

The In's and Out's of DFSMSdss Exit Processing and Patch Options

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Agenda

- **DFSMSdss API's and UIM's**
 - Calling Block Structure
 - Examples
 - Cross Memory
- **DFSMSdss Exits**
 - Installation Exits
 - **ADRUIXIT**
 - **ADREID0**
- **DFSMSdss Patch Options**
 - **ADRPATCH**

DFSMSSdss API's and UIM's

- What is an API?
- What does it do
 - Calls ADRDSSU or ADRXMAIA
 - Using a LINK, LOAD, or ATTACH macro
 - Can establish the address of a UIM that will be called at various points (exit points...EIOPTION=EIOPxx) during DSS processing
 - ADRXMAIA runs DSS in the server address space (ADRXMAIB)
 - Will use more MIPS
 - HSM DSSXMMODE(YES|NO)



DFSMSSdss API's and UIM's

- What is a UIM
- What does it do
 - Is called by ADRDSSU at various exit points (EIOPTION=EIOPxx) during DSS processing
 - ADRDSSU presents the UIM with records and information that the UIM can use and modify if necessary
 - Can also terminate at a particular exit
 - PARM=SNAPX=exitnum
 - Can be used to see the contents of a particular EIOPxx



DFSMSdss API's and UIM's

- API Calling Block Structure
 - Entry point - name of module to be invoked
 - OPTPTR - options to be passed to DSS
 - Must follow the syntax of the PARM EXEC keywords
 - DDPTR - pointer to DDNAME list
 - Alternate names for the SYSIN and SYSPRINT
 - PAGEPTR - pointer to the page number list way to specify starting page number for system output on SYSPRINT
 - UIMPTR - pointer to the UIM
 - UAPTR - pointer to the user area list
 - Specifies an area to be passed to the UIM at exit points
 - ASIDPTR – pointer to the address space identifier
 - Useful only if using ADRXMAIA for the DFSMSDSS name
 - PARAM specifies the names of the pointers passed
 - VL – indicates a variable length. Must be VL=1 for LINK and ATTACH
 - CALL – EP address of program being started

DFSMSSdss API's and UIM's

- Examples calling ADRDSSU using ATTACH, LINK, CALL

ATTACH EP=ADRDSSU,PARAM=(OPTPTR,DDPTR,PAGEPTR,UIMPTR,UAPTR),VL=1

LINK EP=ADRDSSU,PARAM=(OPTPTR,DDPTR,PAGEPTR,UIMPTR,UAPTR),VL=1

CALL (15),(OPTPTR,DDPTR,PAGEPTR,UIMPTR,UAPTR),VL

- Examples calling ADRXMAIA using ATTACH, LINK, CALL

ATTACH EP=ADRXMAIA,PARAM=(OPTPTR,DDPTR,PAGEPTR,UIMPTR,UAPTR),VL=1

LINK EP=ADRXMAIA,PARAM=(OPTPTR,DDPTR,PAGEPTR,UIMPTR,UAPTR),VL=1

CALL (15),(OPTPTR,DDPTR,PAGEPTR,UIMPTR,UAPTR),VL

DFSMSdss API's and UIM's

- Cross Memory API..... WHY?
 - A DSS job step runs under a DFSMSdss server address space
 - There can be multiple DSS job steps (thread) running under the server
 - ADRXMAIB is the entry point
 - ADRXMAIA may be invoked from JCL
 - PGM=ADRXMAIA
 - Address space name will be DSSBATCH
 - Server shut down time varies
 - 1-8 minutes based on how it was created

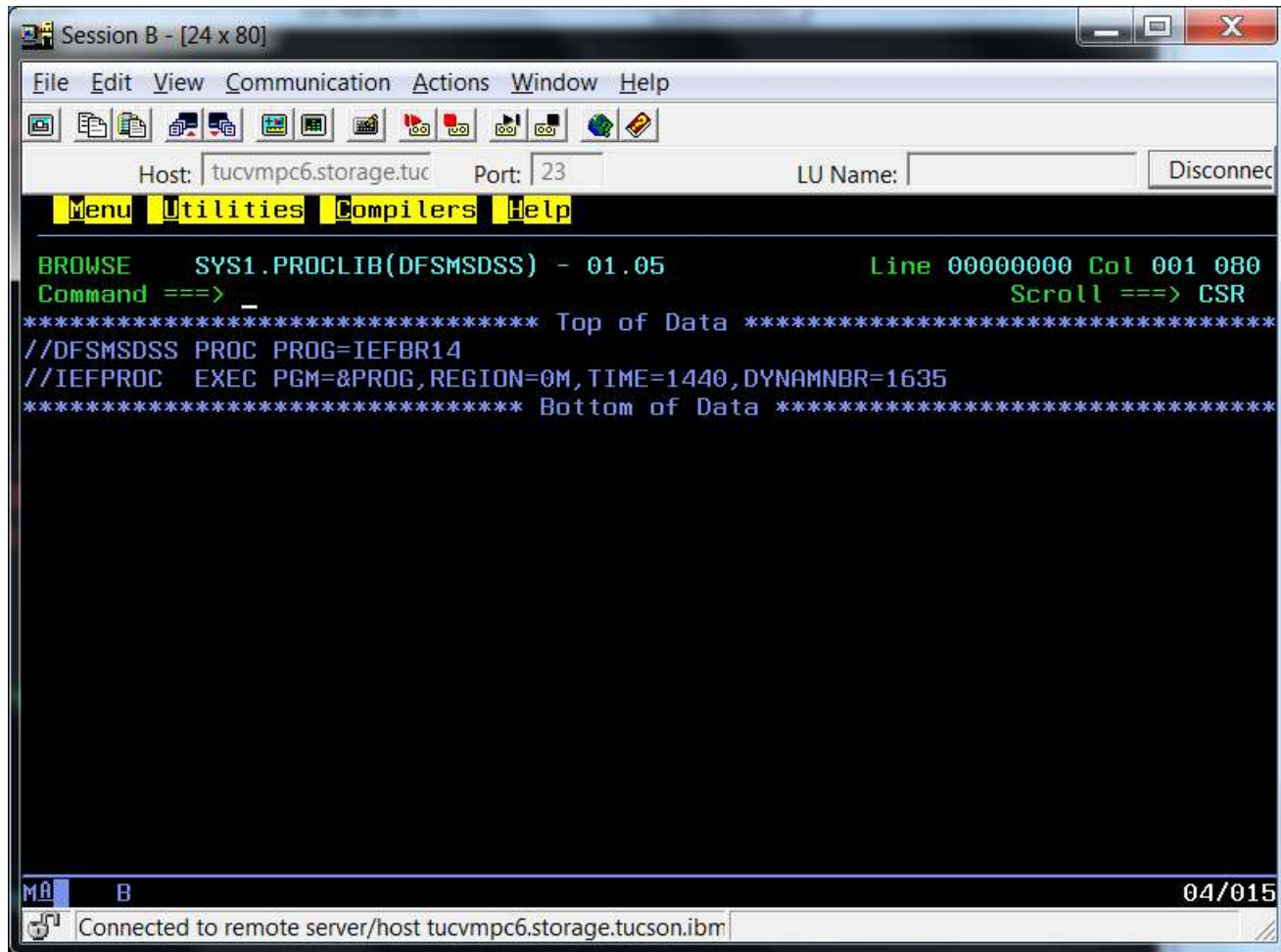
DFSMSdss API's and UIM's

- Cross Memory API..... WHY?
 - Saving 2.5 MB of storage in its own ASID vs more MIPS
 - Can create a server address space using the START command
 - Must add a member to SYS1.PROCLIB who invokes ADRXMAIB
 - Then type START DFSMSDSS,PROG=ADRXMAIB
 - If you want DSS batch jobs to be directed to the DFSMSDSS server you would invoke as follows

//S1 EXEC PGM=ADRXMAIA,PARM='ASPACE=DFSMSDSS'

DFSMSDss API's and UIM's

- DFSMSDSS member in SYS1.PROCLIB



The screenshot shows a TSO session window titled "Session B - [24 x 80]". The menu bar includes File, Edit, View, Communication, Actions, Window, and Help. The toolbar contains various icons for file operations and system functions. The status bar at the top shows "Host: tucvmc6.storage.tuc", "Port: 23", "LU Name:", and a "Disconnect" button. The main display area shows the following text:

```

Menu Utilities Compilers Help
BROWSE  SYS1.PROCLIB(DFSMSDSS) - 01.05          Line 00000000 Col 001 080
Command ==> _                                Scroll ==> CSR
***** Top of Data *****
//DFSMSDSS PROC PROG=IEFBR14
//IEFPROC  EXEC PGM=&PROG,REGION=0M,TIME=1440,DYNAMNBR=1635
***** Bottom of Data *****
  
```

The bottom status bar shows "MA B" on the left, "04/015" on the right, and "Connected to remote server/host tucvmc6.storage.tucson.ibm" in the center.

DFSMSDss API's and UIM's

- Start, Display, Modify

```

Session B - [24 x 80]
File Edit View Communication Actions Window Help
Host: tucvmc6.storage.tuc Port: 23 LU Name: Disconnect
- 10.59.35 SYSTEM1 START DFSMSDSS,PROG=ADRXMAIB
- 10.59.35 SYSTEM1 STC00057 $HASP100 DFSMSDSS ON STCINRDR
- 10.59.35 SYSTEM1 STC00057 $HASP373 DFSMSDSS STARTED
- 10.59.35 SYSTEM1 STC00057 ADR111I DFSMSDSS DFSMSDSS SERVER STARTED
- 10.59.35 SYSTEM1 STC00057 ADR111I DFSMSDSS USE MODIFY WITH STOP TO
- QUIESCE
- 11.01.36 SYSTEM1 d a,dfsmsdss
- 11.01.36 SYSTEM1 IEE115I 11.01.36 2013.037 ACTIVITY 148 C
JOBS M/S TS USERS SYSAS INITS ACTIVE/MAX VTAM OAS
00002 00015 00001 00037 00008 00001/00020 00007
DFSMSDSS DFSMSDSS IEFPROC NSW S A=003C PER=NO SMC=000
PGN=N/A DMN=N/A AFF=NONE
CT=000.010S ET=121.199S
WUID=STC00057 USERID=IBMUER
WKL=STC_WKL SCL=OPSDEF P=1
RGP=N/A SRVR=NO QSC=NO
ADDR SPACE ASTE=0EF4AF00
- 11.06.34 SYSTEM1 f dfsmsdss,stop
- 11.06.34 SYSTEM1 STC00057 DFSMSDSS IEFPROC _ ADRXMAIB 0000
- 11.06.34 SYSTEM1 STC00057 $HASP395 DFSMSDSS ENDED
IEE612I CN=MASTER1 DEVNUM=0500 SYS=SYSTEM1 CMDSYS=SYSTEM1

IEE163I MODE= RD
MR B 19/060
Connected to remote server/host tucvmc6.storage.tucson.ibm

```

Agenda

- DFSMSdss API's and UIM's
 - Calling Block Structure
 - Examples
 - Cross Memory
- **DFSMSdss Exits**
 - **Installation Exits**
 - **ADRUIXIT**
 - **ADREID0**
- DFSMSdss Patch Options
 - ADRPATCH

DFSMSdss Exits

- Installation Exits
 - Intended for use by system programmers
 - May affect all invocations of ADRDSSU (like HSM)
 - Following Installation Exits are available
 - ADRUPSWD
 - Allows exit to control or override authorization checks
 - Applies to volumes and data sets
 - Does not apply to RACF Facility Class Profile Names
 - ADRUENQ
 - To cause VTOC enqueue only for duration of accessing VTOC
 - May increase performance and decrease chance of contention
 - Tradeoff is it decreases data integrity
 - Enable by having ADRUENQ returns a RC=4

DFSMScss Exits

- Installation Exits
 - Following Installation Exits are available
 - ADRREBLK
 - Applies to COPY/RESTORE for Partitioned and Sequential
 - Called when REBLOCK/AUTOREBLOCK not specified
 - ADRRBLKB is the parameter list used
 - ✓ Options for either DSS or system to calculate block sizes

DFSMScss Exits

- ADRUIXIT
 - Method to override what keywords are specified in SYSIN
 - ADRUFO is the parameter list used
 - Can control EXEC PARM options as well
 - You can get very creative
 - Can bypass DSS RACF Facility Class Profile checking
 - Force users to specify keyword options
 - Can force options for all users or applications
 - **BE CAREFULL**
 - Why would you use ADRUIXIT?
 - Modify DSS steps in one place
 - Mutual exclusive checking still applies
 - ✓ CONCURRENT and DELETE
 - Quicker exploitation of new features
 - WYCIWYG “Code”



DFSMsDss Exits

- **ADRUIXIT Example**

ADRUIXIT CSECT	
ADRUIXIT AMODE 31	
ADRUIXIT RMODE 24	
STM 14,12,12(13)	SAVE REGISTERS
USING ADRUIXIT,15	ADDRESSABILITY TO ADRUIXIT
USING ADRUFOB,1	ADDRESSABILITY TO ADRUFO
SR 2,2	ZERO REGISTER 2
CH 2,UFFUNCT	CHECK ENTRY TYPE
BNE FUNCENT	BRANCH TO FUNCTION ENTRY
SR 3,3	PARM CHANGE ENTRY, SAVE RC 0
B FINISH	FINISHED
FUNCENT LH 2,UFBDOFF	GET OFFSET TO UFOFUNCT
AR 2,1	CALCULATE ADDRESS OF UFOFUNCT
USING UFOFUNCT,2	ADDRESSABILITY TO UFOFUNCT
NI UFO8FLGS,X'FF'-(UFOPMPRE+UFOPMNON+UFPMREQ)	
OI UFO8FLGS,UFOPMREQ	PRESERVE MIRROR PRESMIRREQ
LA 3,4	SAVE RETURN CODE 4
DROP 1	DONE USING 1 FOR ADRUFO
DROP 2	DONE USING 2 FOR UFOFUNCT
DROP 15	DONE USING 15 FOR ADRUIXIT
FINISH LR 15,3	SET RETURN CODE
L 14,12(,13)	RESTORE REGISTER 14
LM 0,12,20(13)	RESTORE REGISTERS 0 THRU 12
BR 14	RETURN
ADRUFO	INCLUDE ADRUFO CONTROL BLOCK
END	

- Use as a learning aid. Not guaranteed to run on a particular system without modification
 - See SAP Casebook reference

DFSMsds Exits

- ADREID0
 - Applies for API invocations of DSS
 - DSS calls UIM at several exit points (28 Exits today)
 - Exit points are described in ADREID0
 - Allow program to
 - ✓ Insert, replace, delete, or modify records
 - ✓ Get notified
 - RC = 16 indicates UIM that changes were made
 - Function Start Up – EIOPTION 00
 - This is where bypass options can be requested
 - Volume Security checking, Volume level enqueues
 - Writing WTO/WTOR message – EIOPTION 11/12
 - Call when WTO/WTOR msg is ready to be issued
 - Presenting ADRUFO Records – EIOPTION 13
 - Same functionality of ADRUIXIT (Installation Exit)
 - ADRUIXIT can override EIOPTION 13

DFSMSSdss Exits

- ADREID0
 - Bypass Verification – EIOPTION 22
 - ✓ Bypass options can be requested at data set level
 - Logical Data Set Processed – EIOPTION 23
 - ✓ Notifies if data set was successfully processed or not
 - ✓ Provides data set attributes of source and target
 - Concurrent Copy Initialization Complete – EIOPTION 24
 - ✓ Notifies that CC is complete, success or failure
 - ✓ One call per DSS step
 - Physical Data Set Processed – EIOPTION 27
 - ✓ Notifies if data set was successfully processed or not
 - ✓ Provides data set attributes of source and target
 - SMS Alternate Volume – EIOPTION 30
 - ✓ New in V2.1
 - ✓ Applies to physical data set processing
 - ✓ Program can give alternate volumes to attempt allocation

Agenda

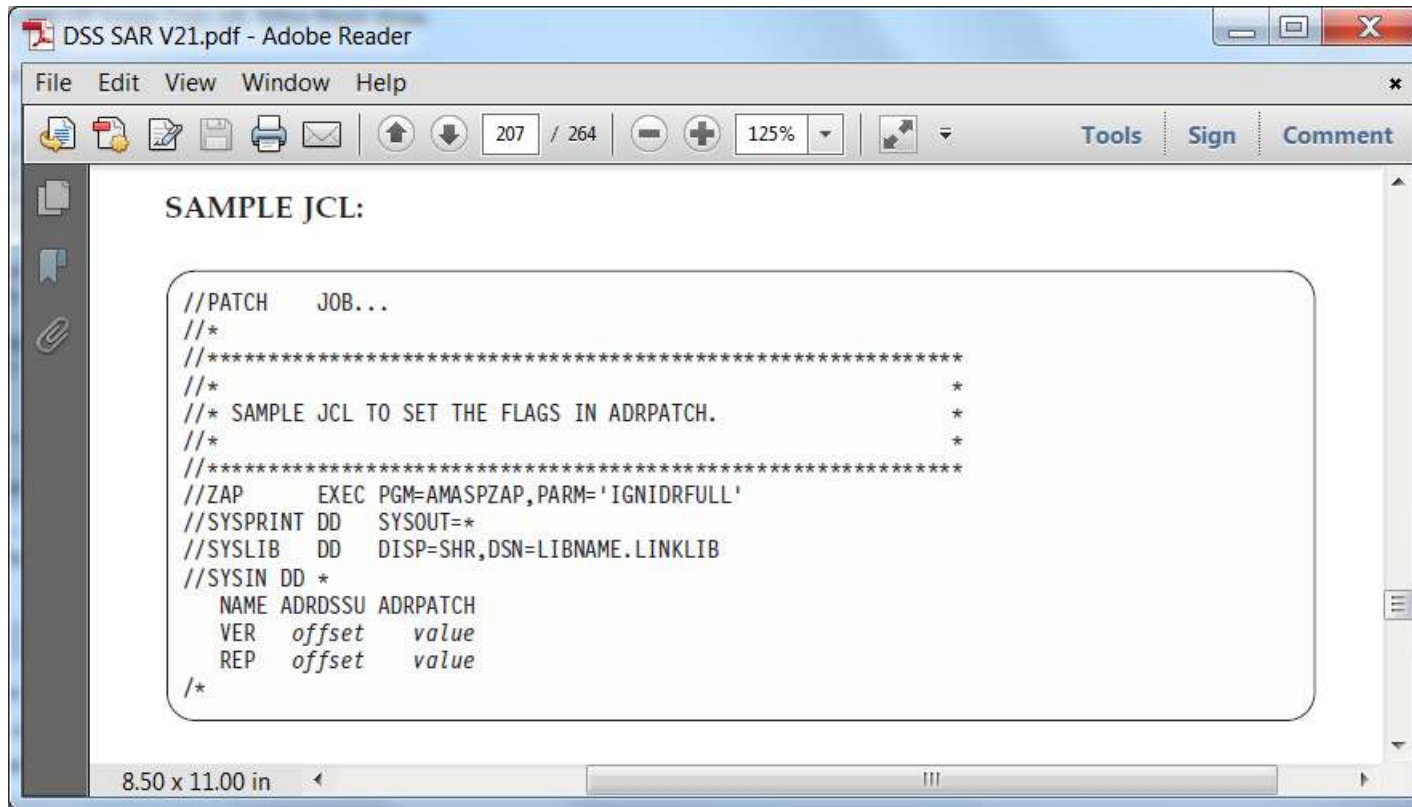
- DFSMSdss API's and UIM's
 - Calling Block Structure
 - Examples
 - Cross Memory
- DFSMSdss Exits
 - Installation Exits
 - ADRUIXIT
 - ADREID0
- DFSMSdss Patch Options
 - ADRPATCH

DFSMScss Patch Options

- ADRPATCH
 - Allows users to override standard DSS processing
 - Patch options described in ADRPTCHB
 - Has the final say in the logic flow
 - Can be set dynamically or system wide
 - SET PATCH
 - AMASPZAP
 - Can be protected using the RACF Facility Class
 - STGADMIN.ADR.PATCH
 - Only applies to SET PATCH

DFSMsDss Patch Options

- ADRPATCH
 - AMASPZAP example



DSS SAR V21.pdf - Adobe Reader

File Edit View Window Help

207 / 264 125% Tools Sign Comment

SAMPLE JCL:

```
//PATCH JOB...  
//*  
//*****  
//*  
//* SAMPLE JCL TO SET THE FLAGS IN ADRPATCH. *  
//* *  
//*****  
//ZAP EXEC PGM=AMASPZAP,PARM='IGNIDRFULL'  
//SYSPRINT DD SYSOUT=*  
//SYSLIB DD DISP=SHR,DSN=LIBNAME.LINKLIB  
//SYSIN DD *  
NAME ADRDSSU ADRPATCH  
VER offset value  
REP offset value  
/*
```

8.50 x 11.00 in

DFSMsDss Patch Options

- ADRPATCH
 - SET PATCH example
 - ADR113I issued

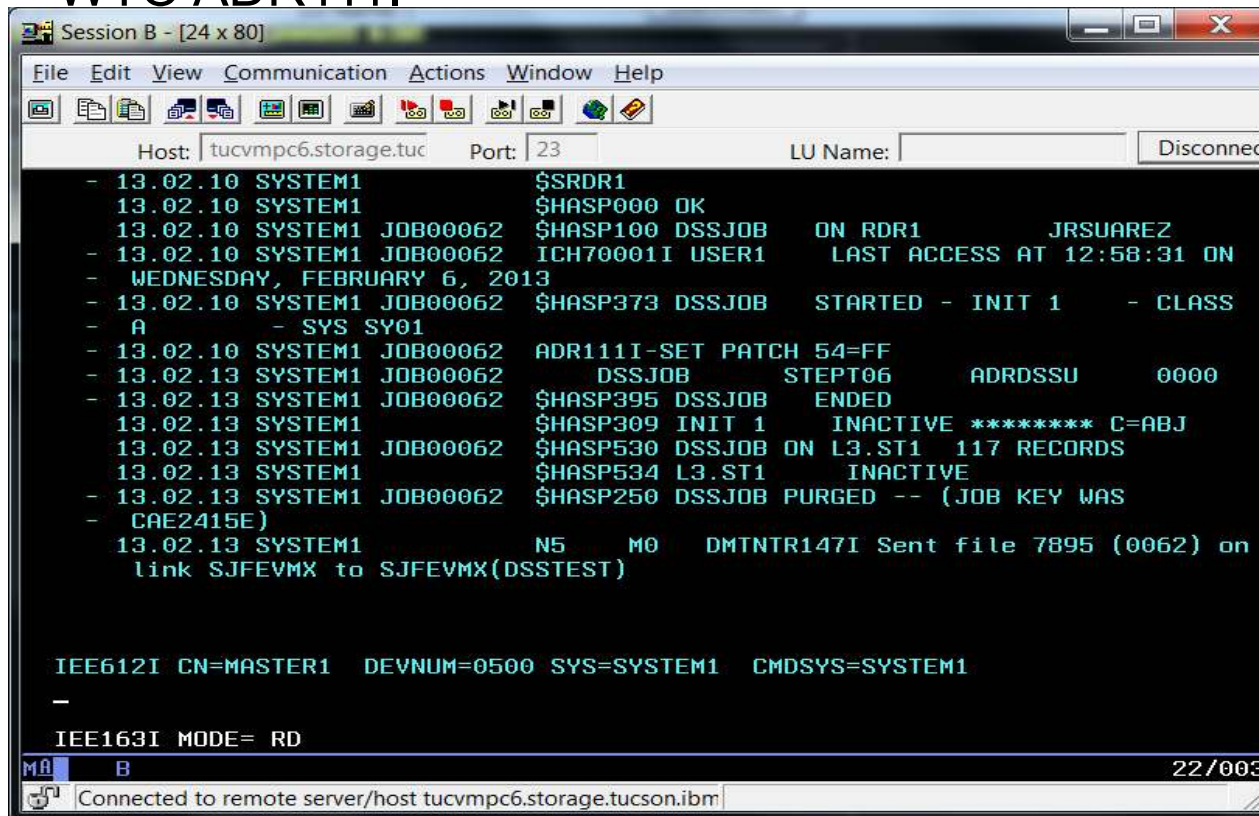
```

2596: JRSLC03 LISTING      Lrecl: 132   Line      59 of      119   Cols 001 to 160
Command input ==> _      SPD4.3xa
/*                               STEP STEPT06                               */
/*****                          *****/
SET PATCH 54 = FF
COPY DS(INC(SOURCE.XSAM.V2.TRK.**)) -
ADR101I (R/I)-RI01 (01), TASKID 001 HAS BEEN ASSIGNED TO COMMAND 'SET '
OUTDYNAM ( -
(T9SS01) -
(T9SS02) -
) -
ALLDATA(*) -
ALLEXCP -
FR(PREF) -
FCTOPPRCP(PMP) -
DEBUG(FRMSG(DETAILED)) -
DELETE -
SPHERE -
CATALOG -
STORCLAS(SC9TG016)
ADR101I (R/I)-RI01 (01), TASKID 002 HAS BEEN ASSIGNED TO COMMAND 'COPY '
ADR109I (R/I)-RI01 (01), 2013.037 13:02:10 INITIAL SCAN OF USER CONTROL STATEMENTS COMPLETED
ADR113I (R/I)-RI01 (01), PATCH BYTE AT OFFSET 0054 = FF
ADR016I (002)-PRIME(01), RACF LOGGING OPTION IN EFFECT FOR THIS TASK
ADR006I (002)-STEND(01), 2013.037 13:02:10 EXECUTION BEGINS

```

DFSMsds Patch Options

- ADRPATCH
 - SET PATCH example
 - WTO ADR111I



Session B - [24 x 80]

File Edit View Communication Actions Window Help

Host: tucvmc6.storage.tuc Port: 23 LU Name: Disconnect

```

- 13.02.10 SYSTEM1 $SRDR1
13.02.10 SYSTEM1 $HASP000 OK
13.02.10 SYSTEM1 JOB00062 $HASP100 DSSJOB ON RDR1 JRSUAREZ
- 13.02.10 SYSTEM1 JOB00062 ICH70001I USER1 LAST ACCESS AT 12:58:31 ON
- WEDNESDAY, FEBRUARY 6, 2013
- 13.02.10 SYSTEM1 JOB00062 $HASP373 DSSJOB STARTED - INIT 1 - CLASS
- A - SYS SY01
- 13.02.10 SYSTEM1 JOB00062 ADR111I-SET PATCH 54=FF
- 13.02.13 SYSTEM1 JOB00062 DSSJOB STEPT06 ADDRSSU 0000
- 13.02.13 SYSTEM1 JOB00062 $HASP395 DSSJOB ENDED
13.02.13 SYSTEM1 $HASP309 INIT 1 INACTIVE ***** C=ABJ
13.02.13 SYSTEM1 JOB00062 $HASP530 DSSJOB ON L3.ST1 117 RECORDS
13.02.13 SYSTEM1 $HASP534 L3.ST1 INACTIVE
- 13.02.13 SYSTEM1 JOB00062 $HASP250 DSSJOB PURGED -- (JOB KEY WAS
- CAE2415E)
13.02.13 SYSTEM1 N5 M0 DMTNTR147I Sent file 7895 (0062) on
link SJFEVMX to SJFEVMX(DSSTEST)

IEE612I CN=MASTER1 DEVNUM=0500 SYS=SYSTEM1 CMDSYS=SYSTEM1
-
IEE163I MODE= RD
MA B 22/003
Connected to remote server/host tucvmc6.storage.tucson.ibm
  
```

Reference Materials

- Publications
 - SC35-0423: DFSMSdss Storage Administration
 - SC26-7396: DFSMS Installation Exits
 - SAP Casebook: DB2 Backup, Recovery and Cloning SAP Environments
[http://www.sdn.sap.com/irj/scn/go/portal/prtroot/docs/library/uuid/80c929c9-fd4f-2f10-eeb5-e9ad675d0b2a?](http://www.sdn.sap.com/irj/scn/go/portal/prtroot/docs/library/uuid/80c929c9-fd4f-2f10-eeb5-e9ad675d0b2a?QuickLink=index&overridelayout=true&53983443977334)
QuickLink=index&overridelayout=true&53983443977334

System z Social Media Channels



- Top Facebook pages related to System z:
 - IBM System z
 - IBM Academic Initiative System z
 - IBM Master the Mainframe Contest
 - IBM Destination z
 - Millennial Mainframer
 - IBM Smarter Computing
- Top LinkedIn groups related to System z:
 - System z Advocates
 - SAP on System z
 - IBM Mainframe- Unofficial Group
 - IBM System z Events
 - Mainframe Experts Network
 - System z Linux
 - Enterprise Systems
 - Mainframe Security Gurus
- Twitter profiles related to System z:
 - IBM System z
 - IBM System z Events
 - IBM DB2 on System z
 - Millennial Mainframer
 - Destination z
 - IBM Smarter Computing
- YouTube accounts related to System z:
 - IBM System z
 - Destination z
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- Top System z blogs to check out:
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 - Smarter Computing
 - Millennial Mainframer
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 - The Mainframe Blog
 - Mainframe Watch Belgium
 - Mainframe Update
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 - Dancing Dinosaur
 - DB2 for z/OS
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THANK YOU!

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