IBM Education Assistant (IEA) for z/OS V2R3

JES2: Resiliency for running out of fixed size resources

Agenda

- Trademarks
- Session Objectives
- Overview
- Usage & Invocation
- Interactions & Dependencies
- Migration & Coexistence Considerations
- Installation
- Session Summary
- Appendix

Trademarks

- See url http://www.ibm.com/legal/copytrade.shtml for a list of trademarks.
- Additional Trademarks:
  - None

Session Objectives

- In this session we will introduce the JES2 enhancements implemented in V2R3 that assist the user in managing their resources
  - Additional counts that indicate resource usage by job
  - Resource set aside as privilege space for privilege users to access the system and run jobs to relieve resource shortages
  - New emergency subsystem for logging in as a privileged user in order to address resource shortage issues
  - New command to display resource consumption and the Top 10 jobs consuming resources
  - Initialization deck checker to report on problems or inconsistencies in the init deck
  - New SMF 84 record that tracks utilization of specific JES2 resources

Overview

- Problem Statement / Need Addressed
  - This line item is intended to aid the user in identifying inappropriate use of key JES2 resources.
  - It is also adding support for a privileged user to have access to resources during a shortage so they can perform actions to resolve/mitigate the shortage.
- Solution
  - Better resource tracking for spool space (tracks), jobs (JQEs), job output (JOEs), and BERTs
  - Track “top 10” users of resources, top 10 consumption rates
  - Predict when resource shortages may occur
  - Set aside “privileged space” for privileged users to have the resources necessary for addressing system resource shortages
  - Initialization deck checker that identifies insufficient/incorrect limits
  - SMF records for recording basic resource usage information

Overview

- Benefit / Value
  - Resiliency

Usage & Invocation – New Counts

- New resource counts are associated with jobs
  - Tracks JOEs owned by a job
    - JOE – Job Output Element
    - $Djxx,JOENUM
  - Tracks BERTs owned by a job and by the JOEs associated with the job
    - BERT – Block Extention Reuse Table – extend checkpointed control blocks
    - $DJxx,BERTNUM for BERTs, $DJxx,JOEBERTS for BERTs owned by the job's JOEs
  - Tracks BERTs owned by a JOE
    - $DOJxx,BERTNUM

Usage & Invocation – New Counts

- Counts are available in Extended Status SSI 80
  - STJ2BRTS – number of BERTs used by this job
  - STJ2JOES – number of JOEs for this job
  - STS2JBRT – number of BERTs used by this JOE

- For BERTs in use on the system, determine the type of data they are storing by identifying the BERTIES that make up the BERTs
  - BERTIE – BERT Information Element
  - $D CKPTSPACE,BERTIES command shows usage of BERTIEs by checkpointed control blocks
    - partial example output on the next slide

Usage & Invocation – New Counts

```
          $dckptspace,berties
           $HASP852 CKPTSPACE
$HASP852 CKPTSPACE  CURRENT BERTIE UTILIZATION
$HASP852            BERT     BERTIE
$HASP852            TYPE     TYPE         COUNT
$HASP852            -------- -------- ---------
$HASP852            INTERNAL JAXCKPT          0
$HASP852            INTERNAL PRAOBJ           0
$HASP852            CURRENT BERTIE UTILIZATION
$HASP852            BERT     BERTIE
$HASP852            TYPE     TYPE         COUNT
$HASP852            -------- -------- ---------
$HASP852            JQE      HASTDIAG         0
$HASP852            JQE      UNOTIFY          0
$HASP852            JQE      ACCT             1
$HASP852            JQE      XEQ              5
$HASP852            JQE      SCH              0
$HASP852            JQE      SUMSK            0
$HASP852            JQE      BATXEQ           0
$HASP852            JQE      SECLAF           0
$HASP852            JQE      JUNSPUN          0
$HASP852            JQE      JDUPTIME         0
$HASP852            JQE      SYSLOG           1
$HASP852            JQE      JOBCOR           0
$HASP852            JQE      JOBTIME          5
$HASP852            JQE      DYNDEP           0
$HASP852            JQE      JQANET           0
$HASP852            CURRENT BERTIE UTILIZATION
$HASP852            BERT     BERTIE
$HASP852            TYPE     TYPE         COUNT
$HASP852            -------- -------- ---------
$HASP852            CAT      CATBASE         38
$HASP852            CAT      CATQAFF          0
$HASP852            CAT      CATACT          38
$HASP852            CAT      CATGROUP         2
(cont)
```

Usage & Invocation – Privilege Support

- Privilege resource is reserved for privilege jobs to deal with and relieve resource exhaustion.
- A small percentage of spool, jobs, output elements and BERTs are set aside for privilege jobs. This assures enough resource to log on, perform analysis, submit jobs, and resolve root cause of resource exhaustion.
  - Privileged resource carved out of current resource pool when first activated.
- Privileged space can only be used by privileged jobs, STCs and TSO logons.
- New “emergency subsystem” for logging in as a privileged user in order to address resource shortage issues.
  - Marks your job (JQE) as privileged.
  - Propagates privilege attribute to jobs you submit.
  - Can submit jobs directly to the emergency subsystem

Usage & Invocation – Privilege Support

- User must be authorized to submit jobs to the emergency subsystem.
  - User must have READ access to security profile JES.EMERGNCY.<subsys> in class FACILITY. <subsys> is the name of the emergency subsystem.
- Privilege support by default is activated if
  - MAS at checkpoint level 2.2.
  - All members at z/OS 2.3
  - Enough resource exists so that privilege reservation will not cause an immediate shortage.
- $T LIMITs may be used to turn privileged support on or off.
  - For off -- privilege resource is returned for Non-privileged use.
  - Default is on.

Usage & Invocation – Privilege Support

- $D Limits may be used to display privileged information on the four resources.
  - Indication if resource protected by privilege support.
  - Amount of privilege resource reserved.
  - % of privilege resource currently in use.

Usage & Invocation – Privilege Support

- Privilege support incorporates a promotion scheme to assure offending jobs or STCs may be cancelled and purged from the system.
  - Offending denotes Non-privileged jobs consuming more than their fair share of resource.
  - An offending job may need limited resource to exit the system.
  - Privilege support may temporarily promote offending jobs so they may exit the system as soon as possible. This assures much needed resource is made available for use.
  - Promotion is only performed when offending job/STC is marked for cancel/purge.
  - $CJ,P used for offending batch jobs
  - $CS,P can be performed on executing STCs (New).

Usage & Invocation – Privilege Support

- Various messages denote Privilege state transitions.
- $HASP1400 - Error encountered in Privilege Resource Support RC= . Privilege Resource Support suspended. Warm start is required to repair and restart privilege support. RC= denotes ...
  - Private storage shortage.
  - $DOGBERT error. (APARABLE condition)
  - Catastrophic error. (APARABLE condition)
  - BERT shortage. Privilege internal checkpoint object could not be created.
- $HASP1401 - Privilege Resource Support activated for BERTs, JQEs, SPOOL/TRACK or JOEs.
  - All members must be at 2.3
  - Checkpoint level 2.2 required.
  - Enough resource to activate privilege support.

Usage & Invocation – Privilege Support

- Messages continued ...
- $HASP1402 - Privilege Resource Support ended.

  Support ended due to down level member joining MAS OR $ACTIVATE to z11 mode.
- $HASP1403 - Privilege Resource Support could not be activated for BERTs, JQEs, SPOOL/TRACK or JOEs.

  The activation algorithm determined resource is not a candidate for privilege support.
- $HASP1404 - Privilege Resource Support has been updated for BERTs, JQEs, SPOOL/TRACK or JOEs.

  Resource configuration change has occurred and privilege resource reservation limits have changed.

Usage & Invocation – Privilege Support

- Messages continued ...
- $HASP1405 - Resource shortage encountered for BERTs, JQEs, SPOOL/TRACK or JOEs.

  Non-privileged jobs will wait for resource specified in message. Privilege jobs will be granted access to reserved resource. Privilege support will temporarily promote non-privilege jobs resource in an attempt to cancel and purge the job from the system.
- $HASP1406 - Resource shortage resolved for BERTs, JQEs, SPOOL/TRACK or JOEs.

  Resource shortage for NON-privileged jobs has been resolved.
- $HASP1407 - Resource has been completely exhausted for BERTs, JQEs, SPOOL/TRACK or JOEs.

  Both privilege and NON-privilege resource has been exhausted.
- $HASP1408 - Exhausted resource has been replenished for BERTs, JQEs, SPOOL/TRACK or JOEs.

  Resource shortage for privileged support has been resolved.

Usage & Invocation – Privilege Support

- Messages continued ...
- $HASP1409 - Defined resource reduction has ended Privilege Support for BERTs, JQEs, SPOOL/TRACK or JOEs.

  The number of resources defined has been decreased below the minimum required to support privileged space. Privileged space has been stopped for the listed resource.
- $HASP1499 - Resource Limits calculations off due to error

  An error has been encountered in the resource limit processing. Resource usage processing has been suspended.

Usage & Invocation – Emergency Subsystem

- Goal is to make normal management environment available when there is a resource shortage.
- Purpose is to identify TSO users, started task, and batch jobs that are privileged and may use reserved privileged resource.
- The emergency subsystem is just another portal into the main subsystem.
  - Can be a static subsystem or JES2 can dynamically add it.
  - Uses the exact same code as main subsystem (just separate subsystem name).
  - No special commands, setup, management, etc.
  - RACF call will protect who can use the emergency subsystem.
- Default name is HASP for primary subsystem if it is named JES2.
  - Initialization statement to specify different value or if primary is not named JES2.
- True secondary subsystems can also have an emergency subsystem.
  - Must use initialization statement to define the name of the subsystem

Usage & Invocation – Emergency Subsystem

- TSO support
  - Allows log on to secondary subsystems.
- TSO SUBMIT support for SUBSYS(xxxx)
  - Allows submit to secondary subsystem User must be authorized to submit jobs to the emergency subsystem.
- User must have READ access to security profile JES.EMERGNCY.<subsys> in class FACILITY. <subsys> is the name of the emergency subsystem.

Usage & Invocation – $D LIMITS command

- In V2R3, JES2 brings together some of the key resource information into a single command - $D LIMITS
- $D LIMITS will show the 4 main resources being addressed in V2R3:
  - SPOOL
  - JQEs for job submitted
  - JOEs
  - BERTs
- $D LIMITS shows the state of Privilege Support for each of those key resources
- $D LIMITS provides metrics on non-privileged and privileged space
- $D LIMITS provides an indication of when a resource may become exhausted given the current allocation rate for the resource

Usage & Invocation – $D LIMITS command

- For example, $D LIMITS(SPOOL) shows the following:

```
          $dlimits(spool)
          $HASP1490 LIMITS(SPOOL)
LIMITS(SPOOL)
SPOOL PRIVILEGE SUPPORT IS OFF
SPOOL UTILIZATION:
----------  NON-PRIVILEGED  ---------|---  PRIVILEGED  --
    MAXIMUM   WARN%        IN-USE    %|  MAX  IN-USE     %
        525       80           474   90|    0       0     0
SPOOL EXHAUST: 17 SEP 2042 AT 18:53
RESOURCE SHORTAGE REPORTED FOR SPOOL
*********************************************************
```

* actual $D LIMITS output format may change before GA

- "SPOOL PRIVILEGE SUPPORT IS OFF" indicates that privilege support is not available for SPOOL, either because there are not enough track groups defined to support privilege space allocation, or the operator used $T LIMITS,PRIV=OFF to turn off privilege support.
- "SPOOL EXHAUST" indicates a projected date/time in the future when SPOOL resource will run out.
- "RESOURCE SHORTAGE REPORTED FOR SPOOL" indicates that a $HASP050 has been issued for the SPOOL resource.

Usage & Invocation – $D LIMITS command

- "NON-PRIVILEGED" space information provides the following:
  - "MAXIMUM" - Maximum number of track groups on all available spool volumes
  - "WARN%" - Percentage of in-use track groups (not including the BLOB) at which the operator will be alerted through message $HASP050 JES2 RESOURCE SHORTAGE
  - "IN-USE" - Number of track groups currently allocated (including track groups in the BLOB)
  - "%" - the percentage of in-use track groups (including the BLOB) compared to the maximum track groups available.
- "PRIVILEGED" space information provides the following:
  - "MAX" - Maximum number of privilege space track groups on all available spool volumes
  - "IN-USE" - Number of privilege space track groups currently allocated
  - "%" - Percentage of in-use privilege space track groups compared to the maximum privilege space track groups available.

Usage & Invocation – $D LIMITS command

- $D LIMITS command also provides information about the Top 10 jobs on the system using the 4 key resources
  - Top 10 job list for each resource type
  - Top 10 job list for total amount of a resource type allocated
  - Top 10 job list for a rate of allocation for a resource type
  - Accessed via $D LIMITS,LONG command

Usage & Invocation – $D LIMITS command

- For example, $D LIMITS(SPOOL) shows the following:

```
-           $dlimits(spool),long
           $HASP1490 LIMITS(SPOOL)
 LIMITS(SPOOL)
 SPOOL PRIVILEGE SUPPORT IS ON
 SPOOL UTILIZATION:
 ----------  NON-PRIVILEGED  ---------|---  PRIVILEGED  --
     MAXIMUM   WARN%       IN-USE    %|  MAX  IN-USE     %
     145,230      80       71,796   49|  300       0     0
 SPOOL EXHAUST: 31 JUL 2017 AT 16:45
 ---------------------------------------------------------
 TOP 10 CONSUMERS OF SPOOL BY COUNT
                           TOTAL           COUNT  ACTIVE
 JOB NAME    JOB ID        COUNT     %     PER M  ON MBR
 --------    --------     ------   --- ---------  ------
 JOBSUBAA    JOB00018      10445    15  2704.826   N2M1
 JOBSUBAH    JOB00025      10155    14  3786.615   N2M1
 JOBSUBAG    JOB00024       9731    14  3694.914   N2M1
 JOBSUBAF    JOB00023       8953    12  3576.145   N2M1
 JOBSUBAE    JOB00022       8815    12  2932.830   N2M1
 JOBSUBAD    JOB00021       8207    11  2747.580   N2M1
 JOBSUBAC    JOB00020       7890    11  2632.661   N2M1
 JOBSUBAB    JOB00019       7507    10  2573.062   N2M1
 SYSLOG      STC00002         63     0     1.613   N2M1
 IRRDPTAB    STC00003          2     0     0.000
 ---------------------------------------------------
 TOP 10 CONSUMERS OF SPOOL BY RATE   (more output not shown)
```

Usage & Invocation – $D LIMITS command

- "TOP 10 CONSUMERS OF SPOOL BY COUNT" lists the 10 batch jobs, started tasks or tso users that are utilizing the most SPOOL track groups by total TG count.
- The Top 10 by Count table reports:
  - "JOB NAME" - name of the batch job, job group, started task, or tso user
  - "JOB ID" - job ID of the batch job, job group, started task, or tso user
  - "TOTAL COUNT" - total count of spool TGs allocated by the batch job, job group, started task or tso user
  - "%" - percentage of the in-use SPOOL TGs that are allocated by this specific batch job, job group, started task, or tso user
  - "COUNT PER M" - during the last period of resource allocation, this batch job, job group, started task, or tso user allocated this many SPOOL TGs per minute.
  - "ACTIVE ON MBR" - If the job is active, the member name it is active on.
- A "TOP CONSUMERS OF SPOOL BY RATE" table is also generated and it lists the top 10 sorted by rate of resource allocation. The fields are the same.

Usage & Invocation – $T LIMITS command

- $T LIMITS command is used to manage privilege space activation
  - JES2 automatically activates privilege space for the SPOOL, JQE, JOE and BERT resources if they are eligible
  - $T LIMITS,PRIV=OFF will indicate that the operator wishes to turn off all privilege support
  - $T LIMITS,PRIV=ON will turn privilege support back ON if it had previously been turned off by operator command
  - Privilege support cannot be turned on by $T LIMITS,PRIV=ON if privilege support is suspended due to an error

Usage & Invocation – Init Deck Checker

- "Initialization deck" analysis to see if current specifications are reasonable
- Two ways to use new support:
  - CHECK start PARM value (e.g. `PARM='cold,check'`)
  - Alternate entry point HASJESCK (e.g. `PGM=HASJESCK`)
- Can run in batch, as a started task, or just be linked to
- Does not require APF authorization (does not run authorized)
  - User under which it runs must be able to read the init decks
- Run normal initialization up to reading the checkpoint
  - Checkpoint data must be obtained from running system
- Verify initialization deck statements and make recommendations
  - Output will be written to the HASPLIST DD
- Minimum checking beyond syntax checks in this release

Usage & Invocation – Init Deck Checker

```
        JES2 parameter library listing                                                2016.263  PAGE   1
DIAGNOSTIC   INFO                      $HASP9998 $$$$LOAD for HASTX0 called successfully!!
DIAGNOSTIC   INFO                      $HASP946 USER MESSAGE TABLES HAVE BEEN SET
DIAGNOSTIC   INFO                      $HASP947 USER $SCAN TABLES HAVE BEEN SET
        JES2 parameter library listing   SYS1.PARMLIB(J2DFAULT)                       2016.263  PAGE   2
PARMLIB      STMT      1               /*********************************************************************/
PARMLIB      STMT      2               /*                                                                   */
PARMLIB      STMT      3               /*       JES2 INITIALIZATION DECK FOR HJE7750                        */
PARMLIB      STMT      4               /*                                                                   */
PARMLIB      STMT      5               /*********************************************************************/
PARMLIB      STMT      6               /**/
PARMLIB      STMT      7               /*-------------------------------------------------------------------*/
PARMLIB      STMT      8               /*  03/29/07 TJW  - NEW (NOT REALLY, COPIED FROM SPOOLZ9)            */
PARMLIB      STMT      9               /*-------------------------------------------------------------------*/
PARMLIB      STMT     10               /**/
PARMLIB      STMT     11               /*------------------------------------------------ PAGE FIX MODMAP */
PARMLIB      STMT     12               /*  PAGE FIX THE MODMAP TO PREVENT THE DO GROUPS FROM HAVING         */
PARMLIB      STMT     13               /*  PROBLEMS BY INVOKING THE ROUTINE FIXMAP FROM EXIT 24.            */
PARMLIB      STMT     14               /**/
PARMLIB      STMT     15               /*********************************************************************/
PARMLIB      STMT     16               /*                                                                   */
PARMLIB      STMT     17               /*       TEST EXITS LOADED                                           */
PARMLIB      STMT     18               /*                                                                   */
PARMLIB      STMT     19               /*********************************************************************/
PARMLIB      STMT     20               /*INCLUDE DSN=SYS1.PARMLIB(DYNEXITS)*/
PARMLIB      STMT     21               INCLUDE DSN=SYS1.PARMLIB(DYNEXIT7)
INCLUDE      STMT     22               /*********************************************************************/
INCLUDE      STMT     23               /*                                                                   */
INCLUDE      STMT     24               /*       ENABLE EXITS FROM HAST PARTS                                */
INCLUDE      STMT     25               /*                                                                   */
INCLUDE      STMT     26               /*********************************************************************/
INCLUDE      STMT     27               /**/
INCLUDE      STMT     28               /*********************************************************************/
INCLUDE      STMT     29               /*                                                                   */
INCLUDE      STMT     30               /*       LOAD THE PARTS CONTAINING THE EXIT POINTS AND DYNAMIC       */
INCLUDE      STMT     31               /*       TABLES                                                      */
INCLUDE      STMT     32               /*                                                                   */
INCLUDE      STMT     33               /*********************************************************************/
INCLUDE      STMT     34               LOAD(HASTDIAG)
DIAGNOSTIC   INFO                      $HASP9900 INIT 0:$$$$LOAD LOADMOD=HASTDIAG ADDR=0FC77000 PVT
INCLUDE      STMT     35               LOAD(HASTCDIA) STORAGE=CSA
DIAGNOSTIC   INFO                      $HASP9900 INIT 0:$$$$LOAD LOADMOD=HASTCDIA ADDR=0FCA3000 LPA
INCLUDE      STMT     36               LOAD(HASXDYNT)
INCLUDE      STMT     37               LOAD(HASTX24)
DIAGNOSTIC   INFO                      $HASP9900 INIT 0:$$$$LOAD LOADMOD=HASTX24 ADDR=0FCC0000 PVT
INCLUDE      STMT     38               LOAD(HASTX26)
DIAGNOSTIC   INFO                      $HASP9900 INIT 0:$$$$LOAD LOADMOD=HASTX26 ADDR=0FCC1000 PVT
INCLUDE      STMT     39               LOAD(HASTX5)
DIAGNOSTIC   INFO                      $HASP9900 INIT 0:$$$$LOAD LOADMOD=HASTX5 ADDR=0FCC2000 PVT
```

Usage & Invocation – Init Deck Checker

```
         JES2 parameter library listing                                          2017.047  PAGE  15

Initialization data sets read:

         Data set name                                          VOLSER      Unit    Records
         -----------------------------------------------------  ------  --------  ---------
         SYS1.PARMLIB(SPOOLZ22)                                 J2SHR2                 458
         SYS1.PARMLIB(DYEXIT21)                                                        124
         SYS1.PARMLIB(NULL)                                     J2SHR2                   1


         JES2 parameter library listing                                          2017.047  PAGE  16

Resource usage information:

JQEs     TYPE        ACTIVE  COMPLETE       JOEs     TYPE         COUNT       TGs      TYPE           COUNT       INUSE
         -------- ---------  ---------              -------- ---------              -------- ----------- -----------
         BATCH            0          3              WORK            10              DEFINED          525          51
         STC              6          8              CHAR             1              ACTIVE           525          51
         TSU              1          0              INDEX            0              FREE             474
         JOBGROUP         0          0              FREE           189
         INTERNAL         1
         FREE           481

BERTs    TYPE         COUNT  CB COUNT       ZJCs     TYPE         COUNT       Jobnum   Description      Value
         -------- ---------  ---------              -------- ---------                -------------  ---------
         INTERNAL        34          3              JOBGROUP         0                Low Range            1
         JQE             10          8              DEP JOB          0                High Range       9,999
         CAT            114         38              DEPENDNT         0                In Use              19
         WSCQ             0          0              FREE         1,000
         DJBQ             0          0
         JOE              0          0
         DAS              0          0
         GRP              0          0
         FREE           492

Recommendations:

                        Current      Current Percent Usage per     Max with  Recommended
                          Limit        Usage   Usage   JQE/JOE max JQE/JOE    min limit
                     ----------  ---------- ------  -------- -----------  ----------
         JQEs               500           19    3.80                          500
         Job Numbers      9,999           19    0.19     1.00          500       500
         JOEs               200           11    5.50     0.90          450       500
         Active TGs         525           51    9.71     2.68        1,340     2,000
         BERTs              650          158   24.30                          500
          JQE BERTs                        10            0.52          260
          JOE BERTs                         0            0.00            0
```

Usage & Invocation – Init Deck Checker

```
         JES2 parameter library listing                                  2017.047  PAGE  17

Summary report:

         Member name                 IBM1
         NJE node name               POK
         JESXCF group name           POK
         MVS system name             SY1
         MVS SYSPLEX name            PLEX1
         Checkpoint data             Obtained
         Checker version             z/OS 2.3

Error Summary:

         Type                          Count
         --------------------------  -------
         Warnings                          0
         Init statement errors             0
         Validation errors                 0
         Read/OPEN errors                  0
         Configuration errors              0
         Exit requested termination        0
         --------------------------  -------
         Total error count                 0
```

Usage & Invocation – Init Deck Checker

Retcode	Set by	Meaning
0	- HASPEXIT	Normal $PJES2 command
4	- HASPIRA	Checker - warning message issued
8	- HASPIRA	Checker - init statement error
12	- HASPIRA	Checker - post init deck validation error
16	- HASPEXIT	Initialization failure
20	- HASPEXIT	Hot start initialization failure
24	- HASPEXIT	JES2 initialization terminated early
28	- HASP	Unable to load or verify HASPINIT
32	- HASPIRA	Checker - Init deck read error
36	- HASPIRA	Checker - Incompatible configuration
40	- HASPIRA	Checker - Exit requested term
44	- HASPEXIT	Checker - Cannot find INIWARM

Usage & Invocation – Checker and exits

- The initialization data set checker honors all LOAD(*xxxxxxxx*) statements
  - Module loaded in private storage
  - Allows exits to validate/add initialization statements
- The normal JES2 initialization exits (0, 19, and 24) are called
  - Allows then to perform any validation processing that might be needed
- If exit code needs to know that the checker is running, then it can check:
  - $STATUS3 bit $INCHECK in the $HCT
  - CCTFLAG0 bit CCTINCHK in the $HCCT
  - Exit 0 is passed a Register 0 set to 12 on entry
  - Exit 24 is passed X024COND set to X024ICHK (value of zero)

Usage & Invocation – Checker and exits

- Exits need to avoid
  - Services that require authorization.
  - Obtaining or updating common storage.
  - Allocating or validating devices (might not be running on correct system).
  - Updating data sets associated with a running subsystem.
  - WTORs and WTOs (use $STMTLOG for WTOs)

Usage & Invocation – SMF 84 & Misc

- New (to JES2) SMF records to track resource usage
  - Reuse JES3 JMF SMF 84 record with new JES2 subtype 21
- Report on usage levels over time period (low, high, average, etc)
  - Similar to existing subtype 4, control block utilization section
- JES2 SMF 84 records have the following sections:
  - Header – same as existing
  - Product section – Same mapping as JES3 uses
  - General section – Section present but nothing set in this section
  - Data section – Subtype 21 – JES2 resource usage
    - Memory usage (24, 31, and 64 bit areas)
    - Resource usage (limit, low, high, average, count over warn, etc)
      - Same 18 resources JES monitor reports on
- Command to adjust SMF buffer limit ($T SMFDEF,BUFNUM=)

Interactions & Dependencies

- Software Dependencies
  - TSO logon panel update to supply subsystem name where logon should be directed
  - Allow subsystem name on TSO SUBMIT command
- Hardware Dependencies
  - None.
- Exploiters
  - Any JES2 user.

Migration & Coexistence Considerations

- From JES2 z/OS 2.1 or z/OS 2.2
  - APAR OA48299 needed on z/OS 2.1 or z/OS 2.2 member to coexist in a MAS with z/OS 2.3
  - APAR OA48299 is also highly recommended for fall back as well
    - Some new data structures created by z/OS 2.3 JES2 may result in problems if OA48299 is not installed
- $T LIMITS,PRIV=OFF may be used to turn off privilege support.

Installation

- None

Session Summary

- In this session we introduced the JES2 enhancements implemented in V2R3 that assist the user in managing their resources
  - Additional counts that indicate resource usage by job
  - Resource set aside as privilege space for privilege users to access the system and run jobs to relieve resource shortages
  - New emergency subsystem for logging in as a privileged user in order to address resource shortage issues
  - New command to display resource consumption and the Top 10 jobs consuming resources
  - Initialization deck checker to report on problems or inconsistencies in the init deck
  - New SMF 84 record that tracks utilization of specific JES2 resources

Appendix

- Publications
  - z/OS V2R3.0 JES Application Programming – SA32-0987-30
  - z/OS V2R3.0 JES2 Commands – SA32-0990-30
  - Z/OS V2R3.0 JES2 Diagnosis - GA32-0993-30
  - z/OS V2R3.0 JES2 Initialization and Tuning Guide – SA32-0991-30
  - z/OS V2R3.0 JES2 Initialization and Tuning Reference – SA32-0992-30
  - z/OS V2R3.0 JES2 Installation Exits – SA32-0995-30
  - z/OS V2R3.0 JES2 Macros – SA32-0996-30
  - z/OS V2R3.0 JES2 Messages – SA32-0989-30
  - z/OS V2R3.0 MVS JCL Reference - SA23-1385-30
  - z/OS V2R3.0 MVS Using the Subsystem Interface – SA38-0679-30