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A User's experience with the Installation, Configuration, and Features of DTS's Space Recovery System (SRS)

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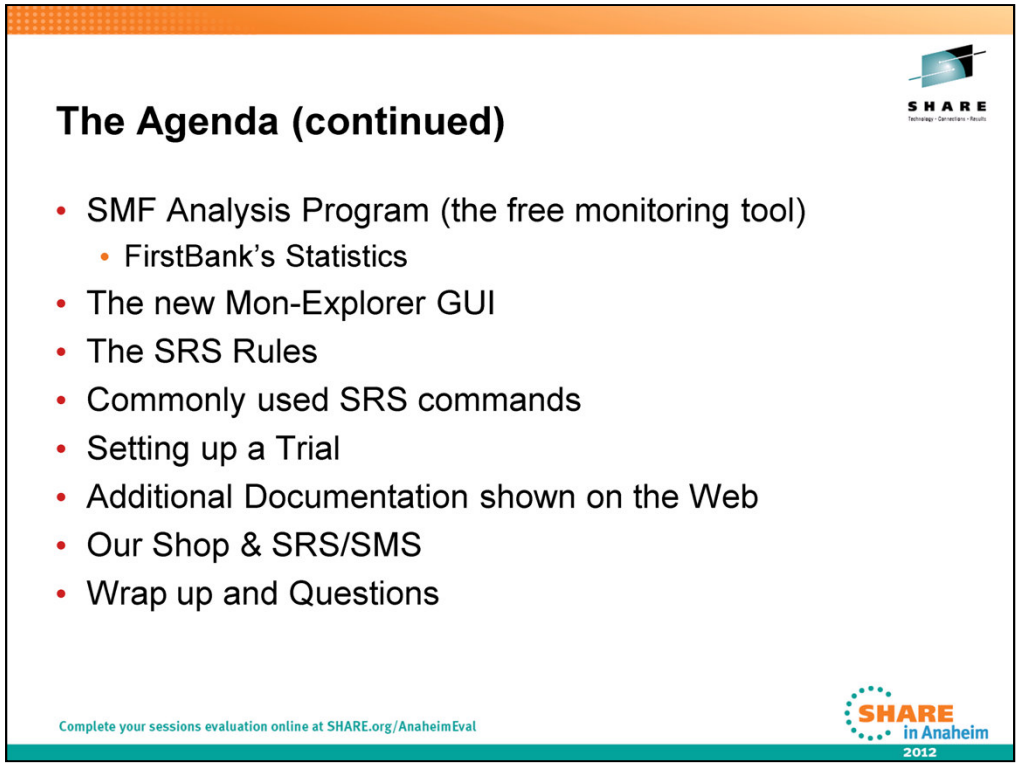
SHARE in Anaheim 2012

The Agenda

- Introduction
  - Recovery functions of SRS
- Installation – Easy – download
  - Installation Support - Excellent
    - DTS software Digest Maintenance Emails
      - *How DTS Software keeps you informed of needed service*
- SRS STC
- RACF Requirements
- SMF recovery analysis report (SRSSMF)



The **SMF recovery analysis report (SRSSMF)** formats SMF records produced by SRS and provides totals for the successful and unsuccessful recoveries performed by SRS.

Oops, the wrong SRS!

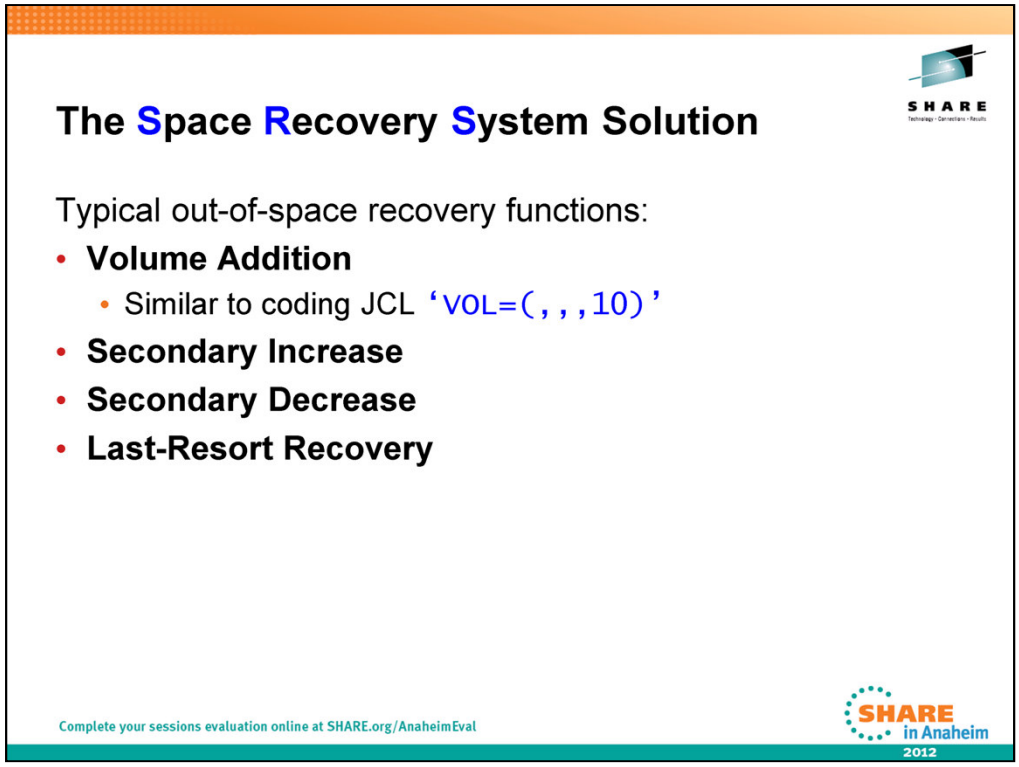
Introduction

- The Space Recovery System (SRS) dynamically recovers disk space allocation failures. When SRS intercepts a space failure, the installation rules are used to determine the recovery options. If the rules allow recovery, SRS forces the operating system to get the required disk space, and the job runs to completion.

```
BROWSE - MESSAGES           *        - Page  1     Line  1      Cols 1-80
COMMAND ===>                                                SCROLL ===> CURSOR
******************************** Top of Data ********************************
ICH70001I DON      LAST ACCESS AT 12:09:48 ON THURSDAY, FEBRUARY 10, 2011
ACC20210-A REDUCEP FOR DD=SRSTEST DSN=SYS11041.T121006.RA000.DONR.SCCIVP1.H01 VO
ACC21110-A PRIMARY SPACE REDUCED FROM 4000 TO 400 CYL
IEF236I ALLOC. FOR DONR STEP1
IGD100I 0A8A ALLOCATED TO DDNAME SRSTEST  DATACLAS (        )
IEF142I DONR STEP1 - STEP WAS EXECUTED - COND CODE 0000
IEF285I   SYS11041.T121006.RA000.DONR.SCCIVP1.H01      DELETED
IEF285I   VOL SER NOS= STOR05.
IEF373I STEP/STEP1   /START 2011041.1210
IEF374I STEP/STEP1   /STOP  2011041.1210 CPU    0MIN 00.00SEC SRB    0MIN 00.00S
IEF236I ALLOC. FOR DONR STEP2
IEF237I 0124 ALLOCATED TO STEPLIB
IGD100I 0A8A ALLOCATED TO DDNAME SRSTEST  DATACLAS (        )
ACC20210-A SETSEC FOR DD=SRSTEST DSN=SYS11041.T121006.RA000.DONR.SCCIVP2.H01 VOL
ACC20400-A SECONDARY SPACE SET TO 500 TRK (50% OF 1000)
ACC20210-A ADDVOL FOR DD=SRSTEST DSN=SYS11041.T121006.RA000.DONR.SCCIVP2.H01 VOL
ACC20600-A VOLUME STOR06 WAS ADDED TO DATA SET
IEF142I DONR STEP2 - STEP WAS EXECUTED - COND CODE 0000
IEF285I   DTS.R51.LOADLIB                              KEPT
IEF285I   VOL SER NOS= DTS003.
IEF285I   SYS11041.T121006.RA000.DONR.SCCIVP2.H01      DELETED
```


OK, the Real SRS!!!!! We'll talk about the RULES that cause the Yellow highlighted area above to be executed in a few minutes!

The Space Recovery System (SRS) dynamically recovers disk space allocation failures. When SRS intercepts a space failure, the installation rules are used to determine the recovery options. If the rules allow recovery, SRS forces the operating system to get the required disk space, and the job runs to completion.



VOLUME ADDITION – Note - If a dataclass had a volume count of 10 and SRS had a pool definition with ADDVOL(YES MAXVOL(20)), SRS will only start adding volumes UP TO 20 (not an additional 20) after the first 10 are used.

SECONDARY INCREASE – If the job needs more secondary allocation to satisfy an allocation request

SECONDARY DECREASE – If the job can get by with less Secondary allocation

LAST-RESORT RECOVERY - Sometimes, despite use of primary and secondary space reduction and dynamic volume addition, it is not possible to prevent an out-of-space condition from occurring. This might happen if, for example, a dataset has extended to all of the available volumes in the storage group, or if one volume on which a sequentially striped dataset must extend is full. In these cases, SRS can dynamically interrupt the job and notify the operator that a failure is imminent. The Operator or Sysprog can then take appropriate action, such as adding new volumes to the storage group or migrating unused data, to allow the job to complete successfully. This feature is unique to SRS. Obviously, this would only be used for mission critical applications where an out of space failure could be disastrous.

Remember that 'MULTIPLE' Reduction Attempts are made to attempt to satisfy an Allocation request!

Installation

Download –

Internet Delivery

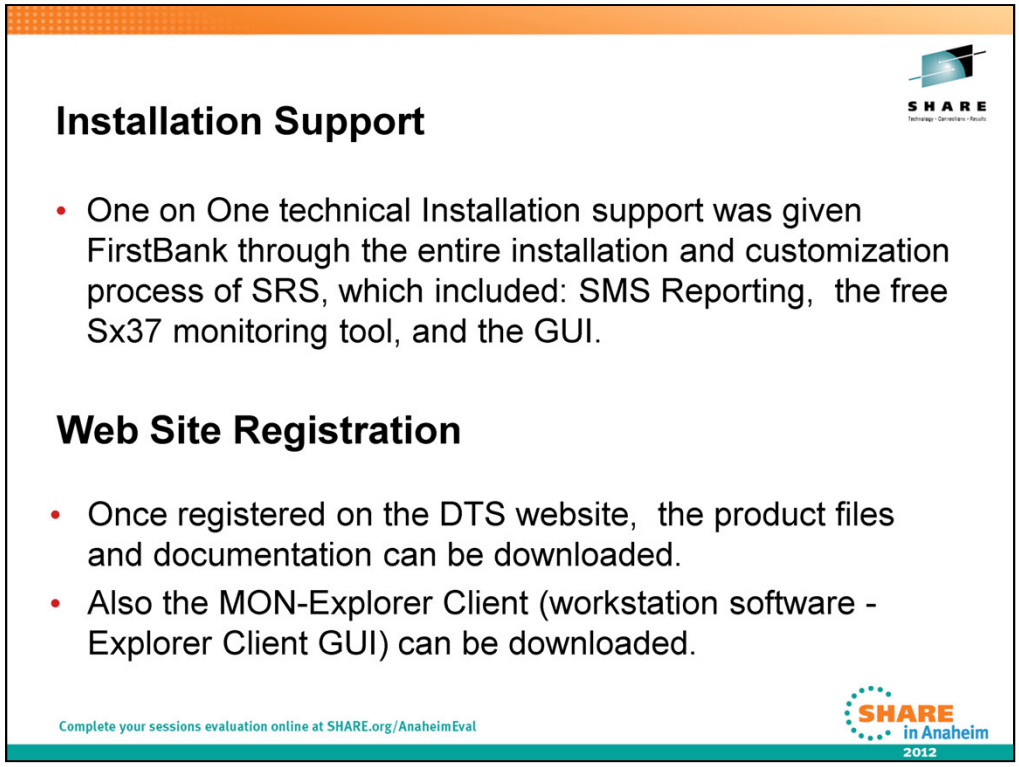
The DTS distribution libraries, manuals and temporary license keys are available on the DTS web server.

Transferring PC Distribution Files to your Host

The DTS FTP Installation application (FTPINSTW.EXE) can be used to create the DTS distribution libraries on your MVS system.

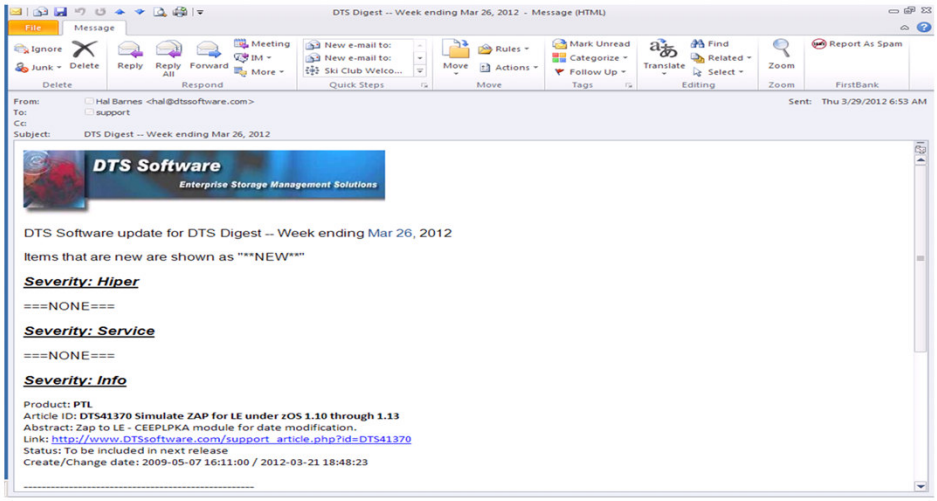
Host Installation – 7 simple steps

Step 1 – Create the DTS Production Libraries (IEFBR14 JCL)
Step 2 – APF Authorize the DTS Load Library (MVS Console command/PROG00 update)
Step 3 - Copy the JCL for DIF task to a system procedure library
Step 4 - Copy members from distribution to production libraries (IEBCOPY JCL)
Step 5 - IEBCOPY DTS Load Modules to an Authorized Library
Step 6 - Install the DTS ISPF Interface (OPTIONAL)
Step 7 - Update the LICENSE and STARTnn Members



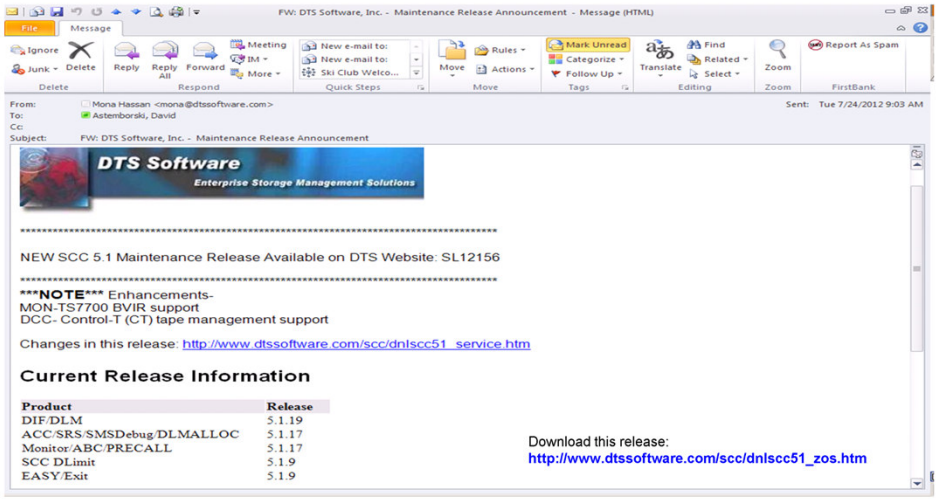
We did a Proof of Concept @ FirstBank and 'One on One technical Installation support' was given FirstBank through the entire installation and customization process of SRS, which included: SMS Reporting, the free Sx37 monitoring tool, and the GUI, plus the creation of initial SRS Rule definitions for our environment.

DTS Digest (weekly)



How DTS Software keeps you informed of critical service!

DTS Maintenance Email

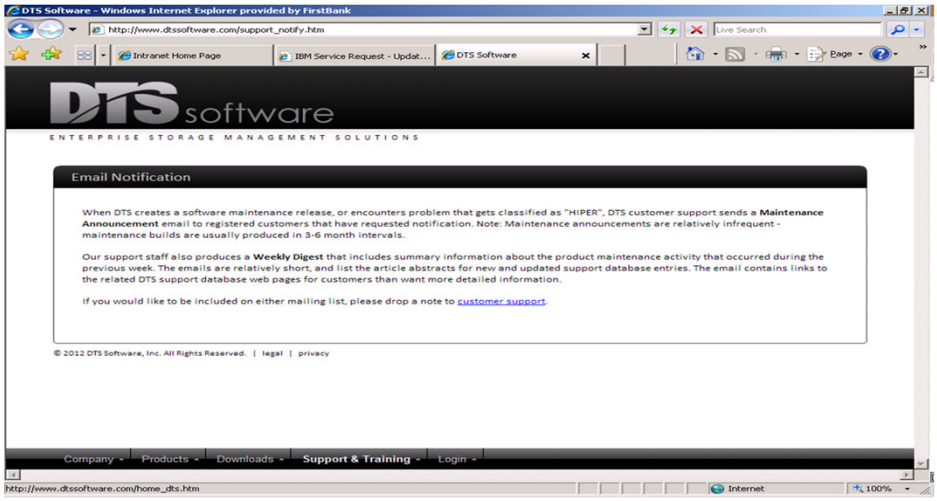


How DTS keeps you as a customer informed!

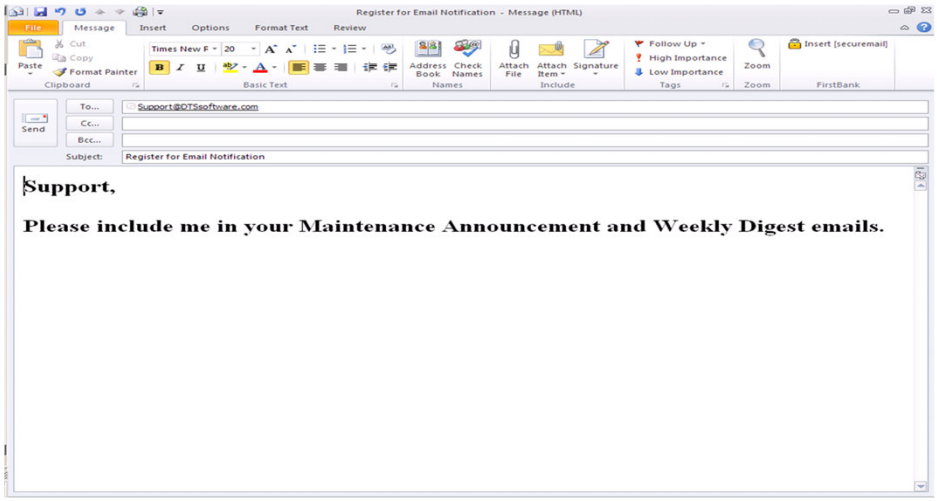
How to subscribe to the weekly DTS software Digest & Maintenance Email

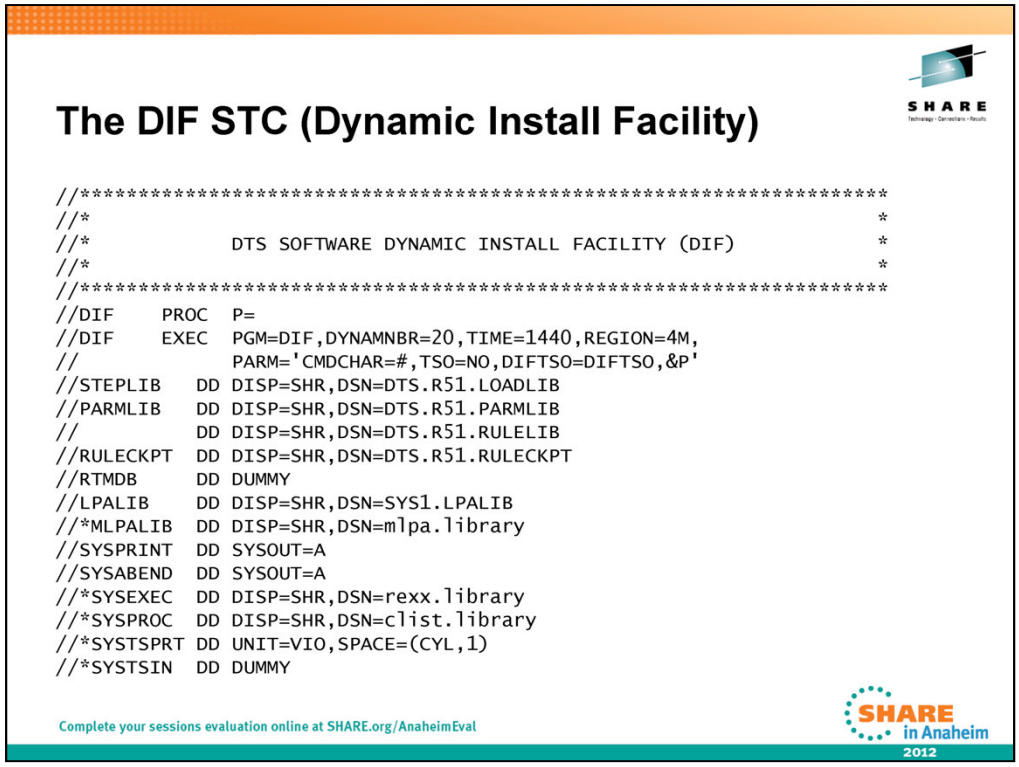
How to subscribe to the weekly DTS software Digest – Email Notifications

What is included in the DTS software Email Notifications



How to subscribe to the weekly DTS software Digest (Emailing support)





The only SRS STC running on MVS (The Dynamic Install Facility)!

RACF Rules required to run SRS

Add STC = DIF to the STC group

Give the SYSPROG group ALTER access to 'SYS3.DTS.**' data sets

Give the STC = DIF ALTER access to 'SYS3.DTS.**' data sets

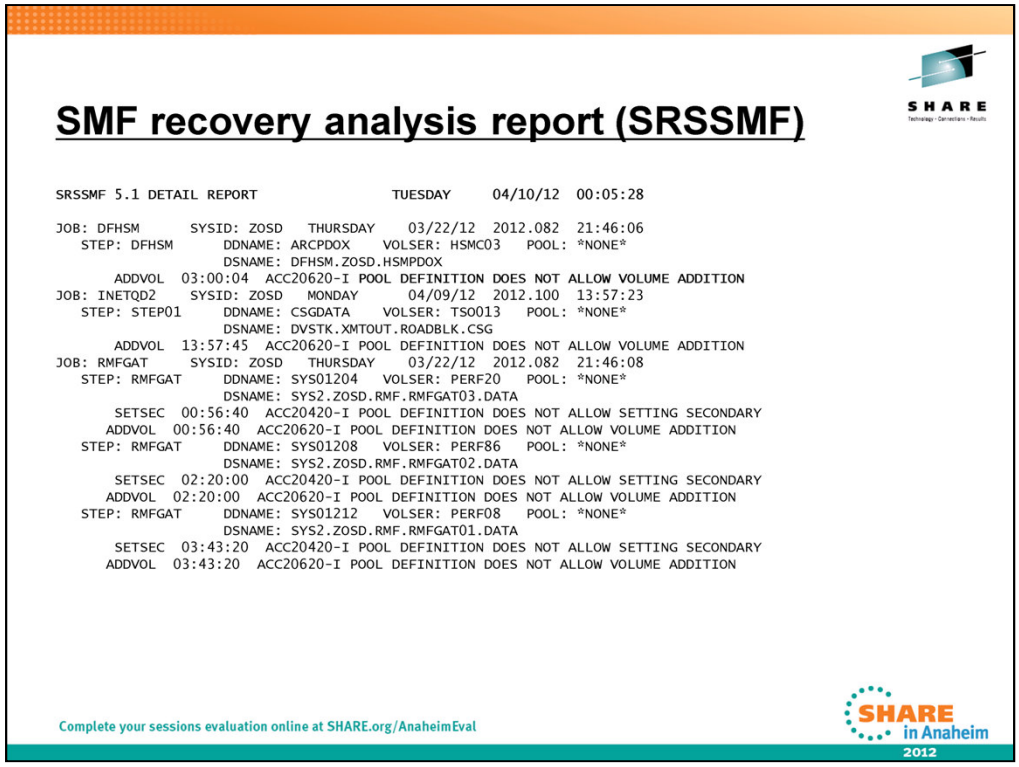
TSO LISTDSD DATASET('SYS3.DTS.') GENERIC AUTHUSER**
INFORMATION FOR DATASET SYS3.DTS.** (G)

LEVEL OWNER UNIVERSAL ACCESS WARNING ERASE
----- -------- ---------- ------- -----
00 SYS3 READ NO NO
ID ACCESS
-------- -------
SYSPROG ALTER
DIF ALTER

Add an OMVS Segment to the STC = DIF
'ALU DIF OMVS(HOME(/) PROGRAM(/bin/sh))'

TSO LU DIF NORACF OMVS
OMVS INFORMATION

UID= 0000000250
HOME= /
PROGRAM= /bin/sh
CPUTIMEMAX= NONE
ASSIZEMAX= NONE
FILEPROCMAX= NONE
PROCUSERMAX= NONE
THREADSMAX= NONE
MMAPAREAMAX= NONE

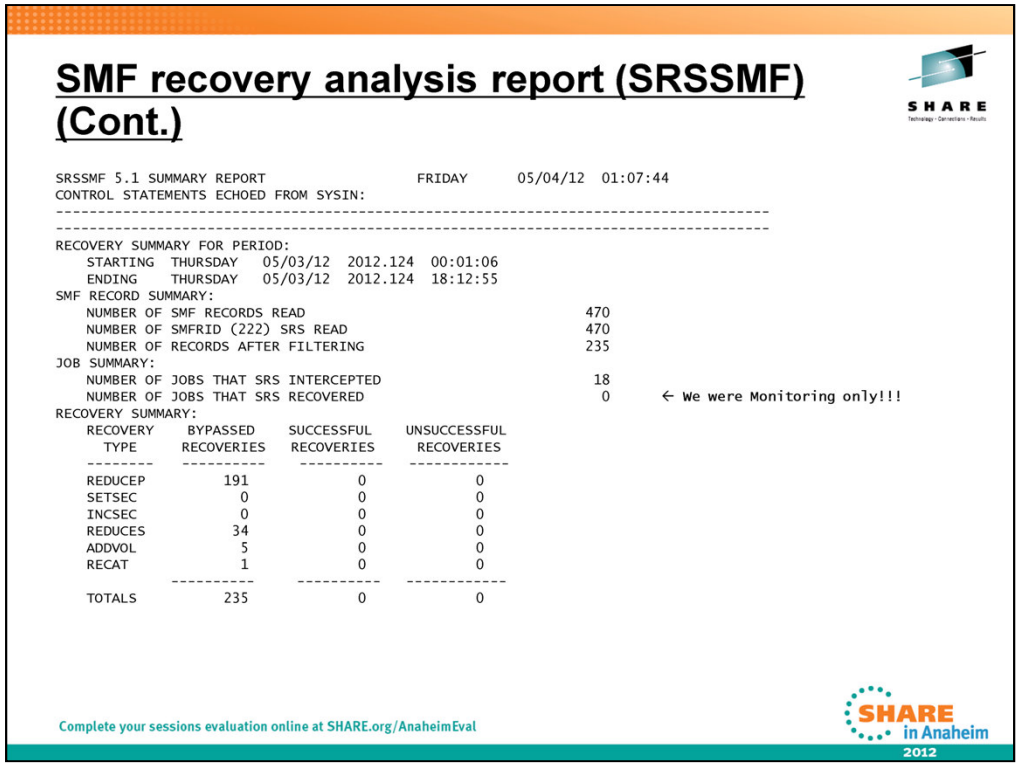


The Detail Report prints each SRS SMF record processed by SRSSMF in a readable format.

The report is written to the DETAIL DD statement.

SRS SMF Reporting was implemented in our environment via the '**DEFPROD MSG(RULESET(@SRSMSG)) SMF(222 LEVEL(I))' rule**

as defined in the SRS Rules member.



The summary report indicates how many recoveries of each type (primary space reduction, secondary space reduction, add-volume, and so on) were performed.

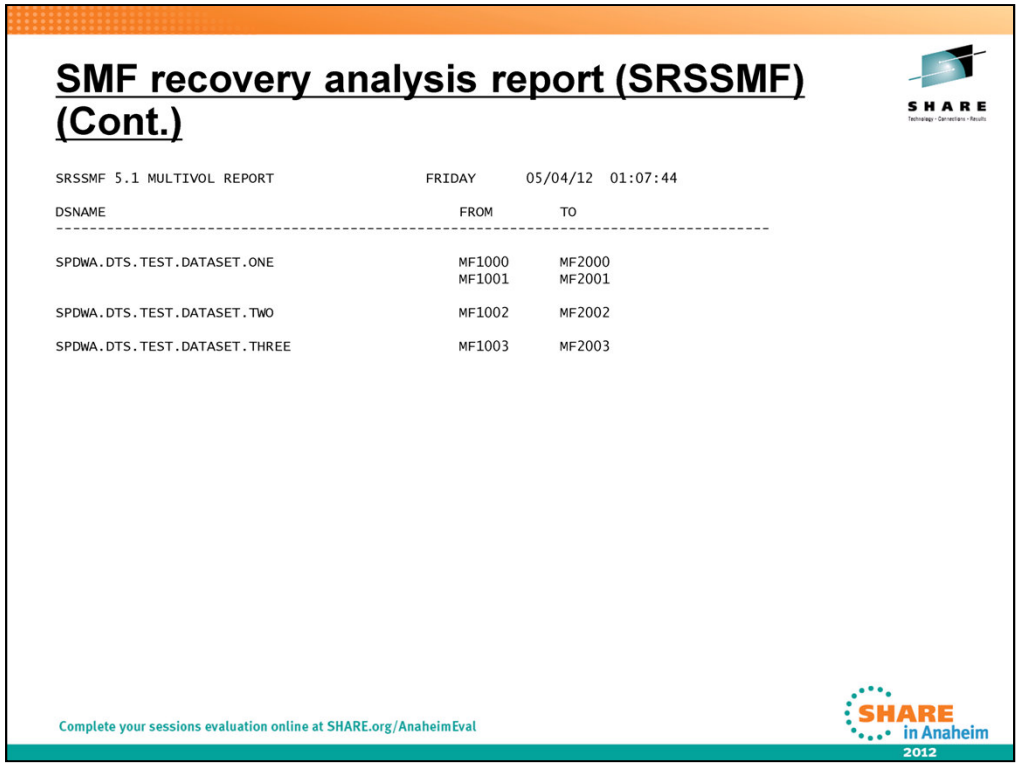
The summary report provides information on the number and type of SMF records processed, and the number and type of SRS recoveries performed. The number of successful and unsuccessful recoveries of each type is shown.

The Summary report is written to the SYSPRINT DD Statement in the JCL

Recovery Types are:

REDUCEP	-	Reduce Primary Allocations
SETSEC	-	Create a Secondary Allocation
INCSEC	-	Increase Secondary (for small allocation requests)
REDUCES	-	Reduce Secondary Allocation
ADDVOL	-	Add Canidate Volumes
RECAT	-	Not Cat 2 (dup non-SMS dataset uncataloged), DUP DSN on vol (non-SMS dup dsn, JCL error), DUP DSN in catalog (SMS dup \ dsn, JCL error). Uncatalog/scratch/or rename old dsn so new dsn can be cataloged.

SMF recovery analysis report (SRSSMF) (Cont.)



```
SRSSMF 5.1 MULTIVOL REPORT                FRIDAY      05/04/12  01:07:44

DSNAME                                      FROM        TO
-------------------------------------------------------------------------------

SPDWA.DTS.TEST.DATASET.ONE                  MF1000      MF2000
                                            MF1001      MF2001

SPDWA.DTS.TEST.DATASET.TWO                  MF1002      MF2002

SPDWA.DTS.TEST.DATASET.THREE                MF1003      MF2003
```

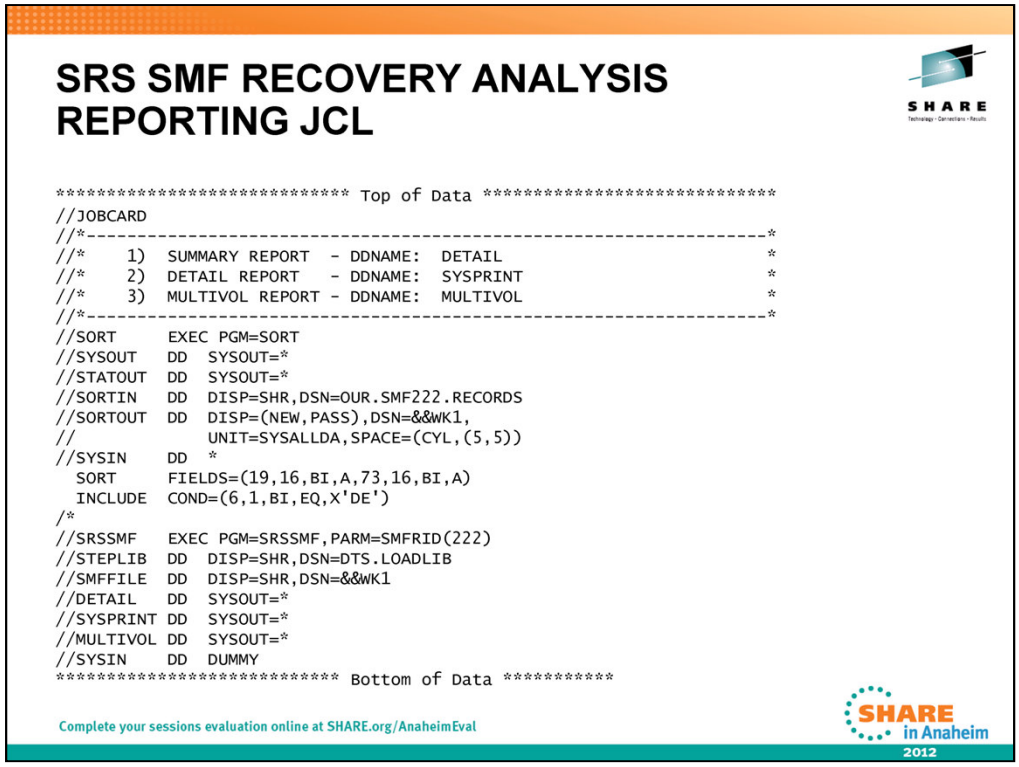

The **Multivolume Report** provides a list of data sets which have become multivolume due

to SRS ADDVOL processing, in order to prevent out of space errors and shows the volumes on which the data sets currently

reside.

The Multivolume Report is written to the data set identified by the MULTIVOL DD statement in the JCL.

SRS SMF RECOVERY ANALYSIS REPORTING JCL



```
****************************** Top of Data ******************************
//JOBCARD
//*-------------------------------------------------------------------*
//*    1)  SUMMARY REPORT  - DDNAME:  DETAIL                          *
//*    2)  DETAIL REPORT   - DDNAME:  SYSPRINT                        *
//*    3)  MULTIVOL REPORT - DDNAME:  MULTIVOL                        *
//*-------------------------------------------------------------------*
//SORT     EXEC PGM=SORT
//SYSOUT   DD  SYSOUT=*
//STATOUT  DD  SYSOUT=*
//SORTIN   DD  DISP=SHR,DSN=OUR.SMF222.RECORDS
//SORTOUT  DD  DISP=(NEW,PASS),DSN=&&WK1,
//             UNIT=SYSALLDA,SPACE=(CYL,(5,5))
//SYSIN    DD  *
  SORT     FIELDS=(19,16,BI,A,73,16,BI,A)
  INCLUDE  COND=(6,1,BI,EQ,X'DE')
/*
//SRSSMF   EXEC PGM=SRSSMF,PARM=SMFRID(222)
//STEPLIB  DD  DISP=SHR,DSN=DTS.LOADLIB
//SMFFILE  DD  DISP=SHR,DSN=&&WK1
//DETAIL   DD  SYSOUT=*
//SYSPRINT DD  SYSOUT=*
//MULTIVOL DD  SYSOUT=*
//SYSIN    DD  DUMMY
***************************** Bottom of Data ************
```

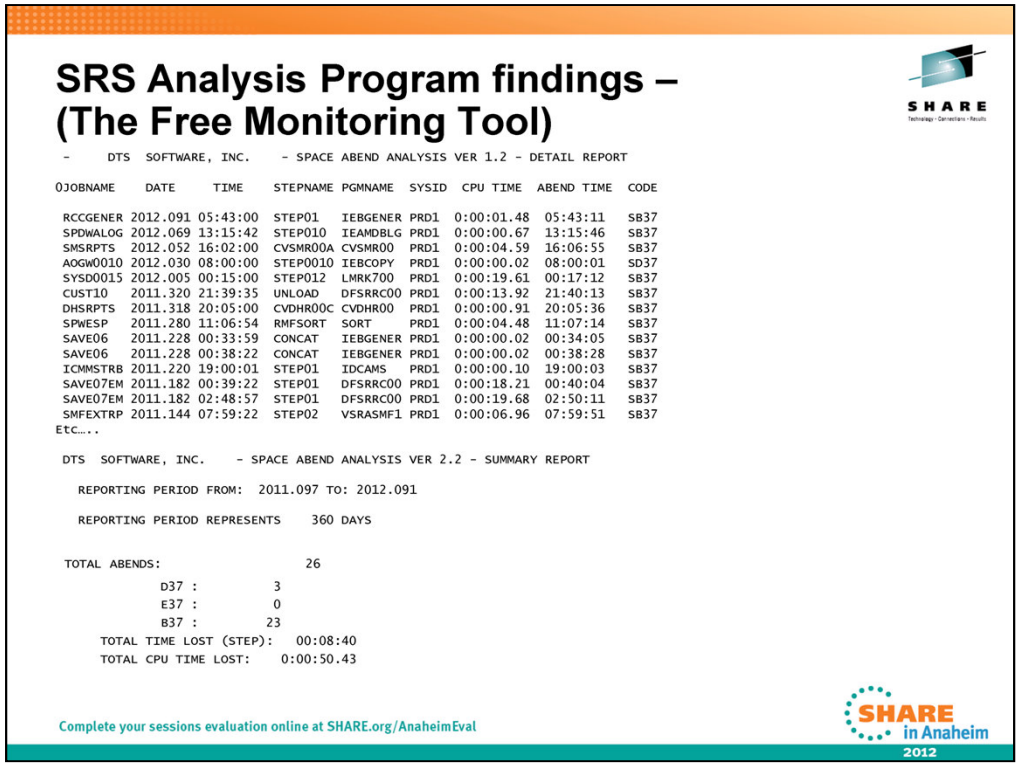

Remember the Reports are generated on DDNames:

DETAIL

SYSPRINT

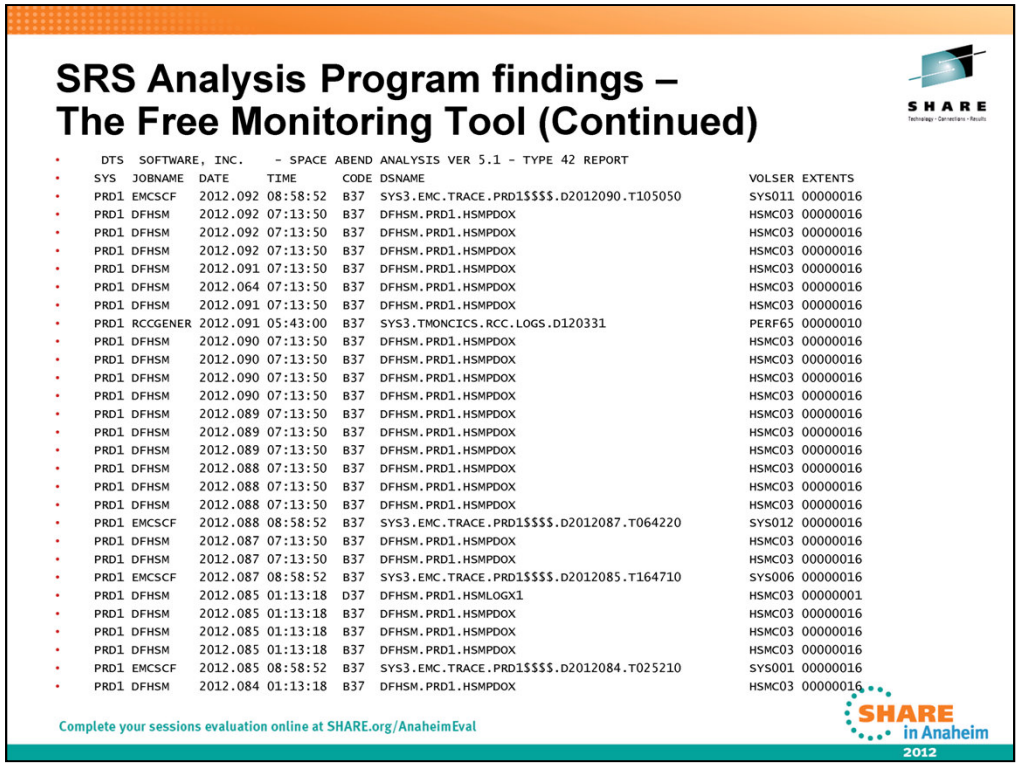
MULTIVOL

SRS Analysis Program findings – (The Free Monitoring Tool)



```
-     DTS  SOFTWARE, INC.    - SPACE ABEND ANALYSIS VER 1.2 - DETAIL REPORT

0JOBNAME    DATE     TIME    STEPNAME PGMNAME  SYSID  CPU TIME  ABEND TIME  CODE

 RCCGENER 2012.091 05:43:00  STEP01   IEBGENER PRD1  0:00:01.48  05:43:11   SB37
 SPDWALOG 2012.069 13:15:42  STEP010  IEAMDBLG PRD1  0:00:00.67  13:15:46   SB37
 SMSRPTS  2012.052 16:02:00  CVSMR00A CVSMR00  PRD1  0:00:04.59  16:06:55   SB37
 AOGW0010 2012.030 08:00:00  STEP0010 IEBCOPY  PRD1  0:00:00.02  08:00:01   SD37
 SYSD0015 2012.005 00:15:00  STEP012  LMRK700  PRD1  0:00:19.61  00:17:12   SB37
 CUST10   2011.320 21:39:35  UNLOAD   DFSRRC00 PRD1  0:00:13.92  21:40:13   SB37
 DHSRPTS  2011.318 20:05:00  CVDHR00C CVDHR00  PRD1  0:00:00.91  20:05:36   SB37
 SPWESP   2011.280 11:06:54  RMFSORT  SORT     PRD1  0:00:04.48  11:07:14   SB37
 SAVE06   2011.228 00:33:59  CONCAT   IEBGENER PRD1  0:00:00.02  00:34:05   SB37
 SAVE06   2011.228 00:38:22  CONCAT   IEBGENER PRD1  0:00:00.02  00:38:28   SB37
 ICMMSTRB 2011.220 19:00:01  STEP01   IDCAMS   PRD1  0:00:00.10  19:00:03   SB37
 SAVE07EM 2011.182 00:39:22  STEP01   DFSRRC00 PRD1  0:00:18.21  00:40:04   SB37
 SAVE07EM 2011.182 02:48:57  STEP01   DFSRRC00 PRD1  0:00:19.68  02:50:11   SB37
 SMFEXTRP 2011.144 07:59:22  STEP02   VSRASMF1 PRD1  0:00:06.96  07:59:51   SB37
Etc…..

 DTS  SOFTWARE, INC.    - SPACE ABEND ANALYSIS VER 2.2 - SUMMARY REPORT

   REPORTING PERIOD FROM:  2011.097 TO: 2012.091

   REPORTING PERIOD REPRESENTS    360 DAYS


 TOTAL ABENDS:                   26
              D37 :           3
              E37 :           0
              B37 :          23
      TOTAL TIME LOST (STEP):   00:08:40
      TOTAL CPU TIME LOST:    0:00:50.43
```


This program will analyze installation SMF data and determine the number and cost of Sx37 abends. This self-extracting file contains a READ.ME entry that describes the installation procedure. **Notice that we only had 26 Sx37 abends in the last 360 days!**



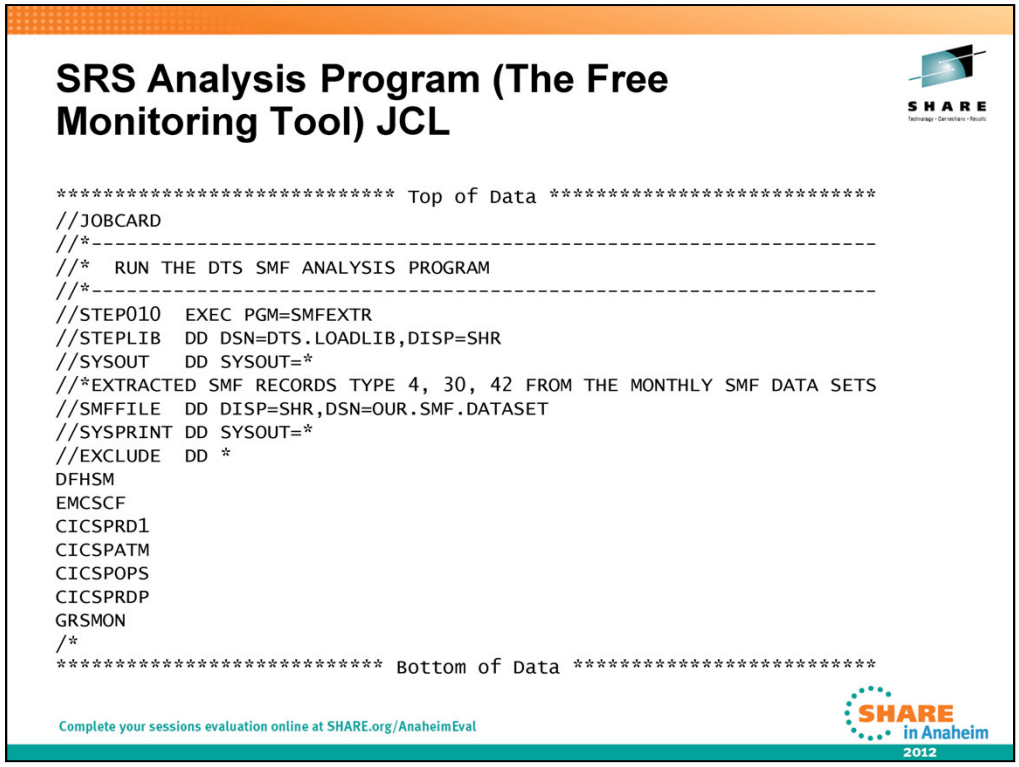
NOTE: SMF Type 42 records are: DFSMS Statistics and Configuration records.

Extracting SMF records for use in the SRS Analysis Program (The Free Monitoring Tool)

```
******************************** Top of Data ***********************
//JOBCARD
//*-------------------------------------------------------------------*
//* EXTRACT SMF TYPE (4, 30(4), 42(9) RECORDS FOR USE IN DTS's SMFEXTR
//*-------------------------------------------------------------------*
//STEP001 EXEC PGM=IFASMFDP
//SYSPRINT DD  SYSOUT=*
//DUMPIN   DD  DISP=SHR,DSN=SYS2.FBDC.SMFMTHBK(+0)
//DUMPOUT  DD  DSN=OUTPUT.TYPE4.TYPE30.TYPE42,
//             DISP=(NEW,CATLG),
//             DATACLAS=LARGE,
//             UNIT=SYSALLDA,
//             VOL=(,,,10),
//             SPACE=(CYL,(500,100))
//SYSIN    DD  *
  INDD(DUMPIN,OPTIONS(ALL))
  OUTDD(DUMPOUT,TYPE(4,30(4)42(9)))
  ABEND(NORETRY)
/*
******************************** Bottom of Data ********************
```

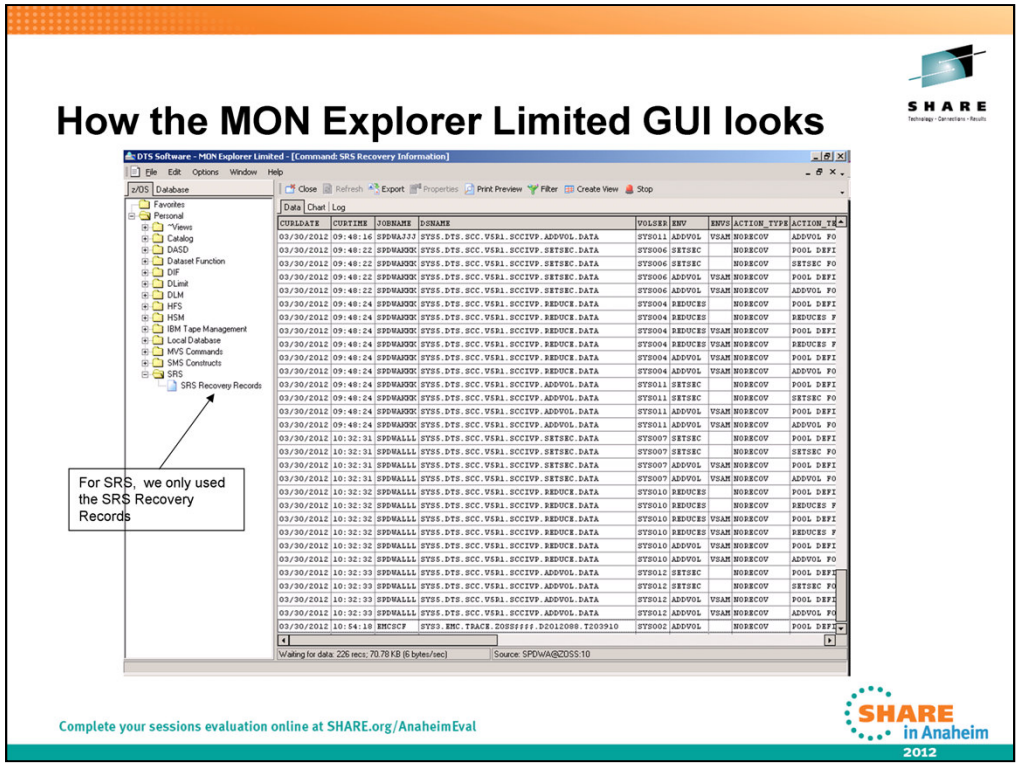

In order to use the SRS Analysis Program (The Free Monitoring Tool) to report on Sx37 ABENDS, you probably should extract TYPE 4, TYPE 30, (SUBTYPE 4), and TYPE 42, (SUBTYPE 9) SMF Records. Prior to running the Free Monitoring tool (PGM=SMFEXTR)

SRS Analysis Program (The Free Monitoring Tool) JCL



```
***************************** Top of Data ******************************
//JOBCARD
//*--------------------------------------------------------------------
//*  RUN THE DTS SMF ANALYSIS PROGRAM
//*--------------------------------------------------------------------
//STEP010  EXEC PGM=SMFEXTR
//STEPLIB  DD DSN=DTS.LOADLIB,DISP=SHR
//SYSOUT   DD SYSOUT=*
//*EXTRACTED SMF RECORDS TYPE 4, 30, 42 FROM THE MONTHLY SMF DATA SETS
//SMFFILE  DD DISP=SHR,DSN=OUR.SMF.DATASET
//SYSPRINT DD SYSOUT=*
//EXCLUDE  DD *
DFHSM
EMCSCF
CICSPRD1
CICSPATM
CICSPOPS
CICSPRDP
GRSMON
/*
***************************** Bottom of Data ***************************
```

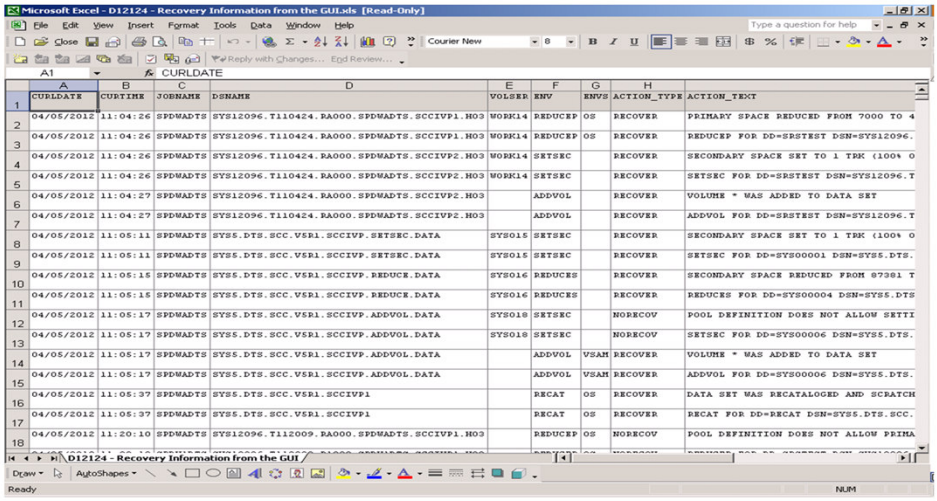

The //EXCLUDE DD * allows the user to NOT report on certain programs, as these programs will most likely be excluded from allocation modification by SRS, as defined in the SRS Rules member.



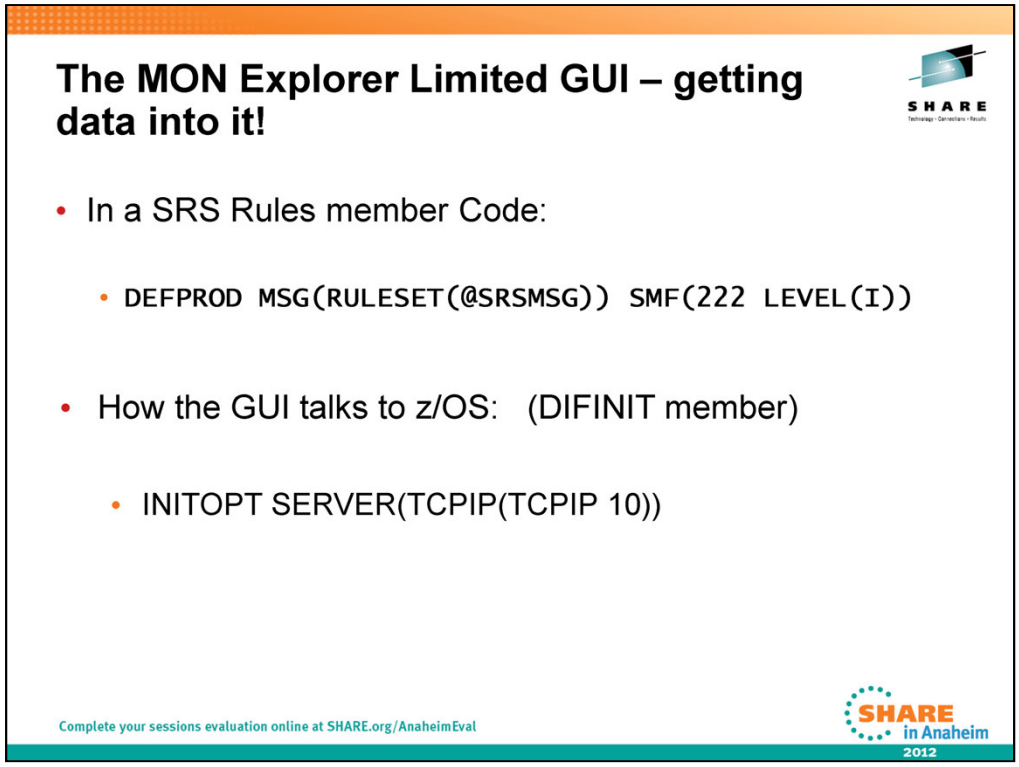
The MON-Explorer Limited GUI is a Windows PC-based client that communicates with the DTS DIF address space. The PC application has interfaces to the DIF console commands, SCC Monitor, MVS Console, TSO commands, and system utilities, as well as third party software products. The Explorer can use these interfaces to gather and display information in a variety of formats, reports and graphs. The product can also perform storage management and installation defined actions on the mainframe, but I have not executed any of these functions.

As you can see, SRS only uses a small portion of the MON Explorer Limited GUI for SRS Allocation Recovery reporting.

Exported Data from the MON Explorer Limited GUI to Excel

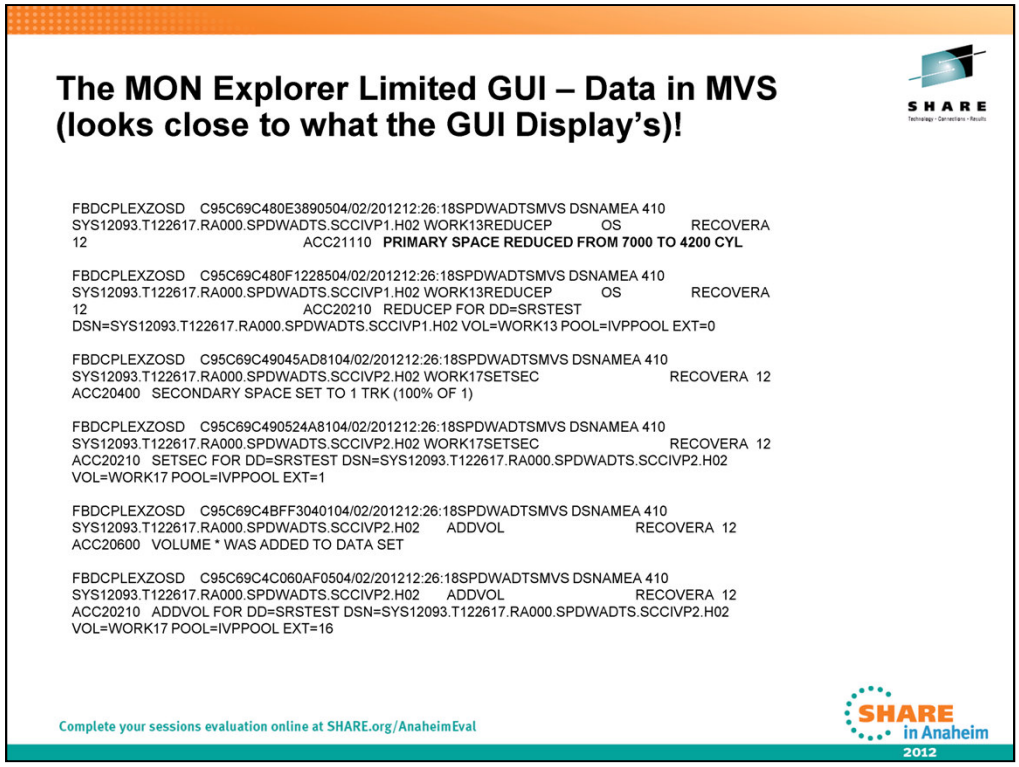


	A	B	C	D	E	F	G	H	
1	CURLDATE	CURTIME	JOBNAME	DSNAME	VOLSER	ENV	ENVS	ACTION_TYPE	ACTION_TEXT
2	04/05/2012	11:04:26	SPDWADTS	SYS12096.T110424.RA000.SPDWADTS.SCCIVP1.HO3	WORK14	REDUCEP	OS	RECOVER	PRIMARY SPACE REDUCED FROM 7000 TO 4
3	04/05/2012	11:04:26	SPDWADTS	SYS12096.T110424.RA000.SPDWADTS.SCCIVP1.HO3	WORK14	REDUCEP	OS	RECOVER	REDUCEP FOR DD=SRSTEST DSN=SYS12096.
4	04/05/2012	11:04:26	SPDWADTS	SYS12096.T110424.RA000.SPDWADTS.SCCIVP2.HO3	WORK14	SETSEC		RECOVER	SECONDARY SPACE SET TO 1 TRK (100% O
5	04/05/2012	11:04:26	SPDWADTS	SYS12096.T110424.RA000.SPDWADTS.SCCIVP2.HO3	WORK14	SETSEC		RECOVER	SETSEC FOR DD=SRSTEST DSN=SYS12096.T
6	04/05/2012	11:04:27	SPDWADTS	SYS12096.T110424.RA000.SPDWADTS.SCCIVP2.HO3		ADDVOL		RECOVER	VOLUME * WAS ADDED TO DATA SET
7	04/05/2012	11:04:27	SPDWADTS	SYS12096.T110424.RA000.SPDWADTS.SCCIVP2.HO3		ADDVOL		RECOVER	ADDVOL FOR DD=SRSTEST DSN=SYS12096.T
8	04/05/2012	11:05:11	SPDWADTS	SYS5.DTS.SCC.V5R1.SCCIVP.SETSEC.DATA	SYS015	SETSEC		RECOVER	SECONDARY SPACE SET TO 1 TRK (100% O
9	04/05/2012	11:05:11	SPDWADTS	SYS5.DTS.SCC.V5R1.SCCIVP.SETSEC.DATA	SYS015	SETSEC		RECOVER	SETSEC FOR DD=SYS00001 DSN=SYS5.DTS.
10	04/05/2012	11:05:15	SPDWADTS	SYS5.DTS.SCC.V5R1.SCCIVP.REDUCE.DATA	SYS016	REDUCES		RECOVER	SECONDARY SPACE REDUCED FROM 67381 T
11	04/05/2012	11:05:15	SPDWADTS	SYS5.DTS.SCC.V5R1.SCCIVP.REDUCE.DATA	SYS016	REDUCES		RECOVER	REDUCES FOR DD=SYS00004 DSN=SYS5.DTS
12	04/05/2012	11:05:17	SPDWADTS	SYS5.DTS.SCC.V5R1.SCCIVP.ADDVOL.DATA	SYS018	SETSEC		NORECOV	POOL DEFINITION DOES NOT ALLOW SETTI
13	04/05/2012	11:05:17	SPDWADTS	SYS5.DTS.SCC.V5R1.SCCIVP.ADDVOL.DATA	SYS018	SETSEC		NORECOV	SETSEC FOR DD=SYS00006 DSN=SYS5.DTS.
14	04/05/2012	11:05:17	SPDWADTS	SYS5.DTS.SCC.V5R1.SCCIVP.ADDVOL.DATA		ADDVOL	VSAM	RECOVER	VOLUME * WAS ADDED TO DATA SET
15	04/05/2012	11:05:17	SPDWADTS	SYS5.DTS.SCC.V5R1.SCCIVP.ADDVOL.DATA		ADDVOL	VSAM	RECOVER	ADDVOL FOR DD=SYS00006 DSN=SYS5.DTS.
16	04/05/2012	11:05:37	SPDWADTS	SYS5.DTS.SCC.V5R1.SCCIVP1		RECAT	OS	RECOVER	DATA SET WAS RECATALOGED AND SCRATCH
17	04/05/2012	11:05:37	SPDWADTS	SYS5.DTS.SCC.V5R1.SCCIVP1		RECAT	OS	RECOVER	RECAT FOR DD=RECAT DSN=SYS5.DTS.SCC.
18	04/05/2012	11:20:10	SPDWADTS	SYS12096.T112009.RA000.SPDWADTS.SCCIVP1.HO3		REDUCEP	OS	NORECOV	POOL DEFINITION DOES NOT ALLOW PRIMA



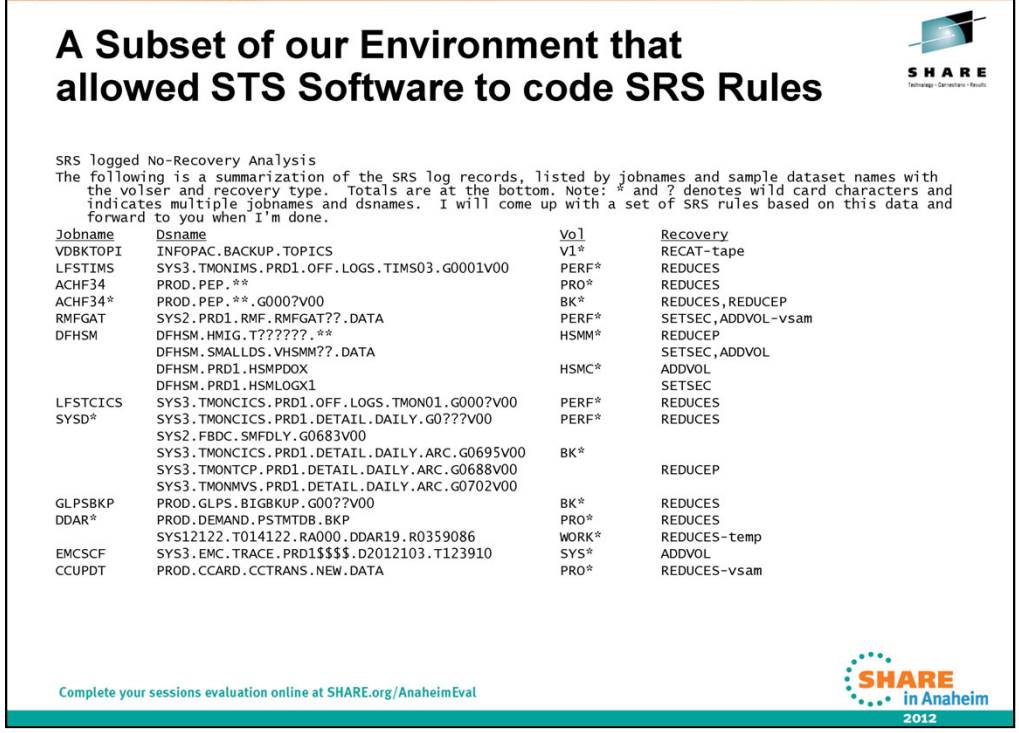
The SRS Rule DEFPROD allows us to cut SMF 222 records each time a Storage Allocation request is done.

The DIFINIT member in the SRS PARMLIB coded with INITOPT allows us to send the SMF 222 records to the MON Explorer Limited GUI.



Here's an example of MVS Data that gets copied to the 'MON Explorer Limited GUI' for browsing. (Hard to Read – Reasons for the GUI)

A Subset of our Environment that allowed STS Software to code SRS Rules

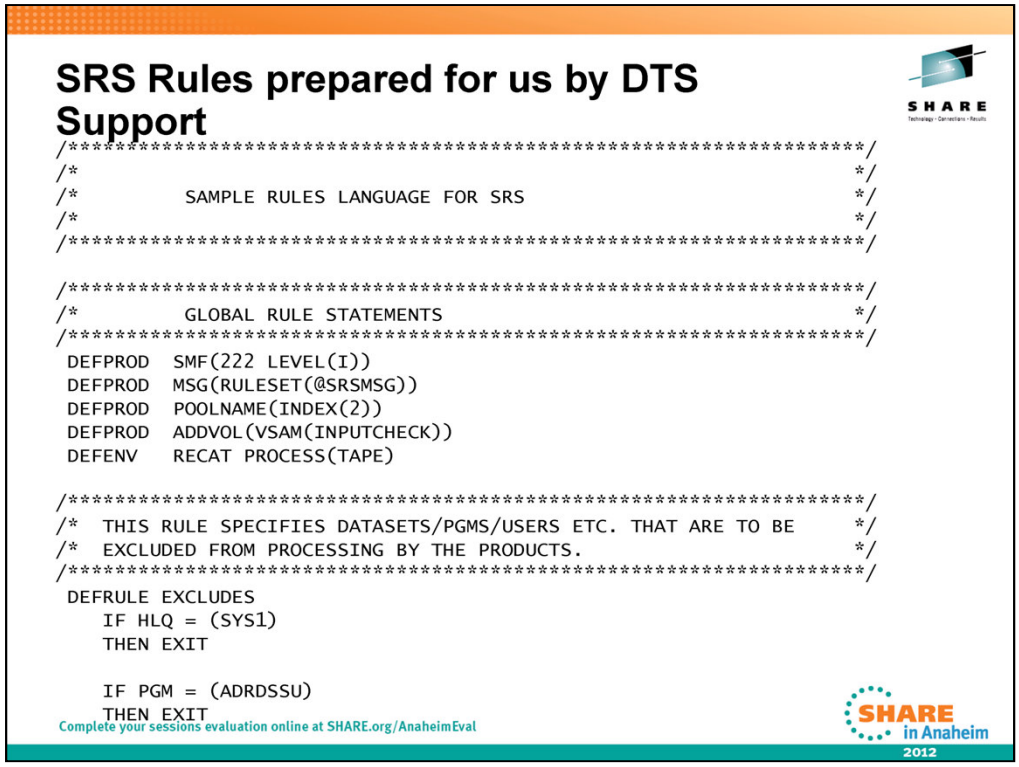


SRS logged No-Recovery Analysis
The following is a summarization of the SRS log records, listed by jobnames and sample dataset names with the volser and recovery type. Totals are at the bottom. Note: * and ? denotes wild card characters and indicates multiple jobnames and dsnames. I will come up with a set of SRS rules based on this data and forward to you when I'm done.

Jobname	Dsname	Vol	Recovery
VDBKTOPI	INFOPAC.BACKUP.TOPICS	V1*	RECAT-tape
LFSTIMS	SYS3.TMONIMS.PRD1.OFF.LOGS.TIMS03.G0001V00	PERF*	REDUCES
ACHF34	PROD.PEP.**	PRO*	REDUCES
ACHF34*	PROD.PEP.**.G000?V00	BK*	REDUCES,REDUCEP
RMFGAT	SYS2.PRD1.RMF.RMFGAT??.DATA	PERF*	SETSEC,ADDVOL-vsam
DFHSM	DFHSM.HMIG.T??????.**	HSMM*	REDUCEP
	DFHSM.SMALLDS.VHSMM??.DATA		SETSEC,ADDVOL
	DFHSM.PRD1.HSMPDOX	HSMC*	ADDVOL
	DFHSM.PRD1.HSMLOGX1		SETSEC
LFSTCICS	SYS3.TMONCICS.PRD1.OFF.LOGS.TMON01.G000?V00	PERF*	REDUCES
SYSD*	SYS3.TMONCICS.PRD1.DETAIL.DAILY.G0???V00	PERF*	REDUCES
	SYS2.FBDC.SMFDLY.G0683V00		
	SYS3.TMONCICS.PRD1.DETAIL.DAILY.ARC.G0695V00	BK*	
	SYS3.TMONTCP.PRD1.DETAIL.DAILY.ARC.G0688V00		REDUCEP
	SYS3.TMONMVS.PRD1.DETAIL.DAILY.ARC.G0702V00		
GLPSBKP	PROD.GLPS.BIGBKUP.G00??V00	BK*	REDUCES
DDAR*	PROD.DEMAND.PSTMTDB.BKP	PRO*	REDUCES
	SYS12122.T014122.RA000.DDAR19.R0359086	WORK*	REDUCES-temp
EMCSCF	SYS3.EMC.TRACE.PRD1$$$$.D2012103.T123910	SYS*	ADDVOL
CCUPDT	PROD.CCARD.CCTRANS.NEW.DATA	PRO*	REDUCES-vsam

Here is the SRS logged No-Recovery Analysis report prepared by DTS Support, to allow DTS Support to define or initial SRS Rules member for SRS.

SRS Rules prepared for us by DTS Support



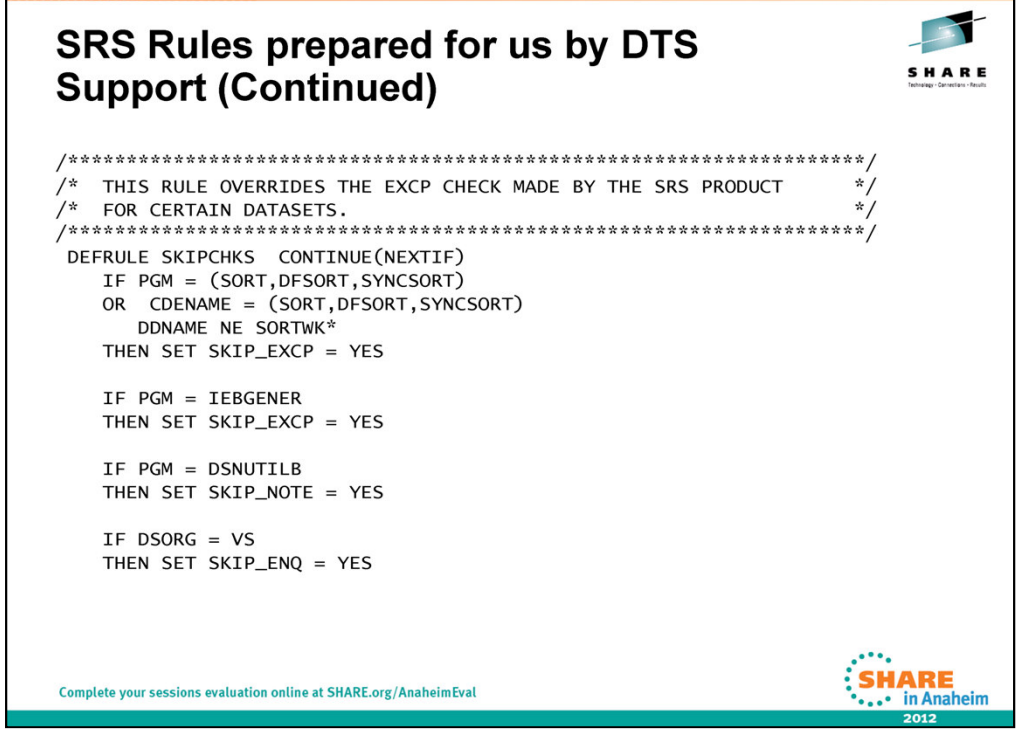
```
/*********************************************************************/
/*                                                                   */
/*          SAMPLE RULES LANGUAGE FOR SRS                            */
/*                                                                   */
/*********************************************************************/

/*********************************************************************/
/*          GLOBAL RULE STATEMENTS                                   */
/*********************************************************************/
 DEFPROD  SMF(222 LEVEL(I))
 DEFPROD  MSG(RULESET(@SRSMSG))
 DEFPROD  POOLNAME(INDEX(2))
 DEFPROD  ADDVOL(VSAM(INPUTCHECK))
 DEFENV   RECAT PROCESS(TAPE)

/*********************************************************************/
/*  THIS RULE SPECIFIES DATASETS/PGMS/USERS ETC. THAT ARE TO BE      */
/*  EXCLUDED FROM PROCESSING BY THE PRODUCTS.                        */
/*********************************************************************/
 DEFRULE EXCLUDES
    IF HLQ = (SYS1)
    THEN EXIT

    IF PGM = (ADRDSSU)
    THEN EXIT
```


Here are SRS Rules created for FirstBank from the SMF Recovery Analysis Report (SRSSMF) and the SMF Analysis Program (The Free Monitoring tool)

DEFRULE - specifies a section for IF-THEN-ELSE logic statements, used to compare variables to values to make decisions. The name after DEFRULE is a user specified descriptive name for the rule.

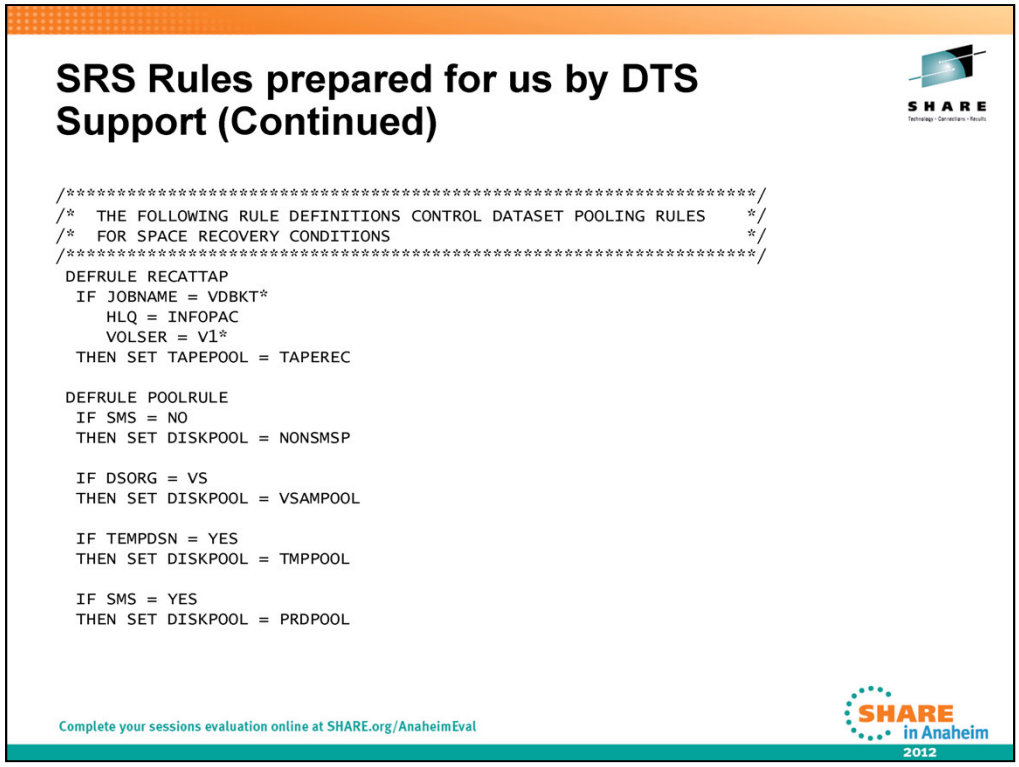
DEFRULE EXCLUDES - Usually jobs, dsns, users, etc. that you want to exclude from SRS processing.

SRS Rules prepared for us by DTS Support (Continued)



```
/*********************************************************************/
/*  THIS RULE OVERRIDES THE EXCP CHECK MADE BY THE SRS PRODUCT       */
/*  FOR CERTAIN DATASETS.                                            */
/*********************************************************************/
 DEFRULE SKIPCHKS  CONTINUE(NEXTIF)
    IF PGM = (SORT,DFSORT,SYNCSORT)
    OR  CDENAME = (SORT,DFSORT,SYNCSORT)
       DDNAME NE SORTWK*
    THEN SET SKIP_EXCP = YES

    IF PGM = IEBGENER
    THEN SET SKIP_EXCP = YES

    IF PGM = DSNUTILB
    THEN SET SKIP_NOTE = YES

    IF DSORG = VS
    THEN SET SKIP_ENQ = YES
```


DEFRULE SKIPCHKS -Various integrity checking is done internally to make sure the dataset is a good candidate for ADDVOL recovery. This rule is where you can override the integrity checks for various files if you know that multivolume is acceptable.



DEFRULE RECATTAP - a rule to allow recatalog for tape dataset names if a duplicate exists

DEFRULE POOLRULE - rules to assign DEFPOOL names (SET DISKPOOL = name) for SRS recovery

SRS Rules prepared for us by DTS Support (Continued)

```
/*********************************************************************/
/*  POOL DEFINITIONS - CONTAIN OPTIONS AND VOLUMES TO BE USED        */
/*  FOR RECOVERING SPACE PROBLEMS                                    */
/*********************************************************************/
 DEFPOOL TAPEREC
   RECAT(YES)

 DEFPOOL NONSMSP
   ALGORITHM(MAXSPACE)
   REDUCEP(PERCENT(10) LIMIT(10))
   REDUCES(YES)
   SETSEC(PERCENT(50))
   ADDVOL(YES MAXVOL(20))
   RECAT(YES)
    VOLSER(1,3) = &O:VOLSER(1,3)

 DEFPOOL VSAMPOOL
   ALGORITHM(MAXSPACE)
   REDUCEP(PERCENT(10) LIMIT(50))
   REDUCES(YES PERCENT(10) LIMIT(30))
   ADDVOL(YES MAXVOL(25))
```


ALGORITHM(MAXSPACE) - when adding a volume, pick the volume with the most free space from the EDL

REDUCEP(PERCENT(10) LIMIT(10)) – reduce primary space value by % loop. If limit is reached before space is found then stop.

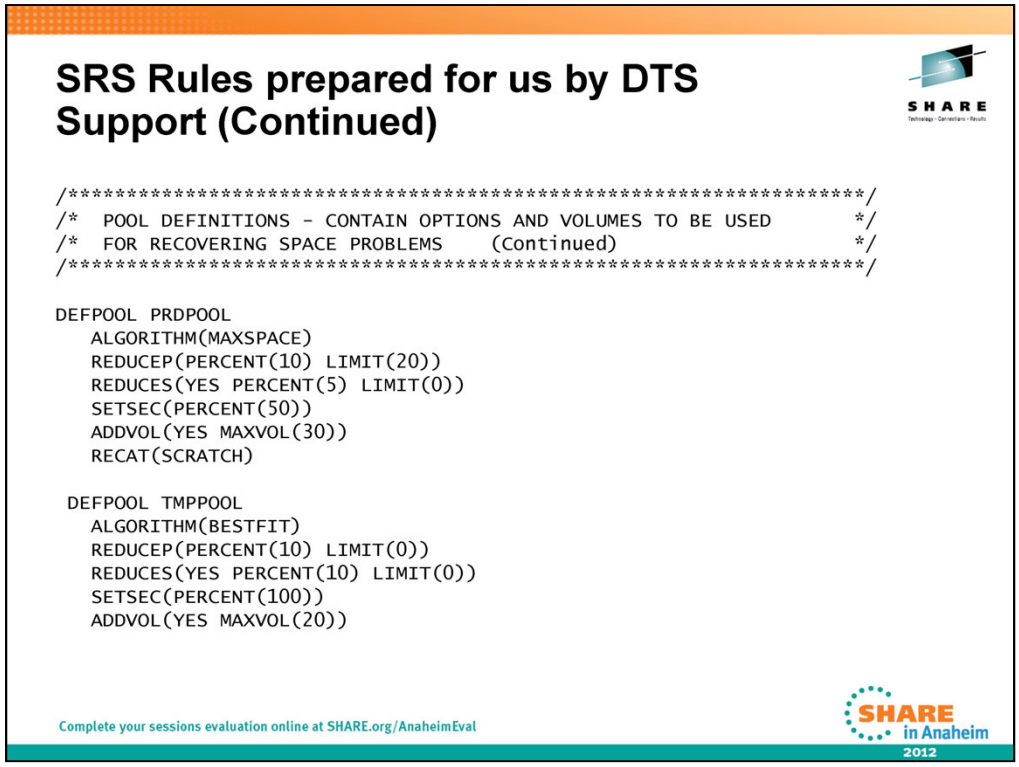
REDUCES(YES) – reduce secondary space value to largest extent on volume when requested amount is not available

SETSEC(PERCENT(50)) – set a secondary value if none exists and is needed, to a percentage of primary value

ADDVOL(YES MAXVOL(20)) – add volumes or candidate entries (SMS) up to the max volume limit

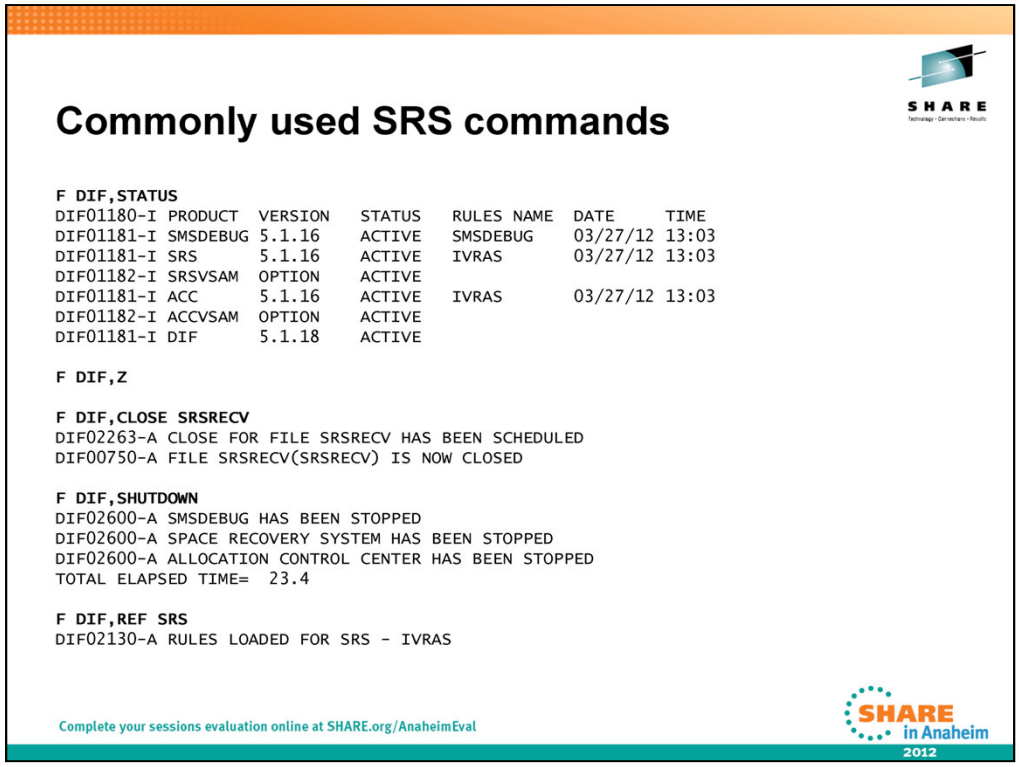
RECAT(YES) – allow new dataset allocations with existing duplicate names to be properly cataloged

VOLSER(1,3) = &O:VOLSER(1,3) - add a volume with the defined criteria (in this example, same first 3 characters of current volume). *Usually* coded for non-SMS only.



Just more DEFPOOL Definitions

`ALGORITHM(BESTFIT)` - When adding a volume, pick the volume with the least amount of free space but still adequate for the secondary space request.



Here are a few of the commands commonly used and commands we used for testing as we rolled out new LPARs on SRS

F DIF,STATUS
Explanation: The DIF STATUS command was issued by the operator. One DIF01181 message is produced for each product running under DIF. The message displays information about the current release of the product, the current status, and the last conversion of the rules language for the product is also displayed.

F DIF,Z
Note: The SCC products running under DIF will remain active during the restart when using the "F DIF,Z" command: (versus F DIF,SHUTDOWN)

F DIF,CLOSE SRSRECV
Explanation: The DIF CLOSE command was issued by the operator.
The ddname belongs to the PRINT subtask running under DIF. The request has been scheduled for execution by the PRINT subtask.

F DIF,SHUTDOWN
Explanation: DIF has successfully stopped the product.

F DIF,REF SRS ← Refreshes BOTH (SRS & ACC) with the current RULE member
Explanation: The DIF REFRESH command was issued by the operator.
The command successfully loaded a new copy of the product rules from memname.

Setting up a Trial

- Setting up a Trial of SRS was as easy as signing one form and emailing this form back to DTS Software.

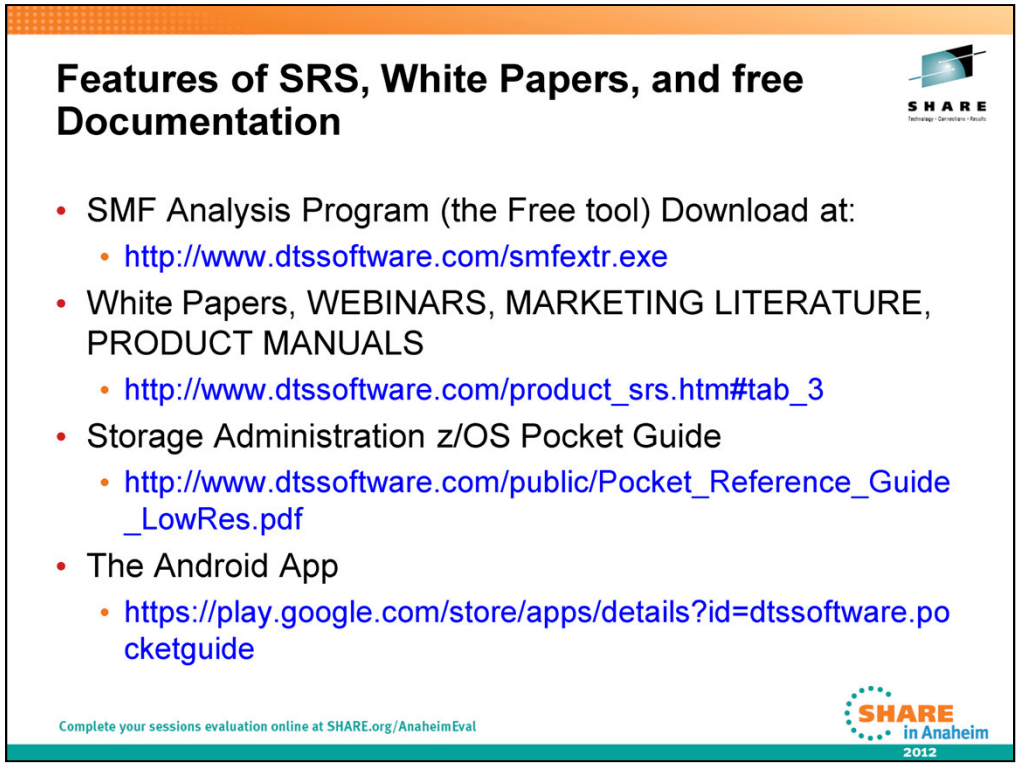
DTS SOFTWARE, INC.

SOFTWARE
EVALUATION
AGREEMENT

between
DTS Software, Inc.
and
FirstBank Data Corporation

Yes, our company would like to begin a FREE no-obligation evaluation of the proprietary software product(s) SRS/Plus MANUALS ONLY from DTS Software, Inc. I understand that the evaluation is free of charge and the evaluation period is for 30 days unless extended. If the Company decides not to license the product(s) at the end of the evaluation period, all product tapes and manuals are to be returned to DTS Software, Inc. and all product libraries are to be removed from any systems on which the product was installed.

DTS Makes it easy and has flexible terms!



The Android APP - DTS Software's popular z/OS Pocket Reference Guide finally makes its way to the app market. Useful information for mainframe programmers, administrators, and others is now even more easily available. New in Version 2.1: Fixed an error in the DASD Calculator's blocks per track calculation that was brought to our attention by someone at SHARE. This should not have impacted users in a meaningful way, but check to be sure. The error resulted in the blocks per track being 1 off in some cases, which may have added another track to the space calculation. Again thank you for your continued support.

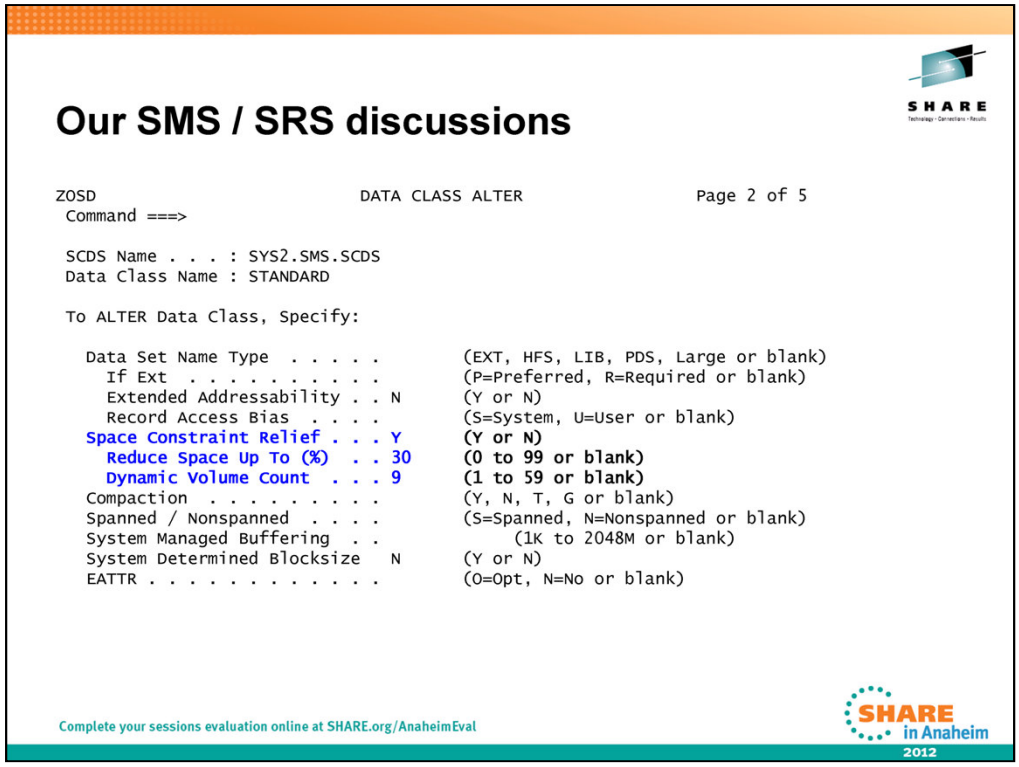
Coming soon: VSAM calculator, and additional support for tablets.

If there's anything else you would like to see in the guide, please contact DTS Software at: *Tel: (770) 922-2444* or *Email:* info@DTSsoftware.com

Our Shop

- New to z/OS as of: May 2010
- We only have 180 physical Disk Drives
- In SMS we only have:
  - A Data Class Member with 78 lines of code (5 Classes)
  - A Management Class Member with 190 lines of code (10 Classes)
  - A Storage Class Member with 435 lines of code (14 Classes)
  - A Storage Group Member with 128 lines of code (15 Groups)

And we were VMESA / VSE/ESA prior to May 2010.



We use the below **three DATA CLASS parameters** to satisfy most of our Space Constraint Recovery.

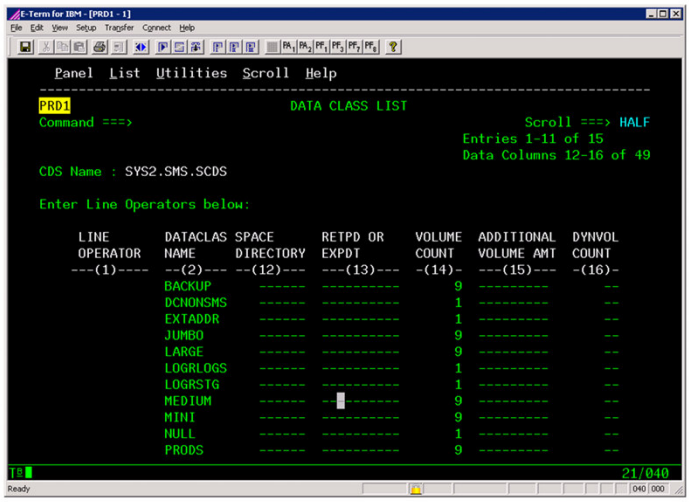
The **SPACE CONSTRAINT RELIEF** field is used to define the data class attribute that will be used by the system to retry allocation and extension failures for SMS managed data sets. Retry is based on a combination of:

1. spreading the requested quantity over multiple volumes,
2. allocating a fraction of requested quantity, and
3. using more than 5 extents to satisfy the allocation.

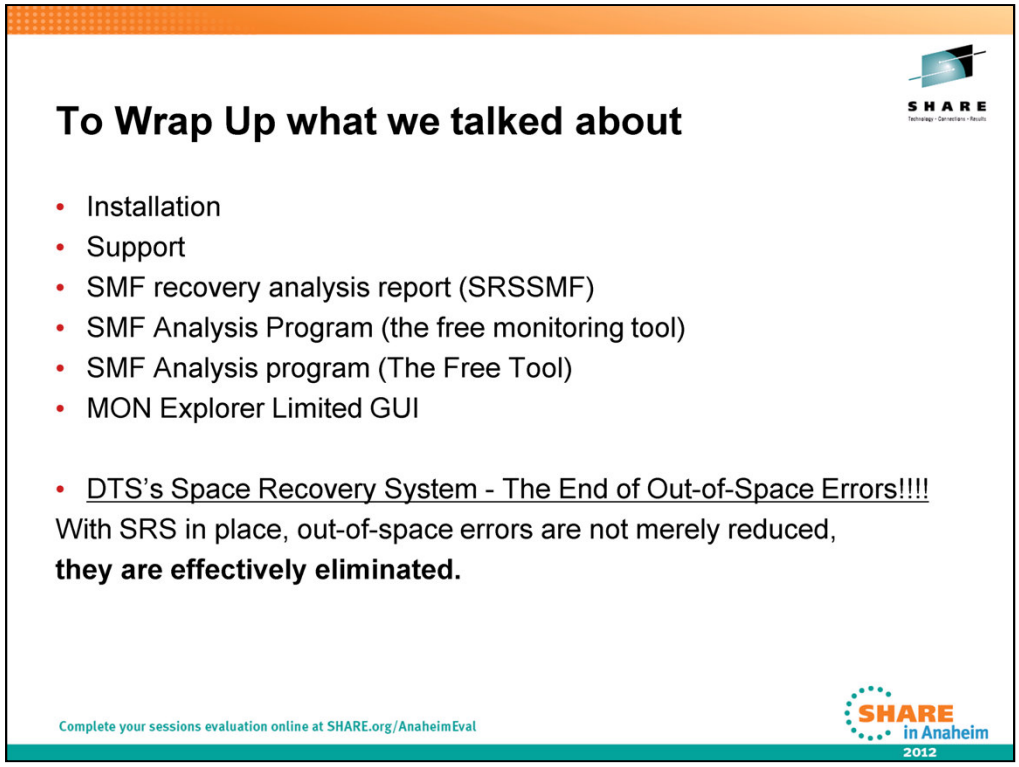
Use the **REDUCE SPACE UP TO** field in order to reduce the amount of requested space quantity by x% and re-drive the best-fit allocation. A specification of 0 by the user implies that the user wishes to take advantage of the facility to use more than 5 extents to satisfy the allocation without reducing the allocation amount.

Use **DYNAMIC VOLUME COUNT** field to specify a maximum number of volumes that DFSMS can add dynamically to a SMS managed dataset. The Dynamic Volume Count needs to be larger than the current volume count of the data set. (Similar to `'VOL=(,,,9)'`)

SRS and SMS Volume Count



Just to reiterate: If a dataclas has a volume count of 10 and SRS had a pool definition with ADDVOL(YES MAXVOL(20)), SRS will only start adding volumes UP TO 20 (not additional 20) after the first 10 are used. In the case where there are not enough eligible volumes period, there is really nothing SRS can do unless more volumes are added to the storage group. SRS does not report on volumes that it does not add, so if a dataset extends to another volume because a multivolume count in the dataclas, SRS is not involved in this. It basically gets involved to help prevent a failure if prevention is possible.



To wrap up we talked about:

Installation
Support
SMF recovery analysis report (SRSSMF)
SMF Analysis Program (the free monitoring tool)
SMF Analysis program (The Free Tool)
MON Explorer Limited GUI

Any Questions?

Disclaimer

- "The presentation is my own and doesn't necessarily represent FirstBank's positions, strategies or opinions."

Complete your sessions evaluation online at SHARE.org/AnaheimEval