z/OS 2.2 User Experiences

Ed Jaffe
Phoenix Software International

11 August 2015
Session Number 17740
Come Out and Play z/OS with Me

• Like many men my age, I enjoy my “toys.”  
  – My electric car, my 6-way DVR, my drone, my HTC One M9
• We know that z Systems represent the most sophisticated and powerful business computers devised by man.
• Despite that, I treat them as “toys.”
• This presentation more or less documents my discoveries as I “fool around” with one of my toys aka z/OS 2.2.
• I hope you enjoy tagging along as we explore some of its cool new features…
• Final tests performed with z/OS 2.2 ETP BLDH 2015-07-28
Early Test Program

• Phoenix Software International (PSI) was privileged to work with early z/OS 2.2 drivers via IBM’s Early Test Program.
  – [http://dtsc.dfw.ibm.com/MVSDS/%27HTTPD2.DSN01.PUBLIC.PDF%28ISVEPROG%29%27](http://dtsc.dfw.ibm.com/MVSDS/%27HTTPD2.DSN01.PUBLIC.PDF%28ISVEPROG%29%27)

• This program is available only to participating ISVs and not to customers. Then why should you care about it?

• Every serious ISV on planet Earth should be involved in IBM Early Test programs. They provide access to early code builds for purposes of:
  – Developing/testing ISV products to ensure they support the latest operating system and middleware.
  – IMHO, all ISVs should at least tolerate new releases by the IBM Early Support Program start.

• Helping to “shake out” bugs and re-shape APIs in z/OS and related products before customers see them.
Early Test Program (continued…)

• Our first ETP was in 1994 with MVS/ESA 4.3. Since then, we have maintained an As-of-GA toleration policy.
• Before that, we had a GA-Plus-Six-Months toleration policy.
• Apparently, based on IBM-MAIN postings, not all ISVs avail themselves of this opportunity. Recent “surprises” include:
  – Abends after AllowUserKeyCsa(No) became default
  – Abends after CaptUcb Protect=Yes became default
  – Abends after UseZosV1R9Rules(No) became default
• If you have ISVs with GA-plus-non-zero-time toleration policies, you might ask if they are involved with IBM Early Testing programs. If not, politely suggest they should be.
• It’s an extra cost, but—for us at least—well worth it!
Table of ISV Products Supporting z/OS 2.2?

• Since the early OS/390 days, IBM has maintained a table of ISV products detailing support for recent releases of the operating system.

• THIS NO LONGER EXISTS FOR z/OS 2.2!

• I was told, “A decision was made to no longer generate similar pages. The IBM Global Solutions directory is our primary repository for this type of information, now and going forward.”


<table>
<thead>
<tr>
<th>Company Name</th>
<th>Product(s)</th>
<th>Available</th>
<th>EAV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phoenix Software International</td>
<td>CONDOR (E)JES FALCON</td>
<td>Now for all products listed</td>
<td>Yes for all products listed</td>
</tr>
<tr>
<td></td>
<td>Key/101 NetTester</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PHX-Adders PHX-KeyPlus</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PHX-ODE zHISR</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

• Similar tables are available going back to z/OS 1.3.
What Difference Did Agile Make?

• Previously, IBM development used a so-called “waterfall” development approach. In recent years, they have started using Agile development techniques.
• With the “waterfall” approach, most functions appeared in the first driver. Each subsequent driver was more stable.
• With Agile development, we now get the first driver much earlier than before! 😊 However, many functions will not appear until later drivers.
• Some planned functions won’t appear until after GA. We seem to be headed toward a continuous delivery model.
ETP Install is Not ServerPac

• The package is delivered in a format agreed upon by ISVs and IBM back in the early 1990s. It is a DSS logical dump of Target, DLIB, and SMP/E volumes.
  – No JCL or tooling to help build a system
  – No catalogs or operational data sets
  – Intended to be overlaid by the next driver rather than being serviced with PTFs.

• In general, this install technique has little relevance for a presentation to customers that will use ServerPac.

• You might recall z/OS 2.1 “blew the doors off” our DASD space. We encountered no such surprises transitioning from z/OS 2.1 to z/OS 2.2.
Our Environment

- zBC12 with 3 CPs, 1 ICF, 1 IFL, 1 zIIP, 1 HMC
- Various LPARs configured including:
  - Our z/OS “primary” parallel sysplex (PHXHQ)
    - Bronzeplex with multi-image JES2 and JES3 JESplexes
    - Mixed z/OS releases during the early test process
    - Eventually all are migrated to new z/OS
  - z/VM LPAR running numerous guests including:
    - New z/OS in a stand-alone system
    - New z/OS in a virtualized parallel sysplex
      - Two virtualized CFs and two z/OS images
- Storage
  - FICON-attached IBM DS8100 DASD (w/zHPF)
  - FICON-attached IBM TS1140 Tape Drives in 3584 Library
Deployment

- We first deploy new z/OS under a stand-alone z/VM guest.
- Then we deploy into a z/VM virtual parallel sysplex with two virtualized CFs and two z/OS systems. Both systems run the new z/OS release. We do some development and testing here. This is also where we apply service.
- Lastly, we deploy into one or more LPARs in our primary parallel sysplex. The other systems continue to run the current z/OS release w/necessary toleration maintenance applied.
- All new z/OS images run from exactly the same read-only SYSRES volumes—shared between z/OS and z/VM.
## SHARE Requirements Satisfied in z/OS 2.2
*(From 2013 “Top 50” and “Next 25” Lists)*

<table>
<thead>
<tr>
<th>Rank</th>
<th>SHARE#</th>
<th>Title</th>
<th>RFE#</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>SSMVSE99007</td>
<td>Externalize IEFUSI to set Storage Limits</td>
<td>50153</td>
</tr>
<tr>
<td>5</td>
<td>SSMVSE03030</td>
<td>Enhance handling of dynamic subsystems</td>
<td>49922</td>
</tr>
<tr>
<td>5b</td>
<td>SSMVSE11001</td>
<td>MVS should validate Subsystem Init Routine before adding subsystem</td>
<td>50057</td>
</tr>
<tr>
<td>19</td>
<td>SSSSHARE016690</td>
<td>Region Size for Private and Extended Private</td>
<td>49889</td>
</tr>
<tr>
<td>22</td>
<td>SSMVSE06001</td>
<td>Add IPL unit address and volume serial to IPL message IEA091I</td>
<td>49928</td>
</tr>
<tr>
<td>26</td>
<td>SSMVSE12011</td>
<td>Private Virtual Storage Exhaustion Health Check is Needed</td>
<td>49952</td>
</tr>
<tr>
<td>28</td>
<td>SSMVSE12018</td>
<td>BCPii needs to have logging facilities</td>
<td>50311</td>
</tr>
<tr>
<td>29</td>
<td>SSMVSE12014</td>
<td>PER SLIP Traps Should Capture the BEAR</td>
<td>49565</td>
</tr>
<tr>
<td>36</td>
<td>SSMVSO07003</td>
<td>Need list of which ZFS is quiesced in message IOEZ00581E</td>
<td>47430</td>
</tr>
<tr>
<td>42</td>
<td>SSMVSE09008</td>
<td>Allow SYS1.LOGREC to be reallocated and used without an IPL</td>
<td>49564</td>
</tr>
<tr>
<td>N4</td>
<td>SSMVSE12006</td>
<td>z/OSMF should accept Service Request PMR format</td>
<td>47383</td>
</tr>
<tr>
<td>N5</td>
<td>SSMVSE11033</td>
<td>Add JCTJOBID and Sysplex to SMF types 14/15 (data set close)</td>
<td>51903</td>
</tr>
<tr>
<td>N10</td>
<td>SSMVSE064943</td>
<td>Create Dataset Level SMF Audit Trail for APF List</td>
<td>49917</td>
</tr>
<tr>
<td>N20</td>
<td>SSMVSE12010</td>
<td>Improve purge of PFA saved exception data</td>
<td>49589</td>
</tr>
</tbody>
</table>
Externalize IEFUSI to set Storage Limits

• I searched around my early publications for this information, but could not find it.
• The information did not make the GA publications either.
• I was told it is expected to be added sometime after GA via new parmlib member SMFLIMxx.
• Welcome to the Agile world of continuous delivery … 😊
• Be on the look-out for this feature when it arrives.
• **UPDATE:** During the session John Eells said it should make the GA delivery. Yay!
Enhance Handling of Dynamic Subsystems

• The problem – *I have been personally burned by this more than once* – was that if anything goes wrong when adding a subsystem, that subsystem is “broken” until the next IPL

• There were three requirements in this area:
  – Ensure initialization routine exists and runs properly before adding the subsystem
  – Allow delete of existing subsystem
  – Allow full reuse of existing subsystem

• IMHO, IBM satisfied all three 😊
Enhance Handling of Dynamic Subsystems

SETSSI ADD, SUBNAME=SHAR, INITRTN=SHARE806, INITPARM=DEMO4SHARE
IEFJ023I SETSSI ADD COMMAND FOR SUBSYSTEM SHAR COMPLETED WITH ERRORS
IEFJ027I SUBSYSTEM INITIALIZATION ROUTINE SHARE806 NOT FOUND

D SSI
IEFJ100I  11.31.21  SSI DISPLAY
...
SUBSYS=IOSH
  DYNAMIC=YES    STATUS=ACTIVE    COMMANDS=REJECT
SUBSYS=SHAR
  DYNAMIC=YES    STATUS=INACTIVE   COMMANDS=REJECT

SETSSI ADD, SUBNAME=SHAR, INITRTN=SHAREAOK, INITPARM=DEMO4SHARE
IEFJ023I SETSSI ADD COMMAND FOR SUBSYSTEM SHAR COMPLETED WITH ERRORS
IEFJ026I SUBSYSTEM SHAR IS ALREADY DEFINED TO THE SSI

SETSSI ADD, SUBNAME=SHAR, INITRTN=SHARE806, INITPARM=DEMO4SHARE
IEFJ023I SETSSI ADD COMMAND FOR SUBSYSTEM SHAR COMPLETED WITH ERRORS
IEFJ027I SUBSYSTEM INITIALIZATION ROUTINE SHARE806 NOT FOUND FOR SUBSYSTEM SHAR

D SSI
IEFJ100I  11.34.50  SSI DISPLAY
...
SUBSYS=IOSH
  HEX=C9D6E2C8
  DYNAMIC=YES    STATUS=ACTIVE    COMMANDS=REJECT

SETSSI ADD, SUBNAME=SHAR, INITRTN=SHARE806, INITPARM=DEMO4SHARE
IEFJ023I SETSSI ADD COMMAND FOR SUBSYSTEM SHAR COMPLETED WITH ERRORS
IEFJ027I SUBSYSTEM INITIALIZATION ROUTINE SHARE806 NOT FOUND FOR SUBSYSTEM SHAR

Complete your session evaluations online at www.SHARE.org/Orlando-Eval
Enhance Handling of Dynamic Subsystems

- Full reuse requires DELETE, which is now supported, even for subsystems defined at IPL!
- It requires use of the FORCE keyword – a big clue that this should not be attempted by the faint of heart.
- SETSSI DELETE also allows SUBNAME to be specified as a hex value (e.g., ‘E2C8C1D9’X)

```snippet
SETSSI DELETE, SUBNAME=SHAR
ASA100I SYNTAX ERROR: ,
EXPECTED BEFORE <END_OF_LINE>.
DETECTING MODULE IS IEFJSMG

SETSSI DELETE, SUBNAME=SHAR, FORCE
IEFJ023I SETSSI DELETE COMMAND FOR SUBSYSTEM SHAR COMPLETED WITH ERRORS
IEFJ024I SUBSYSTEM SHAR NOT DEFINED

SETSSI ADD, SUBNAME=SHAR
IEFJ022I SETSSI ADD COMMAND FOR SUBSYSTEM SHAR COMPLETED SUCCESSFULLY

SETSSI DELETE, SUBNAME=SHAR, FORCE
IEFJ022I SETSSI DELETE COMMAND FOR SUBSYSTEM SHAR COMPLETED SUCCESSFULLY
```

IPL saved!
Region Size for Private and Extended Private

- This has been needed since way, Way, WAY back when MVS/XA was first written. A single REGION= value required numerous silly rules and inferences to be established.

<table>
<thead>
<tr>
<th>JCL REGION= Parm</th>
<th>Results Below 16MB</th>
<th>Results Above 16MB</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>The job step is allocated all storage available below 16M, resulting in region size of 16M minus the amount of virtual storage allocated to MVS.</td>
<td>The job step is allocated all the storage available above 16M, resulting in an extended region size of 2G minus the amount of virtual storage allocated to MVS, minus 16M.</td>
</tr>
<tr>
<td>0 &gt; REGION &gt;= 16M</td>
<td>Establishes the size of the private area below 16M. If the region size specified is not available, an ABEND S822 occurs.</td>
<td>The extended region size is exactly 32M</td>
</tr>
<tr>
<td>16M &gt; REGION &gt;= 32M</td>
<td>The job step is allocated all storage available below 16M, resulting in region size of 16M minus the amount of virtual storage allocated to MVS.</td>
<td>The extended region size is exactly 32M</td>
</tr>
<tr>
<td>32M &gt; REGION &gt;= 2G</td>
<td>The job step is allocated all storage available below 16M, resulting in region size of 16M minus the amount of virtual storage allocated to MVS.</td>
<td>The extended region size is the specified value. If the region size specified is not available, the job step receives the maximum amount available.</td>
</tr>
</tbody>
</table>
Region Size for Private and Extended Private

- New REGIONX= keyword allows both values to be explicitly specified.
- I was given incomplete documentation on this new keyword, so I was able to do basic syntax checking only.

```
//IEFBR14  JOB 1, JAFFE, CLASS=A, MSGCLASS=T, REGIONX=(4M, 256M), REGION=0M
IEF009I KEYWORD REGION IS MUTUALLY EXCLUSIVE WITH KEYWORD REGIONX ON THE JOB STATEMENT

//IEFBR14  JOB 1, JAFFE, CLASS=A, MSGCLASS=T, REGIONX=1K
//IEFBR14  JOB 1, JAFFE, CLASS=A, MSGCLASS=T, REGIONX=15M
//IEFBR14  JOB 1, JAFFE, CLASS=A, MSGCLASS=T, REGIONX=(4M,)
//IEFBR14  JOB 1, JAFFE, CLASS=A, MSGCLASS=T, REGIONX=(4M, 256M)
//IEFBR14  JOB 1, JAFFE, CLASS=A, MSGCLASS=T, REGIONX=16380K
IEF142I IEFBR14 - STEP WAS EXECUTED - COND CODE 0000

//IEFBR14  JOB 1, JAFFE, CLASS=A, MSGCLASS=T, REGION=16380K
IEF085I REGION UNAVAILABLE, ERROR CODE=20
IEF450I IEFBR14 - ABEND=S822 U0000 REASON=00000014

//IEFBR14  JOB 1, JAFFE, CLASS=A, MSGCLASS=T, REGIONX=16M
//IEFBR14  JOB 1, JAFFE, CLASS=A, MSGCLASS=T, REGIONX=256M
//IEFBR14  JOB 1, JAFFE, CLASS=A, MSGCLASS=T, REGIONX=(16M)
//IEFBR14  JOB 1, JAFFE, CLASS=A, MSGCLASS=T, REGIONX=(256M)
//IEFBR14  JOB 1, JAFFE, CLASS=A, MSGCLASS=T, REGIONX=256M
//IEFBR14  JOB 1, JAFFE, CLASS=A, MSGCLASS=T, REGIONX=(15M)
//IEFBR14  JOB 1, JAFFE, CLASS=A, MSGCLASS=T, REGIONX=(4M)
IEF638I SPECIFIED NUMERIC EXCEEDS MAXIMUM ALLOWED IN THE REGIONX FIELD
```

This test proves the function isn’t actually enabled yet on my system.
Region Size for Private and Extended Private

• Like SMFLIMxx, this feature is expected to be added sometime after GA.
• Welcome to the Agile world of continuous delivery … 😊
• Be on the look-out for this feature when it arrives.
• **UPDATE:** During the session John Eells said it should make the GA delivery. Yay!
IPL Unit and Volume Serial on IPL Message

- Who hasn’t been burned by this in the past 40 years?
- You IPLed from the wrong volume!
- Now, this information is captured in the log.
- Instead of updating IEA091I, the developers satisfied the requirement with message IOS128I.

IEA371I SYS4.IPLPARM ON DEVICE 8100 SELECTED FOR IPL PARAMETERS.
IEA246I LOAD ID 22 SELECTED
IEA246I NUCLST ID 00 SELECTED
IEA519I IODF DSN = SYS4.IODFA1
IEA520I CONFIGURATION ID = ZOS . IODF DEVICE NUMBER = 8100
IEA091I NUCLEUS 1 SELECTED
IOS128I IPL DEVICE: 08110 VOLUME: T2RES1
IEA370I MASTER CATALOG SELECTED IS CATALOG.MCATZ.PHXHQ
IEA009I SYMBOLIC DEFINITIONS WILL BE READ FROM: 025
   IEASYM00
   IEASYM28
IEE252I MEMBER IEASYM00 FOUND IN SYS2.PARMLIB
IEE252I MEMBER IEASYM28 FOUND IN SYS2.PARMLIB
IEA008I SYSTEM PARMS FOLLOW FOR z/OS 02.02.00 HBB77A0 028
   IEASYS28
   IEASYS02
IEE252I MEMBER IEASYS00 FOUND IN SYS2.PARMLIB
IEA325I IEASYS00 PARAMETER LIST
   ALLOC=00, Allocation policies
   CEE=(00,L), Language Environment Options
   CLPA, Create Link Pack Area
Private Virtual Storage Exhaustion Health Check

- This health check is delivered as part of the Predictive Failure Analysis component. The name of the new check is PFA_PRIVATE_STORAGE_EXHAUSTION.
- It analyzes samples looking for private area spike, leak and creep in a manner similar to the existing PFA check for common storage exhaustion.
- We don’t run PFA anymore, so I was unable to try this. 😞
- The most fun thing for me is the new LDAX control block, provided by MVS, which contains this information.
- Anyone: IBM, customers, ISV products, etc. can access the information within this control block. Even unauthorized code can get to it because it exists in non-fetch-protected common storage.
- For monitor products, this means no more need for an SRB into every address space to examine its LDA control block.
Private Virtual Storage Exhaustion Health Check

- The new LDAX control block exists in the Nucleus for ASID=1, in SP 245 for address spaces with RCEInitialized off, and in 64bit common for all other address spaces
  - Does REXX STORAGE function support 64-bit pointers?

<table>
<thead>
<tr>
<th>LDAX_LDAASCB</th>
<th>DS</th>
<th>A</th>
<th>Address of ASCB FOR THIS ADDRESS SPACE</th>
</tr>
</thead>
<tbody>
<tr>
<td>LDAX_LDASTRTA</td>
<td>DS</td>
<td>A</td>
<td>Low addr of Region</td>
</tr>
<tr>
<td>LDAX_LDASIZA</td>
<td>DS</td>
<td>F</td>
<td>Size of Region</td>
</tr>
<tr>
<td>LDAX_LDAESTRA</td>
<td>DS</td>
<td>A</td>
<td>Low addr of extended Region</td>
</tr>
<tr>
<td>LDAX_LDAESIZA</td>
<td>DS</td>
<td>F</td>
<td>Size of extended Region</td>
</tr>
<tr>
<td>LDAX_LDACRGTTP</td>
<td>DS</td>
<td>A</td>
<td>Current high address of PRIVATE AREA Reg</td>
</tr>
<tr>
<td>LDAX_LDAERGTP</td>
<td>DS</td>
<td>A</td>
<td>Current high address of EXTENDED PRIVATE AREA Reg</td>
</tr>
<tr>
<td>LDAX_LDALIMIT</td>
<td>DS</td>
<td>A</td>
<td>&lt; 16M V=V Region limit value</td>
</tr>
<tr>
<td>LDAX_LDAVVRG</td>
<td>DS</td>
<td>A</td>
<td>&lt; 16M V=V Region high value</td>
</tr>
<tr>
<td>LDAX_LDAELIM</td>
<td>DS</td>
<td>A</td>
<td>&gt; 16M V=V Region limit value</td>
</tr>
<tr>
<td>LDAX_LDAEVRG</td>
<td>DS</td>
<td>A</td>
<td>&gt; 16M V=V Region high value</td>
</tr>
<tr>
<td>LDAX_LDALOAL</td>
<td>DS</td>
<td>F</td>
<td>&lt; 16M USER Region alloc value</td>
</tr>
<tr>
<td>LDAX_LDAHIAL</td>
<td>DS</td>
<td>F</td>
<td>&lt; 16M AUTH Region alloc value</td>
</tr>
<tr>
<td>LDAX_LDAELOAL</td>
<td>DS</td>
<td>F</td>
<td>&gt; 16M USER Region alloc value</td>
</tr>
<tr>
<td>LDAX_LDAELIAL</td>
<td>DS</td>
<td>F</td>
<td>&gt; 16M AUTH Region alloc value</td>
</tr>
<tr>
<td>LDAX_TCTVALUS</td>
<td>DS</td>
<td>CL16</td>
<td>TCT Water marks</td>
</tr>
<tr>
<td>ORG LDAX_TCTVALUS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LDAX_TCTHWM</td>
<td>DS</td>
<td>F</td>
<td>&lt; 16M max virt stor in SWA and LSQA</td>
</tr>
<tr>
<td>LDAX_TCTLWM</td>
<td>DS</td>
<td>F</td>
<td>&lt; 16M max virt stor in user subpools</td>
</tr>
<tr>
<td>LDAX_TCTEHWM</td>
<td>DS</td>
<td>F</td>
<td>&gt; 16M max virt stor in SWA and LSQA</td>
</tr>
<tr>
<td>LDAX_TCTELWM</td>
<td>DS</td>
<td>F</td>
<td>&gt; 16M max virt stor in user subpools</td>
</tr>
<tr>
<td>LDAX_CurHighBot</td>
<td>DS</td>
<td>A</td>
<td>&lt; 16M Cur bot Auth area</td>
</tr>
<tr>
<td>LDAX_CurEHighBot</td>
<td>DS</td>
<td>A</td>
<td>&gt; 16M Cur bot EAuth area</td>
</tr>
<tr>
<td>LDAX_LDASMADE</td>
<td>DS</td>
<td>A</td>
<td>Storage Management Area</td>
</tr>
<tr>
<td>LDAX_LDASMSZ</td>
<td>DS</td>
<td>A</td>
<td>Storage Management Size</td>
</tr>
</tbody>
</table>

Complete your session evaluations online at www.SHARE.org/Orlando-Eval
BCPii Logging Facilities

- BCPii can cause unwanted disruptions if misused, either by accident or on purpose.
- It now generates SMF 106.1 records to record HWISET activity and SMF 106.2 records to record HWICMD activity.

SMF6ACTP DS H  Connect type from HWICONN
SMF6ACPC DS CL17 CPC Name
SMF6ANLL DS CL1 Word boundary use
SMF6ARTN DS CL16 Request parameter
SMF6AASD DS H  2 Byte Address space ID ASID
SMF6AJOB DS CL8 Job name
SMF6AUSR DS CL8 User name

SMF6ATYP DS F  Set Type
SMF6ATVL DS F  Set Type Value Len
SMFSETDA DS CL257 Set Parameter Data

Common

SMF6ACTY DS F  Command type
SMF6AAOS DS F  CMD Parameter Data Offset
SMFCMDPM DS CL328 CMD Passed in Parameter.

HWISET only

HWICMD only
BCPii Logging Facilities (continued…)

• Unlike the vast majority of z/OS components, the BCPii folks deliver JCL to format their SMF records in a friendly, human-consumable way.
  – I highly commend this above-and-beyond approach!

• Unfortunately, the report is formatted using ICETOOL
  – An extra cost option, but most everyone pays for SORT
  – Hopefully, alternative SORT products support this as well
  – IBM’s ICETOOL is limited to a maximum of twenty HEADER statements.

• Presumably, MXG and similar SMF reporting products will also provide support for the new BCPii records.
The JCL can be found in member HWI6AFMT in SYS1.SAMPLIB

Here are the statements that format the HWISET summary report from the SMF 106.1 records.

Note how some available fields are commented out due to ICETOOL restrictions.
PER SLIP Traps Should Capture the BEAR

• When I first saw this requirement, I was confused.
• How is it possible the BEAR is not being captured?
• It turns out the BEAR is indeed always being captured in LCCABEA2 as IPCS CBF address STR(LCCA) shows:
  
  +0448  BEA1..... 00000000  00000000           BEA2..... 00000000 00FE7ECC
  +0458  BEA3..... 00000000  00000000

• The requirement was satisfied simply by formatting the BEAR on the message produced by SLIP with A=WAIT

  **NOTE:** is that the BEA fields in the LCCA were relocated between z/OS 2.1 and z/OS 2.2
  – Moved as part of SIMD support
• Be sure to use the right IPCS level when inspecting them.
PER SLIP Traps Should Capture the BEAR

00: HCPGIR450W CP entered; disabled wait PSW 00020000 80000000 00000000 0000001B
00: HCPGSP2629I The virtual machine is placed in CP mode due to a SIGP stop from CPU 02.
01: HCPGSP2629I The virtual machine is placed in CP mode due to a SIGP stop from CPU 02.
01: HCPGIR450W CP entered; disabled wait PSW 00020000 80000000 00000000 0000001B
02: HCPPCM6533A Following is a priority message received by the service processor - use the VINPUT command to respond:
02: *IEE844W SLIP TRAP 0003 MATCHED. ACTION=WAIT TYPE=PER
02: PER INFO: 40F0 00000000_0CB65116 BEAR: 00000000_7F32C212
02: PSW: 47142001 80000000 00000000 0CB6511C
02: CR 3-4: 400000022 00000022
02: AR/GR 0: 00000000/FFFFFFFF_FFFFF000 1: 00000000/00000000_7F44A800
02: 2: FFFFFFFF/FFFFFFFF_FFFFF000 3: FFFFFFFF/FFFFFFFC_FFFFFF000
02: 4: FFFFFFFF/FFFFFFFF_FFFFF000 5: FFFFFFFF/FFFFFFFC_FFFFFF000
02: 6: FFFFFFFF/FFFFFFFF_FFFFF000 7: FFFFFFFF/FFFFFFFC_FFFFFF000
02: 8: FFFFFFFF/FFFFFFFF_FFFFF000 9: FFFFFFFF/FFFFFFFC_FFFFFF000
02: A: FFFFFFFF/FFFFFFFF_FFFFF000 B: FFFFFFFF/00000000_7F32C100
02: C: FFFFFFFF/00000000_7F32D100 D: FFFFFFFF/FFFFFFFC_FFFFFF000
02: E: 00000000/00000000_00000000 F: 00000000/00000000_0CB66F00
02: RESTART THE SYSTEM TO CONTINUE
02: *

HOLDING VM80
Supercool SLIP “Thingy” Discovered

- While researching the SLIP/BEAR issue, I found that SLIP in z/OS 2.2 allows MVS commands to be issued when a SLIP trap matches.
- Any command?! WOW!! I can think of a million cool uses!

```
SLIP SET,IF,ID=SHAR,J=EDJAFFE,PVTMOD=(EJESML,116),MODE=HOME,A=CMD,CMD='D T',END
IEE727I SLIP TRAP ID=SHAR SET
IEA992I SLIP TRAP ID=SHAR MATCHED. JOBNAME=EDJAFFE , ASID=0034.
D T
D T
D T
D T
D T
D T
D T
D T
IEE136I LOCAL: TIME=16.17.00 DATE=2015.212 UTC: TIME=23.17.00 DATE=2015.212
SLIP DEL,ID=SHAR
IEE727I SLIP TRAP ID=SHAR DELETED
```
Which zFS is Quiesced in IOEZ00581E?

- According to the response in the RFE:
  APAR OA44214 has the code which will issue the message 830 with the name of one quiesced aggregate. The explanation text for the message explains that a complete list of quiesced aggregates can be obtained by issuing the modify command `f zfs,query,file,quiesced`.

- The z/OS 2.1 PTF for OA44214 is UA72508, which is superseded by UA76562. Both have been installed on my systems for some time, yet I never saw the name of any quiesced aggregate when IOEZ00581E is produced.
  - **UPDATE!** According to IBM, the ‘830’ message is produced only when there is 30 seconds or more of actual contention.

- The F ZFS,QUERY,FILE QUIESCED command does produce a list of quiesced aggregates.

- I’m considering using MPF (or automation) to issue this command when IOEZ00581E is issued.
Supercool zFS “Thingy” Discovered

• While researching this issue, I found a new MODIFY ZFS command in z/OS 2.2!

F ZFS,FSINFO
IOEZ00836I zFS kernel: MODIFY command - FSINFO accepted.
IOEZ00670I Starting FSINFO command.
IOEZ00850I File System Status: 011
AEW11A.SAEWZFS        MVS60     RW,NS
CICSTS51.ZFS           MVS70     RW,NS,L
CICSTS52.ZFS           MVS60     RW,NS
... (lots of other file systems listed)
... HQOMVS.PHXHR.LOCAL.ZFS MVS60     RW,NS
HQOMVS.PHXHR.ROOT.ZFS  MVS60     RW,NS
JVA601.ZFS             MVS60     RO
JVA700.MVSA0.ZFS       MVSA0     RO
JVA700.ZFS             MVS60     RO
JVB601.ZFS             MVS60     RO
JVB700.MVSA0.ZFS       MVSA0     RO
JVB700.ZFS             MVS60     RO
OMVS.VERSYSB.VERSION.ZFS MVSA0     RO
SYS2.EJES540.ZFS       MVS70     RW,NS
SYS3.HKC.HKCCFGFZ      MVS60     RW,NS,L
SYS3.HKC.HKCDATFZ      MVS70     RW,NS
SYS3.HKC.HKLOGFZ       MVSA0     RW,NS
ZFS.Z21Z.VERSION       MVSA0     RW,NS
.
Legend: RW=Read-write,NS=Mounted NORWSHARE,L=Low on space
RO=Read-only
IOEZ00849I FSINFO command done.

Complete your session evaluations online at www.SHARE.org/Orlando-Eval
MODIFY ZFS,FSINFO Command

- An MVS command alias of the zfsadm fsinfo command
- I did not have the documentation for this command, but I found OA48385 (using Google) which suggested issuing:
  - F ZFS,FSINFO,ALL,FULL,SELECT=Q
- The complete description was behind a firewall, but I quickly inferred from the syntax that ALL,FULL provided “verbose” output that SELECT=Q would consider quiesced file systems only.
- I issued F ZFS,FSINFO,ALL,FULL,SELECT=RW to get this information for my file systems mounted read/write and it worked!!!
- **UPDATE!** z/OS 2.2 doc now publicly available from:
MODIFY ZFS,FSINFO Command

• SELECT=RW produced the info you see for all of the read/write zFS on my system.

• This info includes location, size, owner, time stamps, response time statistics, options in effect, etc.

• Spec-freaking-tacular! 😊

SELECT=RW produced the info you see for all of the read/write zFS on my system.

This info includes location, size, owner, time stamps, response time statistics, options in effect, etc.

Spec-freaking-tacular! 😊

File System Name: HQOMVS.MVSA0.Z22Z.WBEM.ZFS.

*** owner information ***

Owner: MVSA0
Converttov5: OFF,n/a
Size: 108000K
Free 1K Frags: 7
File System Size: 1080K
File System Name: 16K
Anode Table Size: 1064K
File System Objs: 4212
Version: 1.4
Overflow Pages: 0
Overflow HiWater: 0
Thrashing Objs: 0
Thrashing Resol: 0
Token Revc: 0
Revc WaitTime: 0.000
Devno: 6155
Space Monitoring: 0,0
Quiescing Sys: n/a
Quiescing Job: n/a
Quiescor ASID: n/a
File System Grow: ON,0
Status: RW,NS
Audit Fid: E5D7C9E9 E4C60006 0000

File System Creation Time: Jul 29 21:26:28 2013
Quiesce Time: n/a
Last Grow Time: n/a
Connected Clients: n/a

*** local data from system MVSA0 (owner: MVSA0) ***

Vnodes: 40
LFS Held Vnodes: 3
Open Objects: 2
Tokens: 0
User Cache 4Kpgs: 122
Meta Cache 8Kpgs: 110
App. Rds: 4305
Avg. Rd RespTime: 0.058
App. Wrs: 21
Avg. Wr RespTime: 0.460
Rd XCF Calls: 0
Avg. Rd XCF RespTime: 0.000
Wr XCF Calls: 0
Avg. Wr XCF RespTime: 0.000
ENOSPC Errors: 0
Disk IO Errors: 0
XCF Comm. Errors: 0
Canceled Ops: 0

DDNAME: SYS00015

VOLSER Reads KBytes Writes KBytes Waits Average
MVSUFS 135 1384 10947 43804 146 1.067
TOTALS 135 1384 10947 43804 146 1.067

• SELECT=RW produced the info you see for all of the read/write zFS on my system.

• This info includes location, size, owner, time stamps, response time statistics, options in effect, etc.

• Spec-freaking-tacular! 😊
SYS1.LOGREC Reallocated without IPL

- I have wanted this since *Old Man Noah* cornered the market on gopher wood!
- The SETLOGRC command has been enhanced to allow specification of a new data set or log stream name.

```plaintext
D LOGREC
IFB090I 09.55.26 LOGREC DISPLAY
   CURRENT MEDIUM = DATASET
      MEDIUM NAME = SYS2.MVSA0.LOGREC

//IFCDIP00 JOB 1,'INITIALIZE LOGREC',CLASS=S,NOTIFY=&SYSUID
  /*JOBPARM S=SA0
   //*MAIN SYSTEM=MVSA0
   //NEWDIP EXEC PGM=IFCDIP00,COND=(8,LT)
   //SERERDS DD DSN=SYS2.MVSA0.LOGREC1,DISP=(,CATLG),
   //      VOLUME=(,RETAI,SER=MVSA0B),UNIT=3390,
   //      SPACE=(CYL,(30))

SETLOGRC DATASET=SYS2.MVSA0.LOGREC1
IEF196I IEF237I 8207 ALLOCATED TO SYS00009
IFB097I LOGREC RECORDING MEDIUM CHANGED FROM DATASET TO DATASET

D LOGREC
IFB090I 10.00.31 LOGREC DISPLAY
   CURRENT MEDIUM = DATASET
      MEDIUM NAME = SYS2.MVSA0.LOGREC1
```

Complete your session evaluations online at www.SHARE.org/Orlando-Eval
JCTJOBID and Sysplex in SMF Types 14/15

- We have NOTYPE(14:16) in our SMFPRMxx member.
- Obviously, someone cares about this. Maybe you?
- See below for the relevant updates to IFGSMF14
- Note the questionable choice of field names.

```
.DSECT9  ANOP
*
*   THIS DESCRIBES THE STEP INFORMATION SECTION OF THE
*   EXTENDED INFORMATION SEGMENT. THE JOB INFORMATION
*   HAS A TYPE CODE OF 3. IT CONTAINS THE STEP NAME,
*   JOB ID AND SYSPLEX NAME OF THE JOB, PLUS THE
*   ACTIVE PROGRAM NAME OF THE JOB.
*
   AIF ('&DSECT' EQ 'NO').NODSECT10
&FRSTSYM.SPI  DSECT
.NODSECT10 ANOP
SMF14SPI EQU     *       STEP INFORMATION SECTION
SMF14SPN DS     CL8' '   STEP NAME
SMF14PGN DS     CL8' '   ACTIVE PROGRAM NAME
SMFJOBID DS     CL8' '   JOBID
SMFPLXID DS     CL8' '   SYSPLEXID
SMF14SPE EQU     *       END OF STEP INFORMATION SECTION
```

Complete your session evaluations online at www.SHARE.org/Orlando-Eval
Dynamic APF List SMF Record

- New member CSVAPSMF
- This extremely robust mapping macro has Peter Relson’s fingerprints all over it! 😊

SMF90T37 DSECT     SMF record (type 90 subtype 37) data
SMF90T37Function DS X  See equates SMF90T37Add, SMF90T37Delete, SMF90T37DynFormat, SMF90T37StatFormat
SMF90T37Flags   DS B  Flags
*  Bit definitions:
SMF90T37_SETPROG EQU X'80'  Update via SETPROG command
SMF90T37_SET_PROG EQU X'40'  Update via SET PROG command
SMF90T37_CSVAPF EQU X'20'  Update via CSVAPF macro
SMF90T37ParmMemSuffix DS CL2  When SMF90T37_SET_PROG, the PROGxx parmlib member name’s "xx".
SMF90T37Dsname   DS CL44 The data set name when function is not "DynFormat" or "StatFormat" (otherwise undefined)
SMF90T37Volume   DS CL6  The volume when function is not "DynFormat" or "StatFormat" (otherwise undefined). This will be zeroes for an add or delete indicating SMS-managed (such as by SMS on SETPROG APF ADD)
SMF90T37TimeStamp DS CL2  Time value (via STCK) of the update
SMF90T37Jobname DS CL8  The jobname of issuer of the APF request. For a SETPROG command or SET PROG processing, this will be the job name of the ASID processing the command (ASID 1 - *MASTER*)
SMF90T37Jobname DS CL8  The CHKEY field from the CSCB (for a started task, this is the stepname). Zeroes if there is no CSCB.
SMF90T37Consid  DS F  Console ID of issuer of the APF request. The value is -1 if the request was via the CSVAPF macro
SMF90T37Consid  DS F  Console ID of issuer of the APF request. The value is -1 if the request was via the CSVAPF macro
SMF90T37UToken  DS CL80 Security product user token of issuer of the APF request
SMF90T37Add     EQU 1  This record is a result of ADD to APF
SMF90T37Delete  EQU 2  This record is a result of DELETE from APF
SMF90T37DynFormat EQU 4  This record is a result of changing to dynamic format
SMF90T37StatFormat EQU 6  This record is a result of changing to static format
SMF90T37_Len    EQU *-SMF90T37

Complete your session evaluations online at www.SHARE.org/Orlando-Eval
Additional Exploration
More JES3 Function Rolled Back to JES2

• In z/OS 2.1, JES2 added 8-character job class names, job class groups, and pre-execution C/I processing.
• In z/OS 2.2, JES2 adds Dependent Job Control and Deadline Scheduling functions, and raises the number of jobs on SPOOL from 400K to one million like JES3.
• We never approach a million jobs and have never used JES3’s Deadline Scheduling feature, but we do use DJC extensively.
• All of our product builds are DJC networks. To learn about JES2’s new function in this area, we re-engineered one of our DJC networks to work under z/OS 2.2 JES2.
This simple, yet effective, DJC Network was first developed in 1988.

- Two jobs run sequentially
  - They run very quickly
- Five jobs run in parallel
  - These are HLASM steps that run for approximately ½ hour on our system.
- Three jobs run sequentially
  - They run for just a couple/few minutes each
Existing JES3 DJC JCL

//EJES00 JOB 1,'EJES GENERATION',REGION=256M,MSGCLASS=E,USER=EJES
//*NET ID=EJESGENR,RL=EJES10
//*MAIN CLASS=GENERATE,LINES=(100,W)

//EJES10 JOB 1,'EJES GENERATION',REGION=256M,MSGCLASS=E,USER=EJES
//*NET ID=EJESGENR,NHOLD=1,RL=(EJES20,EJES21,EJES22,EJES23,EJES24)
//*MAIN CLASS=GENERATE,LINES=(100,W)

//EJES20 JOB 1,'EJES GENERATION',REGION=256M,MSGCLASS=E,USER=EJES
//*NET ID=EJESGENR,NHOLD=1,RL=EJES30
//*MAIN CLASS=GENERATE,LINES=(300,W)

//EJES21 JOB 1,'EJES GENERATION',REGION=256M,MSGCLASS=E,USER=EJES
//*NET ID=EJESGENR,NHOLD=1,RL=EJES30
//*MAIN CLASS=GENERATE,LINES=(300,W)

//EJES22 JOB 1,'EJES GENERATION',REGION=256M,MSGCLASS=E,USER=EJES
//*NET ID=EJESGENR,NHOLD=1,RL=EJES30
//*MAIN CLASS=GENERATE,LINES=(300,W)

//EJES23 JOB 1,'EJES GENERATION',REGION=256M,MSGCLASS=E,USER=EJES
//*NET ID=EJESGENR,NHOLD=1,RL=EJES30
//*MAIN CLASS=GENERATE,LINES=(600,W)

//EJES24 JOB 1,'EJES GENERATION',REGION=256M,MSGCLASS=E,USER=EJES
//*NET ID=EJESGENR,NHOLD=1,RL=EJES30
//*MAIN CLASS=GENERATE,LINES=(600,W)

//EJES30 JOB 1,'EJES GENERATION',REGION=512M,MSGCLASS=E,USER=EJES
//*NET ID=EJESGENR,NHOLD=5,RL=EJES40
//*MAIN CLASS=GENERATE,LINES=(100,W)

//EJES40 JOB 1,'EJES GENERATION',REGION=256M,MSGCLASS=E,USER=EJES
//*NET ID=EJESGENR,NHOLD=1,RL=EJES50
//*MAIN CLASS=GENERATE,LINES=(100,W)

//EJES50 JOB 1,'EJES GENERATION',REGION=256M,MSGCLASS=E,USER=EJES
//*NET ID=EJESGENR,NHOLD=1
//*MAIN CLASS=GENERATE,SYSTEM=MVS70

- EJES00 releases EJES10
- EJES10 releases EJES20, 21, 22, 23 and 24
- EJES20, 21, 22, 23 and 24 release EJES30
- EJES30 releases EJES40
- EJES40 releases EJES50
Equivalent JES2 JCL

More JCL statements required than for JES3

Must define job group, job sets, etc. to describe the processing order.

Then supply the jobs themselves and associate each with job group via SCHEDULE JCL

Complete your session evaluations online at www.SHARE.org/Orlando-Eval
DJC Experiments

EXPERIMENT #1

• Removed all product build steps. Inserted a single IEFBR14 for every job except EJES23.
• EJES23 runs a program called WAIT4REP which issues a WTOR and waits.
• This is how I hope to prove EJES30 is really waiting for the “job set” to complete.

EXPERIMENT #2

• Removed all product build steps. Inserted a single IEFBR14 for every job except EJES23.
• EJES23 runs a program called ABEND806 which issues does not exist.
• This is how I hope to prove I can restart the network after a failure.
DJC Experiment #1 – JES3 Results

M7 2015213 1306352 T2SY2 R= EJES23 IAT2000 JOB EJES23 (JOB01171) SELECTED T2SY2 SRVCLASS=
M7 2015213 1306352 T2SY2 R= EJES23 NET-ID=EJESGENR
2015213 1306353 T2SY2 R= EJES23 IEF403I EJES23 - STARTED - TIME=13.06.35
16 2015213 1306353 *T2SY2 R= EJES23 0251 PHX0001 Job paused, reply to continue
EDJAFFE 2015213 1307170 -R 251,HELLO
16 EDJAFFE 2015213 1307170 T2SY2 R= IEE600I REPLY TO 0251 IS;HELLO
MLG 2015213 1307171 T2SY2 R= EJES30 -EJES30 ENDED. NAME=EJES GENERATION TOTAL TCB CPU TIME=
MLG 2015213 1307171 IAT7100 (MAIN ) *S DJCUDDAT,EJES23 ,EJESGENR,1
INTERNAL2015213 1307171 +S DJCUDDAT,EJES23 ,EJESGENR,1
M7 2015213 1307171 IAT2001 OS MVS WAITING FOR WORK - T2SY2
M7 2015213 1307172 T2SY2 R= EJES30 IAT2000 JOB EJES30 (JOB01173) SELECTED T2SY2 SRVCLASS=
M7 2015213 1307172 T2SY2 R= EJES30 NET-ID=EJESGENR
2015213 1307172 T2SY2 R= EJES30 IEF403I EJES30 - STARTED - TIME=13.07.17
2015213 1307172 T2SY2 R= EJES30 IEF404I EJES30 - ENDED - TIME=13.07.17
MLG 2015213 1307173 T2SY2 R= EJES30 -EJES30 ENDED. NAME=EJES GENERATION TOTAL TCB CPU TIME=
MLG 2015213 1307173 IAT7100 (MAIN ) *S DJCUDDAT,EJES30 ,EJESGENR,1
INTERNAL2015213 1307173 +S DJCUDDAT,EJES30 ,EJESGENR,1
M7 2015213 1307173 IAT2001 OS MVS WAITING FOR WORK - T2SY2
M7 2015213 1307174 T2SY2 R= EJES40 IAT2000 JOB EJES40 (JOB01175) SELECTED T2SY2 SRVCLASS=
M7 2015213 1307174 T2SY2 R= EJES40 NET-ID=EJESGENR
2015213 1307174 T2SY2 R= EJES40 IEF403I EJES40 - STARTED - TIME=13.07.17
2015213 1307174 T2SY2 R= EJES40 IEF404I EJES40 - ENDED - TIME=13.07.17
MLG 2015213 1307174 T2SY2 R= EJES40 -EJES40 ENDED. NAME=EJES GENERATION TOTAL TCB CPU TIME=
MLG 2015213 1307174 IAT7100 (MAIN ) *S DJCUDDAT,EJES40 ,EJESGENR,1
INTERNAL2015213 1307174 +S DJCUDDAT,EJES40 ,EJESGENR,1
M7 2015213 1307174 IAT2001 OS MVS WAITING FOR WORK - T2SY2
M7 2015213 1307175 T2SY2 R= EJES50 IAT2000 JOB EJES50 (JOB01176) SELECTED T2SY2 SRVCLASS=
M7 2015213 1307175 T2SY2 R= EJES50 NET-ID=EJESGENR
2015213 1307175 T2SY2 R= EJES50 IEF403I EJES50 - STARTED - TIME=13.07.17
2015213 1307175 T2SY2 R= EJES50 IEF404I EJES50 - ENDED - TIME=13.07.17
MLG 2015213 1307175 T2SY2 R= EJES50 -EJES50 ENDED. NAME=EJES GENERATION TOTAL TCB CPU TIME=
MLG 2015213 1307175 IAT7100 (MAIN ) *S DJCUDDAT,EJES50 ,EJESGENR,1
INTERNAL2015213 1307175 +S DJCUDDAT,EJES50 ,EJESGENR,1
M7 2015213 1307175 IAT2001 OS MVS WAITING FOR WORK - T2SY2
LOG 2015213 1307177 NET EJESGENR HAS COMPLETED
LOG 2015213 1307177 DJC PROCESSING HAS COMPLETED

Complete your session evaluations online at www.SHARE.org/Orlando-Eval

z/OS 2.2 User Experiences
Complete your session evaluations online at www.SHARE.org/Orlando-Eval

**z/OS 2.2 User Experiences**

---

### DJC Experiment #1 – JES2 Results

- **N 40C0000 T2SY1**
  - 2015213 13:23:07.26 J0033352 00000090 $HASP1301 EJES23 in job group EJESGENR queued for execution
  - **N 4000000 T2SY1**
    - 2015213 13:23:07.39 J0033352 00000281 $HASP373 EJES23 STARTED - INIT 5 - CLASS A - SYS SY1
  - **N 0000000 T2SY1**
  - **W 0001000 T2SY1**
    - 2015213 13:23:07.58 J0033352 00000281 $HASP309 INIT 5 INACTIVE ******** C=A
  - **N 0020000 T2SY1**
    - 2015213 13:28:08.40 J0033352 00000281 $HASP395 EJES23 ENDED - RC=0000
  - **N 0040000 T2SY1**
    - 2015213 13:28:08.46 J0033352 00000281 $HASP309 INIT 5 INACTIVE ******** C=A
  - **N 0060000 T2SY1**
    - 2015213 13:28:08.54 J0033352 00000281 $HASP309 INIT 5 INACTIVE ******** C=A
  - **N 0080000 T2SY1**
    - 2015213 13:28:08.57 J0033352 00000281 $HASP309 INIT 5 INACTIVE ******** C=A
  - **N 0100000 T2SY1**
    - 2015213 13:28:08.66 J0033352 00000281 $HASP309 INIT 1 INACTIVE ******** C=A
  - **N 0120000 T2SY1**
    - 2015213 13:28:08.69 J0033352 00000281 $HASP309 INIT 1 INACTIVE ******** C=A
  - **N 0140000 T2SY1**
    - 2015213 13:28:08.73 J0033352 00000281 $HASP309 INIT 1 INACTIVE ******** C=A
  - **N 0160000 T2SY1**
    - 2015213 13:28:08.73 J0033352 00000281 $HASP309 INIT 1 INACTIVE ******** C=A
  - **N 0180000 T2SY1**
    - 2015213 13:28:08.75 J0033352 00000281 $HASP309 INIT 1 INACTIVE ******** C=A
  - **N 0200000 T2SY1**
    - 2015213 13:28:08.78 J0033352 00000281 $HASP309 INIT 1 INACTIVE ******** C=A
  - **N 0220000 T2SY1**
    - 2015213 13:28:08.81 J0033352 00000281 $HASP309 INIT 1 INACTIVE ******** C=A
  - **N 0240000 T2SY1**
    - 2015213 13:28:08.86 J0033352 00000281 $HASP309 INIT 1 INACTIVE ******** C=A
  - **N 0260000 T2SY1**
    - 2015213 13:28:08.90 J0033352 00000281 $HASP309 INIT 1 INACTIVE ******** C=A
  - **N 0280000 T2SY1**
    - 2015213 13:28:08.93 J0033352 00000281 $HASP309 INIT 1 INACTIVE ******** C=A
  - **N 0300000 T2SY1**
    - 2015213 13:28:09.51 G0033346 00000090 $HASP1304 job group EJESGENR is complete

---

### Notes
- Job paused, reply to continue
- 252,HELLO
- IEF403I EJES23 - STARTED - TIME=13.23.07
- IEF404I EJES23 - ENDED - TIME=13.28.08
- ICH70001I EJES - LAST ACCESS AT 13:28:08 ON SATURDAY, AUGUST 1, 2015
- ICH70001I EJES - LAST ACCESS AT 13:28:08 ON SATURDAY, AUGUST 1, 2015
- ICH70001I EJES - LAST ACCESS AT 13:28:08 ON SATURDAY, AUGUST 1, 2015
- ICH70001I EJES - LAST ACCESS AT 13:28:08 ON SATURDAY, AUGUST 1, 2015
- ICH70001I EJES - LAST ACCESS AT 13:28:08 ON SATURDAY, AUGUST 1, 2015
- ICH70001I EJES - LAST ACCESS AT 13:28:08 ON SATURDAY, AUGUST 1, 2015
D jc Experiment #2 – J ES3 Results
• Not at all what I expected! The job group kept running! 😞
Making Job Group Suspend after Failure

- The `ERROR=` keyword controls error handling
- Multiple conditions, such as `ERROR=(RC>4 | ABEND)`
- I updated my `JOBGROUP` statement and tried again

```c
//EJESGENR JOBGROUP OWNER=EJES,ERROR=ABEND
```

- This time, the job group *suspended* after the abend! 😊

EJES30, 40 and 50 remained in the SETUP queue!
New DJC Experiment #2 – JES2 Results

- **EJES23** was resubmitted and all worked as expected. 😊

<table>
<thead>
<tr>
<th>Time</th>
<th>User</th>
<th>Job</th>
<th>Status</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>15:14:45.50</td>
<td>T2SY1</td>
<td>J0033385</td>
<td>Started</td>
<td>EJES23 registered to job group EJESGENR</td>
</tr>
<tr>
<td>15:14:45.57</td>
<td>T2SY1</td>
<td>J0033385</td>
<td>Queued</td>
<td>EJES23 queued for execution</td>
</tr>
<tr>
<td>15:14:45.65</td>
<td>T2SY1</td>
<td>J0033385</td>
<td>Started</td>
<td>EJES23 - STARTED - TIME=15.14.45</td>
</tr>
<tr>
<td>15:14:45.66</td>
<td>T2SY1</td>
<td>J0033385</td>
<td>Ended</td>
<td>EJES23 - ENDED - TIME=15.14.45</td>
</tr>
</tbody>
</table>

- **EJES30** was resubmitted and all worked as expected. 😊

<table>
<thead>
<tr>
<th>Time</th>
<th>User</th>
<th>Job</th>
<th>Status</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>15:14:45.89</td>
<td>T2SY1</td>
<td>J0033382</td>
<td>Started</td>
<td>EJES30 registered to job group EJESGENR</td>
</tr>
<tr>
<td>15:14:45.91</td>
<td>T2SY1</td>
<td>J0033382</td>
<td>Queued</td>
<td>EJES30 queued for execution</td>
</tr>
<tr>
<td>15:14:45.92</td>
<td>T2SY1</td>
<td>J0033382</td>
<td>Started</td>
<td>EJES30 - STARTED - TIME=15.14.45</td>
</tr>
<tr>
<td>15:14:45.97</td>
<td>T2SY1</td>
<td>J0033382</td>
<td>Ended</td>
<td>EJES30 - ENDED - TIME=15.14.45</td>
</tr>
</tbody>
</table>

- **EJES40** was resubmitted and all worked as expected. 😊

<table>
<thead>
<tr>
<th>Time</th>
<th>User</th>
<th>Job</th>
<th>Status</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>15:14:45.98</td>
<td>T2SY1</td>
<td>J0033383</td>
<td>Started</td>
<td>EJES40 registered to job group EJESGENR</td>
</tr>
<tr>
<td>15:14:45.99</td>
<td>T2SY1</td>
<td>J0033383</td>
<td>Queued</td>
<td>EJES40 queued for execution</td>
</tr>
<tr>
<td>15:14:46.54</td>
<td>T2SY1</td>
<td>J0033383</td>
<td>Started</td>
<td>EJES40 - STARTED - TIME=15.14.46</td>
</tr>
<tr>
<td>15:14:46.55</td>
<td>T2SY1</td>
<td>J0033383</td>
<td>Ended</td>
<td>EJES40 - ENDED - TIME=15.14.46</td>
</tr>
</tbody>
</table>

- **EJES50** was resubmitted and all worked as expected. 😊

<table>
<thead>
<tr>
<th>Time</th>
<th>User</th>
<th>Job</th>
<th>Status</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>15:14:46.61</td>
<td>T2SY1</td>
<td>J0033384</td>
<td>Started</td>
<td>EJES50 registered to job group EJESGENR</td>
</tr>
<tr>
<td>15:14:46.62</td>
<td>T2SY1</td>
<td>J0033384</td>
<td>Queued</td>
<td>EJES50 queued for execution</td>
</tr>
<tr>
<td>15:14:46.63</td>
<td>T2SY1</td>
<td>J0033384</td>
<td>Started</td>
<td>EJES50 - STARTED - TIME=15.14.46</td>
</tr>
<tr>
<td>15:14:46.64</td>
<td>T2SY1</td>
<td>J0033384</td>
<td>Ended</td>
<td>EJES50 - ENDED - TIME=15.14.46</td>
</tr>
</tbody>
</table>

Complete your session evaluations online at www.SHARE.org/Orlando-Eval

z/OS 2.2 User Experiences
Up to 999 GDG Generations

• 255 generations is *highly* restrictive!
• If you create a new generation every day (e.g., of your system log), you can’t even keep a year’s worth of data!
• Specify GDGEXTENDED(YES) in IGGCATxx to raise the GDG limit from 255 to 999.
  – NOTE: Back-level systems cannot tolerate GDGEs. Period!
• Unfortunately, it seemed as if this function wasn’t enabled on my z/OS 2.2 system.
  – Even after IPL with GDGEXTENDED(YES) in IGGCATxx, I received the following:

```bash
DEFINE GDG (NAME(EDJXADM.SHARE.TEST) -
    LIMIT(999) OWNER(EDJXADM) SCRATCH)
0IDC3221I CONSTANT '999' NOT WITHIN VALUE RANGE
0IDC3202I ABOVE TEXT BYPASSED UNTIL NEXT COMMAND. CONDITION CODE IS 12
```

Complete your session evaluations online at www.SHARE.org/Orlando-Eval
TSO/E Password Pre-prompt Function

• A list of all valid TSO/E userids can be obtained by brute-force, programmatic attack on the TSO/E logon screen
  – Some people are not happy about this!
• New PASSWORDPREPROMPT(ON|OFF) keyword has been added to LOGON statement in IKJTSOxx
• I “cloned” IKJTSO00 to IKJTSOB1 and added the new keyword

```
LOGON
  PASSPHRASE (ON)    /* ENABLE PASSWORD PHRASES */ +
  PASSWORDPREPROMPT (ON) /* MORE SECURE LOGON PROTOCOL */
```
TSO/E Password Pre-prompt Function

READY
parmlib update(00)
IKJ712I DEFAULT VALUES WERE USED FOR CONSOLE
IKJ712I DEFAULT VALUES WERE USED FOR TEST
IKJ712I DEFAULT VALUES WERE USED FOR PLATCMD
IKJ712I DEFAULT VALUES WERE USED FOR PLATPGM
IKJ551001 THE PARMLIB UPDATE REQUEST WAS SUCCESSFUL. +
READY
logon edjxadm
IKJ56470I EDJXADM LOGGED OFF TSO AT 16:20:41 ON AUGUST 2, 2015
*** ____________

------------------------------------------ TSO/E LOGON ------------------------------------------

Enter LOGON parameters below: RACF LOGON parameters:

Userid     ====> EDJXADM

Password   ====> _

Procedure  ====> $IKJTEST

Group Ident  ====>

Acct Nmbr  ====> 1

Size        ====> 2096128
TSO/E Password Pre-prompt Function

- With the new protocol, you get only one shot at a good password, so type *carefully*.
- A wrong password ends the TCAS session *with prejudice*.

```
READY
parmlib update(b1)
  IKJ712I DEFAULT VALUES WERE USED FOR CONSOLE
  IKJ712I DEFAULT VALUES WERE USED FOR TEST
  IKJ712I DEFAULT VALUES WERE USED FOR PLATCMD
  IKJ712I DEFAULT VALUES WERE USED FOR PLATPGM
  IKJ55100I THE PARMLIB UPDATE REQUEST WAS SUCCESSFUL. +
READY
logon edjxadm
  IKJ56470I EDJXADM LOGGED OFF TSO AT 16:27:23 ON AUGUST 2, 2015
  IKJ56476I ENTER PASSWORD

  IKJ56474I USERID OR PASSWORD IS INCORRECT OR NOT AUTHORIZED
********
```
READY
logon edjxadm
IKJ564701 EDJXADM LOGGED OFF TSO AT 16:31:14 ON AUGUST 2, 2015
IKJ564761 ENTER PASSWORD

***

---------------------------------- TSO/E LOGON ----------------------------------

Enter LOGON parameters below:                                    RACF LOGON parameters:

  Userid      ==>  EDJXADM

  Procedure ==>  $IKJTEST

  Acct Nmbr  ==>  1

  Size       ==>  2096128

ICH700011 EDJXADM LAST ACCESS AT 16:30:42 ON SUNDAY, AUGUST 2, 2015
IKJ564551 EDJXADM LOGON IN PROGRESS AT 16:35:13 ON AUGUST 2, 2015
IKJ569511 NO BROADCAST MESSAGES
PROCEDURE NAME IS $IKJTEST
*** ALLOCATING SYSPROC ***
*** ALLOCATING SYSEXEC ***
*** ALLOCATING ISPROMF ***
*** ALLOCATING ISPTABL ***
*** ALLOCATING ISPOLLIB ***
*** ALLOCATING ISPMLIB ***
*** ALLOCATING ISPTLIB ***
*** ALLOCATING ISPSLIB ***
**MCS Console Inactivity Time-out**

- Supports automatic MCS console logoff to be performed by the system after a specified time interval elapses
- New `TIMEOUT()` parameter specifies minutes

```plaintext
CONSOLE  DEVNUM(SMCS)
  NAME(SMCS(SYSCLONE.00)
  ROUTCODE (1-2,7-10,16-96,99-112,115-128)
  PFKTAB (PFKTABLE)
  AUTH (MASTER)
  MONITOR (JOBNAMES-T)
  CON (N) SEG (16) DEL (RD) RNUM (5) RTME (1/4) MFORM (J,S) AREA (14)
  RBUF (15)
  LOGON (REQUIRED)
  TIMEOUT (5)
```

```
N 0040000 T2SY1 2015214 13:43:57.35 00000090 00000000 IEE055I CONSOLE SMCSY100 (LU:A60TCP24) IS ACTIVE
NR0000000 T2SY1 2015214 13:44:05.04 SMCSY100 00000090 00000000 IEE185I LOGON EDJXADM COMPLETE FOR LU=A60TCP24 CN=SMCSY100
NC0000000 T2SY1 2015214 13:44:20.61 SMCSY100 00000290 00000000 IEE136I LOCAL: TIME=13.44.20 DATE=2015.214 UTC: TIME=20.44.20
SR ...
... Other activity ...
SR ...
NC0000000 T2SY1 2015214 13:50:11.18 SMCSY100 00000290 00000000 IEE185I LOGOFF EDJXADM COMPLETE FOR LU=A60TCP24 CN=SMCSY100
NR0000000 T2SY1 2015214 13:50:11.18 SMCSY100 00000009 00000000 IEE185I LOGOFF EDJXADM DUE TO INACTIVITY
N 00C0000 T2SY1 2015214 13:50:11.19 00000009 00000000 CNZ2205I USER EDJXADM ON CONSOLE SMCSY100 HAS BEEN LOGGED OFF DUE TO AT LEAST 5 MINUTES OF INACTIVITY
N 0040000 T2SY1 2015214 13:50:11.23 00000000 00000000 IEE055I CONSOLE SMCSY100 (LU:A60TCP24) IS INACTIVE
```
ISPF Display of RDW for RECFM=VBx Files
New Health Checks

- CATALOG_ATTRIBUTE_CHECK
- CTRACE_DEFAULT_OR_MIN
- DMO_REFUCB
- ICSF_KEY_EXPIRATION
- IOS_DYNAMIC_ROUTING
- JES3_DATASET_INTEGRITY
- JES3_DOT_POOL_USAGE
- JES3_JET_POOL_USAGE
- JES3_OST_POOL_USAGE
- JES3_SEE_POOL_USAGE
- RACF_ENCRYPTION_ALGORITHM
- RACF_PASSWORD_CONTROLS
- RACF_RRSF_RESOURCES
- PFA_PRIVATE_STORAGE_EXHAUSTION
- TSOE_OPERSEWAIT_SETTING
- USS_KERNEL_RESOURCES_THRESHOLD
- ZFS_CACHE_REMOVALS
# New Macros in MACLIB and MODGEN

<table>
<thead>
<tr>
<th>Macro</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSFZIXIB</td>
<td>ICSF Exit Information Block</td>
</tr>
<tr>
<td>CSVAPSMF</td>
<td>Dynamic APF SMF record</td>
</tr>
<tr>
<td>CSVFTCHX</td>
<td>CSVFETCH Exit info</td>
</tr>
<tr>
<td>ERBR7410</td>
<td>Monitor III Storage Class Memory Data</td>
</tr>
<tr>
<td>GTZZSMxF</td>
<td>GTZ tracking service GTZTRACK via SMF write services and mapping macros</td>
</tr>
<tr>
<td>HWISMF6A</td>
<td>BCPii mapping for SMF Record Type 106</td>
</tr>
<tr>
<td>IARRAX64</td>
<td>RSM Address Space Block 64-bit Extension</td>
</tr>
<tr>
<td>IARRCE64</td>
<td>RSM Control and Enumeration 64-bit Extension</td>
</tr>
<tr>
<td>IAZASINF</td>
<td>JES Active Job Step information</td>
</tr>
<tr>
<td>IAZJPROC</td>
<td>PROCLIB concatenation parm list for SSI 82</td>
</tr>
<tr>
<td>IAZLGxxx</td>
<td>EVENTLOG data service IAZLGDT and mapping macros</td>
</tr>
<tr>
<td>IEANTRTR</td>
<td>Name/Token Retrieve Register Interface</td>
</tr>
<tr>
<td>IHAESSA</td>
<td>Extended Status Save Area</td>
</tr>
<tr>
<td>IHALDAX</td>
<td>VSM Local Data Area Extension</td>
</tr>
<tr>
<td>IOSDSCxx</td>
<td>IOSSCM Output Mapping macros</td>
</tr>
<tr>
<td>IOSSCM</td>
<td>IOS Storage Class Memory Service</td>
</tr>
<tr>
<td>IVTBFL64</td>
<td>CSM Buffer Descriptor Mapping</td>
</tr>
<tr>
<td>IWMWOPTI</td>
<td>WLM Parmlib Option Information Area</td>
</tr>
<tr>
<td>IWMWQHAA</td>
<td>IWM4QHLT answer area (QHAA)</td>
</tr>
<tr>
<td>IWM4OPTQ</td>
<td>Query Parmlib Information</td>
</tr>
<tr>
<td>IWM4QHLT</td>
<td>Query Server Health Indicator</td>
</tr>
</tbody>
</table>
There were many other z/OS 2.2 features I knew about, but did not explore due to lack of time, lack of pre-reqs, or just good ol’ fashioned lack of interest...
I hope you had fun exploring with me…