



DFSMS Advanced: NaviQuest – Testing ACS Hand-On Lab

Neal Bohling and Tom Reed, IBM

August 6, 2014
Session Number 15758



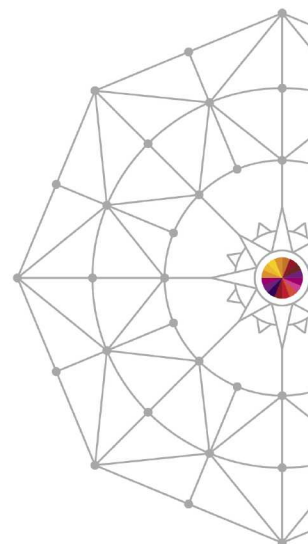
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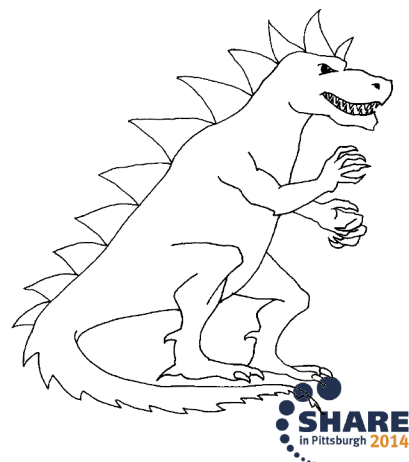
Lab Agenda

- 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



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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

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Logging In

- Find SHARE LPAR icon on the Desktop



- Enter TSO next to Application:

```
Enter Your Userid:
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)'
```

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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
```

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Resources

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

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Lab Data Sets

- **SHARAx.S15758.ACS – edit / use these for the lab**
 - DCLAB – data class
 - SCLAB – storage class
 - MCLAB – management class
 - SGLAB – storage group
- **SHARAx.S15758.ACSTSTS**
 - Library to hold ACS Test Cases
- **SHARAx.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...*

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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

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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!**

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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**

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Let's get started!



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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**

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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 List Name . . . | Query Name To 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) | |

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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**

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Lab 1 - Questions

- *Use ISMF Option L to view your saved lists*
- How many lists do you see?
- What are their names?

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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)

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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)

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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: '**SHARAx.S15758.ACSTSTS**'
 - ACS Test Member: **ATEST1**
- Fill in the panel fields:
 - CDS Name: '**SHARAx.S15758.SMS.SCDS**'
 - ACS Test Library: '**SHARAx.S15748.ACSTSTS**'
 - ACS Test Member: **ATEST1**
 - Listing Data Set: **LISTING**
 - DC, SC, MC, SG: **Y**

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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

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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: **'SHARAx.S15758.ACSTSTS'**
 - You can leave the rest blank
- Hit Enter/CTRL to build the test cases

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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

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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: '**SHARAx.x.S15758.SMS.SCDS**'
 - ACS Test Library: '**SHARAx.x.S15758.ACSTSTS**'
 - ACS Test Member: *
 - Listing Data Set: '**SHARAx.x.S15758.BASELINE**'
 - Select **Y** for DC, SC, MC, SG
- Hit ENTER/CTRL to run the test!

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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?

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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** – 'SHARAx.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)

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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: **'SHARAx.S15758.SMS.SCDS'**
 - ACS Source Data Set: **'SHARAx.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

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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=**SHARAxS15758.BATCHTBL**
 - PROFILE PREFIX(**SHARAx**)
 - DEL **S15758.CHNGTST1**
 - SCDS(**S15758.SMS.SCDS**)
 - TESTBED(**S15758.ACSTSTS**)
 - LISTNAME(**S15758.CHNGTST1**)
- Under TESTGEN EXEC
 - SYSUT1 DSN=**SHARAxS15758.CHNGTST1**
- (see next page for updated JCL)

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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 ACBJBA0B,
//          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=*
```

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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: '**SHARAx.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

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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?

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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: '**SHARAx.x.S15758.BASELINE**'
 - New ACS Test Listing: '**SHARAx.x.S15758.CHNGTST1**'
 - Test Case PDS: '**SHARAx.x.S15758.ACSTSTS**'
 - Comparison Results: '**SHARAx.x.S15758.TESTRES**'
 - Exception Test Case PDS: '**SHARAx.x.S15758.TESTEXS**'
 - Hit ENTER/CTRL to process results
 - Skip the next two pages.....
- **Batch (see next page):**

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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**')

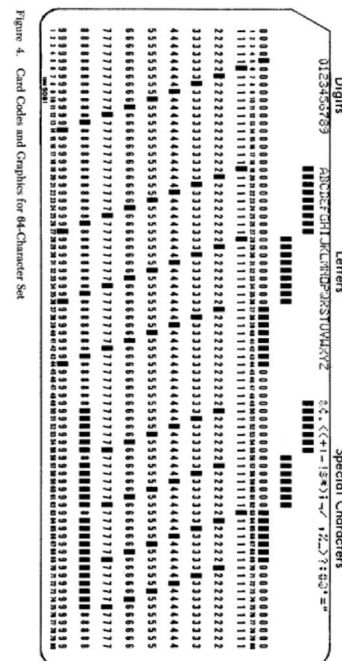
- Save your JCL on exit ('**SHARAx.x.S15758.JCL**')
- Check SDSF to verify RC=0

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Lab 8 – Checking Change via Batch

```
//CMPRSTEP EXEC ACBJBA0B,
//          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=*
```



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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)

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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 SHARAx.S15758.ACS
 - See the next page for recommended changes

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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
```

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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)

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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.

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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!

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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?

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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

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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

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