

# z/OS 1.13 User Experience

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***14 March 2012***  
***Session 10638***



# SCE Configuration

- **Two data centers about 100 KM apart**
  - One in LA County, one in Orange County
  - One is primarily for Disaster Recovery for the other
- **Four full function parallel sysplexes**
  - Two z10s and one z9
  - Sysprog sandbox (two members)
  - Development sysplex subject to SLA (two members)
  - Development sysplex was the agreed target for the ESP
  - Other sysplexes are client oriented production systems
- **Also one basic sysplex for XRC/GDPS (DR)**

# Migration Ambition

- **All images were running on R12**
- **z/OS upgrade to R13 on all images**
- **We do not run multiple levels for long periods**
  - **We lose migration path for down-level releases**
  - **We install and migrate with all deliberate speed**
- **There are tools to help manage multiple levels**
  - **Use ASAP in Service Link**
  - **Run FIXCAT against each release's CSI**
  - **Order maintenance by APAR, not PTF**
  - **Submit the same order list for each level**

# Migration Aids

- Several Health Checks are available
- Install via PTF and run on previous level(s)
- Named ZOSMIGVR\* for z/OS release
  - **ZOSMIGV1R13\_CNZ\_CONS\_OPER\_MODE**
    - R13 defaults to distributed mode if not specified
  - **ZOSMIGV1R13\_RO\_SYMLINKS**
    - Possible symlink definition incompatibility
  - **ZOSMIGV1R13\_ZFS\_FILESYS**
    - Interface level 3 and sysplex level 'filesystem' or higher
- Remember to activate checks via either...
  - UPDATE action
  - SDSF CK function

## More Migration Aids

- **FIXCAT reports using enhanced hold data**
  - Means 'fix category'
- **IBM.TargetSystem-RequiredService.z/OS.V1R13**
- **Identified APARs/PTFs should be installed on all down level systems in advance of first R13 installation**
- **If pulling enhanced hold data from service.boulder.ibm.com via FTP then...**
- **...you must request **full.txt** to get FIXCAT data**

# ESP Migration Time Line

- **04/29/2011** SCE orders ServerPac via ShopzSeries
  - First ESP where we could place a ‘standard’ order
- **06/07/2011** Order ready for download from Shop
- **06/07/2011** SCE downloads order (to PC)
- **06/08/2011** SCE begins ServerPac install
  - My first install in several years
- **06/27/2011** SCE 70+ usermods are installed
- **06/28/2011** IPL on first sandbox sysplex member
  - Included all ‘environmental’ tailoring and config
- **07/07/2011** IPL on remaining sandbox system
- **07/20/2011** First IPL on development sysplex

# Notes on R13 ServerPac

- Download package size 13.2 GB vs. 11.3 GB for R12
- We added some products, e.g. OMEGAstuff
- Unable to download in office via SCE network ???
- From home, accessed Shop directly over internet
  - Using Download Director, process took 5 hrs 20 mins
  - Number of connections varied from two to five @ 700 KBS
- Uploaded to host via FTP to Mod-27 full-volume zFS
  - Allocated as extended VSAM for > 4 GB
    - DEFINE CLUSTER (NAME(hlq.R13WORK1.ZFS) -
    - VOLUMES(R13WK1) SHR(3) DATACLAS(EXT) -
    - CYLINDERS(30000,100) LINEAR)
    - EXT is our SMS data class for extended data sets

## More Notes on ServerPac

- **All DASD Shark virtual allocations**
  - **Single Mod-9 sysres migratable via volume dump/restore**
  - **System zFS files migratable via logical dump/restore**
  - **Non-migrating Mod-9/Mod-27 for SMPE CAT/DLB volumes**
- **USS file system space**
  - **Multi-volume zFS simplifies migration**
  - **Use preallocated object for DFDSS RESTORE**
  - **Capacity not tied to specific volume layout**



## Still More Notes on ServerPac

- **We always use the Full-System Replace option**
- **Easiest ServerPac to date**
- **Sizing of libraries better than ever**
  - **Less need to adjust space or directories**
  - **But be prepared to increase allocations over time**
- **Consider giving LINKLIST libs secondary allocations**
  - **Fixing out-of-space condition during APPLY is laborious**
  - **StarTool (or antecedent PDS command) helps a lot**
  - **Health Checker complains, but YOU run maintenance!**

# ServerPac and Me

- **This was my first ServerPac installation in years**
- **One rut in the road: ‘alien’ HLQs in delivered files**
- **We rename all files to SYS1 during install**
  - **Seven RACF plexes to manage**
  - **We own SYS1, other HLQs could conflict with apps**
- **One job renames install data sets to user HLQ**
- **I had RACF problems with some HLQs like ‘TCPIP’**
- **There were HLQ.\* profiles in place for all aliens**
  - **Created by the regular ServerPac guy**
  - **No ACCESS list in the profiles**
  - **They worked for him because he was the ‘owner’**

# SCE Customizing with USERMODs

- We have more than 70 USERMODs installed via SMP/E
- Exits, option modules, ISPF panels, etc.
- Most of them reinstall with only MCS updates
  - FMID and req/prereq changes
  - REWORK() date set current for doc purposes
- Some changes were required for R12 → R13
  - RMM: EDGUX100 exit module - SAMPLE EDGCVRSX
- Note: migrating from N-(>1) release requires care
  - Much doc deals with one level change at a time
  - May need to consult older doc for previous changes

# ISV Adventures

- **Getting ready for any new z/OS release**
  - Some routine, some emerging surprises
    1. Ask each ISV for required fixes or level
    2. Install required fixes/level and test
    3. Loop until no problems found
- **Some of the 'ISV' (non-ServerPac) products we run**
  - CA HSC and CA MIM for both silos and virtual tape
  - Control-D, Control-V
  - CA11, ISPW, JHS, MXG, Connect Direct (NDM)
  - StarTool, VPS, CA TPX
  - Tivoli Work Load Scheduler (TWS), OMEGAMON suite
  - CA Vision:Results (DYL280), QuickStart
- **No show stoppers!**

# ISV Adventures

- **ESP customers need ducks in a row by GA - 90 days**
- **We did not find any delinquent vendors/products**
  - **I.e. every vendor we contacted had info/fixes available**
- **Our products mostly worked without upgrade**
- **One exception: CA MIM for tape drive mgmt**
  - **“MIM0095E MIM      MSIERROR CODE=1805 issued by ...”**
  - **“Unable to locate IEFW21SD.IEFAB4FA”**
  - **Problem was fixed by RO26445**

# PARMLIB Coexistence Issues

- **Old, chronic problem with mixed releases**
- **New keywords may not be recognized by lower level(s)**
- **Especially true during IPL with IEASYSxx**
- **Sometimes new keywords are simply ignored**
  - **Maybe a complaint, system still comes up OK**
- **Sometimes unrecognized keyword stops IPL**
- **Or worse: system comes up wrong, e.g. SMS**
  - **Unrecognized parameter results in ‘default config’:  
yikes!**
- **A problem for migration, sharing, and fallback**

# PARMLIB Coexistence Issues

- One new keyword implemented so far in R13
- Parm in member DEVSUPxx (more later)
  - Controls O/C/E message description
- New keyword in DEVSUPxx is ignored by R12!
- Likewise command SET DEVSUP=xx ignores kwd
- Allows sharing of PARMLIB among releases
- Allows seamless fallback planned or otherwise
- Allows ROUTE \*ALL commands regardless of level
- Note: toleration/coexistence PTFs are required
- **A major advance in system management**

# First IPL Boo-boos ;-(

- **I forgot new IPL text after post-ServerPac PTF**
  - ServerPac includes a job to build IPL text
  - Before first IPL, I installed a PTF that required new IPL text
  - Got wait state 075-06: IPL text does not match nucleus
- **I forgot zFS parm change on sharing system**
  - Sharing R12 system still had 'sysplex\_admin\_level=2'
  - Changed R12 parm to 'sysplex=filesys' and restarted ZFS task
- **I forgot about ICSF proc, missing in R13**
  - R12 had PGM= change in ICSF task incompatible with R11
  - Moved ICSF proc to sysres resident PROCLIB for all systems
  - Did not think to put ICSF proc into R13 sysres PROCLIB
  - Solution: moved proc back to shared PROCLIB



# Open/Close/End-of-Volume Abend and Reason Code Description

- **PARMLIB(DEVSUPxx): OCE\_ABEND\_DESCRIP=YES**
  - New text borrowed from message manual explanation
  - Appears in joblog and syslog
  - Not for all abends, just O/C/E
- **OS Command: SET DEVSUP=xx**
  - Allows extended messages to be turned on or off
- **No granularity of control at GA: all on or all off**
  - See OA37074/UA61379 to shorten some messages
  - See OA37505 to control verbosity
- **R12 does not complain or acknowledge new parm**

## O/C/E Message for IEC141I

- **IEC141I 013-  
18,IGG0191B,TESTMSG,ABEND214,SYSUT1,7802,BR9  
002,TED066.JCL.**
- **ERROR DESCRIPTION:**
- **An OPEN macro instruction was issued for a  
partitioned data set. The DSNNAME parameter specified  
a member that could not be found.**
- **END ERROR DESCRIPTION: IEC141I**

## O/C/E Message for IEC031I

- **IEC031I D37-04,IFG0554P,TESTMSG,ABENDX37,SYSUT2,7802,BR9002,TED066.TOOS**
- **ERROR DESCRIPTION:**
- **A data set opened for output used all the primary space, and no secondary space was requested. Change the JCL specifying a larger primary quantity or add a secondary quantity to the space parameter on the DD statement.**
- **END ERROR DESCRIPTION: IEC031I**

# SDSF Sysplex Communication

- **SDSF can now use XCF for sysplex communication**
- **Previously MQ was required for...**
  - Health checker
  - Processes
  - Enclaves
  - Resource monitor
- **New cmd SET CMODE 1 to accommodate down-level**
  - 1. z/OS V1R12 (z12)
  - 2. z/OS V1R13 (z13)
  - 3. Default (i.e. #2)

# Multiple Colors in SDSF Operlog

- We modify console messages for color
- Each system in a plex gets its own color
- Code in WTO exit IEAVMXIT sets color flags
- These colors now show up SDSF operlog
- Also some additional color(s) based on ???
- In the following slide...
  - Green is from 'this' system (R13)
  - Blue is from the 'other' system (R12)
  - Yellow is RYO health check, green on MCS console

# Multiple Colors in SDSF Operlog

```

SDSF OPERLOG DATE 2011/08/03 6 WTORS COLUMNS 39- 118
COMMAND INPUT ==> SCROLL ==> CSR
00000010 ANTXX8051I NO ACTIVE XRC SESSIONS. ISSUE XSTART COMMAND
STC01142 00000010 HZS0001I CHECK(SCE,XRC_STATUS_CHECK): 993
993 00000010 XRCH001E No active XRC sessions
993 00000010 Session: None Master: None Couple status: None
993 00000010 Current delay: 0 Current exposure: 0
993 00000010 Start XRC and try again
993 00000010 Check version: XRCK01_EXEC
00000201 $HASP249 COMMAND RECEIVED FROM AUTO COMMAND ID=7775 994
994 00000201 $RALL,Q=AEFHJOP,R=LOCAL,D=N1R99,OUTDISP=WRITE
00000201 $HASP249 COMMAND RECEIVED FROM AUTO COMMAND ID=7776 996
996 00000201 $RALL,Q=G,R=LOCAL,D=RSMD1,OUTDISP=WRITE
00000201 $HASP249 COMMAND RECEIVED FROM AUTO COMMAND ID=7777 998
998 00000201 $RALL,R=COM,D=N1R50,OUTDISP=WRITE
00000201 $HASP249 COMMAND RECEIVED FROM AUTO COMMAND ID=7778 000
000 00000201 $RALL,R=AUTOCOM,D=N1R50,OUTDISP=WRITE
00000201 $HASP249 COMMAND RECEIVED FROM AUTO COMMAND ID=7779 002
002 00000201 $RALL,R=FICHE,D=N1R50,OUTDISP=WRITE
00000201 $HASP249 COMMAND RECEIVED FROM AUTO COMMAND ID=7851 004
004 00000201 $RALL,R=R51,D=N1R51,OUTDISP=WRITE
00000201 $HASP249 COMMAND RECEIVED FROM AUTO COMMAND ID=7920 006
006 00000201 $RALL,R=R120,D=N1R120,OUTDISP=WRITE
00000201 $HASP249 COMMAND RECEIVED FROM AUTO COMMAND ID=7921 008
008 00000201 $RALL,R=R121,D=N1R121,OUTDISP=WRITE
00000201 $HASP249 COMMAND RECEIVED FROM AUTO COMMAND ID=7922 010
010 00000201 $RALL,R=R122,D=N1R122,OUTDISP=WRITE
STC
00000201 ASDA257I LINK ACTIVE from A0 to B1
00000210 ANTL8801I XQUERY ALL
00000010 ANTXX8051I NO ACTIVE XRC SESSIONS. ISSUE XSTART COMMAND
STC07990 00000010 HZS0001I CHECK(SCE,XRC_STATUS_CHECK): 116
116 00000010 XRCH001E No active XRC sessions
116 00000010 Session: None Master: None Couple status: None
116 00000010 Current delay: 0 Current exposure: 0
116 00000010 Start XRC and try again
116 00000010 Check version: XRCK01_EXEC
00000215 !ADP3102 PEER LINK A0 SEND COUNT(1210), RECEIVE COUNT(1211),
VE)
00000215 !ADP3102 PEER LINK A1 SEND COUNT(1209), RECEIVE COUNT(1208),
VE)
00000205 !ADP0208 2 ITEMS SHOWN
STC08109 00000010 +CSQX004I MB10 CSQXSPRM Channel initiator is using 37 MB of l
120 00000010 storage, 1599 MB are free

```

# Wandering SSH

- **At first we could not find SSH**
- **Orderable under 'Ported Tools'**
- **Feared we might have failed to order it**
- **We use SSH a lot**
- **SSH formerly lived in zFS AFOROOT**
- **R13 does not supply an AFOROOT zFS**
- **We eventually found SSH in OMVS ROOT zFS**
- **Same directory structure, different file location**
- **SSH works fine**

# That Demon FTP

- In R13, FTP daemon FTPDx now runs APF authorized
- Previously, FTPDx messages had '+' prefix
  - '+' is standard indication for problem state tasks
- We use Tivoli AFOperator for automation
- Table driven, needs exact msgid w/ or w/out '+'
- In R12 we were looking for...
  - +EZY2702I Server-FTP: Initialization completed
  - +EZYFT59I FTP shutdown complete
- In R13 AFOP didn't know when FTPDx was up/down
- Changing AFOP to plain msgid fails under R12



# CSP Stumbles, Limpes Along

- **Cross System Product**
- **Eons out of support**
- **Still worked without intervention up to z/OS R7**
- **‘Compile’ stage failed in z/OS R8 with new LE**
- **Workaround: save a copy of R7 SCEERUN**
- **It still works in R13 with saved R7 copy**
  
- **Anyone interested in a therapy group?**

# A Funny Thing Happened on the Way

- Our ESP ‘target’ is general development plex
- Robust, diverse, busy, unpredictable environment
- If it works there, it usually works everywhere
- A ‘minor’ glitch showed up early on
- Omegamon complained about errant paging I/Os
  - ASMI Number pages waiting proc’g by ASM (ASMQ) = nn
  - This exception never appeared on sandbox sysplex
  - Grew into hundreds or thousands in under a week!
- So we opened an SR against Omegamon
- We considered it an untidy annoyance

# My Kingdom for a Byte

- Then one day the system flat out died
- Wait 001040A2, meaning ‘partitioned out of plex’
- SAD showed us completely out of real memory!
- IXC431I GROUP **SYSGRS** MEMBER A0 JOB GRS ASID 0007
- STALLED AT 01/13/2012 03:23:18.696428 ID: 0.1
- LAST MSGX: 01/13/2012 03:27:06.470786 0 STALLED
- LAST GRPX: 01/09/2012 11:37:42.979858 0 STALLED
- LAST STAX: 01/13/2012 03:23:00.865967 1 STALLED
- Every major task in the system looked like this
  - SYSMCS SYSWLM SYSBPX SYSIOS ...
- System was totally hosed ;-(((
- OTOH auto-SAD/auto-IPL minimized the pain ;-)

# When ASMQ Hurtles Off the Deep End

- **OM was reporting a ‘real value’ but not a real condition**
- **Two count fields in the ASMVT**
  - **ASMIORQR: I/O requests received by I/O control**
  - **ASMIORQC: I/O requests completed and returned**
- **Difference between the two is the ‘ASMQ count’**
- **Many ‘received’ requests not showing as ‘completed’**
- **IBM identified new logic in ASM I/O handling in R13**
- **In case of I/O anomaly, the I/O was redriven**
- **Request-count was incremented again on redrive**
- **Request/complete counts were never reconciled**

# Mirror Mirror on the Wall

- **Origin of I/O anomalies was DASD mirroring (XRC)**
  - Paging volumes were included in DR mirroring
  - OK, we know we don't need them mirrored, but...
  - GDPS management makes it harder not to mirror them
  - It happens that our sandbox sysplex is not mirrored
- **Anomaly caused by ASM I/O colliding with XRC I/O**
- **ASMQ grew very large, so ASM finally gave up trying**
  - Why start another I/O when hundreds are pending?
- **Eventual result was no real memory available**
- **APAR OA38742 fixes the I/O count discrepancy**
- **With fix on, no more ASMQ problem**



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# Questions?

