IBM

Best practices when using mixed 3590 device types with DFSMShsm

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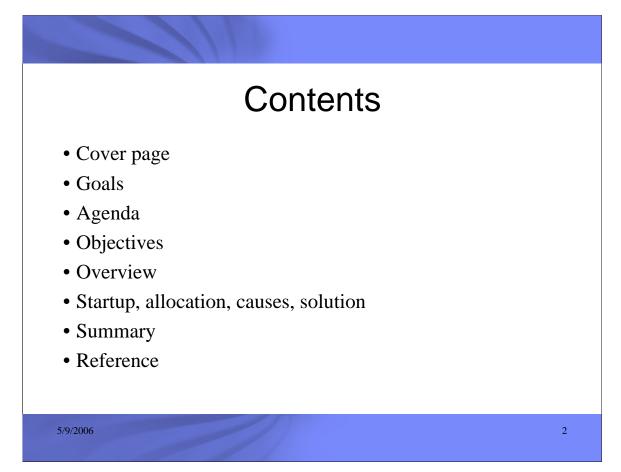
This presentation describes best practices when using mixed 3590 device types with DFSMShsm.

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This presentation includes a cover page, the goals of the presentation, the agenda, its objectives, an overview, details about the problem, its causes, solutions, a final summary, and references.

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Goals

- This presentation provides information about the setup of DFSMShsm, HCD, and DFSMS ACS routines to avoid a loss of function caused by having mixed technologies assigned to a given esoteric.

- After completing this lesson, you will have the information needed to set up DFSMShsm, MVS, and DFSMS to avoid a loss of function denoted by the ARC0030I message.

- Prerequisites: A basic understanding of DFSMShsm, MVS hardware definition (HCD), and DFSMS ACS routines.

With the introduction of 3590H, DFSMShsm encounters a situation where dissimilar device technologies are assigned to the 3590-1 generic. To prevent possible allocation errors, DFSMShsm issues message ARC0030I. This presentation provides information about the setup of DFSMShsm, MVS HCD, and DFSMS ACS routines to avoid a loss of function when the message is issued. After completing this lesson, you will have the information needed to set up DFSMShsm, MVS, and DFSMS ACS routines to avoid a loss of function as indicated by the ARC0030I message. You need to have a basic understanding of DFSMShsm, MVS hardware definition (specifically, HCD), and DFSMS ACS routines.

Agenda

- The problem
- The cause
- The solution

The agenda includes the defining the problem, exploring various causes, and discussing possible solutions.

Objectives

The objective of this presentation is to develop an understanding of DFSMShsm's examination of the 3590-1 generic pool, the causes of a loss of function, and methods of avoidance.

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Overview

Starting with the introduction of 3590H tape support, the possibility of mixed recording technology in the 3590-1 generic exists.

All 359x devices are assigned to the 3590-1 generic.

DFSMShsm inspects the devices assigned to the 3590-1 generic and issues message ARC0030I if 3590-1 becomes the target for allocation and is marked as having incompatible technologies.

Customers who have applied 3590H support (APAR OW53994) might receive ARC0030I messages when mixed recording technologies exist in the 3590-1 generic hardware definition.

All 359x series devices are assigned to the 3590-1 generic pool regardless of recording technology or the other esoterics to which they might be assigned.

DFSMShsm validates the consistency of recording technology for the 3590-1 generic at startup. Later, if mixed incompatible technologies are found, DFSMShsm will not allocate a tape device using the generic 3590-1 unit name, and will issue an ARC0030I message instead.

DFSMShsm 3590-1 Checking

At startup:
- DFSMShsm validates the consistency of recording technology among 3590-1 devices.
- If mixed devices are found, it internally sets an invalid flag.

At allocation:
- DFSMShsm checks for the invalid flag.
- If found, it issues ARC0030I.
- Allocation does not occur.

At startup, DFSMShsm validates the consistency of recording technology for the 3590-1 generic and sets a flag internally. Subsequently, if DFSMShsm is directed to allocate devices from the 3590-1 generic pool and finds the invalid flag set, it will issue the ARC0030I message and will not perform the allocation.

Causes of a Mixed Esoteric

359x technologies:

3590B (128-track write),

3590E (256-track write),

3590H (384-track write),

3592-J1A (EFMT1)

or 3592-E05 (EFMT1 or EFMT2)) are each added to the 3590-1 generic pool when a given device is added to a system.

Microcode changes in vendor devices can change drive type, causing mixed devices in the 3590-1 generic

These are some possible causes of mixed devices within an esoteric:

•When new 3590 series drives are added to the system, possibly with differing technologies, they are also added to the 3590-1 generic pool.

-Microcode changes to non-IBM drives can change configuration to that of a new recording technology. If only a subset of drives are changed, mixed technologies in the 3590-1 generic can occur. Previously, additional microcode updates from the non-IBM vendor corrected this problem.

-DFSMShsm detects the addition at the next startup and issues the appropriate error message. However, before restart, allocation errors can occur.

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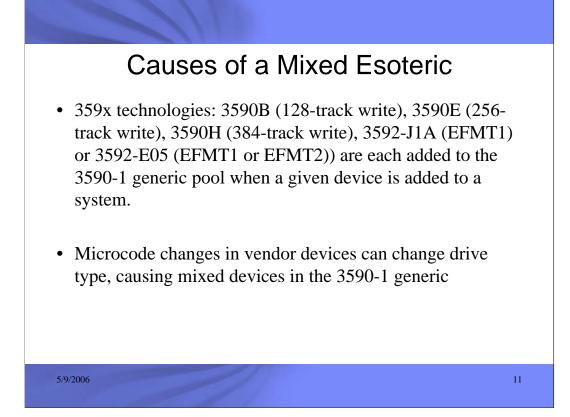
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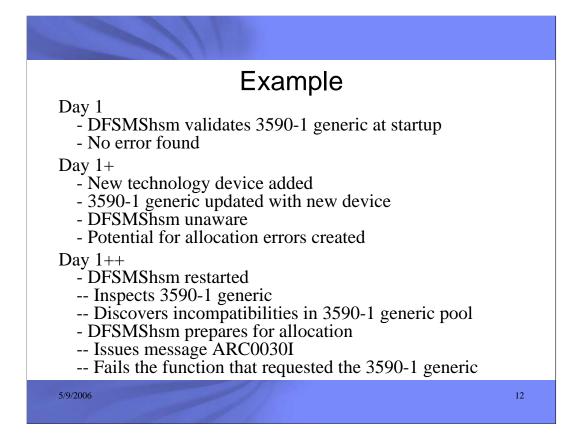
Example

Day 1
- DFSMShsm validates 3590-1 generic at startup
- No error found

Day 1+
- New technology device added
- 3590-1 generic updated with new device
- DFSMShsm unaware
- Potential for allocation errors created

Day 1++
- DFSMShsm restarted
-- Inspects 3590-1 generic
-- Discovers incompatibilities in 3590-1 generic pool
- DFSMShsm prepares for allocation
-- Issues message ARC0030I
-- Fails the function that requested the 3590-1 generic

Here is an example of what can happen when a new technology is added to the 3590-1 generic pool. Because the 3590-1 generic is validated only at startup, introduction of a new technology into the 3590-1 generic pool after DFSMShsm is started might not be seen until HSM is restarted. DFSMShsm will issue the ARC0030I message when it recognizes the error, but until that time the user is exposed to possible allocation errors.

Solution I

Create an esoteric for each technology in the HCD.

Define esoterics to DFSMShsm using SETSYS commands.

Examples:
SETSYS USERUNITABLE(esoteric:esoteric)
SETSYS BACKUP(TAPE(esoteric))
SETSYS RECYCLEOUTPUT(BACKUP(esoteric))
SETSYS RECYCLEOUTPUT(MIGRATION(esoteric))
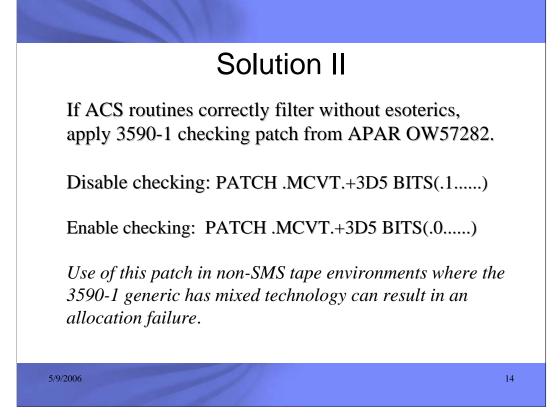SETSYS TAPEMIGRATION(DIRECT(TAPE(esoteric)))

Solution I is to create a new esoteric in HCD for each technology, where each esoteric contains only devices of the same recording technology.

Then define these esoterics to DFSMShsm using SETSYS commands. For example, SETSYS USERUNITABLE(esoteric:esoteric) tells DFSMShsm to use the esoteric without translation to the generic 3590-1.

The following commands tell DFSMShsm to use the defined esoterics when allocating a device for the various DFSMShsm functions.

SETSYS BACKUP(TAPE(esoteric))
SETSYS RECYCLEOUTPUT(BACKUP(esoteric))
SETSYS RECYCLEOUTPUT(MIGRATION(esoteric))
SETSYS TAPEMIGRATION(DIRECT(TAPE(esoteric)))

These are samples of the commands available to DFSMShsm. For a complete list, see the topic "Implementing DFSMShsm Tape Environments" in the DFSMShsm Implementation and Customization Guide.

Solution II

If ACS routines correctly filter without esoterics,
apply 3590-1 checking patch from APAR OW57282.

Disable checking: PATCH .MCVT.+3D5 BITS(.1......)

Enable checking: PATCH .MCVT.+3D5 BITS(.0......)

*Use of this patch in non-SMS tape environments where the
3590-1 generic has mixed technology can result in an
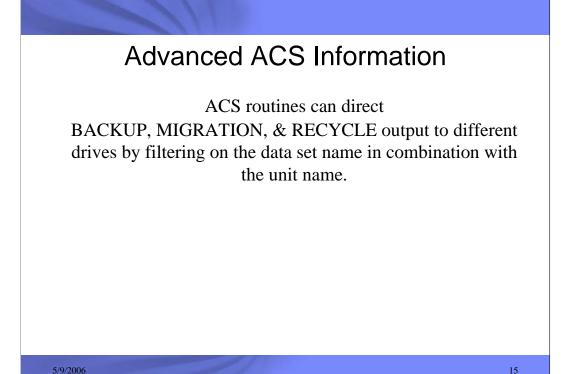allocation failure.*

Solution II is to use ACS routines to filter DFSMShsm tape allocations for the desired device, without the use of esoterics. If you know the result of these allocations, you can use a patch to prevent the ARC0030I message. Specifically, you can use the patch from APAR OW57282 to override the consistency check in the 3590-1 generic.

-The patch to disable the checking is **PATCH .MCVT.+3D5 BITS(.1......)**
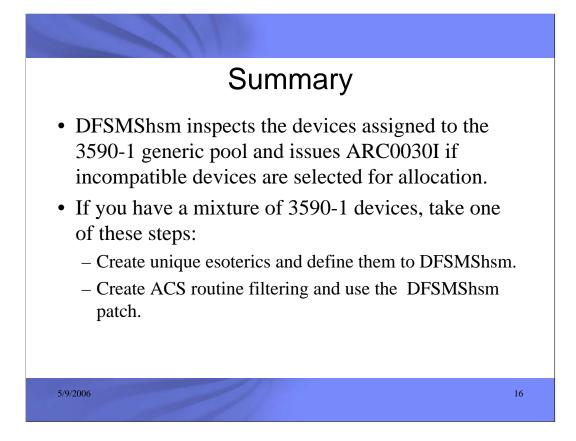
- The patch to enable the checking is **PATCH .MCVT.+3D5 BITS(.0......)**

Be aware that using this patch in non-SMS tape environments where the 3590-1 generic has mixed technology can result in an allocation failure, unless other methods are used to direct the allocation.

Advanced ACS Information

ACS routines can direct
BACKUP, MIGRATION, & RECYCLE output to different
drives by filtering on the data set name in combination with
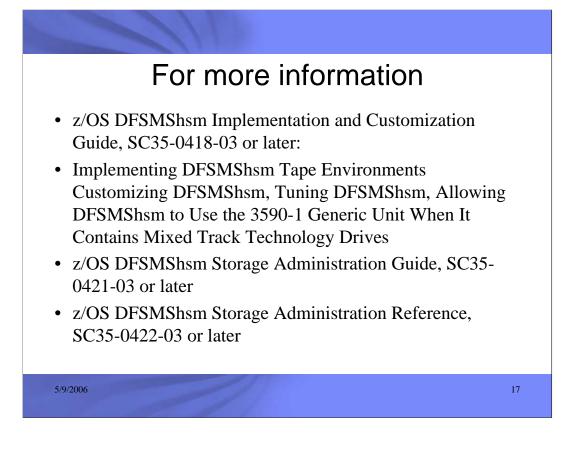the unit name.

You can use filtering by ACS routines to direct backup, migration, recycle of backup, or recycle of migration to different units., even though these outputs are based on the DFSMShsm single-file-format data set name. Because backup and recycle of backup have the same tape data-set name, and migration and recycle of migration have the same tape data-set name, a differentiating value is needed. If different esoterics are defined to DFSMShsm for backup, migration, and recycle, then the unit name passed to the ACS routines will be this esoteric, and it can be used to filter to a unique set of tape devices.

For a list of all the data set names used by the various DFSMShsm functions, see "Implementing DFSMShsm Tape Environments" in the z/OS DFSMShsm Implementation and Customization Guide, SC35-0418.

Summary

- DFSMShsm inspects the devices assigned to the 3590-1 generic pool and issues ARC0030I if incompatible devices are selected for allocation.
- If you have a mixture of 3590-1 devices, take one of these steps:
  – Create unique esoterics and define them to DFSMShsm.
  – Create ACS routine filtering and use the DFSMShsm patch.

In this session we covered the issues encountered after the introduction of 3590H tape support and the possibility of mixed tape technology in the 3590-1 generic pool. DFSMShsm inspects the technology of devices assigned to the 3590-1 generic pool and issues message ARC0030I if incompatible technologies are selected for allocation. DFSMShsm checks to make sure that all 3590-1 devices write in the same format, because 3590 base (with 128-track write), 3590E (with 256-track write), 3590H (with 384-track write), 3592-J1A (with EFMT1) and 3592-E05 (with EFMT1 or EFMT2) are all defined as 3590-1. Allocation could fail if DFSMShsm treated all 3590-1 devices the same. If you have a mixture of 3590-1 devices on the system, you either need to define each type with its own esoteric and then use the appropriate esoteric in the DFSMShsm SETSYS commands, or create ACS routine filtering and possibly use a DFSMShsm patch.

For more information

- z/OS DFSMShsm Implementation and Customization Guide, SC35-0418-03 or later:
- Implementing DFSMShsm Tape Environments Customizing DFSMShsm, Tuning DFSMShsm, Allowing DFSMShsm to Use the 3590-1 Generic Unit When It Contains Mixed Track Technology Drives
- z/OS DFSMShsm Storage Administration Guide, SC35-0421-03 or later
- z/OS DFSMShsm Storage Administration Reference, SC35-0422-03 or later

For more information, see the following documentation:

•z/OS DFSMShsm Implementation and Customization Guide, SC35-0418-03 or later. Specifically, see these topics: "Implementing DFSMShsm Tape Environments," "Customizing DFSMShsm," "Tuning DFSMShsm," and "Allowing DFSMShsm to Use the 3590-1 Generic Unit When It Contains Mixed Track Technology Drives."

•z/OS DFSMShsm Storage Administration Guide, SC35-0421-03 or later.

•z/OS DFSMShsm Storage Administration Reference, SC35-0422-03 or later.