge existing file systems mounted.

z/OS UNIX Migration Actions for z/OS R13 from z/OS R11



Migration Actions Post-First IPL:

- **Accommodate the new Shell and Utilities version of the tsocmd (Required-IF, as of R12)**
 - As of R12, **tsocmd** is included in Shell and Utilities. There are some differences. Tools and Toys download has the R12 level available so you can use a consistent level.
- **Remove MAXSOCKETS values from AF_UNIX in the BPXPRMxx parmlib member (Recommended, as of R12)**
 - Before R12: MAXSOCKETS was required in the NETWORK statement for AF_UNIX, if default of 100 was not acceptable.
 - As of R12: the maximum of 10,000 will be set. It will be ignored if specified on R12. Remove it when not sharing the BPXPRMxx member with pre-R12 systems.
- **Consider skulker invocations due to updated restriction (Required-IF, as of R12)**
 - Before R12: if there were objects whose path name included single quotation marks or newline character, those objects were not deleted, a warning message was issued, and processing stopped.
 - As of R12: there is no warning message, those objects are ignored, and processing continues.

"Big Migs" for z/OS R13 from z/OS R11



Migration Actions You Should NOT Overlook from Part 3:

1. Verify virtual storage usage for zFS (Required, as of R11 APAR OA33451)
2. Accommodate new DASD space requirements for zFS file systems (Required, as of R13)
3. Ensure that sysplex=filesys is available on all systems in shared zFS file system environment (Required-IF, as of R13)
4. Update invocations of MOUNT statements in BPXPRMxx (Required-IF, as of R13)



Migration Actions You Should NOT Overlook from Part 2:

5. Find replacements for removed functions and elements (Required)
6. Review the list of WTORs in parmlib member AUTOR00 (Required, as of R12)
7. Set AUTHQLVL parameter in GRSCNFxx to recognize new GRS qnames (Required IF, as of R13)
8. IP Services: Define a user ID for the system resolver with an associated OMVS segment (Required IF, as of R13)
9. Increase the space in the Printer Inventory file system (Required, as of R12)
10. Remove V2 Printer Inventory files at fallback (Recomm, as of R12)

SMP/E V3R6 (non-z/OSMF) Enhancements



- **Enhancements not related to z/OSMF:**

- **Cross Global Zone Reporting**

- REPORT CROSSZONE and REPORT SYSMODS allow zones to be specified that are in different GLOBALs. This allows better identification of missing conditional requisites and SYSMODS between two zones!
- REPORT CROSSZONE **ZONES((SYS1.ZOS12.CSI,ZOS12T) , (SYS1.ZOS13.CSI,ZOS13T)) .**
- REPORT SYSMODS INZONES (ZOS12T)
COMPAREDTO(**SYS1.ZOS13.CSI,ZOS13T**) .

- **SYSMOD Comparison HOLDDATA Reporting on REPORT SYSMODS command**

- A new report (**SYSMOD Comparison HOLDDATA**) lists the SYSTEM and USER HOLDDATA that must be resolved to install the identified missing SYSMODs. HOLDDATA will now no longer be deleted on ACCEPT when NOPURGE is off, and during RESTORE when NOREJECT is off.

```
SYSMOD COMPARISON HOLDDATA REPORT FOR TARGET ZONE ....
TYPE   REASON ID  FMID   SYSMOD  ++HOLD DATA
-----
SYSTEM ACTION   HBB7770 UA58677 ++ HOLD(UA58677) SYS FMID(HBB7770) REASON(ACT ...
                                           COMMENT
                                           (*****
```

New ServerPac Install Enhancements for z/OS R13



• ServerPac in z/OS R13:

- Improved handling for **user-supplied installation jobs** by preserving their placement in the list of jobs generated by the CustomPac Installation Dialog.
- You can now **merge IBM data sets into target user-defined data sets**. They can be used as target data set to merge eligible IBM component data sets. However, user-defined data sets are not eligible for merge component data sets.
- **Data Set Origin** (IBM or User-Defined) is a new attribute off of Modify System Layout “View and change data sets by selected attributes”.
- Support for WebSphere products that use **IBM Installation Manager, and for additional z/OSMF plug-ins.**
- **Barcoded labels on 3590 and 3592 tape** cartridges designed to enable them to be used in IBM Automated Tape Libraries (ATLs) without first having to label them locally.
- **Program Directories and ServerPac: Installing Your Order in Adobe PDF** format on DVD for orders on tape, so they can be read immediately from an optical drive on a workstation without the need to download them from z/OS data sets after the RECEIVE job has been run.

Previous ServerPac Install Enhancements

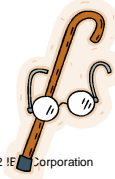


ServerPac in z/OS R12:

- DVD delivery support for product offerings.
- Allows SDSF and JES SMP/E zones to be merged, without having to merge either into the z/OS BCP zone.
- Propagation of your zone names into the mlq of the SMP/E CSI data set names in Modify System Layout.
- A number of jobs, which are no longer needed, are removed.
- Several z/OSMF setup improvements have been made, including new tasks for z/OSMF applications new in z/OSMF.

And some oldies that you may not have appreciated from z/OS R11:

- No more overallocated error on volumes with existing space after ALLOCDS has run! (That is, MSL changes are allowed.)
- Order Tivoli OMEGAMON and other Tivoli monitoring products by themselves, withOUT z/OS in group "IBM Tivoli Monitoring Products" on Shopz.



Some Helpful z/OS R13 Sysprog Enhancements!



- ☺ **z/OS UNIX: Prevent Content Overlay during MOUNT**
- ☺ **DFSMS: IEBPDSE Batch Program**
- ☺ **SDSF: Cursor-sensitive Sort**

R12 goodies you also get in R13:

- ☺ **BCP: Timed Event Data Report**
- ☺ **BCP: Several PROGxx-related enhancements**
- ☺ **DFSMS: IDCAMS DELETE pdsname(*) command**



- Have you ever “lost” updates to files when they’ve been over-mounted?
- Do you want the system to let you know when you’re mounting over something?

★ **Exploitation Example:**

```
SETOMVS NONEMPTYMOUNTPT=WARN
```

```
0290 BPXF263I FILE SYSTEM 901  
0290 IBMUSER.PRODUCT.ZFS  
0290 HAS BEEN MOUNTED ON A NONEMPTY DIRECTORY  
0290 IEE106I IEE227I 0000 ALLOCATED TO SYS00050
```

```
SETOMVS NONEMPTYMOUNTPT=DENY
```

```
BPXF135E RETURN CODE 00000088, REASON CODE 055B063C. THE MOUNT FAILED FOR FILE  
SYSTEM IBMUSER.PRODUCT.ZFS.  
***
```



- Want to check the structural integrity of a PDSE?
- It's a good idea to verify a PDSE's integrity *before* its deployed, and a problem would be propagated.
- If the DUMP parameter option is specified, the PDSE validation utility issues an ABEND in the PDSE address space, which results on an SVC dump

★ Exploitation Example:

```
//STEPCHK EXEC PGM=IEBCPDSE,PARM='DUMP'  
//SYSPRINT DD SYSOUT=*  
//SYSLIB DD DSN=SYS1.SIEALNKE,DISP=SHR  
// DD DSN=MWALLE.UTIL.JOBS,DISP=SHR
```

★ Sample Success Output:

```
***** TOP OF DATA ***  
IGW700I PDSE Directory Validation Successful  
DSN:SYS1.SIEALNKE  
ADPages:36 IXRecords:1054  
NDPages:6 IXRecords:315  
AD ND Tree Nodes:315  
IGW700I PDSE Directory Validation Successful  
DSN:MWALLE.UTIL.JOBS  
ADPages:65 IXRecords:3985  
NDPages:29 IXRecords:1590  
AD ND Tree Nodes:1590  
***** BOTTOM OF DATA *
```

SDSF: Cursor Sensitive Sort

- You can sort on a column by placing the cursor on the column title and pressing Enter.
- Additionally, the column titles are now ISPF point-and-shoot fields, so you can tab to them.
 - Make sure you have “Tab to point-and-shoot fields” enabled under ISPF Settings in Option 0.

★ Exploitation Example:

Before:

```
SDSF OUTPUT ALL CLASSES ALL FORMS      LINES 408      LINE 1-9 (9)
COMMAND INPUT ===>                      SCROLL ==> PAGE
NP  JOBNAME  JobID  Owner  Prty C Forms  Dest  Tot-Rec
TCAS  STC00017  IBMUSER  144  A  STD  LOCAL  14
IBMUSERM  JOB00024  IBMUSER  144  W  STD  LOCAL  47
IBMUSERN  JOB00025  IBMUSER  144  W  STD  LOCAL  50
IBMUSERO  JOB00026  IBMUSER  144  W  STD  LOCAL  46
IBMUSERZ  JOB00021  IBMUSER  144  W  STD  LOCAL  71
IBMUSERZ  JOB00022  IBMUSER  144  W  STD  LOCAL  1
IBMUSERZ  JOB00022  IBMUSER  144  W  STD  LOCAL  89
IBMUSERZ  JOB00023  IBMUSER  144  W  STD  LOCAL  1
IBMUSERZ  JOB00023  IBMUSER  144  W  STD  LOCAL  89
```

After:

```
SDSF OUTPUT ALL CLASSES ALL FORMS      LINES 408      LINE 1-9 (9)
COMMAND INPUT ===>                      SCROLL ==> PAGE
NP  JOBNAME  JobID  Owner  Prty C Forms  Dest  Tot-Rec
IBMUSERZ  JOB00022  IBMUSER  144  W  STD  LOCAL  1
IBMUSERZ  JOB00023  IBMUSER  144  W  STD  LOCAL  1
TCAS  STC00017  IBMUSER  144  A  STD  LOCAL  14
IBMUSERO  JOB00026  IBMUSER  144  W  STD  LOCAL  46
IBMUSERM  JOB00024  IBMUSER  144  W  STD  LOCAL  47
IBMUSERN  JOB00025  IBMUSER  144  W  STD  LOCAL  50
IBMUSERZ  JOB00021  IBMUSER  144  W  STD  LOCAL  71
IBMUSERZ  JOB00022  IBMUSER  144  W  STD  LOCAL  89
IBMUSERZ  JOB00023  IBMUSER  144  W  STD  LOCAL  89
```

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Migrating to z/OS R13: Part 3 of 3 Summary



- **JES2:**
 - PDBLENG references, z11 mode.
- **JES3:**
 - *S main, FLUSH after XCF DOWN response.
- **Language Environment:**
 - Nothing for runtime options ☺, CEEPRMxx, and D CEE command response
- **z/OS UNIX:**
 - Shell mount and unmount changes, changer for read-only root support, tsocmd, MAXSOCKETS, skulker.
- **SMP/E and ServerPac Enhancements for Install:**
 - REPORT CROSSZONE, REPORT SYSMODS in different globals, SYSMOD Comparison HOLDDATA report on REPORT SYSMODS command.
 - More user data set support, barcodes, PDFs for program directories
- **Helpful z/OS R13 Sysprog Enhancements:**
 - IEBCPDSE, NONEMPTYMOUNTPT, and Cursor-sensitive Sort

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