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DFSMS:Intermediate Understanding Someone Else's ACS Routines

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SHARE in Boston

Agenda

- The Problem
- ACS Review
- Tools and Prep
- Two Scenarios
  - Debugging
  - Adding
- General ACS Tips

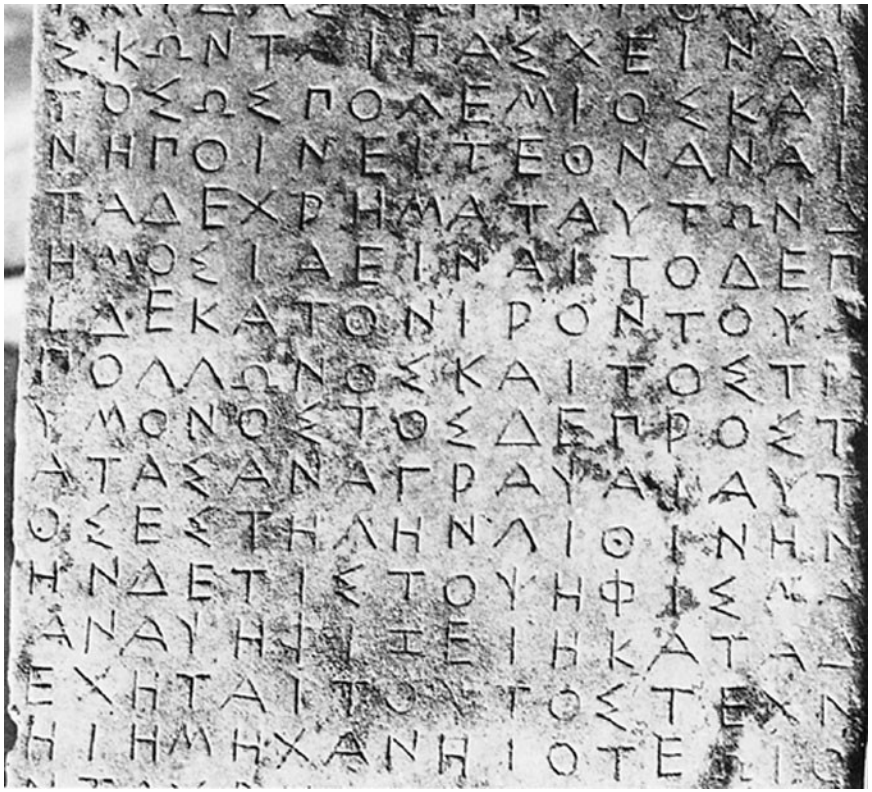
```
IF &LABEL ¬= &DSN(3)
THEN
DO
WRITE '&LABEL NOT SET AS INDICATED BY &DSN(3)'
WRITE '&LABEL NOT VERIFIED BY DATACLAS'
EXIT CODE(16)
END
ELSE
DO
WRITE '&LABEL = '&LABEL' VERIFIED BY DATACLAS'
END
IF &DSN(4) = 'ONE'
THEN
DO
IF &FILENUM ¬= 1
THEN
DO
WRITE '&FILENUM NOT 1 AS INDICATED BY &DSN(4)'
WRITE '&FILENUM NOT VERIFIED BY DATACLAS'
EXIT CODE(16)
END
ELSE
DO
WRITE '&FILENUM NOT 1 AS INDICATED BY &DSN(4)'
WRITE '&FILENUM NOT VERIFIED BY DATACLAS'
EXIT CODE(16)
END
ELSE
DO
WRITE 'DATACLAS ACS ROUTINE -
VERIFIED &FILENUM = '&FILENUM'  '
END
END
ELSE
IF &DSN(4) = 'TWO'
THEN
DO
IF &FILENUM ¬= 2
THEN
DO
WRITE '&FILENUM NOT 2 AS INDICATED BY &DSN(4)'
WRITE '&FILENUM NOT VERIFIED BY DATACLAS'
EXIT CODE(16)
END
ELSE
DO
WRITE '&FILENUM NOT 2 AS INDICATED BY &DSN(4)'
WRITE '&FILENUM NOT VERIFIED BY DATACLAS'
WRITE 'DATACLAS ACS ROUTINE -
VERIFIED &FILENUM = '&FILENUM'  '
END
END
```

The Problem

- Even well-written routines need updated
- Updates are not always as well-written
- Special clauses are added
- Over time, these updates cloud the original purpose

```
IF &LABEL EQ &DSN(3)
THEN
IF &DSN(4) = 'TWO'
THEN
DO
WRITE '&LABEL NOT SET AS INDICATED BY &DSN(3)'
WRITE '&LABEL NOT VERIFIED BY DATACLAS'
IF &FILENUM ¬= 2
WRITE '&LABEL NOT SET AS INDICATED BY &DSN(3)'
EXIT CODE(16)
WRITE '&LABEL NOT VERIFIED BY DATACLAS'
END
ELSE
DO
WRITE '&FILENUM NOT 2 AS INDICATED BY
&DSN(4)'
END
ELSE
DO
WRITE '&LABEL VERIFIED BY DATACLAS'
END
IF &LABEL = 'ONE' &DSN(3) = '&LABEL' VERIFIED BY DATACLAS'
THEN
THEN
IF &DSN(4) = 'ONE'
THEN
DO
IF &FILENUM = 1
WRITE '&LABEL NOT SET AS INDICATED BY &DSN(3)'
THEN
WRITE '&LABEL NOT VERIFIED BY DATACLAS'
DO
IF &FILENUM = 1
EXIT CODE(16)
WRITE '&FILENUM NOT 1 AS INDICATED BY &DSN(4)'
THEN
END
DO
WRITE '&FILENUM NOT VERIFIED BY DATACLAS'
ELSE
WRITE '&FILENUM NOT 1 AS INDICATED BY &DSN(4)'
DO WRITE END &FILENUM NOT VERIFIED BY DATACLAS'
WRITE &LABEL = '&LABEL' VERIFIED BY DATACLAS'
END
DO
WRITE DATACLAS ACS ROUTINE -
IF &DSN(4) = 'ONE'
THEN DO
WRITE END DATACLAS ACS ROUTINE -
DO
VERIFIED &FILENUM = '&FILENUM'
ELSE IF &FILENUM = 1
END &DSN(4) THEN
ELSE
THEN
DO
IF &DSN(4) = 'TWO' WRITE &FILENUM NOT 1 AS INDICATED BY
&DSN(4)
IF &FILENUM = 2
THEN WRITE &FILENUM NOT VERIFIED BY DATACLAS'
DO
IF &FILENUM EXIT CODE(16)
THEN WRITE &FILENUM NOT 2 AS INDICATED BY &DSN(4)'
END
WRITE &FILENUM NOT VERIFIED BY DATACLAS'
DO
ELSE
WRITE &FILENUM NOT 2 AS INDICATED BY &DSN(4)'
WRITE DO &FILENUM NOT VERIFIED BY DATACLAS'
DATACLAS ACS ROUTINE -
VERIFIED &FILENUM = '&FILENUM'
END
```

The Problem



The Solution!

- Unfortunately there is no easy solution
  - But there are things you can do to make it easier!

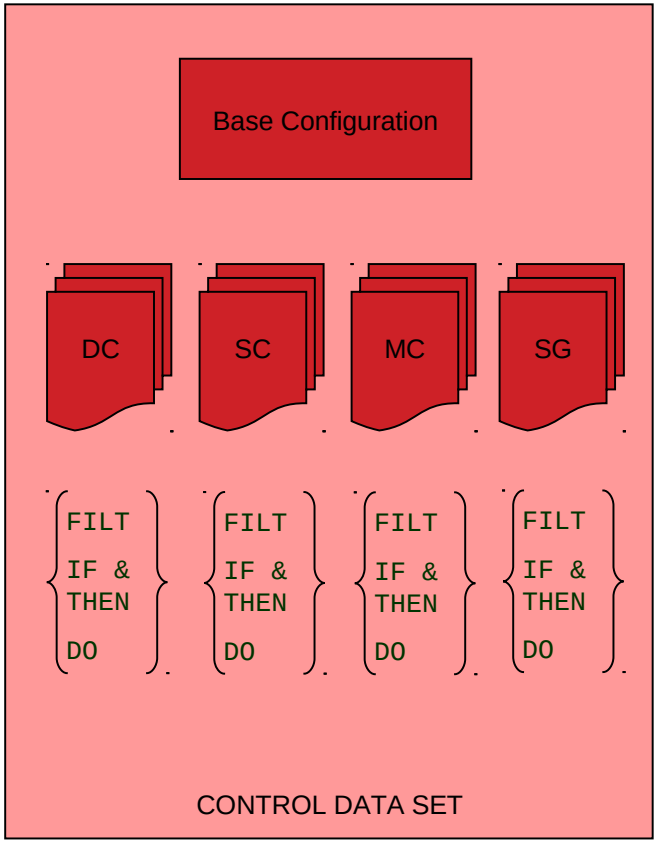
- The **Purpose of this Presentation:**
  - Demonstrate how to find the info you need
  - Tips and tricks for making current ACS easier to read
  - Discuss concepts for good ACS

Part 1 – ACS Review

SMS Review

- SMS has 4 classes:
  - **Data class** – assigns allocation defaults (like size, volcnt)
  - **Storage class*** – assigns performance attributes
  - **Management class** – defines backup characteristics
  - **Storage group*** – groups of volumes
- Each class has it's own ACS routine

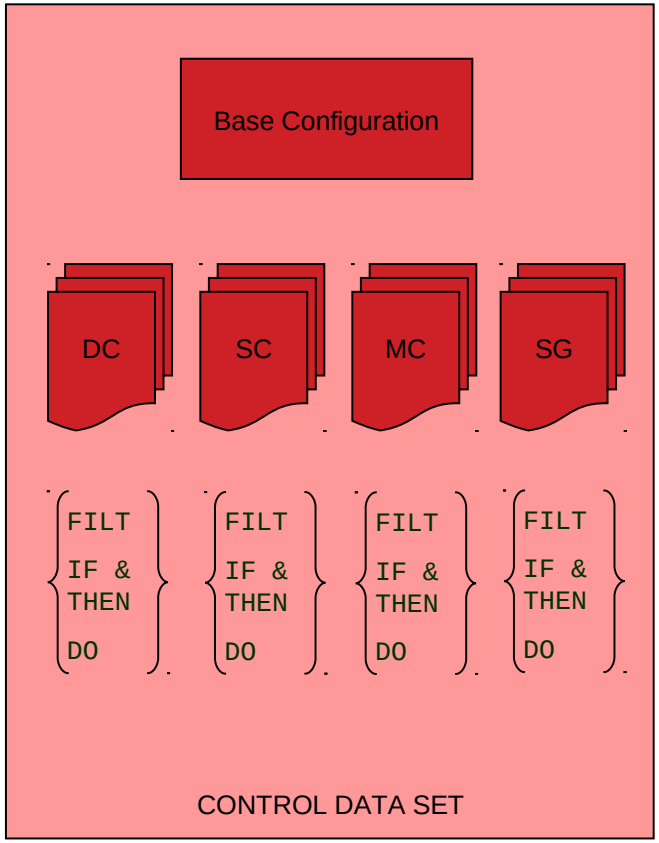
*required to be SMS-managed



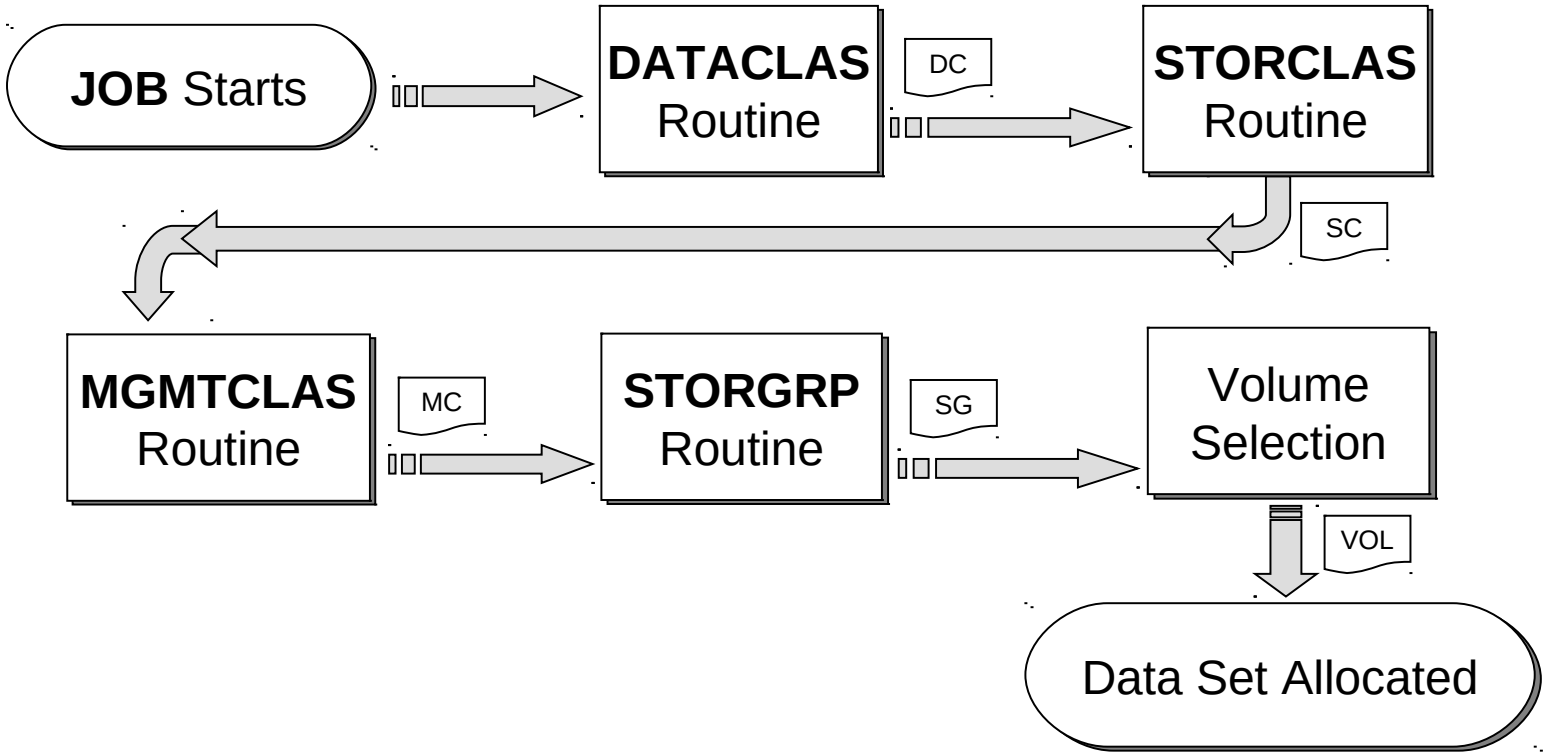
What is ACS?

- Automated Class Selection (ACS)
- User-defined rules
- Assigns SMS classes

- Basically: **YOU** tell **SMS** how to act



Processing Order



ACS Syntax

- Always start with a PROC
- END everything – DO, PROC, SELECT
- IF needs THEN
- SELECT should have WHEN and OTHERWISE
- /* Comments look like this */ - but don't nest them
- Literals are in quotes: 'MY.DATASET' or '3390'
- Masks are not in quotes: MY.* or 33*
- +/- continue literals to the next line

Sample ACS

```
PROC STORCLAS
FILTLIST DBVOLS INCLUDE(IMS*,DB2*)                                /* ALL DATABASE VOLUMES */
                EXCLUDE('IMS053','DB2007')
FILTLIST DBJOBS INCLUDE(IMS*,PROD*,ACCT*)                          /* ALL DATA BASE JOBS */
FILTLIST VALID_UNITS
INCLUDE('3330','3340','3350','3375','3380','3390','SYSDA','')      /* VALID UNITS FOR SMS */
IF &UNIT ^= &VALID_UNITS
   THEN DO
           SET &STORCLAS = ''
           WRITE 'INVALID UNIT TYPE FOR SMS ALLOCATION'
           EXIT
        END
SELECT
       WHEN (&DSN = SYS1.**)                                          /* SYSTEM DATA */
            SET &STORCLAS = 'SYSTEM'
       WHEN ((&ALLVOL = &DBVOLS) && (&JOB = &DBJOBS))                /* DATABASE DATA */
            SET &STORCLAS = 'DBPOOL'
       WHEN ((&DSN(3) = 'CLEAR') | (&ANYVOL ^= TSO*))                /* NON-SMS DATA */
            SET &STORCLAS = ''
       WHEN (&DEF_STORCLAS ^= '')                                    /* IF DEFAULTS EXIST */
            SET &STORCLAS = &DEF_STORCLAS;
       OTHERWISE SET &STORCLAS = 'COMMON'                            /* ALL OTHER DATA */
END
```

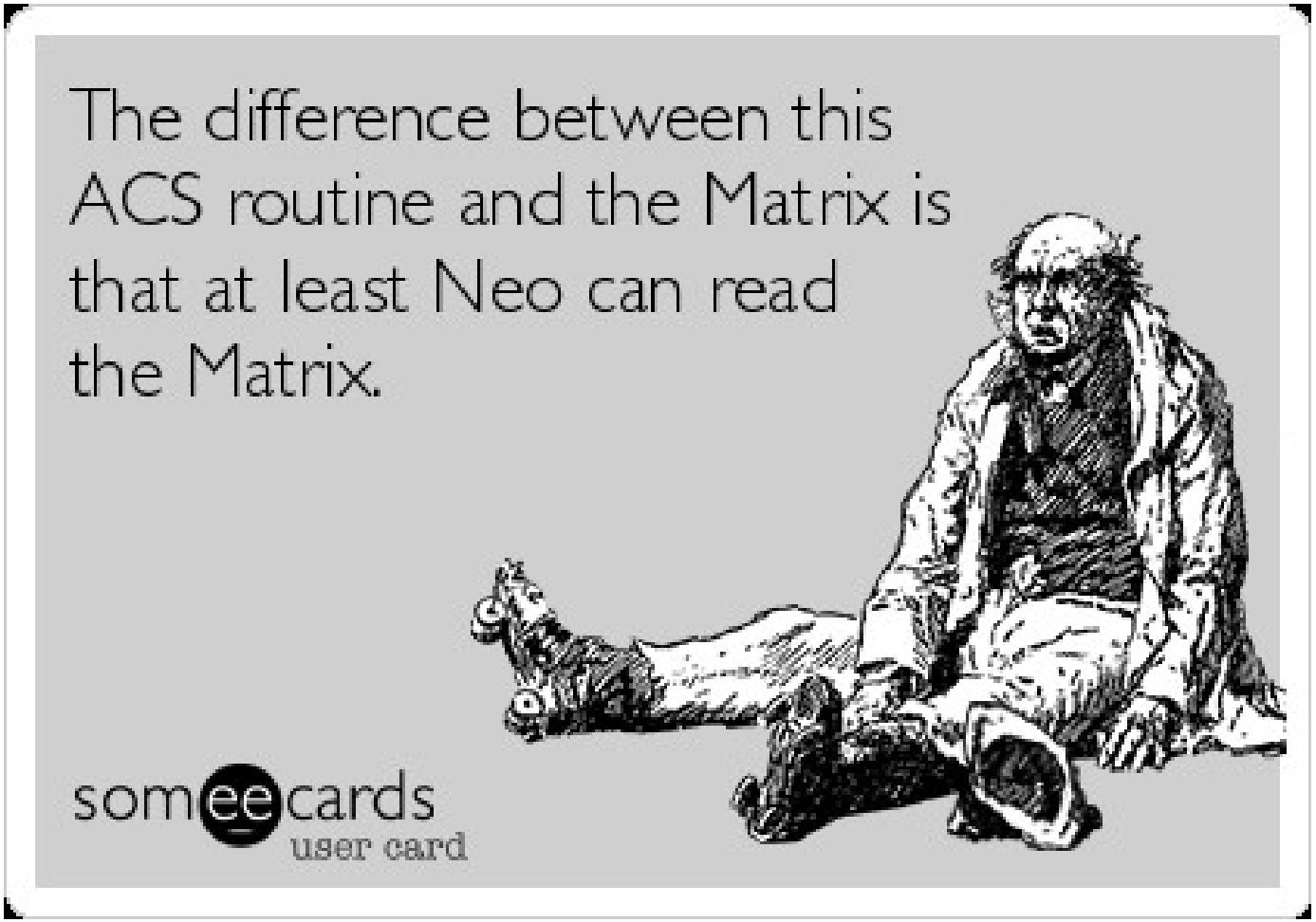
ACS Philosophy

- Several Approaches to ACS routines:

Speedy

Clever

Maintainable



Part 2 – Preparation and Tools

Preparation:

- **Make a copy of your ACS and SCDS**
  - For safety – do any edits on the copy
- Indent
  - Indent after every DO, IF, SELECT
  - Remove indent at every END, ELSE
- Prepare a MAP
  - Helps identify how each class gets set
- Comment where you can -
  - /* document what you already know */
- Add WRITE statements
  - To help trace through routines

Indent Example

Old:

```
IF &DSN(1) = 'TEST' THEN DO
IF &UNIT ^= &VALID_UNITS
  THEN DO
SET &STORCLAS = ''
EXIT
END
ELSE SET &STORCLAS = 'TEST'
END
```

New:

```
/* Check for test data */
IF &DSN(1) = 'TEST' THEN DO
   /* Check if UNITs are VALID */
   IF &UNIT ^= &VALID_UNITS THEN DO
      /* if invalid, set NULL */
      SET &STORCLAS = ''
      WRITE 'INVALID UNIT TYPE'
      EXIT
   END
   ELSE DO
      SET &STORCLAS = 'TEST'
      WRITE 'TEST DATA'
   END
END
```

Making a MAP

- Spreadsheet
- Variables across the top
- Classes down the side

- Allows you to classify how data gets into those classes
- Helps identify groups

	A	B	C	D	E	F	G	H	I
1		&DSTYPE	&JOB	&DSORG	$DSN(2)	&DSTYPE	&SIZE	&USER	&DATACLAS
2	FLATSM								
3	FLATBIG								
4	LIBS								
5	VSAM								
6	CICSVS								
7	TEMPS								
8	JACKS								
9	WRONGDC								
10	ADMIN								
11									

Tools

- **ISMF Option 7.4 – ACS Testing**
  - Define a set of tests
  - Run them and review output
- **NaviQuest (ISMF Option 11)**
  - Very similar, but you can use lists of your actual data sets
  - We'll briefly discuss – for more info, see session 14157
- Many text editors have built-in auto-indent

ACS Testing – ISMF 7.4

```
  Panel  Utilities  Help
                          ACS APPLICATION SELECTION

Select one of the following options:
4  1. Edit            - Edit ACS Routine source code
   2. Translate       - Translate ACS Routines to ACS Object Form
   3. Validate        - Validate ACS Routines Against Storage Constructs
   4. Test            - Define/Alter Test Cases and Test ACS Routines
   5. Display         - Display ACS Object Information
   6. Delete          - Delete an ACS Object from a Source Control Data Set



If Display Option is Chosen, Specify:

  CDS Name  . . 'ACTIVE'
                              (1 to 44 Character Data Set Name or 'Active')



Use ENTER to Perform Selection;
Use HELP Command for Help; Use END Command to Exit.
```

ACS Testing – Define Testcase

```
  Panel  Utilities  Help
                                ACS TEST SELECTION

Select one of the following Options:

  1  1. DEFINE       - Define an ACS Test Case
     2. ALTER        - Alter an ACS Test Case
     3. TEST         - Test ACS Routines


If DEFINE or ALTER Option is Chosen, Specify:

  ACS Test Library . . 'NEAL.SMS.ACS'
  ACS Test Member  . . TESTA___
```

ACS Testing – Define Testcase

```
Panel  Utilities  Scroll  Help
                          ACS TEST CASE DEFINE                    Page 1 of 4

ACS Test Library  : NEAL.SMS.ACS
ACS Test Member . : TESTA

To DEFINE ACS Test Case, Specify:
  Description ==> SC TESTING
  Expected Result SC = SMS
  DSN (DSN/Collection Name) . . NEAL.SMS.MYDATA
  MEMN (Object Name)  . . . . .
  Sysname . . . SYSTEM1   Xmode . . . .  ____      Def_dataclas  . .  ________
  Sysplex . . . ________  ACSenvir  . .  ALLOC     Def_mgmtclas  . .  ________
  DD  . . . . . TESTDD    Dataclas  . .  ________  Def_storclas  . .  ________
  Dsorg . . . . PS        Mgmtclas  . .  ________  Dsntype . . . . .  _____
  Recorg  . . . __        Storclas  . .  ________    If Ext  . . . .  _
  Dstype  . . . ____      Storgrp . . .  ________  Seclabel  . . . .  ________
  Dsowner . . . ________  Size  . . . .  1000      Space_Type  . . .  TRK
  Expdt . . . . _______   Maxsize . . .  __________ Second_Qty  . . .  15
  Retpd . . . . _____     Blksize . . .  __________
Use ENTER to Perform Verification; Use DOWN Command to View next Panel;
Use HELP Command for Help; Use END Command to Save and Exit; CANCEL to Exit.
```

ACS Testing – Running a Test

```
  Panel  Utilities  Help
 ------------------------------------------------------------------------------
                              ACS TEST SELECTION            MEMBER TESTA SAVED

Select one of the following Options:

  3  1. DEFINE       - Define an ACS Test Case
     2. ALTER        - Alter an ACS Test Case
     3. TEST         - Test ACS Routines


If DEFINE or ALTER Option is Chosen, Specify:

  ACS Test Library . . 'NEAL.SMS.ACS'
  ACS Test Member  . . TESTA
```

ACS Testing – Running a Test

```
  Panel  Utilities  Help
                                TEST ACS ROUTINES

To Perform ACS Testing, Specify:

  CDS Name . . . . . . 'ACTIVE'
                          (1 to 44 Character Data Set Name or 'Active')
  ACS Test Library . . 'NEAL.SMS.ACS'
  ACS Test Member  . . TESTA    (fully or partially specified or * for all
                          members)
  Listing Data Set . . TEST.LISTING
                          (1 to 44 Character Data Set Name or Blank)

Select which ACS Routines to Test:

  DC ===> Y  (Y/N)  SC ===> Y  (Y/N)  MC ===> Y  (Y/N)  SG ===> Y  (Y/N)



Use ENTER to Perform Verification and Testing;
Use HELP Command for Help; Use END Command to Exit.
```

ACS Testing - Results

```
 BROWSE    USER2.TEST.LISTING
********************************************************************** Top of Data ************>
                                ACS TESTING RESULTS

CDS NAME          : ACTIVE
ACS ROUTINE TYPES: DC SC MC SG
ACS TEST LIBRARY : NEAL.SMS.ACS

  ACS TEST
  MEMBER        EXIT CODE   RESULTS
  ---------     ----------  ------------------------------------
  DESCRIPTION: SC TESTING
  EXPECTED RESULT: SC = SMS
  TESTA                  0  DC = STD
    MSG : DATACLAS=STD
                         0  SC = SMS
    MSG : STORCLAS=SMS
                         0  MC = NULL VALUE ASSIGNED
                         0  SG = SG1


ACS TESTING RC:  00
********************************************************************** Bottom of Data **********>
```

NaviQuest – ISMF 11

- Allows you to build test cases based on real data
  - ISMF Lists, DCOLLECT data, SMF data
- ACS Testing can be run using those test cases
- Can compare tests before / after changes
- Will generate Reports
- **Can be done in batch**

- Covered in session 14157

Computers are like
Old Testament gods;
lots of rules and no mercy.”

- Joseph Campbell

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Technology · Connections · Results

Part 3 – Digging In
"No more procrastinating"

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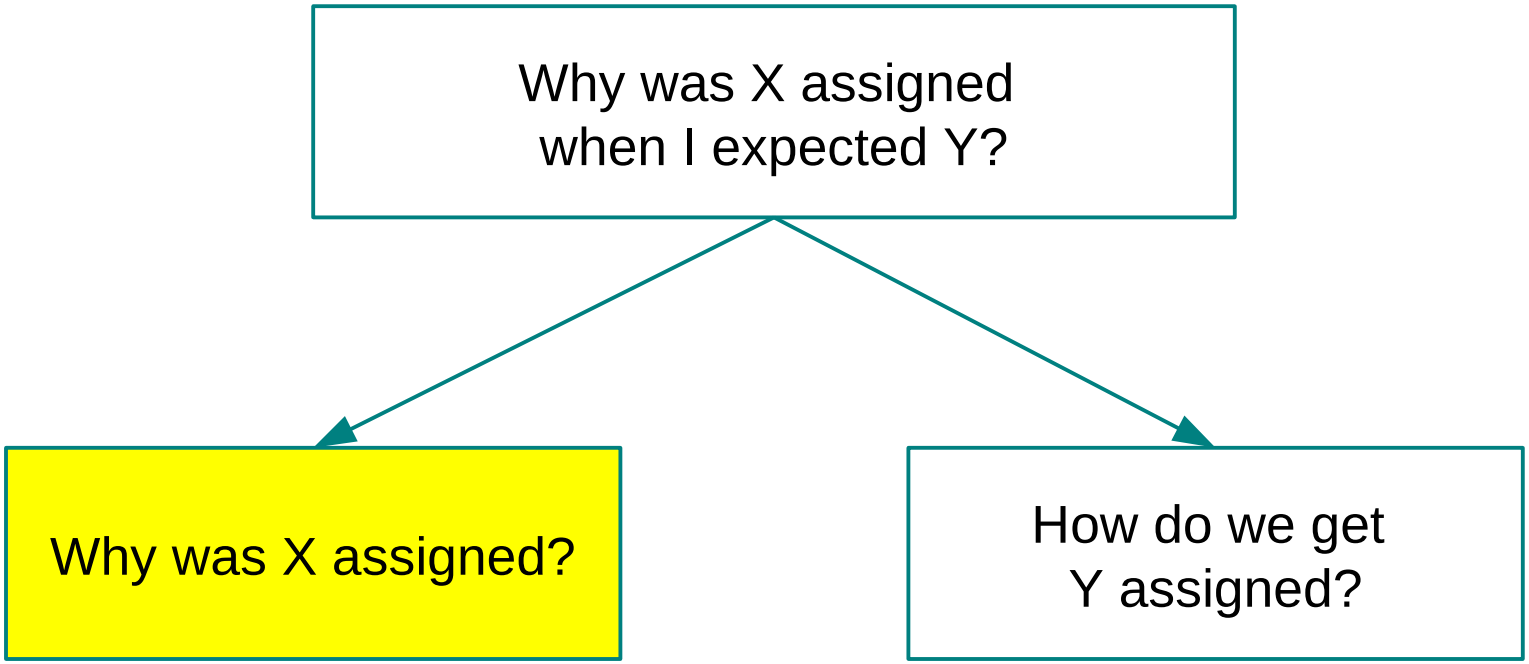
The Common Question

“Why was X assigned when I expected Y?”

Break it Down



Why was X assigned?

- Two ways to solve this:

- **Start at the Beginning**
  - Trace ACS
  - Take each IF that matches
  - End when you find the right SET
- Pros / Cons
  - Can be long
  - There could be multiple paths
  - Straightforward

- **Start at the End**
  - Find all SETs that match
  - Work backwards, noting IF requirements
  - Eliminate redundant requirements
- Pros / Cons
  - Shorter
  - Need less DS information

Working Backwards - Example

- Jack's data set was assigned SC “WrongDC”
- DSNAME : 'SPECIAL.JKTEST.NONVSAM'

- “WRONGDC” this gets set in 2 places
- IF statements just before each:
  - IF &DSN(2) = 'JKTEST'
  - IF &DATACLAS = ''
- IF statements before those:
  - IF &JOB = &CICSJOBS
  - IF &JOB /= &CICSJOBS

```
PROC DATACLAS

FILTLIST ADMINS   INCLUDE('BOB','LARRY','MOE')
FILTLIST CICSJOBS INCLUDE(CICS*,'CISPECL')

/* DATA CLASSES */
/* FLATSM  - flat files, small, < 50mb */
/* FLATBIG - flat files, big > 50mb    */
/* LIBS    - PDS, PDSE                 */
/* VSAM    - VSAM files                */
/* CICSVS  - VSAM files for CICS       */
/* TEMPS   - temporary                 */
/* JACKS   - jacks testing DC          */
/* WRONGDC - invalid combination       */

IF &DSTYPE = 'TEMP' THEN SET &DATACLAS = 'TEMPS'

IF &JOB = &CICSJOBS THEN DO
             IF &DSORG = 'VS' THEN SET &DATACLAS = 'CICSVS'
             IF &DSN(2) = 'JKTEST' THEN SET &DATACLAS = 'JACKS'
             ELSE SET &DATACLAS = 'WRONGDC'
ELSE DO
             IF &DSORG = 'PS' THEN DO
                          IF &DSTYPE = 'TEMP' THEN SET &DATACLAS = 'TEMP'
                          IF &SIZE > 50MB THEN SET &DATACLAS = 'FLATSM'
                          ELSE SET &DATACLAS = 'FLATBIG'
             END

             IF &DSORG = 'PO' THEN SET &DATACLAS = 'LIBS'

             IF &USER = &ADMINS THEN DO
                          SET &DATACLAS = 'ADMIN'
                          EXIT
             END

             IF &DSORG = 'VS' THEN DO
                          SET &DATACLAS = 'VSAM'
                          IF &DSTYPE = 'TEMP' THEN SET &DATACLAS = 'TEMP'
                          END

             IF &JOB = 'JKTEST' THEN SET &DATACLAS = 'JACKS'
             IF &DATACLAS = '' THEN SET &DATACLAS = 'WRONGDC'
END
END
```

```
IF &DSTYPE = 'TEMP' THEN SET &DATACLAS = 'TEMPS'

IF &JOB = &CICSJOBS THEN DO
        IF &DSORG = 'VS' THEN SET &DATACLAS = 'CICSVS'
        IF &DSN(2) = 'JKTEST' THEN SET &DATACLAS = 'JACKS'
        ELSE SET &DATACLAS = 'WRONGDC'
ELSE DO
        IF &DSORG = 'PS' THEN DO
                IF &DSTYPE = 'TEMP' THEN SET &DATACLAS = 'TEMP'
                IF &SIZE > 50MB THEN SET &DATACLAS = 'FLATSM'
                ELSE SET &DATACLAS = 'FLATBIG'
        END

        IF &DSORG = 'PO' THEN SET &DATACLAS = 'LIBS'

        IF &USER = &ADMINS THEN DO
                SET &DATACLAS = 'ADMIN'
                EXIT
        END

        IF &DSORG = 'VS' THEN DO
                SET &DATACLAS = 'VSAM'
                IF &DSTYPE = 'TEMP' THEN SET &DATACLAS = 'TEMP'
                END

        IF &JOB = 'JKTEST' THEN SET &DATACLAS = 'JACKS'
        IF &DATACLAS = '' THEN SET &DATACLAS = 'WRONGDC'
END
END
```

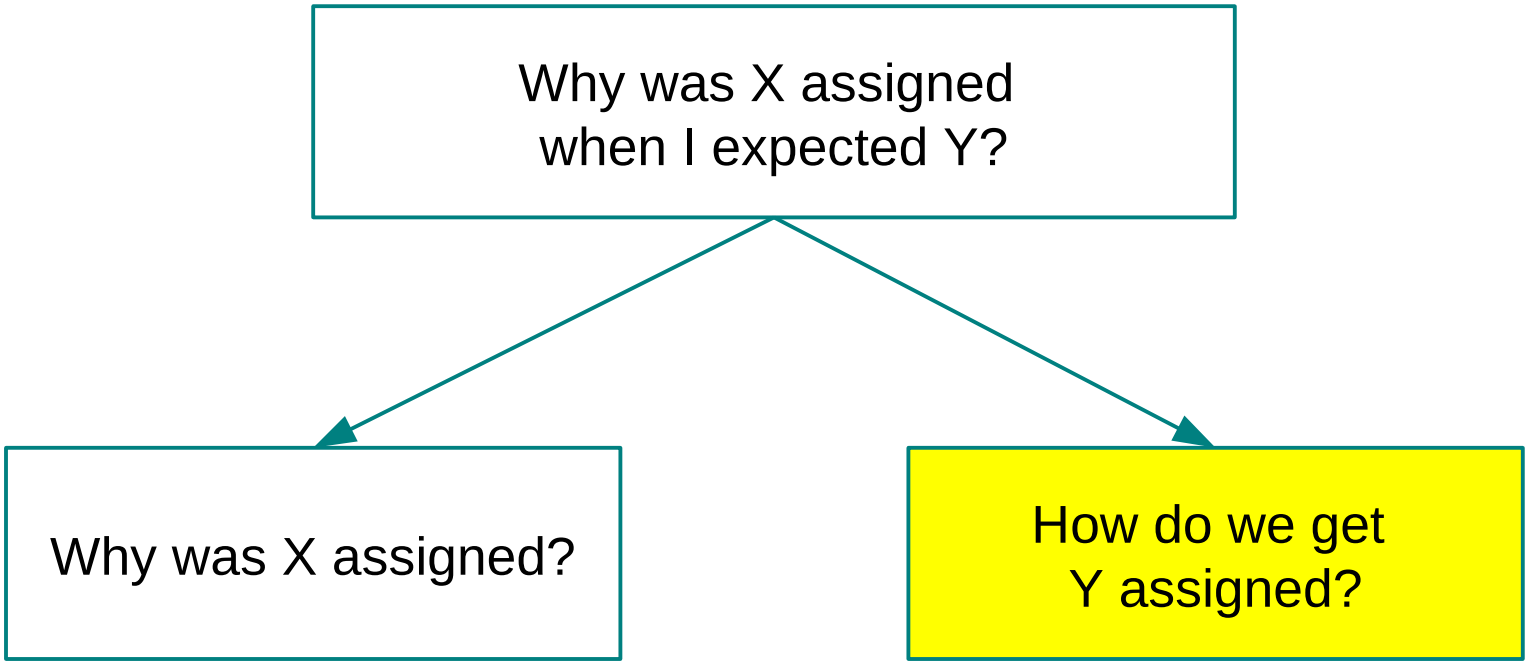
Working Backwards - Example

- Write the full rules:
  - IF &JOB = &CICSJOB AND &DSN(2) /= 'JKTEST'
  - IF &JOB /= &CICSJOB AND &DATACLAS = '' (not set)

- Now we have the 2 cases where WRONGDC gets set
- Update the MAP

	A	B	C	D	E	F	G	H	I
1		&DSTYPE	&JOB	&DSORG	$DSN(2)	&DSTYPE	&SIZE	&USER	&DATACLAS
2	WRONGDC		&CICSJOBS		NOT JKTEST				
3	WRONGDC		NOT &CICSJOBS						null
4									

Break it Down



How do we get Y assigned?

- Let's say the DS is supposed to have DC = 'JACKS'
- Identify all places JACKS is set:
  - IF &DSN(2) = 'JKTEST'
  - IF &JOB = 'JKTEST'
- Second-level tests:
  - IF &JOB = &CICSJOBS
  - IF &JOB /= &CICSJOBS

```
IF &DSTYPE = 'TEMP' THEN SET &DATACLAS = 'TEMPS'

IF &JOB = &CICSJOBS THEN DO
        IF &DSORG = 'VS' THEN SET &DATACLAS = 'CICSVS'
        IF &DSN(2) = 'JKTEST' THEN SET &DATACLAS = 'JACKS'
        ELSE SET &DATACLAS = 'WRONGDC'
ELSE DO
        IF &DSORG = 'PS' THEN DO
                IF &DSTYPE = 'TEMP' THEN SET &DATACLAS = 'TEMP'
                IF &SIZE > 50MB THEN SET &DATACLAS = 'FLATSM'
                ELSE SET &DATACLAS = 'FLATBIG'
        END

        IF &DSORG = 'PO' THEN SET &DATACLAS = 'LIBS'

        IF &USER = &ADMINS THEN DO
                SET &DATACLAS = 'ADMIN'
                EXIT
        END

        IF &DSORG = 'VS' THEN DO
                SET &DATACLAS = 'VSAM'
                IF &DSTYPE = 'TEMP' THEN SET &DATACLAS = 'TEMP'
                END

        IF &JOB = 'JKTEST' THEN SET &DATACLAS = 'JACKS'
        IF &DATACLAS = '' THEN SET &DATACLAS = 'WRONGDC'
END
END
```

How to assign Y - Special note:

- There is an EXIT for combination &USER = &ADMIN
- This creates an IMPLIED condition for getting JACKS:
  - &USER /= &ADMIN
- Now we know how to get what we want:
  - &JOB = &CICSJOB AND &DSN(2) = 'JKTEST'
  - &JOB /= &CICSJOB AND &USER /= &ADMIN AND &JOB = 'JKTEST'

	A	B	C	D	E	F	G	H	I
1		&DSTYPE	&JOB	&DSORG	$DSN(2)	&DSTYPE	&SIZE	&USER	&DATACLAS
2	WRONGDC		&CICSJOBS		NOT JKTEST				
3	WRONGDC		NOT &CICSJOBS						null
4	JACKS		&CICSJOBS		JKTEST				
5	JACKS		JKTEST					NOT &ADMIN	

Getting it Right

- So what do we need to change?
- We're still missing some information:

- Get the data set information for the variables:
  - &JOB = 'MYTEST'
  - &DSN(2) = 'JKTEST'
  - &USER = 'JACK'
  - &DATACLAS = TBD
  - &DSORG = 'DA' (BDAM)

So what went wrong?

- Consolidate:
  - IF &JOB = &CICSJOB
    - IF &DSN(2) = 'JKTEST' – what we want
    - ELSE – what we don't want
  - IF &JOB /= &CICSJOB
    - IF &JOB = 'JKTEST' – what we want
    - IF &DATACLAS = '' - what we don't want
    -
- We know &JOB was NOT &CICSJOB, remove those rules

	A	B	C	D	E	F	G	H	I
1	CLASS	&DSTYPE	&JOB	&DSORG	$DSN(2)	&DSTYPE	&SIZE	&USER	&DATACL
2	WRONGDC		NOT &CICSJOBS						null
3	JACKS		JKTEST					NOT &ADMIN	
4	~~WRONGDC~~		~~&CICSJOBS~~		~~JKTEST~~				
5	~~JACKS~~		~~&CICSJOBS~~		~~JKTEST~~				

What went wrong?

- We now have only 2 tests:
  - IF &JOB = 'JKTEST'
  - IF &DATACLAS = ''

- Expand the second rule by looking at the rules that would let that be true:
  - IF &DSORG /= PS | PO | VS AND &JOB /= 'JKTEST'

What went wrong?

- Adding the Data Set to the Map (some columns hidden)

	A	C	D	E	H
1	CLASS	&JOB	&DSORG	$DSN(2)	&USER
2	WRONGDC	NOT &CICSJOBS and NOT JKTEST	NOT PO|PS|VS		
3	JACKS	JKTEST			NOT &ADMIN
4	DataSet	MYTEST	DA	JKTEST	JACK
5					

Matches WRONGDC

Not Compared

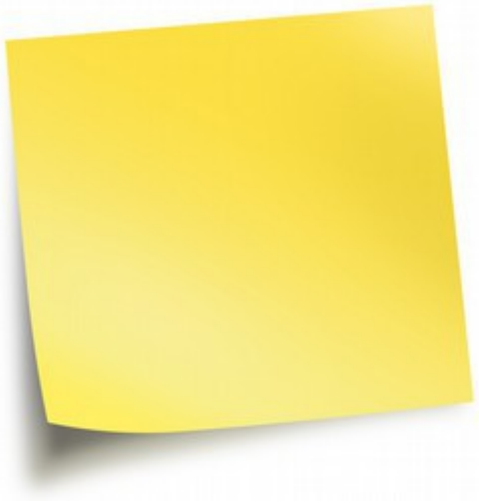
What went wrong?

- If it's not clear yet, here's what happened:
  - Jack was doing his testing the same as for his CICS jobs
  - This job is not CICS, so the rules changed and he didn't realize it
  - To get DC = 'JACKS', for NON-CICS, the JOBNAME needs to be 'JKTEST'

- This was just a simple example – working through the logic can help a lot with bigger, more complex ACS

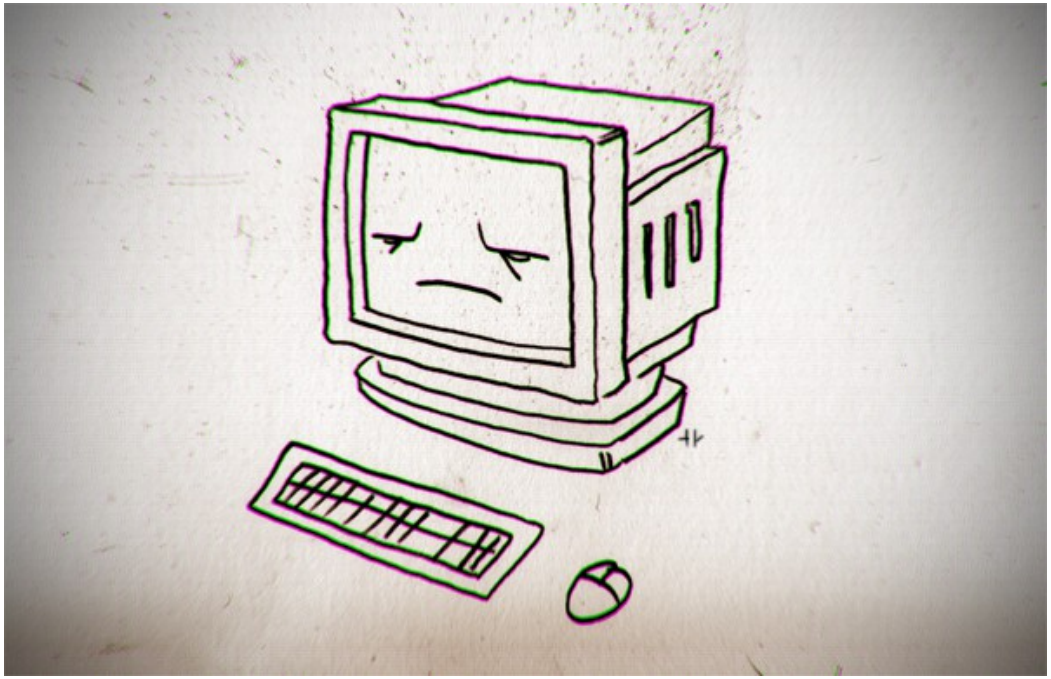
A few notes:

- Implied rules complicate things
  - Using R/W variables adds implied rules
  - Therefore, try to avoid it in your ACS
- EXIT after each set would add implied rules
  - But they would also avoid multiple SETs
- Mutually exclusive rules solves both requirements above
- You could also add strategic WRITES to demonstrate decision logic
- Use ACS testing to run your modified ACS to track logic



Summary:

- Why was X assigned?
- Tracked it backwards from the SET
- Created a MAP to detail conditions
- Compared actual rules to expected result
- Found culprit



“To err is human - and to blame it on a computer is even more so.”

- Robert Orben

Scenario 2

“We added a class, and now we need to update the routines.”

Updating Routines - Overview

- Varying difficulty, depending on new rules
- Simpler with a MAP

- Basic steps:
  - Copy and work from copy!
  - Find logic section that matches
  - Insert new rule
  - Test, fix, test, fix

Updating Routines – Don't

- Don't just add a simple rule to the beginning:
  - IF &DSORG=”VS” THEN SET &DATACLAS = “VSAM”
  - Nothing else will get run
- Don't just add a simple rule to the end:
  - It might never get run
- Don't forget to comment
- Don't use variables that are not used anywhere else
  - You'll end up with non-exclusive paths

Understand the Logic

- How do the routines select classes?
- What variables are used?
- Back to the map:
  - Hopefully each class has only one combination

	A	B	C	D	E	F	G	H	I
1	CLASS	&DSTYPE	&JOB	&DSORG	$DSN(2)	&DSTYPE	&SIZE	&USER	&DATACL
2	WRONGDC		NOT &CICSJOBS and NOT JKTEST	DA				NOT &ADMIN	
3	FLATSM		NOT &CICSJOBS	PS			< 50M		
4	FLATBIG		NOT &CICSJOBS	PS			>= 50M		
5	LIBS		NOT &CICSJOBS	PO					
6	VSAM		NOT &CICSJOBS	VS					
7	TEMPS	TEMP	NOT &CICSJOBS	PS | VS					
8	ADMIN		NOT &CICSJOBS					&ADMIN	
9	JACKS		JKTEST					NOT &ADMIN	
10	CICSVS		&CICSJOB	VS					
11	JACKS		&CICSJOB		JKTEST				
12	WRONGDC		&CICSJOB						
13									

Adding Rules - Example

- New class BDAMSTUF
  - Non-CICS
  - DSORG='DA'
- Add to the MAP:

	A	B	C	D	E	F	G	H	I
1	CLASS	&DSTYPE	&JOB	&DSORG	$DSN(2)	&DSTYPE	&SIZE	&USER	&DATACL
2	WRONGDC		NOT &CICSJOBS and NOT JKTEST	DA				NOT &ADMIN	
3	FLATSM		NOT &CICSJOBS	PS			< 50M		
4	FLATBIG		NOT &CICSJOBS	PS			>= 50M		
5	LIBS		NOT &CICSJOBS	PO					
6	VSAM		NOT &CICSJOBS	VS					
7	TEMPS	TEMP	NOT &CICSJOBS	PS | VS					
8	ADMIN		NOT &CICSJOBS					&ADMIN	
9	JACKS		JKTEST					NOT &ADMIN	
10	CICSVS		&CICSJOB	VS					
11	JACKS		&CICSJOB		JKTEST				
12	WRONGDC		&CICSJOB						
13	BDAMSTUF		NOT &CICSJOBS	DA					
14									

Adding Rules - Example

- Compare to other rules by Variable
  - Only two in play: **&JOB and &DSORG**
- Fits in our NOT &CICSJOB section
- Fits next to other &DSORG tests

	A	B	C	D	E	F	G	H	I
1	**CLASS**	**&DSTYPE**	**&JOB**	**&DSORG**	**$DSN(2)**	**&DSTYPE**	**&SIZE**	**&USER**	**&DATACLAS**
2	**CICSVS**		&CICSJOB	VS					
3	**JACKS**		&CICSJOB		JKTEST				
4	**WRONGDC**		&CICSJOB						
5	**JACKS**		JKTEST					NOT &ADMIN	
6	**BDAMSTUF**		NOT &CICSJOBS	DA					
7	**LIBS**		NOT &CICSJOBS	PO					
8	**FLATSM**		NOT &CICSJOBS	PS			< 50M		
9	**FLATBIG**		NOT &CICSJOBS	PS			>= 50M		
10	**TEMPS**	TEMP	NOT &CICSJOBS	PS | VS					
11	**VSAM**		NOT &CICSJOBS	VS					
12	**ADMIN**		NOT &CICSJOBS					&ADMIN	
13	**WRONGDC**		NOT &CICSJOBS and NOT JKTEST	DA				NOT &ADMIN	

```
IF &DSTYPE = 'TEMP' THEN SET &DATACLAS = 'TEMPS'

IF &JOB = &CICSJOBS THEN DO
        IF &DSORG = 'VS' THEN SET &DATACLAS = 'CICSVS'
        IF &DSN(2) = 'JKTEST' THEN SET &DATACLAS = 'JACKS'
        ELSE SET &DATACLAS = 'WRONGDC'
ELSE DO
        IF &DSORG = 'PS' THEN DO
                IF &DSTYPE = 'TEMP' THEN SET &DATACLAS = 'TEMP'
                IF &SIZE > 50MB THEN SET &DATACLAS = 'FLATSM'
                ELSE SET &DATACLAS = 'FLATBIG'
        END

        IF &DSORG = 'PO' THEN SET &DATACLAS = 'LIBS'

        IF &USER = &ADMINS THEN DO
                SET &DATACLAS = 'ADMIN'
                EXIT
        END

        IF &DSORG = 'VS' THEN DO
                SET &DATACLAS = 'VSAM'
                IF &DSTYPE = 'TEMP' THEN SET &DATACLAS = 'TEMP'
                END

        IF &JOB = 'JKTEST' THEN SET &DATACLAS = 'JACKS'
        IF &DATACLAS = '' THEN SET &DATACLAS = 'WRONGDC'
END
END
```

NOT &CICSJOB

&DSORG Section

Adding Rules - Example

- Insert the new rule:
  - IF &DSORG='DA' THEN SET &DATACLAS = 'BDAMSTUF'
- This many IF statements should be a SELECT
- Use the best practices already in use in the routine
  - Don't change practices unless you're ready to rewrite
- Note your update in the CHANGELOG
  - If one doesn't exit, CREATE ONE!

```
PROC DATACLAS

FILTLIST ADMINS   INCLUDE('BOB','LARRY','MOE')
FILTLIST CICSJOBS INCLUDE(CICS*,'CISPECL')

/* DATA CLASSES */
/* FLATSM  - flat files, small, < 50mb */
/* FLATBIG - flat files, big > 50mb    */
/* LIBS    - PDS, PDSE                 */
/* VSAM    - VSAM files                */
/* CICSVS  - VSAM files for CICS       */
/* TEMPS   - temporary                 */
/* JACKS   - jacks testing DC          */
/* WRONGDC - invalid combination       */

/* CHANGE LOG                                        */
/* 2013.08.13 - Added BDAMSTUF to NON-CICS group     */
/*            - Also switched from IF to SELECT block */
```

```
IF &DSTYPE = 'TEMP' THEN SET &DATACLAS = 'TEMPS'

IF &JOB = &CICSJOBS THEN DO
         IF &DSORG = 'VS' THEN SET &DATACLAS = 'CICSVS'
         IF &DSN(2) = 'JKTEST' THEN SET &DATACLAS = 'JACKS'
         ELSE SET &DATACLAS = 'WRONGDC'
ELSE DO
         SELECT ( &DSORG )
                  WHEN ('PS') THEN DO
                           IF &DSTYPE = 'TEMP' THEN SET &DATACLAS = 'TEMP'
                           IF &SIZE > 50MB THEN SET &DATACLAS = 'FLATSM'
                           ELSE SET &DATACLAS = 'FLATBIG'
                  END
                  WHEN ('PO') THEN SET &DATACLAS = 'LIBS'
                  WHEN ('VS') THEN DO
                           SET &DATACLAS = 'VSAM'
                           IF &DSTYPE = 'TEMP' THEN SET &DATACLAS = 'TEMP'
                  END
                  WHEN ('DA') THEN SET &DATACLAS = 'BDAMSTUF'
                  OTHERWISE SET &DATACLAS = 'WRONGDC'
         END /* END SELECT &DSORG */

         IF &USER = &ADMINS THEN DO
                  SET &DATACLAS = 'ADMIN'
                  EXIT
         END
         IF &JOB = 'JKTEST' THEN SET &DATACLAS = 'JACKS'
         IF &DATACLAS = '' THEN SET &DATACLAS = 'WRONGDC'
END
END
```

Test, Fix, Test

- Use the ACS routine tester
- Run a series of tests to verify new changes work
- Run a series of tests to ensure old rules still work
- If not, figure out why and fix
- Repeat

- You can use NaviQuest to build suites of tests
  - See session 14157 – NaviQuest: Streamlining SMS

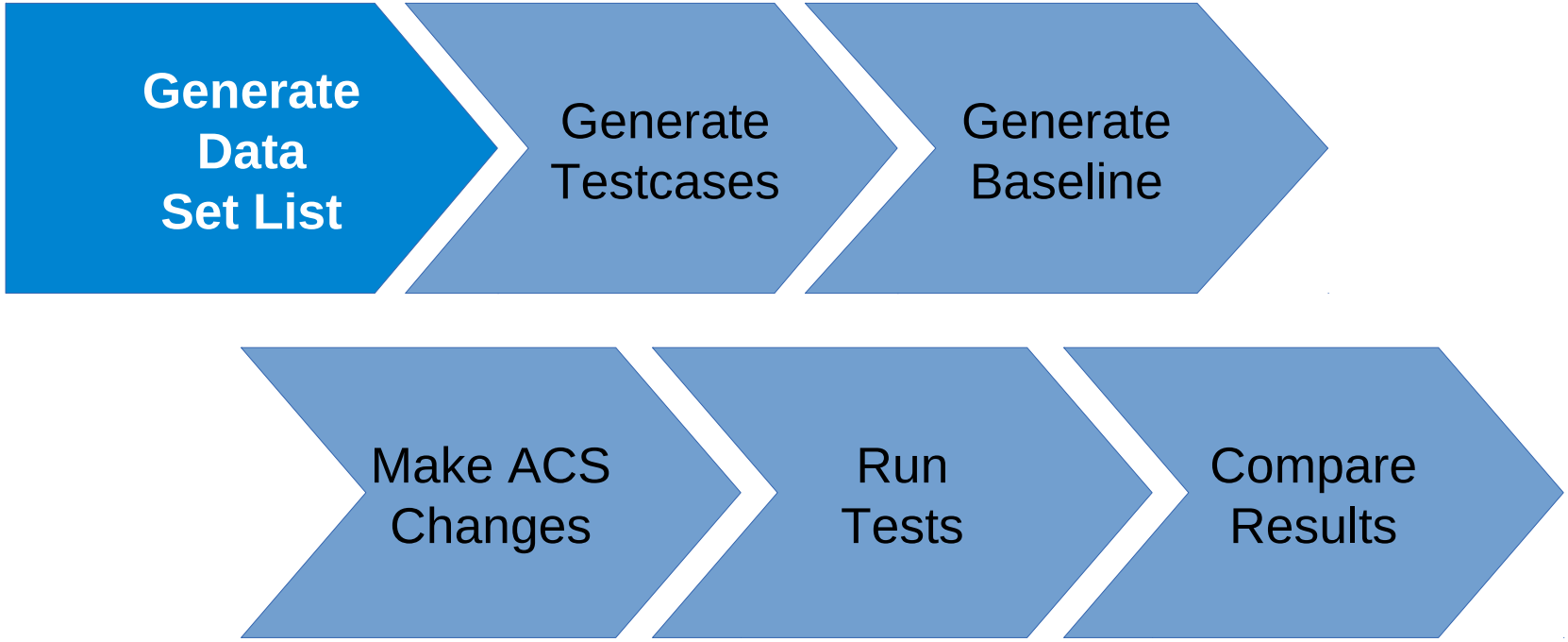
Adding Rules - Summary

- Make a copy
- Understand the logic
- Find relevant section
- Update CHANGELOG
- Add rule
- Avoid breaking anything
- Test, test, test

Summary of Hints and Tips

- Make code more readable by
  - Add WRITE statements to existing ACS
  - Add comments to existing ACS
  - Indent appropriately
  - Renaming FILTLISTS
- If you are going to rewrite
  - Clarify rules BEFORE writing
  - Group rules using nested SELECT / IFs
  - Think about how you might need to expand
  - Comment everything
  - One SET for each class
  - Exit after SET
  - Put most commonly executed paths first
  - Try to make your IF/SELECT statements mutually exclusive
- Remember: the goal is MAINTAINABLE, not clever

ACS Testing - Process



ACS Testing – Generating a Data Set List

- Generate a data set list and save it
  - **ISMF – panel 1 or 2**
  - DCOLLECT – faster than ISMF, good for batch
  - SMF – ACS exit, good for temporary data
  - VMA – good for tape data
- Use NaviQuest to generate test cases
- Generate 'Baseline'

ACS Testing - Generate Data Set List

```
                    ISMF PRIMARY OPTION MENU - z/OS DFSMS V1 R13

 0  ISMF Profile                 - Specify ISMF User Profile
 1  Data Set                     - Perform Functions Against Data Sets
 2  Volume                       - Perform Functions Against Volumes
 3  Management Class             - Specify Data Set Backup and Migration Criteria
```

```
  Panel  Defaults  Utilities  Scroll  Help
                          DATA SET SELECTION ENTRY PANEL              Page 1 of 5

 For a Data Set List, Select Source of Generated List  . . 2  (1 or 2)

   1  Generate from a Saved List          Query Name To
        List Name  . . ________           Save or Retrieve ________

   2  Generate a new list from criteria below
        Data Set Name . . . 'NB.**'
        Enter "/" to select option    _   Generate Exclusive list
        Specify Source of the new list  . . 2     (1 - VTOC, 2 - Catalog)
        1 Generate list from VTOC
           Volume Serial Number . . . ______      (fully or partially specified)
           Storage Group Name . . . . ________    (fully specified)
        2 Generate list from Catalog
           Catalog Name . . . ____________________________________________
           Volume Serial Number . . . ______      (fully or partially specified)
           Acquire Data from Volume . . . . . . . Y  (Y or N)
           Acquire Data if DFSMShsm Migrated  . . Y  (Y or N)
 Use ENTER to Perform Selection; Use DOWN Command to View next Selection Panel;
 Use HELP Command for Help; Use END Command to Exit.
```

ACS Testing – Generate DS List

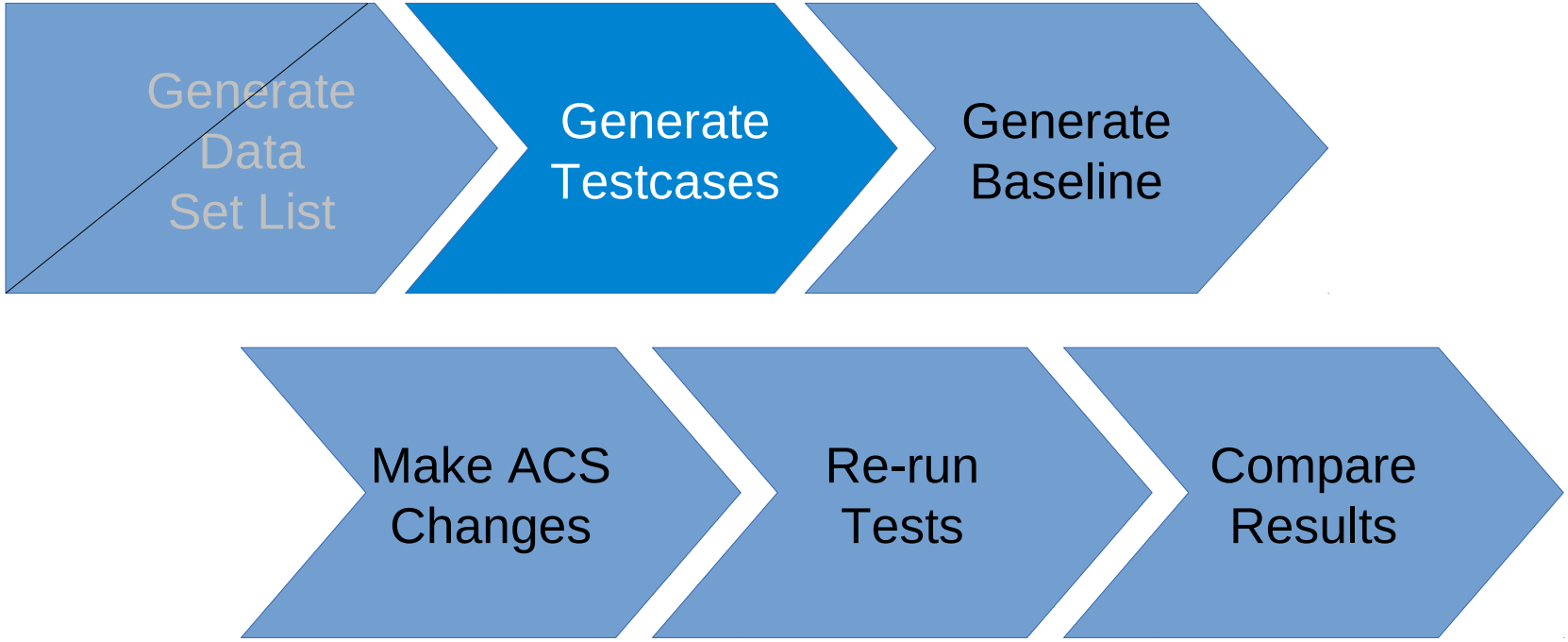
```
  Panel  List  Dataset  Utilities  Scroll  Help
-------------------------------------------------------------------------------
                                                          DATA SET LIST
                                                       Entries 1-8 of 8
Enter Line Operators below:                            Data Columns 4-6 of 42

     LINE                                    ALLOC     % NOT  COMPRESSED
     OPERATOR          DATA SET NAME         USED      USED   FORMAT
    ---(1)----  ------------(2)------------ ---(4)---  -(5)-  ---(6)----
                NB.RLS.TEST1                ---------    ---  ---
                NB.RLS.TEST1.DATA                810K      0  ---
                NB.RLS.TEST1.INDEX                 1K     96  ---
                NB.SMS.TESTA                      55K     93  NO
                NB.SMS.TESTB                      55K     93  NO
                NB.SMS.TESTOUT                    55K     99  NO
                NB.SMSN.TEST1                     55K     93  ---
                NB.SMSN.TEST2                     55K     93  ---
    ----------  ------  -----------  BOTTOM OF  DATA  -----------  ------  ----


Command ===> SAVE NBFILES _                                   Scroll ===> HALF
```

* Note: you can see and edit your saved lists from ISMF Option L (LISTS)

ACS Testing - Process



ACS Testing – Generate Testcases

- ISMF 11.1.1 – NaviQuest generate

```
 9  Aggregate Group          - Specify Data Set Recovery Parameters
10  Library Management       - Specify Library and Drive Configurations
11  Enhanced ACS Management  - Perform Enhanced Test/Configuration Management
C   Data Collection          - Process Data Collection Function
G   Report Generation        - Create Storage Management Reports
```

```
              ENHANCED ACS MANAGEMENT - NaviQuest PRIMARY OPTION MENU

Select one of the following options and press Enter:

  1  Test Case Generation
  2  ACS Test Listings Comparison
  3  Enhanced ACS Test Listing
  4  Test Case Update with Test Results
  5  SMS Report Generation
  6  Model Commands Generation
  7  Batch Testing/Configuration Management
  X  Exit
```

```
                        TEST CASE GENERATION SELECTION MENU

Select the input data to be used and press Enter:

  1  Saved ISMF List
  2  DCOLLECT Data
  3  SMF Data
  4  VMA Extract Data
```

ACS Testing – Generate Testcases

```
  Panel  Help
 ------------------------------------------------------------------------------
              TEST CASE GENERATION FROM SAVED ISMF LIST              Top of data

 To generate test cases, specify the following information and press Enter:
   Saved ISMF List . . . . . . NBFILES   (Data set list)
   Member Name Prefix  . . . . NB        (1 to 4 alpha characters)
   Test Case PDS . . . . . . . 'NEAL.SMS.ACSTST'
     Replace Existing Prefix   N         (Y or N)
 ACS Test Case Variables:
                                                                  More:     +
   Applic  . . . . CICSJOB_          DD  . . . . . . . ________
   Def_dataclas    ________          Def_mgmtclas      ________
   Def_storclas    ________          Filenum . . . . ____
   Group . . . . . ________          Job . . . . . . ________
   Label . . . . . ___               Libname . . . . ________
   Pgm . . . . . . ________          Storgrp . . . . ________
   Retpd . . . . . _____             Sysplex . . . . ________

 Use DOWN Command to Scroll Forward; Use UP Command to Scroll Backward;
 Use HELP Command for Help; Use END Command to Exit.
```

* there is a special prefix – NEVR – for data sets that should never be managed

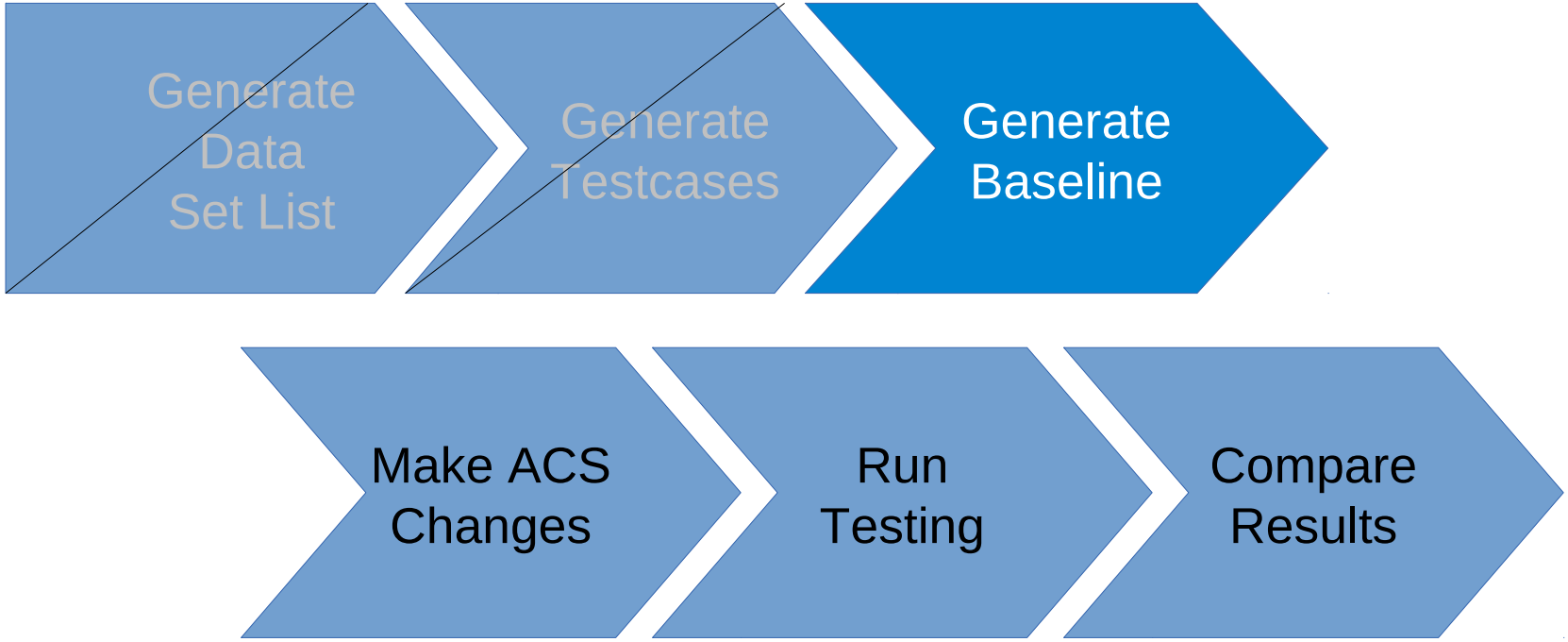
ACS Testing – Generating Testcases

```
  Menu  Functions  Utilities  Help
 ------------------------------------------------------------------------
 BROWSE    NEAL.SMS.ACSTST                                  Row 00001 of 00007
    Name     Prompt          Size    Created          Changed            ID
 . NB1
 . NB2
 . NB3
 . NB4
 . NB5
 . NB6
 . NB7
   **End**



 Command ===> ____________________________________________ Scroll ===> PAGE
  F1=Help    F2=Split   F3=Exit    F5=Rfind   F7=Up      F8=Down    F9=Swap
 F10=Left   F11=Right  F12=Cancel
 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
  Menu  Utilities  Compilers  Help
 ------------------------------------------------------------------------
 BROWSE    NEAL.SMS.ACSTST(NB1)                       Line 00000000 Col 001 080
********************************** Top of Data **********************************
DESCRIPTION1:
TEST CASE CREATED 2013/08/09 AT 13:11 BY USER2
DSN: NB.RLS.TEST1.DATA
DSTYPE: PERM
ACSENVIR: ALLOC
MAXSIZE: 13280
DSORG: VS
SIZE: 830
NVOL: 1
VOL: 01
XP0403
APPLIC: CICSJOB
UNIT: 3390
********************************* Bottom of Data ********************************
```

ACS Testing - Process



ACS Testing – Generate Baseline

- Simply run the tests and save the output
- ISMF 7.4.3 (ACS routines, Test ACS Routines, Test)

```
   Panel  Utilities  Help

                              TEST ACS ROUTINES

 To Perform ACS Testing, Specify:

   CDS Name . . . . . . 'NEAL.SMS.SCDS'
                        (1 to 44 Character Data Set Name or 'Active')
   ACS Test Library . . 'NEAL.SMS.ACSTST'
   ACS Test Member  . . NB*      (fully or partially specified or * for all
                        members)
   Listing Data Set . . 'NEAL.SMS.BASELINE'
                        (1 to 44 Character Data Set Name or Blank)

 Select which ACS Routines to Test:

   DC ===> Y  (Y/N)  SC ===> Y  (Y/N)  MC ===> Y  (Y/N)  SG ===> Y  (Y/N)
```

ACS Testing – Generate Baseline

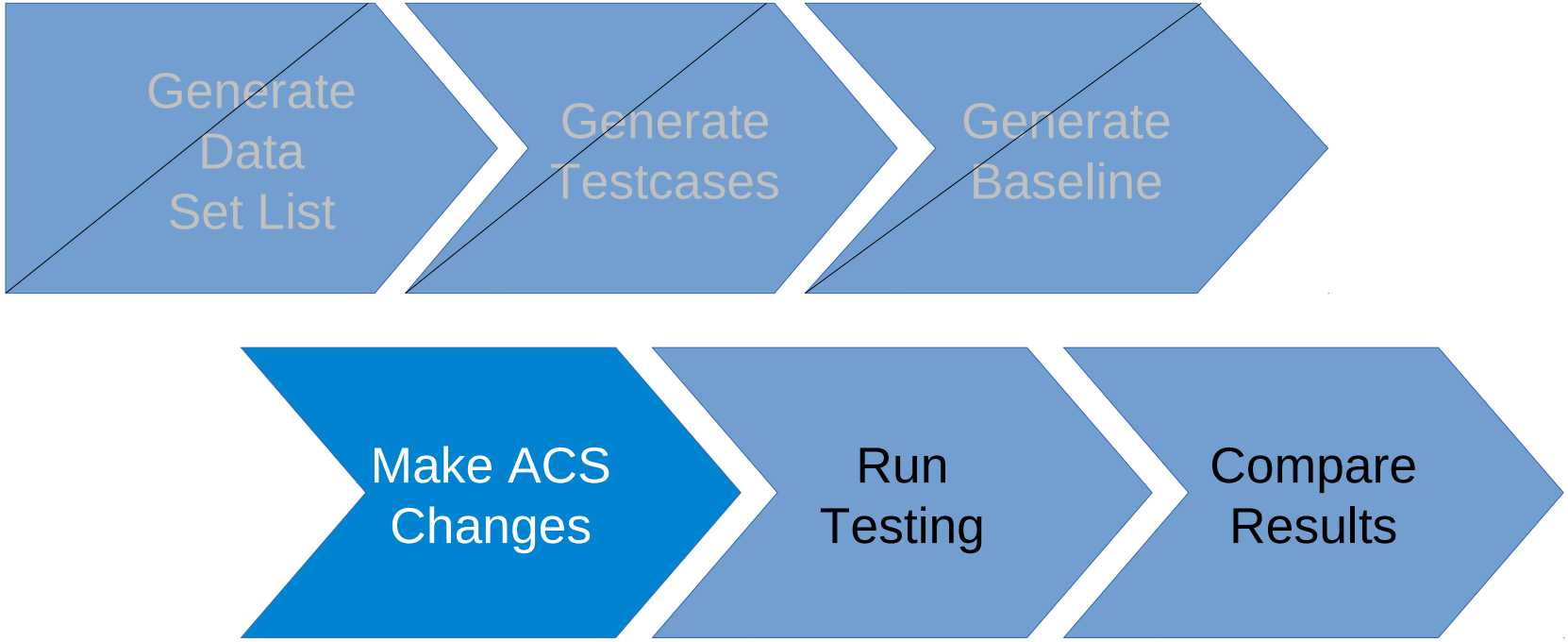
```
 BROWSE    NEAL.SMS.BASELINE
****************************************************************** Top of Data ************
                                ACS TESTING RESULTS

CDS NAME          : NEAL.SMS.SCDS
ACS ROUTINE TYPES: DC SC MC SG
ACS TEST LIBRARY : NEAL.SMS.ACSTST

  ACS TEST
  MEMBER       EXIT CODE   RESULTS
  ---------    ----------  ------------------------------------
  DESCRIPTION: TEST CASE CREATED 2013/08/09 AT 13:11 BY USER2
  EXPECTED RESULT:
  NB1                    0  DC = RLS
    MSG : DATACLAS=RLS
                         0  SC = RLS
    MSG : STORCLAS=RLS
                         0  MC = NULL VALUE ASSIGNED
                         0  SG = SG1

  DESCRIPTION: TEST CASE CREATED 2013/08/09 AT 13:11 BY USER2
  EXPECTED RESULT:
  NB2                    0  DC = RLS
    MSG : DATACLAS=RLS
                         0  SC = RLS
    MSG : STORCLAS=RLS
                         0  MC = NULL VALUE ASSIGNED
                         0  SG = SG1
```

ACS Testing - Process

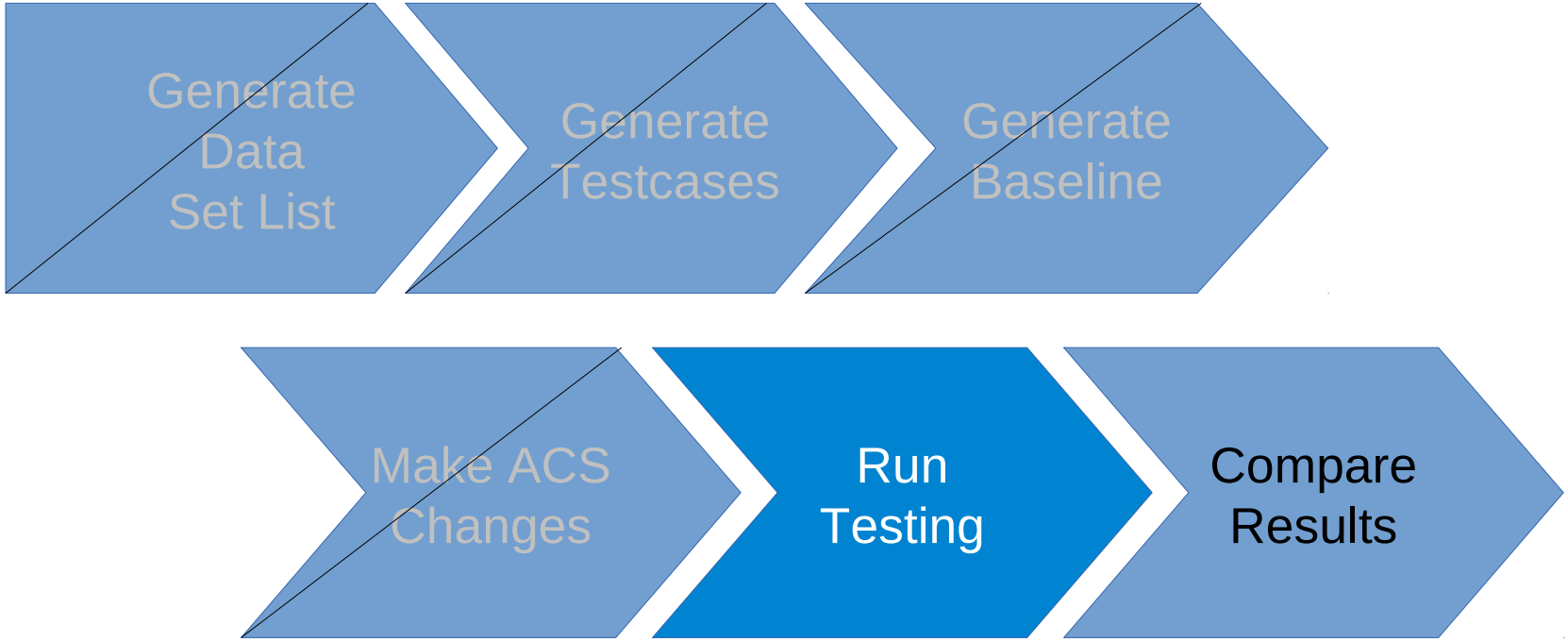


Make Changes to ACS

- Make changes to your ACS
- Recommended that you make changes in a COPY
- Or keep a backup

- Remember to translate and validate!
  - ISMF 7.2 and 3
  - Can translate into a testing SCDS if you prefer

ACS Testing - Process



ACS Testing – Run tests

- Done in the same way as building baseline:
- ISMF 7.4
- Save to a new listing DS

```
                              TEST ACS ROUTINES

To Perform ACS Testing, Specify:

  CDS Name . . . . . . 'NEAL.SMS.SCDS'
                        (1 to 44 Character Data Set Name or 'Active')
  ACS Test Library . . 'NEAL.SMS.ACSTST'
  ACS Test Member  . . NB*      (fully or partially specified or * for all
                        members)
  Listing Data Set . . 'NEAL.SMS.NEWCFG'
                        (1 to 44 Character Data Set Name or Blank)

Select which ACS Routines to Test:

  DC ===> Y  (Y/N)  SC ===> Y  (Y/N)  MC ===> Y  (Y/N)  SG ===> Y  (Y/N)



Use ENTER to Perform Verification and Testing;
Use HELP Command for Help; Use END Command to Exit.
```

ACS Testing – Run Tests Again

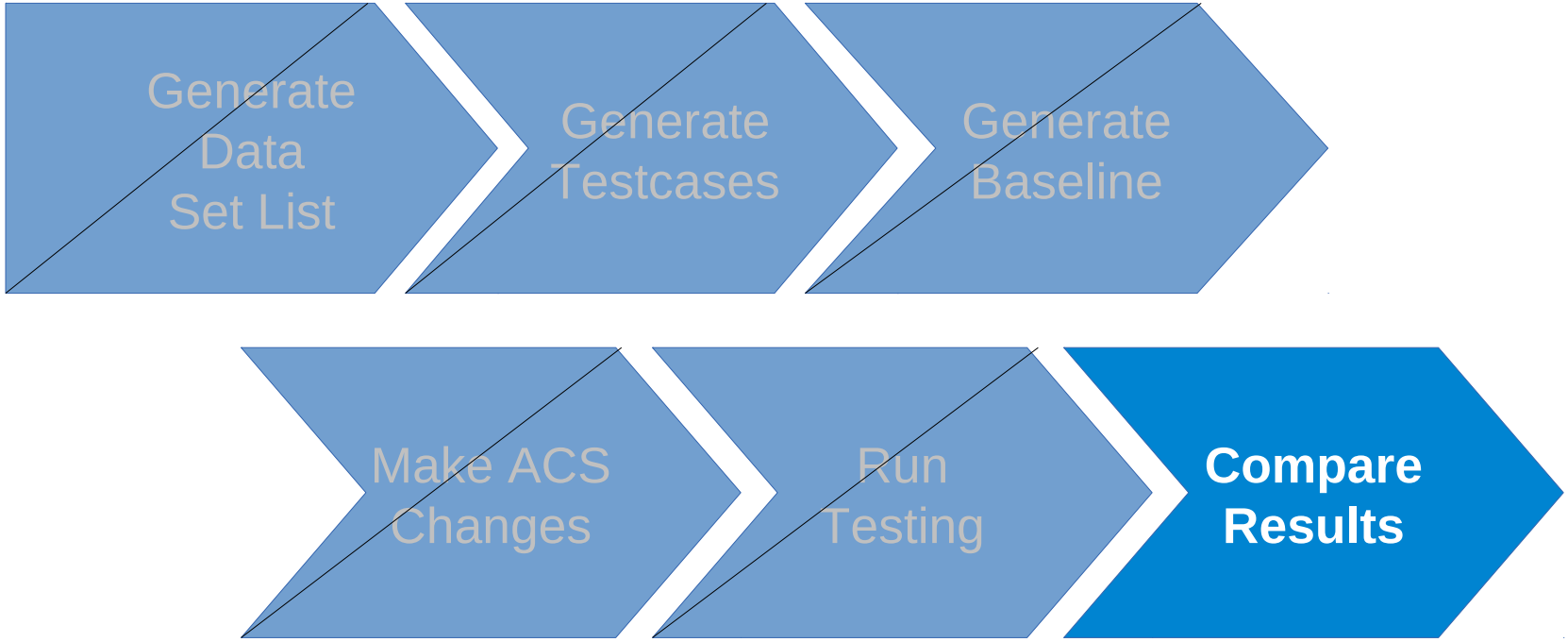
```
 BROWSE    NEAL.SMS.NEWCFG
****************************************************************** Top of Data *****
                                ACS TESTING RESULTS

CDS NAME          : NEAL.SMS.SCDS
ACS ROUTINE TYPES: DC SC MC SG
ACS TEST LIBRARY : NEAL.SMS.ACSTST

  ACS TEST
  MEMBER       EXIT CODE   RESULTS
  ---------    ----------  ------------------------------------
  DESCRIPTION: TEST CASE CREATED 2013/08/09 AT 13:11 BY USER2
  EXPECTED RESULT:
  NB1                    0  DC = RLS
    MSG : DATACLAS=RLS
                         0  SC = SMS
    MSG : STORCLAS=SMS
                         0  MC = NULL VALUE ASSIGNED
                         0  SG = SG1

  DESCRIPTION: TEST CASE CREATED 2013/08/09 AT 13:11 BY USER2
  EXPECTED RESULT:
  NB2                    0  DC = RLS
    MSG : DATACLAS=RLS
                         0  SC = SMS
    MSG : STORCLAS=SMS
                         0  MC = NULL VALUE ASSIGNED
                         0  SG = SG1
```

ACS Testing - Process



ACS Testing – Compare Results

- ISMF Option 11.2
  (NaviQuest ACS Testing Listing Comparison)

```
                    ACS TEST LISTINGS COMPARISON ENTRY PANEL

 To compare ACS listings, specify the following information and press Enter:
   Input Data Sets:
     Base ACS Test Listing (Before latest ACS routine changes)
       ===> 'NEAL.SMS.BASELINE'
     New ACS Test Listing (After latest ACS routine changes)
       ===> 'NEAL.SMS.NEWCFG'
   Reference Data Set for Compare:
     Test Case PDS (Test source for listings above)
       ===> 'NEAL.SMS.ACSTST'

   Output Data Sets:
     Comparison Results Data Set (Summary of exception test cases)
       ===> 'NEAL.SMS.EXPT'
       Replace Contents if DSN Exists  . . Y  (Y or N)
     Exception Test Case PDS (Contents of exception test cases)
       ===> 'NEAL.SMS.EXPTC'
       Replace Contents if DSN Exists  . . Y  (Y or N)

 Use HELP Command for Help; Use END Command to Exit.
```

ACS Testing – Compare Results

```
 BROWSE    NEAL.SMS.EXPT
*********************************************************** Top of Data ****************
                 ACS TEST LISTINGS COMPARISON REPORT

Base ACS listing   :   NEAL.SMS.BASELINE
New ACS listing    :   NEAL.SMS.NEWCFG
Testcase dataset   :   NEAL.SMS.ACSTST
Exception dataset  :   NEAL.SMS.EXPTC


TESTCASE MEMBER : NB1
                       * * * * E X C E P T I O N * * * * *
             RC DATACLAS      RC STORCLAS      RC MGMTCLAS      RC STORGROP
             -- --------      -- --------      -- --------      -- --------
     BASE     0 RLS            0 RLS            0 NULL           0 SG1
      NEW     0 RLS            0 SMS            0 NULL           0 SG1

                      DSN: NB.RLS.TEST1.DATA
                      SIZE: 830
                      VOL: XP0403
                      UNIT: 3390

TESTCASE MEMBER : NB2
                       * * * * E X C E P T I O N * * * * *
             RC DATACLAS      RC STORCLAS      RC MGMTCLAS      RC STORGROP
             -- --------      -- --------      -- --------      -- --------
     BASE     0 RLS            0 RLS            0 NULL           0 SG1
      NEW     0 RLS            0 SMS            0 NULL           0 SG1

                      DSN: NB.RLS.TEST1.INDEX
                      SIZE: 55
                      VOL: XP0403
                      UNIT: 3390
```

ACS Testing - Summary

- Build test cases from data set lists
- Develop a suite of test cases (different prefixes)
- Run the entire suite on any changes – verify results

- ISMF 11.4 – Update test cases with new expected results
  - Updates test cases so that they know what to expect

Stretch break

NaviQuest Batch

- Same functions, different interface
- Plenty of sample JCL exists – start there
  - Update the JOBCARD
  - Update everything after the SYSTSIN DD *
- Controlled by parameters of format PARM(VALUE)
  - Well-documented in JCL Comments
  - Also documented in *DFSMSdfp Storage Administration*
- CLISTS and JCL stored in SYS1.SACBCNTL
  - EXEC ACBJBAOB
  - Specific CLIST called via ISPSTART CMD(cmd name)

ACS Testing in Batch

- ISMF 11.7 Gives Sample JCL for batch processing
- ACS Testing is in 11.7.3 – Configuration Changes Batch

```
                CONFIGURATION CHANGES BATCH SAMPLES SELECTION MENU

Select an option by typing '/' or enter Data Set to Edit and press Enter:

                                                  More:    -
    _  Validate SCDS
    _  Test ACS Routines
    _  Generate Enhanced ACS Test Listing
    _  Compare ACS Test Listings
    _  Update Test Cases with Test Results
    _  Delete Management Class
    _  Delete Data Class
    _  Delete Storage Class
    _  Delete Storage Group
    _  Delete Copy Pool
    _  Delete Aggregate Group
    _  Delete Tape Library

Data Set to Edit . . _____________________________________________________

Use HELP Command for Help; Use END Command to Exit.
```

ACS Testing in Batch - Testing

```
//*****************************************************************
//*                                                               *
//*   TEST STEP                                                   *
//*                                                               *
//*    SCDS     - NAME OF SCDS THAT CONTAINS THE TRANSLATED,     @D1C*
//*               VALIDATED ACS ROUTINES TO BE TESTED (INPUT)     *
//*    TESTBED  - PDS CONTAINING TEST CASES THAT THE ACS ROUTINES    *
//*               SHOULD BE TESTED FOR (INPUT)                    *
//*    MEMBER   - MEMBERS TO BE TESTED IN TESTBED (INPUT)         *
//*    DC,SC,MC,SG - ROUTINES TO BE TESTED Y OR N (INPUT)         *
//*    LISTNAME - TEST LISTING (OUTPUT)                           *
//*                                                               *
//*****************************************************************
//*****************************************************************
//TESTACS  EXEC ACBJBAOB,
//         PLIB1='SYS1.DGTPLIB',
//         TABL2=userid.TEST.ISPTABL
//SYSTSIN  DD *
PROFILE PREFIX(IBMUSER)
DEL NEW.TESTLIST
ISPSTART CMD(ACBQBAIA +
SCDS(MYSCDS) +
TESTBED(TESTCASE.LIBRARY) MEMBER(*) +
LISTNAME(NEW.TESTLIST) +
DC(Y) SC(Y) MC(Y) SG(Y)) +
NEWAPPL(DGT) BATSCRW(132) BATSCRD(27) BREDIMAX(3) BDISPMAX(99999999)
/*
```

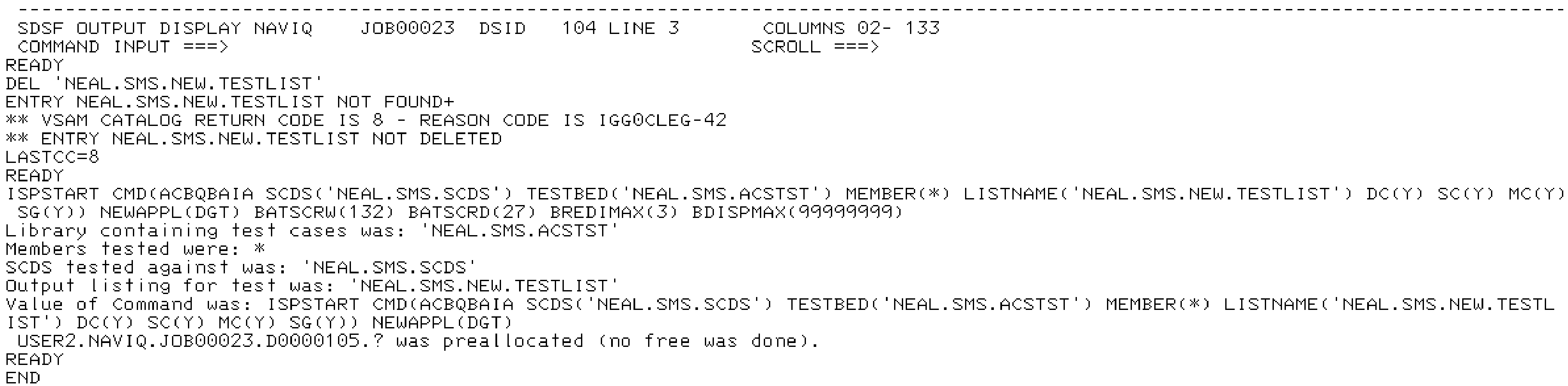
ACS Testing in Batch - Testing

```
//*****************************************************************
//*                                                               *
//*   TEST STEP                                                   *
//*                                                               *
//*    SCDS     - NAME OF SCDS THAT CONTAINS THE TRANSLATED,     @D1C*
//*               VALIDATED ACS ROUTINES TO BE TESTED (INPUT)     *
//*    TESTBED  - PDS CONTAINING TEST CASES THAT THE ACS ROUTINES  *
//*               SHOULD BE TESTED FOR (INPUT)                    *
//*    MEMBER   - MEMBERS TO BE TESTED IN TESTBED (INPUT)         *
//*    DC,SC,MC,SG - ROUTINES TO BE TESTED Y OR N (INPUT)         *
//*    LISTNAME - TEST LISTING (OUTPUT)                           *
//*                                                               *
//*****************************************************************
//*****************************************************************
//TESTACS  EXEC ACBJBAOB,
//         PLIB1='SYS1.DGTPLIB',
//         TABL2=NEAL.SMS.ISPTABL
//SYSTSIN  DD *
PROFILE PREFIX(USER2)
DEL 'NEAL.SMS.NEW.TESTLIST'
ISPSTART CMD(ACBQBAIA +
SCDS('NEAL.SMS.SCDS') +
TESTBED('NEAL.SMS.ACSTST') MEMBER(*) +
LISTNAME('NEAL.SMS.NEW.TESTLIST') +
DC(Y) SC(Y) MC(Y) SG(Y)) +
NEWAPPL(DGT) BATSCRW(132) BATSCRD(27) BREDIMAX(3) BDISPMAX(99999999)
/*
```

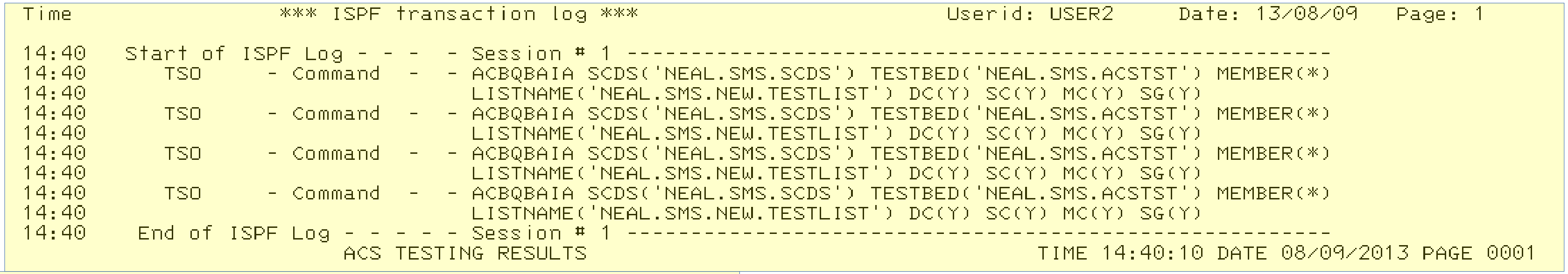
TABL2 must be allocated
It is a standard ISPF table.

PDS Dataset
RECFM=FB
LRECL=80
DSORG=PO (PDS)

ACS Testing in Batch - Results

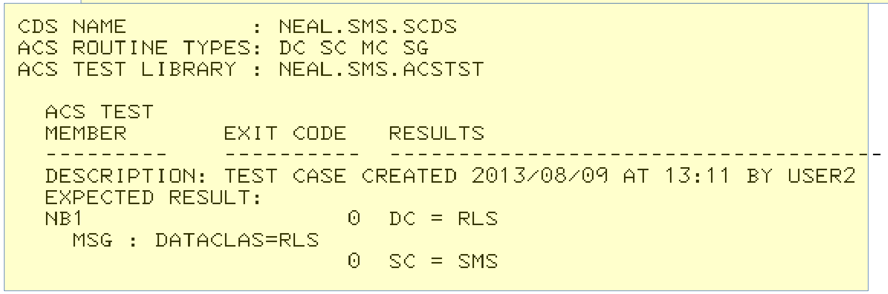


```
 ------------------------------------------------------------------------------------------------------------------------------------
 SDSF OUTPUT DISPLAY NAVIQ    JOB00023  DSID   104 LINE 3       COLUMNS 02- 133
 COMMAND INPUT ===>                                            SCROLL ===>
READY
DEL 'NEAL.SMS.NEW.TESTLIST'
ENTRY NEAL.SMS.NEW.TESTLIST NOT FOUND+
** VSAM CATALOG RETURN CODE IS 8 - REASON CODE IS IGG0CLEG-42
** ENTRY NEAL.SMS.NEW.TESTLIST NOT DELETED
LASTCC=8
READY
ISPSTART CMD(ACBQBAIA SCDS('NEAL.SMS.SCDS') TESTBED('NEAL.SMS.ACSTST') MEMBER(*) LISTNAME('NEAL.SMS.NEW.TESTLIST') DC(Y) SC(Y) MC(Y)
 SG(Y)) NEWAPPL(DGT) BATSCRW(132) BATSCRD(27) BREDIMAX(3) BDISPMAX(99999999)
Library containing test cases was: 'NEAL.SMS.ACSTST'
Members tested were: *
SCDS tested against was: 'NEAL.SMS.SCDS'
Output listing for test was: 'NEAL.SMS.NEW.TESTLIST'
Value of Command was: ISPSTART CMD(ACBQBAIA SCDS('NEAL.SMS.SCDS') TESTBED('NEAL.SMS.ACSTST') MEMBER(*) LISTNAME('NEAL.SMS.NEW.TESTL
IST') DC(Y) SC(Y) MC(Y) SG(Y)) NEWAPPL(DGT)
 USER2.NAVIQ.JOB00023.D0000105.? was preallocated (no free was done).
READY
END
```



```
 Time                *** ISPF transaction log ***                          Userid: USER2     Date: 13/08/09    Page: 1

 14:40   Start of ISPF Log - - -  - Session # 1 -------------------------------------------------------
 14:40      TSO     - Command   -  - ACBQBAIA SCDS('NEAL.SMS.SCDS') TESTBED('NEAL.SMS.ACSTST') MEMBER(*)
 14:40                               LISTNAME('NEAL.SMS.NEW.TESTLIST') DC(Y) SC(Y) MC(Y) SG(Y)
 14:40      TSO     - Command   -  - ACBQBAIA SCDS('NEAL.SMS.SCDS') TESTBED('NEAL.SMS.ACSTST') MEMBER(*)
 14:40                               LISTNAME('NEAL.SMS.NEW.TESTLIST') DC(Y) SC(Y) MC(Y) SG(Y)
 14:40      TSO     - Command   -  - ACBQBAIA SCDS('NEAL.SMS.SCDS') TESTBED('NEAL.SMS.ACSTST') MEMBER(*)
 14:40                               LISTNAME('NEAL.SMS.NEW.TESTLIST') DC(Y) SC(Y) MC(Y) SG(Y)
 14:40      TSO     - Command   -  - ACBQBAIA SCDS('NEAL.SMS.SCDS') TESTBED('NEAL.SMS.ACSTST') MEMBER(*)
 14:40                               LISTNAME('NEAL.SMS.NEW.TESTLIST') DC(Y) SC(Y) MC(Y) SG(Y)
 14:40    End of ISPF Log - - - - - Session # 1 -------------------------------------------------------
                         ACS TESTING RESULTS                                    TIME 14:40:10 DATE 08/09/2013 PAGE 0001
```



```
CDS NAME         : NEAL.SMS.SCDS
ACS ROUTINE TYPES: DC SC MC SG
ACS TEST LIBRARY : NEAL.SMS.ACSTST

  ACS TEST
  MEMBER       EXIT CODE   RESULTS
  ---------    ----------  -------------------------------------
  DESCRIPTION: TEST CASE CREATED 2013/08/09 AT 13:11 BY USER2
  EXPECTED RESULT:
  NB1                   0  DC = RLS
    MSG : DATACLAS=RLS
                        0  SC = SMS
```

ACS Testing in Batch – Compare job

```
//*******************************************************************
//*                                                                 *
//* SAMPLE JCL TO COMPARE ACS TEST LISTINGS IN BATCH                *
//*                                                                 *
//*   INSTRUCTIONS BEFORE SUBMITTING:                               *
//*                                                                 *
//*     CHANGE JOBCARD                                              *
//*     CHANGE PREFIX                                               *
//*     CHANGE PARAMETERS                                           *
//*                                                                 *
//*   PARAMETERS:                                                   *
//*                                                                 *
//*     BASELIST - BASE ACS TEST LISTING (INPUT)                    *
//*     NEWLIST  - NEW ACS TEST LISTING (INPUT)                     *
//*     TESTBED  - TEST CASE PDS (REFERENCE INPUT)                  *
//*     RSLTDSN  - COMPARISON RESULTS DATA SET (OUTPUT)             *
//*     XCPTPDS  - EXCEPTION TEST CASE PDS (OUTPUT)                 *
//*     XCPSPACE - SPACE values of Except DS (Optional)    3a@WA32832*
//*       Values: (Primary Tracks,Secondary Tracks,Directory Blocks) *
//*         which are positional and optional. Defaults: (3,1,20).  *
//*                                                                 *
//*   NOTE:  If you receive message IEC217I B14-0C on your exception *
//*       data set, you need to increase your data set size by using *
//*       the XCSPACE parameter (specially the directory blocks)    *
//*                                                                 *
//*******************************************************************
```

```
//CMPRSTEP EXEC  ACBJBAOB,
//         PLIB1=SYS1.DGTPLIB,
//         TABL2=userid.TEST.ISPTABL
//SYSTSIN  DD *
PROFILE PREFIX(IBMUSER)
DEL COMPARE.LISTING
DEL TESTCASE.EXCP
ISPSTART CMD(%ACBQBAC1 +
BASELIST(BASE.TESTLIST) +
NEWLIST(NEW.TESTLIST) +
TESTBED(TESTCASE.LIBRARY) +
RSLTDSN(COMPARE.LISTING) +
XCPTPDS(TESTCASE.EXCP) +
XCPSPACE(5,3,30)) +
BATSCRW(132) BATSCRD(27) BREDIMAX(3)
BDISPMAX(99999999)
/*
```

ACS Batch Summary

- Sample JCL is in ISMF 11.7 or SYS1.SACBCNTL
- Change the necessary parameters
- Submit

- Get work done.

Sources

- *DFSMS Implementing System-Managed Storage*
  - SC26-7407
  - http://publib.boulder.ibm.com/infocenter/zos/v1r11/topic/com.ibm.zos.r11.idai600/acsrec.htm

- *DFSMSdfp Storage Administration*
  - SC26-7402
  - http://publibfp.dhe.ibm.com/cgi-bin/bookmgr/BOOKS/DGT2S2A1/17.0?DT=20120126150025

#SHAREorg

SHARE

DFSMS:Intermediate
Understanding Someone Else's ACS Routines

Neal Bohling
DFSMS Defect Support, IBM

August 14, 2013
Session# 13158

SHARE in Boston

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