

z/OS V2R4 User Experiences

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Phoenix Software International

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Session **BD**

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Come Out and Play z/OS with Me

- We know that IBM Z represents the most sophisticated and powerful line of business computers ever 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 new toys aka z/OS 2.4.
- I hope you enjoy tagging along as we explore some of its cool new features...

Our Environment

- Small but "mighty!"
- z13s (2965) with 3 CPs, 1 ICF, 1 IFL, 1 zIIP, 1 HMC, 2 Crypto, 1 zEDC
- 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 DS8870 DASD (w/zHPF)
 - FICON-attached IBM TS1140 Tape Drives in 3584 Library

We Don't Use ServerPac Install

- During early testing, we install the ETP system. After GA, we install the ADLT (ADCD) system.
- Both installs involve restoring DSS full volume dumps of pre-installed systems.
- In general, these install techniques have little relevance to customers that use ServerPac.
- You might recall z/OS 2.1 “blew the doors off” our DASD space. We encountered no such surprises transitioning to z/OS 2.2 or z/OS 2.3 and we were pleased to find that z/OS 2.4 had a similar DASD footprint.

SHARE Requirements Satisfied in the Release*

- By FAR the smallest list I have seen in many years...

RFEID	Summary
121915	HSM - Provide windows to disable automatic interval and on-demand migration
47828	MVS/TSO Should Time-out Sessions in Starting State
131787	Add Compaction information to HSM FSR SMF records
117388	DFSORT should provide a way for comparison operations to be case-insensitive
63432	Add JCTJBID and Sysplex to SMF types 62/64 (VSAM activity)
116667	Create D DEVSUP MVS command to display DEVSUP parms in real-time
107054	DSS needs to support Extended TIOT

*Thanks to Laura Carbone for putting together these requirements lists for me

SHARE Requirements Satisfied via SPE

RFEID	Summary
52277	Incremental backup improvement (shipped in 2.3 base then fixed later via APAR OA52901/OA54628)
48859	Parameter for Detecting DSA Overlay (shipped via APAR PI73324)
119495	In WFE, soft wrap Instruction edit window rather than forcing scrolling left and right (APAR PH04817)
94711	Enhance Converter function of RMF Spreadsheet Reporter (APAR OA56492)

One-Year and Five-Year SPE Lists (Web Browser Format or Spreadsheet CSV File)

	A	B	C	D	E	F
521	10/29/2017	PI87941	5655S7700	IMS DB SOLN PACK	210/UI51513	THIS APAR ENHANCES THE ANALYZEPART FUNCTION TO SUPPORT UNLOAD DATA SETS AS INPUT FOR SIM
522	10/27/2017	OA53394	5695SCPX1	OPENMVS SYS SRVS	7A0/UA94165 7E	LONG SYMBOL RESOLUTION RC79 EINVAL RSN05940567 JRSYMBFAILED NEW FUNCTION - SUPPORT LONG
523	10/26/2017	OA53197	5752SC1CR	RSM - REAL STOR MGR	79J/UA94122 7B	NEW FUNCTION MEMORY POOL ENHANCEMENTS
524	10/25/2017	PI48109	5655U9100	IMS CLONING TOOL	120/UI51409	ONLINE CLONING GENERATES AN EXTRA STEP AFTER THE IMSUPDATE PROCEDURE.
525	10/23/2017	PI81900	5740XYR00	DB2 OS/390 & Z/OS	B10/UI51358	DB2 11 FOR Z/OS NEW FUNCTION
526	10/20/2017	OA52282	5752SC1C3	IOS	7A0/UA92227 79	NEW FUNCTION APAR - HYBRID MULTI-TARGET PPRC HYPERSWAP METRO MIRROR AND HARDENED FREI
527	10/19/2017	PI83286	5740XYR00	DB2 OS/390 & Z/OS	B10/UI51280	THIS APAR PROVIDES NEW FUNCTION FOR DB2 FOR Z/OS V11
528	10/19/2017	PI83288	5740XYR00	DB2 OS/390 & Z/OS	B10/UI51280	THIS APAR PROVIDES NEW FUNCTION FOR DB2 FOR Z/OS V11
529	10/19/2017	PI85470	5655W1400	IMS FP SOLUTION PCK	130/UI51261	ENHANCE THE FPA ANALYZE FUNCTION AND FPO OPC TO PROVIDE A NEW IOVF CI REPORT BY RBA
530	10/17/2017	PI70066	568819802	LE COBOL LIB	7A0/UI51202 79C	Enhancement: User control of IGZ0268/IGZ0269 warning messages for OS/VS COBOL Program.
531	10/16/2017	OA52466	5647A01OP	OS390 PRINT INTRFC	7A0/UA93984 79	ADD SUPPORT FOR IBM PRINT TRANSFORM FROM AFP TO ACCESSIBLE PDF
532	10/13/2017	OA53111	5752SCLOG	SYSTEM LOGGER	7BJ/UA93963 7A	NEW FUNCTION - LOGGER STACK AFFINITY FOR IBM ZAWARE SERVER.
533	10/13/2017	OA53780	5752SCDMP	SDUMP/ABDUMP	7B0/UA93940 7A	SDUMPX ECB usage is complex
534	10/12/2017	PI84302	5635A0600	IMS V15	500/UI51059	PROVIDE ENCODING SUPPORT FOR CONFIGURING JVM USING JCL AND SHELLSYNTAX FOR DD STDOUT A
535	10/11/2017	OA53156	5752SC1C3	IOS	7B0/UA93910 7A	PROVIDE CAPABILITY FOR USER-WRITTEN SPOF HEALTH CHECKS
536	10/11/2017	OA53793	5647A01OP	OS390 PRINT INTRFC	7B0/UA93932	ADD SUPPORT FOR IBM PRINT TRANSFORM FROM AFP TO ACCESSIBLE PDF
537	10/10/2017	PI87813	5655I4200	IMS LIBR INTEG UTIL	220/UI50962	TRACE FUNCTION SUPPORT UNDER IMS ADMINISTRATION TOOL
538	10/9/2017	OA52341	5695DF107	DATA MGMT SUPPORT	220/UA93884	TRANSPARENT CLOUD TIERING (TCT): DISABLE AOM0496I BY DEFAULT.
539	10/9/2017	PI86350	5655E1500	IMS PERF ANALYZER	440/UI50949	IMS PA IN-FLIGHT PROCESSING TO RUN WITHOUT REQUIRING THE BMPSYNC(YES) OPTION
540	10/6/2017	PI78036	5655P0100	IMS SYSPLX MGR ZOS	130/UI50928	TIME VALUE CHANGES IN PANEL GJEPS00 WHEN THE ENTER KEY IS PRESSED
541	10/6/2017	PI87559	5697H7700	IMS BUFFER POOL	140/UI50917	IMPROVE BPA TO READ SECOND SET OF CONFIGURATION TRACE RECORDS IFNOT ALL RECORDS ARE IN T
542	10/6/2017	PI88305	5655A1400	IMS BTS	410/UI50918	ENHANCEMENT TO SUPPORT BTSISRIO DD
543	10/5/2017	PI82090	5655OPE00	OM XE DB2PE/PM BPA	530/UI50913	Enhancement to add Thread History to Enhanced 3270 UI
544	10/5/2017	PI82480	5635A0500	IMS V14	400/UI50910	PROVIDE ENCODING SUPPORT FOR CONFIGURING JVM USING JCL AND SHELLSYNTAX FOR DD STDOUT A
545	10/5/2017	PI86229	568819806	LE VA PL/I	7B0/UI50167	ADDITIONAL FORWARD-FIT APAR TO LE V2 R3
546	10/4/2017	PI88221	5697I8200	CLASSIC FED & EP	B3G/UI50860 B3	NEW FUNCTION TO ADD A HEARTBEAT BETWEEN SOURCE AND TARGET Z/OS SYSTEMS TO DETECT COMM
547	10/3/2017	PI82316	5697P3700	IBM TRANS ANALYS W	130/UI50844	NEW FUNCTION TO PROVIDE IMPROVED SUPPORT FOR LOG ANALYTICS
548	10/1/2017	PI87645	5655V9300	IMS TOOLS BASE	160/UI50788	CHANGE THE SETUP ADDPROD STATEMENTS TO MATCH EXACTLY WHAT THE SAMPLE HAS
549	9/29/2017	PI86400	694235B00	GDPS	3DH/UI50782 3D	NEW FUNCTION - GDPS/ACTIVE-ACTIVE 1.7.3 STOP REPLICATION FOR ZDL WORKLOADS DURING ROUTIN
550	9/29/2017	PI87569	5655F7400	IMS DB REORG EXPERT	410/UI50737	DECODEDBD SUPPORT IN AN IMS-MANAGED ACBS ENVIRONMENT
551	9/28/2017	OA53664	5695DF122	VSAM REC LEV SHARN	210/UA93738 22	New Funtion - Performance enhancements for encrypted data sets onz14 machines
552	9/28/2017	PI86306	5655S7700	IMS DB SOLN PACK	210/UI50682	ORF: TOSI COMMAND SECURITY SUPPORT
553	9/27/2017	PI73749	5655F4300	IMS HP SYSGEN TOOLS	230/UI50629	HIGH PERFORMANCE SYSGEN TOOL IMS V15 ENHANCEMENT
554	9/27/2017	PI79464	5655E0700	IMS HP Load	210/UI50633	ENABLE IMS MANAGED ACBS SUPPORT FOR HP LOAD
555	9/25/2017	PI84947	5635A0600	IMS V15	500/UI49791	NEW FUNCTION
556						

• <http://www-01.ibm.com/support/docview.wss?uid=isg3T1027684>

- ~555 SPEs in the 91 weeks from z/OS 2.3 GA through end of June
- That's approximately six SPEs per week!

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To Edward Jaffe ★

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z/OS family - all hardware, OS, and related software
New Function APARs: COMPONENT ID: 5695DF121 (NETWORK FILE SYSTEM) OA56224 - The New Function APAR has closed. A fix is pending. Subscription to this APAR is available.

NEW FUNCTION

z/OS family - all hardware, OS, and related software
New Function APARs: COMPONENT ID: 5655MQ900 (IBM MQ Z/OS V9) PH13236 - The New Function APAR has closed. A fix is pending. Subscription to this APAR is available.

IBM MQ V9.1.3 CONTINUOUS DELIVERY (CD) RELEASE.

Unread: 0 Total: 6329 29 Today Pane ^

- <https://www-01.ibm.com/support/docview.wss?uid=ibm10718119>
- Click “Subscribe Now” to subscribe for the products you are interested in.
- Note “z/OS” is a single product. You can’t break it down by component.

SHARE Requirements IN THE RELEASE

HSM - Provide windows to disable automatic interval and on-demand migration

Description:

HSM automatic migration via interval or on-demand migration sometimes runs during peak CPU utilization times. We are looking for the ability to provide windows in which we can turn off both types of automatic migration. It is already disabled during primary space management (PSM) processing; we look for additional times to disable it. We want to keep command migration available at all times. Disabling automatic migration should not prevent command migration.

Use case:

Submitted By: 3100012R4F #164

Submitted Date: 2018-07-01, Submitted By: Kenneth Nufer

UGVOTES: +1=0 +2=0 +3=0 +4=0 +5=0 +6=0 +7=8 +8=4 +9=0 +10=5 +11=1

Priority: 8.28

Keywords: HSM Migration Interval On-Demand

Use Case: One key use of a blackout window for HSM automatic migration would be for turning off interval (or on-demand) migration during peak CPU billing times. This could enable shops to reduce peak CPU utilization and lower costs.

Suggested Solution: Provide an HSM parameter to specify windows in which automatic migration will or will not run. This could be a 'blackout window' (not run) or an 'enabling window' (will run).

HSM - Provide windows to disable automatic interval and on-demand migration

- A new optional keyword `EVENTDRIVENMIGRATIONQUIESCE` has been added to the `SETSYS` statement
- This allows the HSM admin to specify one or two time ranges during which interval and on-demand migration are both disabled
- The requirement explicitly requested that on-demand migration **NOT** be disabled by the new option, but clearly IBM had other ideas
- We don't run HSM on our z/OS 2.4 test system and have not yet brought 2.4 into our primary sysplex, so I was unable to test this.

MVS/TSO Should Time-out Sessions in Starting State

Use case: BUSVAL :
 INVVAL :
 ENDVAL :
 GROVAL :
 SYSVAL :
 KEYWORDS :
 UGVOTES : +5=4 +4=6 +3=9 +2=8 +1=3 abstain=3 Priority=3.0
 DESCRIPT : Users who initiate a logon but do not finish logging on stay in a state of limbo (starting)
 indefinitely. TimeLimit: N/A

- Could not find it mentioned in any pre-GA draft publications
- I experimented to see if the normal SMF JWT timeout mechanism was being used by setting it to four minutes in SMFPRMxx. I got five instead of four.
- It turns out there is a new keyword on the LOGON statement in IKJTSOxx.
 - Defaults to five minutes.
 - Still not documented 😞

```
NC0000000 T4SY1      2019179 12:26:59.56 INSTREAM 00000290 LOGON
N 4040000 T4SY1      2019179 12:31:59.75          00000090 IKJ604I TSOLOGON TIMED OUT. USERID UNKNOWN, PROC UNKNOWN
N 0000000 T4SY1      2019179 12:31:59.75          00000281 IEA989I SLIP TRAP ID=X13E MATCHED. JOBNAME=*UNAVAIL, ASID=0038.
NR4000000 T4SY1      2019179 12:31:59.77 INTERNAL 00000290 IST804I CLOSE IN PROGRESS FOR AY1T0001 OPENED BY ***NA***
NR4000000 T4SY1      2019179 12:31:59.77 INTERNAL 00000090 IST400I TERMINATION IN PROGRESS FOR APPLID AY1T0001
N 0000000 T4SY1      2019179 12:31:59.78          00000281 IEA989I SLIP TRAP ID=X33E MATCHED. JOBNAME=*UNAVAIL, ASID=0038. 12
NR4000000 T4SY1      2019179 12:31:59.81 INTERNAL 00000090 IST805I VTAM CLOSE COMPLETE FOR AY1T0001
```

Add Compaction information to HSM FSR SMF records

Description:

The SMF type 14/15 records normally contain the information about whether sequential data sets are compressed or not, and if they are, what type of compression as used. However, HSM uses DSS to process sequential data sets from Primary devices - DSS does not open the data sets, so no type 14/15 records are created. Similarly, no 42.6 records are created. The HSM FSR SMF records provide information about the primary data sets, but NOT whether they are compressed or not. As a result, is it difficult, if not impossible, to accurately predict the benefit that zEDC would provide for HSM.

Use Case: IBM's zBNA tool does not provide estimates of the benefit that zEDC would provide for HSM because the SMF records that it uses do not contain information about HSM accesses to primary data sets.

If the HSM FSR SMF records included information about whether the primary data sets are compressed or not, those records could be used to estimate the potential savings if zEDC was used by HSM.

Suggested Solution: Add information from the Compressed format data set section (Type 1) of the Type 14/15 SMF records to the HSM FSR Records.

It would be great if information about the compression state of the ML1 data sets could be added to the FSR records are part of the same change.

Add Compaction information to HSM FSR SMF records

OA57834: NEW FUNCTION

APAR status

OPEN

Error description

New Function

Local fix

Problem summary

Problem conclusion

Temporary fix

Comments

APAR Information

- As you can see, the APAR text contains a wealth of information.
- Glenn Wilcock told me this would be down to the “wire” meaning it might or might not make GA.
- Even as of last night (November 4) there was nothing at all being shown for this APAR.

DFSORT should provide a way for comparison operations to be case-insensitive

Description:

DFSORT comparison operations, including EQ,NE,GE,GT,LE,LT; SS; and PARSE operations should have an easy way to make those comparisons case-insensitive to accomodate cases where data is allowed to be entered in upper and lower case, but the constants searched for would be the same if they were all uppercase (such as 'hare', 'Hare', and 'HARE')

ALTSEQ= provides a solution in some cases but requires the user to code an ALTSEQ= table in each run and to use character format AQ (or OPTION CHALT - and I don't see documented the behavior if OPTION CHALT is coded without ALTSEQ)

Use case:

Submitted By: 3100012R4F #159

Submitted Date: 2018-03-09, Submitted By: Tim Hare

UGVOTES: +1=0 +2=0 +3=0 +4=0 +5=2 +6=3 +7=5 +8=0 +9=0 +10=0 +11=0

Priority: 6.30

Keywords: SORT case case-sensitive case-insensitive uppercase lowercase

DFSORT should provide a way for comparison operations to be case-insensitive

Use Case: Providing this can greatly simplify and reduce the number of SORT control statements needed to accomplish a task; reducing the possibility of error (especially if removing the coding of ALTSEQ=) and saving human time, which is costly.

Suggested Solution: The solution of course is up to IBM but here are some ideas I have had:

1. Format UC (Uppercase) - in all operations treat the field as though it were uppercase (and remember to be locale-sensitive). Do not modify the original record (same as format AQ)
2. Allow constants of the form UC'This is a string' to provide an uppercase version of whatever is in the string. DO allow these constants to be moved into the record if necessary, although TRANS= already provides this function
3. (alternative to 1 maybe) - provide case-insensitive versions of all comparison operators (EQCI, GECI ?) or some other modifier to make comparisons case-insensitive

My preference might be for 1 and 2

DFSORT should provide a way for comparison operations to be case-insensitive

New information

This edition includes the following new enhancements:

Regular expressions

DFSORT now supports Regular expressions in the following DFSORT comparison operands: COND, INCLUDE, OMIT, BEGIN, END, WHEN and TRILID. This support allows DFSORT users to use Regular expressions in their batch jobs for additional filtering capabilities. Regular expressions contain a series of characters that define a pattern of text to be matched, which allows for more robust filtering capabilities.

Unicode comparisons

DFSORT now supports the usage of Unicode data formats (UTF-8, UTF-16 and UTF-32) in the following comparison operands: COND, INCLUDE and OMIT.

ASCII free format numeric

DFSORT now supports two new ASCII free format numeric data formats (AUF and ASF) in SORT and MERGE operands. The new ASCII free format numeric data formats (AUF and ASF) are also now supported in the following comparison operands: COND, INCLUDE and OMIT.

DFSORT should provide a way for comparison operations to be case-insensitive

- DFSORT treats all regular expressions as case insensitive i.e., as if the -i option was specified on the grep command.
- That is important to know because usually it's the other way around. Typically you must use some kind of modifier or flag to get case insensitive matching!

```
//SORTTEST JOB 1,JAFFE,CLASS=A,MSGCLASS=T,NOTIFY=&SYSUID
//SORT      EXEC PGM=SORT
//SYSOUT    DD SYSOUT=*
//SORTDIAG DD DUMMY
//SORTIN    DD *
lower case      florida department of Palm trees
UPPER CASE      FLORIDA DEPARTMENT OF ORANGE GROVES
exclude this record  California state
alternate case  FLORIDA DePARTMeNt Of PaLm TrEeS
sentence        Florida Department Of Revenue
Mixed case      ARIZONA DEPARTMENT of Motor Vehicles
//SORTOUT DD SYSOUT=*
//SYSIN        DD *
OPTION COPY
INCLUDE COND=(25,50,SS,RE,C'DEPARTMENT')
//*
```

- This sample job selects all records except the one in [this color](#).
- You can also code the search string using any case: C'dEpArTmEnT' and get exactly the same output results.

DFSORT should provide a way for comparison operations to be case-insensitive

- I tried to achieve case sensitivity using the modifier (?-i) :

```
//SORTTEST JOB 1,JAFFE,CLASS=A,MSGCLASS=T,NOTIFY=&SYSUID
//SORT      EXEC PGM=SORT
//SYSOUT   DD SYSOUT=*
//SORTDIAG DD DUMMY
//SORTIN   DD *
lower case      florida department of Palm trees
UPPER CASE      FLORIDA DEPARTMENT OF ORANGE GROVES
exclude this record  California state
alternate case  FLORIdA DePaRtMeNt Of PaLm TrEeS
sentence        Florida Department Of Revenue
Mixed case      ARIZONA DEPARTment of Motor Vehicles
//SORTOUT   DD SYSOUT=*
//SYSIN     DD *
OPTION COPY
INCLUDE COND=(25,50,SS,RE,C'(?-i)(DePaRtMeNt)')
//*
```

- Had it worked, it should have selected only the line in **this color**.
- Unfortunately, the parser didn't like it and I received:
ICE167A E THE REGULAR EXPRESSION COMPILE ENDED WITH AN ERROR. EC=13
- Will pursue another time.

Add JCTJOBID and Sysplex to SMF types 62/64 (VSAM activity)

Use case:

BUSVAL : 4

INIVAL : 4

ENDVAL : 4

GROVAL : 4

SYSVAL : 4

KEYWORDS : SMF TYPE 62 TYPE 64 VSAM

UGVOTES : +5=1 +4=6 +3=9 +2=7 +1=3 abstain=5 -2=1 Priority=2.6

DESCRIPT : JCTJOBID and Sysplex should be added to all SMF job-related records because its often important to understand where a job ran for charge back or capacity planning. The SMF types 62 and 64 dont have the jobid or sysplex name so must be merged back to the type 30 record to determine the correct sysplex. The JCTJOBID is needed because its possible to have duplicate job names with the same reader timestamp. TimeLimit: 2 years

VALUE :

Add JCTJBID and Sysplex to SMF types 62/64 (VSAM activity)

Offset	Name	Length	Format	Description
296	128 SMF64RLM	4	binary	Number of control areas reclaimed in the KSDS since the Last EOV or CLOSE
300	12C SMF64NTA	4	binary	DASD data set key label
304	130 SMF64JobID	8	EBCDIC	Job ID
312	138 SMF64SysplexName	8	EBCDIC	Sysplex Name

The fields SMF64RLM and SMF64NTA are preexisting and are shown in the above table for context.

Problem conclusion

The fields have been added to the SMF 62 and 64 records.

Temporary fix

Comments

APAR Information

- Two APARs in support of this enhancement:
 - OA57105 (VSAM)
 - OA57152 (RLS)
- Both made GA!
- The APAR text describes the changes made to the records in detail.
 - SMFnnJobID
 - SMFnnSysplexName

Create D DEVSUP MVS command to display DEVSUP parms in real-time

Description:

While you can dynamically set DEVSUP parms with SET DEVSUPxx, there is no way to confirm the settings because there isn't an MVS command to display DEVSUP. An MVS command to display DEVSUP parms is necessary and should be added to the operating system.

Use case:

Submitted By: 3100012R4F #156

Submitted Date: 2018-02-20, Submitted By: Tom Conley

UGVOTES: +1=0 +2=0 +3=0 +4=0 +5=0 +6=0 +7=5 +8=6 +9=0 +10=1 +11=0

Priority: 7.75

Keywords: DEVSUPxx DISPLAY MVS z/OS COMMAND

Use Case: Sysprogs have no way to determine the current settings of the DEVSUPxx parms. This makes it impossible to determine, for example, the value of the NON_VSAM_XTIOT value at any given time. It also makes it impossible to determine if the results of a SET DEVSUP=XX command completed successfully.

If IBM does not provide a command to do this, sysprogs must "trust" that the OS is doing what it is supposed to do, with no way to confirm it. No time limit for a solution.

Suggested Solution: D DEVSUP console command.

Create D DEVSUP MVS command to display DEVSUP parms in real-time

OA57711: OCEOV SUPPORT FOR D DEVSUP CMD

APAR status

Closed as new function.

Error description

New function DISPLAY DEVSUP requires OCEOV support. This APAR will provide a new module (IFG0DEV D) and its code to 240.

Problem summary

```

*****
* USERS AFFECTED:                                *
* D DEVSUP                                        *
*****
* PROBLEM DESCRIPTION:                            *
* adding functionality, development              *
*****
* RECOMMENDATION:                                *
*****

```

- This APAR delivered with PTF UA99731.
- It made GA!

Create D DEVSUP MVS command to display DEVSUP parms in real-time

```

D DEVSUP
IEA253I DISPLAY DEVSUP Start of Report 093
ALVERSION=3
COMPACT=NO
COPYSDB=INPUT
DDRSIZELIM=1000M
ENABLE(ZERO_DIR_PDS)  DISABLE(CI_LVL_CHK)  ENABLE(REFVTOC)
ENABLE(REFUCB)  DISABLE(PPRCSUM)  ENABLE(SSR)  DISABLE(PPRCMT)
DISABLE(AOM496I)
ENFORCE_DC_MEDIA=*
EOSCYCLES=0
EOSV2=NO
ERROR=000E
EXPIRATION_MESSAGE=ALWAYS
FLASHCOPYTOXRC=NO
GREATER_253=NO
ICKDSF_NODSEXIST=NO
ICKDSF_VERIFYOFFLINE=YES
JES3_ALLOC_ASSIST=NO
MEDIA1=0001  MEDIA2=0002  MEDIA3=0003  MEDIA4=0004
MEDIA5=0005  MEDIA6=0006  MEDIA7=0007  MEDIA8=0008
MEDIA9=0009  MEDIA10=000A  MEDIA11=000B  MEDIA12=000C
MEDIA13=000D
MULTINCRFLC=YES
NON_VSAM_XTIOT=YES
PPRCSYMCONFIG=NO
PRIVATE=000F
TAPEAUTHDSN=NO
TAPEAUTHF1=NO
TAPEAUTHRC4=ALLOW
TAPEAUTHRC8=FAIL
TAPEBLKSZLIM=32760
VOLNSNS=NO
DISPLAY DEVSUP End of Report
***** Bottom of Data *****

```


DSS needs to support Extended TIOT

Description:

When copying a large number of data sets, DSS can very quickly reach the TIOT limit if there are lots of multi-volume data sets spread across a lot of volumes. When this happens, DSS just issues the following message for all subsequent attempts to add volumes to the TIOT.

```
ADR405E (001)-DYNA (02), DYNAMIC ALLOCATION OF VOLUME P2P0F0 FAILED.  
ERROR CODE 0450. INFORMATION CODE 0000
```

The data sets on the volumes that cannot be dynamically allocated then fail to get copied/moved. This requires capturing a list of the failed data sets and submitting an additional DSS job to copy the remaining data sets. If there are more ADR405E errors, this has to be done again.

DSS by nature tends to dynamically allocate a lot of volumes. DSS should be enhanced to supported Extended TIOT to be able to dynamically allocate more volumes.

SHARE Requirements DELIVERED VIA SPE

Incremental Backup Improvement

Description:

SUBMITTER SECTION

FIT Number: MR00043059

User Marketing Field Requirement Number: JOOS0094028

Title: Incremental backup improvement

Submitted By: Yutaka Nikkoh/Japan/IBM

Originators Area: N/A / 81-3-3808-3795

FPOC: Glenn Wilcock/Tucson/IBM

Submitted Date: 03/29/1994

Due Date: 02/17/2000

Use case:

Want or Need: Incremental backup control by SG unit in DFHSM. Time
Limit: 1 year.

Incremental Backup Improvement

**Most recent IBM
developer update:**

 [IBM_Systems_Developer](#) (IBM)

V2R3 introduced the capability to assign multiple HSM hosts system affinity to individual storage groups. By running Automatic Backup at different times on different HSM hosts (on different systems or via MASH), those Hosts can process just those storage groups that they have been assigned.

Updated on:

12 Jun 2019, 07:22 PM Eastern Time (ET)

Submitter:

 [SHAREInc.](#)

Incremental Backup Improvement

OA52901: NEW FUNCTION

Problem summary

```

*****
* USERS AFFECTED:                                *
* All DFSMShsm users.                            *
*****
* PROBLEM DESCRIPTION:                          *
* New Function: Transparent Cloud                *
* Tiering (TCT) Automatic Migration             *
* to Cloud Storage for DFSMS.                   *
*****
* RECOMMENDATION:                               *
*****
TCT Automatic Migration to Cloud Storage for DFSMS.
  
```

- SPE aka “continuous delivery”
- Closed 2017-12-16
- Last modified 2018-09-12
- PTF UA94825 in z/OS 2.3
- PE FIX APAR OA54628 is also required
- Closed 2018-03-16
- Last modified 2018-05-10
- PTF UA95593 in z/OS 2.3

Parameter for Detecting DSA Overlay

Use case:

BUSVAL : 4

INWVAL : 4

ENDVAL : 3

GROVAL : 4

SYSVAL : 5

KEYWORDS : LE Language Environment DSA Storage

UGVOTES : +5=3 +4=4 +3=8 +2=5 +1=2 abstain=2 Priority=3.0

DESCRIPT : Id like a run-time parameter that is able to tell when a DSA stack element has been overlaid similar to HEAPCHK for the heap. We run into the problem sometimes where there is a DSA overlay and restoring the callers registers and returning yields a wild branch. TimeLimit: Having the parameter implemented within 6 months would be nice. Theres no immediate need for this enhancement but the ocassion does come up from time to time.

VALUE : As mentioned earlier storage overlays can be very difficult to diagnose.

Parameter for Detecting DSA Overlay

PI73324: NEW FUNCTION.

Problem summary

```
*****
* USERS AFFECTED: Language Environment users who want to      *
*                   exploit STACKPROTECT option in XL C/C++    *
*                   compiler, or users who want to exploit    *
*                   STKPROT keyword in Language Environment   *
*                   provided assembler macros.                 *
*****
```

```
*****
* PROBLEM DESCRIPTION: Language Environment is updated to     *
*                   support XL C/C++ compiler option          *
*                   STACKPROTECT and Language Environment     *
*                   provided assembler macros with             *
*                   keyword STKPROT.                           *
*****
```

```
*****
* RECOMMENDATION:                                             *
*****
```

See Problem Description.

- SPE aka “continuous delivery”
- Closed 2018-06-28
- Last modified 2018-08-02
- PTF UI56964 in z/OS 2.3

- Haha! I don’t personally ever code in languages with a run-time. So, you’ll just have to take IBM’s word for it that this works! LOL

In WFE, soft wrap Instruction edit window rather than forcing scrolling left and right

Description:

In z/OSMF WorkFlow Editor, soft wrap text edit windows rather than forcing scrolling left and right to see entire statements for Description and Instructions.

Typing information in the description or Instruction text entry window is extremely unfriendly. Typing longer text than the few characters visible in the tiny, unchangable window means text disappears on the right until you scroll. It's very hard to enter text if you cannot see it or have to frequently scroll right and left to view information that you want to provider to the workflow user.

Use case:

Submitted By: 3100012QPR #148

Submitted Date: 2018-05-01, Submitted By: Ed Webb

UGVOTES: +1=0 +2=1 +3=0 +4=1 +5=5 +6=1 +7=5 +8=2 +9=1 +10=2
+11=0

Priority: 6.50

Keywords: z/OSMF Workflow editor usability

Use Case: As in the description, usability of text entry is very awkward and unfriendly. It's so hard to edit this info in the Workflow Editor that we abandoned using z/OSMF Workflows for some internal tasks.

In WFE, soft wrap Instruction edit window rather than forcing scrolling left and right

PH04817: NEW FUNCTION -

Problem summary

```
*****
* USERS AFFECTED: *
* ALL USERS OF WORKFLOW FOR z/OS V2R2 and V2R3 *
*****
* PROBLEM DESCRIPTION: *
* THIS APAR PROVIDES NEW FUNCTION *
*****
* RECOMMENDATION: *
*****
This APAR delivers new function to workflows and workflow
editor.
```

The following new features have been added to Workflow:

- Rest Step Support for HTTPS
- Support for Array Variables
- Workflow Editor Support for Data Sets
- Workflow Editor Step Tool Box

- SPE aka “continuous delivery”
- Closed 2018-11-30
- Last modified 2019-01-02
- PTF UI60040 in z/OS 2.3

Enhance Converter function of RMF Spreadsheet Reporter

Description:

Copied from old SHARE Requirements system SSEWCP00003: Voting
Priority=2.4

+5=1 +4=2 +3=7 +2=7 +1=5 abstain=2 Priority=2.4

The Converter portion of the RMF spreadsheet reporter often blows up when confronted with RMF (postprocessor output) data which has been contaminated or distorted somehow. When it does so; there is no clear error message indicating in

1. which RMF report the problem lies;
2. Which line has the problem.

It should be noted that IBM RMF Development requested the requirement rather than accepting a PMR to address a change.

- Could not find this APAR using “Granular APAR Search for System Z”
- Could not find it with traditional Google search either
- Nevertheless, IBM says it has been delivered.

FUN STUFF PLANNED for 2.4
I WANTED TO TRY

RACF ACEE Privilege Escalation Detection

- After activating ACEECHK, I wrote this trivial program for illustration purposes only:

```

. Loc      Object Code      Addr1      Addr2      Stmt  Source Statement      HLASM R6.0
.00000000          00000000 0000001C      1 ZAPACEE  CSECT ,
.00000000 E330 0224 0017          00000224      2          LLGT 3,PSAAOLD-PSA(,0)  Get ASCB address
.00000006 E330 306C 0017          0000006C      3          LLGT 3,ASCBASXB-ASCB(,3) Get ASXB address
.0000000C E330 30C8 0017          000000C8      4          LLGT 3,ASXBSENV-ASXB(,3) Get ACEE address
.          R:3 00000000      5          USING ACEE,3          <Synchronize ACEE
.00000012 96B0 3026          00000026      6          OI  ACEEFLG1,ACEESPEC+ACEEOPER+ACEEAUDT
.00000016 94F7 3026          00000026      7          NI  ACEEFLG1,X'FF'-ACEELOGU Lets have fun!
.          8          DROP 3          <Drop ACEE
.0000001A 07FE          9          BR  14

```

- For ways to surreptitiously execute this code while in PSW key zero, you might wish to attend a session by Phil Young, Chad Rikansrud, Mark Wilson, Marlaina Chirdon and others that specialize in helping you learn how to do such things.
- I simply used z/XDC (by ColeSoft) from TSO/E READY as follows:

```

xdccalla iefbr14
zap 224?+6c?+c8?+26=b0
end c

```

RACF ACEE Privilege Escalation Detection

- So what happened? Absolutely nothing. No messages of any kind issued.
- Then I entered ISPF, edited and saved a member in a library, and exited.

```
IRR421I ACEE modification detected 898
for user EDJX2 in address space ID 0x0000007B running under user
EDJX2 and job name EDJX2 while program ISPMAIN is running. The RACF
function detecting the modification is IRRRCK00. Rsn=0xA8000000.
(ACEEAUDT is ON) (ACEESPEC is ON) (ACEEOPER is ON). Occurrences 1.
Resource=EDJX2.MVS60.ISPPROF(DATASET). Call chain: ISPMAIN <- ISPF
<- IKJEFT09 <- IKJEFT02 <- IKJEFT01
```

```
IRR421I ACEE modification detected 899
for user EDJX2 in address space ID 0x0000007B running under user
EDJX2 and job name EDJX2 while program ISREDIT is running. The RACF
function detecting the modification is IRRRCK00. Rsn=0xA8000000.
(ACEEAUDT is ON) (ACEESPEC is ON) (ACEEOPER is ON). Occurrences 1.
Resource=SYS2.MVSUTIL.CNTL(DATASET). Call chain: ISREDIT <- ISPTASK
<- ISPF <- IKJEFT09 <- IKJEFT02 <- IKJEFT01
```

```
IRR421I ACEE modification detected 900
for user EDJX2 in address space ID 0x0000007B running under user
EDJX2 and job name EDJX2 while program ISPMAIN is running. The RACF
function detecting the modification is IRRRCK00. Rsn=0xA8000000.
(ACEEAUDT is ON) (ACEESPEC is ON) (ACEEOPER is ON). Occurrences 75.
Resource=EDJX2.ISP59836.SPFLOG1.LIST(DATASET). Call chain: ISPMAIN
<- ISPF <- IKJEFT09 <- IKJEFT02 <- IKJEFT01
```

- It's pretty great that it tells you someone is scamming on your system!!! 😊
- Just be careful not to point fingers at the programs whose names appear in the call chain.
- They will almost certainly be unwitting victims and NOT the perpetrator.

RACF ACEE Privilege Escalation Detection

- Some programs depend on privilege escalation for normal function.
- For them, you will need to create profiles in the ACEECHK class.

```

MVS60 - RACF COMMAND OUTPUT----- LINE 00000000 COL 001 080
COMMAND ==> ██████████ SCROLL ==> CSR
***** Top of Data *****
CLASS      NAME
-----
ACEECHK    IRR.EXCLUDE.ARCCTL

LEVEL      OWNER      UNIVERSAL ACCESS  YOUR ACCESS  WARNING
-----
 00        SYS1          NONE             ALTER        NO

INSTALLATION DATA
-----
NONE

APPLICATION DATA
-----
NONE

SECLEVEL
-----
NO SECLEVEL

CATEGORIES
-----
NO CATEGORIES

SECLABEL
-----
NO SECLABEL

AUDITING
  
```

HSM ZFS File Backup

- This SPE was implemented in z/OS 2.3 via APARs: OA54218, OA56145, OA52703, OA52836 and OA55165.
- The April doc is here: <http://publibz.boulder.ibm.com/zoslib/pdf/OA52703.pdf> and should hopefully be integrated into the official books by now.
- I was able to request backup of all files in a very small directory using this command from my TSO/E session:
 - HBACKDS '/u/edjx2/*'
- Despite me being a UID(0) requester, all files were accessed using the DFHSM userid and backup operations for z/OS UNIX files without read permission for 'other' failed.
 - Naturally, DFHSM was authorized for BPX.SUPERUSER (FACILITY) and for SUPERUSER.FILESYS.PFSCTL (UNIXPRIV).
 - Scratching my head about what was wrong, but at least it proved the backups do work.
- I also successfully HRECOVERed an individual z/OS UNIX file!

HSM ZFS File Backup

- I did TARGET(DASD) and observed a one-to-one relationship between the number of traditional MVS backup files on ML1 and z/OS UNIX files backed up.
 - Each required a minimum of one track.

```

Menu  Options  View  Utilities  Compilers  Help
MVS60 - Data Sets on volume MVSHM1                               Row 1 of 512
Command ==> █                                                Scroll ==> CSR
-----
Total Tracks:          32522 non-x:          32522 Data Sets:          512 non-x:          512
-----
Command - Enter "/" to select action                               Tracks %Used      XT
-----
DFHSM.BACK.THGVC20.$USEDJX2.EJESGPTF.A9180                      1    100      1
DFHSM.BACK.THHAH20.$USEDJX2.IZU$DISC.A9180                       3    100      1
DFHSM.BACK.TKBV016.$USEDJX2.$EJESCUR.A9180                       7    100      3
DFHSM.BACK.TKBXT16.$USEDJX2.ALLCLASS.A9180                       1    100      1
DFHSM.BACK.TKBYP16.$USEDJX2.ALLCLASS.A9180                       1    100      1
DFHSM.BACK.TKCAL16.$USEDJX2.CONSTANT.A9180                        1    100      1
DFHSM.BACK.TKCBG16.$USEDJX2.DEPRECAT.A9180                       1    100      1
DFHSM.BACK.TKCCB16.$USEDJX2.DIFF.A9180                            1    100      1
DFHSM.BACK.TKCCU16.$USEDJX2.EJESAPIC.A9180                        1    100      1
DFHSM.BACK.TKCDP16.$USEDJX2.EJESGPTF.A9180                       1    100      1
DFHSM.BACK.TKCE016.$USEDJX2.EJESLIC$.A9180                       1    100      1
DFHSM.BACK.TKCFJ16.$USEDJX2.EJESUNLK.A9180                       1    100      1
DFHSM.BACK.TKCGE16.$USEDJX2.EJES3.A9180                          1    100      1
DFHSM.BACK.TKCGY16.$USEDJX2.EXTRACT$.A9180                       1    100      1
DFHSM.BACK.TKCHT16.$USEDJX2.FILE1$TX.A9180                       1    100      1
DFHSM.BACK.TKCIQ16.$USEDJX2.FILE2$TX.A9180                       1    100      1
DFHSM.BACK.TKCMF16.$USEDJX2.HELP-DOC.A9180                       1    100      1
DFHSM.BACK.TKCNB16.$USEDJX2.INDEX$HT.A9180                       1    100      1
DFHSM.BACK.TKCNV16.$USEDJX2.INDEX-AL.A9180                       2    100      1
DFHSM.BACK.TKCOQ16.$USEDJX2.ISPFCMD.A9180                         1    100      1
DFHSM.BACK.TKCPO16.$USEDJX2.IZU$DISC.A9180                       2    100      1
DFHSM.BACK.TKCRI16.$USEDJX2.MY$SRV.A9180                          1    100      1
DFHSM.BACK.TKCSD16.$USEDJX2.MY$SRV$.A9180                        1    100      1

```


HSM ZFS File Backup

- I could not find a way to specify that z/OS UNIX file backups occur during automatic backup processing (of course the ZFS itself gets backed up).
- IBM indicated this SPE was intended to provide an alternative to IBM Spectrum Protect (aka Tivoli Storage Manager aka ADSTAR Distributed Storage Manager)
- I tried to set up an analog to our existing ISP nightly on-demand backup procedure.

```
//BKUPPUB1 JOB 1,SYSOPER,CLASS=A,MSGCLASS=T,TIME=NOLIMIT
//*MAIN SYSTEM=MVS60
//*
//* Perform Incremental Backup
//*
//BPXBATCH EXEC PGM=BPXBATCH,REGION=0M,
// PARM='SH dsmc incremental /hostlan/public1'
//STDOUT DD SYSOUT=*
//STDERR DD SYSOUT=*
//
```

HSM ZFS File Backup

- ISP does not support cascading mounts (what HSM calls "crossmount" processing), so I wanted to maintain that behavior.
- I started by trying to create an equivalent job using HSM's new **HBACKFIL** TSO command.

```
//BKUQPUB1 JOB 1,DFHSM,CLASS=A,MSGCLASS=T,TIME=NOLIMIT
//*MAIN SYSTEM=MVS60
//*
//* Perform Incremental Backup
//*
//DFHSM      EXEC PGM=IKJEFT01,DYNAMNBR=99,REGION=0M
//SYSTSPRT DD SYSOUT=*
//SYSPRINT DD SYSOUT=*
//SYSTSIN  DD *
  PROFILE PREFIX(DFHSM)
  HBACKFIL '/hostlan/public1/*' WAIT +
          CC(PREF) RECURSE(NOCROSSMOUNTS)
//
```

HSM ZFS File Backup

- My log filled up with tens of thousands of ICH70001I messages.

```

N 0020000 MVS60      2019181 08:01:56.61 DFHSM60 00000281 ICH70001I EDJXADM LAST ACCESS AT 08:01:56 ON SUNDAY, JUNE 30, 2019
N 0020000 MVS60      2019181 08:01:56.99 DFHSM60 00000281 ICH70001I EDJXADM LAST ACCESS AT 08:01:56 ON SUNDAY, JUNE 30, 2019
N 0020000 MVS60      2019181 08:01:57.38 DFHSM60 00000281 ICH70001I EDJXADM LAST ACCESS AT 08:01:56 ON SUNDAY, JUNE 30, 2019
N 0020000 MVS60      2019181 08:01:57.73 DFHSM60 00000281 ICH70001I EDJXADM LAST ACCESS AT 08:01:57 ON SUNDAY, JUNE 30, 2019
N 0020000 MVS60      2019181 08:01:57.80 DFHSM60 00000281 ICH70001I EDJXADM LAST ACCESS AT 08:01:57 ON SUNDAY, JUNE 30, 2019
N 0020000 MVS60      2019181 08:01:58.13 DFHSM60 00000281 ICH70001I EDJXADM LAST ACCESS AT 08:01:57 ON SUNDAY, JUNE 30, 2019
N 0020000 MVS60      2019181 08:01:59.63 DFHSM60 00000281 ICH70001I EDJXADM LAST ACCESS AT 08:01:58 ON SUNDAY, JUNE 30, 2019
N 0020000 MVS60      2019181 08:01:59.99 DFHSM60 00000281 ICH70001I EDJXADM LAST ACCESS AT 08:01:59 ON SUNDAY, JUNE 30, 2019
N 0020000 MVS60      2019181 08:02:00.19 DFHSM60 00000281 ICH70001I EDJXADM LAST ACCESS AT 08:01:59 ON SUNDAY, JUNE 30, 2019
N 0020000 MVS60      2019181 08:02:00.56 DFHSM60 00000281 ICH70001I EDJXADM LAST ACCESS AT 08:02:00 ON SUNDAY, JUNE 30, 2019
N 0020000 MVS60      2019181 08:02:00.77 DFHSM60 00000281 ICH70001I EDJXADM LAST ACCESS AT 08:02:00 ON SUNDAY, JUNE 30, 2019
N 0020000 MVS60      2019181 08:02:01.22 DFHSM60 00000281 ICH70001I EDJXADM LAST ACCESS AT 08:02:00 ON SUNDAY, JUNE 30, 2019
N 0020000 MVS60      2019181 08:02:01.30 DFHSM60 00000281 ICH70001I EDJXADM LAST ACCESS AT 08:02:01 ON SUNDAY, JUNE 30, 2019
N 0020000 MVS60      2019181 08:02:01.68 DFHSM60 00000281 ICH70001I EDJXADM LAST ACCESS AT 08:02:01 ON SUNDAY, JUNE 30, 2019
N 0020000 MVS60      2019181 08:02:01.94 DFHSM60 00000281 ICH70001I EDJXADM LAST ACCESS AT 08:02:01 ON SUNDAY, JUNE 30, 2019
N 0020000 MVS60      2019181 08:02:02.30 DFHSM60 00000281 ICH70001I EDJXADM LAST ACCESS AT 08:02:01 ON SUNDAY, JUNE 30, 2019
N 0020000 MVS60      2019181 08:02:02.87 DFHSM60 00000281 ICH70001I EDJXADM LAST ACCESS AT 08:02:02 ON SUNDAY, JUNE 30, 2019
N 0020000 MVS60      2019181 08:02:03.26 DFHSM60 00000281 ICH70001I EDJXADM LAST ACCESS AT 08:02:02 ON SUNDAY, JUNE 30, 2019
N 0020000 MVS60      2019181 08:02:04.45 DFHSM60 00000281 ICH70001I EDJXADM LAST ACCESS AT 08:02:03 ON SUNDAY, JUNE 30, 2019
N 0020000 MVS60      2019181 08:02:04.78 DFHSM60 00000281 ICH70001I EDJXADM LAST ACCESS AT 08:02:04 ON SUNDAY, JUNE 30, 2019
N 0020000 MVS60      2019181 08:02:05.10 DFHSM60 00000281 ICH70001I EDJXADM LAST ACCESS AT 08:02:04 ON SUNDAY, JUNE 30, 2019
N 0020000 MVS60      2019181 08:02:05.61 DFHSM60 00000281 ICH70001I EDJXADM LAST ACCESS AT 08:02:05 ON SUNDAY, JUNE 30, 2019
N 0020000 MVS60      2019181 08:02:05.87 DFHSM60 00000281 ICH70001I EDJXADM LAST ACCESS AT 08:02:05 ON SUNDAY, JUNE 30, 2019
N 0020000 MVS60      2019181 08:02:06.26 DFHSM60 00000281 ICH70001I EDJXADM LAST ACCESS AT 08:02:05 ON SUNDAY, JUNE 30, 2019
N 0020000 MVS60      2019181 08:02:06.58 DFHSM60 00000281 ICH70001I EDJXADM LAST ACCESS AT 08:02:06 ON SUNDAY, JUNE 30, 2019
N 0020000 MVS60      2019181 08:02:06.83 DFHSM60 00000281 ICH70001I EDJXADM LAST ACCESS AT 08:02:06 ON SUNDAY, JUNE 30, 2019
N 0020000 MVS60      2019181 08:02:07.35 DFHSM60 00000281 ICH70001I EDJXADM LAST ACCESS AT 08:02:06 ON SUNDAY, JUNE 30, 2019
N 0020000 MVS60      2019181 08:02:12.13 DFHSM60 00000281 ICH70001I EDJXADM LAST ACCESS AT 08:02:07 ON SUNDAY, JUNE 30, 2019

```

HSM ZFS File Backup

- My TSO/E session was sent annoying messages for every "no read access" failure. I pressed <Enter> literally hundreds of times!

```

PAGE 0001      5695-DF175  DFSMSDSS V2R03.0 DATA SET SERVICES      2019.181 08:06
ADR035I (SCH)-PRIME(06), INSTALLATION EXIT ALTERED BYPASS FAC CLASS CHK DEFAULT TO YES
  DUMP PATH(INCLUDE('hostlan/public1/zHPF/First: zHPF: example: program:+
    run.eml')) -
    WORKINGDIRECTORY('/') -
    OUTDDNAME(SYS02004) CANCELERROR -
    CLONE(PREFERRED) -
    SHARE
ADR101I (R/I)-RI01 (01), TASKID 001 HAS BEEN ASSIGNED TO COMMAND 'DUMP '
ADR109I (R/I)-RI01 (01), 2019.181 08:06:12 INITIAL SCAN OF USER CONTROL STATEMENTS COMPLETED
ADR050I (001)-PRIME(02), DFSMSDSS INVOKED VIA CROSS MEMORY APPLICATION INTERFACE
ADR035I (001)-PRIME(50), INSTALLATION EXIT ALTERED TAPE BLOCK SIZE DEFAULT TO 32 K-BYTES
ADR016I (001)-PRIME(01), RACF LOGGING OPTION IN EFFECT FOR THIS TASK
ADR006I (001)-STEND(01), 2019.181 08:06:12 EXECUTION BEGINS
ADR650I (001)-UDFLT(01), ALL PATHS ARE RELATIVE TO WORKING DIRECTORY
/
ADR651W (001)-UDFLT(03), VFS CALLABLE SERVICE V_LOOKUP COMPLETED WITH
RETURN CODE 00000081 AND REASON CODE EF076028 WHILE FILTERING
  ./hostlan/public1/zHPF/First zHPF example programrun.eml
ADR664I (001)-DTUNX(01), 2019.181 08:06:12 PATH FILTERING IS COMPLETE. 3 OF 4 FILES WERE SELECTED
ADR454I (001)-UPRTT(01), THE FOLLOWING FILES WERE SUCCESSFULLY PROCESSED
  d ./hostlan
  d ./hostlan/public1
  d ./hostlan/public1/zHPF
ADR006I (001)-STEND(02), 2019.181 08:06:12 EXECUTION ENDS
ADR013I (001)-CLTSK(01), 2019.181 08:06:12 TASK COMPLETED WITH RETURN CODE 0004
ADR012I (SCH)-DSSU (01), 2019.181 08:06:12 DFSMSDSS PROCESSING COMPLETE. HIGHEST RETURN CODE IS 0004 FROM:
TASK      001
  
```

HSM ZFS File Backup

- I canceled the job, but the messages kept coming and coming.
- So I decided to perform a QUERY REQUEST followed by CANCEL REQUEST.
- I saw hundreds of entries and, erroneously assuming each was a separate request, decided to wait for completion.
- In fact, each work unit has the same request number.

```

ARC0167I (CONT.) EDJXADM, REQUEST 00000304, WAITING TO BE PROCESSED, 00132
ARC0167I (CONT.) MWE(S) AHEAD OF THIS ONE
ARC0167I BACKUP MWE FOR FILE /hostlan/public1/831_Roof/IMG_1479.JPG FOR USER
ARC0167I (CONT.) EDJXADM, REQUEST 00000304, WAITING TO BE PROCESSED, 00133
ARC0167I (CONT.) MWE(S) AHEAD OF THIS ONE
ARC0167I BACKUP MWE FOR FILE /hostlan/public1/falcon64/FUT04.FMF FOR USER
ARC0167I (CONT.) EDJXADM, REQUEST 00000304, WAITING TO BE PROCESSED, 00134
ARC0167I (CONT.) MWE(S) AHEAD OF THIS ONE
ARC0167I BACKUP MWE FOR FILE /hostlan/public1/831_Roof/IMG_1480.JPG FOR USER
ARC0167I (CONT.) EDJXADM, REQUEST 00000304, WAITING TO BE PROCESSED, 00135
ARC0167I (CONT.) MWE(S) AHEAD OF THIS ONE
ARC0167I BACKUP MWE FOR FILE /hostlan/public1/831_Roof/IMG_1481.JPG FOR USER
ARC0167I (CONT.) EDJXADM, REQUEST 00000304, WAITING TO BE PROCESSED, 00136
ARC0167I (CONT.) MWE(S) AHEAD OF THIS ONE
ARC0167I BACKUP MWE FOR FILE /hostlan/public1/falcon64/FUT06.FMF FOR USER
ARC0167I (CONT.) EDJXADM, REQUEST 00000304, WAITING TO BE PROCESSED, 00137
ARC0167I (CONT.) MWE(S) AHEAD OF THIS ONE
ARC0167I BACKUP MWE FOR FILE /hostlan/public1/831_Roof/IMG_1469.JPG FOR USER
ARC0167I (CONT.) EDJXADM, REQUEST 00000304, WAITING TO BE PROCESSED, 00138
ARC0167I (CONT.) MWE(S) AHEAD OF THIS ONE
  
```

HSM ZFS File Backup

- Feeling a little frustrated, I went to breakfast and let the system "do its thing".
- Eventually an ML1 DASD space shortage put a stop to the madness.
- The book recommended "inline backup" using ARCINBAK as an alternative technique, but you can't specify a whole directory with that.
 - Just one file per DD statement! Yikes!
- I decided to try using the new **hbackup** z/OS UNIX command instead.

```
//BKUQPUB1 JOB 1,DFHSM,CLASS=A,MSGCLASS=T,TIME=NOLIMIT
//*MAIN SYSTEM=MVS60
//*
//* Perform Incremental Backup
//*
//BPXBATCH EXEC PGM=BPXBATCH,REGION=0M,
// PARM='SH hbackup -cX -t DASD -C PREF /hostlan/public1/'
//STDOUT DD SYSOUT=*
//STDERR DD SYSOUT=*
//
```

HSM ZFS File Backup

- As expected, no TSO/E messages.
- ICH70001I messages still produced. ☹️

```

IEF403I BKURPUB1 - STARTED - TIME=14.57.21
ICH70001I EDJXADM LAST ACCESS AT 14:57:21 ON SUNDAY, JUNE 30, 2019
ICH70001I EDJXADM LAST ACCESS AT 14:57:21 ON SUNDAY, JUNE 30, 2019
ICH70001I EDJXADM LAST ACCESS AT 14:57:22 ON SUNDAY, JUNE 30, 2019
ICH70001I EDJXADM LAST ACCESS AT 14:57:22 ON SUNDAY, JUNE 30, 2019
ICH70001I EDJXADM LAST ACCESS AT 14:57:22 ON SUNDAY, JUNE 30, 2019
ICH70001I EDJXADM LAST ACCESS AT 14:57:22 ON SUNDAY, JUNE 30, 2019
ICH70001I EDJXADM LAST ACCESS AT 14:57:22 ON SUNDAY, JUNE 30, 2019
ICH70001I EDJXADM LAST ACCESS AT 14:57:22 ON SUNDAY, JUNE 30, 2019
ICH70001I EDJXADM LAST ACCESS AT 14:57:22 ON SUNDAY, JUNE 30, 2019
ICH70001I EDJXADM LAST ACCESS AT 14:57:22 ON SUNDAY, JUNE 30, 2019
ICH70001I EDJXADM LAST ACCESS AT 14:57:22 ON SUNDAY, JUNE 30, 2019
  
```

HSM ZFS File Backup

- I felt like I *must* have been doing something wrong!
- We use z/OS as our corporate file server for Windows, Mac and Linux clients. (Previously using SMB – currently transitioning to NFS.) We use it for VSS, GIT and everything else we have. There are hundreds of thousands of files in some really big ZFSes which we incrementally back up every day using ISP.
 - We depend on those backups for our Business Recovery Plan.
- To do the equivalent with DFHSM in our site, we need learn how to request that incremental z/OS UNIX file backups occur daily without regard to permission bit settings and (hopefully) without clogging up our z/OS log with millions of useless messages.
 - Perhaps we should have been a sponsor user for this SPE?

HSM ZFS File Backup

- IBM contacted me after SHARE in Pittsburgh to discuss my issues.
- The developer agreed my complaints were legitimate and was able to reproduce my observations in-house. The following APARs were created:
 - OA58150: HBACKDS / HBACKUP OF UNIX DIRECTORY CAUSES TOO MANY ICH700011 MESSAGES TO GO TO SYSLOG
 - OA58228: INSUFFICIENT AUTHORITY TO BACKUP UNIX FILE
 - Both available now
- With these installed, I tried backup up a large file system and ran into an issue backing up files with a embedded blanks in the file name. The backup stops due to a DSS failure: a “not found” condition caused by wrong syntax.
 - OA58295: UNABLE TO BACKUP UNIX FILE WITH A BLANK CHARACTER IN THE 72 CHARACTER BOUNDARY OF THE PATH OR FILENAME
 - Still open last time I looked (seems to have a November 22 target)

HSM ZFS File Backup

- I do believe IBM will eventually make it all work. However, to truly replicate ISP's behavior one would need to backup everything to DASD (ML1) and then migrate HSM's backup files to ML2.
- I'm not a fan of rounding up the size of every file to a 3390 track boundary. When I "complained" about that, Glenn Wilcock told me the intended use is to backup to tape.
- I'm trying to make that work, but it is sloooow. For one thing, every file starts a completely new process (there is no "batching" of requests) and, of course, tape speeds simply can't compare to DASD.
 - We're using TS1140s driven by a 3592-C07 controller
- A VTS (which I do not have) will likely improve the transfer speed considerably and make direct-to-tape backup much more viable.
- There is still work to do on this project.

MCS Console Passphrases

- Delivered via APAR OA54790
 - UA97483 for z/OS 2.2 and UA97482 for z/OS 2.3
- Needed for Multi-Factor Authentication (MFA)!
- Passphrase checking is enabled by defining the new SAF resource MVS.CONSOLE.PASSWORDPHRASE.CHECK in the OPERCMDS class.
- Active consoles will not perform checking until re-activated.
- Old way you get a 26-character entry field which allows old/new/new change format.
- New way you get 47 character fields, but must enclose passphrases in apostrophes.

```

IEE187I ENTER LOGON PARAMETERS
LOGON      PASSWORD
GROUP     SECLABEL
IEE163I MODE= RD
MA      D                               41/009
Connected to remote server/host 192.168.10.248 using lu/pool B600609 and port 1023
  
```

```

IEE187I ENTER LOGON PARAMETERS
LOGON      PW
GROUP     NEWPW
SECLABEL  VERPW
MA      D                               41/012
Connected to remote server/host 192.168.10.248 using lu/pool B600609 and port 1023
  
```

z/OS Container Extensions (zCX)

- Haha! I WISH!
- To run zCX I would have needed a z14 with a special hardware feature code.
- Plus some of the necessary support was delayed, so I couldn't have done much.
- Nevertheless, I am on record with this quote from IBM-MAIN...

“*Suppose your z/OS-resident application wants to access a microservice that runs on Linux. Do you want the request to go off platform, across interfaces you don't necessarily trust, into systems whose performance characteristics you don't necessarily understand, and whose maintenance schedules and downtime philosophies might not align with yours?*

Or would you prefer bullet-proof, secure, z/OS performance and infrastructure behind that microservice so you know it will be there when you need it – guaranteed? I know what my answer is...”

Ed Jaffe, CTO – Phoenix Software International

New LISTDSI Return Variables

- **SYSMAXGENS** - Maximum number of PDSE member generations allowed. Returned only when DIR operand is specified for a PDSE.
- **SYSDSVERSION** - Returns the PDSE data set version. Returned only when DIR operand is specified for a PDSE.
- **SYSENCRYPT** – Returns encryption status of a data as ‘YES’ or ‘NO’. If 'YES' then **SYSKEYLABEL** is also returned.
- **SYSKEYLABEL** - Key label of encrypted data set if **SYSENCRYPT** = ‘YES’.

Source Code

```

/* REXX */
rc = listdsi(ADATA dir)
say 'SYSMAXGENS=' SYSMAXGENS
say 'SYSDSVERSION=' SYSDSVERSION
say 'SYSENCRYPT=' SYSENCRYPT
say 'SYSKEYLABEL=' SYSKEYLABEL
  
```

z/OS 2.3

```

listtest
SYSMAXGENS=SYSMAXGENS
SYSDSVERSION=SYSDSVERSION
SYSENCRYPT=SYSENCRYPT
SYSKEYLABEL=SYSKEYLABEL
READY
  
```

z/OS 2.4

```

listtest
SYSMAXGENS=0
SYSDSVERSION=1
SYSENCRYPT=NO
SYSKEYLABEL=
READY
  
```

APF Authorization Checking by Dynamic LPA ADD

- The LPA ADD commands (via PROGxx and SETPROG command) have been enhanced to optionally disallow LPA adds from non-APF authorized libraries.
- APFREQ and NOAPFREQ keywords have been added to LPA ADD.

```
SETPROG LPA,ADD,DSNAME=PHOENIX.PROD.LOADLIB,MODNAME=$CPU,APFREQ
IEF196I IEF237I 911B ALLOCATED TO SYS00013
IEF196I IEF285I PHOENIX.PROD.LOADLIB KEPT
IEF196I IEF285I VOL SER NOS= T4USR1.
CSV551I 07.50.22 LPA ADD 630
SUCCESSFUL: 1 UNSUCCESSFUL: 0 NOT PROCESSED: 0
MODULE RESULT
$CPU SUCCESSFUL
```

```
SETPROG LPA,ADD,DSNAME=EDJXADM.NOTAPF.LOADLIB,MODNAME=$CPU,APFREQ
IEF196I IEF237I 911B ALLOCATED TO SYS00014
IEF196I IEF285I EDJXADM.NOTAPF.LOADLIB KEPT
IEF196I IEF285I VOL SER NOS= T4USR1.
CSV552I LPA ADD FUNCTION WAS NOT SUCCESSFUL. 636
DATA SET EDJXADM.NOTAPF.LOADLIB
IS NOT APF-AUTHORIZED
```

APF Authorization Checking by Dynamic LPA ADD

- New DEFAULTS LPA APFREQ|NOAPFREQ setting allows installation to establish the default mode of operation.

```
SETPROG DEFAULTS,LPA,APFREQ
```

```
CSV563I LPA DEFAULTS ARE SET TO 643
```

```
NOADDALIAS, APFREQ
```

```
SETPROG LPA,ADD,DSNAME=EDJXADM.NOTAPF.LOADLIB,MODNAME=$CPU
```

```
IEF196I IEF237I 911B ALLOCATED TO SYS00015
```

```
IEF196I IEF285I EDJXADM.NOTAPF.LOADLIB
```

```
KEPT
```

```
IEF196I IEF285I VOL SER NOS= T4USR1.
```

```
CSV552I LPA ADD FUNCTION WAS NOT SUCCESSFUL. 649
```

```
DATA SET EDJXADM.NOTAPF.LOADLIB
```

```
IS NOT APF-AUTHORIZED
```

C Headers for MVS Control Blocks

- Converted from PL/X mappings and NOT assembler mappings!
- This makes them actually readable and usable!

```
Navigation: see help for details
EUID=0 /VERYSB/usr/include/zos/
Type  Filename
-- Dir      .
-- Dir      ..
-- File     bpxysmf.h
-- File     cbrsmf.h
-- File     cnzmysmf.h
-- File     cnzmysm2.h
-- File     csvapsmf.h
-- File     csvdlsmf.h
-- File     csvftchx.h
-- File     csvlpsmf.h
-- File     cvt.h
-- File     fxefr.h
-- File     fxezctrl.h
-- File     gtzzsmf1.h
-- File     hisysmf.h
-- File     iazctkn.h
-- File     iazjcor.h
-- File     iazjpckp.h
-- File     iazjpcls.h
-- File     iazjpitd.h
-- File     iazjplex.h
-- File     iazjplxh.h
-- File     iazjpnjn.h
-- File     iazjproc.h
-- File     iazjpspl.h
-- File     iazlimd.h
-- File     iazsmf24.h
-- File     iazsmf25.h
```


C Headers for MVS Control Blocks

- IMHO they look great!!!
- Kudos to Peter Relson and the team: Bill Blair, David Crayford, Ed Legowski, Steve Goetze, Tony Harminc, Charles Mills, Jan Ott, Thomas David Rivers, Gord Tomlin, Kirk Wolf

```

File Edit Edit_Settings Menu Utilities Compilers Test Help
T4SY1 /VERYSB/usr/include/zos/cvt.h
Command ==>
000263 unsigned char cvtcvt[4]; /* CVT ACRONYM IN EBCDIC (EYE-CATCHER) */
000264 void * __ptr32 cvtcucb; /* ADDRESS OF THE UNIT CONTROL MODULE (UCM) */
000265 /*
000266 void * __ptr32 cvtqte00; /* ADDRESS OF THE TIMER ENQUEUE ROUTINE FOR
000267 INTERVAL TIMER */
000268 void * __ptr32 cvtqtd00; /* ADDRESS OF THE TIMER DEQUEUE ROUTINE FOR
000269 INTERVAL TIMER */
000270 void * __ptr32 cvtstb; /* ADDRESS OF THE I/O DEVICE STATISTICS
000271 TABLE */
000272 union {
000273     uint8_t cvtdcb; /* OPERATING SYSTEM FOR S/370-XA MODE
000274 EXECUTION, CVTMVSE, CVT4MS1, CVTOSEXT,
000275 CVT6DAT AND CVTMVS2 BITS ARE SET ON AT CVT
000276 CREATION. */
000277     struct {
000278         uint32_t cvtmvse : 1; /* S/370-XA MODE EXEC. */
000279         uint32_t cvt1sss : 1; /* PCP. ALSO, LANGUAGE COMPILERS MAY USE
000280 THIS BIT TO DETERMINE IF THEY ARE RUNNING
000281 UNDER OS OR VM (BIT WILL BE 0 FOR OS). */
000282         uint32_t cvt2sps : 1; /* MFT, OS/VVS1, VSE */
000283         uint32_t cvt4ms1 : 1; /* MVT, OS/VVS2 */
000284         uint32_t cvtosext : 1; /* INDICATOR THAT THE CVTOSLVL AREA IS
000285 PRESENT AND MAY BE REFERENCED. */
000286         uint32_t cvt4mps : 1; /* MODEL 65 MULTIPROCESSING */
000287         uint32_t cvt6dat : 1; /* DYNAMIC ADDRESS TRANSLATION BY CPU
000288 (OS/VVS1, OS/VVS2) */
000289         uint32_t cvtmvs2 : 1; /* MULTIPLE MEMORY OPTION OF OS/VVS2 IS
000290 PRESENT MDC131 */
000291     };
000292 };

```

IARV64 Explicit Origin Address

- Delivered via APAR OA56664
 - UA99159 for z/OS 2.2 and UA99158 for z/OS 2.3
- Implements new INORIGIN= keyword where you provide an eight-byte value that specifies the origin of the area.

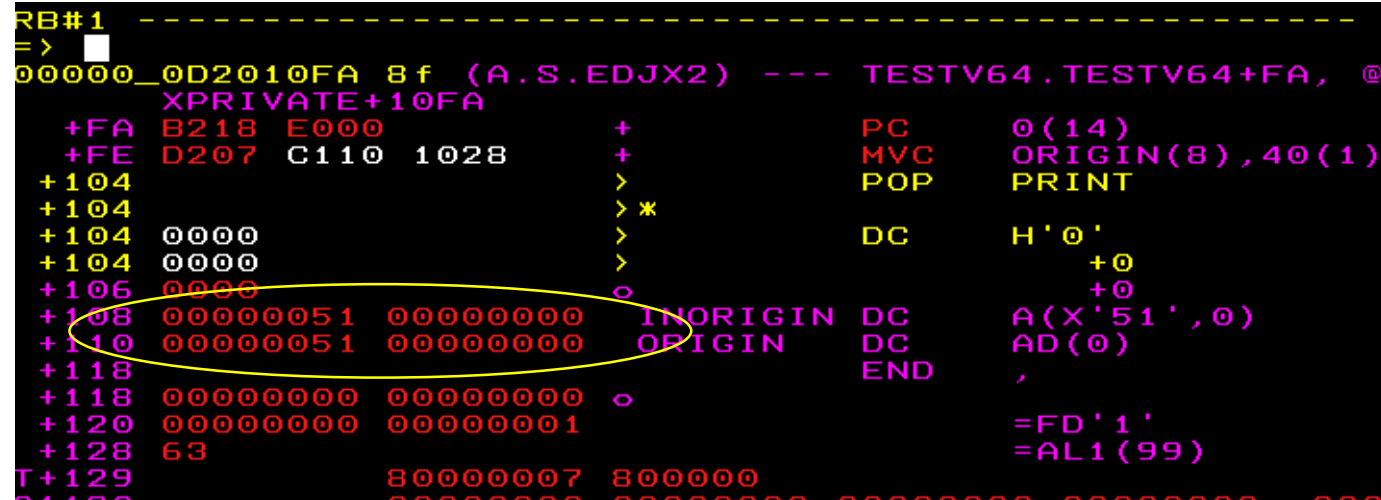
```

TESTV64 CSECT ,
TESTV64 AMODE 31
TESTV64 RMODE 31
LLGTR 12,15
USING TESTV64,12
IARV64 REQUEST=GETSTOR,      Acquire segment
      TYPE=PAGEABLE,        .Pageable storage
      SEGMENTS==FD'1',      .Just one 1M page
      PAGEFRAMESIZE=PAGEABLE1MEG, Prefer 1M
      INORIGIN=INORIGIN,    .Desired origin
      ORIGIN=ORIGIN         .Actual origin
DC     H'0'                  Force an abend

INORIGIN DC     A(X'51',0)    51_00000000
ORIGIN  DC     AD(0)         Return pointer

END ,
    
```

Tracing it through in z/XDC



```

RB#1 -----
=>
000000_0D2010FA 8f (A.S.EDJX2) --- TESTV64.TESTV64+FA, @
      XPRIVATE+10FA
+FA B218 E000 + PC 0(14)
+FE D207 C110 1028 + MVC ORIGIN(8),40(1)
+104 > POP PRINT
+104 >*
+104 0000 > DC H'0'
+104 0000 > +0
+106 0000 0 +0
+108 00000051 00000000 INORIGIN DC A(X'51',0)
+110 00000051 00000000 ORIGIN DC AD(0)
+118 00000000 00000000 0 END ,
+120 00000000 00000001 =FD'1'
+128 63 =AL1(99)
T+129 80000007 800000
    
```

TSO/E Password Special Characters

- The TSO/E LOGON panel has for many years allowed nearly all characters to be entered into the password field.
 - It's up to the security product to validate passwords.
- However, the LOGON command itself still allowed only A-Z, 0-9, @#\$.
- This restriction in the LOGON command was removed.
- It's valuable to know (and for me to let you know) this was done, but I didn't spend any time at all testing it.

RSM Sensitive Pages IARV64

- When you acquire storage, a new keyword allows you to indicate if the area might potentially contain “sensitive” customer data.
- For all I know, the system is ignoring this new setting at the moment. But, the idea is cool!
- New keyword: SENSITIVE=UNKNOWN|YES|NO on IARV64
- I compiled a test program with this keyword to show the flags being set in the parameter list, but beyond that there really wasn’t much I could do.

SENSITIVE=NO inserts this:

```
177+          OI      169(1),B'01000000' ++ INPUT BL1          01-IARV64
```

SENSITIVE=YES inserts this:

```
177+          OI      169(1),B'00100000' ++ INPUT BL1          01-IARV64
```

Stuff I WANTED To Look At But Didn't Have Time

- z/OS Encryption Readiness Technology (zERT) Network Analyzer
- IEAARRs Support Asynchronous Exits
- RSM Support for 64-Bit Data Sharing
- Perhaps if SHARE asks me back in Fort Worth, I'll have something in this space <wink>

Lotsa Other Cool Stuff Wasn't Ready In Time

- JES2 Disk Reader Support
- JES2 Encryption of SPOOL Data Sets
- JES2 Policy-Based Exit Replacement
- TLS 1.3 Support - Phase 1 support
- PDSE Encryption
- Data Set Level Encryption Phase 2
- zFS HA High Availability Mount Option
- Randomized Private Area Code and Data Start Points (ASLR)

New Macros in MACLIB and MODGEN

Macro	Description
APSGEXTP	PSF: INSTALLATION EXIT PARAMETER AREA
APSLCRL	PSF: CONCATENATED RETRIEVAL LIST
APSUECA	PSF: EXIT COMMUNICATIONS AREA
APSURLST	PSF: EXIT 7 RESOURCE LIST
APSUXP16	PSF: Installation Exit 16 Parameter Area
APSXUCOM	PSF: XUCOM Table Used for Date Calculations
CSFZCOMP	ICSF: Compliance-related structures
HISUSER	HIS: Retrieve task-related instrumentation data (RI)
IAZENOBJ	JES: SPOOL Encryption object
IAZENOPR	JES: SPOOL compression and/or encryption services
IAZJPCKP	JES: CKPT information parameter list for SSI 82 (JES2 only)
IAZLIMD	JES: JES Resource Limits Information Parameter List
IEATXDC	Transactional eXecution Diagnostic Controls
IGGENCPL	DFP: Access Method Encryption Routine Parameter List
IGGSYNT	DFP: SYNADAF Text Return Area
IGGVREC	DFP: BDW and RDW Mappings for Variable Format Data

- PSF user exit interface macros have finally been added. That component has been an optional z/OS feature for quite some time.
- Although Transactional Execution has been available since the z196 days, it could never be counted on until now because of z/VM restrictions.
- **BDW & RDW mappings have been needed since the S/360 days!**
 - Better late than never!
 - It only been 50+ years!!!!
 - The macro was created in 1999!

Deleted Macros in MACLIB and MODGEN

Macro	Description
CHSCED	MVSSERV: External Mapping of Environment Descriptor
CHSDCPRB	MVSSERV: Connectivity Programming Request Block
CHSTRACE	MVSSERV: Trace Facility Macro
DEFSERV	MVSSERV: Define Server Macro
IEFQMAT	SWA MANAGER ADDRESS TABLE AND EXTENSIONS
INITTERM	MVSSERV: Initialization/Termination Area
IOSDTCA	IOS: Descriptor Control Word List (Transport Mode I/O)
SENDREQ	MVSSERV: Send Request Macro

- TSO/E MVSSERV is removed in this release.
- IEFQMAT was missing in z/OS 2.3 and was re-added via OA53526 (PTF UA93054).
 - It disappeared again! An oversight or on purpose?
 - After asking IBM about it, they re-added it again with OA58066. Will it stick?
- IOSDTCA never should have been released to begin with. The proper mappings are in IOSDTCCB.

There were many other z/OS 2.4 features I knew about or heard 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...

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1 2 3 4 5 6 7 8 9

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