JES2 Product Update

SHARE 96, Session 2655

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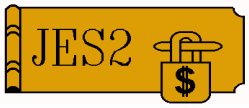
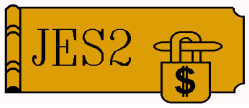
Recent JES2 OS/390 Releases



- **JES2 OS/390 V2R10M0**
  - $#GET/$#POST performance
  - Spool management and performance
  - Serviceability enhancements
    - Multi-member dumps
    - Tailored SVC dumps
    - ZAPJOB service
    - and more ...
- **Coming attractions**

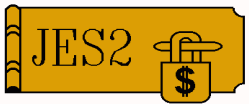
OS/390 Release 10

Release 10 Installation



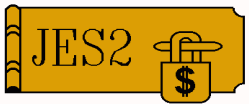
- MAS coexistence with HJE6605-HJE6608
  - **Must be $ACTIVATEd**
    - **$HASP446**
  - No **$ACTIVATE** command in R10!
  - No **UNACTIVATE** start option in R10!
  - APAR OW42299 needed to run R5+ in MAS with JES2 R10
  - APAR needed to run R5+ on BCP R10
  - Release 4 version of APAR shipped but not officially supported in a MAS
- **COLD** start required from HJE6603 and prior
  - Migrate to HJE6604 or higher first to avoid cold start

SPOOL Management



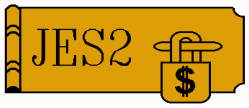
- **Prior to OS/390 R10**
  - **SPOOLDEF FENCE=YES**
    - All tracks for job obtained from single volume
    - **Advantage:** Minimizes impact of spool volume failure
    - **Disadvantage:** Performance
  - **SPOOLDEF FENCE=NO**
    - Tracks for job obtained from any volume
    - **Advantage:** Performance
    - **Disadvantage:** Spool volume failure can impact all jobs in system

SPOOL Management



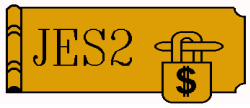
- **New in OS/390 R10:**
  - **SPOOLDEF FENCE=(ACTIVE=YES/NO, VOLUMES=*nn*)**
    - *nn* represents the maximum number of volumes a job will use
    - Allows easier tradeoff between advantages and disadvantages of spool fencing
    - **FENCE=NO** same as **FENCE=ACTIVE=NO**
    - **FENCE=YES** same as **FENCE=(ACTIVE=YES, VOLUMES=1)**

SPOOL Management

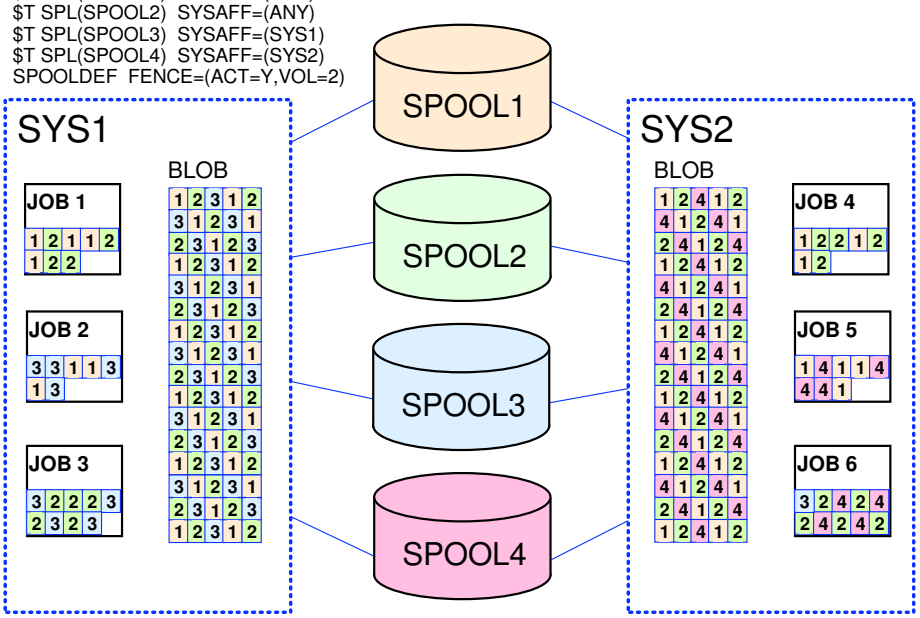


- **New in OS/390 R10:**
  - **SYSAFF=(*sys1*,*sys2*,...)** parameter on **$S SPOOL** and new **$T SPOOL** commands
    - Tracks are only assigned on systems to which volume has affinity
  - **SPOOLDEF TGBPERVL** is now obsolete
    - Always **255** if enough space exists
    - In spool shortage, 80% of remaining space divided by number of active members
    - If spool shortage, **SYSAFF** and **FENCE** values may be overridden
    - Tracks assigned to BLOB are reported as free rather than allocated

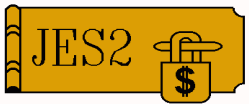
Spool Mangement Example




```
$T SPL(SPOOL1)  SYSAFF=(ANY)
$T SPL(SPOOL2)  SYSAFF=(ANY)
$T SPL(SPOOL3)  SYSAFF=(SYS1)
$T SPL(SPOOL4)  SYSAFF=(SYS2)
SPOOLDEF  FENCE=(ACT=Y,VOL=2)
```

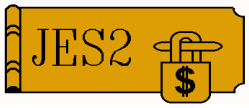


Spool Management



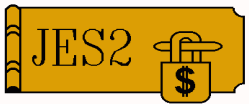
- **Caveats:**
  - If a spool shortage exists, volumes which do not have affinity to a member may have space allocated on that member
  - If a shortage exists on a single volume, jobs using that volume may allocate from additional volumes regardless of the fencing limit
  - A job may own space on a volume that does not have affinity to a system it's running on, or exceed the fencing limit, if it allocated space on another volume during some other phase (input, conversion)
  - In general, **FENCE=** and **SYSAFF=** should be considered as guidelines, not hard and fast rules, for spool allocation

ZAPJOB



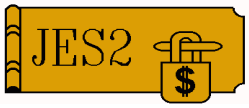
- Code defects (in either IBM or user code) sometimes result in jobs that
  - Cause **ABEND**s when processed
  - Warm start **ABEND**s when processing
  - JES2 won't come up or stay up
  - Job just won't go away
  - Ever had to **COLD** start because of this?
- **Solution:**
  - Make unwanted job structures go away
    - **ZAPJOB** initialization statement
    - **$ZAPJOB** command

ZAPJOB Syntax



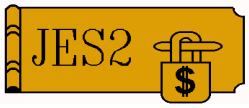
- Syntax - **ZAPJOB** (initialization) or **$ZAPJOB** (command) with combination of filters to identify job:
  - **JOBID**, **JQEOFF**, **JQEINDEX**, **JOBKEY**, **JOBNAME**
- At least one of **JOBID**, **JQEOFF**, **JQEINDEX**, or **JOBKEY** must be specified
- Specify as many parameters as are known (to ensure a typo does not delete wrong job)
- Any job can be ZAPed, even free JQEs

ZAPJOB



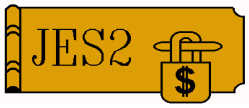
- Only CKPT structures are deleted
- No SMF 26 (purge) record
- SPOOL space eventually cleaned up by sniffer PCE
- All JOEs are deleted with the JQE
- ZAPJOB is *not* a fix for a job/output queue error
- Init statement allowed from CONSOLE mode only (Not allowed in the init deck!)
- New RACF profile for command
  - **JESx.ZAP.JOB**

ZAPJOB *WARNINGS!*



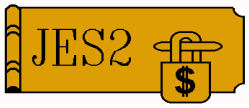
- **ZAPJOB** is intended as an option of **LAST RESORT** to prevent cold starts
- **ZAPJOB** is intended to operate on jobs that have incorrect state data
- Cannot verify job is not busy or locked since state data may be incorrect
- **ZAPJOB** will make the specified job go away even if there are PCEs using the job
- **ZAP**ping the wrong job may result in other problems (and even ABENDs **$Qxx** or **$Jxx**)

Multi System Dump



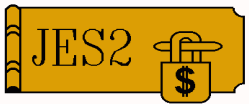
- Certain $ERROR codes can now trigger multi-system dumps
  - JES2 will be dumped on all MAS members
  - One dump data set per MVS image
  - "Incident Token" links related dumps
  - Currently used for checkpoint-related errors
- Tailored SVC dump exit ensures correct data is dumped
  - Forces SDATA to include all relevant areas
  - Adds data spaces and JES2AUX
  - Add JES2 if ASID is waiting on JES2 service
  - Applies to CONSOLE dumps as well

PERFDATA(EVENT)



- $D PERFDATA(EVENT) tracks "interesting" events in the JES2 main task
- Currently 3 events are tracked
  - Excessive run time (>5 seconds)
  - ABEND/$ERROR
  - $DISTERR
  - More may be added in the future
- Events can also be viewed in dump via IPCS as of APAR **OW46462**

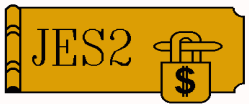
PERFDATA(EVENT) Examples



- Sample command output

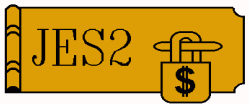
```
$dperfdata(event)
$HASP660 $DPERFDATA(EVENT)
$HASP660 EVENT INFORMATION - INTERVAL=18:43.320667,

$HASP660 TIME=2000.123,20:46:15.60,EVENT=LONG PCE DISPATCH,PCE=COMM,
$HASP660 MOD=HASPNUC,28570000,DATA=$POJQ(*),DURATION=51.909227,

$HASP660 TIME=2000.123,20:51:54.73,EVENT=ABEND/$ERROR,PCE=PRT,
$HASP660 MOD=UNKNOWN,+ 000000,DATA=S0C1,

$HASP660 TIME=2000.123,20:57:41.25,EVENT=ABEND/$ERROR,PCE=COMM,
$HASP660 MOD=HASTDIAG,84570000,DATA=$CW1,

$HASP660 TIME=2000.123,21:01:28.61,EVENT=$DISTERR,PCE=STCINRDR,
$HASP660 MOD=HASPNUC,68689400,JOB=STC00008,DATA=CBIMPL4,

$HASP660 TIME=2000.123,21:01:38.66,EVENT=LONG PCE DISPATCH,PCE=STCINRDR,
$HASP660 MOD=HASPRDR,56713500,JOB=STC00008,DURATION=9.923563
```

SPOOL Browse enhancements



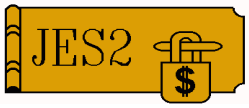
- SPOOL Browse allows dynamic allocation of any SYSOUT or SYSIN data set
  - Has been around since JES2 SP 4.1.0
- Difficult to use because:
  - Needed internal JES2 data areas to use
  - Not well documented (only DYNALLOC key)
- Solution:
  - Eliminate required use of internal JES2 data
  - Document interface in ***JES2 Initialization and Tuning Guide***

SPOOL Browse enhancements



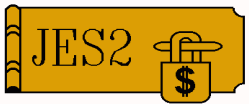
- What makes SPOOL browse special?
  - Uses DYNALLOC (SVC 99) interface
    - MUST be authorized (Supervisor state)
    - No SSI calls needed
  - Once allocated use normal QSAM/BSAM to read data
  - Can access data sets that SAPI/PSO cannot
    - SYSIN, SYSOUT without a JOE, SYSOUT busy on a device, NJE bound SYSOUT
  - Does not lock or busy any JES2 control blocks
  - Can access queued records (Not written to SPOOL)
  - Does NOT return meta data (SWBs, etc.)
  - Read only interface, no updates, no delete

SPOOL Browse enhancements



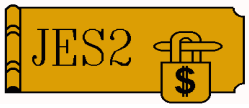
- Required input to dynamic allocation
  - **DALDSNAM** - JES2 Data set name
    - *userid.jobname.jobid.***D***dsnumb.dsname*
    - Must specify *jobname* and *jobid*
    - Other fields can be generics
    - Special data set names supported
      - *userid.jobname.jobid.jesddnam*
      - JESMSGLG, JESJCL, JESYSMSG, JESJCLIN
  - **DALSSREQ** - Name of JES2 subsystem to process request
  - **DALBRTKN** - SPOOL browse allocation token

SPOOL Browse enhancements



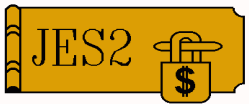
- SPOOL browse allocation token
  - Mapped by **IAZBTOKP**
  - Call type indicator (normal or spool DS token allocation)
  - *Optional* job key (to verify correct job selected)
  - *Optional* IOT MTTR or Client/DS Token
  - *Optional* ASID (or X'FFFF') if instorage buffers are needed
  - *Optional* information for SAF calls
  - Token sections must be the exact size documented

Miscellaneous



- **HASPINIT** load module moved above the line
  - INIT PCE was moved with the module
  - Beware in any **$EXIT 0**, **19**, or **24**, or $SCAN pre/postscan that still runs $AMODE 24 or can't otherwise deal with above the line data.
- **$#GET/$#POST** performance enhanced
  - $#POST passes eligible output directly to idle devices
  - $#GET skips queue scan if there are 0 or 1 elements to be processed
  - Aimed at customers with large numbers of mostly idle local or RJE printers

SNA Buffer Size Increased

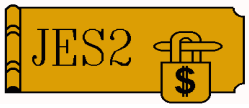


- **TPDEF SNABUF=(SIZE=)** limit has been increased from 3840 to **32512**
  - New limit for NJE only
  - RJE uses only part of buffer
- **TRACEDEF PAGES=** has new minimum
  - Needed to be big enough to trace SNA buffers
  - 9 pages are needed for buffer + other data
  - Lower values incremented to 9

COPYMARK=NONE

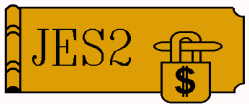
- Added **NONE** as valid **PRTnn COPYMARK=** value
  - No copy marks are printed
- Supported on FSS interface only
  - New bit GDS2CMNO indicates specification
- PSF will support new setting

Miscellaneous



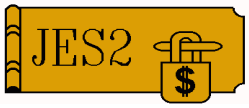
- Warm start verification of CKPT last write time
  - Problem when:
    - CKPT1/CKPT2 times too far apart
    - Current CKPT has an old time stamp
    - Current checkpoint significantly older than alternate
  - New confirmation message when potentially bad data is detected
    - **$HASP478 CONFIRM INITIAL CHECKPOINT READ FROM CKPT***n dsname/strname*
      LAST WRITTEN *day, dd mmm yyyy* **AT** *hh:mm:ss*
    - Includes information about both datasets when times are too far apart
  - Available in earlier releases in **OW43697**

Miscellaneous

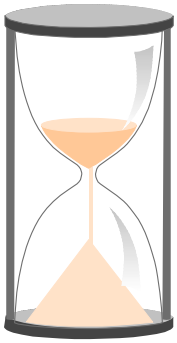


- **HASP272** message (checkpoint dialog WTOR) displays related message ID
  - ***$*HASP272 ENTER RESPONSE (ISSUE D R, MSG=*$*HASP*xxx* FOR RELATED MSG)**
- New diagnostic message if CKPT is in an old format
  - **$HASP446 CURRENT CHECKPOINT DATASETS ARE IN *xxxxxxxx* FORMAT. THIS IS NOT SUPPORTED BY THE *yyyyyyyy* LEVEL OF JES2.**
  - 4.3.0, Pre-Release 4, and Release 4 modes are recognized.

Release 10 Installation Reiteration

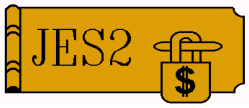


- Time is running out for pre-release 4 mode
- Release 10 REQUIRES installation to be $ACTIVATEd prior to migration
- COLD start required from HJE6603 and prior



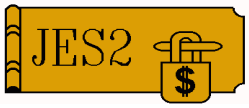
Coming Attractions

Prepare for future migrations



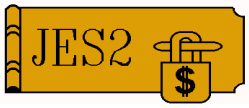
- Current JOBID formats:
  - **JOB***nnnnn*
  - **STC***nnnnn*
  - **TSU***nnnnn*
  - Limit job number to **99,999**
- Be prepared for additional jobid formats:
  - **J***nnnnnnn*
  - **S***nnnnnnn*
  - **T***nnnnnnn*
  - **$JBIDBLD** and **TSCNVJB** services deal with these today

Prepare for future migrations



- Many job number fields are currently 2 bytes
  - Limit job number to **65,534**
  - Many are preceded by 2 byte reserved fields
- Use fullword operations to manipulate job numbers wherever possible
- Use NJE 4-byte field **NJHGJNO** in preference to 2-byte **NJHGJID**

Running class queues

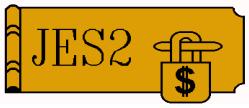


- Use **$QJQE** macro to run class queues wherever possible
  - Returns JQAs for each job on queue

```
LABEL    $QJQE   CLASS=(R2),        Points to 8-byte class
                 REG=(R6),          Return JQA addr in R6
                 MODE=READ,         Read mode only
                 LOOP=LBLLOOP,      Loop label (within macro)
                 NOMORE=LBLDONE     When out of jobs, go here

          USING  JQA,R6

*         Process job

          B      LBLLOOP            Loop for next job

LBLDONE   DS     0H                 Here when done
```

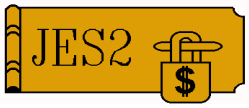
- Specify **MODE=REAL** to loop through real JQEs for faster search

$QJQE



- Use to run other queues as well
  - **$QJQE CLASS=(R2)** - R2 points to 8-byte class
  - **$QJQE CAT=(R2)** - R2 points to CAT (returned by **$DOGCAT** service)
    - **$DOGCAT ACTION=FETCHNEXT** - all queue heads for class queues
    - **$DOGCAT ACTION=FETCHNEXT, ALLQUES=YES** - all queue heads
  - **$QJQE TYPE=(R2)** - R2 contains type (see JQETYPE)
  - **$QJQE TYPE=CNVT** - can specify a specific type such as converter queue, hardcopy, etc.

APPLCOPY



- **CKPTDEF APPLCOPY=YES/NO**
  - **APPLCOPY=YES** is no longer supported
  - Use **checkpoint versions** instead