DATASHEET

SMS/Debug and Audit

from DTS SOFTWARE

- *Visualizes z/OS installation DFSMS environment for storage administrators*
- *Quickly find errors, omissions, and other problems before they affect production*
- *Provides tracing with audit trail for ACS Routines, DADSM volumes, SMS volumes and other storage subsystems important to storage administrators*
- *Installs in minutes without the need for SMP/E tracking or an IPL*

DTS Software's ***SMS/Debug and Audit*** is an essential tool for the storage administrator that provides a window into your z/OS installation's critical DFSMS environment so you can ***find problems in the storage subsystem before they become critical and affect production***. SMS/Debug and Audit installs in minutes, does not require any SMP/E work or an IPL and no changes are made to z/OS libraries. At startup time, SMS/Debug and Audit dynamically installs all required operating system interfaces and automatically removes them at shutdown time. Tracing can be initiated either through JCL key-words or via flexible policy rules.

SMS/Debug and Audit provides unique storage management subsystem facilities such as:

Batch and ISPF ACS Testing, Tracing, and Debugging

SMS Configuration Compare Facility

ACS Routine Tracing

Volume Selection Tracing

DADSM Exit Tracing

SMS Construct Usage Reports

SMS Configuration and Recording

Major Features

ACS Routine Tracing

Have you ever tried to implement an ACS Routine change and found it didn't work as expected? When this happens, it's nearly impossible to easily discover the source of the error. Have you ever encountered a programming language that didn't allow for some form of execution tracing? How productive would you or your application programmers be if there was no trace facility for COBOL or C++? Wouldn't it be great if you could see the logic flow of your ACS routines and the values of all the ACS variables as classes are assigned to datasets? With SMS/Debug and Audit's ACS routine tracing facility, the ACS routines become more powerful because they are easier to test and debug. Special JCL keywords and DTS policy rules functions installations to trace individual datasets as they are allocated or as part of ISMF test. Both active and inactive sets of ACS routines can be traced.

SMS Volume Tracing

Have you ever been faced with trying to figure out why DFSMS picked, say volume SMS102 to place a dataset rather than another volume, or maybe why it never seems to pick volume SMS212? This can be especially difficult when unusual allocations occur at three o'clock in the morning. With SMS/Debug and Audit Volume Tracing, you can see all of the volumes considered for allocation, the threshold values, storage groups, and volume placement in the SMS Primary, Secondary, and Tertiary lists so that it becomes clear why one volume is selected and another is not.

SMS Configuration Compare Facility

SMS/Debug and Audit can directly compare the contents of a SMS Source Control Data Set (SCDS) to another SCDS or to the ACTIVE configuration. Every attribute of each SMS construct (data class, management, class, storage class, storage group, and more) is compared to the corresponding construct in another configuration and any differences are identified. Constructs which have changed, or which have been added or deleted, can be easily found, and the exact differences noted. The date, time, and userid of the user making the change is obtained from the configuration and included in the detailed report. A summary report identifies exactly how many constructs differ and which ones they are. SMS/Debug and Audit's Configuration Compare Facility allows installations to easily determine whether an SCDS properly matches the ACTIVE configuration, and to identify the differences between configurations.

SMS Configuration SMF Recording

SMS/Debug and Audit can write SMF records for each construct in a configuration, allowing installations to easily determine when the last change was made to SMS, who made it, and which construct or routine was changed. The SMF records record the date, time, and userid of the most recent change for each construct, and when used with the SMS Configuration Compare facility, can provide a complete history of all changes to an SMS configuration – who, what, and when.

DADSM Exit Tracing

When placing a dataset on a DASD volume, SMS may attempt placement on a number of volumes in sequence; DADSM (Direct Access Device Space Management) exits such as IGGPRE00/IGGPOST0 or vendor products may cause some of these volumes to be bypassed. Other conditions such as full or damaged VTOCs may also cause volumes to be bypassed. DFSMS however displays only the return code for the last volume tried, and then only if the allocation fails. It's impossible to know which volumes were rejected by DADSM and why. SMS/Debug and Audit will display all of the pre- and post-processing codes, providing a complete trail of which volumes were and were not considered for use by DFSMS.

Automated Test Case Generation, Testing, and Debugging

The ACSQA (Quality Assurance) component of SMS/Debug and Audit provides a set of robust tools for creating and executing ISMF test cases, either interactively or in batch, using real data and with much greater speed, accuracy, and ease-of-use than the very limited facilities available with SMS's Naviquest or native ISMF test. With ACSQA, installations can easily and automatically create, execute, and verify any number of ISMF test cases, an essential step whenever changes must be made to the SMS environment. ACSQA provides facilities for:

- Automatic creation of ISMF test cases from actual dataset allocations
- Automatic test case execution with side by side ACS results, and no need for multiple jobs and listings
- Complete and accurate comparison results and faster performance
- Test case execution with ACS trace, control statement overrides, and use of data class attributes

SMS Construct Usage Reports

Have you ever wanted to know how many datasets are actually assigned to a particular SMS class? Or whether there are 'orphan' classes that are no longer used? The SMS Construct Usage reports can provide information about which constructs are most used, which least, and which are unassigned. Constructs that were assigned to migrated datasets but which no longer exist in the SMS configuration can be identified.

Installation and Support

Like all DTS Software products, SMS/Debug and Audit installs in minutes and does not require any SMP/E work or an IPL. No changes are made to z/OS libraries. At startup time, SMS/Debug and Audit dynamically installs all required operating system interfaces and automatically removes them at shutdown time. Tracing can be initiated either through JCL keywords or via flexible policy rules. Also, like all DTS Software products, SMS/Debug and Audit is backed by the expert 24x7x365 DTS Software support team at 1.919.833.8426 / support@dtssoftware.com.

Sample Output

DADSM Exit Tracing

```
// EXEC PGM=IEFBR14
//DD1 DD DSN=DON.DD1,SPACE=(TRK,1),SMSDEBUG=(NOACS,NOVOL,DADSM)
ACC00510-* STARTING TRACE FOR POST_DADSM-ALLOCATE, DSN=DON.DD1, VOL=SMS001, DD=DD1
ACC05201-* ALLOCATE FOR 1 TRACKS EXTENT 0 RC=8 - VTOC IS FULL
ACC00510-* STARTING TRACE FOR POST_DADSM-ALLOCATE, DSN=DON.DD1, VOL=SMS002, DD=DD1
ACC05201-* ALLOCATE FOR 1 TRACKS EXTENT 0 RC=0 - SUCCESSFUL
```

All IGGPRE00 & IGGPOST0 retcodes

ACS Routine Tracing

```
//IEFBR14 EXEC PGM=IEFBR14
//DD1 DD
DSN=SJP.TEST.DS2,UNIT=SYSALLDA,EATTR=OPT,
VOL=SER=STOR01
,
// SPACE=(CYL,
(1,1)),DISP=(,PASS),STORCLAS=STC1,DATACLAS=EF,
// LRECL=80,BLKSIZE=8000,RECFM=FB,DSORG=PS,
// ACSTRACE=(YES,BOTH)

ACC00510-* STARTING TRACE FOR SMSACS_TRACE-,
DSN=SJP.TEST.DS2, VOL=STOR01, DD=DD1
ACC08100-* ..SMSACS VARIABLES BEFORE CALL
TO ACS ROUTINES
ACC08120-* ...ACCT_JOB(ACCT1,ACCT2)
ACC08120-* ...ACSENVIR(ALLOC)
ACC08120-* ...ALLVOL(STOR01)
ACC08120-* ...ANYVOL(STOR01)
ACC08120-* ...APPLIC()
ACC08121-* ...BLKSIZE(8000)
ACC08120-* ...DATACLAS(EF)
ACC08120-* ...DB2SSID(DB2C)
ACC08120-* ...DD(DD1)
ACC08120-* ...DSN(SJP.TEST.DS2)
ACC08120-* ...DSORG(PS)
ACC08120-* ...DSTYPE(PERM)
ACC08120-* ...EATTR(OPT)
ACC08120-* ...EXPDT(0000.000)
ACC08121-* ...FILENUM(0)
ACC08120-* ...HLQ(SJP)
ACC08120-* ...JOB(SJP1)
ACC08120-* ...LABEL(SL)
ACC08120-* ...LLQ(DS2)
ACC08121-* ...MAXSIZE(13280)
ACC08121-* ...NVOL(1)
ACC08120-* ...PGM(IEFBR14)
ACC08120-* ...RECORG()
ACC08121-* ...SECOND_QTY(1)
ACC08121-* ...SIZE(830)
ACC08120-* ...SPACE_TYPE(CYL)
ACC08120-* ...STORCLAS(STC1)
ACC08120-* ...SYSNAME(S0W1)
ACC08120-* ...SYSPLEX(ADCDPL)
ACC08120-* ...USER(IBMUSER)
ACC08120-* ...USER_ACSVAR1(PROD)
ACC08120-* ...UNIT(SYSALLDA)
ACC08120-* ...XMODE(BATCH)
```

Real-time ACS variables

```
ACC08110-* ..TRACE FOR ACS ROUTINE DATACLAS
ACC08115-* ACS SOURCE=SYS2.SMS.ACS MEMBER=DATA1
ACC08116-* TRANSLATE DATE=2019/12/18
TIME=14:23:44 USERID=STEVE
ACC08111-* ...COMPARE DSN(SJP.TEST.DS2) =
LITERAL(DTS.R61.DSLDB)
ACC08111-* ...COMPARE DSN(SJP.TEST.DS2) =
LITERAL(SJP.TEST.DS1)
ACC08111-* ...COMPARE ALLVOL(STOR01) =
LITERAL(DTS*)
ACC08111-* ...COMPARE ALLVOL(STOR01) =
LITERAL(TSO*)
ACC08114-* ...BRANCH
ACC08113-* ...SET DATACLAS = EF
ACC08114-* ...NO MORE
ACC08110-* ..TRACE FOR ACS ROUTINE STORCLAS
ACC08115-* ACS SOURCE=SYS2.SMS.ACS MEMBER=STC1
ACC08116-* TRANSLATE DATE=2019/12/03
TIME=16:10:49 USERID=DELORES
ACC08112-* ...COMPARE NVOL(1) > LITERAL(5)
ACC08111-* ...COMPARE DSN(SJP.TEST.DS2) =
LITERAL(DSNB10.DBBG.ARCLOG1.**)
ACC08111-* ...COMPARE STORCLAS(STC1) =
LITERAL(STC2)
ACC08111-* ...COMPARE DSN(TEST) = LITERAL(SMS)
ACC08111-* ...COMPARE DSN(DS2) = LITERAL(FAIL)
ACC08111-* ...COMPARE STORCLAS(STC1) <>
LITERAL(*NULL*)
ACC08113-* ...SET STORCLAS = STC1
ACC08114-* ...EXIT
ACC08100-*..SMSACS VARIABLES AFTER CALL TO
ACS ROUTINES
ACC08120-* ...DATACLAS(EF)
ACC08120-* ...STORCLAS(STC1)
ACC08120-* ...MGMTCLAS()
ACC08120-* ...STORGRP(STG1)
ACC08121-* ...*STORGRP_COUNT(1)
ACC08120-* ...*STORGRP_TYPE(POOL)
```

ACS Logic Trace for each routine

Volume Selection Tracing

```
// EXEC PGM=IEFBR14
//DD1 DD DSN=DON.DD1,SPACE=(TRK,1),STORCLAS=
STC1,SMSDEBUG=(NOACS,VOL)
//DD2 DD DSN=DON.DD2,SPACE=(TRK,1),STORCLAS=
STC1,SMSDEBUG=(NOACS,VOLA)SMSTRACE=VOLUME
ACC00510-* STARTING TRACE FOR SMS_TRACE-VOLUME,
DSN=DON.DD1, VOL=, DD=DD1
ACC03750-* VOLSER STORGRP FLAGS LIST FREE CAP THRESH
ACC03751-* SMS002 STG1 EE9B9BA6 PRI 9 14 6
ACC03751-* SMS004 STG1 649B9BA2 SEC 2 14 0
ACC03751-* SMS001 STG1 649B9BA2 SEC 1 34 0
ACC03751-* SMS003 STG1 649B9BA2 SEC 0 14 0
ACC03752-* SMS SELECTED VOLUME SMS002
```

Real-time ACS variables

SMS Configuration Compare Detail Report

```
ACC90129-I              DATA CLASS          DATA1                    SELECTED FOR PROCESSING
ACC90122-I              DATA CLASS          DATA1                    IS PRESENT IN CDS1 AND CDS2
ACC90126-A     ***      DATA CLASS          DATA1                    IS DIFFERENT IN CDS1 AND CDS2

                                           CDS1                                                CDS2
                                           ----                                                ----
       DATA CLASS NAME============> DATA1                                              =====> DATA1
*DIFF* LAST MOD USER==============> IBMUSER                                           =====> STEVE
*DIFF* LAST MOD DATE==============> 2019/12/16                                         =====> 2019/03/11
*DIFF* LAST MOD TIME==============> 12:10                                               =====> 14:14
       DESCRIPTION(1-40)==========> THIS IS DATA1                                      =====> THIS IS DATA1
       DESCRIPTION(41-80)=========>                                                    =====>
       DESCRIPTION(81-120)========>                                                    =====>
       RECFM======================>                                                    =====>
*DIFF* LRECL======================> 80                                                 =====> 90
*DIFF* OVERRIDE SPACE=============> Y                                                  =====> N
       SPACE AVGREC===============> M                                                  =====> M
       AVG VALUE==================> 1                                                  =====> 1
       PRIMARY====================> 1                                                  =====> 1
       SECONDARY==================> 1                                                  =====> 1
       DIRECTORY==================>                                                    =====>
       RETPD======================>                                                    =====>
       EXPDT======================>                                                    =====>
*DIFF* VOLUME COUNT===============> 1                                                  =====> 2
       ADDL VOLUME AMOUNT=========>                                                    =====>
...
...
       RLS CF CACHE VALUE=========> ALL                                                =====> ALL
       RLS ABOVE 2-GB BAR=========> N                                                  =====> N
       EXTENT CONSTR REMOVAL======> N                                                  =====> N
       CA RECLAIM=================> Y                                                  =====> Y
       LOG REPLICATE==============> N                                                  =====> N
ACC90128-I NUMBER OF DIFFERENCES IN CLASS = 7
```

Highlight differences

SMS Configuration Summary Report

```
ACC90223-I SUMMARY FOR DATA CLASS
ACC90120-I CDS1 SYS1.S0W1.SCDS                                    NO. OBJECTS=23 DEFNLEN=552 VER=1
ACC90120-I CDS2 STEVE.S0W1.SCDS                                   NO. OBJECTS=20 DEFNLEN=552 VER=1

          CDS1                                  | CDS2
          CLASS      LAST       LAST        LAST | CLASS        LAST       LAST       LAST
 **DIFF** NAME       USERID     DATE        TIME | NAME         USERID     DATE       TIME

      5   AAB        STEVE      2019/04/06 10:31 | AAB          STEVE      2019/03/11 14:16
      6   DATAF      IBMUSER    2019/12/16 11:39 | DATAF        STEVE      2019/01/05 19:58
      0   DATAFB     STEVE      2018/05/22 15:15 | DATAFB       STEVE      2018/05/22 15:15
     65   DATAMV     IBMUSER    2019/11/08 14:08 | . . . .      . . . .    . . . . .  . . .
     65   DATAMVE    STEVE      2019/11/25 10:07 | . . . .      . . . .    . . . . .  . . .
     65   DATANEW    IBMUSER    2019/12/16 11:40 | . . . .      . . . .    . . . . .  . . .
      3   DATAVB     STEVE      2019/11/05 10:14 | DATAVB       STEVE      2018/05/22 10:31
      7   DATA1      IBMUSER    2019/12/16 12:10 | DATA1        STEVE      2019/03/11 14:14
      3   DATA2      STEVE      2019/11/05 10:24 | DATA2        STEVE      2018/05/20 21:10
     65   . . . .    . . . .    . . . . . . . . | DATA3        STEVE      2019/01/04 22:53
      0   DBAGDC     IBMUSER    2014/10/07 00:57 | DBAGDC       IBMUSER    2014/10/07 00:57


 ACC90224-I NO. OF MATCHING DATA CLASS CONSTRUCT PAIRS=14
 ACC90225-I NO. OF NON-MATCHING DATA CLASS CONSTRUCT PAIRS=10
```

Missing or changed constructs

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