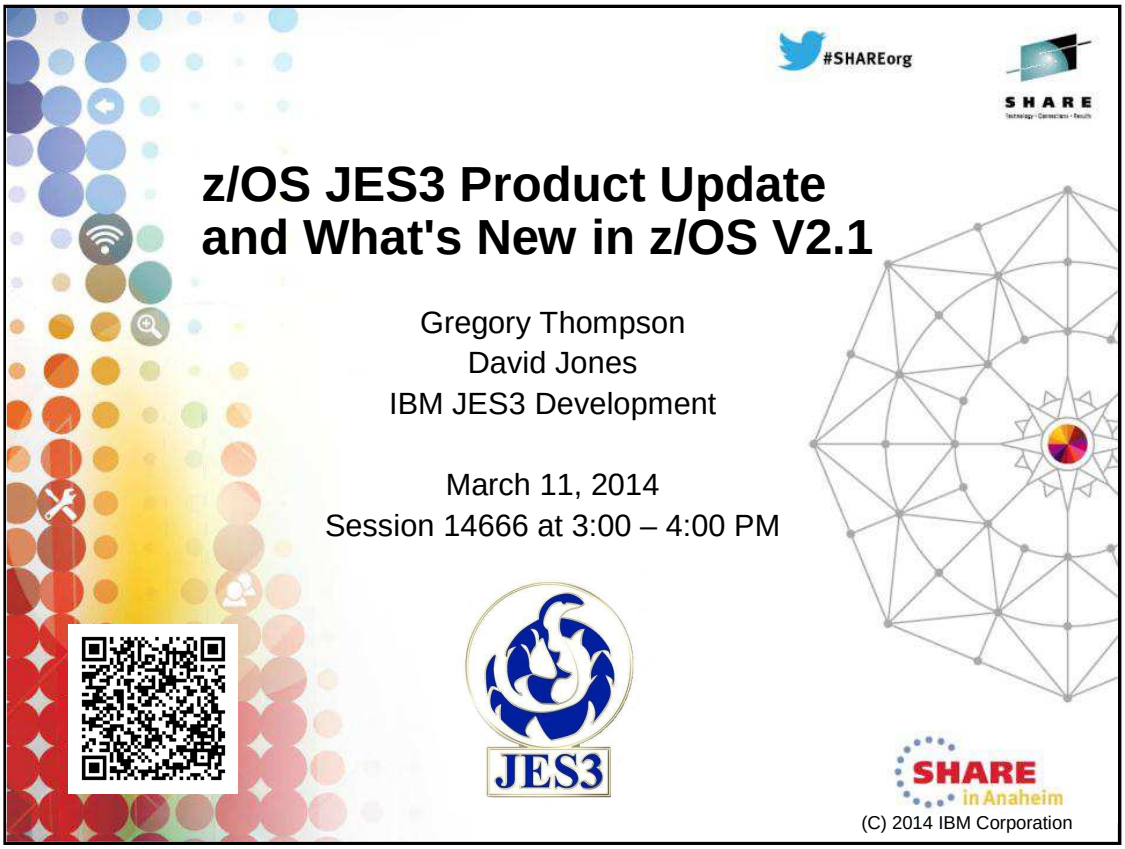
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SHARE
z/OS JES3 Product Update and What's New in z/OS V2.1
Gregory Thompson
David Jones
IBM JES3 Development
March 11, 2014
Session 14666 at 3:00 – 4:00 PM
JES3
SHARE in Anaheim
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Active Releases

Release	JES3 FMID	Available	End of Service
z/OS V2.1.0	HJS7790	September 30, 2013	
z/OS V1.13.0	HJS7780	September 30, 2011	September 30, 2016
z/OS V1.12.0	HJS7770	September 29, 2010	September 30, 2014

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

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Lifecycle Extensions are a fee-based offering that provides corrective service (a fix, bypass, or restriction to a problem) for up to two years beyond the withdrawal of service date for a z/OS release.

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BCP Compatibility

	z/OS V1.12	z/OS V1.13	z/OS V2.1
z/OS V1.12 JES3 (HJS7770)			
z/OS V1.13 JES3 (HJS7780)			
z/OS V2.1 JES3 (HJS7790)			

Starting in z/OS V2.1, customers need to migrate to all elements of z/OS at the same time, including JES2, JES3, or both.

Through z/OS V1.13, JES3 code can be compiled and executed on the same or a higher level of the BCP, but never a lower level.

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Service Highlights
Information APARs

APAR	Problem description	Updated
II07968	JES3 Maintenance Philosophy.	2/1/2012
II11768	JES3 Toleration APARs.	3/5/2013
II11784	Recommended JES3 SAPI and Extended Status (SSI 80) maintenance.	8/19/2013
II12051	Known causes of ATL or VTS problems in a JES3 environment.	12/20/2004
II14347	Jobs hung in GMS SELECT state when initiators are defined as JES3 managed.	12/05/2007
II14434	Recommended JES3 TCP/IP/NJE maintenance.	8/6/2013
II14572	Recommended JES3 SPOOL Browse and SYSLOG Browse maintenance.	8/6/2013
II14635	SDSFINFO : REC-CNT on SDSF JDS for JES3 datasets incorrect	4/18/2012

Updated since 3/1/2013

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Service Highlights

Extended Status & SAPI APARs

APAR	Problem description	
II11784	Recommended SAPI and Extended Status (SSI 80) maintenance.	INFO
OA42547	ABEND0C4 in IATOSSO in SAPIDSP	
OA44052	Jobs may not purge after all output has been processed using SAPI application	PE,HIPER

SPOOL and SYSLOG Browse APARs

APAR	Problem description	
II14572	Recommended JES3 SPOOL Browse and SYSLOG Browse maintenance.	INFO
OA42641	ABEND1FB RSN04 in module IATDMEB	HIPER

PE = Fixes a PTF in Error

APARs closed since 3/1/2013

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Service Highlights
NJE over TCP/IP APARs

APAR	Problem description	
II14434	Recommended JES3 TCP/IP/NJE maintenance.	**INFO**
OA41576	OPTCD=J not honored for output transmitted via NJE/TCPIP in JES3	
OA41633	ABEND of TCP FCT does not dump NETSERV	
OA41983	TRUNC=NO not honored for output transmitted via NJE/TCPIP in JES3	
OA43464	ABEND0C4 in IATCNNJ	
OA43779	MSGIAT8131 issued without MSGIAT8141 for TCP output	

APARs closed since 3/1/2013

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Service Highlights
JES3 APARs (1 of 2)

APAR	Problem description	
OA41680	Various abends during JES3 restart with OA40545 applied	**PE**
OA41758	Unclear documentation for the PDEFAULT parameter in JES3 books	**DOC**
OA41978	ABENDS722 results in IMS ABENDU0113	
OA42045	ABENDDM764 RSN8	
OA42496	JES3AUX ABENDSA03 IATDMCB(DMCBERTN)	**HIPER**
OA42792	DOI corruption	
OA42864	MSGIAT3122 issued on JES3 local in z/OS 1.13 HJS7780 with DYNALLOC statements	
OA43129	ABENDDM721 in DJ FCT processing SWBS	
OA43325	Incorrect JES3 C/I message macro usage causes overlay	**DOC**
OA43344	After error doing dynamic spool add, I/O errors and abends occur	**HIPER**
OA43384	MSGLEVEL for started tasks	**DOC**

PE = Fixes a PTF in Error
DOC = Documentation

APARs closed since 3/1/2013

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Service Highlights
JES3 APARs (2 of 2)

APAR	Problem description	
OA43488	MSGIAT8344 configuration modification failed - severe error	
OA43624	ABEND0C4 in IATPURG	
OA43680	ABEND0C4 in IATUTIS (Initialization stream checker)	
OA43739	ABENDS9C7 RSN2 or ABENDSD22 RSN40 after restart of JES3	
OA43772	ABENDDM037 RSN=3 issued by INJOBVAL during restart	**HIPER**
OA43796	Wrong CPU-ID in MSGIAT3123	
OA43839	System hang - loop in IATSIJS	**HIPER**
OA44261	After ABENDU0001 JES3 will not start - ABENDS2FB	**HIPER**
OA44358	JES3DRDS is not being allocated during DSI after application of OA42864	**PE,HIPER**

PE = Fixes a PTF in Error

APARs closed since 3/1/2013

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OA44261 – After ABENDU0001 JES3 will not start - ABENDS2FB

- A JES3 global was restarted (hot start with refresh) to apply recent updates to an inish deck.
  - A syntax error was detected processing the inish deck changes, and JES3 was terminated with ABENDU0001.
- Subsequent attempt to hot start JES3 failed with ABENDS2FB.
  - Also posted MSGIAT3021 JES3 ALREADY ACTIVE.
- Code corrected to allow restart after an inish deck failure.
- User's affected:
  - All HJS7780

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OA44261 – After ABENDU0001 JES3 will not start - ABENDS2FB

PROBLEM SUMMARY:

A JES3 global was restarted (hot start with refresh) to apply recent updates to an inish deck. A syntax error was detected processing the inish deck changes, and JES3 was terminated. Module IATSIEM received control to process the subsequent EOM (end of memory) request, and perform cleanup. Routine SIEM119 attempted to access the associated MEMDATA using the MEM vector table field SVTMEMVT (macro IATYSVT) in the SVT. But since SVTMEMVT does not get updated until later in the restart process (IATINM3), IATSIEM was unable to locate and clean-up the associated MEM data, eventually causing the next hot start of JES3 to fail with ABEND2FB, and MSGIAT3021 - JES3 already active, requiring an IPL to recover.

PROBLEM CONCLUSION:

Module IATINTK was changed to set SVTMEMVT (macro IATYSVT) earlier in the (re)start process, so that it will be available for use whenever IATSIEM gets called for JES3 end of memory processing.

Module IATINGL was also changed to set SVTMEMVT, since it has the same exposure, but for an alternate path. Module IATINGL has been changed to skip the call to module IATINGS if an auto-restart is in progress.

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JES3 V2R1
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Must migrate JES3 along with MVS

- Running previous level JES3 on MVS V2R1 is not supported.
- JES3 initialization will display warning message IAT3210:

```
IAT3210 JES3 z1.13.0 is not supported on z/OS 02.01.00,
reply CONTINUE or CANCEL
```

- You can choose to continue JES3 initialization with the unsupported configuration.
- Does NOT affect what releases can co-exist in a JESPLEX

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JES3 Spool utilization commands

- Implemented new internals to maintain in-storage counts of spool track group allocations.
  - Existing mechanisms required a lot of spool I/O to identify owners of spool allocations.
- Allowed us to enhance commands for reporting spool usage.
  - *INQUIRY,Q,SP=*spart*,U improved (SHARE SSJES399351)
  - *INQUIRY,Q,DD=*ddn*,U,N=*nnn* added (SHARE SSJES3032649)
  - *INQUIRY,J=*job*,SD,U added
  - *START,DJ,DD=*ddn* added (SHARE SSSHARE01633)

JES3 Spool utilization commands
*INQUIRY,Q

- The *INQUIRY,Q command displays information about the spool partitions specified on the SP=*spart* parameter.
  - No new parameters or output.
  - Performance improved when using the U and N= parameters to display a list of jobs which have data on the specified partitions.
- The *INQUIRY,Q command displays information about the spool extent (or extents) specified on the DD=*ddn* parameter.
  - The U and N= parameters have been added to display a list of jobs which have data on the specified extents.
  - Similar to *INQUIRY,Q,SP=*spart* command, except focused on extents rather than partitions.

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JES3 Spool utilization commands
*INQUIRY,Q (*continued*)

- INQUIRY,Q,DD=*ddn*,U,N=*nnn*
  - U
    - Displays a sorted list of the largest spool space users for the specified spool extents.
    - A maximum of eight extent names can be specified when you use the U parameter.
    - Track group totals will be displayed for each extent specified.
  - N=ALL or nnn or 10
    - Specifies the number of jobs for which status information is to be displayed. If ALL is specified, the status of all jobs in the job queue is displayed. If this parameter is omitted, the default is 10 jobs.

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JES3 Spool utilization commands
*INQUIRY,Q example

- V1R13 example: ***I,Q,DD=SPOOL2,U,N=ALL**
  - U and N parameters are ignored.

```
IAT8513 SPOOL2   PART1        120 GRPS,    106 LEFT ( 88%)
IAT8611 INQUIRY ON SPOOL DATA SET STATUS COMPLETE
```

- V2R1 example: ***I,Q,DD=SPOOL2,U,N=ALL**

```
IAT8752 SPOOL2    TOTAL IN USE                14 TRKGPS
IAT8752 SPOOL2    TOTAL IN USE BY JES3         0 TRKGPS
IAT8752 SPOOL2    TOTAL IN USE BY JOBS        14 TRKGPS
IAT8753 SPOOL2    USERS FOUND=  0 JES3  3 JOBS;  3 DISPLAYED
IAT8754 SPOOL2  : JOB PRTSIMO2 (JOB00021)      8 TRKGPS,   7%
IAT8754 SPOOL2  : JOB WRITRECS (JOB00023)      4 TRKGPS,   3%
IAT8754 SPOOL2  : JOB RUNON    (JOB00018)      2 TRKGPS,   2%
IAT8755 INQUIRY ON SPOOL DATA SET USAGE COMPLETE
```


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JES3 Spool utilization commands
*INQUIRY,J

- The *INQUIRY,J command has been updated to display information about a job's spooled data.
  - The U (Usage) parameter has been added to display the distribution of a job's data across spool extents.
  - The U parameter is valid for both the SD and SH versions of the command.
- *INQUIRY,J=*job*,SD,U
  - Displays extent names and track group counts for ALL extents that contain data from the specified job.
- *INQUIRY,J=*job*,SH,U
  - Displays extent names and track group counts for those extents in SPOOL HOLD status that contain data from the specified job.

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JES3 Spool utilization commands
*INQUIRY,J example

- V1R13 example: ***I,J=WRITRECS,SD**

```
IAT8674 JOB WRITRECS (JOB00016) P=02 CL=W OUTSERV(PENDING WTR)
IAT8677 JOB WRITRECS (JOB00016) DD=SPOOL2, SPOOL3, SPOOL4, SPOOL5
IAT8699 INQUIRY ON JOB STATUS COMPLETE,       1 JOB  DISPLAYED
```

- V2R1 example: ***I,J=WRITRECS,SD,U**

```
IAT8674 JOB WRITRECS (JOB00016) P=02 CL=W OUTSERV(PENDING WTR)
IAT8750 JOB WRITRECS (JOB00016) DD=SPOOL2     4 TRKGPS
IAT8750 JOB WRITRECS (JOB00016) DD=SPOOL3     3 TRKGPS
IAT8750 JOB WRITRECS (JOB00016) DD=SPOOL4     4 TRKGPS
IAT8750 JOB WRITRECS (JOB00016) DD=SPOOL5     4 TRKGPS
IAT8699 INQUIRY ON JOB STATUS COMPLETE,       1 JOB  DISPLAYED
```


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JES3 Spool utilization commands
*START DJ

- The *START,DJ,DD=*ddn* command dumps all jobs that have data on a specified spool extent.
  - The DD=*ddn* is a new parameter that allows the caller to specify one or more spool extents.
  - The DD=*ddn* parameter also will be allowed for *START,DJ commands with the RESET parameter specified.
  - The Dump Job DSP must have been called for Out Mode via the *CALL,DJ,OUT= command.
    - If the Dump Job DSP was started for Input Mode via the *CALL,DJ,IN= command, the DD= parameter on the *START command will be flagged as an unrecognized operand (IAT7203).

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JES3 Spool utilization commands
*START DJ example

- V1R13 example: ***START,DJ,DD=SPOOL3**
  - DD= parameter not recognized.

```
IAT7203 DJ05BA (JOB00014): UNRECOGNIZED OPERAND:  DD
IAT7220 DJ05BA (JOB00014): FUNCTION COMPLETE ON UNIT 05BA
IAT7228 ISSUE START OR CANCEL FOR DJ (JOB00014) (05BA)
```

- V2R1 example: ***START,DJ,DD=SPOOL3**

```
IAT7229 DJ05BA (JOB00027): SUCCESSFULLY DUMPED JOB RUNON    (JOB00018)
IAT7450 JOB RUNON    (JOB00018) PURGED
IAT7229 DJ05BA (JOB00027): SUCCESSFULLY DUMPED JOB WRITRECS (JOB00023)
IAT7450 JOB WRITRECS (JOB00023) PURGED
IAT7230 DJ05BA (JOB00027): DUMP PROCESSING COMPLETE FOR DD NAME SPOOL3
IAT7253 DJ05BA (JOB00027): 0000002 JOBS SUCCESSFULLY DUMPED TO TAPE
IAT7220 DJ05BA (JOB00027): FUNCTION COMPLETE ON UNIT 05BA
IAT7228 ISSUE START OR CANCEL FOR DJ (JOB00027) (05BA)
```


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JES3 Dynamic Spool Remove

- Changing JES3 spool extents is disruptive to the JESplex.
  - Requires an IPL and warm start of the JES3 global main followed by an IPL and restart of all the JES3 local mains.
  - z/OS JES3 V1R13 provided the capability to add a spool extent without an IPL.
- z/OS JES3 V2R1 provides the capability to remove a spool extent without an IPL.
  - No IPL required for mains at z/OS JES3 V1R13 and later.
  - Can remove extents and add new extents at the same time.
- Extents can be added/removed with *MODIFY CONFIG command or using JES3 hot start with refresh.

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Why remove rather than delete?

The spool extent is a data set that is allocated on a disk volume by the user.

JES3 adds or removes a spool extent to or from the spool configuration.

JES3 does not allocate or delete the spool extent or data set.

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JES3 Dynamic Spool Remove
Create a JSAM initialization stream member

- As of V1R13, we recommend that customers create a new initialization stream member for the JES3 Spool Access Method (JSAM) related statements.
- This will allow customers to update and use the same JSAM member for dynamic spool add or delete and for subsequent JES3 starts which read the INISH deck.
- Include the JSAM related statements:
  - Start with the DYNALLOC statements…
  - …end with the ENDJSAM statement.
  - **ALL** DYNALLOC statements must be contained within a single INCLUDE member.
  - Cannot contain additional INCLUDE statements (no nesting).

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JES3 Dynamic Spool Remove
JSAM member example (simplified with 2 spool)

```
DYNALLOC,DDN=IATPLBI1,DSN=SYS1.PROCLIB
*
DYNALLOC,DDN=SPLX30,DSN=SYS1.JESPACE,VOLSER=SPLX30,UNIT=3390
DYNALLOC,DDN=SPLX31,DSN=SYS1.JESPACE,VOLSER=SPLX31,UNIT=3390
*-------------------------------------------------------*
SPART,NAME=PART1,DEF=YES,INIT=YES
*-------------------------------------------------------*
TRACK,DDNAME=SPLX30,SPART=PART1
TRACK,DDNAME=SPLX31,SPART=PART1
*-------------------------------------------------------*
OPTIONS,WANTDUMP=YES,JOBNO=(65500,999999,10000),
XCFGRPNM=JESXCFX3,DUMP=PRDMP,MT=ON
*-------------------------------------------------------*
BUFFER,BUFSIZE=4084,GRPSZ=20,PAGES=(1024,64,256),MINBUF=32,
SPLIM=(10,20)
*-------------------------------------------------------*
ENDJSAM
```


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JES3 Dynamic Spool Remove
INCLUDE new JSAM member

- Set up the INISH deck with an INCLUDE statement for the new JSAM member.
  - NOTE: The INISH deck cannot be used for JES3 levels earlier than V1.13.
- The INISH deck & JSAM member can be used for any hot start with refresh, warm, or cold start of JES3.
  - You should use the JES3 initialization stream checker utility to test the JES3 INISH deck.
  - *F CONFIG,M=*member*,LOG=YES can be used to check the contents of the JSAM member and create a log data set. The command can be terminated before any spool changes are actually made.

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JES3 Dynamic Spool Remove
INISH deck including a JSAM member

```
*--------------------------------------------------------------------*
* AN INISH DECK
*
*--------------------------------------------------------------------*
INCLUDE,MEMBER=JSAM
*--------------------------------------------------------------------*
INCLUDE,MEMBER=STANDRDS
*--------------------------------------------------------------------*
OUTSERV,CARRIAGE=6,WS=(C,F,FL,U,CL,D,P),NPRO=75,
   CHARS=GS15,OUTSVFCT=5,SNAGROUP=YES
*--------------------------------------------------------------------*
INCLUDE,MEMBER=MAINS
*--------------------------------------------------------------------*
  .
  . <additional statements>
  .
*--------------------------------------------------------------------*
INCLUDE,MEMBER=TAPE
*--------------------------------------------------------------------*
INCLUDE,MEMBER=DASD
*--------------------------------------------------------------------*
ENDINISH
```


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JES3 Dynamic Spool Remove
Removing an extent

- Update the INISH deck member containing the JSAM statements to remove the spool extent.
  - The full set of DYNALLOC statements for non-spool data sets must still be included. JES3 will fail the dynamic spool change if statements are changed or missing.
- *MODIFY Q,DD=*ddname*,DRAIN command to drain the spool extent to be removed.
  - JES3 stops allocating tracks from the spool extent.
  - JES3 moves STT records as part of this command (more later).

JES3 Dynamic Spool Remove
Removing an extent (*continued*)

- Remove job data from the spool extent.
  - *INQUIRY Q,DD=*ddname*,U,N=*nnn* to determine which jobs have data on the extent.
  - Purge jobs or use *START,DJ,DD=*ddname* to dump all job data from the extent.
  - Use *MODIFY CONFIG and respond to WTOR messages to allow JES3 to delete the job data when removing the extent.
- *MODIFY CONFIG,M=*member* command, specifying the updated JSAM member, to dynamically remove the extent.
  - Alternatively, restart the JES3 global using hot start with refresh.
  - Note that M= has been added for V2R1 and can be used for adding or removing a spool extent.

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JES3 Dynamic Spool Remove
JSAM member example (2nd spool removed)

```
DYNALLOC,DDN=IATPLBI1,DSN=SYS1.PROCLIB
*
DYNALLOC,DDN=SPLX30,DSN=SYS1.JESPACE,VOLSER=SPLX30,UNIT=3390
* DYNALLOC,DDN=SPLX31,DSN=SYS1.JESPACE,VOLSER=SPLX31,UNIT=3390
*-------------------------------------------------------------*
SPART,NAME=PART1,DEF=YES,INIT=YES
*-------------------------------------------------------------*
TRACK,DDNAME=SPLX30,SPART=PART1
* TRACK,DDNAME=SPLX31,SPART=PART1
*-------------------------------------------------------------*
OPTIONS,WANTDUMP=YES,JOBNO=(65500,999999,10000),
XCFGRPNM=JESXCFX3,DUMP=PRDMP,MT=ON
*-------------------------------------------------------------*
BUFFER,BUFSIZE=4084,GRPSZ=20,PAGES=(1024,64,256),MINBUF=32,
SPLIM=(10,20)
*-------------------------------------------------------------*
ENDJSAM
```


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JES3 Dynamic Spool Remove
JES3 processing to drain the extent

- Initiated with *MODIFY Q,DD=*ddname*,DRAIN
- JES3 stops allocating tracks from the spool extent.
- JES3 moves contents of existing STT track groups to another spool extent within the default partition.
  - Normal overflow rules apply when allocating the new track groups.
  - Command completes when all STT track groups have been moved.
- New user exit IATUX73 is provided for any STT records containing non-JES3 data.
  - Processing may be required by non-JES3 code that created the STT records.

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JES3 Dynamic Spool Remove
JES3 processing for remove

- Initiated with *F CONFIG or JES3 hot start with refresh.
- JES3 parses the initialization statements in the JSAM member for parameters that qualify for dynamic modification:
  - **FORMAT/TRACK:** All parameters qualify.
  - **BADTRACK:** All parameters qualify.
  - **BUFFER:** MINBUF and TRUNC parameters qualify. All other parameters are syntax checked only.
  - **SPART:** All parameters except GRPSZ qualify.
  - **OPTIONS:** DUMP, WANTDUMP, INTERVAL, MT, DUMPLINS, INTRDR, DUPJOBN, and DUPLOGON parameters qualify. All other parameters are syntax checked only.

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JES3 Dynamic Spool Remove
JES3 processing for remove (*continued*)

- Spool extents and partitions to be removed are identified.
  - New spool extents and partitions are also identified to be added.
  - IAT4000 WTOR message is used to confirm removal (deletion).
  - *F Q,DD=*ddname*,DRAIN issued if removed extent not yet drained.
- JES3 verifies that no job or DSP data exists on the extent to be removed.
  - Job data will not be moved!
  - *F CONFIG provides operator with options for handling any job data that is found (next page).
  - Hot start with refresh is terminated if job data is found.

JES3 Dynamic Spool Remove
JES3 processing for remove (*continued*)

- *F CONFIG has additional handling when job or DSP data exists on the extent to be removed.
  - IAT4126 identifies a job or DSP with data on extent to be removed.
  - IAT4174 WTOR message confirms job or DSP is to be cancelled.
    - Operator can confirm cancel or terminate the spool remove operation.
    - *MODIFY J=*nn*,C command is used and is subject to normal limitiations (e.g. started tasks are not cancelled).
    - CONT,ALL reply to cancel all jobs or DSPs without further WTORs.

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JES3 Dynamic Spool Remove
JES3 processing for remove (*continued*)

- Special processing for the active SYSLOG job.
  - JES3 issues ROUTE *main*,WRITELOG command to close the current, active data set.
  - JES3 issues *F J=*nnn*,SPIN to offload current, active JESMSGLG & JESYSMSG data sets.
    - Data sets are now forced to be spin eligible for the SYSLOG job.
  - Customer must assure the output is processed and purged from the spool extent.
  - JES3 control blocks for SYSLOG job are moved.
    - Not the output!

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JES3 Dynamic Spool Remove
JES3 processing for remove (*continued*)

- JES3 makes multiple passes until no job or DSP data exists on the extent.
- Removal of the spool extent is committed when the extent is empty and no errors occurred.
- Changes are committed if no errors occurred and the spool extent is empty.
  - Errors during *F CONFIG end the command with no changes committed.
  - Errors during hot start with refresh require restarting JES3 with hot start to restore the original configuration.
  - Errors can then be fixed and the spool remove attempted again.
  - Spool extent remains drained if drained by customer. Returned to USE if drained by JES3.

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JES3 Dynamic Spool Remove
JES3 processing for remove (*continued*)

- Locals at z/OS JES3 V1R13 or later levels are automatically restarted by the JES3 global.
  - No operator intervention or IPL is required.
- Locals at pre-V1R13 levels require an IPL and restart.
  - WTOR messages are issued for the local mains that must be reset.
  - CANCEL will abort the configuration changes.
- Added spool extents and partitions are available and used after all restarted local mains connect or have been flushed.
  - Automatic FLUSH occurs for local mains which leave the JESplex thereby allowing the updates to be used without further intervention.

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JOB JCL statement
New SYSTEM= and SYSAFF= keywords

- New keywords for the JOB JCL statement in both JES3 and JES2.
- Reduces the need for customers to use JES3 specific //*MAIN job entry control (JECL) statements.

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JOB JCL statement
SYSAFF= details

- SYSTEM={SystemName}
  {(SystemName,SystemName,...,SystemName)}
  {(-SystemName,SystemName,...,SystemName)}
  {-SystemName}
  {ANY}
  {JGLOBAL}
  {JLOCAL}
  - Up to 32 one to eight character system names.
  - A value of "*" indicates the system where the job was submitted.
  - A "-" preceding a system name indicates the system is not eligible for processing the job.
  - A "-" preceding the first system name in a list indicates that none of system listed are eligible for processing the job.
- Similar to JES3 //*MAIN SYSTEM= JECL statement.

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JOB JCL statement
SYSAFF= details

- SYSAFF={MemberName}
  {-MemberName}
  {(MemberName,MemberName,...,MemberName)}
  {(-MemberName,MemberName,...,MemberName)}
  {(MemberName,...,IND)}
  {(-MemberName,...,IND)}
  {ANY}
  {(ANY,IND)}
  - Up to 32 one to eight character JES3 system names.
  - A value of "*" indicates the system where the job was submitted.
  - A "-" preceding a system name indicates the system is not eligible for processing the job.
  - A "-" preceding the first system name in a list indicates that none of system listed are eligible for processing the job.
- Similar to JES2 /*JOBPARM SYSAFF= JECL statement.

JOB JCL statement
Using SYSTEM= and SYSAFF= keywords

- Cannot specify both SYSTEM= and SYSAFF= keywords.
- Use of a SYSTEM= or SYSAFF= keyword overrides //*MAIN SYSTEM= JECL statement.
- Same considerations that exist when using //*MAIN SYSTEM= also apply to using SYSTEM= or SYSAFF= keywords.
- JES3 system names are specified for SYSTEM= or SYSAFF= keywords.
- JES3 ignores IND for SYSAFF= unless it is a valid JES3 system name.

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JOB JCL statement
SYSTEM= and SYSAFF= examples

- SYSTEM=(SYS01,SYS02)
  - Systems SYS01 and SYS02 are eligible to process the job.
- SYSTEM=(SYSPROD,*,SYSTEST)
  - Systems SYSPROD, SYSTEST, and the system where the job was submitted are eligible to process the job.
- SYSTEM=(-SYSPROD,*,SYSTEST)
  - Systems SYSTEST, SYSPROD and the system where the job was submitted are not eligible to process the job.
- SYSTEM=JLOCAL
  - Any system which is a JES3 local main are eligible to process the job.
- SYSAFF=(SYS01,SYS02,IND)
  - Systems SYS01 and SYS02 are eligible to process the job.
  - IND is ignored unless it is valid JES3 system name in which case IND would also be eligible to process the job.
- SYSAFF=ANY
  - Any system is eligible to process the job.

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JOB JCL statement
CLASS parameter

- The CLASS parameter on the JOB JCL statement has been extended from 1 to up to 8 characters.
- Reduces the need for customers to use JES3 specific //*MAIN job entry control (JECL) statements.
- JES3 Global must be V2R1 or the job still fails input service processing with message IAT6133.
- V2R1 C/I capability must also be available or the job will wait until eligible C/I capability becomes available.
  - Either within the V2R1 JES3 global or with a V2R1 JES3 C/I FSS.

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JOB JCL statement
CLASS parameter details

- The job class name must be defined in the JES3 initialization deck (no change).
- The first character of the job class name must be alphanumeric (A-Z or 0-9).
  - Same as currently required for single character class name.
- Subsequent characters must be either alphanumeric or one of the three national characters (@,#,$).
  - More restrictive than JES3 which allows more special characters when specified in the initalization deck and when used for //*MAIN CLASS=*name*.

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JOB JCL statement
CLASS parameter example

- Using JES3 //*MAIN JECL statement:
  - CLASS=WLMCLASS overrides CLASS=A

```
//WRITRECS JOB   MSGCLASS=T,MSGLEVEL=(1,1),CLASS=A
//*MAIN CLASS=WLMCLASS
//GO1      EXEC PGM=WRITRECS
//OUT1     DD SYSOUT=*
```

- Using new V2R1 support:

```
//WRITRECS JOB   MSGCLASS=T,MSGLEVEL=(1,1),CLASS=WLMCLASS
//GO1      EXEC PGM=WRITRECS
//OUT1     DD SYSOUT=*
```


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JOB JCL statement
JES3 CLASS parameter override

- If present, //*MAIN CLASS= still overrides JOB CLASS=.
- Previously, the job would fail if the JOB CLASS= name was invalid.
- With JES3 V2R1 the job no longer fails as long as //*MAIN CLASS= name is valid.
  - The invalid JOB CLASS= name is still identified in JESMSGLG with message IAT6131.
- Example:

```
//WRITRECS JOB   MSGCLASS=T,MSGLEVEL=(1,1),CLASS=BOGUS
//*MAIN CLASS=WLMCLASS
//GO1      EXEC PGM=WRITRECS
//OUT1     DD SYSOUT=*
```

SAF control of job classes

- JES3 V2R1 supports control over the use of job classes using new profiles in the JESJOBS class.
- Provides more flexibility in job class naming and helps eliminate the need for user exits used solely to restrict the use of job classes.
- Activated by defining either or both of the following profiles to the FACILITY class:
  - JES.JOBCLASS.OWNER
  - JES.JOBCLASS.SUBMITTER

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SAF control of job classes
Define profiles

- Define at least one JESJOBS profile with UACC(READ) to allow users to submit jobs:
  RDEFINE JESJOBS ** UACC(READ)
- Define specific JESJOBS profiles with UACC(NONE) for the job classes that you want to protect:
  RDEFINE JESJOBS JOBCLASS.*localnodeid.jobclass.jobname* UACC(NONE)
  - *localnodeid* specifies the local node name.
  - *jobclass* specifies the name of a job class.
  - *jobname* specifies the name of the job.
- Example of protecting all job classes that begin with the characters PAY:
  - RDEFINE JESJOBS JOBCLASS.NODE1.PAY*.* UACC(NONE)

SAF control of job classes
Activate the controls

- **RDEFINE FACILITY JES.JOBCLASS.OWNER UACC(READ)**
  - Verify that the owner of a batch job that is completing input service has access to the job class.
  - Verify that the owner of a job has access to the new job class when the job's job class is modified.
  - Verify that the owner of a job has access to a job class when it is restored using Dump Job.
- **RDEFINE FACILITY JES.JOBCLASS.SUBMITTER UACC(READ)**
  - Verify that the submitter of an INTRDR job has access to the job class.
  - Verify that the operator who is submitting a modify job command that specifies job class has authority to the new job class.

SAF control of job classes
Authorize users

- To allow users to submit jobs that are protected by the profile, give them READ access to the profile.
  PERMIT JOBCLASS. *localnodeid.jobclass.jobname* CLASS(JESJOBS) ID(*userid*) ACCESS(READ)
- This example authorizes IBMUSER to job classes beginning with the characters PAY:
  - PERMIT JOBCLASS.NODE1.PAY*.* CLASS(JESJOBS) ID(IBMUSER) ACCESS(READ)
- Don’t forget to refresh the profiles and FACILITY:
  - SETR GENERIC(JESJOBS) REFRESH
  - SETR RACLIST(FACILITY) REFRESH

In-stream data sets

- JES3 supports in-stream data in JCL PROCs and INCLUDEs.
  - Works for batch jobs and started tasks.
  - Works like in-stream data in job JCL.
- Support is based on where the job converts – z/OS V2R1.
  - Job can then run on a down-level system.
- Additional SYSIN data sets are created which contain the in-stream data.
  - They are included in extended status DSLIST function.
  - They are visible via SDSF Data Set Display after selecting “Change include SYSIN to ON” under “Options.”
  - They are NOT included with SPOOL Data Set Browse of JCLIN.
    - Not part of original JOB JCL submitted.

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In-stream data sets
Example 1

- In-stream data in JOB JCL as currently supported.

```
//EXAMPLE1  JOB   MSGLEVEL=(1,1),MSGCLASS=A,CLASS=B
//STEP1     EXEC  PGM=IEBGENER
//SYSIN     DD    DUMMY
//SYSPRINT  DD    SYSOUT=*
//SYSUT2    DD    SYSOUT=*
//SYSUT1    DD    *
  JOB IN-STREAM DATA RECORD 1
  JOB IN-STREAM DATA RECORD 2
  JOB IN-STREAM DATA RECORD 3
/*
//
```


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In-stream data sets
Example 2

- In-stream data in an in-stream procedure.

```
//EXAMPLE2  JOB   MSGLEVEL=(1,1),MSGCLASS=A,CLASS=W
//PROC1     PROC
//STEP1     EXEC  PGM=IEBGENER
//SYSIN     DD    DUMMY
//SYSPRINT  DD    SYSOUT=*
//SYSUT2    DD    SYSOUT=*
//SYSUT1    DD    *
  IN-STREAM PROC IN-STREAM RECORD 1
  IN-STREAM PROC IN-STREAM RECORD 2
/*
//          PEND
//*
//RUNPROC   EXEC PROC=PROC1
//
```


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In-stream data sets
Example 3

- In-stream data in a cataloged procedure.

```
//EXAMPLE3  JOB   MSGLEVEL=(1,1),MSGCLASS=A,CLASS=W
//STEP1     EXEC  PROC=MYPROC1
//
```

- PROCLIB member MYPROC1 contains:

```
//MYPROC1   PROC
//STEP1     EXEC  PGM=IEBGENER
//SYSIN     DD    DUMMY
//SYSPRINT  DD    SYSOUT=*
//SYSUT2    DD    SYSOUT=*
//SYSUT1    DD    *
  CATALOGED PROC IN-STREAM RECORD 1
  CATALOGED PROC IN-STREAM RECORD 2
/*
//          PEND
```


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In-stream data sets
Example 4

- In-stream data in an include member.

```
//EXAMPLE4  JOB   MSGLEVEL=(1,1),MSGCLASS=A,CLASS=W
//INSTEP    INCLUDE MEMBER=MYSTEP
//
```

- INCLUDE member MYSTEP contains:

```
//STEP1     EXEC  PGM=IEBGENER
//SYSIN     DD    DUMMY
//SYSPRINT  DD    SYSOUT=*
//SYSUT2    DD    SYSOUT=*
//SYSUT1    DD    *
  INCLUDE MEMBER IN-STREAM RECORD 1
  INCLUDE MEMBER IN-STREAM RECORD 2
/*
```


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System symbol support for batch jobs

- System symbol substitution is supported for batch jobs.
  - Previously only supported for demand select jobs.
- MVS Converter does the actual symbol substitution
- JES3 supplies a system symbol table at conversion time based upon where the job is eligible to run:
  - The set of systems defined for the batch job's class AND…
  - … the system affinity of the job, if any, AND…
  - … the job's scheduling environment, if any.
- If multiple systems are eligible, then the system symbol table from one system is selected.
  - This may or may not be the same system where the job actually runs.

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System symbol support for batch jobs
Message

- A new message is added to the batch job's JESMSGLG when system symbol substitution is enabled for the job.

  IAT4221 SYSTEM SYMBOLS SELECTED FROM SY2

  - Message identifies which system symbol table is used.

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System symbol support for batch jobs
Controls

- **CLASS,NAME=A,...SYSSYM=ALLOW** initialization statement used to enable system symbols substitution for the job class.
  - Default is SYSSYM=DISALLOW.
- ***MODIFY,C=*_class_** to change a job class:
  - *MODIFY,C=*class*,SYSSYM=ALLOW | DISALLOW
- ***INQUIRY, C=*_class_** to display the current setting for a job class.

Minimum MVS level from converter

- z/OS V2R1 converter may return to JES3 a minimum MVS level required for a job to run.
- Support introduced at a z/OS level may require that a job be run at that z/OS level (or newer).
- If no system at the minimum level is available, then JES3 select will put the job into a wait until an eligible system becomes available.

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Minimum MVS level from converter
The wait

- ***INQUIRY J=*nnn*,W** output updated:

```
*i j=57,w
IAT8674 JOB WRITRECS (JOB00057) P=02 CL=A      MAIN(GMS SELECT)
IAT8756 MINIMUM MVS EXECUTION LEVEL = z/OS 02.01.00
IAT8685     SY2      - SYSTEM NOT AT MIN MVS EXECUTION LEVEL
IAT8685     SY3      - MAIN OFFLINE/NOT CONNECTED
IAT8685 . . .
```

- ***CALL DISPLAY,J=*jobno*** output updated:

```
*x display,j=57
IAT6306 JOB (JOB00057) IS DISPLAY , CALLED BY C3E0SY1
IAT7762 - 02 JOB00056 WRITRECS SE=(CI-COMPLETE,MAIN-ACTIVE,
IAT7762 - OUTSERV-NOSTAT,PURGE-NOSTAT),JCTMAINS=(SY2),
. . .
IAT7762 - OUSID=ANIBMER,TUSID=ANIBMER,RQJSTAT=(SY2,
IAT7762 - SYSTEM NOT AT MIN MVS EXECUTION LEVEL),
IAT7762 - MVSMINLV=z/OS 02.01.00
```


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ENF 70 for job process tracking

- JES3 issues ENF 70 events when jobs change state.
  - Intent is to reduce polling for status via SSI 80.
  - Reduces need for user exits to track job flow.
  - JES-independent means of tracking job status.
- ENFs are sent to all system of SYSPLEX.
  - Cannot always predict where a JOB will be processed.
  - Allows for single application instance to monitor entire SYSPLEX.
- Multiple JESPLEXes in SYSPLEX can increase total ENFs.
  - May notice increased XCF traffic for ENF processing.
  - Group associated with messaging is SYSENF.

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ENF 70 for job process tracking
Using

- ENFREQ macro is used to listen for ENF 70 events.
  - Parameter list mapped by IAZENF70 is passed to the listener for each event signaled.
- Events signaled:
  - ENF70_SELECT indicates job was selected by a processing phase conversion, execution, job transmitter, etc.
  - ENF70_DESELECT indicates job was deselected by a processing phase
  - ENF70_CHANGE indicates job was queued for a new phase old and new phases are identified this event also includes being requeued to a new class or service class queue prior to execution
  - ENF70_PURGE indicates job was purged

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ENF 70 for job process tracking
Controls

- **OPTIONS …JOBTRACK=** initialization statement keyword to control the scope of ENF 70 events:
  - JOBTRACK=SYSPLEX – All systems in the sysplex (default)
  - JOBTRACK=JGLOBAL – Only to the JES3 global
  - JOBTRACK=OFF – ENF 70 event signalling is disabled
- ***MODIFY** to change signalling scope:
  - *MODIFY,JOBTRACK=SYSPLEX | JGLOBAL | OFF
  - *MODIFY,CONFIG
- ***INQUIRY,OPTIONS** to display the current setting of JOBTRACK.

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TSO logon to multiple systems

- Same TSO user id can be used to log on to multiple V2R1 systems in the JESplex.
- When a TSO user is logged onto multiple systems, the following notification rules apply:
  - When a system was specified explicitly, then notification messages are sent to that system.
  - When no explicit specification is made, then the notification goes to the system from which the TSO user submitted the job.
  - When no system specification is found, then a search is made starting with the first system defined via MAINPROC; the first occurrence of the TSO user id triggers the notification to be sent to that system.
  - When no user is logged on, then the notification is sent to the global.

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TSO logon to multiple systems
Control

- **OPTIONS …DUPLOGON=** initialization statement keyword to control when duplicate logons are allowed:
  - DUPLOGON=NO – Not allowed (default)
  - DUPLOGON=YES – Allowed
- ***MODIFY** to change DUPLOGON setting:
  - *MODIFY,CONFIG
- ***INQUIRY,OPTIONS** to display the current setting of DUPLOGON.

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JES3 initalization statement changes

- **OPTIONS …DUMP=** keyword parameter change:
  - PRDMP is the only valid parameter (OA40989).
  - MVS and JES are obsolete.
    - JES3 defaults to PRDMP and issues warning message IAT3255.
- **OPTIONS …SDI=** keyword is obsolete:
  - Spool Data Integrity checking is now always enabled due to spool remove support.
  - JES3 issues warning message IAT3256.
  - *MODIFY,Q,SDI= is also obsolete.
  - *INQUIRY OPTIONS updated to remove SDI display.

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Extended status SSI80 updated
User data above the bar

- JES3 supports the capability to return user data above the bar (64-bit addressable storage).
- IAZSSST macro updated to add 64-bit pointers along with existing 31-bit pointers.
- User allows for data to be returned above the bar with new input flag STAT1B64.
- New output flag STATO164 indicates request was honored and 64-bit addresses were used to chain the return data.
- New reason code STATRJST when a request contains data using the wrong pointer fields for input or existing data.

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Extended status SSI80 updated
JES3 rules for above the bar requests

- JES3 honors a request to return data above the bar and use 64-bit pointers when:
  - User data from a previous SSI80 request is above the bar.
    - Otherwise, the request is ended with reason code STATRJST.
    - Cannot mix 31-bit and 64-bit pointers when a request contains return data from a previous request (i.e. no intervening STATMEM operation).
  - Both the JES3 global and local mains are at V2R1 or later.
    - Otherwise, 31-bit storage and pointers will be used and output flag STATO164 will be off.

Extended status SSI80 updated
JES3 supports more

- Job Queue Element Member Affinity Section mapped by STATAFFS DSECT.
- STSCAHLD and STSCAHL2 flags, which indicate reasons why a job will not run, as returned in the Job Queue Element Execution Scheduling Section mapped by STATSCHD DSECT.
  - New function provided and new data returned, common to JES3 and JES2, that would be of use to application developers:
    - Suppress duplicate data sets returned for STATDLST.
    - New STSCPSEQ field for minimum MVS level required for a job.
    - New STATPHTP and STATJDTP pointer fields for job phase code and job delay flag text descriptions.

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Extended status SSI 80 updated
More support added

- Input flag STAT1NDP added.
  - Specifies that for a STATDSLT request (data set list for a job) a data set name is returned once (i.e. no duplicate data set names in the returned list).
- Returning the Job Queue Element Member Affinity Section (STATAFFS DSECT).
- Return flags in STSCAHLD and STSCAHL2 in the scheduling section (STATSCHD DSECT).
  - Flags indicate reasons why the job will not run.
- STSCPSEQ added to the scheduling section (STATSCHD DSECT).
  - Indicates minimum z/OS level that the job can run on.

Extended status SSI80 updated
More text description tables

- JES2 and JES3 now provide text descriptions for job phase code (STTRPHAZ) and job delay flags (STSCAHLD and STSCAHL2) as returned with SSI80.
  - Two new tables that will be located in CSA similar to IAZOHLD text description tables.
- Two new pointers added to the SSOB extension:
  - STATPHTP = Pointer to the table for processing STTRPHAZ.
  - STATJDTP = Pointer to the table for processing STSCAHLD and STSCAHL2.

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Extended status SSI80 updated
Text description service

- New JES common service to convert the job phase and job delay reasons to text.
- Multiple “levels” of detail supported:
  - 1 = JES specific text
  - 2 = JES independent (neutral) text
  - 3 and above = Greater length and details (table specific)
- May require multiple calls to get all texts (delay reasons).
- Macro interface for the service:

```
IAZTLKUP TABLEID=,        3 char text table ID
      LEVEL=,             Level of text to return
      SSOB=,              Ptr to SSI request
      DATASTR=,           SSI data section
      OUTAREA=,           Area for storing results
      OUTLEN=,            Length of output to store
      MOREFLG=            More flag bit indicators
```


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JES3 V2R1 Toleration APARs

APAR	Problem description	
OA36848	New function - Toleration support for spool delete in JES3 V2R1	
OA36924	New function - Toleration APAR to allow lower level JES3 releases to coexist with new function being shipped in z/OS V2R1	
OA38975	New function - Toleration support for FSSDEF parameter in JES3 V2R1	
OA42062	New function - Toleration support for DUPLOGON keyword on the OPTIONS initialization statement in JES3 V2R1	

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JES3 V2R1 FIN/SUG/UR1 APARs

- V2R1 includes:
  - 5 FIN APARs
  - 5 SUG APARs
  - 8 UR1 APARs

APAR	Problem description	
OA16930	Long JESMSGLG messages can have messages intertwined	**SUG**
OA19557	JES3 destination class not in JES3DLOG.	**SUG**
OA23732	Dynamic allocation failure RC=4 RSN=210 in JES3 environment	**SUG**
OA24649	JES3 initialization stream checker IATUTIS runs slowly	**UR1**
OA31594	MSGIAT5060 issued for job on system select queue	**SUG**
OA33664	System managed dataset byte counts lower when job run locally versus NJE	**UR1**
OA35491	Storage alignment and processing of JMQETXLN in IATABJM	**FIN**
OA36365	ABEND0D3 RC13 using REUSEASID in a JES3 system	**UR1**

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JES3 V2R1 FIN/SUG/UR1 APARs (*continued*)

APAR	Problem description	
OA36460	After activating an SCDS, some jobs may remain hung in CI(RESCHEDULED) forever	**SUG**
OA36478	ABENDS0C4 in IATGRES	**FIN**
OA37275	MVS cancel issued by JES3 intercepted	**UR1**
OA38109	Additional diagnostics required for IAT6946 GETREC FSI error no buffers available condition followed by ABEND024	**UR1**
OA38292	ABEND1FB RSN43	**UR1**
OA38575	JES3 FSS'S do not terminate over auto-restart - MSGIAT3098	**UR1**
OA38619	MSGIAT6128 issued incorrectly	**FIN**
OA40126	ABEND0C4 in IATSISO after ABEND6FB	**FIN**
OA40989	*DUMP causes JES3 to terminate when DUMP=JES set on OPTIONS statement	**UR1**
OA41270	ABENDDM132 issued after inquiry with invalid syntax	**FIN**

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SHARE JES3 Requirements in V2R1

- JES3 Dynamic Spool enhancement
  - SSJES3032645 (MR0203033521)
- Provide access to SPOOL utilization data
  - SSJES399351 (MR041400724)
- Provide a Way to Know Which JES3 Jobs Use a Spool Extent
  - SSJES3032649 (MR0210035755)
- JES3 Dump Job (DJ) support for dumping jobs by spool dataset
  - SSSHARE01633 (MR1020084712)
- Support Multiple TSO/E LOGON within a JESplex
  - SSJES310001 (MR0614114611)

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SHARE JES3 Requirements
Share Top Ten Summary

	SHARE / FITSMO numbers	Title
1	SSJES3032645 (MR0203033521)	JES3 Dynamic Spool enhancement • **Dynamic Spool Remove available z/OS V2R1 JES3.** • **Dynamic Spool Add available z/OS V1R13 JES3.**
2	SSJES397305 (MR1020084630)	JES3 OUTDISP support of OUTPUT JCL statement
3	SOJES393353 (MR1020084625)	Dataset Integrity for JES3's Datasets
4	SSJES300352 (MR0614114610)	Enhance the JES SSI • **Available z/OS V1.13 JES3**
5	SSJES399351 (MR041400724)	Provide access to SPOOL utilization data • **Available z/OS V2R1 JES3**
6	SSSHARE011776 (MR1020084632)	Perform DFHSM 'RECALL' for Batch Jobs Before They Are Active
7	SSJES3032649 (MR0210035755)	Provide a Way to Know Which JES3 Jobs Use a Spool Extent • **Available z/OS V2R1 JES3**
8	SSSHARE01633 (MR1020084712)	JES3 Dump Job (DJ) support for dumping jobs by spool dataset • **Available z/OS V2R1 JES3**
9	SBJES383304 (MR1020084616)	JES3 Job Scheduling With HSM.
10	SBJES379323 (MR1020084614)	JES3 Inquiry for Job Reserving a Device

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Other SHARE Sessions

- **JES3 Spool Management**
  - Thursday, March 13, 2014: 1:30 PM – 2:30 PM
    Grand Ballroom Salon C (Anaheim Marriott Hotel)
  - Ever wonder how JES3 spool is used and how it can be managed? In this session, the speaker will present how JES3 utilizes the spool volumes and the controls available. Also covered will be the new features added in z/OS V2.1 and V1.13 that make it easier for you to manage your JES3 spool volumes.
- **Understanding the Other JES**
  - Thursday, March 13, 2014: 4:30 PM – 5:30 PM
    Grand Ballroom Salon G (Anaheim Marriott Hotel)
  - Ever wonder just what's going on in that "other JES"? In this session, an IBM avid user of both JESs will look at how JES2 and JES3 manage NJE, FSS devices, off-load of output, handle JCL, and commands.

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Redbooks

- ABCs of z/OS System Programming Volume 13 (SG24-7717-01)
  - JES3 internals and externals
  - JES3 initialization statements
  - JES3 operator commands
  - Updated in 2012 to include SDSF in a JES3 Environment
    - Formerly published as a Redpaper (REDP-4531)
- All ABCs of z/OS System Programming
  - www.redbooks.ibm.com/cgi-bin/searchsite.cgi?query=abcs

ABCs Volume 13 – SG24-7717 (http://www.redbooks.ibm.com/abstracts/sg247717.html)

Using SDSF in a JES3 Environment – REDP-4531 (http://www.redbooks.ibm.com/abstracts/redp4531.html)

All ABCs (www.redbooks.ibm.com/cgi-bin/searchsite.cgi?query=abcs)

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References
Internet Discussion Group

- Subscribe to JES3-L@LISTSERV.UGA.EDU
- To subscribe mail to LISTSERV@LISTSERV.UGA.EDU with no subject and the body containing the command:
  - SUBSCRIBE JES3-L *your name*
- To post, mail to JES3-L@LISTSERV.UGA.EDU

Source: www.lsoft.com/scripts/wl.exe?SL1=JES3-L&H=LISTSERV.UGA.EDU

http://www.lsoft.com/scripts/wl.exe?SL1=JES3-L&H=LISTSERV.UGA.EDU

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Appendix

- JES3 tailored SVC dump exit
  - Additional JES3 dumps
- Use WANTDUMP=YES
- Avoid Tape Library definition problems
- JES3 automatic FLUSH of a main
- SYSPROG Tools:
  - Use SMP/E
  - Use MODIFY JES3,CHK
  - Autostart for JSS
  - Display a Spool Record
  - Dynamic LPA Facility
  - JES3 Auto-Restart

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JES3 tailored SVC dump exit
Adds to an SVC dump

- In R11 JES3 added an SVC dump exit.
  - Created during JES3 initialization and deleted if JES3 ends.
  - The exit was updated with APAR OA29940.
- The exit is designed to conditionally add the JES3, JES3AUX, and JESXCF address spaces to the dump.
  - Added when at least one ASID included in the SVC dump may have a hung subsystem call.
    - JES3 looks for an outstanding SSI request.
- Does not apply to stand-alone dumps.

Beginning with z/OS V1.11, JES3 establishes an SVC dump exit. The SVC dump exit is created during JES3 initialization. The dump exit is new JES3 module IATABTDX which is a dynamic LPA module. The MVS service CSVDYNEX is used to establish the dump exit when JES3 is started. If JES3 is ended, then MVS service CSVDYNEX is used to delete the dump. The delete allows for the dump exit module to be updated when JES3 is started. During initialization, if the call to the MVS service fails and the dump exit cannot be established, initialization will continue and message IAT3207 is written.

Whenever an SVC dump is taken in a user address space, either because it fails, because the operator requests a dump, or because a dump is triggered by a SLIP trap, the JES3 dump exit is called. The dump exit conditionally adds the address spaces for JES3, JES3AUX, and JESXCF to the SVC dump. This occurs if the exit determines that least one ASID, included in the SVC dump, has an outstanding SSI request. Identification of the address spaces with outstanding SSI requests is based upon the same internal activity table counters used to control the setting and resetting of the IAZJSAB activity flags.

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Additional JES3 dumps
Why the additional dump?

- An outstanding SSI request may be hung if there is a problem on the JES3 global.
  - Service may need the JES3 global to determine if and why an SSI request is hung.
  - Past problems have gone unresolved without a dump from the JES3 global.
- May not even be related to the cause of SVC dump on the local.
  - There just may have been an outstanding SSI request at the time of the SVC dump.
  - Let service make that determination.

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Additional JES3 dumps
When can this occur?

- Occurs whenever an SVC dump is taken in a user address space on a JES3 local.
  - Due to a failure in the address space.
  - Operator requested a dump of the address space.
  - The address space dump is triggered by a SLIP trap.
- An SVC dump on the JES3 global already includes the JES3, JES3AUX, and JESXCF address spaces.
- Does not apply to stand-alone dumps.
  - If you are forced to obtain a stand-alone dump on a local, and you suspect a JES3 issue, please get a dump of the JES3 global using the JES3 *DUMP command.

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Additional JES3 dumps
What will you see?

- Along with the SVC dump on the local, a separate dump of the JES3 global will be created.
- JES3 global dump will be created with ABEND DM137:
  - Either the operator issued the *DUMP command or the command was automatically issued from the JES3 tailored dump exit to supplement a user address space dump. In that case, the dump title will contain the following text: 'COMPON= JES3 DYN DUMP,COMPID=SC1BA,ISSUER=IATABTDX'.
- Operators will need to respond to more IAT3714 messages if WANTDUMP=ASK is defined.
  - IAT3714 SPECIFY DUMP OPTION FOR JES3 GLOBAL ,main

Use WANTDUMP=YES
IBM Recommendation

- Provides for more immediate capture of data in the event of a JES3 failure.
- Waiting for an operator to respond to message IAT3714 can result in lost data.
  - System continues processing while the JES3 address space is stopped.
  - System trace records related to the failure may be lost.
- LIMIT and INTERVAL values can be set which force WANTDUMP=ASK should a JES3 failure occur frequently.
  - IAT3714 will occur when the LIMIT is reached within the INTERVAL.
  - *DUMP command generated by dump exit counts against the LIMIT.

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Specifies that a dump should be taken immediately when a JES3 failure occurs.

WANTDUMP is a parameter of the OPTIONS initialization statement.

Default is WANTDUMP=YES,LIMIT=3,INTERVAL=10 (INTERVAL is in minutes)

Commands allow the WANTDUMP option to be changed including the LIMIT and INTERVAL specifications.

IBM suggests that you allow the WANTDUMP option on the STANDARDS initialization parameter to default to ″YES″ instead of setting it to ″ASK″. Using the default of ″YES″ allows the system to determine what action to take when a JES3 failure condition occurs. In today’s sysplex environment setting this parameter to ″ASK″ can cause delays in operations because the JES3 address space essentially stops functioning until you respond to the IAT3714 message. Also, certain portions of the dump, such as the system trace, are invalid because the system continues processing until you response to message IAT3714.

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Avoid Tape Library definition problems

- Customers have reported problems after adding new Tape Library devices.
- Often the problem has been an error in defining the device to HCD or JES3, or with changes to ACS routines.
- Another cause of the problem can be as a result of not restarting JES3 C/I FSS's.

Avoid Tape Library definition problems
Use correct device related names

- The *Device-specific Library Unitname Table* in the *JES3 Initialization and Tuning Guide* contains device related names that are used for the SETNAME, HWSNAME, and DEVICE initialization statements.
  - With the addition of new devices, this table is not always current!
  - Refer to the DFSMS publication for the specific device to get proper LD and LDG names.
    - *z/OS DFSMS Software Support for IBM System Storage TS1140, TS1130, and TS1120 Tape Drives (3592)*
- An example is TS1140 (3592 Model E07):
  - LDG359N and LDN*nnnnn* should be used.
  - Not LDG359J and LDJ*nnnnn* which are for 3592 Model J.

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Avoid Tape Library definition problems
JES3 restarts

- Before doing any restarts, use the JES3 initialization stream checker to validate the updates between the HCD and the JES3 inish deck.
- Restart JES3 and C/I FSSes.
  - For FSSDEF,TYPE=CI initialization statements, consider using TERM=YES,START=YES.
  - With an orderly restart of JES3, this will incorporate and establish the changes made to HWSNAME.

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JES3 initialization stream checker

- IBM recommends you use the JES3 initialization stream checker utility to test your JES3 initialization statements.
  - Check any new or modified inish deck before you perform a hot start with refresh, warm, or cold start of JES3.
- The checker detects most syntax errors and some logical errors in the initialization stream.
  - Checks for errors between the HCD and DEVICE, HWSNAME, RJPLINE, and SETNAME initialization statements.
- Recent customer service calls could have been avoided.
  - Most have been syntax errors!

JES3 automatic FLUSH of a main

- A z/OS JES3 V1.13 global main will automatically perform the FLUSH operation when a local main leaves the JESplex.
- This does not vary the main offline like the *S,main,FLUSH command.
- Eliminates the need for operator intervention and allows JES3 to immediately clean up jobs and FSSes that were active on the affected local.
  - JES3 knows sooner that the local main is not available for processing jobs, accessing spool, etc. rather than later at reconnect time.
  - Affected jobs can be restarted sooner.
  - Restarted system will connect without further operator intervention.

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The automatic flush is related to XCF message IXC102A. When XCF partitions the system out of the Sysplex, JESXCF notifies JES3. JES3 will then perform the flush ***operation.***

The flush operation is similar to the *S main,FLUSH command but the difference is that the main's online status is unchanged. That allows it to reconnect as soon as the system is re-IPLed and ready to connect again.

If you have automation that issues the flush command based on the message, you should consider removing it. If you are used to having the system be varied offline, you can replace the flush command by a *V,main,OFFLINE command.

Documented in z/OS Migration V1.13 (GA22-7499-19)

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Automatic FLUSH of a main
Before V1.13…

- After operator responds DOWN to XCF message IXC102A, the local is DOWN, but still CONNECTED and ONLINE.
  - JES3 global cannot proceed with any cleanup/restarts.

```
*SY1          *29 IXC102A XCF IS WAITING FOR SYSTEM SY2 DEACTIVATION. REPLY
DOWN WHEN MVS ON SY1 HAS BEEN SYSTEM RESET
29,down
SY1           IEE600I REPLY TO 29 IS;DOWN
SY1           IXC808I ELEMENTS FROM TERMINATED SYSTEM SY1 WERE NOT PROCESSED
BY THIS SYSTEM.  ARM COUPLE DATA SET IS NOT AVAILABLE TO THIS SYSTEM.
SY1           IXC105I SYSPLEX PARTITIONING HAS COMPLETED FOR SY1
- PRIMARY REASON: LOSS OF CONNECTIVITY
- REASON FLAGS: 000002
SY1           ISG011I SYSTEM SY1 - BEING PURGED FROM GRS COMPLEX
SY1           ISG013I SYSTEM SY1 - PURGED FROM GRS COMPLEX
SY1           IEA258I CONSOLE PARTITION CLEANUP COMPLETE FOR SYSTEM SY1.
*i main=all
IAT8643 MAIN INQUIRY RESPONSE
INFORMATION FOR MAINPROC SY1
  FMID=HJS7770, STATUS=(ONLINE,CONNECTED,ATTACHED,GLOBAL)
INFORMATION FOR MAINPROC SY2
  FMID=HJS7770, STATUS=(ONLINE,CONNECTED,DOWN,LOCAL)
MAINPROC INQUIRY RESPONSE COMPLETE
```


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After SY2 is deactivated by responding DOWN to XCF message IXC102A, JES3 knows SY2 is down, but it is still connected and active.

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Automatic FLUSH of a main
Before V1.13…

- A *S SY2,FLUSH is required to tell JES3 that SY2 is no longer connected.
  - This will also take the system offline.

```
*s sy2,flush
IAT2061 SYSTEM SY2      IS ACTIVE IN JESXCF GROUP NODE1
*i main=all
IAT8643 MAIN INQUIRY RESPONSE
INFORMATION FOR MAINPROC SY1
  FMID=HJS7770, STATUS=(ONLINE,CONNECTED,ATTACHED,GLOBAL)
INFORMATION FOR MAINPROC SY2
  FMID=HJS7770, STATUS=(OFFLINE,FLUSHED,DOWN,LOCAL)
MAINPROC INQUIRY RESPONSE COMPLETE
```

- *VARY SYS2,ONLINE is needed to for the system to reconnect when it is restarted.

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Doing *S SY2,FLUSH will tell JES3 that SY2 is no longer connected. The flush operation will be done but the system will also be taken offline. The operator will need to do *V SY2,ONLINE in order for the system to reconnect.

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Automatic FLUSH of a main
With V1R13 JES3 global…

- JES3 is notified when a local main leaves the JESplex after the DOWN response to XCF message IXC102A.
- JES3 global will automatically FLUSH the down system.
  - This does not vary the down system offline!

```
*i main=all
IAT8643 MAIN INQUIRY RESPONSE
INFORMATION FOR MAINPROC SY1
  FMID=HJS7780, STATUS=(ONLINE,CONNECTED,ATTACHED,GLOBAL)
INFORMATION FOR MAINPROC SY2
  FMID=HJS7770, STATUS=(ONLINE,FLUSHED,DOWN,LOCAL)
MAINPROC INQUIRY RESPONSE COMPLETE
```

- Note the global is JES3 V1.13 (HJS7780) and the locals can be any supported level.

With a global at V1.13 (HJS7780) the automatic flush will do the flush operation but not vary the system offline. When JES3 is started on SY2, it will reconnect without further operator intervention.

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Automatic FLUSH of a main
With V1.13 JES3 global…

- After restart of JES3 on the local main, the system will be reconnected and attached without further operator intervention.

```
*i main=all
IAT8643 MAIN INQUIRY RESPONSE
INFORMATION FOR MAINPROC SY1
  FMID=HJS7780, STATUS=(ONLINE,CONNECTED,ATTACHED,GLOBAL)
INFORMATION FOR MAINPROC SY2
  FMID=HJS7770, STATUS=(ONLINE,CONNECTED,ATTACHED,LOCAL)
MAINPROC INQUIRY RESPONSE COMPLETE
```

- You should consider removing any automation for doing a *S,main,FLUSH command.
- If you are used to having the system be varied offline, you can replace the flush command by a *VARY,main,OFFLINE command.

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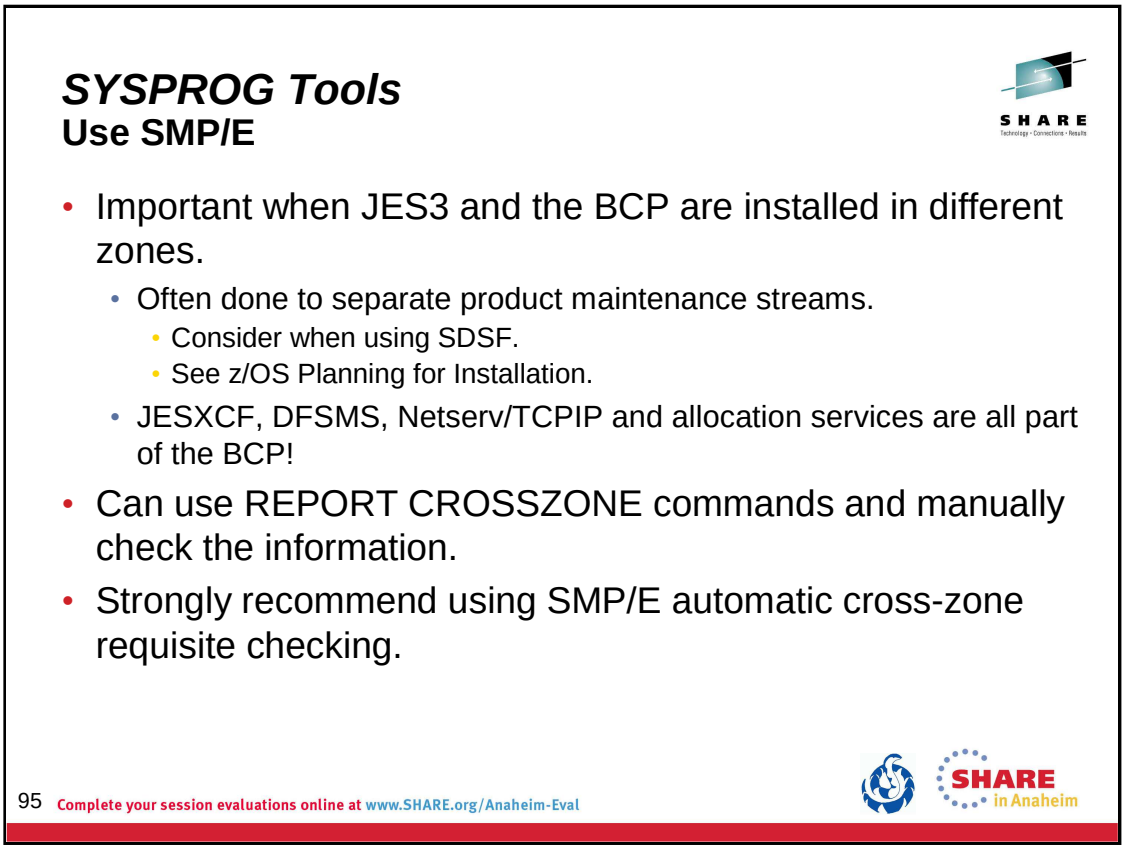
With a global at V1.13 (HJS7780) the automatic flush will do the flush operation but not vary the system offline. When JES3 is started on SY2, it will reconnect without further operator intervention.



The SMP/E REPORT command helps you obtain information about SYSMODs installed on your system. REPORT CROSSZONE is used to list conditional requisites that must be installed in certain zones because of SYSMODs installed in other zones. This information can help you synchronize service for related products that are in different zones like JES3 and JESXCF. You can used separate REPORT CROSSZONE commands and closely review the output -- very manual and prone to mistakes. We strongly recommend using the SMP/E automatic cross-zone requisite checking.

Creating a cross-zone set is documented in the z/OS Program Directory:

7.3.1 Create a Cross-Zone Set

There are different methods that can be used for cross-zone processing. A zone group can be defined and added to the install jobs or the XZGROUP operand can be used. XZGROUP(value) contains a list of ZONESETs or zones that are used to establish the zone group. Each value in the list must be a valid ZONESET or zone name. XZGROUP(value) would be added to the install jobs instead of adding the XZREQCHK operand to one or more ZONESETs.

In OS/390 Release 3, SMP/E introduced the operand, XZREQ, which provides a method for a user to more easily install cross-zone requisites. SMP/E identifies the cross-zone requisites needed in the set-to zone by reading CIFREQ data in the secondary zones of the zone group in effect for the current APPLY/ACCEPT commands. Any CIFREQ data that is for FMIDs installed or being installed in the set-to zone that are not yet in the set-to zone causes the required SYSMODs to become candidates for installation. If the FORFMID operand is also used, the FMID specified on the CIFREQ must match one of the FMIDs specified on the FORFMID operand for the SYSMOD to become a candidate.

By adding the XZREQ operand, the CIFREQ SYSMODs are installed automatically into the set-to zone. However, XZREQ does not install the CIFREQs in the other cross-dependent zones. An APPLY XZREQ needs to be performed against the other zones in order to synchronize service.

Note: If SYSMODs being installed into the set-to zone have requirements against the other cross-zones, that service must be APPLY'd to those zones before installation can be completed into the set-to zone.

SYSPROG Tools
Use MODIFY JES3,CHK

- **MODIFY JES3,CHK**
- Allows the operator to check the “health” of a JES3 address space.
- A summary report issued to the console lists any exception conditions found.
- **CHK may save you an outage!**

MODIFY JES3,CHK is an exception analysis function. This function is invoked by an operator MVS command while JES3 is running or offline during dump analysis. The function provides a summary report of unusual conditions as defined by JES3. This function will be enhanced and fine-tuned over time as more and more checks are implemented.

The command runs asynchronously to the JES3 address space code. Therefore, it is possible that JES3 is changing the data while the command is executing. This can lead to an occasional program check or a loop while the command is executing. When a loop is detected, message ″IAT6417 Command ’CHK ’ exceeded 1 minute. Reply ’CANCEL’ to stop″ is issued and a response is required. In either case, enter the command again.

The same function can be invoked in IPCS and Dump Core (DC).

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SYSPROG Tools
Use MODIFY JES3,CHK

- Categories of exception conditions checked are:
  - CI and MDS
  - FCTs and DSPs
  - General
  - JSS and Job queue
  - Spool

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There are various types of exception analysis, each of which is called in turn by IATABEA. Each one is contained in its own module. Over time more checks may be added based on your and our experience.

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SYSPROG Tools
Use MODIFY JES3,CHK

- Some of the more interesting exception conditions are:
  - PROCLIB update is disabled
  - LOCATE subtask has abended
  - Job queue is held
  - FAILDSP pending for an FCT
  - IATXARQ issued for JESMSG processing
  - There are unprocessed WTDs (i.e. commands) on the Work-to-do queue
  - There are WEVs on one or more WLM queue
  - Main has been flushed
  - WLM reclassification is in progress
  - One or more priorities has been held
  - Threshold percent of job numbers in use
  - Marginal/minimal spool condition
  - Minimal JSAM buffer condition

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There are too many exception conditions to list. The ones listed here are probably among the more interesting or likely to be seen by you, the customer.

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SYSPROG Tools
Use MODIFY JES3,CHK (Example 1)

- Customer problem:
  - No jobs being processed by C/I.
- Customer actions:
  - Hot start JES3 – no change
  - IPL and hot start – no change
  - Open SEV 1 call.
- F JES3,CHK showed that job priorities were held.
  - The operator had inadvertently held all job priorities often with *F Q,H.
- Solution:
  - Release job priorities and job processing resumes.

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SYSPROG Tools
Use MODIFY JES3,CHK (Example 2)

- Customer problem:
  - Following a hardware issue, JES3 is not responding to certain commands.
- Customer actions:
  - Opens a SEV 1 call.
- F JES3,CHK shows that the SETUP FCT is stuck waiting for I/O (due to the hardware issue).
- Solution:
  - Use *FAIL for the SETUP FCT which would then recover and resume processing.

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SYSPROG Tools
Use MODIFY JES3,CHK (Example 3)

- Customer problem:
  - Auxiliary storage shortage when starting an initiator.
  - JES3 issues IAT2008 message for maximum inits but may be missed or ignored.
  - Customer later wonders why job processing has slowed or stopped.
- Customer actions:
  - Opens a call.
- F JES3,CHK would show that the start of an initiator failed hence why job processing has been impacted.
- Solution:
  - Customer can check the log for IAT2008 messages they may have missed and take the appropriate action.

SYSPROG Tools
Autostart for JSS

- Autostart can be used to make JES3 functions available after JES3 initialization without requiring the *S,JSS command.
- Add PARM=NOREQ to the start command
  - S JES3,PARM=NOREQ
- Modify the JES3 Cataloged Start Procedure
  - //IEFPROC EXEC PGM=IATINTK,DPRTY=(15,15),PARM=NOREQ
  - Can nullify on the start command: S JES3,PARM=

PARM=NOREQ specifies that JES3 global will start JES automatically if you want JES3 functions to be available after JES3 initialization without requiring the ***S,JSS** command. Place this in the JES3 start procedure. This avoids having operators forget to do the *S JSS command when restarting JES3. To nullify the parameter you can specify S JES3,PARM= on the start command.

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SYSPROG Tools
Display a Spool Record

- Dump core DSP can be used to display the contents of a spool record that has a spool address of *mmmm.rrrrrrrr*
  - ***S DC,SPADDR=mmmm.rrrrrrrr***
  - The *mmmm* portion of the spool address is the spool extent number (module) where the record resides.
  - The *rrrrrrrr* portion of the spool address is the spool record number within the spool extent.
  - The spool address must be coded exactly as shown; leading zeros in either part of the spool address must be specified.
- When the contents of the spool record are displayed, only the non-zero portion at the end of the record is displayed.

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The dump core DSP is used to display and modify data in main storage, to intercept program flow during execution, and to format control blocks for debugging. This facility can be used only on the global processor.

SPADDR=mmmm.rrrrrrrr

Displays the contents of the spool record that has a spool address of *mmmm.rrrrrrrr*. The *mmmm* portion of the spool address is the spool extent number (module) where the record resides. The *rrrrrrrr* portion of the spool address is the spool record number within the spool extent. The spool address must be coded exactly as shown; leading zeros in either part of the spool address must be specified.

When the contents of the spool record are displayed, only the non-zero portion at the end of the record is displayed. For example, if a particular spool record contains only zeros after the first 100 bytes of the records, only the first 100 bytes of the record will be displayed.

In order to use SPADDR, you must specify KEY=SYSTEM when calling dump core:

*CALL DC,OUT=CON,KEY=SYSTEM

See the *z/OS JES3 Commands* document for more details on using dump core.

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SYSPROG Tools
Display a Spool Record Examples

```
*CALL,DC,OUT=CON,KEY=SYSTEM
IAT6306 JOB09992 IS DC, CALLED BY CN 01
IAT7921 ISSUE START/CANCEL/RESTART DC REQUEST

*S,DC,SPADDR=0003.00000384
SPOOL RECORD: 0003.00000384
00000000-00030000 03840000 C3E2C240 00000000 *.....D..CSB ....*
00000010-00000000 00000000 5CA2A3A3 0012D6E4 *........*stt..OU*
00000020-E37EC3D6 D540D2C5 E87EE2E8 E2E3C5D4 *T=CON KEY=SYSTEM*

*S,DC,SPADDR=0002.000012A8
SPOOL RECORD: 0002.000012A8
00000000-00020000 12A80001 D6E2C540 00000000 *.....y..OSE ....*
00000010-00000000 00000000 5CA2A3A3 00600060 *........*stt.-.-*
00000020-00000000 00000000 00000000 00000000 *................*
00000030-00000000 00000000 00000000 00000000 *................*
00000040-00000000 00000000 00000000 00000000 *................*
00000050-00000000 00000000 00000000 00000000 *................*
00000060-FFFFFFFF                            *....            *
```

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SYSPROG Tools
Dynamic LPA Facility

- APARs with restart type DynLPA can be activated without an IPL.
- New versions of JES3 LPA modules can be dynamically added to LPA by issuing the following commands:
  - **F LLA,REFRESH**
  - **SETPROG LPA,ADD,MODNAME=modname,DSN=LNKLST**
  - Message CSV551I confirms the LPA add.
- Perform a hot start of local start of JES3 to activate the changed module.
  - No IPL required!
  - Message IAT3085 confirms the changed module.

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APARs eligible for refresh with the dynamic LPA facility will be marked in the APAR closure text.
- Type/IPL (Local,DynLPA)
- Type/IPL (Global,DynLPA)
- Type/IPL (Rolling,DynLPA)

See Info APAR II07968 – JES3 Maintenance Philosophy

The SETPROG command can be issued while JES3 is active. The change does not take effect until JES3 is restarted. This allows you to back out the change if necessary.

If the fix must be installed on more than one system, a SETPROG command must be issued for each system.

Multiple modules can be added at one time using MODNAME=(*modname,...,modname*)

When the required modules have been added to LPA, perform a hot start or local start of JES3 (without an IPL of the system) to activate the change. During initialization, JES3 picks up the new versions of the modules and issues message IAT3085. On the JES3 global processor, the message appears in JES3OUT only. On the JES3 local processors, the message appears on the console.

Monitor CSA usage. Dynamic addition of modules to the LPA reduce the CSA space available as older versions of the module are not removed.

SYSPROG Tools
Dynamic LPA Facility Example

- Build a new copy of all the library directory indexes:
  MODIFY LLA,REFRESH
- Use SETPROG to add updated module IATSICA to the LPA:
  SETPROG LPA,ADD,MODNAME=IATSICA,DSN=LNKLST
  CSV551I 10.16.14 LPA ADD 868
  SUCCESSFUL: 1 UNSUCCESSFUL: 0 NOT PROCESSED: 0
  MODULE RESULT
  IATSICA SUCCESSFUL
- CSV551I confirms the add was successful.
- Perform a hot or local start to activate the changed module.
- IAT3085 identifes the changed modules:
  IAT3085 LPA MODULES CHANGED: IATSICA ...

The APAR ++hold data will contain instructions. An example is:

```
New versions of JES3 LPA modules can be dynamically added to
LPA by issuing the following commands:

F LLA,REFRESH       followed by:
SETPROG LPA,ADD,MODNAME=IATSICA,DSN=LNKLST
```

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SYSPROG Tools
JES3 Auto-Restart

- JES3 will auto-restart if a critical DSP or FCT terminates.
  - CRITICAL=YES is added to the DSP/FCT definition.
  - DSPs/FCTs defined as critical include:
    - JSAM
    - WTDDRVR (I/O bound Inquiry/Modify)
    - MSGC (JDS access, Started Task init., Main Connect, etc.)
    - JSS
    - MAIN
    - ENSTDRV (Extended Status)
- JES3 will auto-restart for repetitive and consecutive failures.
- JES3 initiates a hot start without an operator prompt.
  - IAT3098 identifies the reason for the auto-restart.

Auto-restart logic previously existed for a configuration change. Auto-restart means detaching the IATNUC task and reattaching it. It's like doing a DSI without changing the global.

The parameter CRITICAL=YES is added to the DSP or FCT definition in the DSP directory.

Refer to the z/OS JES3 Customization document:

- IATYDSD (Generate a DSP Dictionary Entry)
- IATYFCD (Generate Function Control Table)

IAT3098 text identifies if JES3 is restarting due to a CONFIGURATION CHANGE, a CRITICAL FCT ABEND, or REPETITIVE FAILURES.

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End of slides.

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