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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
DFSMSdss 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)
DFSMSdss 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
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
DFSMSdss API's and UIM's

- Start, Display, Modify
Agenda

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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
DFSMSdss 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
DFSMSdss 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,UFBDYOFF GET OFFSET TO UOFUNCT
AR 2,1 CALCULATE ADDRESS OF UOFUNCT
USING UOFUNCT,2 ADDRESSABILITY TO UOFUNCT
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 UOFUNCT
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
DFSMSdss 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
DFSMSdss 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

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  - ADREID0
- DFSMSdss Patch Options
  - ADRPATCH
DFSMSdss 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

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 
** SYSSIN DD = 
** NAME ADDRSSU ADRPATCH 
** VER offset value 
** REP offset value
/*
```
DFSMSdss Patch Options

- **ADRPATCH**
  - SET PATCH example
    - ADR113I issued

```
2596: JRSLC03 LISTING  Lrecl: 102  Line 59 of 119  Cols 001 to 160
Command input =>* SET STEP STEPT06 */
/*******************************************************************************/
SET PATCH 54 = FF
COPY DS(INC(SOURCE.XSAM.V2.TRK.**)) -
ADR1011 (R/I)-RI01 (01), TASKID 001 HAS BEEN ASSIGNED TO COMMAND 'SET'
OUTDYNAM (-
(TYSS01) -
(TYSS02) -
)
ALJDATA(*) -
ALEXCP -
FR(PREF) -
FCIOPPRCP(PMP) -
DEBUG(FRMSG(DETAILED)) -
DELETE -
SPHERE -
CATALOG -
STORCLASS(XCSTG016)
ADR1011 (R/I)-RI01 (01), TASKID 002 HAS BEEN ASSIGNED TO COMMAND 'COPY'
ADR1091 (R/I)-RI01 (01), 2013.037 13:02:10 INITIAL SCAN OF USER CONTROL STATEMENTS COMPLETED
ADR1FR1 (R/I)-RI01 (01), PATCH BYTE AT OFFSET 0054 = FF
ADR616I (002)-PRIME(01), RACF LOGGING OPTION IN EFFECT FOR THIS TASK
ADR606I (002)-STEND(01), 2013.037 13:02:10 EXECUTION BEGINS
```
DFSMSdss Patch Options

- ADRPATCH
- SET PATCH example
  - WTO ADR111I
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?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
  - IBM Smarter Computing

- Top System z blogs to check out:
  - Mainframe Insights
  - Smarter Computing
  - Millennial Mainframer
  - Mainframe & Hybrid Computing
  - The Mainframe Blog
  - Mainframe Watch Belgium
  - Mainframe Update
  - Enterprise Systems Media Blog
  - Dancing Dinosaur
  - DB2 for z/OS
  - IBM Destination z
  - DB2utor
THANK YOU!

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

Jeff Suarez
IBM

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jrsuarez@us.ibm.com