Simplify Your Life with New Mainframe Management Tools

Ros Schulman – Hitachi Data Systems
John Varendorff – Hitachi Data Systems
Session 16925
March 3, 2015 4:30-5:30pm
Sheraton – Boren

Insert Custom Session QR if Desired.

#SHAREorg

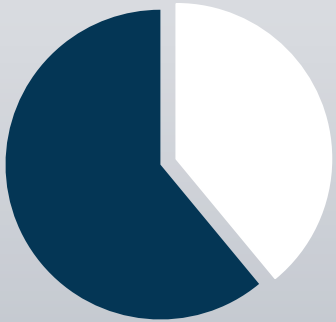
SHARE is an independent volunteer-run information technology association that provides education, professional networking and industry influence.

Agenda

- What brought us here?
- Replication Management
- Replication Management Scenario
- Role of SYSREXX
- Dynamic Tiering Management
- Dynamic Tiering Management Scenario
- Summary

The Need For Automation Is Clear

29% of time spent on ***lower-value*** admin and provisioning



39% of storage outages caused by ***human error***

Why do we need to simplify our life

- Explosive data growth
  - Even in MF
- Doing more with less
  - Storage Admins sometime manage in excess of 500TB a person
- Keeping Data forever
  - Large ML2 Pools
- Downtime is basically zero

Because HERE we are Today

- After 50 years, many mainframe'ers have retired, gone into seclusion, become homeless, or passed on
- New skills are being developed, but experience is not – "Waldo" retired years ago
- ACS routines, JCL, REXX Execs, have become outdated
  - Afraid to touch "Waldo's" ACS routines or JCL
  - Complicated job dependencies exacerbate to fear
  - Minimum number or changes minimize risk
  - Often times, changes are contracted out
  - Copy/Paste becomes a Storage Admins best friend
  - Many M&A's bring different disciplines together. Who owns the technology?

Result: with all the promises of SMS, the mainframe is NOT nearly as efficient as most believe, and datastores are 1,000,000's of times larger than when SMS was initially shipped.. Yes, MILLIONS!!

Rule of thumb: If doubling capacity, assume complexity goes up by 2.2x-2.8x. It's not linear.

Software has become more complex

- In 1995 only replication solution was Synchronous
- Today we have
  - Sync
  - Async
  - 3DC
  - 4DC
  - Flashcopy[tm]
  - Other In-system replication technologies

Disks have become more complex

- We used to have basically 1 size disk/array
- People owned volumes
- Today we can intermix multiple drive sizes, raid types and media types and store over a PB in a single array
- Performance is more critical than ever
- SMS routines are increasingly complex to help manage this

How do we solve these problems

- Newer technologies can significantly help simplify the environment
  - Dynamic Provisioning
  - Dynamic Tiering
  - Large Volume Sizes
    - Managing 54TB with 255 large volumes vs. 20,000 3390-3 requires less effort
  - Flash

Management is integral to simplification

- Accelerates deployment
- Centralized and automated management of Mainframe storage solutions
- Single, consistent interface
  - Based on TSO/ISPF
- Decreases staffing and training costs
- Real time display of critical thresholds
- Improves problem avoidance
- Auto discovery eliminates errors
- Automatic notification of key event completion
- Provides greater control

Replication Management

Today's Mainframe Replication Challenges

- Manage mainframe system-based replication solutions while maintaining reliable disaster recovery capabilities
- Operational testing of DR plan
- Protect data recoverability against rolling disasters
- Application data integrity spanning multiple storage systems
- Need for operations simplification

Solution Hitachi Business Continuity Manager

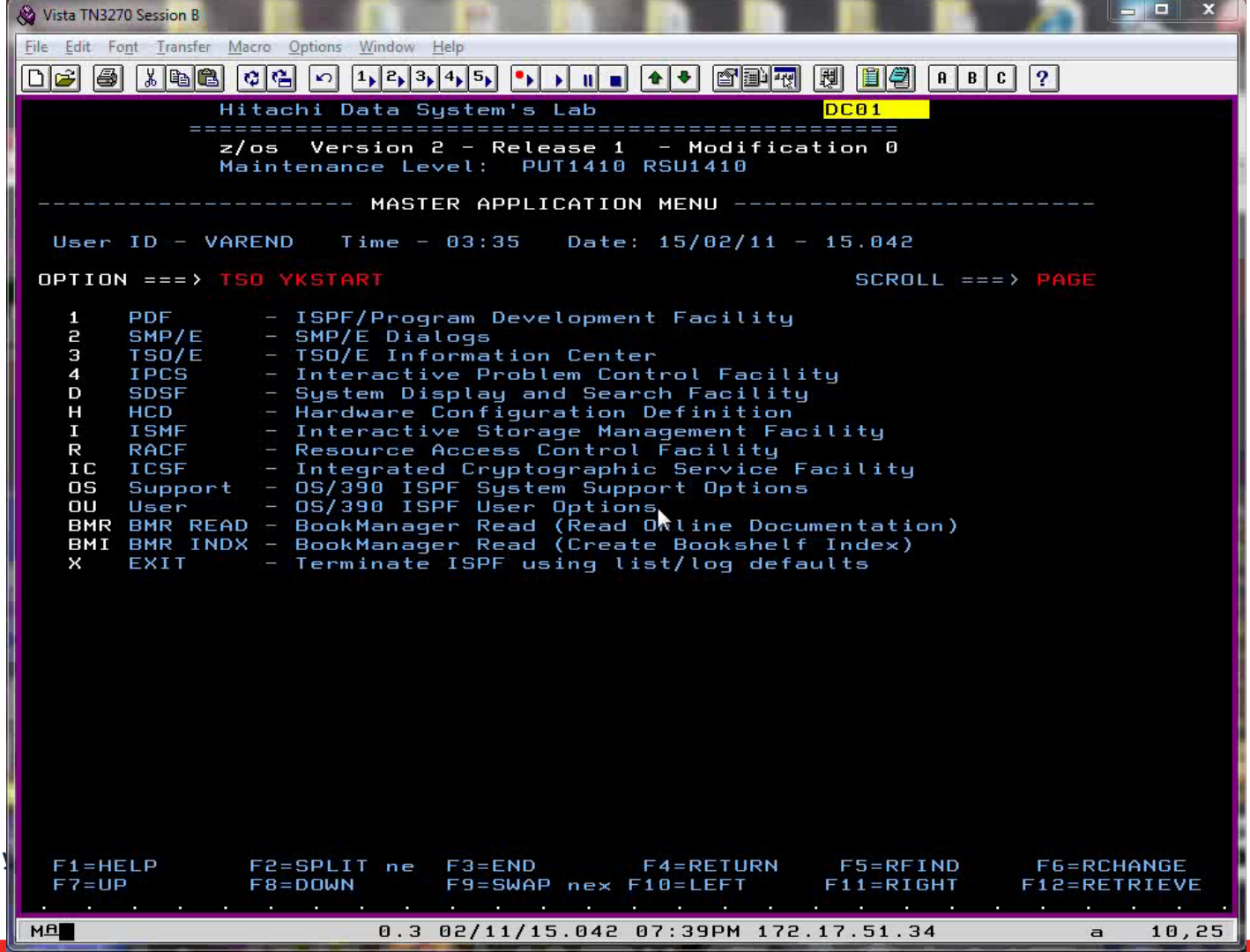
- Automates management of distributed copy groups, solves synchronization problems
  - Integrates with z/OS based Basic HyperSwap and GDPS Hyperswap to enable quick restart in a 3DC configuration
- Supports Advanced TrueCopy, ShadowImage and Universal Replicator features
  - Extended consistency groups
- Real time view of Universal Replicator Metrics
- Improved detection and notification
  - Receives auto notification of key copy “state transitions”
- Monitoring Feature

Lets show you how simple it is to manage replication

#SHAREorg

SHARE is an independent volunteer-run information technology association that provides education, professional networking and industry influence.

SHARE in Seattle 2015


Vista TN3270 Session B
File Edit Font Transfer Macro Options Window Help
Hitachi Data System's Lab DC01
z/os Version 2 - Release 1 - Modification 0
Maintenance Level: PUT1410 RSU1410
MASTER APPLICATION MENU
User ID - VAREND Time - 03:35 Date: 15/02/11 - 15.042
OPTION ===> TSO YKSTART SCROLL ===> PAGE
1 PDF - ISPF/Program Development Facility
2 SMP/E - SMP/E Dialogs
3 TSO/E - TSO/E Information Center
4 IPCS - Interactive Problem Control Facility
D SDSF - System Display and Search Facility
H HCD - Hardware Configuration Definition
I ISMF - Interactive Storage Management Facility
R RACF - Resource Access Control Facility
IC ICSF - Integrated Cryptographic Service Facility
OS Support - OS/390 ISPF System Support Options
OU User - OS/390 ISPF User Options
BMR BMR READ - BookManager Read (Read Online Documentation)
BMI BMR INDX - BookManager Read (Create Bookshelf Index)
X EXIT - Terminate ISPF using list/log defaults
F1=HELP F2=SPLIT ne F3=END F4=RETURN F5=RFIND F6=RCHANGE
F7=UP F8=DOWN F9=SWAP nex F10=LEFT F11=RIGHT F12=RETRIEVE
MA 0.3 02/11/15.042 07:39PM 172.17.51.34 a 10,25

Role of z/OS System REXX™ (also known as SYSREXX™) in Simplified System Management

#SHAREorg

SHARE is an independent volunteer-run information technology association that provides education, professional networking and industry influence.

SHARE in Seattle 2015

Role of SYSREXX - According to IBM:

"The role of SYSREXX in 'New Face of z/OS' is to provide an infrastructure through which REXX execs may be run outside the normal TSO/E or Batch environments, using a simple programming interface. This enables the leveraging of base operating system components by new style applications that will, over time, lead to simplified interaction and more intuitive system management capabilities on z/OS.

The ability to initiate REXX execs directly from an operator console has been long overdue on z/OS and is a drag along benefit of this initiative.

The possibilities for exploiting existing REXX code through the use of SYSREXX are vast, whether to provide operator assists or to provide routines that can be leveraged by new strategic initiatives."[1]

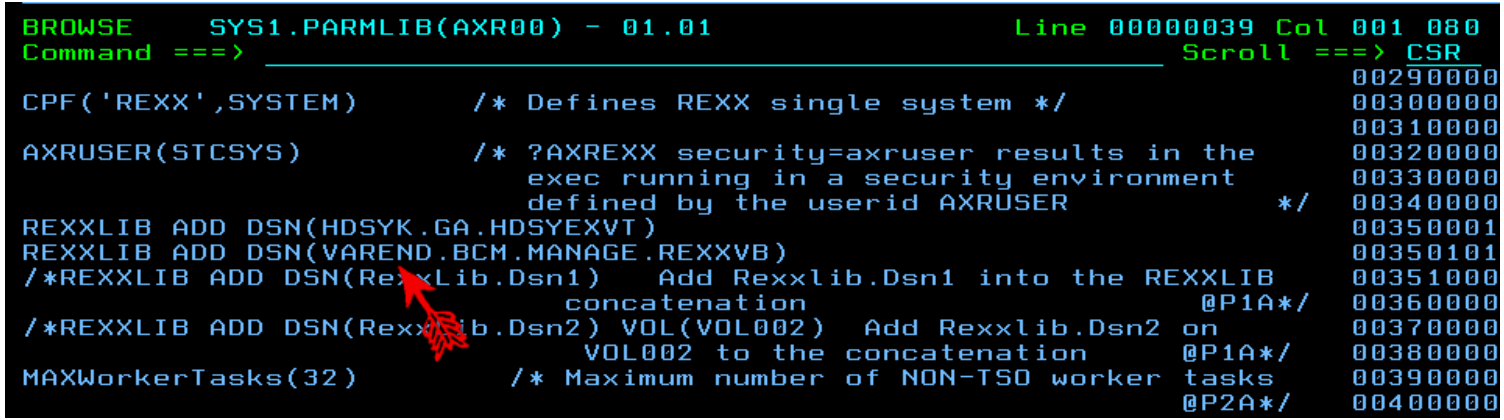
1. Extract from "z/OS System REXX" by Ron Northrup IBM at REXX Language Symposium 2010

Role of SYSREXX

- Easiest and Most Obvious Exploitation
  - Execute Interpretive Rexx or CEXECs (Compiled Execs) directly from z/OS Console
- Facilitate Hitachi Replication Management via z/OS Commands
- Simple Implementation…..☺!

Role of SYSREXX

- Add Rexx Libraries to **REXXLIB** Concatenation in **AXR**xx Member of PARMLIB
  - Libraries must be **RECFM=VB** as libraries are concatenated to **'SYS1.SAXREXEC'** which is also **RECFM=VB**.



Role of SYSREXX

- Terminate **AXR** Address Space
  - **Note:** No Stop Command for **AXR**
  - Issue **FORCE AXR,ARM**
- Restart **AXR** Address Space
  - Issue **START AXRPSTRT**

Role of SYSREXX

- Validate **REXXLIB** Libraries as available
  - Issue **F AXR,SYSREXX REXXLIB**

```
-F AXR,SYSREXX REXXLIB
 AXR0202I SYSREXX REXXLIB DISPLAY 178
 ENTRY VOLUME  DATA SET
    1  DC0001  HDSYK.V081000.HDSYEXVT
    2  GSS001  VAREND.BCM.MANAGE.REXXVB
    3  DC1RS1  SYS1.SAXREXEC
```

Role of SYSREXX

- Confirm **CPF** (Command Prefix) for SYSREXX
  - Issue **F AXR,SYSREXX STATUS**

```
-F AXR,SYSREXX STATUS
 AXR0200I SYSREXX STATUS DISPLAY 180
  SYSTEM REXX STARTED AT 05.13.12 ON 02/16/2015
  PARMLIB MEMBERS:        AXR00
  CPF:  REXX  (SYSTEM)       AXRUSER:  STCSYS
  TIMEOUT: 30             TMP: NOT ENABLED
  SUBSYSTEM:              AXR
  REQUESTS QUEUED:        0  ACCEPTING NEW WORK
  REXX WORKER TASKS:      ACTIVE:    0      TOTAL:    4
                          IDLE:      4      MAX:     32
                          ASYNC:     0      SYNC:     0
                          UNTIMED:   0
  TSO SERVER SPACES:      ACTIVE:    0      TOTAL:    0
                          IDLE:      0      MAX:      8
                          ASYNC:     0      SYNC:     0
                          UNTIMED:   0
```

Role of SYSREXX

- Ensure **AXRWTO** Rexx Function used to issue Unsolicited WTOs
  - Rexx **SAY** Commands will be output only after Rexx Exec has completed execution.
- Ready to Go!

Role of SYSREXX

- Execute Rexx Exec from z/OS Console
  - *rexx_cpf rexx_exec_name rexx_arguments*

```
                        System Command Extension

Type or complete typing a system command, then press Enter.

===> REXX BCMREXXC SUSPEND PREFIX(DEMO.SHARE) DAD(PRI) ROUTE(PRI2SEC
===> ) GROUP(ASYNC) PAIRLIST(YES) WAITSECS(15) WAITLOOPS(10)

Place the cursor on a command and press Enter to retrieve it.
                                                            More:      +
=>   REXX BCMREXXC SUSPEND PREFIX(DEMO.SHARE) DAD(PRI) ROUTE(PRI2SEC
=>   D M=DEV(2210)
=>   DS P,2210,1
=>   DS QD,2210,1
=>   V 2210,OFFLINE
=>   D U,,,2210,1
=>   S YKDSPENV

_   Wait 1 second to display responses (specify with SET DELAY)
_   Do not save commands for the next SDSF session
 F1=Help       F2=Split      F3=Cancel     F5=FullScr    F7=Backward
 F8=Forward    F9=Swap      F11=ClearLst  F12=Cancel
```

Role of SYSREXX

- Execute Rexx Exec from z/OS Console

```
   Display  Filter  View  Print  Options  Search  Help
 ------------------------------------------------------------------------------
 SDSF SYSLOG  69374.101 DC01  DC01  02/11/2015 0W          8,116   COLUMNS 52- 131
 COMMAND INPUT ===> _                                            SCROLL ===> CSR
0010   ***
0010   ***              --- Primary ----    --- Secondary --
0010   ***  Status   Devn CU SSID CCA    Devn CU SSID CCA Match
0010   *** -------- ----------------    ---------------- -----
0010   ***  SUSPOP   2014 20 0006  14 >  2214 20 0007  14  100%
0010   ***  SUSPOP   2015 20 0006  15 >  2215 20 0007  15  100%
0010   ***  SUSPOP   2018 20 0006  18 >  2218 20 0007  18  100%
0010   ***  SUSPOP   2019 20 0006  19 >  2219 20 0007  19  100%
0010   ***
0010   AXR0500I AXREXX OUTPUT DISPLAY 836
0010   EXECNAME=BCMREXXC REQTOKEN=00004000000000000CE7DECFE57EC9D30
0010   YKL099I YKLOAD command return code=0, reason code=0.
0010   YKQ099I YKQUERY command return code=0008, reason code=0000
0010   YKU099I YKSUSPND command return code=0000, reason code=0000
0010   YKE099I YKEWAIT command return code=0000, reason code=0000
0010   YKQ099I YKQUERY command return code=0008, reason code=0000
```

Dynamic Tiering Management

#SHAREorg

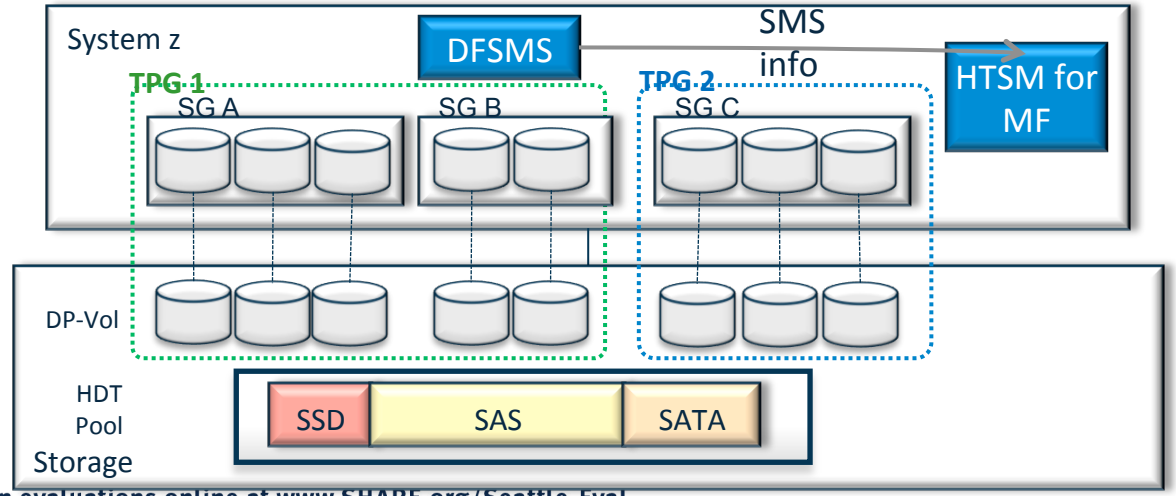
SHARE is an independent volunteer-run information technology association that provides education, professional networking and industry influence.

So how do I simplify management of Dynamic Tiering using Management Tools

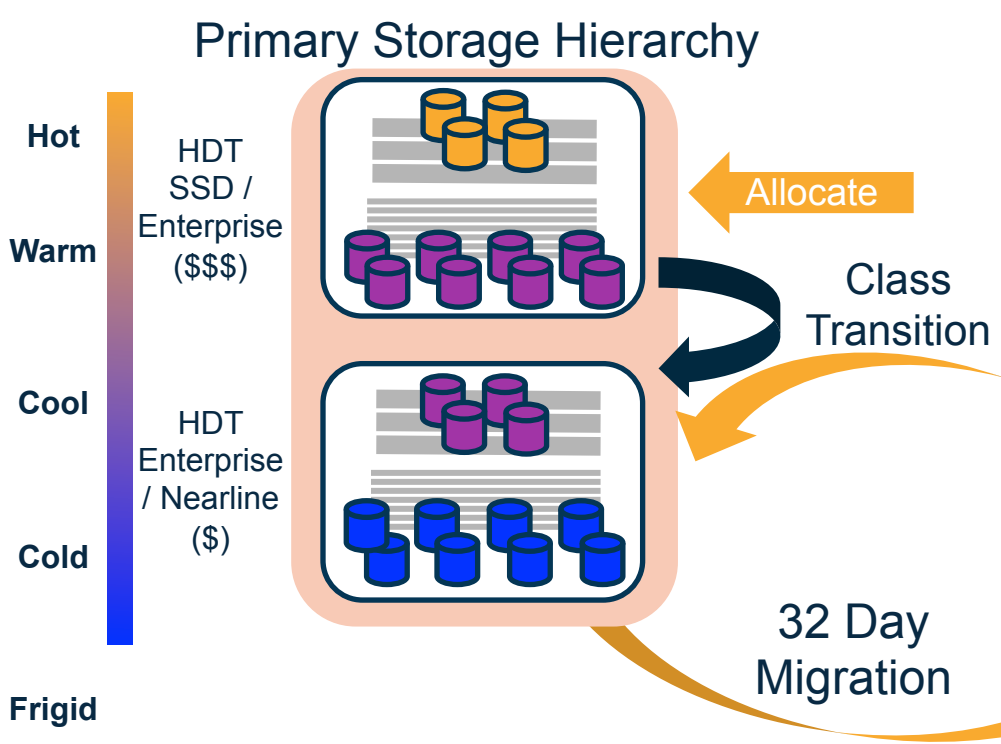
- Native management from z/OS
  - Control for data location from host's point of view, not storage system's point of view – improves control and simplifies operations
  - Reduce dependency on open server-based operations
- Control of storage service levels using HDT policies
- Linkage with z/OS SMS (storage group) speeds integration and reduces opex
- Simplify management in large-scale environments with group operations
- Both ISPF panel and flexible command-line interface (TSO/E REXX) offer users an easy way to get the most out of Dynamic Tiering
  - Intuitive Point and Shoot capability helps both old-timers and newbies alike

Linkage with z/OS SMS Feature

HTSM works with DFSMS constructs (storage group). Each tiering policy group can have 1 or more storage groups. This feature gives users the capability to manage the HDT for MF environment from a z/OS point of view. SMS integration makes it easy to add dynamic tiering to existing SMS operations



Hitachi Dynamic Tiering and Management by Storage groups with DFSMShsm 2.1



HDT Policy Level 2 by Storage Group Prod: 'Hot' data is moved to SSD, but 'Cold' data is never allowed below Enterprise Class storage.

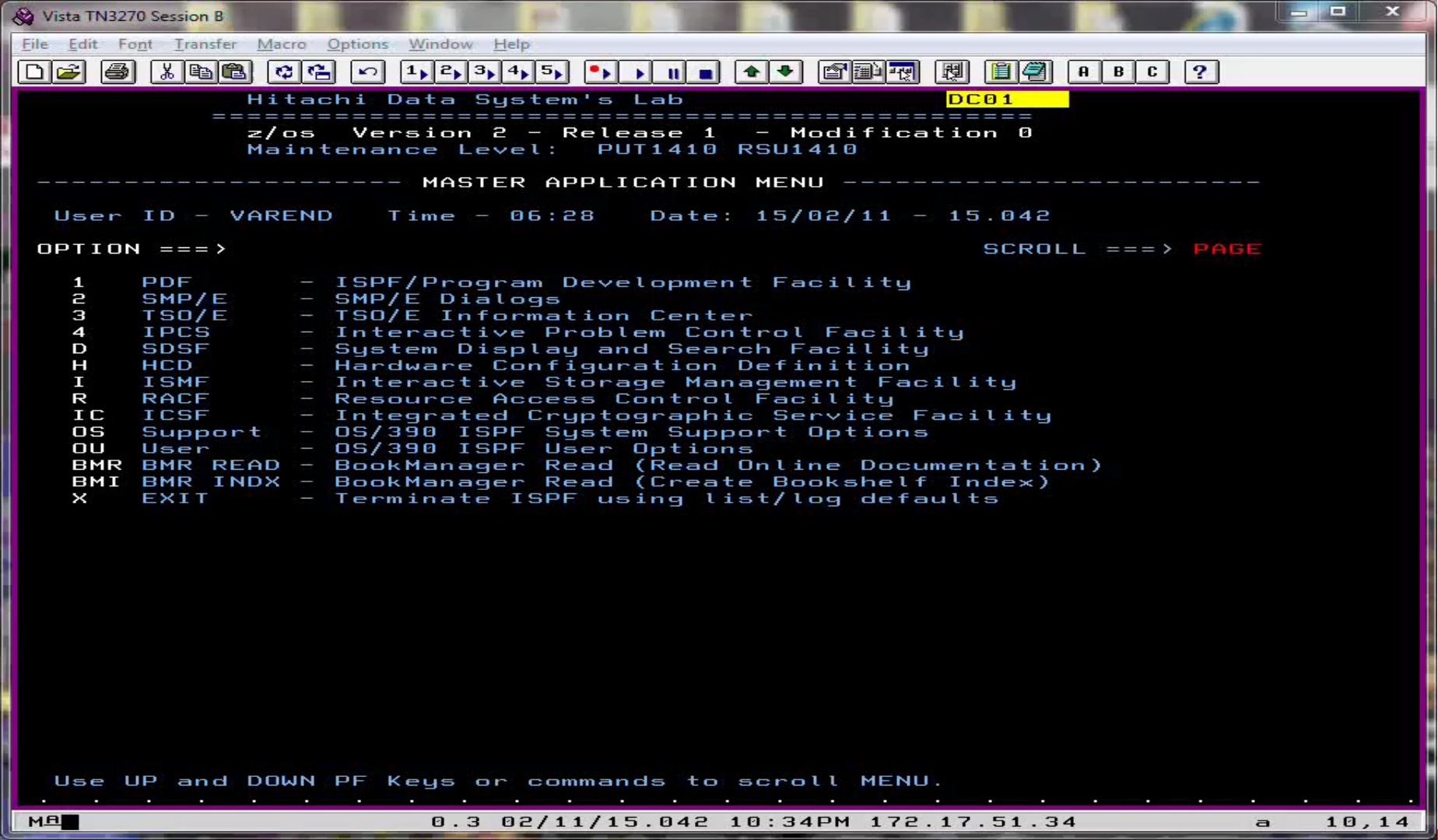
HDT Policy Level 4 by Storage Group Oldprod: 'Hot' data is not allowed higher than Enterprise Class, and 'Cold' data is allowed to reside on NL.

And this is how it works

#SHAREorg

SHARE is an independent volunteer-run information technology association that provides education, professional networking and industry influence.

SHARE in Seattle 2015


Vista TN3270 Session B
File Edit Font Transfer Macro Options Window Help
Hitachi Data System's Lab DC01
z/os Version 2 - Release 1 - Modification 0
Maintenance Level: PUT1410 RSU1410
MASTER APPLICATION MENU
User ID - VAREND Time - 06:28 Date: 15/02/11 - 15.042
OPTION ===>
SCROLL ===> PAGE
1 PDF - ISPF/Program Development Facility
2 SMP/E - SMP/E Dialogs
3 TSO/E - TSO/E Information Center
4 IPCS - Interactive Problem Control Facility
D SDSF - System Display and Search Facility
H HCD - Hardware Configuration Definition
I ISMF - Interactive Storage Management Facility
R RACF - Resource Access Control Facility
IC ICSF - Integrated Cryptographic Service Facility
OS Support - OS/390 ISPF System Support Options
OU User - OS/390 ISPF User Options
BMR BMR READ - BookManager Read (Read Online Documentation)
BMI BMR INDX - BookManager Read (Create Bookshelf Index)
X EXIT - Terminate ISPF using list/log defaults
Use UP and DOWN PF Keys or commands to scroll MENU.
MA
0.3 02/11/15.042 10:34PM 172.17.51.34 a 10,14

Summary

- Doing more with less is not easy
- Take advantage of newer technologies
  - Dynamic Tiering for performance
  - Large Volumes sizes to reduce #volumes managed
- Take advantage of automation
- Use Z/OS aware tools for
  - Discovery
  - Simplified Management
  - Time to implement
  - Easier learning curve

Thank You!

For additional Hitachi information, please contact

Ros.Schulman@hds.com
973 207 4138 (cell)

John.Varendorff@hds.com

Visit us in Booth #401

Session 16926 – Improve your IT Analytics capabilities through Mainframe consolidation and simplification
Speakers: Roselinda Schulman (Hitachi Data Systems) and John Harker (Hitachi Data Systems)

Session 16923 – The Reality of Storage Virtualization
Thursday, March 5, 2015, 1:45-2:45\
Speaker: William Smith (Hitachi Data Systems)

Session 16757- Agile, Available, and Recoverable – Demystifying Time to Data
Thursday, March 5, 2015, 4:30-5:30,
Speaker: Ros Schulman (Hitachi Data Systems) and Rebecca Levesque (21st Century Software)