

# **z/OS 2.1 JES2 Product Update and Latest Status**

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IBM Rochester, MN

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# Agenda . . .

## ■ JES2

- ▶ Current JES2 Releases
- ▶ Migration & Implementation Tips
- ▶ Recent Service

## ▶ Other Presentation

- ▶ **Batch Modernization in JES2 z/OS 2.1**
  - ▶ Tuesday 1:30 PM-2:30 PM – Hynes 313
- ▶ **JES2 Bootcamp - Part 1 of 3 – What is JES2 and what does it do**
  - ▶ Wednesday 11:00 AM-12:00 PM – Hynes 201
- ▶ **JES2 Bootcamp - Part 2 of 3 – Setup and operations**
  - ▶ Wednesday 3:00 PM-4:00 PM – Hynes 201
- ▶ **JES2 Bootcamp - Part 3 of 3 – Customization and other considerations**
  - ▶ Thursday 9:30 AM-10:30 AM – Hynes 201
- ▶ **z/OS 2.1 JES2 Symbol Services and Other New Services**
  - ▶ Thursday 4:30 PM-5:30 PM – Hynes 313



# Current JES2 Releases



## FMIDs, Birthdays & Obituaries

JES2 Rel.#	FMID	First Available	No Longer Available	End of Service
z/OS 1.5	HJE7708	3/04	9/04	9/07
z/OS 1.6	<b>HJE7708</b>	9/04	10/05	9/07
z/OS 1.7	HJE7720	9/05	10/06	9/08
z/OS 1.8	HJE7730	9/06	10/07	9/09
z/OS 1.9	HJE7740	9/07	10/08	9/10
z/OS 1.10	HJE7750	9/08	10/09	9/11
z/OS 1.11	HJE7760	9/09	10/10	9/12
z/OS 1.12	HJE7770	9/10	10/11	<b>9/14*</b>
z/OS 1.13	HJE7780	9/11	01/14	<b>9/16*</b>
z/OS 2.1	HJE7790	9/13		<b>9/18*</b>

See [http://www-03.ibm.com/systems/z/os/zos/support/zos\\_eos\\_dates.html](http://www-03.ibm.com/systems/z/os/zos/support/zos_eos_dates.html)

**\* = projected...**



# JES2/MVS Compatibility



## JES2 Release:

z/OS Release	JES2 z/OS R.8 HJE7730	JES2 z/OS R.9 HJE7740	JES2 z/OS R.10 HJE7750	JES2 z/OS R.11 HJE7760	JES2 z/OS R.12 HJE7770	JES2 z/OS R.13 HJE7780	JES2 z/OS R2.1 HJE7790
z/OS R8	X						
z/OS R9	X	X					
z/OS R10	X	X	X				
z/OS R11		X	X	X			
z/OS R12			X	X	X		
z/OS R13				X	X	X	
z/OS R2.1							X

IBM recommends the same level of z/OS & JES2 throughout your plex.

-JES levels must match z/OS level starting in z/OS 2.1,

-See "**z/OS V1R13.0 Planning for Installation**" Ch. 4 (GA22-7504)

at [http://publibz.boulder.ibm.com/cgi-bin/bookmgr\\_OS390/BOOKS/e0z2b1c0/4.5.1](http://publibz.boulder.ibm.com/cgi-bin/bookmgr_OS390/BOOKS/e0z2b1c0/4.5.1)



# JES2/MVS Compatibility

## Statement of Direction

- z/OS 1.13 will be the last z/OS release that supports running a down level JES.
- As of z/OS 2.1, IBM only supports running the 2.1 JES on the 2.1 MVS
  - z/OS 1.13 and earlier will not be **supported** running on a z/OS 2.1 z/OS
- This does NOT affect what members can co-exist in a MAS
  - Just the mixing and matching of JES and MVS levels.
- New messages during initialization:
  - WTO - JES2 *level (HJExxxx)* is not supported running on *mvs\_level*
  - WTOR - Reply "CONTINUE" to initialize JES2 in this unsupported environment, "TERM" to shut down JES2



# z2 Checkpoint Mode

## Statement of Direction

- z/OS 2.1 is planned to be the last release to support z2 checkpoint mode
  - \$ACTIVATE LEVEL=Z2
- z11 checkpoint mode was introduced in z/OS 1.11
  - \$ACTIVATE LEVEL=Z11
- Migrate to z11 mode if you have not already done so
  - See z/OS 1.11 presentation for information on impacts of z11 mode





# Survey Questions



**What is your JES2 Release level (are you \$ACTIVATED) ?**

JES2 Rel.#	SHARE 121 8/2013	SHARE 120 2/2013	SHARE 119 8/2012	SHARE 118 3/2012	SHARE 117 8/2011	SHARE 116 2/2011	SHARE 115 8/2010	SHARE 114 3/2010	SHARE 113 8/2009	SHARE 112 3/2009	SHARE 111 8/2008	SHARE 110 2/2008	SHARE 109 8/2007	SHARE 108 3/2007
z/OS R2														
z/OS R4						1						1	4(4)	4(4)
z/OS R5			1				1						6(6)	5(5)
z/OS R7			1						2	1	2	12	19	10
z/OS R8			1			1			3	4	14	13	18	6
z/OS R9			2	1	1	5	5	19	31	14	16	5		
z/OS R10	1		1		3	8	9	12	20	5				
z/OS R11		4(3)	6(5)	21(19)	20(9)	26(7)	12(5)	9(2)	3(0)					
z/OS R12	9(8)	7(4)	10(10)	15(15)	14(7)	13								
z/OS R13	32(30)	10(8)	11(11)	8(8)										





# z/OS 2.1 Overview

- Batch Modernization
  - New JCL keywords
  - Limit jobs by MVS level
  - 8 Character job class
  - SAF checks for JOBCLASS access
  - Calling interpreter after converter
  - System symbols in batch jobs
  - Exporting symbols to runtime
  - New symbols services
  - Symbolic substitution in instream data sets
  - Symbols on INTRDR
  - Job Correlator support
  - Job Completion ENF 78
- Other enhancements
  - Job Modify SSI
  - Performance Updates
  - Miscellaneous changes



# New JOB JCL keywords

- **SYSTEMS=** – List of MVS system names where job can run
  - Similar to SYSAFF but a list of MVS system names
    - Does not support independent more (IND)
  - If poly-JES, then SYSTEMS refers to primary not secondary
  - Binding to member number done at INPUT time
    - If JES2 member moves to new MVS SYSTEM, affinity follows JES2 member
  - JES2 must have run on system to be valid
    - COLD starts will reset MVS system names
- **SYSAFF=** – List of JES2 members where job can run
  - Same as JECL JOBPARM SYSAFF=
    - Includes support for independent mode (IND)
  - Preferred to using JECL
- SYSAFF and SYSTEMS are mutually exclusive
- SYSADD and SYSTEMS overrides JOBPARM SYSAFF=



# New OUTPUT JCL Keywords

- **MERGE=YES** – Merge operands on all SYSOUT
  - Single default for JCL keywords
  - Provides base default for the job
  - Does not create new instance of a data set
  - Applies even if other OUTPUT card referenced
  - Replaces functions provided by various JECL statements
- **DDNAME=** – Forward pointing OUTPUT specification
  - Similar to DDNAME on JES3 *//\*FORMAT* card
    - DDNAME= *ddname* or *step.ddname* or *proc.step.ddname*
  - Allows easy specification of OUTPUT cards to DD statement
  - One instance per matching OUTPUT card
    - If DDNAME matches, then DEFAULT=YES does not apply
    - Can be used with DD OUTPUT= specified OUTPUT cards (creates more instances)
    - If DDNAME= and DD OUTPUT= matches same OUTPUT card, creates 1 instance



# New JCLLIB JCL Keyword

- **PROCLIB=** – Specifies the DDNAME of the PROCLIB concatenation to use
  - Same as JECL JOBPARM PROCLIB= statement
  - Preferred to using JECL
- JCLLIB PROCLIB= overrides JOBPARM PROCLIB=
- Static PROCLIBs displayed with \$D PROCLIB
  - Can be “altered” by command (creates new concatenation)

# Limiting Job Execution/Conversion by z/OS level

- New JCL only understood on new z/OS
- When detected, INPUT or CNVT set minimum z/OS
  - Can also be triggered by JES2 parameters like DSENQSHR
- Part of compatibility APAR for z/OS 2.1
- Required level displayed in \$DJ command
- New reason added to \$DJ DELAY=
- Added to extended status (z/OS 2.1 only)
  - New delay reason
  - Actual ECVT level needed (job terse call)
  - Determination if job can execute was updated (all releases)

# Eight Character Job Class

- JES2 supports up to 8 character job class names
  - Similar to existing support in JES3
- JCL JOB card CLASS= will be expanded to support up to 8 characters
- Classes will be managed by \$ADD/\$DEL JOBCLASS command
- Other commands updated to support 8 character job classes
- Any job classes can be set inactive (ACTIVE=NO)
  - Stops NEW jobs from specifying the job class
    - Does not affect existing jobs or job selection
  - Causes same error as undefined class
  - Applies to single and multi character classes
- New default JOBCLASS for use in error cases
  - JOBDEF DEF\_CLASS= specifies value



# Job Class Groups

- Each job class can be in one group
- Group name and job classes must be unique
  - Cannot have a job class group with the same name as a job class
- Facilitates selecting on job classes
  - Inits and Offload Job Transmitters can specify either
    - 1-36 single character job classes
    - 1-8 multi (or single) character job classes or job class groups
- Selection from groups is done round robin
  - When a job is selected, the classes are rotated so the next select will start with the next job class in a group
- CLASS= parameter updated (command & init statement)
  - CLASS=ABCD – implies single character job classes A, B, C, D
  - CLASS=(ABCD) – implies 4 character job class or job class group ABCD





# SAF Check to Use JOBCLASS

- New SAF check to control use of a JOBCLASS
- Will use a new entity in JESJOBS class
  - `JOBCLASS.nodename.classname.jobname`
  - Userid checked for access based on FACILITY class profiles
  - READ access to entity is required
- Will be activated by profiles in FACILITY class
  - Existence of FACILITY class profile activates check  
JES.JOBCLASS.OWNER
    - Checks if execution userid (owner) has access to entity
  - Existence of FACILITY class profile activates check  
JES.JOBCLASS.SUBMITTER
    - Checks if submitting userid has access to entity
  - Can perform both or neither check
  - UACC and access list on FACILITY class profile NOT used
- Additional check made when \$T alters class
  - Verify either operator (submitter) or owner ID has access to entity



# Interpreter After Converter

- Allows processing of OUTPUT JESDS= if job not executed
- More complete checking with TYPRUN=SCAN
- New option to call interpreter after conversion
  - JOBDEF INTERPRET=JES|INIT
  - Must be z11 mode and all members z/OS 2.1 before option takes effect
    - If down level joins MAS, revert to prior release processing

## Converter/interpreter run in a separate address space

- No change if not calling interpreter
- CISUB\_PER\_AS= controls number of task per C/I address space
- Migration impact to exit 7
  - Exit 8 not 7 always called to read/write IOTs for conversion
- EXIT 6 only called in JES2 address space
  - New exit 60 called in JES2CI address space (same function as exit 6)
    - No access to HCT or JES2 private in exit 60



# Converter Issues Input Error/Warning Messages

- Input phase detected errors currently written to JCLIN
  - Causes confusion for input detected errors
  - JCLIN data set becomes only print data set
- Input errors will now be passed to Converter
  - JECL assigned statement numbers
  - Added to standard message data set with other errors
  - Job will not be failed at input time but queued to converter
    - Will be forced to convert on the input member
  - Interpreter called to ensure OUTPUT JESDS= will be processed
- Consistent processing of JCL errors
  - JES2, Converter, and Interpreter error processed the same



# System Symbol Substitution in BATCH Jobs



- Any system symbol (IEASYMxx) can be referred to in JCL
  - `JOBCLASS SYSSYM=ALLOW|DISALLOW` option
- Substitution occurs at conversion time
- Control conversion using scheduling environment
  - `JOBDEF CNVT_SCHENV=IGNORE|HONOR`
- Provides consistent conversion and execution symbols
- Can also use traditional affinity
  - `JOB JCL` and `JOBPARM JECL`



# Exporting Symbols to Run Time Environment

- Makes JCL symbols available to running job
- **EXPORT SYMLIST=(xxx,yyy....)** JCL identifies symbols
- Subsequent SET statements are exported to run time
  - Only need to identify a symbol to export once
- Only one value of symbol per step
  - Last SET statement value is exported

# New Symbol Services

- JCL symbol service IEFSJSYM
  - All exported symbols with value for step can be accessed
  - Access is READ ONLY, cannot be updated or deleted
- JES symbol service IAZSYMBL
  - Provides dynamic symbols at the step or TCB level
  - Symbols can be created/deleted/updated by runtime
    - Application variable symbols
    - Special system use symbols for passing data
  - Can access JCL symbols using this service
  - Symbol names can be 16 characters
  - Symbol values can be up to 4K



# Symbolic Substitution in Instream Data Sets

- **SYMBOLS=** keyword on DD DATA or DD \* JCL  
SYMBOLS=[ ( ) JCLONLY | EXECSYS | CNVTSYS [ , *DDname* ])
  - JCLONLY – Substitute **EXPORT**ed JCL symbols and current JES symbols
  - EXECSYS – JCL plus system symbols from execution system
  - CNVTSYS – JCL plus system symbols from conversion system  
Consistent with system symbol substitution
  - *DDname* – DD name for LOG data set
  - Not specified – No substitution (default and current processing)
- Valid for JES and Converter created instream data sets
- Substitution as records are read by application
- Blank elimination to try to make things fit
  - Overflow if possible, I/O error if not
- Log will track what was passed to application
  - Original and substituted text available
  - DD name for LOG data set passed in
  - Does not work with NEW PARMDD= on EXEC card





# Passing Symbols on INTRDR

- JES or JCL symbols can be passed on INTRDR
- Become initial SET symbols for jobs submitted
  - Automatically exported
- **SYMLIST=** keyword identifies symbols to pass
  - Only symbols that obey JCL rules can be passed
  - Generics can be used to identify symbols (eg \* or DSN\*)
- Values extracted when JOB card is processed
- Values can be updated between jobs

# New Job Correlator Function

- 64 byte unique identifier to track and manage jobs
  - 32 characters of system information
  - 32 characters of application data
  - “:” delimiter between 2 sections
    - Last character in system section
- Specify application section using reserved JES symbol
  - SYS\_CORR\_USRDATA – 32 characters
  - Set before submitting job card
- Last submitted jobs correlator set in task level JES symbol
  - SYS\_CORR\_LASTJOB – 64 characters
- Correlator of current job set in step level JES symbol
  - SYS\_CORR\_CURRJOB – 64 characters
- JOBID of last job submitted at task level JES symbol
  - SYS\_LASTJOBID – 8 characters



# Using the Job Correlator

- Correlator can be used (with wildcards) for selection on
  - Extended status SSI
  - SAPI SSI
  - JES2 job list command
- Returned on request job ID SSI
- Passed on ENF 58 (SYSOUT) and 70 (JOB)
- Address space correlator available using IAZXJSAB
  - From any address space
- Added to JMR
- Added to SMF records

# New ENF 78 for Job Completion

- Multi system ENF issued when job is past execution
- Only issued if there is a notify value set for job
  - Set before job card is submitted
  - JES symbol SYS\_JOB\_NOTIFY - up to 4K bytes
- ENF data is similar to ENF 70
  - Job information, correlator
  - Job completion information
  - SYS\_JOB\_NOTIFY value



# Job Modify SSI service

- New SSI to modify jobs
  - Unauthorized SSI to modify jobs and their characteristics
  - Input/Filters similar to Extended Status SSI
  - JESJOBS SAF checks to authorize user can affect changes
  - Requests can be synchronous or asynchronous
- Functions supported
  - Modify job characteristics (\$T) – Hold a job (\$H)
  - Release a job (\$A)
  - Purge a job (\$P)
  - Cancel a job (\$C) – with options to purge and/or dump
  - Restart a job (\$E) – with the cancel or step and hold options
  - SPIN a job (\$T, SPIN) – with the optional DDNAME option
  - Change execution node (\$R XEQ) – only if pre-execution
  - Start a job (\$S)



# Job Modify SSI Services SAF entities

- SAF entities checked for other requests
  - Requesting address space userid checked against entity names

SSI Action	JESJOBS Class Entity	Access
Modify	MODIFY.nodename.userid.jobname	Update
Hold	HOLD.nodename.userid.jobname	Update
Release	RELEASE.nodename.userid.jobname	Update
Purge	PURGE.nodename.userid.jobname	Alter
Cancel	CANCEL.nodename.userid.jobname - Existing profile	Alter
Restart	RESTART.nodename.userid.jobname	Control
Spin	SPIN.nodename.userid.jobname	Control
Reroute execution	REROUTE.nodename.userid.jobname	Update
Start	START.nodename.userid.jobname	Control

# SAPI Performance Updates

- New search tree structures to improve SAPI processing
  - Improves search for output (JOEs) for SAPI selection
  - Improves SAPI search when new output is created
- Controlled by parameters on OUTDEF
  - SAPI\_OPT=YES|NO controls selection optimization
  - WS\_OPT=YES|NO controls SAPI selection performance
- Benefit requires selection on at least
  - QUEUE,ROUTECD,OUTDISP
  - QUEUE,OUTDISP
  - ROUTECD,OUTDISP
  - OUTDISP





# Miscellaneous Changes

- Internal readers can be allocated from any address space
  - No need to get a JES environment to submit a job
- `$D INITINFO` - display initialization information command
  - Start command, Init decks used, STEPLIB concatenation
- `JOBCLASS DSENQSHR=AUTO|DISALLOW|ALLOW`
  - Supports ENQ downgrade changes
- Extended status output can be in 64 bit storage
- Extended status data set list can suppress duplicates
- SAPI returns data set number of passed data set



## z/OS 2.1 Migration/Coexistence

- APAR OA36155 is needed for coexistence with 2.1
  - From JES2 z/OS 1.10 or z/OS 1.11 (with extended support)
  - From JES2 z/OS 1.12 or z/OS 1.13
- APAR also highly recommended for fall back as well
  - Jobs created on 2.1 may not be processed properly on earlier releases without OA36155
- Exit 6 only runs in JES2 address space
  - New exit 60 with same function runs in user address space
    - Exit 60 must be in common storage
  - If running in JES2Clxx address space, then no HCT access
- Converter IOT read moved from exit 7 to exit 8
  - From JES2 to user environment



# SHARE Requirements Satisfied by 2.1

- SSSHARE018281 - OUTPUT JCL Not Honored
- SSSHARE016034 - Converter Support for JECL cards and \$HASP Messages
- SSJES294003 - Provide for more than 36 JES2 job classes.
- GGMVJS94002 - JES OUTPUT JESDS Processing When Job Fails Before Execution
- SSJES299001 - JES2 command to display parmlib members used
- SSJES297205 - JES2 does not provide job class protection



## >10M Data Sets SPE

- JES2 currently supports up to 9,999,999 JES data sets per job
  - Data set name format limits number of characters  
userid.jobname.jobid.Dnnnnnnn.dsname
- Limit can be reached with long running job creating SPIN DSs
- Dynamic allocation fails when limit is reached
  
- Solution is to allow *nnnnnnnn* to include characters
  - Does NOT impact values 1-9999999
  - New limit is 4,294,967,295
  - 10000000 and above will be alpha numeric (0-9 and A-Z)
  - 1-9999999 and BDPLQBB-9999999E sort within each range
    - Cannot sort numeric and character
- New keyword to enable
  - OUTDEF DSLIMIT=10M|4B
- Shipped in OA38944 - OA42642 fixed init deck specification



# JES2 Service Information



## HiPer APARs (Hi Impact, or Pervasive)

<u>yy/mm/dd</u>	<u>APAR</u>	<u>COMMENTS</u>
13/07/12	OA42787	JOBS WITH SAME NAME RUNNING CONCURRENTLY DESPITE DUPL_JOB=DELAY
13/06/04	OA42452	INCOMPLETE \$CDCT BUILT FOR JES2 DEVICES IN ERROR AT STARTUP
13/03/26	OA41793	CORRUPTED FREE \$JOE CHAIN MAY CAUSES LOOP IN HASPJOS (\$HASP9202)
13/03/26	OA41768	SAPI & PSO PCE DEADLOCK FOR JOBLOCK AND BERTLOCK RESOURCES
13/02/27	<b>OA41571</b>	ABEND \$Q01 after issuing command with certain null operands
13/02/07	OA41400	FSS PRINTER FAILS TO RESTART DUE TO OUTSTANDING ORDER CONDITION
13/01/31	OA41330	Wild branch out of FRETRE routine when \$VERIFY is called
12/11/26	OA40901	\$Q14 ABEND when SYSOUT transmitter updates unserialized JQE
12/11/13	OA40790	\$HASB recovery code results in \$SJB chaining errors/loops needing IPL
12/07/17	OA39972	ABEND 0C4 submitting jobs to an internal reader
12/07/02	OA39891	SEGMENT= or spun data sets fail to print
12/06/08	OA39737	After OA36256, JES2 fails to completely clean up a spool volume
12/04/11	OA39337	AFTER OA37764, POSSIBLE MSGHASP401 WHEN STARTING JES2
12/03/26	OA39223	JES2 ENF PROCESSING MAY PREVENT \$ZAPJOB SUCCESS
12/03/01	OA38951	JES2 UNABLE TO OBTAIN CHECKPOINT AFTER CF SYSTEM-MANAGED REBUILD
12/02/28	OA38935	Improvements to JES2 ENF70 and ENF58 processing
12/02/03	OA38683	\$BR3 RC8 DATA ERROR DETECTED BY \$DOGBERT SERVICE
12/02/03	OA38671	High CPU utilization after \$CJ or ABEND in converter



# Job and SYSOUT ENFs

- JES issues ENFs to notify JOB or SYSOUT events
  - Used by applications to track job or SYSOUT progress
    - ENF 58 – SYSOUT processing tracking
    - ENF 70 – JOB processing tracking
- Events creating ENFs include
  - Object create and delete
  - Selection and deselection
  - Phase or queue changes for jobs
  - Print progress via checkpoints for SYSOUT (upon request)
- Number of ENFs has increased in recent releases
  - Job level ENFs
  - High level ENFs for SYSOUT
  - SAPI application can request details for SYSOUT



# Job and SYSOUT ENFs

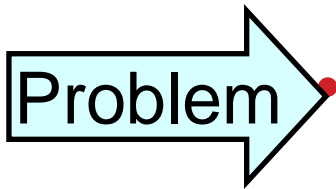
- Intent of ENFs is to reduce “polling” for status
  - Push or event driven vs regular queries
  - Goal is to reduce overall system CPU needs
- Vendors are aware of capability
  - Not sure which have implemented listening to the ENFs
- ENFs are sent to all members of SYSPLEX (multi-system)
  - Cannot always predict where JOB/SYSOUT will be processed
  - Allows single application instance to monitor entire SYSPLEX
- Multiple JESPLEXes in SYSPLEX can increase total ENFs
  - Especially when jobs/SYSOUT sent to other JESPLEX for processing
    - ENFs for original instance and again for destination node
- May notice increased XCF traffic for ENF processing
  - Group associated with messaging is SYSENF



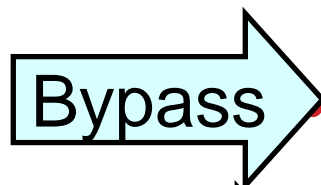
# Performance APARs

- ENF performance enhancements
  - OA41698 – Open APAR will limit ENFs to MAS vs SYSPLEX
    - Option to control scope
    - Default will be SYSPLEX
  - OA42099/OA41738 – Reduce CPU overhead of ENFs
    - Filters out JES2 listening to certain ENFs
    - Reduces overhead when ENF is received if no other listeners
    - OA41738 is conditioning APAR and must be applied first

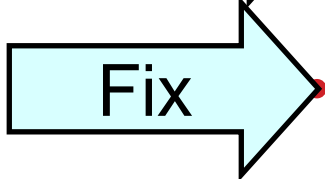
# OA41571 – Various ABENDs after commands



- Command issued with null affinity operand
  - Eg \$TJ(\*),/SYSAFF=()
    - SCHENV\_AFF and SECLABEL\_AFF affected
    - Also SRCVLASS QAFF=()
    - Can be \$T or \$D command
- Results can be varied and cross MAS
  - Checkpoint updates are lost
- Error can be greatly delayed after command



Avoid null affinity operands



JES2 z/OS 1.12 and 1.13

- 1.11 with extended contract



# OA42099/OA41738 – ENF performance

## Problem

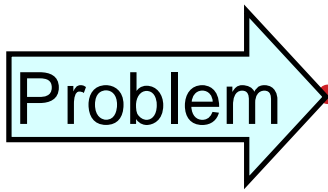
- Extra overhead listening to multi system ENFs
  - Overhead because JES2 listens to ENFs it issues
  - ENF filtering was done in listen exit
  - APARs add bit masks to ENF for filtering
    - Filtering done by ENF and not listen exit
    - If no listeners on member for ENF, then SRB is skipped
- OA41738 adds new bits to ENF being issued
  - MUST be on all members (conditioning APAR)
- OA42099 changes listener to filter on bits
  - If sender did not set bits, then EXIT does not run
  - SDSF (and others) displays break in this case

## Fix

- JES2 z/OS 1.12 and 1.13
  - 1.11 with extended contract

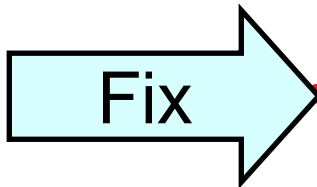


# OA42996 – Reporting Class Incorrect



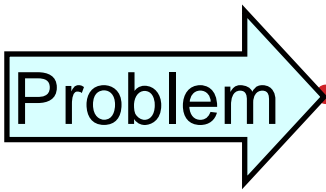
Reporting class not correct after service class change

- PE of OA40963
- Service class changes AND other classification attributes
- Reporting class does not reflect the other changes
  - Never changes after service class change



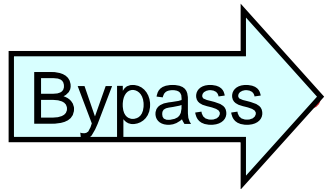
JES2 z/OS 1.13

# OA42787 – Duplicate job names running



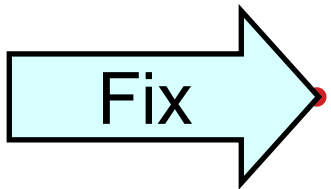
Jobs with duplicate job names running

- DUPL\_JOB=DELAY is set
- Only for job classes S and T
- Only after command set DUPL\_JOB=NODELAY for JOBCLASS STC or TSU
  - Could have be set as part of a generic set



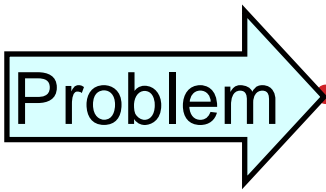
Set DUPL\_JOB=DELAY for JOBCLASS STC/TSU

- Does not effect STCs or TSUs

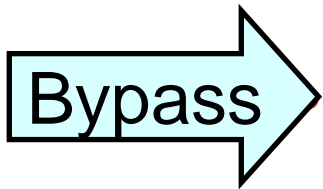


JES2 z/OS 1.12 and 1.13

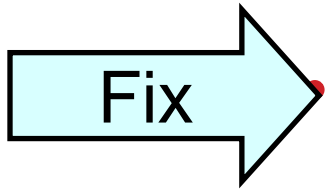
# OA42452 – Invalid Data from Device SSI



- Init deck error encountered for a device
- Device is created but not completely
  - Device SSI on another member can return bad data
  - This bad data can cause SDSF (etc) ABENDs
    - Cannot process output from device SSI

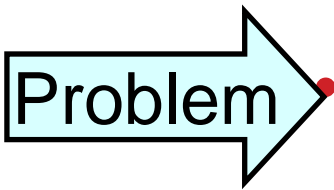


Fix errors in initialization decks



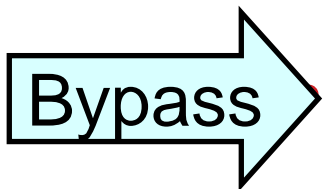
JES2 z/OS 1.12 and 1.13

# OA41793 – Loop processing free JOEs



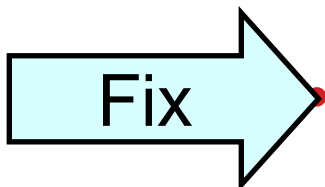
• Command issued to free many JOEs

- Purge job command issued
  - \$PJQ, \$PJ, \$PT, \$PS
  - NOT \$POJQ, \$POJ, \$POT, \$POS
- Command need to run for more that 0.4 seconds
- Command does not hit DISPMAX and waits for CMBs
- Symptom can occur hours later



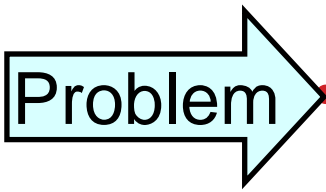
• Ensure number of CMBs greater than DISPMAX

- Should be significantly larger



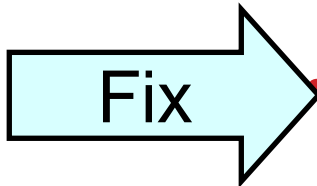
• JES2 z/OS 1.12 and 1.13

# OA41768 – SAPI/PSO PCE Deadlock



• PSO held data set and SAPI deadlock

- Both accessing same held data set at the same time
- JOB lock and BERT lock involved in deadlock
- Requires hot start to clear problem
- Deadlock could be spread across members



• JES2 z/OS 1.12 and 1.13



# OA41440 – FSS printer fails to restart



## Problem

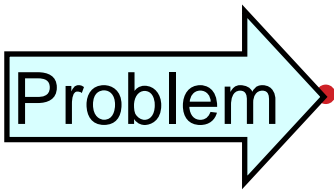
- FSS device fails or is canceled
- Address space could be gone
- Restart of FSS device fails
  - IPL needed to clear this
- Error recovery left FSS in a non-restartable state
- **IF YOU RUN FSS, YOU WANT THIS!**



## Fix

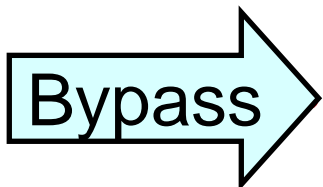
• JES2 z/OS 1.12 and 1.13

# OA41330 – Wild Branch after ABEND

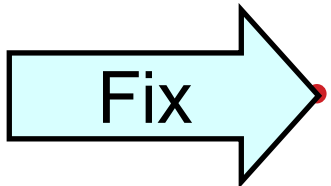


Address space is canceled or ABENDs

- Occurs while a JCT write is in progress
- SPOOLDEF CYL\_MANAGED=FAIL set
- Code to clean up JCT takes a wild branch
- Cleanup for the address space does not complete



Switch to CYL\_MANAGED=ALLOW



JES2 z/OS 1.12 and 1.13

# OA40901 – LINEx.ST improper JQE update



Problem

- NJE SYSOUT transmitter encounter error
  - Decides to hold job
- Job is active on another process (OUTPUT)
- NJE update does not have proper serialization
  - \$Q14 ABEND results
- Rare timing window



Fix

JES2 z/OS 1.12 and 1.13

# OA40790 – \$SJB chaining error cause IPL

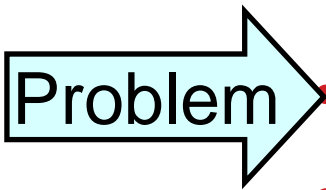
## Problem

- Unknown overlay of JES2 HASB data area (CSA)
- Recovery of HASB results in \$SJB removal
- But running address space still using \$SJB
  - Double usage of \$SJB is possible
- Various chaining problems can result
  - Loop in \$SJB chain can require IPL to fix
- APAR correct recovery code and prevents loop
  - Does not address overlay

## Fix

JES2 z/OS 1.12 and 1.13

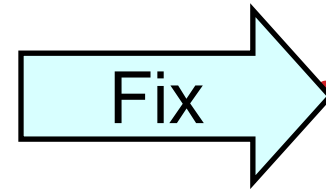
# OA40755 – CKPT reconfiguration hangs



- CKPT on CF is being reconfigured
- During reconfiguration process, CF rebuild is done
  - Any system managed process could trigger this
- Reconfiguration ends up waiting forever for subtask

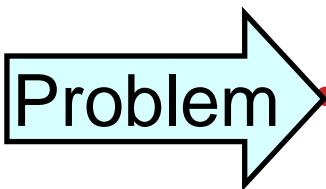


• System managed process during CKPT reconfiguration

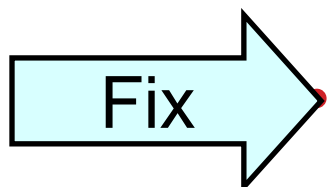


• JES2 z/OS 1.12 and 1.13

# OA40735 – ABEND in CKPT reconfiguration



- Checkpoint on DASD
- I/O error reconfiguration occurs due to lost paths
  - Device old CKPT is on cannot be accessed
- CLOSE processing for old data set fails
  - ABEND314 RSN4
- JES2 terminates



JES2 z/OS 1.12 and 1.13

# OA39972 – ABEND submitting job to RJE RDR

- Problem** → Invalid job submitted via RJE (or card) RDR
- Message \$HASP125 SKIPPING FOR JOB CARD
  - Other invalid jobs will get an ABEND 0C4
  - 0C4 continue until valid job is submitted

**Fix** → JES2 z/OS 1.13

## OA39891 – Segmented or spun output errors

Problem

• Job creates SYSOUT with SEGMENT= value  
or

• SPIN data is spun (due to SPIN any support)  
and

• Data set is referenced by OUTPUT cards  
then

• If first segment prints and purges, then subsequent  
segment cannot be printed (\$CBIO error)

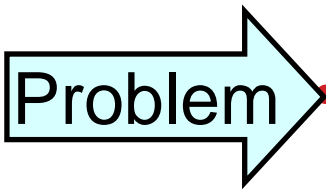
Fix

• JES2 z/OS 1.13



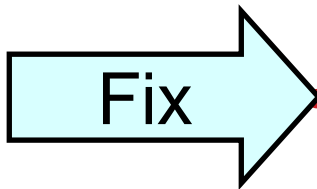


## OA38935 – ENF 58 and 70 Fixes



Excessive multi system ENFs some with no useful data

- PSO issued ENF 58 when not requested
- JQS issued ENF 70 in cases where not needed
- Missing data in various ENF 58 and 70
- See APAR for list of issues fixed
- Added ENF 58 (43 & 44) and 70 (45 & 46) JES2 \$TRACE ids
  - Send and receive ENFs respectively



JES2 z/OS 1.11, 1.12, 1.13

# OA37835 – Track Group Recovery Improvements

## Problem

- Unusual problem in disaster recovery
  - Seems to be related to PPRC and Flash Copy of SPOOL
  - Signature records (SPOOL ownership records) corrupted
  - Causes double allocation of SPOOL at target (recovery) site
- APAR makes SPOOL garbage collector more conservative
  - Examines data and signature record before reclaiming space
  - Could delay SPOOL recovery
- Original problem has been diagnosed and fix is in process
  - Fix number 264749, microcode release 6 and 7

## Avoid!

Flash Copy and PPRC of SPOOL

## Fix

JES2 z/OS 1.11, 1.12, 1.13



# Don't Run Out of BERTs

- Don't run out of BERTs

# System z Social Media

- System z official Twitter handle:
  - [@ibm\\_system\\_z](https://twitter.com/ibm_system_z)
  
- Top Facebook pages related to System z:
  - [Systemz Mainframe](#)
  - [IBM System z on Campus](#)
  - [IBM Mainframe Professionals](#)
  - [Millennial Mainframer](#)
  
- Top LinkedIn Groups related to System z:
  - [Mainframe Experts Network](#)
  - [Mainframe](#)
  - [IBM Mainframe](#)
  - [System z Advocates](#)
  - [Cloud Mainframe Computing](#)
  
- YouTube
  - [IBM System z](#)



- Leading Blogs related to System z:
  - [Evangelizing Mainframe \(Destination z blog\)](#)
  - [Mainframe Performance Topics](#)
  - [Common Sense](#)
  - [Enterprise Class Innovation: System z perspectives](#)
  - [Mainframe](#)
  - [MainframeZone](#)
  - [Smarter Computing Blog](#)
  - [Millennial Mainframer](#)

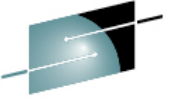


Questions?

# Questions?

Session 13842





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# The Perfect Storm

- JES2 **RED ALERT** – Draining and halting SPOOL volumes
- OA36256 – Fixed a problem with JESXCF messaging
  - Messages went to wrong member name due to down level QSE
  - Changed tests so a \$QSUSE was done to wait for latest QSEs
  - Delayed XCF member status information
  - Initializing member appears MVS-GONE for one JES2 dispatcher cycle
  - Exposes bug in HASPSPOL that messes up DASALOCS flags
    - Only for starting, draining and halting volumes
    - Members allocated to a CKPT volume
  - Causes HASPSPOL to make incorrect decisions
    - Thinks volume can be halted/drained prematurely
  - Real problems if/when a halting/draining volume is started (\$S)
    - DYNALLLOC fails if a members DASALOCS bit is wrong



# The Perfect Storm

- OA38016 – Fixes obscure problem when \$S command fails
  - Only happens if \$S command and some members need to allocate
  - “Should” never happen for draining volume
  - Rare for halting volume
  - If allocate fails, volume is REMOVED from the configuration
    - All data on the volume is lost
  - Problem was fixed in z/OS 1.13, APAR was rolling down fix
- Second problem with DEB for SPOOL volumes
  - If volume incorrectly drained or halted (due to OA36256 and \$S problem) the DEB is not cleared
  - New volume starting on member will use OLD DEB and OLD VOLUME
    - Only on members affected by OA36256
  - Member using different physical volumes for same SPOOL
  - Also addressed by OA38016





# The Perfect Storm

- OA39737 – Corrects XCF status problems
  - Removes \$QSUSE for status updated
  - Member status is now blend of XCF status and \$QSE status
  - Corrects problems causing DASALOCS to be bad
  - Adds DEBUG option to track member status changes via WTO
- What to do?
  - Back off OA36256 if possible
  - Apply OA38016 as soon as possible (fixes data loss problem)
  - Avoid Halting (\$Z) or draining (\$P) SPOOL volumes
    - If you want to drain, set SYSAFF=(-ANY) and wait for jobs to purge
    - Do \$P when all jobs are off volume
  - If a \$S fails with  
IKJ56246I DATA SET SYS1.HASPACE NOT ALLOCATED, FILE IN USE  
then hot start the member to correct the DASALOCS bits
  - Warning, JES2 can halt volumes at any time due to loss of connectivity



## OA39337 – JES2 start fails with \$HASP401

- In z/OS 1.13, the IHADVA size unintentionally increased from x'18' to x'20' bytes
- OA37764 restored the original x'18' size of the IHADVA
- JES2 is sensitive to the size of the IHADVA
  - Used in data areas shared across modules
- JES2 PTF all used larger size
- Local re-assemblies could use smaller size if OA37764 applied
  - Caused inconsistent mappings resulting in errors and failed starts
- Overabundance of caution resulted in all PTFs shipping parts using IHADVA to be PEd.
  - Fix reworks code to not have dependency across modules
- Not a problem if you do not assemble JES2 locally or if you always assemble everything when anything changes



# Performance APARs

- OA38935 – Reduce number of ENF70s and ENF58s
  - Also corrected problems with payload in ENFs
  - Added \$TRACE points to trace ENFs sent and received
    - Useful if developing applications to use ENFs
- OA36382 – Eliminate extraneous job lock to improve SAPI performance
  - Major improvements if you have many SPIN data sets and multiple SAPI threads
  - PE – Output not selected after SAPI splits JOE – OA40499
- OA36328 – \$TO commands to change DEST= can take a long time due to unnecessary subtask processing

# DOC APAR OA38750

- \$HASP492 message indicates start process status  
\$HASP492 JES2 MEMBER-N1M1 QUICK START HAS COMPLETED
- APAR OA24118 dealt with ABENDs during \$E MEMBER
  - ABENDs caused the \$E MEMBER processing to fail
  - New variant of \$HASP492 was issued in this case  
\$HASP492 JES2 MEMBER-N1M1 RESTART HAS FAILED
  - Variant is ONLY for RESTART (\$E MEMBER) processing
    - Other starts just fail to complete and JES2 terminates
- Message update appeared in recent manuals
  - Not clear when HAS FAILED came out
  - Was a concern for automation
- DOC APAR clarified the message and variants
- Ironically, automation was part of the reason for using the same message ID
  - It indicated that the process completed



## OA39223 – JQE Overlay Prevents \$ZAPJOB

### Problem

- Unknown problem (exit?) overlays JQE node number
  - Input (JQEINPND) or Execution (JQEXEQND) node
- Various ABENDs trying to access job
- Attempt to \$ZAPJOB fails with similar ABEND
- \$ZAPJOB should not fail
- Code added to validate binary NJE node before using

### Fix

JES2 z/OS 1.11, 1.12, 1.13



# OA38951 – JES2 CKPT hung after System managed process

## Problem

- The JES2 CKPT process (PCE) can hang
  - CKPT must be on CF
  - A system managed process has just completed
    - Such as a rebuild
  - The post of the CKPT on CF subtask is lost
  - CKPT PCE waiting for subtask, subtask waiting for PCE
  - Very small timing window
- No CKPT work will happen (Start, logon, etc)
  - Hot start clears problem

## Avoid!

- System managed rebuild of CKPT CF structure

## Fix

- JES2 z/OS 1.11, 1.12, 1.13 - OPEN



## OA38043 – Allow Null JOBCCLASS QAFF=

### Problem

• Can remove members from QAFF but list cannot be null

- Wanted to shut down last member in QAFF but had to hold the jobclass instead of removing member
- No good reason to disallow null list
- Code that ensures list not null removed

### Fix

• JES2 z/OS 1.11, 1.12, 1.13

## OA38683 – \$JOA Cleanup Problem

### Problem

- PCE ABENDs owning BERT lock for a \$JOA
- Code in MISC PCE attempts clean up BERT lock
  - Uses wrong offset (offset from JQE) for BERT token
- Result is various errors including \$BR3
  - Errors could result in corruption of some existing BERTs
- Problem in z11 mode only
  
- If you encountered the problem, expect to see errors on warm start (even with APAR on)
  - \$DISterr at Label BERTERR
  - \$HASP483 JES2 JOB QUEUE ERROR, RC=51

### Fix

JES2 z/OS 1.11, 1.12, 1.13





## OA38671 – CPU Loop after \$CJ

- Problem**
- Loop in JES2 converter processing
  - Caused when job is \$CJed while in converter
    - \$CJ has to occur at an inopportune moment
      - Middle of JES2 chaining an SDB for a data set
  - Loops occurs due to additional validation during free

- Avoid!**
- \$CJ of jobs in conversion (unless truly hung)

- Fix**
- JES2 z/OS 1.13

## OA38135 – SYSLOG Browse Hang (SDSF)

- Problem** →
- Loop can occur if browsing SYSLOG as it is SPUN
    - Easy to re-create if writelog done from SDSF browse panel
  - TSO user in a never ending loop with an I/O in it

**Avoid!** → WRITELOG from SDSF SPOOL Browse panel

**Fix** → JES2 z/OS 1.11, 1.12, 1.13