DFSMS Advanced: NaviQuest – Testing ACS Hand-On Lab

Neal Bohling and Tom Reed, IBM

August 6, 2014
Session Number 15758
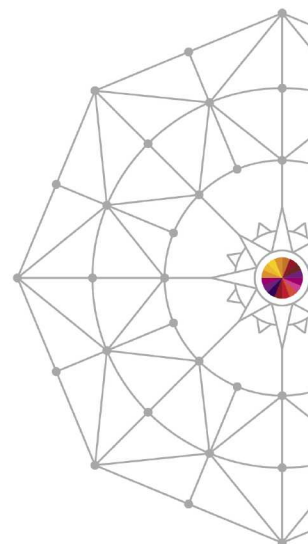
SHARE
in Pittsburgh 2014

DFSMS Advanced: NaviQuest – Testing ACS Hand-On Lab

Neal Bohling and Tom Reed, IBM

August 6, 2014
Session Number 15758

Lab Agenda

- Quick NaviQuest Recap
- Get Logged In
- Resources Overview
- Set up ISMF Profile
- Labs
  - We'll do the first few together
  - The rest are for you to play!

NaviQuest Overview

- A suite of simple tools based around SMS
- Accessible via ISMF or Batch
- Helps simplify some of the more arduous SMS tasks
  - **Testing ACS**
  - Creating reports
  - Batch-updating SMS configuration
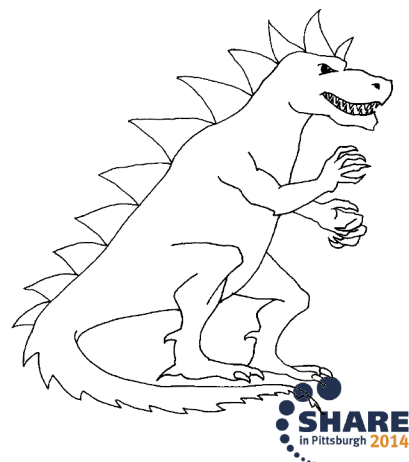
What can it do?

- **ACS Test Case Generation and Comparisons**
  - Generate ACS test cases from your data
  - Build and manage libraries of test cases
  - Reporting exceptions found ACS testing
- **Reporting**
  - Build reports about data sets, disk volumes, tape volumes
  - Builds based on DCOLLECT or ISMF saved tables
- **Batch Storage Administration**
  - Do many ISMF commands in batch
  - Save and recall ISMF queries
  - Keep FILTLISTS consistent between ACS routines
  - Generate large numbers of commands based on ISMF lists

Logging In

- **Find SHARE LPAR icon on the Desktop**

SHARE LPAR

- **Enter TSO** next to Application:

```
Enter Your Userid:
Password:                              New password:
Application: TSO_
Application Required. No Installation Default
```

- **Log in with your workstation's USERID**
  - SHARA01 thru SHARA20

- **On the COMMAND line, please ensure it says:**
  `ex 'share.clist(navqlab)'`

Finding NaviQuest

```
                    ISMF PRIMARY OPTION MENU - z/OS DFSMS V2 R1
Selection or Command ===>

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
4   Data Class                - Specify Data Set Allocation Parameters
5   Storage Class             - Specify Data Set Performance and Availability
6   Storage Group             - Specify Volume Names and Free Space Thresholds
7   Automatic Class Sele      - Specify ACS Routines and Test Criteria
8   Control Data Set          - Specify System Names and Default Criteria
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
L   List                      - Perform Functions Against Saved ISMF Lists
P   Copy Pool                 - Specify Pool Storage Groups for Copies
R   Removable Media Manager   - Perform Functions Against Removable Media
```

Resources

- **Publications**
    - DFSMS Storage Administration Reference - Chapter 22
    - DFSMS Using the Interactive Storage Management Facility

- See **SHARAxx.S15758.DOCLINKS** for links

- Quick note on using PCOMM:
    - ENTER is newline
    - CTRL is execute (what we think of as ENTER)
    - F7/F8 for page up / page down

Lab Data Sets

- **SHARAxx.S15758.ACS – edit / use these for the lab**
    - DCLAB – data class
    - SCLAB – storage class
    - MCLAB – management class
    - SGLAB – storage group

- **SHARAxx.S15758.ACSTSTS**
    - Library to hold ACS Test Cases

- **SHARAxx.S15758.SMS.SCDS**
    - Your own SCDS, make changes to this one

- **SHARE.S15758.***
    - "User" and "Application" data used for ACS testing

- ***And a few more that we'll introduce along the way...***

Our Lab SMS Configuration

- **VERY Simple SMS configuration**
  - Everything split to USER or APPLICATION groups
  - Based on DSN(3)

- **No DATACLAS or MGMTCLAS**

- **Two STORCLASs**
  - APPDATA – for applications
  - USRDATA – for user data

- **Two STORGRPs**
  - APPDATA – for applications
  - USRDATA – for user data

Lab Agenda

- **Total of 10 Labs**
- Feel free to work at your own pace!

- We'll work through the first few together
- The remainder will be on your own

- Workbook contains two sections per lab (usually):
  - Instructions – how to get the task done
  - Questions – ask you about the results

- Don't hesitate to ask if you have questions!

Pre-Lab Setup

- **Set yourself up as a Storage Administrator**
  - Enter **ISMF** (command ISMF from main menu)
  - Select **0** - Profile Options
  - Select **0** - User Mode Selections
  - Select Option **2** - Storage Administrator
  - End/Exit
- **Update your default JCL:**
  - From Profile Options Menu (**ISMF.0**)
  - Select **2** - "ISMF Job Statement"
  - Set 'Specify ISMF Job Statement Source' to **2**
  - Modify the ISMF Job Statement Information to look like:
    ```
    //SHARAxxA  JOB  (ACCOUNT),'NAME',NOTIFY=&SYSUID
    ```
- **Hit PF3 (END/EXIT) 3 times to return to main ISPF menu**

Let's get started!

Lab 1 - Generate ISMF Data Set List

- Enter ISMF List Panel
  - ISMF Option 1
  - Select '**2**' for Source
  - Enter '**SHARE.S15758.US*R*.****' for DS Name
  - Specify '**2**' for 'Source of the New List' to indicate Catalog
  - Specify '**Y**' for 'Acquire Data from Volume'
  - Hit Enter
- You should have 5 data sets listed
- On the command line, type **SAVE USRDATA**

Lab 1 - Example

```
                      DATA SET SELECTION ENTRY PANEL              Page 1 of 5
 Command ===>

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 . . .  'SHARE.S15758.US*R*.**'
     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  . . N  (Y or N)
```

Lab 1 - Generate More Lists

- Repeat for first application group:
  - Search for '**SHARE.S15758.APP*.***'
  - Save list as **APPS**

- Repeat for second application group:
  - '**SHARE.S15758.*JOB*.***'
  - Save list as **JOBS**

Lab 1 - Questions

- *Use ISMF Option L to view your saved lists*

- How many lists do you see?

- What are their names?

Lab 2 – Data Set Report

Our first foray into the NaviQuest Panels

- Select ISMF Option **11** - "Enhanced ACS Management"
- Select Option **5** - "SMS Report Generation"
- Select Option **1** - "Data Set Report from Saved ISMF List"
- Select the following options:
  - Saved ISMF List: **USRDATA**
  - Data Set to Hold Report: **S15758.REPORT1**
  - Replace Contents: **Y**
- For the columns:
  - Data Set Name: **1**
  - Alloc Space: **2**
  - % Not Used: **3**
  - Volume Serial: **4**   (you'll have to scroll down to find it)

Lab 2 – Data Set Report - Questions

- How many data sets are in the List?

- Which data set uses the most space?

- What is the total allocated space?
  - (Scroll to the bottom to see the totals)

Lab 3 – Run an ACS Test Case

Get the feel for ACS Testing – we've built the first testcase for you!

- Use ISMF Option **7** - "ACS Class Selection"
- Select Option **4** - "Test" and fill in:
- Select Option **3** - "Test" and fill in:
  - ACS Test Library: '**SHARAxx.S15758.ACSTSTS**'
  - ACS Test Member: **ATEST1**
- Fill in the panel fields:
  - CDS Name: '**SHARAxx.S15758.SMS.SCDS**'
  - ACS Test Library: '**SHARAxx.S15748.ACSTSTS**'
  - ACS Test Member: **ATEST1**
  - Listing Data Set: **LISTING**
  - DC, SC, MC, SG: **Y**

Lab 3 – Questions:

- What Data Class was assigned?

- What Storage Class was assigned?

- What Management Class was assigned?

- What Storage Group was assigned?

- What was the final ACS Testing Return Code?
  - If non-zero, double-check your inputs and re-run

Lab 4 – Generate Test Cases

Use the ISMF Lists to Generate ACS Test Cases

- ISMF Option **11** - "Enhanced ACS Management"
- Option **1** - "Test Case Generation"
- Option **1** - "Saved ISMF List"
- Fill in:
  - Saved ISMF List: **USRDATA**
  - Member Name Prefix: **USR**
  - Test Case PDS: **'SHARAxx.S15758.ACSTSTS'**
  - You can leave the rest blank

- Hit Enter/CTRL to build the test cases

Lab 4 – Questions and Next Steps

- You should see members ATEST1 and USR1 – USR5
- Use 'b' to browse one the members

- What does member USR1 list as the DSN?

- What is the ACSENVIR listed in USR4?

- **Re-run the ACS Test Case Generation for:**
  - Saved list **APPS**, using prefix **APP**
  - Saved list **JOBS**, using prefix **JOB**

- Verify that you now have 12 test cases

Lab 5 – Generate ACS Testing Baseline

This will run the tests you just created and save the results for later comparison

- Use ISMF Option **7** - "Automatic Class Selection"
- Option **4** - "Test"
- Option **3** - "Test"
- Fill in:
  - CDS Name: **'SHARAxx.S15758.SMS.SCDS'**
  - ACS Test Library: **'SHARAxx.S15758.ACSTSTS'**
  - ACS Test Member: *****
  - Listing Data Set: **'SHARAxx.S15758.BASELINE'**
  - Select **Y** for DC, SC, MC, SG

- Hit ENTER/CTRL to run the test!

Lab 5 – Questions

- You'll now see the testing results for every test case in your test case library. Scroll through and answer:

- What Storage Class is set for test APP1?

- What Storage Group is set for test USR1?

- What Storage Class is set for test JOB1?

- Go back and look at your test case PDS..
  What DSN is used for JOB1?

Lab 6 – Make Changes to the ACS

- **We're going to add two new application filters: US* and CA***
- We'll make use of the COPYFILT tool to do this!

- Open your ACS PDS in **ISPF 3.4** – 'SHARAxx.S15758.ACS'
- Open the **FILTLIST** member for editing
- Change the line:
  - From: **FILTLIST APPDATA INCLUDE(APP*,JOB*,BANK*)**
  - To: **FILTLIST APPDATA INCLUDE(APP*,JOB*,BANK*,US*,CA*)**
- On the command line, enter: **SAVE**
- On the command line, enter: **COPYFILT**
- Fill in:
  - Member Containing FILTLISTs: **FILTLIST**
  - Data Class ACS Routine Name: **DCLAB**
  - Fill in the other 3 routine names: **SCLAB, MCLAB, SGLAB**
  - Change Log Entry: **Updated in Lab** (or whatever you like)

Lab 6 – Translate and Verify

- Go back and browse ACS Member SCLAB.
  Do you see your comment line above the FILTLIST?

- **Now we need to TRANSLATE the routines:**
  - ISMF Option **7** - "Automatic Class Selection"
  - Option **2** - "Translate"
  - Fill in:
    - SCDS Name: **'SHARAxx.S15758.SMS.SCDS'**
    - ACS Source Data Set: **'SHARAxx.S15758.ACS'**
    - ACS Source Member: **DCLAB**
    - Listing Data Set: **LISTING**
  - Hit ENTER/CTRL and verify that TRANSLATION RETURN CODE: 0000
- Repeat Above steps but use ACS Source Members:
  - **SCLAB, MCLAB, SGLAB**, one at a time

Lab 7 – Run the ACS Tests Again

Except this time, we'll do it with JCL

- ISMF Option **11** - "Enhanced ACS Management"
- Option **7** - "Batch Testing/Configuration Management"
- Option **3** - "Configuration Change Batch Sample"
- Scroll down and select "**TEST ACS Routines**"
- You'll now see JCL for this job. Make the following changes:
  - Verify JOBCARD uses jobname: **SHARAxxA**
  - TABL2=**SHARAxx.S15758.BATCHTBL**
  - PROFILE PREFIX(**SHARAxx**)
  - DEL **S15758.CHNGTST1**
  - SCDS(**S15758.SMS.SCDS**)
  - TESTBED(**S15758.ACSTSTS**)
  - LISTNAME(**S15758.CHNGTST1**)
- Under TESTGEN EXEC
  - SYSUT1 DSN=**SHARAxx.S15758.CHNGTST1**
- (see next page for updated JCL)

Lab 7 – Run ACS Tests Again

- Edited JCL (Using SHARA01 as Example – remember to use your ID!)

```
//SHARA01A  JOB  (ACCOUNT),'SHARA01',NOTIFY=&SYSUID

//TESTACS  EXEC ACBJBAOB,
//         PLIB1='SYS1.DGTPLIB',
//         TABL2=SHARA01.S15758.BATCHTBL
//SYSTSIN  DD *
PROFILE PREFIX(SHARA01)
DEL S15758.CHNGTST1
ISPSTART CMD(ACBQBAIA +
SCDS(S15758.SMS.SCDS) +
TESTBED(S15758.ACSTSTS) MEMBER(*) +
LISTNAME(S15758.CHNGTST1) +
DC(Y) SC(Y) MC(Y) SG(Y)) +
NEWAPPL(DGT) BATSCRW(132) BATSCRD(27) BREDIMAX(3) BDISPMAX(99999999)

//TESTGEN  EXEC  PGM=IEBGENER
//SYSUT1   DD  DSN=SHARA01.S15758.CHNGTST1,DISP=SHR
//SYSUT2   DD  SYSOUT=*
//SYSIN    DD  DUMMY
//SYSPRINT DD  SYSOUT=*
```

Lab 7 – Run ACS Tests Again

- Enter '**SUB**' on the Command Line
  - This submits the job for processing
- Hit F3 to exit and save your JCL:
  - Select '**Y**' to Save JCL
  - Data Set Name: **'SHARAxx.S15758.JCL(TESTACS)'**
  - Replace Contents: **Y**
- Return to ISPF Main menu (or split your screen with F2)
- Enter option **SDSF** to start SDSF
- Enter command: **ST**
- Find your job (should be at the bottom of the list)
  - Select with '**S**'
  - Verify RC 0

Lab 7 - Questions

- Go back to ISPF 3.4 and browse SHARA01.S15758.CHNGTST1

- What Storage Class is set for test APP1?

- What Storage Group is set for test JOB1?

- What Storage Class is set for test USR1?

Lab 8 – Compare Listings

Now we'll compare the BASELINE to our CHNGTST1
Two options – Choose ONE of the following:

- **NaviQuest Panels:**
  - ISMF Option **11** - "Enhanced ACS Management"
  - Option **2** - "ACS Test Listings Comparison"
  - Fill in:
    - Base ACS Test Listing: **'SHARAxx.S15758.BASELINE'**
    - New ACS Test Listing: **'SHARAxx.S15758.CHNGTST1'**
    - Test Case PDS: **'SHARAxx.S15758.ACSTSTS'**
    - Comparison Results: **'SHARAxx.S15758.TESTRES'**
    - Exception Test Case PDS: **'SHARAxx.S15758.TESTEXS'**
  - Hit ENTER/CTRL to process results
  - Skip the next two pages.........
- **Batch (see next page):**

Lab 8 – Batch Option

To Compare Listings via Batch:
- ISMF Option **11** - "Enhanced ACS Management"
- Option **7** – "Batch Testing/Configuration Management"
- Option **3** - "Configuration Change Batch Examples"
- Scroll down and select "**Compare ACS Test Listings**"

- Update JCL – see next page for changes
- Submit job (**'SUB'**)

- Save your JCL on exit (**'SHARAxx.S15758.JCL'**)
- Check SDSF to verify RC=0

Lab 8 – Checking Change via Batch

```
//CMPRSTEP EXEC  ACBJBAOB,
//        PLIB1=SYS1.DGTPLIB,
//        TABL2=SHARAxx.S15758.BATCHTBL
//SYSTSIN  DD *
PROFILE PREFIX(SHARAxx)
DEL S15758.TESTRES
DEL S15758.TESTEXS
ISPSTART CMD(%ACBQBAC1 +
BASELIST(S15758.BASELINE) +
NEWLIST(S15758.CHNGTST1) +
TESTBED(S15758.ACSTSTS) +
RSLTDSN(S15758.TESTRES) +
XCPTPDS(S15758.TESTEXS) +
XCPSPACE(5,3,30)) +
BATSCRW(132) BATSCRD(27) BREDIMAX(3) BDISPMAX(99999999)

//REPGEN  EXEC PGM=IEBGENER
//SYSUT1   DD DISP=SHR,DSN=SHARAxx.S15758.TESTRES
//SYSUT2   DD SYSOUT=*
//SYSIN    DD DUMMY
//SYSPRINT DD SYSOUT=*
```
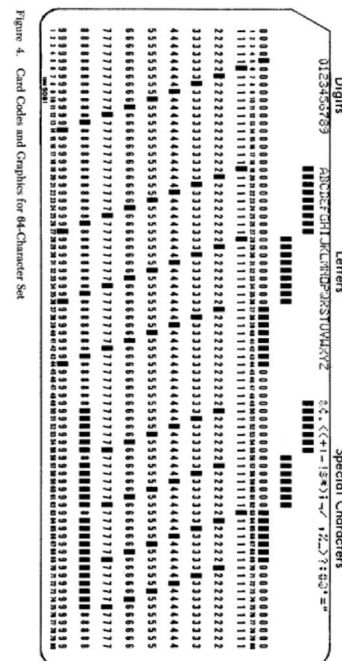
Lab 8 - Questions

Inspect SHARAxx.S15758.TESTRES

This data set contains only the cases with different results.

- For test cases JOB1 and JOB4, which classes changed?

- For cases USR1 – USR5, what changed?

- This doesn't seem right... (next page)

Lab 9 – Fix ACS Again

With the addition of the mask US* to the application FILTLIST, the USR* data sets are also getting assigned to the application class!

- **The lab assignment:** correct the ACS and try again.
  - Update ACS (see below)
  - Translate the ACS routines (see lab 6)
  - Repeat labs 7 and 8 to Test and Compare
    Note: if you saved your JCL, this should be quick and easy!

- **ACS Fix:**
  - The ACS did not follow best practice: "Put your most specific tests first."
  - Use ISPF 3.4 to open the SHARAxx.S15758.ACS
  - See the next page for recommended changes

Lab 9 – ACS Changes Again

- **The solution is to switch the order of the WHEN statements**
  - Check USRDATA first because
  - USR* and USER* masks are more specific than US*
  - The SELECT will stop checking as soon as a WHEN matches

- SCLAB Solution:
```
/* LOGIC */
SELECT(&DSN(3))
  WHEN(&USRDATA) SET &STORCLAS = 'USERDATA'
  WHEN(&APPDATA) SET &STORCLAS = 'APPDATA'
END
```

- SGLAB Solution:
```
/* LOGIC */
SELECT(&DSN(3))
  WHEN(&USRDATA) SET &STORGRP = 'USERDATA'
  WHEN(&APPDATA) SET &STORGRP = 'APPDATA'
END
```

Lab 9 - Continuing

- Remember to Translate the updated routines (Lab 6)
  - You can also do this through batch if you're feeling dangerous

- Re-run the ACS Tests
  - Run in batch (Lab 7, did you save your JCL?)
    or via panels (Lab 5)
  - Just don't overwrite the BASELINE

- Compare the results again
  - Run in batch or via panels (Lab 8)

Lab 9 – Summary and Questions

Examine the test output and comparison output:

- Do all the APP* and JOB* test cases result with:
  - STORCLAS: APPDATA
  - STORGRP: APPDATA

- Do all the USR* test cases result in:
  - STORCLAS: USRDATA
  - STORGRP: USRDATA

- If so, then congratulations! You've now experienced ACS testing with NaviQuest! Excellent work.

Lab 10 – Define a volume to a storage group

We'll use batch to add volume S15758 to SG APPDATA

- ISMF Option **11** – NaviQuest
- Option **7** – Batch Testing
- Option **3** – Configuration Change Batch Examples
- Scroll to find "**Change Storage Group Volume Status**"
- Update the JCL again:
  - Verify JOBCARD (jobname should be unique to you)
  - Update TABL2 on BOTH exec statement (ADDVOL1 and 2)
  - Update PROFILE PREFIX to your ID
  - Delete all the lines in the VOLADD DD and replace with:
    ```
    UPDHLVLSCDS(Y)
    SCDS(S15758.SMS.SCDS) SG(APPDATA) VOL(S15758) STATUS(DISALL)
    ```
- Submit the job!

Lab 10 – Verification

Check the storage group to verify the volume addition.

- ISMF Option **6** – Storage Group
- Specify:
  - CDS Name: **'SHARA01.S15758.SMS.SCDS'**
  - Storage Group Name: *****
- Select Option **1** – List
- On the resulting list
  - Use **LISTVOL** next to APPDATA

- Do you see the volume S15758?

Need More?

- Set up a batch job to run a VOLUME report from a saved list

- Set up a batch job to set field GURNTSPC=Y in the APPDATA storage class

- Create one single batch job to run after ACS changes:
  - Translate ACS
  - Run suite of test cases
  - Compare results

- Construct a single batch job to build a minimal SMS configuration from scratch:
  - Define SCDS (IDCAMS)
  - Define base configuration
  - Create one STORCLAS
  - Create one STORGRP with 1 volume
  - Translate and Validate ACS

- Build a REXX job to call JCL to add a volume to a storage group

Conclusion

- **After this Lab, you should know:**
  - How to generate ISMF lists
  - How to use those lists to generate ACS test cases
  - How to run those test cases through ACS
  - Compare the results and identify changes
  - How to find the JCL for any batch SMS

- For more information, see the manuals on the resources page

DFSMS Advanced: NaviQuest – Testing ACS Hand-On Lab

Neal Bohling and Tom Reed, IBM

August 6, 2014
Session Number 15758

#SHAREorg

Notices & Disclaimers

Trademarks

DFSMSdfp, DFSMSdss, DFSMShsm, DFSMSrmm, IBM, IMS, MVS, MVS/DFP, MVS/ESA, MVS/SP, MVS/XA, OS/390, SANergy, and SP are trademarks of International Business Machines Corporation in the United States, other countries, or both.

AIX, CICS, DB2, DFSMS/MVS, Parallel Sysplex, OS/390, S/390, Seascape, and z/OS are registered trademarks of International Business Machines Corporation in the United States, other countries, or both.

Domino, Lotus, Lotus Notes, Notes, and SmartSuite are trademarks or registered trademarks of Lotus Development Corporation. Tivoli, TME, Tivoli Enterprise are trademarks of Tivoli Systems Inc. in the United States and/or other countries.

Java and all Java-based trademarks are trademarks of Sun Microsystems, Inc. in the United States, other countries, or both. UNIX is a registered trademark in the United States and other countries licensed exclusively through The Open Group.

Other company, product, and service names may be trademarks or service marks of others.