JES2 Project Opening
JES2 & SDSF Latest Status

- Current JES2 Releases
- Migration & Implementation Tips
- Recent Service, Publications, etc.

Session# **2652**

SHARE 101 Technical Conference - Summer 2003 - Washington DC
John Hutchinson - hutchjm@us.ibm.com
IBM Washington Systems Center, Gaithersburg, Maryland

other JES2 & Printing sessions . . .

Tue 08:00 2661 Intro to JES2 for New Systems Programmers [Kennedy]
Tue 09:30 2655 JES2 z/OS 1.4 Product Update [Washington 4]
Tue 11:00 2668 Getting JES2 to z/OS 1.4 User Experience [Washington 4]
Tue 11:00 2705 Infoprint Server - What's New [Kennedy]
Tue 04:30 2653 JES2 Short Subjects [Kennedy]
Tue 07:15 2679 JES2 Project Dinner [Meet in the Lobby]
Wed 08:00 2657 The z/OS 1.4 JES2 Health Monitor [Salon 3]
Wed 09:30 2702 VPS and DRS Printing Update [Kennedy]
Wed 03:00 2662 The JES2 Reconfiguration Dialog [Kennedy]
Wed 04:30 & 6:00 2663 JES2 Debugging Parts 1 & 2 [Kennedy]
Thu 08:00 2665 How We Converted from JES2 to WLM Initiators [Kennedy]
Thu 09:30 2703 How and Why VPS Uses SAPI [Kennedy]
Thu 11:00 2704 Writing Filter Programs for Infoprint Server [Kennedy]
Thu 01:30 2709 Infoprint Server User Experience [Kennedy]
Thu 03:00 2706 You Inherited Print Admin-What Does PSF Do? [Kennedy]
Thu 04:30 2659 JES2 Q&A and Requirements Demo [Kennedy]
Thu 05:30 2651 JES2 Project Planning for Long Beach [Kennedy]
Thu 10:00 2680 JES2: Esprit de Corps [Salon 1]

Current JES2 Releases

FMIDs, Birthdays & Obituaries

JES2 Rel.#	FMID	First Available	No Longer Available	End of Service
~~OS/390 R.8/9~~	~~HJE6608~~	~~9/99~~	~~9/00~~	~~3/03~~
OS/390 R.10	HJE7703	9/00	3/02	9/04
z/OS R. 1	HJE7703	3/01	10/01	3/04
z/OS R. 2/3	HJE7705	10/01	9/02	10/04
z/OS R. 4	HJE7707	9/02	1Q04	9/05
z/OS R. 5	*HJE7708*	*3/04*	*9/04*	*3/07*

See www.ibm.com/services/sl/products/java.html (requires JVM 1.3)
See 'JES2 Migration Notebook' &
'Migration from OS/390 V2R10 to z/OS V1R4'
www.ibm.com/servers/eserver/zseries/zos/installation/zos_migration.html

JES2/MVS Compatibility

	JES2 Release:			
OS/390 z/OS Release	Rel.10 & z/OS R.1 HJE7703	z/OS R.2 HJE7705	z/OS R.4 HJE7707	z/OS R.5 HJE7708
R.10	X			
z/OS R1	X			
z/OS R2	X	X		
z/OS R3	X	X		
z/OS R4	X	X	X	
z/OS R5	X	X	X	X

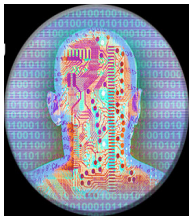
JES levels supported by a given z/OS release will be the same as the JES levels that can coexist in a MAS.

See "***z/OS and z/OS.e Planning for Installation Guide***" GA22-7504 at http://www.ibm.com/servers/eserver/zseries/zos/bkserv/find_books.html - Chapters 4 & 5

Autonomic Computing - JES2 OnDemand

- **Self-Configuring**
  - Fence to multiple SPOOL Volumes & Fence by System (zR1)
  - Dynamic Proclibs (zR2)
  - Checkpoint MODE reconfiguration (zR2)
  - Dynamic NJE definitions (zR2)

- **Self-Healing**
  - PCE cleanup & recovery (zR2)
  - Proclib Open/Close to access new Extents (zR2)
- **Self-Optimizing**
  - WLM Initiator balancing (zR4)
  - $#GET/$#POST efficiencies for idle printers (zR1)
  - Health Monitor (zR4)



- **Self-Protecting**
  - ZAPJOB service (zR2)
  - Long-running job spin-off support (zR2)
  - Checkpoint protection against invalid updates (zR4)

Checkpoint Data Corruption

Problems

- Checkpoint data may be corrupted by hardware or software (IBM or user) errors ...
- Volumes used for checkpoint and SPOOL may be wrong (operator error)

Ongoing work to fix this . . .

- Checkpoint never written until warm start has completed.
- If too many (=10) Disastrous errors, warm start asks the operator's opinion about continuing via HASP863 / HASP272
- (OW57260 - MsgHASP478 "Initial CKPT read is invalid" issued incorrectly - fixed in F301)

Problems have occurred over the years where an installation started with the wrong SPOOL or checkpoint volumes online (production on a test system or test on a production system). Also problems have occurred where only one checkpoint data set was bad. Typically, an installation notices this when they start to see thousands of error messages flood the screen. Often the system is stopped at that point to try and prevent problems. But it is too late. JES2 has already written some or all of the bad data to checkpoint.
New logic will ensure that

- Nothing is written to the checkpoint until warm start processing completes
- If more than 10 errors are encountered, the operator is given the option of not starting JES2 (before anything has been written)

JES2/z4

TSO duplicate logons

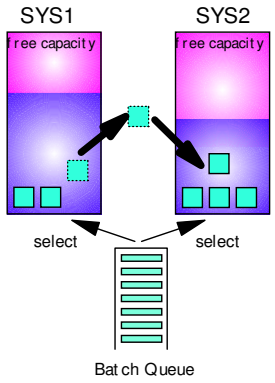
- **JES2 doesn't check TSO logons for duplicate IDs in the same sysplex...**
  - Same UserID can logon to multiple systems in the MAS
    - Not prevented by JES2, and "not supported" by z/OS.
- **Caveats:**
  1. TSO User Notifications are "random". (They go to the first TSO user logged on in the sysplex.)
  2. If TSO logon ENQ is 'SYSTEMS' scope in the GRS RNL, then TSO will reject second logon with "already logged on".
  3. Use JES2 exits 2, 20 or 44 to reject.
  4. ISPF data set names must be unique. Qualify them with the system name with ISPF Exit 16 and Logon Profile EXEC.
  5. Be careful not to edit or update the same data set from duplicate TSO UserIDs on different systems, because there is no SYSTEMS level ENQ to guarantee serialization.
  6. Extended MCS consoles with the same TSO ID are shared.

- WLM needed additional information to better determine where to start/stop initiators. This information is provided by the z4 level of JES2. For more details on how this works, refer to the WLM presentations and documentation.
- A problem has long existed with page mode (binary) data steams that are printed on FSS printer. If the installation selected blank truncation for the SYSOUT class, x'40' at the end of each record are removed so save space on SPOOL. The problem is that for binary data, the x'40' may not represent a blank. For external writers and SAPI devices, JES2 adds the blanks back in before passing the records across the interface. However, since FSS reads are locate mode, there is no way to insert the blanks back into the record. Also, the original record length was never passed to the FSS. That is what was corrected. The original record length is now passed to the FSS printer. It is up to the FSS printer to add any truncated blanks back into the record when it is printed. An updated FSS application may be needed to take advantage of this support.

WLM-Managed Initiators - z/OS Rel. 4

Enhanced Initiator Balancing:

- Goal is to balance distribution of initiators more evenly over sysplex members
- More aggressive reduction of initiators on heavily loaded systems (< 5% CPU capacity)
- Start up to 5 initiators at once on systems with relaxed capacity.
- Balancing evaluation done every 10 seconds
- WLM keeps enough initiators available for jobs with system affinity
- See APAR OW56117 for corrections to the balancing algorithm.



"Migration from OS/390 V2R10 to z/OS V1R4"

JES2 Migration Actions: Chapter 13

- **Before Installing z/OS R4:**
  - Activate JES2 checkpoint level R4
  - Command syntax migration aid removal (HASX05C default exit)
  - APPLCOPY no longer supported
- **Before you first IPL z/OS V1R4:**
  - Default SMP/E target library name changes (no longer VxRxMx qualified)
  - Message based automation (HASP070, -089, -098, -863, -272, -443, & 9xxx)
  - Counting null records & Original record length passed by way of the FSI
  - TSO GR, TSO SEND commands and logons
  - JES2 Health Monitor command updates, profiles, & alert updates
  - System trace contents
  - Exit 9, 14, 49, 22, & 44 changes
  - Field, field name and control block changes
    - $XMPOST, $#BUSY, IAZIDX, $PSO, $SDB changes
- **After the first IPL of z/OS V1R4**
  - Activate to z2 mode
  - Support for a maximum of 999,999 job numbers
  - Large volume support
  - Tivoli Operations Planning and Control (OPC) V2 . . . . .

JES2 Service Information

- HiPer APARs (Hi Impact, or Pervasive)
  - See PSP buckets for an up-to-date list
    - ZOSV1Rx / JES2
  - https://techsupport.services.ibm.com/server/390.psp390
    (requires IBM Registration userid)
- Other service of interest:
  - New Function
  - Performance Improvements

OW55708 - Compatibility with z/OS Rel. 5

Problem
- MsgHASP710 if attempting to initialize zR5 with earlier levels of JES2 in a MAS

Fix
- JES2 releases prior to z/OS Rel. 5 must be able to recognize JES2 Release 5
- OS/390 R10, z/OS R2, R4 (DLL)

Note
- Service level J2SLVL increased

OA03779 - Checkpoint Damage

Problem

- $ACTIVATE on JES2 z/OS R2 or R4, then $T command changing checkpoint size on a different member without a hotstart updates KITKLNG incorrectly.

Fix

- HASPCKPT ensures that the JIX size is correct .
- z/OS R2, R4 (DLL)

Circumvention

- Issue $T commands on same member you $ACTIVATEd
- Hotstart all members after $ACTIVATE

OA03216 - Catastrophic errors

Problem

- $Q06, Qxx, Jxx catastrophic errors after JES2 restart and Checkpoint MODE=DUAL.
- (Some checkpoint updates may be lost.)

Fix

- HASPCKPT sets the correct CKPT MODE during initialization.
- z/OS R4 (F306)

Circumvention

- Switch to CKPTDEF MODE=DUPLEX.
- (Also remember to update your JES2 init deck in the unlikely even you need to cold-start.)

OW49317 - Spool support for 3390-9

Problem

- Spool data sets had to be within first 64K tracks of DASD volumes. (3390-9 has 150,255 tracks.)
  - Also applies to "large volume support"

Fix

- Relative track addressing allows the spool space to be located anywhere on the volume.
  - "TT" in "MTTR" is relative to dataset origin.
  - New init parm and display message:
    SPOOLDEF RELADDR=NEVER|ASNEEDED|ALWAYS
    $D SPOOL,UNITDATA displays status of RELADDR
- OS/390 R10 - z/OS R2 (F112)

Note

- OW56311 (F301 - HIPer) Msg HASP096 writing beyond extent - see APAR cover letter.
- OW49373 (F112) provides SSI 71 mapping macros IAZSPLIO and changes to IAZSSJI

OW53863 - Fast Spool Garbage Collect'n

Problem

- TrackGroups marked "allocated" during spool space assignment if non-ownership not verified.
  - Maybe caused by overlay of JES2 control blocks.
- Not cleaned up until the weekly cycle (Sniffer).

Circumvention

- Wait for the weekly spool garbage collection.
- Add more spool volumes; Purge large jobs.
- All member warm start with SPOOL=VALIDATE.

Fix

- Oper command to validate/recover TGs quickly
  - `$T SPOOLDEF,GCRATE=FAST`
  - `$HASP9163 FAST SPOOL GARBAGE COLLECTION ...`
  - `$HASP844 SPOOLDEF GCRATE=(FAST,nn% FINISHED)`
- OS/390 R8 - z/OS R4 (F208)

OW55693 - Coupling Facility Ckpt Delays

Problem

- Excessive IXCQUERY requests and delays when MASDEF LOCKOUT - $HASP263 occurs.
  - May cause a member to hold checkpoint several seconds or minutes.
- Validate with PERFDATA showing long waits in CKPT PCE in HASPNUC at 99676000.

Circumvention

- Tune Checkpoint performance, Use DASD, or Specify a higher values for MASDEF LOCKOUT= (default = 1000 = 10 seconds)

Fix

- Cache info & don't $WAIT on IXCQUERY
- **`$D PERFDATA(SUBTSTAT)`** added
- OS/390 R8 - z/OS R4 (F209)

JES2 Performance APARs

Since PUT/RSU F206:

- OW54137: High JES2 CPU w/ SAPI after system crash (F207)
- OW55693: Checkpoint delays for coupling facility (F209)
- OW55602: JES2 ROUT Receiver loops after neg. close. (F208)
- OW56924: JES2 loop after OW53863 if small SPOOLDEF TGSIZE value (F211)
- OW56117: WLM managed inits not rebalanced on constrained system. (F211)
- OA01825: MSGHASP263 w/job producing a large amount of spin datasets goes into unspun processing (F304)
- OA02686: High CPU w/PSO processing Held datasets (F306)

$D PERFDATA service aid commands

(undocumented - intended for service personnel - subject to change)

- **$D PERFDATA(INITSTAT)** - JES2 initialization routines
- **$D PERFDATA(QSUSE)** - Checkpoint delays
- **$D PERFDATA(PCESTAT)** - PCE detailed statistics
- **$D PERFDATA(CPUSTAT)** - Summary of PCE stats
- **$D PERFDATA(SAMPDATA)** - WLM init sampling data
- **$D PERFDATA(EVENT)** - JES2 internal errors & delays
- **$D PERFDATA(CKPTSTAT)** - JES2 Checkpoint Performance (z/OS R.2)
- **$D PERFDATA(SUBTSTAT)** - JES2 Subtask Performance (APAR OW55693)

```
$HASP660 $DPERFDATA(SUBTSTAT)
$HASP660 SUBTASK STATISTICS - INTERVAL=884:10:55.376013,
$HASP660 ROUTINE=$RACROUT,COUNT=105,AVG_QUEUE_TIME=0.000218,
$HASP660 AVG_RUN_TIME=0.000217,AVG_CPU_TIME=0.000199,
$HASP660 ROUTINE=FULLPATH,COUNT=16,AVG_QUEUE_TIME=0.000045,
$HASP660 AVG_RUN_TIME=0.212998,AVG_CPU_TIME=0.203200,
$HASP660 ROUTINE=JOBVALM,COUNT=330,AVG_QUEUE_TIME=0.000021,
$HASP660 AVG_RUN_TIME=0.001362,AVG_CPU_TIME=0.000263,
$HASP660 ROUTINE=PSAFSCAN,COUNT=392,AVG_QUEUE_TIME=0.000033,
$HASP660 AVG_RUN_TIME=0.000080,AVG_CPU_TIME=0.000078,
$HASP660 ROUTINE=RPDBSEC,COUNT=330,AVG_QUEUE_TIME=0.000008,
$HASP660 AVG_RUN_TIME=0.000106,AVG_CPU_TIME=0.000102,
$HASP660 ROUTINE=XINITST,COUNT=16,AVG_QUEUE_TIME=0.000151,
$HASP660 AVG_RUN_TIME=0.002650,AVG_CPU_TIME=0.001659
```

http://www.ibm.com/support/techdocs/atsmastr.nsf/PubAllNum/W9744B

$D PERFDATA Usage Examples

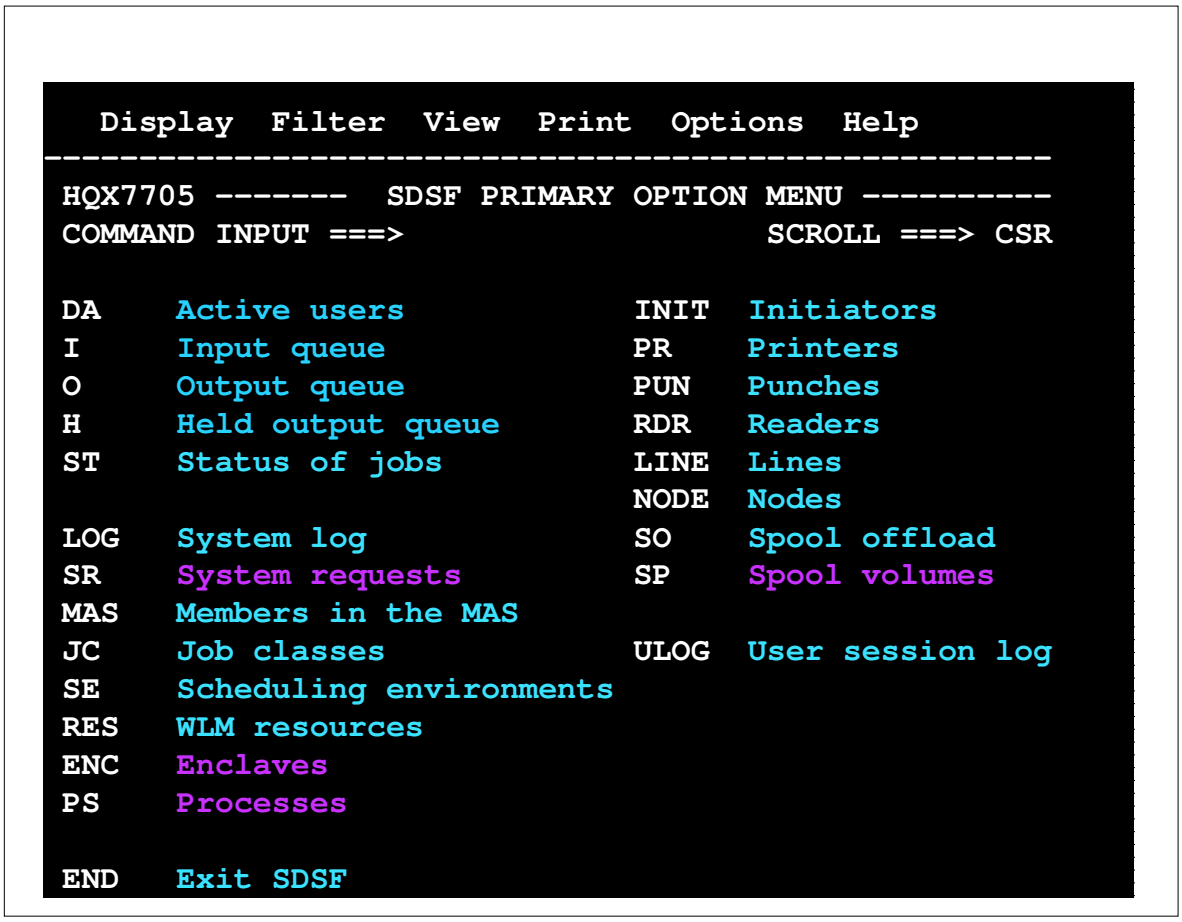
- **JES2 initialization takes too long:**
  - $D PERFDATA(INITSTAT) - See elapsed time for each routine
- **Checkpoint delays:**
  - $D PERFDATA(CKPTSTAT) - El. time for R1, R2, PW, IW, FW
  - $D PERFDATA(QSUSE) - Callers of $QSUSE & avg. delays
- **JES2 CPU Utilization to high:**
  - $D PERFDATA(CPUSTAT) - Summary of PCE stats
  - $D PERFDATA(PCESTAT) - PCE detailed statistics
  - $D PERFDATA(SUBTSTAT) - Subtask statistics
- **WLM managed initiators not behaving:**
  - $D PERFDATA(SAMPDATA) - WLM init sampling data
- **Misc. errors:**
  - $D PERFDATA(EVENT) - JES2 internal errors & delays

Survey Questions

What is your JES2 Release level ($ACTIVATEd) ?

JES2 Rel.#	Count	Last SHARE (3/2003)	SHARE 99 (7/2002)	SHARE 98 (3/2002)	SHARE 97 (7/2001)
OS/390 R.5/6		1 (1)	0	4 (2)	3
OS/390 R.7		0	0	3 (2)	1
OS/390 R.8/9		3 (3)	6	7 (4)	8
OS/390 R.10/z1		27	20 (9)	21 ()	9
z/OS R2		14 (4)	9 (4)	5 (3)	n/a
z/OS R4		8 (1)	n/a	n/a	n/a

SDSF Update



Recent SDSF Releases

OS/390 R10 SDSF

- **Systems management in a MAS** (Requires MQSeries for OS/390)
  - MAS-wide display of Printers and Initiators
  - View in-core buffers for active jobs on other systems
  - Improved Management of WTORs - SR panel, RSYS cmd
- **Other enhancements:**
  - SDSF Server management (operator commands)
  - Web-based Configuration Assistant
  - Conditional processing of ISFPARMS

z/OS R1 SDSF

- Same as OS/390 Rel. 10 SDSF
- ***Guide & Reference*** and ***Customization & Security*** replaced by ***SDSF Operation and Customization***, SA22-7670

z/SDSF (z/OS Release 2 SDSF)

- **Systems management in a MAS** (Requires MQSeries)
  - MAS-wide display of Lines, Nodes, Rdrs, Puns, SO
- **z/OS JES2 Support:**
  - >64K Jobs & Long-running Jobs (Spin joblogs)
- **New Panels:**
  - Spool Volumes
  - WLM Enclaves
  - Processes (UNIX System Services)
- **Other enhancements:**
  - Logger multi-block exploitation (performance)
  - DA panel shows additional RMF fields for 64-bit virtual
    - MemLimit, CPUCrit, STORCrit, RptClass, TRANACT, TRANRES
  - MAS panel shows Comchar, JESName, SLevel, Type/Time
  - Generated commands don't need/use Exit 5

z/OS R4 SDSF Enhancements

- JES2 Exploitations
  - Spool I/O interface used for in-core buffers
  - JES2 Recovery States (Rebuild, EOM) shown
  - Additional JES2 zR4 fields displayed on most panels
- System Command extensions
  - Recall last 10 unique commands
  - Reply to WTOR pop-up displays message text
- Minor usability enhancements
  - Full-screen version of WTOR pop-up
    - allows for Insert in the command text
- Migration / Coexistence PTFs
  - Check PSP buckets or SDSF home page

Recent SDSF HiPer APARs

- PQ56166 (R12 / F201)
  - S0C4 when scrolling SYSLOG
- PQ61532 (R12 - R14 / F206)
  - Default server name not filled into WORSRVNM then into RACF GROUP.ISFSPROG.<server_name>
- PQ62907 (R10 - R14 / F208)
  - Potential overlays using SDSF Trace Facility & large ISFPARMS
- PQ62988 (R14 / F207)
  - Occasinal message "SUBS RETURN CODE 12" or "SPOOL DATA ERROR"
- PQ64234 (R12 / F208)
  - SPOOL errors ISF001I and "JCT NOT AVAILABLE" with high paging

Appendix

- OS/390 & z/OS JES2 Releases
- z/OS JES2 Library
- Softcopy Books
- other JES-related Books
- JES2 Education
- z/OS Web Sites

OS/390 & z/OS JES2 Releases

OS/390 Release 1 - Spool Offload Enhancements

OS/390 Release 3 - SYSOUT API (SAPI)

OS/390 Release 4 - WLM Inits, SCHENV & Constraint Relief
- **$ACTIVATE required for new functions**

OS/390 Release 5 - Open Print Server Support

OS/390 Release 7 - FiCon & New DASD Support

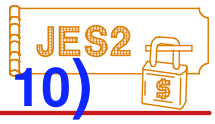
OS/390 Release 8 - CF Auto Rebuild for Checkpoint Structure

OS/390 Release 10 Spool Mgmt, Browse, ZAPJOB,...
- **$ACTIVATE=R4 required**

z/OS Release 2 - >64K jobs, Spool, Proclib, etc. relief ...
- **$ACTIVATE=Z2 required for new functions**

z/OS Release 4 - Health Monitor, Usibility, RAS, ...

JES2 - z/OS R. 1 (& OS/390 Rel. 10)



- **Spool Management**
  - Fence to multiple Vols & by System
- **Performance**
  - $#GET/$#POST for many local/remote idle Printers
  - SNA buffers up to 32K
  - HASPINIT load module loaded above the line
- **Spool Browse Enhancements**
  - SVC 99, QSAM/BSAM Interface
- **Serviceability enhancements**
  - Multi-member dumps
  - Tailored SVC dumps
  - ZAPJOB service
  - and more ...

JES2 - z/OS R.2

- **Greater than 64K jobs support**
  - Watch for significant JobID format changes (Jnnnnnnn)
- **Dynamic PROCLIB & INCLUDE initialization statement**
- **Long running jobs support** (Spin/Suppress JESLOG)
- **Large spool volume support** (64K trks anywhere on vol)
- **Misc. enhancements**
  - Spool Read & Convert Device - new functions on SSI 71
  - Dynamic NJE devices - $ADD LINEnn,JTNUM=n,STNUM=m
  - $TCKPT mode=DUAL/DUPLEX w/out all-member warm start
  - $DJQ,SPOOL for >32K track groups
  - Termination changes - "Nag" message & PCE clean-up
  - $D PERFDATA(CKPTSTAT) - summary without $TRACE(17)
  - $DPCE details filter
- **JES2 can operate in two modes:**
  - Full function mode (z2 = default), or Compatibility mode (R4)

JES2 - z/OS R4

- **Usability enhancements**
  - INCLUDE statement
  - Default PARMLIB processing
  - //XMIT JCL support
  - WLM Initiator Balancing
  - Blank Truncation on FSS Printers
  - JES2 no longer checks for duplicate TSO logons in a sysplex
- **JES2 Health Monitor**
  - Examine/Diagnose JES2 from separate address space
- **Miscellaneous changes**
  - End of Memory (EOM) processing
  - Prevention of and Recovery from JES2 CKPT errors
  - HASP Access Method (HAM) I/O

The major themes for this release are reducing outages and performance.
- A health monitor has been created for JES2 to help installations deal with cases when JES2 is not responsive.
- To deal with the EOM timer added by MVS in z/OS 1.2, JES2 added a timer of its own that prevented us from being canceled. With this release, we remove the timer and all waits in the EOM SSI code.
- Processing in HAM (HASP access method used to read and write data sets to SPOOL) has been enhanced to improve performance and reliability
- Based on customer response, the INCLUDE statement that was added in z/OS 1.2 has been enhanced in this release to allow use of the default PARMLIB concatenation and to have a default JES2 initialization member.
- Initialization processing was enhanced to not update JES2 checkpoint data sets until warm start processing has completed.
- The //XMIT card is now supported to transmit jobs to other nodes via NJE. Previously, this was only supported by JES3
- We also updated the data passed to FSSes (original LRECL) and WLM (more sampling data)
- There is a compatibility APAR (as usual) for this release. It applies to R8, R10, and z2. R4 and z2 modes of operation are still supported.

z/OS JES2 LIBRARY

SA22-7535	JES2 Introduction *
GA22-7538	JES2 Migration
SA22-7532	JES2 Initialization & Tuning Guide
SA22-7533	JES2 Initialization & Tuning Reference
SA22-7537	JES2 Messages
SA22-7526	JES2 Commands
SA22-7527	JES2 Commands Summary
SA22-7534	JES2 Installation Exits
SA22-7536	JES2 Macros
GA22-7531	JES2 Diagnosis
GA22-7528	JES2 Data Areas, V.1 $A - $E *
GA22-7529	JES2 Data Areas, V.2 $F - $O *
GA22-7530	JES2 Data Areas, V.3 $P - $X *

- ★ SoftCopy only (CD-ROM)

z/OS Softcopy Books

- z/OS Softcopy Collection CD-ROMs
  - z/OS Rel. 1 CD-ROMs: SK3T-4269 (Unlicensed)
    - available on tape (optional, no-charge feature)
  - Software Products: SK3T-4270
  - z/OS & S/W Products - DVD: SK3T-4271
  - Licensed z/OS CD-ROM: LK3T-4307
- Softcopy site:
  http://www.ibm.com/servers/eserver/zseries/softcopy
- Online books at:
  http://www.ibm.com/servers/eserver/zseries/zos/bkserv
- JES2 PDF files at:
  http://www.ibm.com/servers/eserver/zseries/zos/bkserv/r1pdf/jes2.html
- See what's new at:
  http://www.ibm.com/servers/eserver/zseries/softcopy/whatsnew.htm

NJE Formats & Protocols

- "**Network Job Entry Formats & Protocols**" SC23-0070 dropped from OS/390 & z/OS library (no "product owner"...)
  - Will be restored to the OS/390 OnLine Softcopy Bookshelf (& eventually to the z/OS Bookshelf.)
- In the mean-time you can access it by...
  1. Go to http://www.ibm.com/servers/s390/os390/bkserv/
  2. Click on OS/390 elements and features publications V2R10
  3. Click on OS/390 V2R10.0 elements and features bookshelf (Discs 1 and 2) - Search (Titles, names or doc numbers)
  4. Type in a search argument of 'network job entry' or 'protocols'.

Other JES2-Related Documents

- z/OS V1 R3 & R4 Implementation, SG24-6581
- z/OS V1 R2 Implementation, SG24-6235
- OS/390 V2 R10 Implementation, SG24-5976
- VSE to OS/390 Migration Notebook, SG24-2043

- Deleted (obsolete) - save your old copies
  - ~~MVS/ESA JES2 Exit Coding, GG24-4127~~
  - ~~SDSF/RACF 1.9.2 Conversion, GG24-4085~~
  - ~~NJE with JES2 and Other Systems, GG22-9339-1~~
  - ~~JES2 MAS in Sysplex Environment, GG66-3263~~

IBM JES2 Education

- **JES2 for OS/390 Facilities & Implementation** (ES710) - 4.5 days
  - JES2 Facilities & Initialization
  - SDSF & Operations
  - Security Issues
  - Controlling JES2 Processes
  - Spool & Checkpoint Configurations
  - NJE & RJE (& SNA) Concepts & Implementation
  - JES2 Exits and Problem Determination
- **JES2 for OS/390 Operations** (ES280) 2.5 days
  - Start, Stop, Control JES2 processes and devices
  - JES2 and Workload Manager, and Sysplex
  - NJE, RJE, SNA, and OS/390 Print Server

z/OS Web Sites

z/OS Product Support - find everything from here!

- http://techsupport.services.ibm.com/server/support

Planning for Installation

- http://www.ibm.com/servers/eserver/zseries/zos/installation/

Publications (view, print, order books)

- http://www.ibm.com/servers/eserver/zseries/zos/bkserv/

SDSF home page

- http://www.ibm.com/servers/eserver/zseries/zos/sdsf/

Advanced Tech. Support (Flashes, White Papers, etc.)

- http://www.ibm.com/support/techdocs

Redbooks

- http://www.redbooks.ibm.com