



JES2 Product Update and Latest Status Updated February 6th 2013

Tom Wasik IBM Rochester, MN

Tuesday 4:30PM Session Number 13029







Trademarks

S H A R E Technologi - Consections - Assudi

The following are trademarks of the International Business Machines Corporation in the United States and/or other countries.

- IBM®
- MVS[™]
- Redbooks®
- RETAIN®
- z/OS®
- zSeries®

The following are trademarks or registered trademarks of other companies.

- Java and all Java-related trademarks and logos are trademarks of Sun Microsystems, Inc., in the United States and other countries.
- Linux is a registered trademark of Linus Torvalds in the United States, other countries, or both.
- Microsoft, Windows and Windows NT are registered trademarks of Microsoft Corporation.
- UNIX is a registered trademark of The Open Group in the United States and other countries.
- SET and Secure Electronic Transaction are trademarks owned by SET Secure Electronic Transaction LLC.
- All other products may be trademarks or registered trademarks of their respective companies.

Notes:

2

Performance is in Internal Throughput Rate (ITR) ratio based on measurements and projections using standard IBM benchmarks in a controlled environment. The actual throughput that any user will experience will vary depending upon

considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve throughput

improvements equivalent to the performance ratios stated here.

IBM hardware products are manufactured from new parts, or new and serviceable used parts. Regardless, our warranty terms apply.

All customer examples cited or described in this presentation are presented as illustrations of the manner in which some customers have used IBM products and the results they may have achieved. Actual environmental costs and performance

characteristics will vary depending on individual customer configurations and conditions.

This publication was produced in the United States. IBM may not offer the products, services or features discussed in this document in other countries, and the information may be subject to change without notice. Consult your local IBM

Business contact for information on the product or services available in your area.

All statements regarding IBM's future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only.

Information about non-IBM products is obtained from the manufacturers of those products or their published announcements. IBM has not tested those products and cannot confirm the performance, compatibility, or any other claims related to

non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

Prices subject to change without notice. Contact your IBM representative or Business Partner for the most current pricing in your geography.



Agenda . . .



JES2

- Current JES2 Releases
- Migration & Implementation Tips
- Recent Service
- References
 - Documentation & Web Sites
- Other Presentation
 - 13026: JES2 Performance Considerations
 - Tuesday 1:30 PM (See charts online)
 - ► 13028: What are All These JES2 NJE Options? (The A-Zs of NJE)
 - Wednesday 11:00AM-12:15PM (Long session)



JESZ

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	HJE7708	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	9/14 *	
z/OS 1.13	HJE7780	9/11		9/16*	
z/OS 2.1	HJE7790	9/13		9/18 *	

See http://www-03.ibm.com/systems/z/os/zos/support/zos_eos_dates.html



4

Complete your sessions evaluation online at SHARE.org/SFEval © 2013



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/0S R8	Х						
z/OS R9	Х	Х					
z/OS R10	Х	Х	Х				
z/OS R11		Х	Х	Х			
z/OS R12			Х	Х	Х		
z/OS R13				X	X	X	
z/OS R2.1							X

IBM recommends the same level of z/OS & JES2 thoughout 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





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:

WTOR

WTO - JES2 *level* (*HJExxxx*) is not supported running on *mvs_level*

 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 119 8/2012	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	SHARE 107 8/2006
z/OS R2														
z/OS R4					1						1	4(4)	4(4)	6(4)
z/OS R5		1				1						6(6)	5(5)	14(10
z/OS R7		1						2	1	2	12	19	10	6
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		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	7(4)	10(10)	15(15)	14(7)	13									
z/OS R13	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
- 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)
 - Calculation if job can execute 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 mannabes by \$ADD/\$DEL JOBCLASS command
- Existing 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





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 JES.JOBCLASS.SUBMITTER
 - Checks if submitting userid has access to entity
 - Can perform both or neither check
- 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
 - EXIT 6 run in JES2 address space. No access to HCT.
- Migration impact to Exits 6 and 7
 - Exit 6 is now always user environment (R11 is HCCT)
 - Exit 8 not 7 always called to read/write IOTs for conversion



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
 - JOBLCASS 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





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 sumbitting 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,ROUTECDE,OUTDISP
 - QUEUE,OUTDISP
 - ROUTECDE,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/Coexistance

- APAR OA36155 is needed for coexistance 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 (Converter internal text) must be updated
 - Now user environment (R11 is HCCT)
 - Must be in common storage
 - If running in JES2CIxx 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

Execution

SSJES299001

SSJES297205

SSSHARE016034 - Converter Support for JECL cards and \$HASP Messages

- Provide for more than 36 JES2 job classes. SSJES294003

GGMVJS94002 - JES OUTPUT JESDS Processing When Job Fails Before

- JES2 command to display parmlib members used
- 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 *nnnnnn* 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-999999E sort within each range
 - Cannot sort numeric and character
- New keyword to enable
 - OUTDEF DSLIMIT=10M|4B
- Shipped in OA38944



JES2 Service Information



HiPer APARs (Hi Impact, or Pervasive)

yy/mm/dd APA	AR	COMMENTS
12/11/26 OA	40901	\$Q14 ABEND when SYSOUT transmitter updates unserialized JQE
12/11/13 OA	40790	\$HASB recovery code results in \$SJB chaining errors/loops needing IPL
12/07/17 OA	39972	ABEND 0C4 submitting jobs to an internal reader
12/07/02 OA	39891	SEGMENT= or spun data sets fail to print
12/06/08 OA	39737	After OA36256, JES2 fails to completely clean up a spool volume
12/04/11 OA	39337	AFTER OA37764, POSSIBLE MSGHASP401 WHEN STARTING JES2
12/03/26 OA	39223	JES2 ENF PROCESSING MAY PREVENT \$ZAPJOB SUCCESS
12/03/01 OA	38951	JES2 UNABLE TO OBTAIN CHECKPOINT AFTER CF SYSTEM-MANAGED REBUILD
12/02/28 OA	38935	Improvements to JES2 ENF70 and ENF58 processing
12/02/03 OA	38683	\$BR3 RC8 DATA ERROR DETECTED BY \$DOGBERT SERVICE
12/02/03 OA	38671	High CPU utilization after \$CJ or ABEND in converter
11/12/02 OA	38254	\$HASP9202 JES2 MAIN TASK LOOP DETECTED NEAR HASPSASR+000987
11/11/10 OA	38016	\$S SPOOL allocation problems
11/11/08 OA	37992	JES2 errors following termination
11/10/04 OA	37835	Improvements to SPOOL track group recovery
11/09/27 OA	37654	\$DJ2 error after \$DOGJQE WAIT=(NO,DEFER) is issued
11/08/04 OA	37233	SP230 KEY1 storage leak in initiators
11/07/29 OA	37147	ABEND02A RC28 in HASCPHAM after restart
11/07/26 OA	37104	I/O error writing JCT during conversion causes loop
11/06/08 OA	36674	Duplicate jobs not executing or invalidly marked as such
11/07/21 OA	37018	Specifying JESLOG=(SPIN,criterion) can result in creating unnecessary spin data sets (z/OS 1.13)





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





1F57

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 SYSQUT



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



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





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







OA40735 – ABEND in CKPT reconfiguration



- Problem 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





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





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)



OA38935 – ENF 58 and 70 Fixes



Problem 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



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







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





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







OA38043 – Allow Null JOBCLASS 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





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







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







Don't Run Out of BERTs

Don't run out of BERTS







System z Social Media System z official Twitter handle:

- - <u>@ibm_system_z</u>
- 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**



58 Complete your sessions evaluation online at SHARE.org/SFEval

© 2013 IBM Corporation



Questions?

Questions?

Session 13029







z/OS 1.13 Overview

- Batch Modernization
 - Instream data in PROCs (cataloged and instream)
 - Controlling job return code
 - Spin and SPIN data set
 - Requeue job by command on a step boundary
- SPOOL Enhancements
 - Extend SPOOL data set
 - Greater flexibility on names and volumes
 - SPOOL Migration
- Enhanced SSIs
 - Completion of device SSI





z/OS 1.13 Instream Data in PROCs

- Instream data in PROCs and INCLUDEs
 - Simplifies writing JCL PROCs
 - No need for separate control data set
 - Support DD * and DD DATA in full in PROCs and INCLUDEs
 - Works with instream PROCs
 - No automatic generation of SYSIN DD * like JCL
 - Works for all users of PROC (batch and started tasks)
 - Job must run under JES2 (no MSTR subsystem)
 - Must convert on a z/OS 1.13 member
 - Can run on any level member





z/OS 1.13 Instream Data in PROCs

• Instream data in PROC example

//HELLO PROC //STEP1 EXEC ASMHCLG //C.SYSIN DD * TEST CSECT , STM 14, 12, 12(13)BALR 12,0 USING *,12 13, SAVAREA+4 ST13, SAVAREA TIA SPACE 1 WTO 'Hello world!' SPACE 1 L 13, SAVAREA+4 LM 14,12,12(13) SR 15,15 BR 14 SPACE 1 DC 18F'0' SAVAREA END //L.TEST DD DUMMY //L.SYSXX DD * 11 PEND





z/OS 1.13 Job Return Code

- New job card operand to control job RC
 - JOBRC= MAXRC | LASTRC | (STEP, name.name)
 - MAXRC is existing processing (default)
 - LASTRC is return code of last step
 - (STEP, name. name) is return code of identified step
 - If step not executed, defaults to MAXRC
- Affects return code seen in
 - Extended status (eg SDSF)
 - ENF 70
 - HASP165 message
 - \$DJ,CC= command
- JOBCLASS JOBRC= MAXRC|LASTRC to affect processing for all jobs in the job class
- Two additional error case return codes defined
 - CONVERTER ERROR Conversion processing ABENDed processing the job
 - SYSTEM FAILURE System crashed while job was running and job could not be restarted.





z/OS 1.13 Spin Any SPIN

- Added function to spin any spin data set
 - Similar to what was done for JESLOG
 - Applies to any data set allocated as SPIN
 - No application code/JCL change needed
 - Spin based on size, time, operator command
- Update to SPIN= DD operand
 - SPIN=(UNALLOC, option)
 - 'hh:mm' Spin at specific time
 - '+hh:mm' Spin every hh:mm interval
 - nnn, nnnK, nnnM Spin every nnn lines
 - NOCMND Cannot be spun by command
 - CMNDONLY Can be spun via operator command (default if no interval)

• \$TJ*n*,SPIN,DDNAME=*name* command added





z/OS 1.13 Requeue Job

Remove job on step boundary

- New STEP operand on \$EJ command
 - Causes job to exit execution at end of current step
 - Optional HOLD operand makes job held
 - Job is requeued for execution
- Job must be journaling (JOURNAL=YES on JOBCLASS)
- Uses existing continue restart function of z/OS
 Previously used to restart jobs after an IPL
- Full syntax \$EJxxx,STEP [,HOLD]
 - Full cross member support





z/OS 1.13 Extend SPOOL

- Command to extend SPOOL to adjacent free space
 - \$TSPOOL(xxxxxx),SPACE=
 - SPACE= same as \$\$ SPOOL
- SPACE is total size after expand is complete (NOT increment)
- Total size limited to architecture
 - JES2 limit is based on LARGEDS on SPOOLDEF
 - Allowed/Always limit is 1M tracks
 - Fail limit is 64K
 - DSCB format limits expansion into EAS storage
 - Should migrate to CYL_MANAGED=ALLOWED
 - Allocate SPOOL using DD EATTR = OPT to build format 8/9 DSCB





z/OS 1.13 SPOOL DSN/VOLSER

- Data set name for SPOOL can now be specified on \$S SPOOL
 - SPOOLDEF DSNMASK limits values
 - Can have generics
 - Default is only SPOOLDEF DSNAME value allowed
 - Must be in z11 \$ACTIVATE mode
- SPOOL volume prefix can now have generics
 - SPOOLDEF VOLUME= still 5 characters
 - If no generics, then prefix
 - If generics, then volume must match pattern
- New SPOOL initialization statement
 - Used on COLD start to locate SPOOL volumes
 - If present, only SPOOLs with initialization statements used
 - If SPOOL volume has generics, then SCAN is not done
 - UCB scan for SPOOL volumes only done if no SPOOL init stmts and no generics in VOLUME=

JES2@

Should not use until all members migrated to z/OS 1.13



z/OS 1.13 SPOOL Migration

- \$M SPOOL command to move data off volume
 - Faster than \$P SPOOL (Minutes not days)
 - Function enabled with OA36158 (PTF UA64366)
- Command works with active address spaces using volume
 - Less activity is better/faster but no need to IPL to stop active jobs
- Goal of SPOOL migration is to stop using SPOOL data set
 - It is NOT to eliminate the internal representation of the volume
 - Old data set can be deleted and SPOOL volume taken offline
- After a successful SPOOL migration
 - \$DSPOOL still shows volume
 - \$DJQ,SPOOL= still displays volume
 - New status is MAPPED





z/OS 1.13 SPOOL Migration

- Two forms of SPOOL migration, MOVE and MERGE
 - Move takes all data on an existing volume and moves it to a new one
 - Source must be INACTIVE (\$Z SPOOL done)
 - No active jobs on the volume
 - Target cannot be currently an active SPOOL volume
 - Can specify space to create data set on target
 - At the end of move, old (source) volume does not exist
 - Target after a move is active
 - Merge takes all data on one volume and merges it onto free space on another volume
 - Most flexible migration option
 - Source can be in any state with active jobs/address spaces
 - Less activity is good
 - Results is a mapped volume that goes away when all jobs using it are deleted
 - Similar to \$P SPOOL but device is no longer in use





z/OS 1.13 SPOOL Migration

- MERGE Migration :
 - Copies an existing Source Volume to free space on a Target Volume :



- Upon completion, the Source Volume becomes a Mapped Volume.
 - Remains MAPPED until all jobs and SYSOUT that have space on the Source Volume are purged. It then goes away (no longer exists).





z/OS 1.13 SSI Enhancements

- SSI 82 JES Property SSI
- Node information SSI sub-function of JES properties SSI (SSI 82)
 - Enhanced to provide information from all active members of JES2 MAS
 - Available from MAS members starting from z/OS 1.11
 - Requires APAR OA35942 (760 UA90569, 770 UA90570)
- New function is exploited by SDSF
- For more information, see publication MVS Using the Subsystem Interface





z/OS 1.13 SSI Enhancements

- SSI 83 Device information SSI
 - Enhanced to support all types of devices managed by JES2 (readers, punches, transmitters, receivers, lines, offload etc.)
 - Provides extensive filtering capabilities e.g. by device state, device name, a variety of device attributes
 - Provides information about all devices managed by all active members of JES2 MAS
 - Device information is available from JES2 MAS members starting from z/OS 1.11 (requires coexistence APAR on z/OS 1.11 and 1.12)
- New function is exploited by SDSF
- For more information, see publication MVS Using the Subsystem Interface




z/OS 1.13 SSI Enhancements

- JES subsystem data set allocation support for XTIOT
 - Option on DYNALLOC request
 - S99TIOEX bit for authorized callers
 - S99DXACU bit supports all callers (unauthorized)
 - Moves allocations control blocks from 24 to 31 bit storage
- Relieves pressure on 24 bit storage
- Increases number of concurrent allocations
 - Reduces pressure on 24 bit TIOT
- Implications include not being able to find DD in TIOT
 - Could break applications looking into TIOT
 - Very unlikely
- Controlled by parmlib option
 - NON_VSAM_XTIOT=<u>NO</u>|YES in DEVSUPxx
- Good ideas for use include
 - SPOOL data set browse, SPIN data set allocation





z/OS 1.13 Migration/Coexistance

- From JES2 z/OS 1.9 or 1.10
 - Can all member warm to z/OS 1.13
 - No coexistence support
 - Fall back implications
 - Some new data structures created by z/OS 1.13 JES2 may result in problems in z/OS 1.10 and prior
 - Prior to z/OS 1.10 may not be able to use SPOOL volumes with nonstandard data set names
- From JES2 z/OS 1.11 or z/OS 1.12
 - COMPAT APAR OA31806 is needed on a z/OS 1.11, or z/OS 1.12 member to coexist in a MAS with z/OS 1.13
 - HJE7760 UA59434
 - HJE7770 UA59435
 - APAR also highly recommended for fall back as well
 - Some new data structures created by z/OS 1.13 JES2 may result in problems if OA31806 is not installed.





z/OS 1.13 JES2 SPOOL Migration Enabled

- z/OS 1.13 SPOOL migration function has been enabled
 - APAR OA36158 (PTF UA64366) closed February 24, 2012
- SPOOL migration page on the web
 - JES2 SPOOL Migration
- SHARE session
 - 10844: JES2 SPOOL: Defining, Managing, and Updating
 - Atlanta 2012 proceedings

JES2 spool migration

A JES2 spool migration moves an existing JES2 spool volume (an extent or data set) to a new spool volume, or merges an existing volume with another existing spool volume.

The following resources provide information to help you migrate spool volumes:

Spool migration FAQ

Spool migration frequently asked questions [PDF-0.23 MB]

z/OS V1R13 JES2 Migrating spool volumes documentation JES2 Infocenter [HTML]

SHARE presentations on JES2 spool migration

- JES2 Product Update SHARE, August 2011:
 - Overview of JES2 function added in z/OS V1.13 [<u>PDF-0.93MB</u>]
- z/OS 1.13 JES2 New Functions, Features, and Migration Actions - SHARE, August 2011
 - Technical details of the changes made in z/OS 1.13 JES2 [PDF - 0.73MB]
- SHARE conference (Scheduled March 15, 2012)
 - JES2 SPOOL: Defining, Managing, and Updating [HTML]

