IBM z/OS DFSMS Cloud Data Manager Version 1.1

Guide and Reference

GC28-3275-00

Note

Before using this information and the product it supports, read the information in Notices.

This edition applies to Version 1 Release 1 of IBM® z/OS® DFSMS Cloud Data Manager (program number 5698-CDM) and to all subsequent releases and modifications until otherwise indicated in new editions.

Last updated: December 2023

Contents

Figures

Tables

About this information

This document contains information you need to configure and use IBM z/OS DFSMS Cloud Data Manager.

Who should use this information

This document is intended for use by anyone responsible for implementing and administering IBM z/OS DFSMS Cloud Data Manager. Information presented in one topic is often based on knowledge obtained in a preceding topic.

Publications and related information

This section lists available online IBM z/OS DFSMS Cloud Data Manager publications.

Publications

The following publications can be viewed or downloaded from IBM Documentation:

https://www.ibm.com/docs/zdcdm

Table 1. IBM z/OS DFSMS Cloud Data Manager 1.1 product publications

Title	Form number
IBM z/OS DFSMS Cloud Data Manager Guide and Reference	GC28-3275-00
IBM z/OS DFSMS Cloud Data Manager Japanese Guide and Reference	GC28-3446-00
IBM z/OS DFSMS Cloud Data Manager Program Directory English and Japanese	GI13-5574-00

How to send your comments to IBM

We invite you to submit comments about the IBM z/OS DFSMS Cloud Data Manager product documentation. Your valuable feedback helps to ensure accurate and high-quality information.

Important: If your comment regards a technical question or problem, see instead "If you have a technical problem" on page x.

Submit your feedback by using the appropriate method for your type of comment or question:

Feedback on z/OS function
If your comment or question is about z/OS itself, submit a request through the IBM RFE Community.

Feedback on IBM Documentation
If your comment or question is about the IBM Documentation functionality, for example search capabilities or how to arrange the browser view, send a detailed email to IBM Documentation at ibmdocs@us.ibm.com.

Feedback on the z/OS product documentation and content
If your comment is about the information that is provided in the z/OS product documentation library, send a detailed email to mhvrcfs@us.ibm.com. We welcome any feedback that you have, including comments on the clarity, accuracy, or completeness of the information.

To help us better process your submission, include the following information:

- Your name, company/university/institution name, and email address
- The following deliverable title and order number: IBM z/OS DFSMS Cloud Data Manager, GC28-3275-00
- The section title of the specific information to which your comment relates

- The text of your comment

When you send comments to IBM, you grant IBM a nonexclusive authority to use or distribute the comments in any way appropriate without incurring any obligation to you.

IBM or any other organizations use the personal information that you supply to contact you only about the issues that you submit.

If you have a technical problem

If you have a technical problem or question, do not use the feedback methods that are provided for sending documentation comments. Instead, take one or more of the following actions:

- Go to the IBM Support Portal.
- Contact your IBM service representative.
- Call IBM technical support.

What's new in this edition (December 2023)

This information includes terminology, maintenance, and editorial changes. Technical changes or additions to the text and illustrations for the current edition are indicated in the PDF by a vertical line to the left of the change.

APAR PH56485

- When selecting data sets to be migrated in a simulation job, added option for specifying a range of dates or days a data set was migrated to ML2. Added capacity to filter data set selection by specifying data set names or masks:
  - Chapter 1, “Overview,” on page 1
  - “Simulate function” on page 4
  - “Simulate job” on page 12
  - “Simulate control statements” on page 12
  - “Option 2 Simulate - Create a job to simulate a cloud migration” on page 19
  - “Option 5 Display - Display cloud simulate/migrate logs” on page 27
  - Template for simulate job JCL *grpname*1
- Updated messages:
  - Specifying a date prior to 1970 is not supported: “GBQ0225E” on page 52
  - Message type is now debug: “GBQ0244D” on page 53 to “GBQ0246D” on page 53
  - Selection of data sets support a date range: “GBQ0275I” on page 55, “GBQ0276I” on page 55

Chapter 1. Overview

IBM z/OS DFSMS Cloud Data Manager (also known as DFSMScdm), is used to migrate large amounts of data from DFSMShsm ML2 storage to cloud storage.

In existing DFSMShsm environments, as data sets age, they are often migrated to tape (also known as migration level 2, or ML2 in DFSMShsm terms). DFSMShsm provides a recycle function to recover unused space on tape when a data set expires or is deleted. However, this consumes z/OS processor time. Cloud migration eliminates recycles and does not create contention issues when multiple applications need to access data on the same tape.

Data sets can be migrated to a specific cloud location, or to one or more destinations determined by the current SMS management class assignments.

Migrations can be planned around expected workloads. By using *migration groups* to organize data sets, you can pause and restart migrations from the same point as needed.

DFSMScdm migrations are performed through the following steps:

1. Configure the control data set and DFSMShsm libraries to be used by DFSMScdm.
2. Submit a simulation job to select which data sets are to be migrated.
3. Submit a migration job for DFSMScdm to migrate to cloud.

DFSMScdm performs migrations by first using the DFSMShsm RECALL command to bring selected ML2 data into a storage class used exclusively by DFSMScdm jobs.

Afterwards, the DFSMShsm MIGRATE STORAGEGROUP command is used to migrate the recalled data sets out to the cloud using an explicit cloud name, or using SMS management class definitions that have been defined on the system to control data set migration. The assumption is that the management class that directed the data sets to be migrated to ML2 at the time they were created has now been updated to migrate data sets to the cloud. Once the data sets have been recalled to disk from ML2, normal SMS processing moves these data sets to the required location.

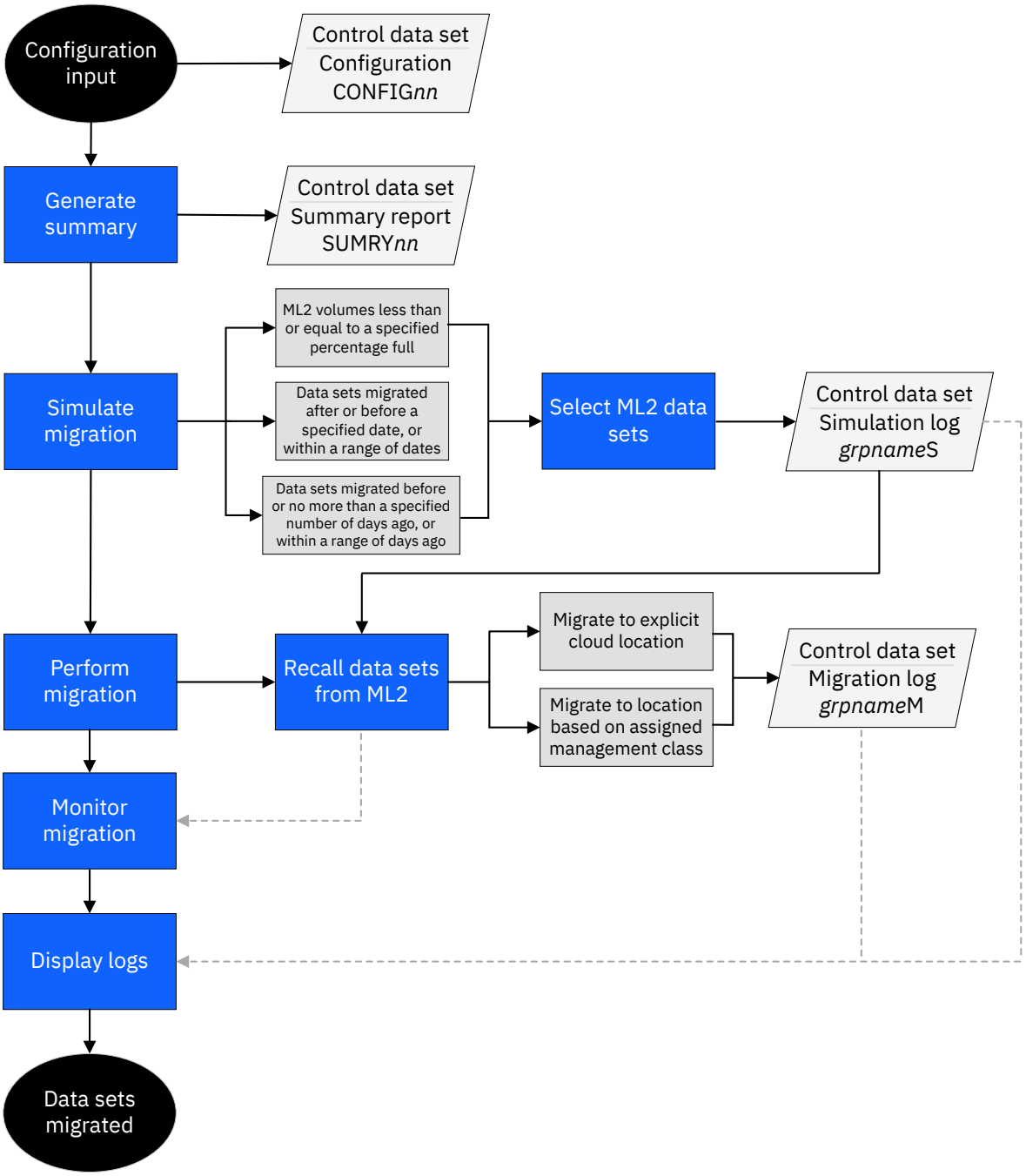

Figure 1. DFSMScdm process

A migration group is a set of DFSMShsm ML2 data sets selected for cloud migration using one of the following selection criteria specified by the user:

- ML2 volumes less full than a specified percentage
- Data sets migrated to ML2 after or before a specified date, or within a range of dates
- Data sets migrated to ML2 before or no more than a specified number of days ago, or within a range of days ago

DFSMScdm is managed using a control data set PDSE allocated during setup. The control data set contains the following members:

- Configuration members to save user-defined configuration options
- Simulation and migration job JCL for migration groups
- Simulation and migration logs
- Status summary of ML2 data sets
- Placeholder information

DFSMScdm can be customized to display in Japanese.

DFSMScdm usage scenarios

DFSMScdm assists in your management of data storage in several scenarios.

To apply current SMS management policies to existing ML2 data sets
This data has management policies defined years or decades ago. Over time, the acquisition of new storage options such as cloud has resulted in the definition of new policies. DFSMScdm uses DFSMShsm to recall migrated data sets, and to remigrate them to long-term storage. The current management policies of the data sets determine the destination of the remigration.

To accommodate an IBM z/OS environment moving from disk and tape to disk only
Regulatory or business considerations require existing data on ML2 data sets to be retained. Before removing the tape subsystem, these ML2 data sets must be moved to new storage.

To move infrequently accessed ML2 data sets to cloud objects
Cloud migration eliminates recycles for infrequently accessed data, avoiding CPU processing and reduces tape storage resources needed. DFSMScdm can select ML2 data sets by the last migration date to prioritize which data to move. When DFSMScdm migrates a data set to a cloud object, the date last referenced and the migration date remain unchanged, retaining critical historical accuracy about the data set. DFSMScdm provides user-customizable parameters to set the pace of migration to avoid bottlenecks with other DFSMShsm work on the system.

DFSMScdm functions

DFSMScdm consists of three main functions: summary, simulate, and migrate. The functions are batch jobs submitted by the user and monitored using the ISPF interface.

Summary function

Create a report that summarizes the status of your ML2 environment.

The report lists the number of ML2 data sets and volumes, the oldest and average age of those data sets, the number and percentage of data sets never recalled, and the number of cloud objects that have been created. This job is optional.

For more information, see “Summary job” on page 11.

Simulate function

Simulate the migration process from DFSMShsm ML2 to the cloud by selecting data sets that meet the selection criteria specified by the user.

Specify one of the following selection criteria:

- ML2 volumes less full than a specified percentage
- Data sets migrated to ML2 after or before a specified date, or within a range of dates
- Data sets migrated to ML2 before or no more than a specified number of days ago, or within a range of days ago

When selecting by date or number of days, you can use data set filtering to select only certain data sets. You may enter fully qualified data set names or masks and specify whether to include or exclude them in the selection.

The simulate function must be run before the migrate function is started; the log output is recorded in a member in the control data set, and that member is used as input to the migrate function.

For more information, see "Simulate job" on page 12.

Migrate function

Bring selected ML2 data sets back to disk, then either migrate these data sets to the specified cloud, or to a location determined by the management class for each data set.

The migrate function ensures that the data sets in a migration group are the same between the simulation and migration run times. If a volume identified in the simulate no longer meets the specified criteria, it is skipped from the migration.

While the migrate function is running, you can use MODIFY commands to stop the recall process, or display the status of the migrate job on the operator console. The status, such as the elapsed time or the number of data sets recalled, is periodically saved in the CSA. You can view status information for a running migration job in "Option 4 Monitor - Monitor active DFSMScdm migration jobs" on page 26.

It is recommended to run the migrate function during low DFSMShsm migration activity, and not when DFSMShsm space management functions are running. You can use pacing parameters to better share resources and allow other jobs on the system to acquire resources as required. For example, you can define the number of data sets in a batch so that a migration group is recalled in batches for segmented processing. You can also implement intervals between processing individual data sets and wait times between whole batches of migration processing.

Note: DFSMScdm uses the DFSMShsm migration control data set (MCDS) and offline control data set (OCDS) on your system. The MCDS may consist of up to 4 large volumes of data, so the MCDS is read in segments during the simulation process. After a simulation job has been run, a placeholder member is saved. To provide an initial estimate of the amount of ML2 data sets that can be migrated to the cloud, a summary job reads through the entire MCDS and generates a report summarizing the amount of data currently migrated to ML2.

For more information, see "Migrate job" on page 14.

Chapter 2. Installation and setup

Installation and setup of DFSMScdm is outlined in this topic.

DFSMScdm is installed with the following steps:

1. Define a storage class, placeholder volser, and if necessary, a storage group in ISMF to be used only by DFSMScdm for recalls and migrates.
2. Update ACS routines.
3. Define a PDSE to be used as the control data set.
4. APF-authorize the load library data set *hlq*.IBM.HGBQ110.SGBQLLIB used by the Shopz installation.
5. Start the DFSMScdm ISPF dialog and provide configuration parameters.

System requirements

The following requirements are post-Shopz installation.

Hardware requirements

To move data to the cloud, the following support is required for IBM Transparent Cloud Tiering:

- IBM DS8900 9.2.x or later
- Feature Code 5283

For IBM Transparent Cloud Tiering with a TS7700 as a target, TS7770 VED 5.3 or later is required.

For instructions on how to implement, see IBM DS8000 Transparent Cloud Tiering DS8000 Release 9.3.

Software requirements

The following requirements are needed for DFSMScdm as long as these versions remain available and supported by IBM:

- IBM z/OS 2.4 (5650-ZOS) or later
- The z/OS DFSMS Hierarchical Storage Manager component of a supported release of z/OS. For DFSMShsm on z/OS 2.4, APAR OA59904 (PTF UJ04709) is required.

Updates to ACS routines

ACS routine updates are required for management of recalls in DFSMScdm.

An SMS storage class and group must be defined for use only by DFSMScdm. DFSMScdm requests DFSMShsm RECALLS for data sets that will be migrated to the cloud. An update to the ACS routine is required to direct the DFSMShsm RECALL to the DFSMScdm storage group.

1. Define a storage class, placeholder volser, and if necessary, a storage group in ISMF to be used for recalls and migrates.
2. Update ACS routines for the DFSMScdm storage class, storage group, and optionally, the management class. The following updates are covered in this section:
   - Update to storage class
   - Update to storage group
   - Optional update to management class
   - Additional ACS routine updates

SMS change

The following SMS definitions are required for DFSMScdm processing:

- Storage class *cdmclass* to be used only for DFSMShsm recalls. The storage class and storage group ACS routines must be defined such that a recall to the volser uses the storage class and storage group reserved for use by DFSMScdm.
- Placeholder volser *placeholdervol* associated with the storage class *cdmclass*. Data sets are recalled to a specific volser *placeholdervol*. The migrate function issues DFSMShsm RECALL commands using this volser to allow the recalls to be directed by SMS to the specified storage group.
- Storage group *cdmgroup* to be used only for DFSMShsm recalls. The storage class and storage group ACS routines must be defined such that a recall to the volser uses the storage class and storage group reserved for use by DFSMScdm. The storage group must be defined with **Auto Migrate=No** or **(AM=N)**, so that data set migrations from the storage group are triggered only by DFSMShsm MIGRATE commands.
- One or more management classes that control where data sets that have been recalled by DFSMScdm are subsequently migrated by DFSMShsm. This is used when the DFSMScdm job does not specify an explicit cloud location. These management classes normally already exist on your system to control data set migration for new data sets.

Update to storage class

This routine recalls data sets to volume *placeholdervol*, and sets the storage class for these recalled data sets to *cdmclass*.

```
IF (&&ACSENVIR EQ 'RECALL' AND &&ANYVOL EQ 'placeholdervol') THEN
  DO
    SET &&STORCLAS = 'cdmclass'
    EXIT
  END
```

Update to storage group

This routine checks for the storage class *cdmclass* set by the storage class ACS routine, and sets the storage group for these recalled data sets to *cdmgroup*. DFSMScdm migrates all the data sets in *cdmgroup* to a cloud specified in the DFSMScdm job.

```
IF (&ACSENVIR EQ 'RECALL' AND &STORCLAS EQ 'cdmclass') THEN
  DO
    SET &STORGRP EQ 'cdmgroup'
    EXIT
  END
```

Optional update to management class

This routine recalls data sets to storage class *cdmclass*, and allows recalled data sets to be managed by management class *hsmmc*. If this is omitted, the movement of data sets are managed according to the management class assignments in your existing management class routine. For example, if your management class routine assigns management classes based on the data set name, then different data sets may be migrated to different clouds based on those management class assignments.

```
IF (&STORCLAS EQ 'cdmclass') THEN
  DO
    SET &MGMTCLAS EQ 'hsmmc'
    EXIT
  END
```

Additional ACS routine updates

Data sets being recalled from ML2 by DFSMScdm for remigration to the cloud require that the ACS routines set the STORCLAS and STORGRP variables based on the ANYVOL variable that DFSMScdm

passes to the ACS routines, as defined in your DFSMScdm configuration. This ensures that all data sets recalled on behalf of DFSMScdm are recalled to the storage group that has been reserved for use by DFSMScdm.

Important: If you are using class transitions in DFSMShsm, perform one of the following actions:

- Turn off class transitions so that the DFSMShsm recalls initiated by DFSMScdm are directed to the correct storage group.
- Update your ACS routines to nullify the STORCLAS assignment during the class transition call for DFSMShsm recalls being done on behalf of DFSMScdm. For example, use this in the STORCLAS routine:

```
IF &ACSENVIR = 'SPMGCLTR' THEN SET &STORCLAS = ''
```

Refer to the DFSMScdm Preventive Service Planning (PSP) for further information regarding future DFSMScdm support for DFSMShsm class transitions.

Setting up DFSMScdm

Setup and start the DFSMScdm ISPF dialog by following the procedure outlined in this topic.

Before you begin

Complete the SMP/E installation process described in the *IBM z/OS DFSMS Cloud Data Manager Program Directory*.

Procedure

1. Define a PDSE to be used as the control data set with the following parameters: **RECFM=FB, LRECL=80, DSORG=PO**.

   The GBQCONFG member of the SAMPLIB data set provides an example of doing this allocation.
2. APF-authorize the load library data set *hlq*.IBM.HGBQ110.SGBQLLIB used by the Shopz installation.
3. Execute the following TSO command to start DFSMScdm and enter the configuration panel:

   ```
   EX 'hlq.IBM.HGBQ110.SGBQELIB(GBQCDM)' 'hlq.IBM.HGBQ110'
   ```
4. Optional: To use DFSMScdm in Japanese, in the configuration panel, change the values of the panel library and message library to *hlq*.IBM.HGBQ110.SGBQPJPN and *hlq*.IBM.HGBQ110.SGBQMJPN, respectively.

   a) Press **F3** to save the values and exit the configuration panel.

   b) Exit DFSMScdm and start DFSMScdm again by executing the TSO command in step 3.

   DFSMScdm can be customized to display in Japanese, as long as a terminal is set up to support double-byte character set (DBCS) with code page 939 (cp939).

What to do next

Define DFSMScdm configurations to start using DFSMScdm. For more information, see “Configuration input” on page 7 and “Option C Configure - Configure control data set and session options” on page 30.

Configuration input

DFSMScdm can be customized to suit your needs.

The configuration panel manages DFSMScdm actions. You can enter and update the following configuration values:

- Control data set used for DFSMScdm that you allocated during setup
- Member name of the configuration member which configuration parameters are saved into

- DFSMScdm product libraries
- DFSMShsm MCDS and OCDS names
- Name of the cloud location to migrate to
- Storage class, placeholder volser, and storage group used strictly for DFSMShsm recalls
- Date format used in DFSMScdm reports and dialog panel displays
- Default JOB statement for DFSMScdm batch jobs

Data set libraries

DFSMScdm can be customized to display in Japanese, as long as a terminal is set up to support double-byte character set (DBCS) with code page 939 (cp939). DFSMScdm ships with the following data set libraries. For more information, see the *IBM z/OS DFSMS Cloud Data Manager Program Directory*.

Table 2. Data set libraries in DFSMScdm

Data set library	**Description**
hlq.IBM.HGBQ110.SGBQLLIB	Load library
hlq.IBM.HGBQ110.SGBQELIB	REXX library
hlq.IBM.HGBQ110.SGBQPENU	English panel library
hlq.IBM.HGBQ110.SGBQPJPN	Japanese panel library
hlq.IBM.HGBQ110.SGBQTLIB	Table library
hlq.IBM.HGBQ110.SGBQMLIB	English message library
hlq.IBM.HGBQ110.SGBQMJPN	Japanese message library
hlq.IBM.HGBQ110.SGBQSLIB	Skeleton library

Multiple configurations

In most installations, only one configuration member is used. Define multiple configurations if you are doing migrations for multiple DFSMShsm environments and want to make it easy to switch between different cloud or DFSMShsm recall destinations. Consider the following scenarios:

- You have a site with different DFSMShsm environments.
- You want to recall to different storage classes or storage groups. Each configuration member can have different specifications for the default cloud name, storage class, and storage group to accommodate different types of recall.
- You want to migrate different sets of data sets to different cloud locations.
- You want migrations to be controlled by the assigned management class.

You can define multiple configuration members CONFIG01, CONFIG02, CONFIG03, and so on, each with different configuration values for each purpose. In the configuration panel, update the configuration member name to switch between configurations.

Each configuration is stored as a member in the control data set as CONFIG*nn*, where *nn* is any value between 00 and 99 you specify in the configuration panel. The following configurations are saved in CONFIG*nn*.

```
* CDM Configuration file *
CLOUD_NAME=CLOUD01
MCDS=DFHSMT.MCDS1
MCDS2=DFHSMT.MCDS2
MCDS3=DFHSMT.MCDS3
OCDS=DFHSMT.OCDS
STORCLAS=CDUWRKSC
STORGRP_VOL=CDUW01
STORGRP=CDUWRKSG
DATEFMT=YYYY/MM/DD
```

Figure 2. Sample configuration file CONFIGnn

CLOUD_NAME
Name of the cloud to migrate the data out to; otherwise, a management class controls the migration destination. This name can be overridden on a per-job basis.

MCDS, MCDS2, MCDS3, MCDS4
DFSMShsm migration control data set name for your installation. You can specify up to 4 MCDS clusters.

OCDS
DFSMShsm offline control data set name for your installation.

STORCLAS
Storage class used for DFSMShsm RECALL to prevent using standard day-to-day production DFSMShsm resources.

STORGRP_VOL
Placeholder volser associated with the storage group associated with the storage class specified by the **STORCLAS** parameter. The migrate function issues DFSMShsm RECALL commands using this volser to allow the recalls to be directed by SMS to the specified storage group.

STORGRP
Storage group associated with the storage class specified by the **STORCLAS** parameter for DFSMScdm recalls. In the migrate function, data sets are moved from volumes in this storage group to the cloud.

DATEFMT
Date format. Specify either MM/DD/YYYY, DD/MM/YYYY, or YYYY/MM/DD.

For more information about configuration, see “Option C Configure - Configure control data set and session options” on page 30.

Chapter 3. Administration

DFSMScdm consists of three functions to perform migrations. The control data set specified during installation of DFSMScdm contains members that are output by a function.

Security

DFSMScdm is intended to be used by system-level administrators.

DFSMScdm maintains the security of DFSMScdm operations through the use of RACF® FACILITY class profiles. DFSMScdm users must have read access to the FACILITY classes STGADMIN.ARC.RECALL and STGADMIN.ARC.MIGRATE. In addition, limit read access to the control data set to administrators who are authorized to run DFSMScdm.

Members in the control data set

The control data set contains members detailing user-specified configurations; summary, simulation and migration jobs; and the status summary of ML2 data sets.

CONFIG*nn*
Member defining a DFSMScdm configuration.

SUMRY*nn*
Summary report log output for configuration CONFIG*nn*. This is overwritten if another summary job is run for the same configuration.

SUMRY*nn*J
Summary job JCL to create the summary report log output SUMRY*nn*.

grpname
Migration group name defined by the user during configuration. Each migration group has five members in the control data set.

***grpname*1**
Simulation job JCL

***grpname*2**
Migration job JCL

***grpname*S**
Simulation job log output

***grpname*M**
Migration job log output

***grpname*B**
Bookmark file for simulations that select by migration date. If the control statement that limits the number of data sets to be selected is specified, resubmitting the simulation job reads this bookmark file to resume from where the previous job for the migration group left off (instead of returning the data sets that were already previously selected).

Summary job

Display a summary report of data sets that have been migrated to ML2.

The summary job is built, saved, and automatically submitted using **Option 1 Submit batch job to generate report**. The summary report is displayed using **Option 2 View most recently generated report**.

The summary job is optional. The job reads through the entire DFSMShsm MCDS to gather general statistics about the migrated data sets. If the job is submitted again, the output from any previous run of the summary job is overwritten.

For more information, see “Option 1 Summary - Generate/display summary report of migrated data sets” on page 18.

Simulate job

Select which DFSMShsm ML2 data sets are to be migrated to the cloud based on the specified selection criteria.

The simulate job is built, displayed, and saved using “Option 2 Simulate - Create a job to simulate a cloud migration” on page 19. You can submit the job when it is displayed, or submit the saved job later as the job is stored in the control data set.

Important: You must run a simulation job for a migration group before a migration job can be built and run for that migration group.

The simulate job selects data sets to be migrated based on the specified selection criteria.

A) ML2 volumes less than a specified percentage
A simulate reads through the DFSMShsm OCDS and MCDS. The simulate job uses the DFSMShsm OCDS as input and scans until the specified number of volumes or data sets are returned. All of the data sets on volumes with less than the specified percentage of valid data are recalled from ML2 and moved to the cloud, freeing up those tape volumes. This option always starts selection at the beginning of the OCDS.

B) Data sets migrated to ML2 after or before a specified date, or within a range of dates
The entire MCDS is read sequentially, looking for data sets that were migrated after or before a specified date, or within a range of dates. Since an MCDS can be a very large file, DFSMScdm uses a bookmark technique so that any simulate using this method resumes from where the previous job for the migration group left off. The simulate bookmark corresponding to migration group *grpname* is named *grpname*B, and is stored in the control data set.

C) Data sets migrated to ML2 before or no more than a specified number of days ago, or within a range of days ago
Similar to the method of selecting data sets migrated to ML2 based on a specified date or dates, except DFSMScdm calculates the job run date minus the specified number of days, and works exactly as if a date was specified for option B. A bookmark is written based on the date calculated. A simulation using this method can be resumed from where the previous simulation for the migration group ended, continuing to select data sets based on the date calculated by the first simulation.

Simulation and migration job logs are saved using the migration group name. If you reuse a migration group name for another simulation job, the previous simulation and migration logs for that migration group are deleted. However, if the specified selection criteria is based on data sets migrated to ML2 before a specified date or number of days, and you select the option to resume the previous simulation, the simulation results are appended to the previous simulation log, and any existing migration log is retained.

Note: It is recommended to use the dialog panels to build a job instead of directly coding the JCL to prevent errors.

The simulation job output can be viewed and analyzed, and is used as input to the execution of a migrate job.

For information about usage and parameters, see “Option 2 Simulate - Create a job to simulate a cloud migration” on page 19.

View a summary of the simulation results using “Option 5 Display - Display cloud simulate/migrate logs” on page 27.

Simulate control statements

Control statements limit the number of data sets to be selected.

After building a job using the ISPF dialog panels, you can make changes to the values of the control statements by editing the JCL stored in the control data set.

Selection criteria

ML2_PERCENT_USED_LESS_OR_EQUAL=*nnn*
Select data sets less than or equal to *nnn*% full.

DATA_SETS_MIGRATED_BEFORE=*date*
DAYS_SINCE_MIGRATED=*nnnn*
Select data sets migrated to ML2 before *date* or if they were migrated to ML2 at least *nnnn* days ago. You can pause the simulate and have the progress saved, then resume the job later. An MCDS can contain large volumes of data, so it is often desirable for DFSMScdm to start from where it left off.

DATA_SETS_MIGRATED_AFTER=*date*
MAX_DAYS_SINCE_MIGRATED=*nnnn*
Select data sets migrated to ML2 after *date* or if they were migrated to ML2 no more than *nnnn* days ago. You can pause the simulate and have the progress saved, then resume the job later. An MCDS can contain large volumes of data, so it is often desirable for DFSMScdm to start from where it left off.

DSN_EXCLUDE=*datasetmask*
DSN_INCLUDE=*datasetmask*
datasetmask is either a fully qualified data set name, or a data set name mask using standard mask rules (% representing any single character, * representing zero or more characters, and ** representing zero or more qualifiers). These values are used to filter the list of data sets that satisfy the migration date or days specification.

- If **DSN_INCLUDE** statements are used, a data set must match at least one of those masks, and not any **DSN_EXCLUDE** mask, to be selected.
- If **DSN_INCLUDE** statements are not used, a data set is selected unless it matches any **DSN_EXCLUDE** mask.

Rules for using control statements

Only certain combinations of these control statements are allowed.

- If **ML2_PERCENT_USED_LESS_OR_EQUAL** is used, none of the control statements that select by date, number of days, or data set name filter can be used.
- To specify a range of dates, use **DATA_SETS_MIGRATED_BEFORE** and **DATA_SETS_MIGRATED_AFTER** in the same job.
- To specify a range of days, use **DAYS_SINCE_MIGRATED** and **MAX_DAYS_SINCE_MIGRATED** in the same job.
- To filter data sets by names or using masks, use **DSN_EXCLUDE** and **DSN_INCLUDE**. These control statements can be used in the same job as the control statements that select either by date or days, or a range of dates or days.
- Multiple instances of **DSN_EXCLUDE** and **DSN_INCLUDE** can be used in the same job.

Optional control statements

Optional control statements stops the simulate after the specified value is reached and limits the number of data sets moved to the cloud by the subsequent migration job:

MAX_NUMBER_OF_ML2_VOLUMES=*nnnnn*
Maximum number of ML2 volumes to be migrated. This control statement is only used for the parameter **ML2_PERCENT_USED_LESS_OR_EQUAL**.

MAX_DATA_SETS_MIGRATED=*nnnnnnn*
Maximum number of data sets to be migrated.

Resuming a simulation

This parameter is only used when selecting data sets by a date or number of days. If the simulation ends because it reaches a limit on the number of data sets to be selected, you can run another simulation for the same migration group with the same selection date or number of days.

RESUME_FROM_LAST_SIMULATED_DSN=YES|NO

YES - Resumes selection of data sets from where the previous simulation ended. Simulation results are appended to the previous simulation log, and any existing migration log is retained.

Note that the same selection date must be used; the **DATA_SETS_MIGRATED_BEFORE** or **DAYS_SINCE_MIGRATED** value must be the same as the previous run. In the latter case, the resumed simulation uses the same selection date that was calculated by the first simulation job run for that migration group; the program does not calculate *nnnn* days subtracted from the date the resume job is run.

NO - Selection of data sets starts at the beginning of the MCDS. Simulation results overwrite any previous simulation results for the migration group, and any previous migration log for the migration group is deleted.

For more information on the simulate job parameters, see Table 3 on page 21.

Migrate job

Migrate data sets that have been recalled to disk by DFSMShsm to either a specific cloud location, or to one or more cloud locations determined by the management classes of the data sets.

The migrate job is built, displayed, and saved using “Option 3 Migrate - Create a cloud migration job from a simulated group” on page 22. You can submit the job when it is displayed, or submit the saved job later as the job is stored in the control data set.

Important: You must run a simulation job for a migration group before a migration job can be built and run for that migration group.

The migration job uses the results from the corresponding simulation to determine which data sets have been recalled from ML2 and migrates them to the cloud. Selected ML2 data sets are brought back to disk using the DFSMShsm RECALL command. The destination for the migration is specified by either a cloud name, or a location determined by the management class for each data set. If you specify a cloud name, DFSMScdm recalls data sets from ML2 to the DFSMScdm storage class, and then migrates all data sets from the DFSMScdm storage group to the cloud.

Note: It is recommended to use the dialog panels to build a job instead of directly coding the JCL to prevent errors.

Migration considerations

It is recommended to schedule migration jobs during a time when they will not be competing with high levels of production DFSMShsm activity. Define pacing parameters to allow DFSMScdm migrations to have limited impact on production DFSMShsm jobs.

Batches

Recalls from ML2 are done in batches to limit the impact that DFSMScdm has on other jobs on the system. A single migration job recalls data sets in a series of batches. You can specify options to control the pacing of batches:

- Number of data sets in each batch
- Interval between each data set within a batch. A value of 0 seconds is recommended
- Interval between batches

Runtime

You can specify options to control the runtime of a migration job to:

- Limit the processing time of a migration job to stop at a certain time of day.
- Limit the processing time of a migration job to stop after a certain number of hours if all of the data sets in the simulate list have not been completed.
- Limit capacity using a percentage-full threshold for the storage group to pause the recall process and start migration from disk to cloud. The percentage of storage of the ML2 volumes in the recall

storage group are checked at the end of each batch, and when the specified threshold is met, recalls are paused and migration starts. As this migration runs and frees up space in the storage group, recalls resume when the disk space usage drops to half of the specified threshold value.

Migration process

The migration process starts when the migration job is submitted. Data sets are recalled from disk to either the specified cloud location, or to the location determined by the data set management class.

The migrate function ensures that the data sets in a migration group are the same between the simulation and migration run times. If an ML2 data set identified in the simulate no longer meets the specified criteria, it is skipped from the migration.

During this recall process, you can use MODIFY commands to stop the recalls or query the status of the migration. For more information, see "MODIFY commands to interact with a migrate job" on page 16.

The job stops when all data sets have been recalled, when one of the specified time limits is reached, or if the job was stopped by an operator command.

Note: To continue a migration that has been interrupted, resubmit the same JCL as the original job. The resubmitted job continues from where the previous job left off.

For information about usage and parameters, see "Option 3 Migrate - Create a cloud migration job from a simulated group" on page 22.

View the status of the migration process using "Option 4 Monitor - Monitor active DFSMScdm migration jobs" on page 26.

View a summary of the migration results using "Option 5 Display - Display cloud simulate/migrate logs" on page 27.

Migrate control statements

Control statements manage the pacing of batches and process runtimes.

After building a job using the ISPF dialog panels, you can make changes to the values of the control statements by editing the JCL stored in the control data set.

Note: It is recommended to use the dialog panels to build a job instead of directly coding the JCL to prevent errors.

MIGRATE_TO_CLOUD_NAME=*cldname*
Explicit cloud name where recalled data sets are migrated to.

When specifying a cloud name, you must also specify **MIGRATE_TO_DEFAULT_MGMTCLAS=NO**.

MIGRATE_TO_DEFAULT_MGMTCLAS=YES|NO
The destination for the migration of recalled data sets may be determined by the management class for each data set.

YES - Each data set recalled from ML2 is migrated to a destination determined by the management class assigned by the ACS routines on the system.

NO - The migration destination is specified by the **MIGRATE_TO_CLOUD_NAME** parameter, which is required when **NO** is used.

RECALL_TIME_OF_DAY_TO_STOP=*hh:mm:ss*
Time of day at which DFSMScdm stops issuing DFSMShsm recall commands.

RECALL_MAXIMUM_TIME_FOR_RECALLS=*hh:mm*
Maximum amount of time that a DFSMScdm job is allowed to spend doing DFSMShsm recalls.

RECALL_BATCH_SIZE=*nnnn*
Number of data sets that DFSMScdm recalls in a single batch.

RECALL_WAIT_BETWEEN_DATA_SET=*nn*
Number of seconds between each data set recall within a single batch. A value of 0 is strongly recommended.

RECALL_WAIT_BETWEEN_BATCHES=*mm:ss*
Number of minutes and seconds between each batch of recalls.

PERCENT_FULL_START_CLOUD_MIGRATE=*nn*
Percentage-full threshold for when recalls are paused and a cloud migration is started.

For more information on the migrate job parameters, see Table 4 on page 24.

MODIFY commands to interact with a migrate job

Use z/OS console commands to interact with a running migrate job.

During an active migration job, you can use MODIFY commands to display the status of the job, or stop the recall process:

F *jobname*,STATUS
Displays the status of the migrate job in a WTO message to the system console.

F *jobname*,STOP
Stops the recall process. However, DFSMShsm will still continue to process any recalls queued or in process. Once any recalls are complete, the MIGRATE STORAGEGROUP command is issued to migrate any data sets already recalled.

F *jobname*,NOMIGRATESTOP
Similar to the STOP command, except the MIGRATE STORAGEGROUP command is not invoked.

If a migrate job has been interrupted by a console command, the migration can be continued by resubmitting the migration job. The resubmitted job reads the simulation and migration logs to determine which data sets still need to be migrated. Resubmitted jobs append a new section to the existing migration log.

Usage sequence

A typical usage of DFSMScdm is described in this topic.

Before you begin

Complete the installation and setup described in Chapter 2, “Installation and setup,” on page 5.

About this task

The DFSMScdm primary interface method is using ISPF panels.

```
                          DFSMS Cloud Data Manager
Option ===>

SMF ID : BXC1                                              Version : 1.1.0
                                                           23/08/11  10:49:39

                      DFSMScdm - DFSMShsm Functions Menu

     1 Summary     Generate/display summary report of migrated data sets
     2 Simulate    Create a job to simulate a cloud migration
     3 Migrate     Create a cloud migration job from a simulated group
     4 Monitor     Monitor active DFSMScdm migration jobs
     5 Display     Display cloud simulate/migrate logs
     C Configure   Configure control data set and session options
     H Help        Message help

 F1=Help    F2=Split   F3=Exit    F7=Up      F8=Down    F9=Swap   F12=Cancel
```

Figure 3. DFSMScdm main menu

Tip: To display help text on any given field, place the cursor on the field and press **F1**.

Procedure

1. Execute the following TSO command to start DFSMScdm and enter the configuration panel:

   ```
   EX 'hlq.IBM.HGBQ110.SGBQELIB(GBQCDM)' 'hlq.IBM.HGBQ110'
   ```

2. Specify configurations using “Option C Configure - Configure control data set and session options” on page 30. You can specify a new configuration member or use the values of an existing configuration member.

   To specify a new configuration member:

   a) Enter values in the fields.

   b) Save the values:

   - To save the values and exit the panel, press **F3** or enter **EXIT** on the command line.
   - To save the values without exiting the panel, press **F5** or enter **SAVE** on the command line.

   To read the contents of an existing configuration member or switch between configurations:

   a) Enter the control data set and configuration member names then press **F6**.

   Important: Pressing **F3** or **F5** saves the configuration with the currently-displayed values. To use values for another configuration, press **F6**. If you change the control data set or configuration member name on the panel and press **Enter**, you are given the option to read values from that configuration member if the member already exists.

3. Submit a batch job to generate and view a report of the status of DFSMShsm data sets using “Option 1 Summary - Generate/display summary report of migrated data sets” on page 18.
4. Create and run a simulation job to simulate which ML2 data sets are selected to be migrated using “Option 2 Simulate - Create a job to simulate a cloud migration” on page 19:

   a) Enter values in the appropriate fields according to your chosen selection criteria and other optional parameters.

   b) Submit the job using one of the following methods:

   - To submit the job with the current values, press **F3** or enter **EXIT** on the command line. This saves the member and displays the job in the ISPF editor where you can examine, modify, and submit the job.
   - To submit the job at a later time, press **F5** or enter **SAVE** on the command line. This saves the values in the panel as a member in the control data set.

5. Create and run a migration job for the migration group using “Option 3 Migrate - Create a cloud migration job from a simulated group” on page 22.

   Similar to the simulation job step, enter values in the appropriate fields and submit the job.

6. Optional: Enter **S** next to the group name to display the status of the running migration job using “Option 4 Monitor - Monitor active DFSMScdm migration jobs” on page 26.
7. Optional: Enter **S** or **M** to the left of the group name to review the simulation and migration log using “Option 5 Display - Display cloud simulate/migrate logs” on page 27.

Related concepts

“Members in the control data set ” on page 11
The control data set contains members detailing user-specified configurations; summary, simulation and migration jobs; and the status summary of ML2 data sets.

“ISPF dialog panels” on page 18
The ISPF panel interface is the principal tool for interacting with DFSMScdm. Information on the usage of DFSMScdm panels are outlined in the subtopics here.

Related reference

“MODIFY commands to interact with a migrate job” on page 16

Use z/OS console commands to interact with a running migrate job.

ISPF dialog panels

The ISPF panel interface is the principal tool for interacting with DFSMScdm. Information on the usage of DFSMScdm panels are outlined in the subtopics here.

DFSMScdm functions are accessed from the main menu.

```
                          DFSMS Cloud Data Manager
Option ===>

SMF ID : BXC1                                                Version : 1.1.0
                                                             23/08/11  10:49:39

                      DFSMScdm - DFSMShsm Functions Menu

     1 Summary     Generate/display summary report of migrated data sets
     2 Simulate    Create a job to simulate a cloud migration
     3 Migrate     Create a cloud migration job from a simulated group
     4 Monitor     Monitor active DFSMScdm migration jobs
     5 Display     Display cloud simulate/migrate logs
     C Configure   Configure control data set and session options
     H Help        Message help

 F1=Help    F2=Split   F3=Exit    F7=Up      F8=Down    F9=Swap   F12=Cancel
```

Option 1 Summary - Generate/display summary report of migrated data sets

Generate and display a summary report of data sets that have been migrated to ML2, using the DFSMShsm control data sets specified by the currently active DFSMScdm configuration. The summary report job is optional.

Output

The JCL and output log are stored in the DFSMScdm control data set. For a template of the JCL and a sample of a job output, see “Summary job output” on page 34. For configuration name CONFIG*nn*, the JCL and output log are as follows:

SUMRY*nn*J
JCL for the summary job

SUMRY*nn*
Output log

```
             Generate/Display Summary Report of Migrated Data Sets
Option ===>

         Migration Summary Report for DFSMScdm Configuration CONFIGnn

                 1  Submit  Submit batch job to generate report
                 2  View    View most recently generated report

 F1=Help    F2=Split   F3=Exit    F7=Up      F8=Down    F9=Swap   F12=Cancel
```

Figure 4. Option 1 Summary - Generate/display summary report of migrated data sets panel

- **Option 1 Submit** submits a batch job that generates the report.
- **Option 2 View** displays the summary report for the specified DFSMScdm configuration after the batch job has completed.

  Tip: Each option can be directly reached from the main menu by entering **1.1** or **1.2**.

The summary report is based on the DFSMShsm control data sets specified in the DFSMScdm configuration CONFIG*nn*. The summary output is overwritten if another summary job is run for the same configuration.

Option 2 View displays the summary report for the specified DFSMScdm configuration:

```
                    Migrated Data Sets Summary Statistics
Command ===>

                 Summary for DFSMScdm Configuration CONFIG01

Total number of data sets migrated to ML2  . : 8,939
Total amount of data migrated to ML2 . . . . : 88,692 TB
Average age of data sets migrated to ML2 . . : 224 Days
Oldest ML2 data set  . . . . . . . . . . . . : 2021/08/24
ML2 data sets never recalled . . . . . . . . : 8,673
Percent ML2 never recalled . . . . . . . . . : 97%
Total number of ML2 volumes  . . . . . . . . : 399
Total number of cloud objects  . . . . . . . : 204

Date above statistics calculated . . . . . . : 2023/08/11

 F1=Help    F2=Split   F3=Exit    F7=Up      F8=Down    F9=Swap   F12=Cancel
```

Figure 5. Option 1 Summary - Migrated data sets summary statistics panel

The age of a data set refers to the number of days between the migration date of the data set recorded by DFSMShsm, and the date the summary job was run. All days are added and the average age calculated.

Option 2 Simulate - Create a job to simulate a cloud migration

Build a batch job to perform a simulation of a DFSMScdm migration.

Important: You must run a simulation job for a migration group before a migration job can be built and run for that migration group.

The simulation job determines which ML2 data sets are selected to be migrated with the given selection criteria. The subsequent migration job recalls the selected data sets from ML2 and migrates them to the cloud. You can also use this option to continue a previous simulation that was interrupted by the specified data set limit threshold.

A summary of the results is viewed using “Option 5 Display - Display cloud simulate/migrate logs” on page 27.

Output

The JCL and output log are stored in the DFSMScdm control data set. For more information, see “Simulate job output” on page 35. For migration group *grpname*, the JCL and output log are as follows:

***grpname*1**
JCL for the simulation job

***grpname*S**
Output log. The output can be viewed and analyzed, and is used as input to the execution of a migrate job.

UI controls

F3 | EXIT
Save the member and display the job in the ISPF editor, where you can examine, modify, and submit the job using the **SUBMIT** command.

F5 | SAVE
Save the currently displayed values in the panel as a member in the DFSMScdm control data set without exiting the panel.

F6 | FILTER
Display a panel where you can specify data set names or masks used for filtering data sets that meet the date selection criteria. Used only when a value of YES is specified in the **`Filter by DSN?`** parameter.

F12 | CANCEL
Exit the panel without saving the job in the library.

Tip: To display help text on any given field, place the cursor on the field and press **F1**.

```
                  Create a Job to Simulate a Cloud Migration
Command ===>


Name of migration group to simulate . . . . . _______

Choose ONE method of selection (A, B, or C):
 ------------------------------------------------------------------------------
A) Select ML2 volumes less than or equal to . . ___  percent full
   Maximum number of ML2 volumes (optional) . . _____
 ------------------------------------------------------------------------------
B) Select data sets migrated to ML2 after . . . __________ (YYYY/MM/DD)
     and/or data sets migrated before . . . . . __________ (YYYY/MM/DD)
   Resume from last simulated DSN?  . . . . . ___        (Yes/No)
   Filter by DSN? (F6 to show/edit list)  . . ___        (Yes/No)
 ------------------------------------------------------------------------------
C) Select data sets migrated to ML2 at least  . ____ days ago
     and/or data sets migrated no more than . . ____ days ago
   Resume from last simulated DSN?  . . . . . ___        (Yes/No)
   Filter by DSN? (F6 to show/edit list)  . . ___        (Yes/No)
 ------------------------------------------------------------------------------

Optional for all selection methods:
Maximum number of migrated data sets  . . . . .  _______

Active DFSMScdm Configuration . . . . . : CONFIGnn

 F1=Help    F2=Split   F3=Exit    F5=Save    F6=Filter  F7=Up      F8=Down
 F9=Swap   F12=Cancel
```

Figure 6. Option 2 Simulate - Create a job to simulate a cloud migration panel

Table 3. Simulate job parameters

Parameter	Value	Description
Name of migration group to simulate	*grpname*	Name of a migration group (up to 7 characters) to be used by the simulation job and the subsequent migration job. Simulation and migration job logs are saved using this name. If you enter a migration group name for which a simulation or a migration log already exists, running the simulation job deletes any existing logs for the specified migration group. However, if you select data sets by migration date (option B) or days since migrated (option C), and you choose to resume from the last simulated DSN, simulation results are appended to the previous simulation log, and any existing migration log is retained. If you enter a migration group name for which a simulation job JCL *grpname*1 already exists in the control data set, you are given the following options: • Use a different migration group name for the job. • Reuse this migration group name. The existing simulation job in the library is overwritten when you save the job. • Use the existing job. Instead of the values currently displayed on the panel, the existing parameter values from the JCL job are used.
Select ML2 volumes less than or equal to *nnn* percent full	*nnn*	A method of selecting a migration group. This allows you to select under-utilized volumes for cloud migration, freeing up those volumes.
Maximum number of ML2 volumes	*nnnnn*	Maximum number of ML2 volumes to be migrated.
Maximum number of migrated data sets	*nnnnnnn*	Maximum number of data sets to be migrated.
Select data sets migrated to ML2 before	MM/DD/YYYY | DD/MM/YYYY | YYYY/MM/DD	A method of selecting a migration group. This allows you to select data sets that may be less likely to be recalled to disk in the near future. The date format can be changed in "Option C Configure - Configure control data set and session options" on page 30.
Select data sets migrated to ML2 after		
Select data sets migrated to ML2 *nnnn* or more days ago	*nnnn*	A method of selecting a migration group. *nnnn* days are subtracted from the job run date, and data sets migrated to ML2 are selected based on that date.
Select data sets migrated to ML2 no more than *nnnn* days ago		

Table 3. Simulate job parameters (continued)		
Parameter	**Value**	**Description**
Filter by DSN?	YES | NO	**YES** - Press **F6** to display a panel where you can specify data set names or masks used for filtering data sets that meet the date selection criteria. If you have not specified whether to include or exclude data sets according to certain names or masks, any data set matching the selection criteria are selected. If you have specified to include data sets according to certain names or masks, any data set matching at least one of those values are selected. Data sets matching an exclude value are not selected. If you have specified to exclude data sets according to certain names or masks, any data set matching at least one of those values are not selected. **NO** - Do not use filtering.
Resume from last simulated DSN?	YES | NO	Resume or overwrite a previous simulation. If the simulation ends because it reaches a limit on the number of data sets to be selected, you can run another simulation for the same migration group with the same selection date or number of days. **YES** - Resumes selecting from where the previous simulation ended. Simulation results are appended to the previous simulation log, and any existing migration log is retained. Note that the same selection date must be used; the selection date or the number of days must be the same as the previous run. In the latter case, the resumed simulation uses the same selection date that was calculated by the first simulation job run for that migration group; the program does not calculate *nnnn* days subtracted from the date the resume job is run. **NO** - Simulation results overwrite any previous simulation results for the migration group, and any previous migration log for the migration group is deleted.

Option 3 Migrate - Create a cloud migration job from a simulated group

Build and submit a batch job to migrate select data sets to the cloud for which you have previously run a simulation.

You can submit the job when it is displayed, or submit the saved job later as the job is stored in the control data set.

Important: You must run a simulation job for a migration group before a migration job can be built and run for that migration group.

It is recommended to schedule migration jobs when DFSMShsm recall activity is low. Define pacing parameters to allow DFSMScdm migrations to have limited impact on production DFSMShsm jobs. For example, you can specify options for batches and the runtimes of a job.

During this recall process, you can use MODIFY commands to stop the recalls or query the status of the migration. For more information, see "MODIFY commands to interact with a migrate job" on page 16.

The job stops when all data sets have been recalled, when one of the specified time limits is reached, or if the job was stopped by an operator command.

View the status of the migration process using "Option 4 Monitor - Monitor active DFSMScdm migration jobs" on page 26.

View a summary of the migration results using "Option 5 Display - Display cloud simulate/migrate logs" on page 27.

Output

The JCL and output log are stored in the DFSMScdm control data set. For more information, see "Migrate job output" on page 36. For migration group *grpname*, the JCL and output log are as follows:

***grpname*2**
JCL for the migrate job

***grpname*M**
Output log

Restarting an interrupted migration job

A migration that has been interrupted when one of the specified time limits is reached, or if the job was stopped by an operator command can be continued by resubmitting the same JCL as the original job.

1. Enter the same migration group name and press **Enter**.
2. Select **Resubmit existing job** to display the JCL, and then submit the job.

UI controls

F3 | EXIT
Save the member and display the job in the ISPF editor, where you can examine, modify, and submit the job using the **SUBMIT** command.

F5 | SAVE
Save the currently displayed values in the panel as a member in the DFSMScdm control data set without exiting the panel.

F6 | FILTER
Display a panel where you can specify data set names or masks used for filtering data sets that meet the date selection criteria. Used only when a value of YES is specified in the **`Filter by DSN?`** parameter.

F12 | CANCEL
Exit the panel without saving the job in the library.

Tip: To display help text on any given field, place the cursor on the field and press **F1**.

```
              Create a Cloud Migration Job from a Simulated Group
Command ===>


Name of migration group  . . . . . _______

Migrate to specific cloud named  . . . . . _______________________________
                  OR
Migrate using assigned management class    ___        (Yes/No)

 -- Parameters to create migrate job --
Time of day to stop recall processing  . . ________   (hh:mm:ss)
Maximum amount of time to recall . . . . . _____      (hh:mm)

-- DFSMShsm recall pacing parameters --
Number of data sets in recall batch  . . . ____
Seconds to wait between data sets  . . . . __
Minutes:seconds between batches  . . . . . _____      (mm:ss)
Percent STORGRP full before remigrate  . . __

Active DFSMScdm Configuration  . . . . . : CONFIGnn

 F1=Help    F2=Split   F3=Exit    F5=Save    F7=Up      F8=Down    F9=Swap
F12=Cancel
```

Figure 7. Option 3 Migrate - Create a cloud migration job from a simulated group panel

Table 4. Migrate job parameters

Parameter	Value	Description
Name of migration group	*grpname*	Name of the migration group for which a corresponding simulation has already been done. If you enter a migration group name for which a migration job JCL *grpname*2 already exists in the control data set, you are given the following options: • Reuse the existing job. If a previous migration job terminated, resubmitting the job picks up from where the previous job ended. • Save new parameters for the migration group. If a previous migration job used the same migration group name, the output from this migration job is appended to the existing migration output log in the control data set.
Migrate to specific cloud named	*cldname*	Migrate recalled data sets from DFSMShsm ML2 to a specific cloud destination. When specifying a cloud name, you must also specify **Migrate using assigned management class**=**NO** If you blank out this field and press **Enter** while **Migrate using assigned management class**=**NO**, then the default cloud name (saved in the current configuration file) is inserted.

Table 4. Migrate job parameters (continued)		
Parameter	**Value**	**Description**
Migrate using assigned management class	YES | NO	**YES** - Each data set recalled from DFSMShsm ML2 are migrated based on the active ACS routine for your management class for each data set. Further management of that data set is controlled by the class transition criteria of the assigned management class. **NO** - Provide a specific cloud destination in the **`Migrate to specific cloud named`** field.
Time of day to stop recall processing	*hh:mm:ss*	Time of day at which DFSMScdm stops issuing DFSMShsm RECALL commands, therefore limiting CPU processing. Only values up to 23:59:59 are accepted. When a DFSMScdm migration job has ended because it reached a time limit, another job can be run using the same JCL to pick up from where the previous job left off. The second migration job reads the simulation and migration logs for the migration group to determine the next data set to recall from DFSMShsm ML2 and migrate to the cloud.
Maximum amount of time to recall	*hh:mm*	Maximum amount of time a DFSMScdm job spends doing DFSMShsm recalls, therefore limiting CPU processing. When a DFSMScdm migration job has ended because it reached a time limit, another job can be run using the same JCL to pick up from where the previous job left off. The second migration job reads the simulation and migration logs for the migration group to determine the next data set to recall from DFSMShsm ML2 and migrate to the cloud.
Number of data sets in recall batch	*nnnn*	Number of data sets recalled in a single batch.
Seconds to wait between data sets	*nn*	Number of seconds between each data set recall within a single batch. A value of 0 seconds is strongly recommended.
Minutes:seconds between batches	*mm:ss*	Number of minutes and seconds between each batch of recalls.
Percent STORGRP full before remigrate	*nn*	Percentage threshold for when recalls are paused and a migration from disk to cloud is started. When the storage group being used by DFSMScdm reaches the specified percentage of storage in use, recalls pause and a migration of data sets from ML2 to cloud starts. Recalls resume when the disk space usage drops to half of the threshold value.

Option 4 Monitor - Monitor active DFSMScdm migration jobs

View the status of a running migration job.

```
                  Monitor Active DFSMScdm Migration Jobs     Row 1 to 2 of 2
Command ===>                                                Scroll ===> CSR

  Group    HSM Recall Started   CLD Migrate Started    #Recalled    #Remaining
_ GROUP0A  2023/08/11 03:36:21                             2            23
S MAR08A   2023/08/11 02:42:20                             2             4
****************************** Bottom of data ********************************

 F1=Help      F2=Split     F3=Exit      F6=Refresh   F7=Up        F8=Down
 F9=Swap     F12=Cancel
```

Figure 8. Option 4 Monitor - Monitor active DFSMScdm migration jobs panel

- To see details about the current status, such as batch sizing, migration wait times between data sets, and migration wait times between data set batches, enter **S** next to the group name.
- The panel only displays active jobs; once a job has completed, it is removed from the list.

```
                  Monitor Active DFSMScdm Migration Jobs
Command ===>

Current status of migration job ABCXYZ   for group MAR08A

Recall from ML2 date/time  . . . . . : 2023/08/11 02:42:20
Elapsed time . . . . . . . . . . . . : 0:00:22   (hh:mm:ss)
Maximum duration for recalls . . . . : 09:09     (hh:mm)
Time of day to stop recalls  . . . . : 12:00     (hh:mm)
Recall batch size  . . . . . . . . . : 2
Recall wait between data sets  . . . : 00        seconds
Recall wait between batches  . . . . : 08:00     (mm:ss)
Number of data sets recalled . . . . : 2
Number of data sets remaining  . . . : 4
Number of data set recall errors . . : 0
What stopped recall  . . . . . . . . :
Recall from ML2 end date/time  . . . :
Last data set recalled . . . . : ELI.A130418.NA100513

Migration to cloud start date/time  . . . . :
Migrate using assigned management class . . : YES
Percent full to start cloud migration . . . : 55
```

Figure 9. Option 4 Monitor - Monitor active DFSMScdm migration jobs detail panel

- The job continues to run while you are in the panel. To refresh the information displayed, press **Enter** or **F6**, or enter **Refresh** on the command line.

For a description of parameters, see Table 4 on page 24.

Option 5 Display - Display cloud simulate/migrate logs

Display a list of migration groups for which simulation logs or migration logs exist and view a summary of the results.

```
                    Display Cloud Simulate/Migrate Logs    Row 1 to 17 of 48
Command ===>                                                Scroll ===> CSR

  Group      Simulate            Migrate            Process   Number  Number
             Date/Time           Date/Time          Complete  DSNs    ML2 vols
_ APR12A     2023/08/11 23:00    --N/A--            Yes          273         4
_ MAR25A     2023/08/11 22:06    2023/08/11 22:26   No             6        22
_ MAR18B     2023/08/11 21:40    2023/08/11 21:43   Yes            4        22
_ MAR18A     2023/08/11 20:23    2023/08/11 20:25   Yes            4        22
_ MAR17A     2023/08/11 19:20    2023/08/11 19:30   Yes            6        22
_ MAR11A     2023/08/11 18:17    2023/08/11 18:23   Yes            6        21
_ MAR10A     2023/08/11 17:03    --N/A--            Yes            6        21
_ MAR08B     2023/08/11 16:05    2023/08/11 16:11   Yes            6        21
_ MAR08A     2023/08/11 15:03    2023/08/11 15:20   Yes            6         1
_ MAR07B     2023/08/11 14:02    2023/08/11 14:22   Yes            6         1
_ MAR07A     2023/08/11 13:01    2023/08/11 13:11   Yes            6         1
_ MAR04B     2023/08/11 12:03    2023/08/11 12:13   Yes            6         1
_ MAR04A     2023/08/11 11:01    2023/08/11 11:06   Yes            6         2
_ MAR02B     2023/08/11 10:45    2023/08/11 10:49   Yes            6        21
S MAR02A     2023/08/11 09:33+   2023/08/11 09:35+  Yes            6        21
_ MAR01B     2023/08/11 08:30    2023/08/11 08:36+  Yes            6        21
_ MAR01A     2023/08/11 07:46    2023/08/11 07:48   Yes            6        21

 F1=Help    F2=Split   F3=Exit    F7=Up      F8=Down    F9=Swap   F12=Cancel
```

Figure 10. Option 5 Display - Display cloud simulate/migrate logs panel

Group
Name of migration group for which a simulation job, migration job, or both was run.

Simulate Date/Time
Date and time a simulate job was run for that migration group.

If a simulation or migration was run in multiple parts, the date and time of the most recent run is displayed, followed by + .

Migrate Date/Time
Similar to the **Simulate Date/Time** column, except if the value is `--N/A--`, only a simulation was done for that group.

Process Complete
Indicates whether all the data sets selected during the simulation step have been processed. Note that DFSMShsm may have not yet migrated all of the recalled data sets to the cloud location.

Number DSNs
Number of selected data sets.

Number ML2 vols
Number of ML2 volumes containing the selected data sets.

UI controls

- To sort the list by the values in a column, double-click the column header. To toggle between ascending and descending sort sequence, double-click the column header again.
- To display another panel with information from the simulation or migration log for a migration group. Enter **S** or **M** to the left of the group name.

Simulate detail results panel

To display a panel with information from the simulation log for a group, enter **S** to the left of the group name on the previous panel. The simulate detail results panel displays a list of data sets selected by a simulation.

```
                    DFSMScdm SIMULATE Detail for MAR02A       Row 1 to 6 of 6
Command ===>                                                 Scroll ===> CSR

Statistics from DFSMScdm SIMULATION phase - part 1 of 2
Simulation run on 2023/08/11 TIME=09:33:09 at 09:33:09
Simulation started from beginning of MCDS
Simulation ended by 6 migrated data sets returned
Options used at execution time:
  Selected data sets migrated after  . . : 2022/09/09
  Selected data sets migrated before . . : 2022/10/10
  Maximum number of migrated data sets . : 6
  Maximum number of ML2 volumes  . . . . : no limit
  Filtering by data set mask?  . . . . . : No
Last MCDS data set name read: ABCDEF1.CDM.A210928.C0000001
Amount of data selected by this simulation: 3 MB
Total amount of data in this migration group: 6 MB

Data sets selected                          ML2 Migrate Date    ML2 Volume
ABCDEF1.CDM.A210923.X0000001                   2022/09/23         V20153
ABCDEF1.CDM.A210923.X0000002                   2022/09/23         V20153
ABCDEF1.CDM.A210923.X0000003                   2022/09/23         V20153
ABCDEF1.CDM.A210923.X0000004                   2022/09/23         V20153
ABCDEF1.CDM.A210923.X0000005                   2022/09/23         V20153
ABCDEF1.CDM.A210928.C0000001                   2022/09/28         V20153
****************************** Bottom of data ********************************

 F1=Help      F2=Filters   F3=Exit      F4=Browse    F5=Prev      F6=Next
 F7=Up        F8=Down      F9=Swap     F10=Part     F11=All      F12=Cancel
```

Figure 11. Option 5 Display - DFSMScdm simulate detail results panel

The options used for selecting data sets are shown at the top of the panel. The selection of data sets depends on the specified criteria.

Tip: To view the full job log, press **F4**, instead of entering SDSF to look at the job output.

Migrate detailed results panel

To display a panel with information from the migration log for a group, enter **M** to the left of the group name on the previous panel. The migrate detailed results panel displays a list of data sets migrated to the cloud using the specified migration group.

```
                    DFSMScdm MIGRATE Detail for MAR02A       Row 1 to 2 of 2
Command ===>                                                 Scroll ===> CSR

Statistics from DFSMScdm MIGRATE phase - part 1 of 3
Migrate using assigned management class  . . : YES
Date/time DFSMShsm recall processing started : 2023/08/11 09:33:31
Date/time DFSMShsm recall processing ended . : 2023/08/11 09:33:44
Total time in DFSMShsm recall phase  . . . . : 00:00:13
Condition that stopped recall  . . . . . . . : STOP command
Number of data sets successfully recalled  . :
Remaining number of data sets to recall  . . : 4
Date/time cloud migration processing started : 2023/08/11 09:33:44
Date/time cloud migration job ended  . . . . : 2023/08/11 09:33:44
Number of times storage group reached 55%  . : 0

Data sets migrated in part 1             Date/time cloud       ML2    Current
                                         migration submitted   volume volume
ABCDEF1.CDM.A210923.X0000001             2023/08/11 09:33:44   V20153 N/A
ABCDEF1.CDM.A210923.X0000002             2023/08/11 09:33:44   V20153 N/A
****************************** Bottom of data ********************************

 F1=Help    F3=Exit    F4=Browse  F5=Prev    F6=Next    F7=Up      F8=Down
 F9=Swap   F10=Part   F11=All    F12=Cancel
```

Figure 12. Option 5 Display - DFSMScdm migrate detail results panel

In this example, the migration was interrupted and restarted twice by operator console commands, resulting in 3 parts of the migration for group MAR02A.

The top section of the panel shows summary statistics for the simulation or migration, such as the condition that stopped the recall process. Possible conditions are as follows:

None
Recall process ongoing.

STOP command
MODIFY command was entered by the user.

STOPNOW command
MODIFY command was entered by the user.

Maximum time
Maximum time specified in the job by the user was reached.

Time of day
Time of day specified in the job by the user was reached.

Storage group full
Storage group usage exceeds threshold specified by the job.

No data sets to recall
No data sets selected; therefore, no data sets to recall.

Finished recalling
Recall process completed.

The bottom scrollable section of the panel lists the data sets selected or migrated to the cloud. Column headers are as follows:

Data sets migrated in part *n*
Name of data set migrated to cloud.

Date/time cloud migration submitted
Date and time cloud migration job was submitted.

ML2 volume
Name of ML2 volume read from the simulation log for this migration group.

If another simulation was done for the same migration group after the migration job was run, it would have selected different data sets, so the panel cannot display the ML2 volume information for the migration.

Current volume
Where the data set is currently located. The job will complete before DFSMShsm completes the migration from disk to cloud. Press **Enter** to refresh the display. When each data set has been migrated, MIGRAT*x* is displayed.

If the simulation or migration was stopped and restarted at least once, only the statistics for one of those parts are displayed. You can move between the displays for the statistics of each part. The initial display upon entering the panel is for the first part.

Tip: To view the full job log, press **F4**, instead of entering SDSF to look at the job output.

UI controls

To sort the list by the values in a column, double-click the column header. To toggle between ascending and descending sort sequence, double-click the column header again.

F2 | FILTER
Display a panel with the data set names or masks used for filtering data sets that meet the date selection criteria specified in the simulation job.

F4 | BROWSE
View the full job log.

F5 and F6 | PREV and NEXT
Move between the displays for the statistics of each part, if the job was run in multiple parts.

F7 and F8 | Page Up and Page Down
View the rest of the list of data sets selected, and their ML2 migrate date and ML2 volume.

F10 | PART
Show only the data sets selected or migrated by one part of the simulation or migration job.

F11 | ALL
Show all the data sets in all parts.

Option C Configure - Configure control data set and session options

Display and update configuration values in the DFSMScdm configuration member and your ISPF user profile.

```
               Configure Control Data Set and Session Options
Command ===>

                                                                More:     +
Control data set name . . . . . hlq.CNTL.LIB
Configuration member name . . . . CONFIG01

DFSMScdm load library . . . . . hlq.IBM.HGBQ110.SGBQLLIB
DFSMScdm REXX library . . . . . hlq.IBM.HGBQ110.SGBQELIB
DFSMScdm panel library  . . . . hlq.IBM.HGBQ110.SGBQPENU
DFSMScdm table library  . . . . hlq.IBM.HGBQ110.SGBQTLIB
DFSMScdm message library  . . . hlq.IBM.HGBQ110.SGBQMLIB
DFSMScdm skeleton library . . . hlq.IBM.HGBQ110.SGBQSLIB

DFSMShsm MCDS name  . . . . . DFHSM.MCDS
                              _____________________________________________
                              _____________________________________________
                              _____________________________________________
DFSMShsm OCDS name  . . . . . DFHSM.OCDS
Name of cloud to migrate to . . . CLOUD01
STORCLAS for DFSMScdm to use for DFSMShsm recalls  CDMSTORC   <-- These must
Placeholder volser to use for DFSMShsm recalls . . CDMPHV     <-- match your
STORGRP for DFSMScdm to use for DFSMShsm recalls   CDMSTORG   <-- ACS routines
Date format  . . . . . YYYY/MM/DD (MM/DD/YYYY
                                    DD/MM/YYYY
                                    YYYY/MM/DD)

                User model JOB card for DFSMScdm batch jobs
//JOBNAME  JOB  CLASS=A,MSGCLASS=X,NOTIFY=&SYSUID
//* CLEAN UP JCL JOBCARD

 F1=Help      F2=Split     F3=Exit      F5=Save      F6=ReadCfg   F7=Up
 F8=Down      F9=Swap     F12=Cancel
```

Figure 13. Option C Configure - Configure control data set and session options panel

The following values are saved in your ISPF user profile *hlq*.ISPF.ISPPROF in member GBQPROF:

- DFSMScdm control data set and configuration member names
- DFSMScdm library names
- Model JOB card for submitting DFSMScdm batch jobs

The following values are saved in the DFSMScdm configuration member in the control data set specified in the panel:

- DFSMShsm MCDS and OCDS names
- Name of the cloud to migrate to
- Storage class, placeholder volser, and storage group used strictly for DFSMShsm recalls
- Date format

UI controls

F3 | EXIT
Save the currently-displayed values and exit the panel.

F5 | SAVE
Save the currently-displayed values into your user profile and into the specified configuration member without exiting the panel.

F6 | READCFG
Read the contents of an existing DFSMScdm configuration member. Enter the control data set and configuration member names then press **F6** to retrieve configuration values. This is useful if you want to switch configurations.

F12 | CANCEL
Exit the panel without saving any updated values.

Enter
Similar to pressing **F6**, except you are given the option to read values from the specified configuration member if it already exists. To retrieve configuration values from the member, enter **Y**. To keep the values currently displayed on the panel, enter **N**.

Tip: To display help text on any given field, place the cursor on the field and press **F1**.

Table 5. Configuration parameters

Parameter	Description
Control data set name	PDSE library allocated during setup containing DFSMScdm configuration members, simulation and migration jobs and logs, and placeholder members. This value is saved in your ISPF profile in member GBQPROF.
Configuration member name	Member listing configuration parameters and their values that you defined on this panel. This is saved in the control data set as CONFIG*nn*, where *nn* is any value between 00 and 99. The following configuration parameters are saved in this member: • Name of default target cloud • DFSMShsm MCDS names • DFSMShsm OCDS name • Name of storage class to use for DFSMShsm recalls • Name of storage group to use for DFSMShsm recalls • Date format to use in reports and dialog displays For most usages of DFSMScdm, only one configuration member is used. You can define multiple configuration members, each with different configuration values for each purpose. For more information, see “Configuration input” on page 7. Update the configuration member name to switch between configurations. Press **F3** to save the currently-displayed values into the configuration member and exit the panel. Similar to **F3**, press **F5** to save values, but stay on the panel. Press **F6** to retrieve values from the specified configuration member if it already exists. Press **Enter** to be given the option to either retrieve values from the specified configuration member if it already exists, or to keep the values currently specified on the panel. This value is saved in your ISPF profile in member GBQPROF.

Table 5. Configuration parameters (continued)

Parameter	Description
DFSMScdm load library DFSMScdm REXX library DFSMScdm panel library DFSMScdm table library DFSMScdm message library DFSMScdm skeleton library	DFSMScdm product libraries. These fields are initially filled in with default values based on the high-level qualifiers of the REXX member to run the product the first time. Update these values if you have installed the product into different libraries, moved their contents, or renamed the libraries. The list of product libraries is listed in "Configuration input" on page 7 and detailed information described in the *IBM z/OS DFSMS Cloud Data Manager Program Directory*. These values are saved in your ISPF profile in member GBQPROF.
DFSMShsm MCDS name DFSMShsm OCDS name	DFSMShsm migration control data set (up to four segments can be specified), and offline control data set names. These libraries are searched by DFSMScdm to determine which data sets are recalled and migrated to the cloud, based on criteria specified by the user in the simulation job. These data set names must match the names used by the active DFSMShsm system running when the migration is performed. These names are saved in the current configuration member being used in your DFSMScdm control data set.
Name of cloud to migrate to	Optional field to specify the network connection name of the cloud to which DFSMScdm migrations are directed. This is used as the default cloud name in migration jobs. However, when building a job, you can still change the cloud name used for that job in the JCL. If no cloud name is specified, the management class assigned by SMS determines the migration destination. For more information, see "Updates to ACS routines" on page 5. This name is saved in the current configuration member being used in your DFSMScdm control data set.
STORCLAS for DFSMScdm to use for DFSMShsm recalls	Name of the storage class in your ACS routines defined by the storage administrator. This storage class is used strictly for DFSMShsm recalls by DFSMScdm jobs to avoid conflicts with normal DFSMShsm production processing. The storage class ACS routine must be defined to include a selection clause that specifies a placeholder volser to be used by DFSMScdm to direct DFSMShsm recalls to that storage class. For more information, see "Updates to ACS routines" on page 5. This name is saved in the current configuration member being used in your DFSMScdm control data set.
Placeholder volser to use for DFSMShsm recalls	Name of any volser in the storage group defined by the storage administrator. This storage group is used strictly for DFSMShsm recalls by DFSMScdm jobs to avoid conflicts with normal DFSMShsm production processing. This volser is used by DFSMScdm to recall data sets to any volume in that storage group. For more information, see "Updates to ACS routines" on page 5. This value is saved in the current configuration member being used in your DFSMScdm control data set.

Table 5. Configuration parameters (continued)	
Parameter	**Description**
STORGRP for DFSMScdm to use for DFSMShsm recalls	Name of the storage group in your ACS routine defined by the storage administrator. This storage group is used strictly for DFSMShsm recalls by DFSMScdm jobs to avoid conflicts with normal DFSMShsm production processing. For more information, see “Updates to ACS routines” on page 5. If you are using the assigned management class to control data set migration, this value is not required.
Date format	Date format used in DFSMScdm reports and dialog panel displays. Enter a valid first character, press **Enter**, and the value autofills on the panel. The following date formats are supported: • MM/DD/YYYY • DD/MM/YYYY • YYYY/MM/DD This value is saved in the current configuration member being used in your DFSMScdm control data set.
User model JOB card for DFSMScdm batch jobs	Default JOB statement used by DFSMScdm to create batch jobs. When building a batch job, it is displayed in the ISPF editor, so you can edit the JOB statement before the job is submitted. This value is saved in your ISPF profile in member GBQPROF.

Related tasks

“Setting up DFSMScdm” on page 7
Setup and start the DFSMScdm ISPF dialog by following the procedure outlined in this topic.

Related reference

“Updates to ACS routines” on page 5
ACS routine updates are required for management of recalls in DFSMScdm.

“Configuration input” on page 7
DFSMScdm can be customized to suit your needs.

Option H Help - Message help

Display a GBQ*nnnn* message.

Enter a message number to display the message text, explanation, system programmer response and system action.

For a list of all messages, see “DFSMScdm messages” on page 43.

```
                                Message Help               Row 1 to 10 of 10
Command ===>                                                Scroll ===> CSR

This screen displays information about error and warning messages that may
occur in DFSMScdm batch job logs (summary, simulation, and migration).

Within the message text there may be special string variables that will be
replaced when the message is generated.
 ------------------------------------------------------------------------------
Message Number: 0001
GBQ0001I

Message Text:
DFSMScdm initializing.

Explanation:
DFSMScdm has started the initialization process.

System Action:
DFSMScdm execution continues.

 F1=Help    F2=Split   F3=Exit    F9=Swap   F12=Cancel
```

Figure 14. Option H Help - Message help panel

Sample job outputs

The JCL and output log are located in the DFSMScdm control data set.

The figures in the following sections show a template of the JCL and a sample of a job output. For a list of all members stored in the control data set, see “Members in the control data set ” on page 11.

Summary job output

For configuration name CONFIG*nn*, the JCL for the summary job is in member SUMRY*nnJ*. The output log is in member SUMRY*nn*.

For a description of the parameters, see “Option 1 Summary - Generate/display summary report of migrated data sets” on page 18.

```
//* JCL for running a DFSMScdm summary job.
//*
//* The PARM defines the control data set, and the configuration member.
//* For configuration member CONFIGnn, the summary output is
//* written to the control data set in member SUMRYnn.
//GBQUTILM    EXEC  PGM=GBQSUMRY, REGION=64M,
//            PARM=('cdm.control.data.set',
//            CONFIGnn)
//*
//STEPLIB     DD DISP=SHR,DSN=hlq.IBM.HGBQ110.SGBQLLIB
//SYSUDUMP    DD SYSOUT=*
//GBQPRINT    DD SYSOUT=*
//* No control statements are needed for the summary job.
/*
```

Figure 15. Template for summary job JCL SUMRYnnJ

```
TOTAL=15,171
TOTALSIZE=158 GB
AVERAGE=252 Days
OLDEST=2021/10/04
NORECALL=15,028
PERNORECALL=99%
BACKUPVOLS=438
CLOUDOBJS=13,223
REPORTDATE=2023/08/11
```

Figure 16. Sample summary job output SUMRYnn

Simulate job output

For migration group named *grpname*, the JCL for the simulate job is in member *grpname*1. The output log is in member *grpname*S.

For a description of the simulate job parameters, see Table 3 on page 21.

```
//* JCL for running a DFSMScdm simulate job for migration group grpname
//*
//* The PARM defines the control data set, the configuration member,
//* and the DFSMScdm migration group name (used to name the output).
//GBQUTILS    EXEC  PGM=GBQUTILS,REGION=64M,
//            PARM=('cdm.control.data.set',
//            CONFIGnn,grpname)
//*
//STEPLIB     DD DISP=SHR,DSN=hlq.IBM.HGBQ110.SGBQLLIB
//GBQPRINT    DD SYSOUT=*
//SYSUDUMP    DD SYSOUT=*
//*
//* The control cards for the simulate run
//GBQSYSIN DD *
//* Only one of the three selection methods are valid
ML2_PERCENT_USED_LESS_OR_EQUAL=nnn
* Specify a date or a range of dates
DATA_SETS_MIGRATED_BEFORE=MM/DD/YYYY    (or DD/MM/YYYY, or YYYY/MM/DD)
DATA_SETS_MIGRATED_AFTER=MM/DD/YYYY     (or DD/MM/YYYY, or YYYY/MM/DD)
* Specify a number of days or a range of days
DAYS_SINCE_MIGRATED=nnnn
MAX_DAYS_SINCE_MIGRATED=nnnn
* Date format=MM/DD/YYYY                (or DD/MM/YYY, or YYYY/MM/DD)
* Simulate ends if this value is reached. Valid for any type of simulate:
MAX_DATA_SETS_MIGRATED=nnnnnnnn
* Simulate ends if this value is reached. Valid only if ML2_PERCENT_USED_LESS_OR_EQUAL is also
used:
MAX_NUMBER_OF_ML2_VOLUMES=nnnnnnnn
*
RESUME_FROM_LAST_SIMULATED_DSN=YES|NO
* Filter data sets. Multiple instances can be used in the same job.
DSN_EXCLUDE=datasetmask
DSN_INCLUDE=datasetmask
/*
```

Figure 17. Template for simulate job JCL grpname1

The following simulation ran in two parts, since the threshold for each run was a maximum of three data sets. The second run of the simulation function uses the same JCL as the first, and logically appends its records to the records for the first run.

```
SIMULATE SUMMARY FOR GROUP=JUN09A  DATE=2023/08/12 TIME=21:29:55
DSETCT=3,VOLCT=3,FIRSTVOL=V20525,LASTVOL=V20520,RTOT=46 MB
SIMULATE SUMMARY FOR GROUP=JUN09A  DATE=2023/08/12 TIME=21:28:56
DSETCT=3,VOLCT=2,FIRSTVOL=V20520,LASTVOL=V20525,RTOT=23 MB
SIMULATE OUTPUT FOR GROUP=JUN09A  DATE=2023/08/12 TIME=21:28:56
OPTIONS USED AT EXECUTION TIME:
Date format  . . . . . YYYY/MM/DD
Maximum number of migrated data sets . 3
Maximum number of ML2 volumes  . . . . No limit
Select data sets migrated before . . . 2022/11/01
Simulate started from beginning of MCDS
Simulate ended by 3 migrated data sets returned
Last MCDS data set name read: ABC.CDM.XYZ.X02
Amount of data selected by simulate  . 23 MB


CDMOUTPUT_START_OF_ML2_TABLE
ML2VOL=V20520,PERCVAL=100,NUMDSNS=1,CRTDATE=2021/12/09,OLDEST=2021/12/09
ML2VOL=V20525,PERCVAL=100,NUMDSNS=2,CRTDATE=2021/12/09,OLDEST=2021/12/09
==>VOLCT=2,FIRSTVOL=V20520,LASTVOL=V20525


CDMOUTPUT_SIMULATE_DETAIL_DSN
V20520,DSN=ABC.CDM.XYZ.C05,NUMRECAL=0,
CRTDATE=2021/12/09,MIGDATE=2021/12/09,SIZE=7.7 MB
V20525,DSN=ABC.CDM.XYZ.X01,NUMRECAL=0,
CRTDATE=2021/12/09,MIGDATE=2021/12/09,SIZE=7.7 MB
V20525,DSN=ABC.CDM.XYZ.X02,NUMRECAL=0,
CRTDATE=2021/12/09,MIGDATE=2021/12/09,SIZE=7.7 MB
==>DSNCT=3


SIMULATE OUTPUT FOR GROUP=JUN09A  DATE=2023/08/12 TIME=21:29:55
OPTIONS USED AT EXECUTION TIME:
Date format  . . . . . YYYY/MM/DD
Maximum number of migrated data sets . 3
Maximum number of ML2 volumes  . . . . No limit
Select data sets migrated before . . . 2022/11/01
Simulate resumed from a previous run
Simulate ended by 3 migrated data sets returned
Last MCDS data set name read: ABC.CDM.XYZ.X05
Amount of data selected by simulate  . 23 MB

CDMOUTPUT_START_OF_ML2_TABLE
ML2VOL=V20525,PERCVAL=100,NUMDSNS=1,CRTDATE=2021/12/09,OLDEST=2021/12/09
ML2VOL=V20518,PERCVAL=100,NUMDSNS=1,CRTDATE=2021/12/09,OLDEST=2021/12/09
ML2VOL=V20520,PERCVAL=100,NUMDSNS=1,CRTDATE=2021/12/09,OLDEST=2021/12/09
==>VOLCT=3,FIRSTVOL=V20525,LASTVOL=V20520


CDMOUTPUT_SIMULATE_DETAIL_DSN
V20525,DSN=ABC.CDM.XYZ.X03,NUMRECAL=0,
CRTDATE=2021/12/09,MIGDATE=2021/12/09,SIZE=7.7 MB
V20518,DSN=ABC.CDM.XYZ.X04,NUMRECAL=0,
CRTDATE=2021/12/09,MIGDATE=2021/12/09,SIZE=7.7 MB
V20520,DSN=ABC.CDM.XYZ.X05,NUMRECAL=0,
CRTDATE=2021/12/09,MIGDATE=2021/12/09,SIZE=7.7 MB
==>DSNCT=3
```

Figure 18. Sample simulate job output JUN09AS

Migrate job output

For migration group named *grpname*, the JCL for the migrate job is in member *grpname*2. The output log is in member *grpname*M.

For a description of the migrate job parameters, see Table 4 on page 24.

```
//* JCL for running a DFSMScdm migrate job for migration group grpname
//*
//* This job should be started by the user during a period of low
//* migration.  It stops when all data sets have been recalled,
//* or when one of the times specified below are reached.
//*
//* The PARM defines the control data set, the configuration member,
//* and the DFSMScdm migration group name (which is used to name the
//* output).
//GBQUTILM    EXEC  PGM=GBQUTILM,
//            PARM=('cdm.control.data.set',
//            CONFIGnn,grpname)
//*
//STEPLIB     DD DISP=SHR,DSN=hlq.IBM.HGBQ110.SGBQLLIB
//*     Same output written to control data set
//GBQPRINT    DD SYSOUT=*
//SYSUDUMP    DD SYSOUT=*
//*
//*    The control cards for the MIGRATE run
//GBQSYSIN    DD *
* Pick either specific cloud **or** default management class
* Migrate to specific cloud
MIGRATE_TO_CLOUD_NAME=cldname
MIGRATE_TO_DEFAULT_MGMTCLAS=YES|NO
*
* Time of day to stop recalls
RECALL_TIME_OF_DAY_TO_STOP=hh:mm:ss
*
* Maximum duration of a recall
RECALL_MAXIMUM_TIME_FOR_RECALLS=hh:mm
*
* --- Pacing parameters ---
*
* Number of data sets in a recall batch
RECALL_BATCH_SIZE=nnnn
*
* Number of seconds to wait between recalls: 0 recommended
RECALL_WAIT_BETWEEN_DATA_SET=nn
*
* Time (mm:ss) to wait between batches of recalls
RECALL_WAIT_BETWEEN_BATCHES=mm:ss
* Percent full when recalls are paused, and a migrate of the
* storage group is started.
PERCENT_FULL_START_CLOUD_MIGRATE=nn
/*
```

Figure 19. Template for migrate job JCL grpname2

The first part of the migration log starts with MIGRATE OUTPUT00001 and lists the following information:

- Options used at execution time.
- A summary of the execution, such as the start and end time of the DFSMShsm recalls and cloud migrations, and number of data sets processed.
- Details for each data set migrated. The data sets are grouped into batches. The migration job has a pacing parameter to limit the number of data sets in an individual recall. Multiple recalls are done if necessary.

A migration may be broken into multiple parts when a migration job hits a time threshold (such as time of day or duration limit specified when the job was created) or is stopped by an operator command.

If a migration job is interrupted, it can be resumed by submitting the exact same JCL as the original job. The resubmitted job determines where to restart by reading the existing migration log for the group. This appends a new section MIGRATE OUTPUT00002 to the log. Further job interrupt and restart cycles result in additional MIGRATE OUTPUT*nnnnn* sections in the log.

```
MIGRATE SUMMARY00001 FOR GROUP=JUN09A  DS2R=NONE     DS2M=NONE

MIGRATE OUTPUT00001 FOR GROUP=JUN09A  DATE=2023/08/12 TIME=21:41:03
OPTIONS USED AT EXECUTION TIME:
Date format used . . . . . YYYY/MM/DD
Migrate to default management class. . YES
Parameters to create migrate job
Time of day to stop recall processing. 05:00
Maximum amount of time to recall . . . 20:22
Number of data sets in recall batch. . 2
Seconds to wait between data sets  . . 00
Minutes/seconds between batches  . . . 00:30
Percent STORGRP full before remigrate. 85
CDM_MIGRATE_OUTPUT
Condition that stopped recall:  Finished Recalling
Number of recall requests   :   00006
Number of recall failures   :   00000
Number of data sets recalled:   00006
Remaining data sets to recall:  NONE
Remaining data sets to migrate: NONE
Last MCDS data set name read:   ABC.CDM.XYZ.X05
Number of times cloud storage group reached 85%: 000
Date/time recall processing started: 2023/08/12 21:40:00
Date/time recall processing ended:   2023/08/12 21:41:03
Total time in DFHSM RECALL phase:    00:01:02
Date/time migrate started: 2023/08/12 21:41:03
Date/time job ended:       2023/08/12 21:41:03
CDMOUTPUT_START_OF_DETAIL_RECALL_MIGRATE
BATCH=1,RECALL=2023/08/12,21:40:00,MIGRATE=2023/08/12,21:41:03
DSN=ABC.CDM.XYZ.C05
DSN=ABC.CDM.XYZ.X01
BATCH=2,RECALL=2023/08/12,21:40:32,MIGRATE=2023/08/12,21:41:03
DSN=ABC.CDM.XYZ.X02
DSN=ABC.CDM.XYZ.X03
BATCH=3,RECALL=2023/08/12,21:41:02,MIGRATE=2023/08/12,21:41:03
DSN=ABC.CDM.XYZ.X04
DSN=ABC.CDM.XYZ.X05
```

Figure 20. Sample migrate job output JUN09AM

Sample use cases

Detailed examples of possible usages of DFSMScdm are outlined in this topic.

Migrating to multiple cloud locations

Define multiple configurations to migrate to different cloud locations.

When data sets have been recalled to the SMS storage group defined for use by DFSMScdm, and the data sets are to be migrated to a specific cloud, DFSMScdm migrates all of the data sets that are in that storage group to the specified cloud.

When using multiple clouds for your migrations, data sets may be mistakenly remigrated to different cloud locations. For example:

1. In your configuration, you specify that storage group CDMSGRP with placeholder volser CDM000 is to be used for DFSMScdm recalls and migrations.
2. You run a simulation job for migration group MIGGRP1, selecting 1000 data sets.
3. You run a simulation job for migration group MIGGRP2, selecting 50 data sets.
4. You submit a migration job for MIGGRP1, directing that data sets be migrated to CLOUD1. This migration starts to recall 1000 data sets to CDMSGRP.
5. At the same time, you submit a migration job for MIGGRP2, directing that data sets be migrated to CLOUD2. This migration recalls 50 data sets to CDMSGRP.

   The second migration job finishes recalling its 50 data sets, while the first migration job is still recalling data sets and has recalled 400 so far. The second migration job migrates all of the data sets in CDMSGRP (at that point, 450 data sets) to CLOUD2, even though data sets from the first migration job should go to CLOUD1.

Solution

To avoid data sets from being migrated to different locations when using multiple clouds, define two different DFSMScdm configurations, each of which uses a different SMS storage group for its processing. For example:

1. Define configuration CONFIG01 using SMS storage group CDMSGRP1, with placeholder volser CDM100.
2. Define configuration CONFIG02 using SMS storage group CDMSGRP2, with placeholder volser CDM200.
3. With configuration CONFIG01 active, build the simulation and migration jobs for migration group MIGGRP1.
4. With configuration CONFIG02 active, build the simulation and migration jobs for migration group MIGGRP2.

This way, data sets recalled for MIGGRP1 are recalled to a different storage group than the data sets recalled for MIGGRP2. The migration job for MIGGRP1 only migrates data sets that have been recalled to CDMSGRP1, and the migration job for MIGGRP2 only migrates data sets that have been recalled to CDMSGRP2.

Note: You do not need to use two different configurations if you only migrate data sets using their assigned management classes. In this case, DFSMScdm internally issues a command which migrates all of the data sets in the storage group but does not specify a cloud name. This results in each data set being migrated to the correct destination, based on its management class, no matter how many concurrent DFSMScdm migration jobs might overlap.

Automating jobs on a timely basis

You can automate the DFSMScdm simulation and migration process so that you do not have to repeatedly use the ISPF dialog to create the simulation and migration jobs.

You can also retain the logs from each simulation and migration job in the DFSMScdm control data set for future reference. For example, you want to move data sets which have been on ML2 for at least a year to the cloud on a monthly basis. Consider the following scenario:

On 1 September 2023, as a base, you used the following criteria to select all data sets migrated to ML2 before 1 September 2022:

```
                 Create a Job to Simulate a Cloud Migration
Command ===>


Name of migration group to simulate . . . . . BASEGRP

Choose ONE method of selection (A, B, or C):
 ------------------------------------------------------------------------------
A) Select ML2 volumes less than or equal to . . ___  percent full
   Maximum number of ML2 volumes (optional) . . _____
 ------------------------------------------------------------------------------
B) Select data sets migrated to ML2 after . . . __________ (YYYY/MM/DD)
     and/or data sets migrated before . . . . . __________ (YYYY/MM/DD)
   Resume from last simulated DSN?  . . . . . ___        (Yes/No)
   Filter by DSN? (F6 to show/edit list)  . . ___        (Yes/No)
 ------------------------------------------------------------------------------
C) Select data sets migrated to ML2 at least  . 366 days ago
     and/or data sets migrated no more than . . ____ days ago
   Resume from last simulated DSN?  . . . . . NO         (Yes/No)
   Filter by DSN? (F6 to show/edit list)  . . ___        (Yes/No)
 ------------------------------------------------------------------------------

Optional for all selection methods:
Maximum number of migrated data sets  . . . . .  _______

Active DFSMScdm Configuration . . . . . : CONFIG01
```

Submitting the simulation job creates a log output BASEGRPS, and a JCL member BASEGRP1 which are stored in the control data set:

```
//GBQUTILS    EXEC  PGM=GBQUTILS,
//            PARM=(BIXNCE.CNTL.DSN,
//            CONFIG01,BASEGRP)
//STEPLIB     DD DISP=SHR,DSN=BIXNCE.IBM.HGBQ110.SGBQLLIB
//GBQPRINT    DD SYSOUT=*
//SYSUDUMP    DD SYSOUT=*
//* The control cards for the simulate run
//GBQSYSIN DD *
DAYS_SINCE_MIGRATED=366
RESUME_FROM_LAST_SIMULATED_DSN=NO
```

You then ran a migration job for migration group BASEGRP to migrate all of the selected data sets. Submitting the migration job creates a log output BASEGRPM and is stored in the control data set.

```
//GBQUTILM    EXEC  PGM=GBQUTILM,
//            PARM=(BIXNCE.CNTL.DSN,
//            CONFIG01,BASEGRP)
//STEPLIB     DD DISP=SHR,DSN=BIXNCE.IBM.HGBQ110.SGBQLLIB
//GBQPRINT    DD SYSOUT=*
//GBQSYSIN    DD *
...
[DFSMScdm control statements go here]
...
```

Now, on a monthly basis, you run a job that selects data sets that have been on ML2 for at least a year. Each selection of data sets consists of a new migration group, so you can create a reusable job by specifying system symbols to create a unique migration group name (maximum of 7 characters) for each job run, assuming that they are run on different dates. In the following example, the migration group name is B&YYMMDD. Submitting the simulation job creates a log output B231001S and is stored in the control data set.

```
//GBQUTILS    EXEC  PGM=GBQUTILS,
//            PARM=(BIXNCE.CNTL.DSN,
//            CONFIG01,B&YYMMDD)
//STEPLIB     DD DISP=SHR,DSN=BIXNCE.IBM.HGBQ110.SGBQLLIB
//GBQPRINT    DD SYSOUT=*
//SYSUDUMP    DD SYSOUT=*
//GBQSYSIN DD *
DAYS_SINCE_MIGRATED=366
RESUME_FROM_LAST_SIMULATED_DSN=NO
```

Other examples for the migration group name are G&LMON.&LDAY.&LYR2 and Q&LYR2.&JDAY.

When you run this simulation on 1 October 2023, all data sets migrated before 1 October 2022 are selected as migration group B231001. However, since the prior migration job already recalled data sets migrated to ML2 before 1 September 2022, and remigrated them to the cloud, the only data sets that are selected by this job are data sets migrated between 1 September 2022 and 30 September 2022.

You then run a migration job on the same date using the same substitution for the migration group name. The migration job created the following migration log in member B231001M in the control data set.

```
//GBQUTILM    EXEC  PGM=GBQUTILM,
//            PARM=(BIXNCE.CNTL.DSN,
//            CONFIG01,B&YYMMDD)
//STEPLIB     DD DISP=SHR,DSN=BIXNCE.IBM.HGBQ110.SGBQLLIB
//GBQPRINT    DD SYSOUT=*
//GBQSYSIN    DD *
...
[DFSMScdm control statements go here]
...
```

You can schedule these simulation and migration jobs to run monthly to create a new migration group each month (B231001, B231101, B231201, B240101, and so on) to migrate on a rolling basis a month's worth of year-old data sets.

Note: It is essential to use a new migration group name each month to retain all of the simulation and migration logs in the DFSMScdm control data set.

When a simulation is done using **RESUME_FROM_LAST_SIMULATED_DSN=NO**, you are starting a new migration group, so any previous simulation and migration logs for that migration group are overwritten or deleted.

When a simulation is done using **RESUME_FROM_LAST_SIMULATED_DSN=YES**, the results of the simulation are appended to the results for a previous simulation using the same simulation group name, picking up from where the previous simulation left off in the MCDS, as recorded in the bookmark file for the migration group. The bookmark file records the selection date calculated by the first simulation run for the group; subsequent runs use the same selection date (not a new date calculated by subtracting 366 days from the date of the resumed job), so this cannot be used to select data sets with a new range of migration dates.

Chapter 4. DFSMScdm messages

This section documents the DFSMScdm messages.

Message types are either informational, warning, error, serious, debug, or trace. Message identifiers include a GBQ prefix, a number, and either I, W, E, or S to indicate the severity. Message identifiers D and T are for troubleshooting purposes for internal use by IBM Support.

I
Informational message, with return code 0. Describes information or the status for normal conditions and operations. These messages can also provide supporting information accompanying warning or error messages.

W
Warning message, with return code 4. Alerts to a condition that might cause problems in the future. When a warning message is displayed, processing usually continues, but might not complete in a way that is expected. Examine for possible future errors and possible action.

E
Error message, with return code 8. Alerts to a problem that has occurred. Processing cannot continue. Error messages might be accompanied by additional supporting information for diagnosis, problem determination, and action.

S
Serious error message, with return code 12. Alerts that a failure has occurred and likely requires the attention of a system programmer.

D
Diagnostic message. Provides information to help with troubleshooting.

T
Trace message. For internal use by IBM Support.

DFSMScdm messages

DFSMScdm messages are listed in numerical order for reference.

GBQ0001I DFSMScdm initializing.

Explanation:
DFSMScdm has started the initialization process.

System action:
DFSMScdm execution continues.

Detecting CSECT:
GBQUTILM

GBQ0002I Error in PARM passed on the EXEC statement.

Explanation:
There must be three parameters passed separated by commas. The three parameters are a control data set name, a config member name, and a group name.

System action:
GBQUTILM is terminated.

Detecting CSECT:
GBQUTILM

GBQ0003I DFSMScdm is now cleaning up old environment.

Explanation:
DFSMScdm is reinitializing any previously existing environments.

System action:
DFSMScdm execution continues.

Detecting CSECT:
GBQMAIN

GBQ0004I DFSMScdm old environment located at *location* has been orphaned.

Explanation:
DFSMScdm is reinitializing any previously existing environments.

System action:
DFSMScdm execution continues.

Detecting CSECT:
GBQMAIN

GBQ0005I DFSMScdm is terminating.

Explanation:
DFSMScdm has started the termination process.

System action:
DFSMScdm termination continues.

Detecting CSECT:
GBQMAIN

GBQ0019S CPFX registration failed. Return code *return-code*, reason code *reason-code*.

Explanation

DFSMScdm failed to locate or register the command prefix. Possible values for the return and reason codes are:

04/04
Invalid command prefix

04/0C
Prefix was defined with FAILDISP=PURGE

08/04
Prefix not found in command prefix table at warm start

08/08
Prefix already in use

08/1C
CPF table does not exist at warm start

0C/--
Probable abend

System action:
DFSMScdm execution terminates.

Detecting CSECT:
GBQMAIN

GBQ0100E DYNALLOC error allocating DSN=*dsn* DD=*ddn* ERR=*err* REAS=*reas* EREAS=*ereas*

Explanation:
An error occurred trying to allocate a required data set using the DD name specified.

System action:
The utility terminates.

User response:
Determine why the dynamic allocation failed by looking up the return, reasons and extended reason codes.

Detecting CSECT:
GBQUTILM

GBQ0101E GBQUTILM EXEC PARM is invalid. Missing a comma or a required parameter.

Explanation:
Parameters on the EXEC PGM statement are incorrect. Either there was no PARM specified or there were not at least three parameters specified separated by commas.

System action:
The utility terminates.

User response:
Ensure the PARM is the correct format of ctrl_dsn,config,group.

Detecting CSECT:
GBQUTILM

GBQ0102E STORCLAS parameter missing from DSN=*dsn* MEMBER=*mem*

Explanation:
While scanning the CONFIGnn member in the control data set, the STORCLAS parameter was not found.

System action:
The utility terminates.

Programmer response:
Ensure that the CONFIGnn member specified on the EXEC PARM has a statement that starts with STORCLAS=.

Detecting CSECT:
GBQUTILM

GBQ0103E STORGRP parameter missing from DSN=*dsn* MEMBER=*mem*

Explanation:
While scanning the CONFIGnn member in the control data set, the STORGRP parameter was not found.

System action:
The utility terminates.

User response:
Ensure that the CONFIGnn member specified on the EXEC PARM has a statement that starts with STORGRP=.

Detecting CSECT:
GBQUTILM

GBQ0104E Invalid time format in RECALL_TIME_OF_DAY_TO_STOP statement. No colon between HH and MM.

Explanation:
While scanning the RECALL_TIME_OF_DAY_TO_STOP statement there was no colon found between the HH and MM.

System action:
The utility terminates.

User response:

Ensure the time format includes a colon, using RECALL_TIME_OF_DAY_TO_STOP=hh:mm

Detecting CSECT:
GBQUTILM

GBQ0105E **Invalid time format in RECALL_TIME_OF_DAY_TO_STOP statement. HH was not in the range 00 - 24.**

Explanation:
In the RECALL_TIME_OF_DAY_TO_STOP statement, the minimum allowed value for HH is 00, and the maximum allowed value is 24.

System action:
The utility terminates.

Programmer response:
Ensure the time format is correct, using RECALL_TIME_OF_DAY_TO_STOP=hh:mm

Detecting CSECT:

GBQ0106E **Invalid time format in RECALL_TIME_OF_DAY_TO_STOP statement. MM was not in the range 00 - 59.**

Explanation:
In the RECALL_TIME_OF_DAY_TO_STOP statement, the minimum allowed value for MM is 00, and the maximum allowed value is 59.

System action:
The utility terminates.

User response:
Ensure the time format is correct, using RECALL_TIME_OF_DAY_TO_STOP=hh:mm

Detecting CSECT:
GBQUTILM

GBQ0107E **Invalid time format in RECALL_WAIT_BETWEEN_BATCHES statement. No colon between MM and SS.**

Explanation:
While scanning the RECALL_WAIT_BETWEEN_BATCHES statement there was no colon found between the MM and SS.

System action:
The utility terminates.

User response:
Ensure the time format includes a colon, using RECALL_WAIT_BETWEEN_BATCHES=mm:ss

Detecting CSECT:
GBQUTILM

GBQ0108E **Invalid time format in RECALL_WAIT_BETWEEN_BATCHES statement. MM was not in the range 00 - 59.**

Explanation:
In the RECALL_WAIT_BETWEEN_BATCHES statement, the minimum allowed value for MM is 00, and the maximum allowed value is 59.

System action:
The utility terminates.

User response:
Ensure the time format is correct, using RECALL_WAIT_BETWEEN_BATCHES=mm:ss

Detecting CSECT:

GBQ0109E **Invalid time format in RECALL_WAIT_BETWEEN_BATCHES statement. SS was not in the range 00 - 59.**

Explanation:
In the RECALL_WAIT_BETWEEN_BATCHES statement, the minimum allowed value for SS is 00, and the maximum allowed value is 59.

System action:
The utility terminates.

User response:
Ensure the time format is correct, using RECALL_WAIT_BETWEEN_BATCHES=mm:ss

Detecting CSECT:
GBQUTILM

GBQ0110E **Invalid numerics in RECALL_BATCH_SIZE statement. There are not up to 4 digits after the equal sign.**

Explanation:
While scanning the RECALL_BATCH_SIZE statement there were not up to 4 digits after the equal sign.

System action:
The utility terminates.

User response:
Ensure the number of digits is correct with up to 4 digits following directly after RECALL_BATCH_SIZE=

Detecting CSECT:
GBQUTILM

GBQ0111E **Invalid numerics in RECALL_WAIT_BETWEEN_DATA_SET statement. There are not two numerics after the equal sign.**

Explanation:

While scanning the RECALL_WAIT_BETWEEN_DATA_SET statement the seconds were not two digits.

System action:
The utility terminates.

User response:
Ensure the number of seconds is correct with two digits following directly after RECALL_WAIT_BETWEEN_DATA_SET=

Detecting CSECT:
GBQUTILM

GBQ0112E **Invalid numerics in PERCENT_FULL_START_CLOUD_MIGRATE statement. There are not 1 or 2 numerics after the equal sign.**

Explanation:
While scanning the PERCENT_FULL_START_CLOUD_MIGRATE statement the percentage was not two digits.

System action:
The utility terminates.

User response:
Ensure the percentage has two digits or one digit followed by a blank directly after PERCENT_FULL_START_CLOUD_MIGRATE=

Detecting CSECT:
GBQUTILM

GBQ0113E **GBQHSMI module could not be loaded.**

Explanation:
The GBQHSMI module could not be found.

System action:
The utility terminates.

User response:
Ensure the GBQHSMI module is in the JOBLIB, STEPLIB or LINKLIST.

Detecting CSECT:
GBQUTILM

GBQ0114E **STIMERM for RECALL_TIME_OF_DAY_TO_STOP failed RC=*rc***

Explanation:
There was an unexpected return code from STIMERM while processing the RECALL_TIME_OF_DAY_TO_STOP parameter.

System action:
The utility terminates.

User response:
Ensure the RECALL_TIME_OF_DAY_TO_STOP parameter has a valid time. If RECALL_TIME_OF_DAY_TO_STOP appears correct, contact IBM Support.

Detecting CSECT:
GBQUTILM

GBQ0115E **STIMERM for RECALL_MAXIMUM_TIME_FOR_RECALLS failed RC=*rc***

Explanation:
There was an unexpected return code from STIMERM while processing the RECALL_TIME_OF_DAY_TO_STOP parameter.

System action:
The utility terminates.

User response:
Ensure the RECALL_MAXIMUM_TIME_FOR_RECALLS parameter has a valid time. If RECALL_MAXIMUM_TIME_FOR_RECALLS appears correct, contact IBM Support.

Detecting CSECT:
GBQUTILM

GBQ0116E **Member *member* does not exist in *dsn***

Explanation:
A data set member that is required by GBQUTILM is not present in the specified data set.

System action:
The utility terminates.

User response:
Ensure the configuration and simulate members exist within the control data set.

Detecting CSECT:
GBQUTILM

GBQ0117E **Unable to open *dsn* member *mem* return code *rc***

Explanation:
A data set member that is required by GBQUTILM is not present in the specified data set.

System action:
The utility terminates.

User response:
Ensure the configuration and simulate members exist within the control data set.

Detecting CSECT:
GBQUTILM

GBQ0118E **Invalid value for MIGRATE_TO_DEFAULT_MGMTCLAS**

Explanation:
While scanning the MIGRATE_TO_DEFAULT_MGMTCLAS statement an invalid value was found.

System action:
The utility terminates.

User response:
Ensure the MIGRATE_TO_DEFAULT_MGMTCLAS parameter is either YES or NO.

Detecting CSECT:
GBQUTILM

GBQ0119E Invalid RECALL_BATCH_SIZE was specified.

Explanation:
RECALL_BATCH_SIZE was either not set, or was set to 0. which is not a valid batch size.

System action:
The migration utility terminates.

User response:
Ensure the RECALL_BATCH_SIZE parameter is an integer greater than 0.

Detecting CSECT:
GBQUTILM

GBQ0120I Non-zero value for RECALL_WAIT_BETWEEN_DATA_SET specified. A value of 0 is recommended.

Explanation:
While the specified value in RECALL_WAIT_BETWEEN_DATA_SET is allowed, a value of 0 will provide better recall performance. Each RECALL command waits until the recall is finished before issuing another RECALL command which will prevent GBQUTILM from building up the queue of recall requests. A nonzero value will slow down the utility processing.

System action:
The utility continues with specified value.

User response:
Specifying 0 is highly recommended for RECALL_WAIT_BETWEEN_DATA_SET=

Detecting CSECT:
GBQUTILM

GBQ0121I MIGRATION UTILITY STATUS

Explanation:
User requested via the Modify (F) command a status report from the GBQUTILM Cloud migration utility program. Several lines will be written to the console, system log, and JES log containing current status of the migration process. The output is similar to what is displayed on the DFSMScdm Option 4 panel for status information for the migration utility job.

Detecting CSECT:
GBQUTILM

GBQ0124E Migration Utility name/token request failed, Return code *return-code*

Explanation:
Internal error.

System action:
The migration utility terminates. Review messages in the job log from the system security product.

User response:
Make note of the message and return code. Contact IBM Support for assistance.

Detecting CSECT:
GBQUTILM

GBQ0125E Migration/Simulation Utility access authorization failed for DFSMShsm RECALL or MIGRATE service.

Explanation:
Attempt to validate authorization through SAF failed. Refer to messages in the job log issued by the system's security software. DFSMScdm requires the user to be authorized to issue DFSMShsm RECALL and MIGRATE commands.

System action:
The utility terminates with return code 8.

User response:
Either have an authorized user submit the job, or request authorization from your system security administrator for DFSMShsm RECALL and MIGRATE commands.

Detecting CSECT:
GBQUTILM

GBQ0126W Migration/Simulation Utility access authorization could not be determined for DFSMShsm RECALL or MIGRATE services.

Explanation:
Attempt to validate authorization through SAF failed with a return code of 4. Either security software was not active, or there was no specification for access to STGADMIN.ARC.RECALL or STGADMIN.ARC.MIGRATE. Processing continues. Refer to messages in the job log issued by the system's security software. DFSMScdm requires the user to be authorized to issue DFSMShsm RECALL and MIGRATE commands.

System action:

The utility continues processing, but will get a return code of 4.

User response:
None required if this is expected. Otherwise determine why the security software was unable to make a decision on the authorization request. Most likely causes are that either the security was not active, or the requested resources were incorrectly defined to the system's security product.

Detecting CSECT:
GBQUTILM

GBQ0127E Migration Utility EXEC PARM ERROR: *line*

Explanation:
GBQUTILM failed due to the execution parameter exceeding the maximum size as indicated in the message

System action:
The migration utility terminates.

User response:
Correct the parameter value that is in error.

Detecting CSECT:

GBQ0130I Migration Utility Initializing

Explanation:
The GBQUTILM Migration Utility is reading the provided control information and performing a validation of that information.

Detecting CSECT:
GBQUTILM

GBQ0131I OPTION: *line*

Explanation:
This provides a listing of the information provided in the GBQSYSIN DD data set, without the comment cards.

Detecting CSECT:
GBQUTILM

GBQ0132E Invalid migration parameter on above statement

Explanation:
The migration parameter provided was not recognized by GBQUTILM. Parameter was either misspelled or not supported by this program.

System action:
The Migration Utility terminates.

User response:
Remove or correct the invalid migration parameter in the GBQSYSIN input.

Detecting CSECT:
GBQUTILM

GBQ0138I Migration Utility Initialization Completed

Explanation:
The migration utility has completed the initialization process, and is now ready to start processing.

Detecting CSECT:
GBQUTILM

GBQ0139W Migration Utility terminated with errors, Return code *return-code*

Explanation:
The migration utility is terminating with a return code of 8. The errors can be identified by messages preceding this message.

System action:
The migration utility terminates with return code 8.

User response:
Correct the indicated errors and rerun.

Detecting CSECT:
GBQUTILM

GBQ0140E Recall failed for DSN=*dsn* DFSMShsm is not active, or is not accepting requests.

Explanation:
DFSMShsm failed a recall request with a return code of 100 indicating it is not active.

System action:
The migration utility terminates.

User response:
Submit the job when DFSMShsm is active and ready to accept new requests.

Detecting CSECT:
GBQUTILM

GBQ0141E Recall failed for DSN=*dsn* DFSMShsm is terminating and not accepting new requests.

Explanation:
DFSMShsm failed a recall request with a return code of 92 indicating that DFSMShsm is terminating.

System action:
The migration utility terminates.

User response:
Submit the job when the DFSMShsm has been restarted.

Detecting CSECT:
GBQUTILM

GBQ0142E Recall failed for DSN=*dsn* DFSMShsm is not running at the minimum required level.

Explanation:
DFSMShsm failed a recall request with a return code of 78 indicating it is not a recent enough level for DFSMScdm.

System action:
The migration utility terminates.

User response:
Install a level that supports the DFSMScdm product. DFSMScdm requires DFSMShsm for z/OS 2.4 or later. For DFSMShsm 2.4, APAR OA59904 (PTF UJ04709) is required.

Detecting CSECT:
GBQUTILM

GBQ0143E **Recall failed for DSN=*dsn* DFSMShsm recall processing is being held.**

Explanation:
DFSMShsm failed a recall request with a return code of 74 indicating RECALL processing is currently held.

System action:
The migration utility terminates.

User response:
Release the hold on DFSMShsm recall processing, and then resubmit this job.

Detecting CSECT:
GBQUTILM

GBQ0144E **Recall failed for DSN=*dsn* DFSMShsm data set is not cataloged.**

Explanation:
DFSMShsm failed recall a request with a return code of 402 indicating a data set is not cataloged. The data set has most likely been deleted.

System action:
The migration utility continues, bypassing this data set.

User response:
None required, unless the data set was accidentally deleted, in which case it can be defined in the catalog again with a volume of MIGRAT2.

Detecting CSECT:
GBQUTILM

GBQ0145W **Recall failed for DSN=*dsn* Return code *return-code* Refer to DFSMShsm manual for information.**

Explanation:
DFSMShsm failed a recall request with the indicated return code. Look up the code in the DFSMShsm manual for more information on the reason for the failure. If the return code is only one digit *n*, look up message ARC110*n*. If the return code is only two digits *nn*, look up message ARC11*nn* with *nn* replaced by the return code in the message. For 3 digit return codes, look up that message number in the DFSMShsm manual.

System action:
The migration utility continues, bypassing this data set.

User response:
If corrective action is suggested for the error code, that can be done and attempt the RECALL again. Otherwise no action is necessary. The data set is not recalled and will not be migrated.

Detecting CSECT:
GBQUTILM

GBQ0146E **MIGRATE failed for STORGRP=*storgrp* Request for space utilization in storage group failed**

Explanation:
GBQUTILM request to find amount of space currently used in the indicated storage group failed. The storage group may not be currently available or may not exist. If the return cod is only one digit, look up message ARC110#. If the return code is only two digits, look up message ARC11## with ## replaced by the return code in the message. For 3 digit return codes, look up that message number in the DFSMShsm manual.

System action:
The migration utility fails, no migrate is issued

User response:
Validate that the storage group specified is valid and available for migration to cloud. GBQUTIM will end with return code of 8.

Detecting CSECT:
GBQUTILM

GBQ0201S **Out of memory**

Explanation:
GBQUTILS was unable to allocate enough memory to complete the simulation processing.

System action:
The utility terminates.

User response:
Increase the REGION in your JOB card. Or contact your system programmer to increase the space available to GBQUTILS.

Detecting CSECT:
GBQUTILS

GBQ0202E **Invalid number of parameters. Expected *expected* Got *got***

Explanation:
GBQUTILS expects 1 PARM with the following format: control_dsn,config_member,group_member

System action:
The utility terminates.

User response:
Provide the correct number of parameters for PARM.

Detecting CSECT:
GBQUTILS

GBQ0203E **Parm value *name* exceeds maximum length of *maxlen* Length provided *provided***

Explanation:
The length of the provided value is too long.

System action:
The utility terminates.

User response:
Provide a valid value for the specified field.

Detecting CSECT:
GBQUTILS

GBQ0204E **Bad parm. Expected format: control_dsn,config_member,group_member**

Explanation:
GBQUTILS expects 1 PARM with the following format: control_dsn,config_member,group_member.

System action:
The utility terminates.

User response:
Provide parm with the proper format: control_dsn,config_member,group_member

Detecting CSECT:
GBQUTILS

GBQ0205E ***value* is not a valid CONFIG member name.**

Explanation:
The configuration member name must be CONFIGnn where nn is 00-99. Valid values are from CONFIG00 to CONFIG99.

System action:
The utility terminates.

User response:
Rename the configuration member to comply with the requirements.

Detecting CSECT:
GBQUTILS

GBQ0206E ***value* is not a valid GROUP name.**

Explanation:
The migration group name is invalid. The group name must be less than 8 characters long, and must not start with CONFIG or SUMRY, which are reserved prefixes.

System action:
The utility terminates.

User response:
Correct the GROUP name.

Detecting CSECT:
GBQUTILS

GBQ0210I **OPTION: *line***

Detecting CSECT:
GBQUTILS

GBQ0211E **Invalid configuration parameter on line *lineno***

Explanation:
The configuration parameter provided was not recognized by GBQUTILS.

System action:
The utility terminates.

User response:
Remove or correct the invalid configuration line in the provided configuration member.

Detecting CSECT:
GBQUTILS

GBQ0212E **Invalid option on line *lineno***

Explanation:
The option provided was not recognized by GBQUTILS.

System action:
The utility terminates.

User response:
Remove or correct the invalid option provided.

Detecting CSECT:
GBQUTILS

GBQ0213I **No data set limit was specified.**

Explanation:
Not providing a data set limit may result in long processing time, and hurt DFSMShsm performance.

System action:
The utility continues.

User response:
Provide a data set limit to avoid excess processing.

Detecting CSECT:
GBQUTILS

GBQ0214I **No data set or volume limit was specified.**

Explanation:

Not providing a limit may result in long processing time, and degrade DFSMShsm performance.

System action:
The utility continues.

User response:
Provide either a data set or volume limit to avoid excess processing.

Detecting CSECT:
GBQUTILS

GBQ0215E No filter option specified.

Explanation:
No filter was provided for the simulate job, which is required to determine how data should be processed.

System action:
The utility terminates.

User response:
Provide a filtering option.

Detecting CSECT:
GBQUTILS

GBQ0216E Cannot resume an ML2 volume simulation.

Explanation:
GBQUTILS can only resume from a migrated data set simulation, not an ML2 volume simulation.

System action:
The utility terminates.

User response:
Specify RESUME_FROM_LAST_SIMULATED_DSN=NO

Detecting CSECT:
GBQUTILS

GBQ0217E No MCDS was provided in the configuration.

Explanation:
While processing the configuration member, no MCDS parameter was found.

System action:
The utility terminates.

User response:
Provide an MCDS in the configuration member.

Detecting CSECT:
GBQUTILS

GBQ0218E No OCDS was provided in the configuration.

Explanation:
While processing the configuration member, no OCDS parameter was found.

System action:
The utility terminates.

User response:
Provide an OCDS in the configuration member.

Detecting CSECT:
GBQUTILS

GBQ0219E No date format was provided in the configuration.

Explanation:
While processing the configuration member, no DATEFMT= parameter was found.

System action:
The utility terminates.

User response:
Provide a DATEFMT in the configuration member.

Detecting CSECT:
GBQUTILS

GBQ0220W Nothing to resume.

Explanation:
RESUME_FROM_LAST_SIMULATED_DSN=YES was specified, but previous simulations have already found all data sets meeting the criteria. There's nothing left to do.

System action:
The utility terminates.

User response:
To start from the beginning of the MCDS again, specify RESUME_FROM_LAST_SIMULATED_DSN=NO, or delete the simulate and bookmark members for the corresponding group.

Detecting CSECT:
GBQUTILS

GBQ0221E *fmt* is not a valid DATEFMT.

Explanation:
An invalid or unsupported date format was specified for the DATEFMT parameter in the configuration.

System action:
The utility terminates.

User response:
Provide a valid DATEFMT value: - DD/MM/YYYY - MM/DD/YYYY - YYYY/MM/DD

Detecting CSECT:
GBQUTILS

GBQ0222E Previous simulation log is missing.

Explanation:
A bookmark was found from a prior simulation, but no prior simulation log was found, or an error occurred trying to open it.

System action:

The utility terminates.

User response:
If the previous simulation log was deleted, delete the corresponding bookmark member belonging to that group. If the simulation log exists, ensure it is not allocated by another program.

Detecting CSECT:
GBQUTILS

GBQ0223E DD statement *ddname* is missing.

Explanation:
The required DD statement was not specified.

System action:
The utility terminates.

User response:
Provide a valid DD statement.

Detecting CSECT:
GBQUTILS

GBQ0224E *keyword* value out of range. *value* is not in range *lower* to *upper*

Explanation:
The value specified is not within the acceptable range for the specified keyword statement.

System action:
The utility terminates.

User response:
Specify a value inside the range specified.

Detecting CSECT:
GBQUTILS

GBQ0225E Value of *keyword* is invalid. *rsn*

Explanation:
The value specified is not valid for the reason given. The value may be too long, contain an invalid character, or break other rules for the data type (for example, a data set name starting with a number). Dates prior to 1970 are not supported, and are considered invalid.

System action:
The utility terminates.

User response:
Specify a valid value.

Detecting CSECT:
GBQUTILS

GBQ0226E MCDSs specified out of order.

Explanation:
At least 1 MCDS in the configuration was specified out of order. MCDS= must always be present. Additional MCDSs must start at MCDS2 and go to MCDS4. For example, MCDS4 cannot be used unless MCDS2 and MCDS3 are already used.

System action:
The utility terminates.

User response:
Reorder the MCDSs starting at 1 and going to 4.

Detecting CSECT:
GBQUTILS

GBQ0227E Duplicate definition of *keyword* on line *lineno*. First defined on line *original*

Explanation:
The specified keyword was defined twice. A keyword is only allowed to be specified once.

System action:
The utility terminates.

User response:
Remove one of the duplicate definitions.

Detecting CSECT:
GBQUTILS

GBQ0228E Did not find keyword *keyword* in *src*

Explanation:
The specified keyword was not found when it is required. In some cases, a keyword may be required, but the value can be left blank.

System action:
The utility terminates.

User response:
Add the keyword in the location specified.

Detecting CSECT:
GBQUTILS

GBQ0229E Duplicate MCDS found in configuration.

Explanation:
At least 1 MCDS in the configuration was specified twice. Each MCDS specified must be unique from all preceding MCDSs.

System action:
The utility terminates.

User response:
Either remove the duplicate or type a different MCDS.

Detecting CSECT:
GBQUTILS

GBQ0230E Unable to open data set *dsn* member *member* for reading. RC: *rc*

Explanation:

An error occurred when opening a data set member for reading.

System action:
The utility terminates.

User response:
Ensure the data set is an existing PDS/PDSE that is not allocated by another job. Check the error number for more information.

Detecting CSECT:
GBQUTILS

GBQ0231E Unable to open data set *dsn* member *member* for writing. RC: *rc*

Explanation:
An error occurred when opening a data set member for writing.

System action:
The utility terminates.

User response:
Ensure the data set is an existing PDS/PDSE that is not allocated by another job. Check the error number for more information.

Detecting CSECT:
GBQUTILS

GBQ0240E VSAM open error opening *dsn* RC:*rc* FDBK:*fdbk* Errno:*errno*

Explanation:
An error occurred when opening the specified VSAM data set.

System action:
The utility terminates.

Programmer response:
Check the VSAM return code, and feedback code for information.

Detecting CSECT:
GBQUTILS

GBQ0241E VSAM read error reading *dsn* RC:*rc* FDBK:*fdbk* Errno:*errno*

Explanation:
An error occurred when reading the specified VSAM data set.

System action:
The utility terminates.

Programmer response:
Check the VSAM return code and feedback code for information.

Detecting CSECT:
GBQUTILS

GBQ0242W Could not find data set record for aliased data set *alias* in *dsn*

Explanation:
An alias record had no data set record for the associated data set.

System action:
The utility continues.

Detecting CSECT:
GBQUTILS

GBQ0243W Key *key* not found in *dsn*

Explanation:
The key specified was not found in the specified VSAM data set during a LOCATE.

System action:
The utility continues.

Detecting CSECT:
GBQUTILS

GBQ0244D Unable to open *dsn* in RLS mode.

Explanation:
The cluster could not be opened in RLS mode.

System action:
The utility continues and will attempt to open the cluster in non-RLS mode.

Detecting CSECT:
GBQUTILS

GBQ0245D Opening *dsn* in RLS mode.

Explanation:
The cluster was opened in RLS mode.

System action:
The utility continues.

Detecting CSECT:
GBQUTILS

GBQ0246D Opening *dsn* in non-RLS mode.

Explanation:
The cluster was opened in non-RLS mode.

System action:
The utility continues.

Detecting CSECT:
GBQUTILS

GBQ0247I Migration log member *dsn* has been deleted.

Explanation:
This simulation is reusing a migration group name used by a previous migration, without resuming the previous simulation for the migration group. The previous migration log output has been deleted from

the control data set so that simulation and migration information for the migration group will be consistent.

System action:
The utility continues.

Detecting CSECT:
GBQUTILS

GBQ0250I **Simulation utility starting**

Detecting CSECT:
GBQUTILS

GBQ0251I **Performing migrated data set simulation**

Detecting CSECT:
GBQUTILS

GBQ0252I **Performing ML2 volume simulation**

Detecting CSECT:
GBQUTILS

GBQ0253I **Resuming from last simulated DSN *dsn***

Detecting CSECT:
GBQUTILS

GBQ0254I **Beginning from start of MCDS**

Detecting CSECT:
GBQUTILS

GBQ0255D **Found *count* data sets meeting criteria**

Detecting CSECT:
GBQUTILS

GBQ0256D **Found *count* ML2 volumes meeting criteria**

System action:
The utility continues.

Detecting CSECT:
GBQUTILS

GBQ0257T **Found *volser* with *valid* percent valid data**

Detecting CSECT:
GBQUTILS

GBQ0258T **Ended search on key *key***

Detecting CSECT:
GBQUTILS

GBQ0259T **Found extension record for *volser***

Detecting CSECT:
GBQUTILS

GBQ0260T **Adding data set *dsn* on volume *volser***

Detecting CSECT:
GBQUTILS

GBQ0261D **Filling missing data for *count* volumes**

Detecting CSECT:
GBQUTILS

GBQ0262T **Filling missing data for *volser***

Detecting CSECT:
GBQUTILS

GBQ0263D **Opening data set *dsn* with mode *mode***

Detecting CSECT:
GBQUTILS

GBQ0264T **Found data set *dsn***

Detecting CSECT:
GBQUTILS

GBQ0265T **Data set *dsn* resides on *volser***

Detecting CSECT:
GBQUTILS

GBQ0266D **Filling missing data for *count* data sets**

Detecting CSECT:
GBQUTILS

GBQ0267T **Filling missing data for *dsn***

Detecting CSECT:
GBQUTILS

GBQ0268T **Found alias *alias* for *dsn***

Detecting CSECT:
GBQUTILS

GBQ0269D **Bookmarking data set *dsn***

Detecting CSECT:
GBQUTILS

GBQ0270I **Simulation Utility completed normally**

Detecting CSECT:
GBQUTILS

GBQ0271W **Simulation Utility completed with errors**

Detecting CSECT:
GBQUTILS

GBQ0272T **Searching for alias *alias* in *dsn* RC= *code***

Detecting CSECT:
GBQUTILS

GBQ0273E **Migration date mismatch: previous simulation used *date***

Explanation:
This simulation is attempting to resume a previous simulation selecting by migration date. The previous simulation specified a different migration date than this job specified. Resuming a simulation for a migration group requires that the same migration date be specified in both the first simulation and all resumed simulation runs.

System action:
The utility terminates.

User response:
Update the control statements to use the same migration date limit that was used in the first simulation for this migration group. Or set RESUME_FROM_LAST_SIMULATED_DSN=NO, which will start a new simulation from the beginning of the MCDS.

Detecting CSECT:
GBQUTILS

GBQ0274E **Date format mismatch: previous simulation used *format***

Explanation:
This simulation is attempting to resume a previous simulation selecting by migration date. When this job was run, the configuration's specified date format was different than what was in effect when the previous simulation was run. Resuming a simulation for a migration group requires that the configuration's migration date format be the same as when the previous simulation was run.

System action:
The utility terminates.

User response:
Update the DFSMScdm configuration to use the same date format that was used when the first simulation was run for this migration group.

Detecting CSECT:
GBQUTILS

GBQ0275I **Simulation will select data sets migrated *beforeOrAfter date***

Explanation:
The simulation is selecting by the number of days before the job run date. The displayed date is the date calculated for the selection.

Detecting CSECT:
GBQUTILS

GBQ0276I **Resuming selection of data sets migrated *beforeOrAfter date***

Explanation:
The simulation is resuming a previous simulation for the migration group. The first simulation selected data sets by a number of days before that job date. The date calculated by that job is the date used when resuming the selection procedure.

Detecting CSECT:
GBQUTILS

GBQ0301E **No PARM provided.**

Explanation:
GBQSUMRY expected a PARM with the format: control_dsn,config_member but no PARM was provided.

System action:
The utility terminates.

User response:
Provide a valid PARM with the specified format.

Detecting CSECT:
GBQSUMRY

GBQ0302E **Bad PARM field format.**

Explanation:
GBQSUMRY expected a PARM with the format: control_dsn,config_member but no delimiter was found.

System action:
The utility terminates.

User response:
Provide a valid PARM with the specified format.

Detecting CSECT:
GBQSUMRY

GBQ0303E **PARM value *name* exceeds maximum length of *maxlen* Length provided *provided***

Explanation:
The length of the provided value is too long.

System action:
The utility terminates.

User response:
Provide a valid value for the specified field.

Detecting CSECT:
GBQSUMRY

GBQ0304E **Config_name *value* is invalid. Config_name must be CONFIGnn where nn is 00-99**

Explanation:
The value of config_name provided in the PARM field is not valid. Config_name must start with CONFIG and end with two digits. Valid values are from CONFIG00 to CONFIG99.

System action:
The utility terminates.

User response:
Provide a valid config_name.

Detecting CSECT:
GBQSUMRY

GBQ0310I **OPTION: *line***

Detecting CSECT:
GBQSUMRY

GBQ0311E **No MCDS configuration specified in *dsn* member *member***

Explanation:
While processing the configuration member, no MCDS parameter was found.

System action:
The utility terminates.

User response:
Provide an MCDS in the specified configuration member.

Detecting CSECT:
GBQSUMRY

GBQ0312E **No DATEFMT configuration specified in *dsn* member *member***

Explanation:
While processing the configuration member, no DATEFMT parameter was found.

System action:
The utility terminates.

User response:
Provide a DATEFMT in the specified configuration member.

Detecting CSECT:
GBQSUMRY

GBQ0313E ***fmt* is not a valid DATEFMT value.**

Explanation:
An invalid DATEFMT was specified in the configuration.

System action:
The utility terminates.

User response:
Provide a supported DATEFMT: =MM/DD/YYYY =DD/MM/YYYY =YYYY/MM/DD

Detecting CSECT:
GBQSUMRY

GBQ0314E **MCDSs specified out of order.**

Explanation:
At least 1 MCDS in the configuration was specified out of order. MCDS= must always be present. Additional MCDSs must start at MCDS2 and go to MCDS4. For example, MCDS4 cannot be used unless MCDS2 and MCDS3 are already used.

System action:
The utility terminates.

User response:
Reorder the MCDSs starting at 1 and going to 4.

Detecting CSECT:
GBQSUMRY

GBQ0315E **Duplicate MCDS found in configuration.**

Explanation:
At least 1 MCDS in the configuration was specified twice. Each MCDS specified must be unique from all preceding MCDSs.

System action:
The utility terminates.

User response:
Either remove or type a different MCDS.

Detecting CSECT:
GBQSUMRY

GBQ0316I ***stat***

Explanation:
GBQSUMRY output statistic. Fields printed with this message number are identical to fields in the SUMRYnn output member, in the control data set. This displays information about the amount of data on ML2 and the number of cloud objects found.

Detecting CSECT:
GBQSUMRY

GBQ0330E **Failed to allocate *dsn* to *ddn* RC:*rc* ERR:*err* INFO:*info***

Explanation:
Dynamic allocation error.

System action:
The utility terminates.

Programmer response:
Check the allocation return, error, and info codes for more information.

Detecting CSECT:
GBQSUMRY

GBQ0331E **Failed to open *dsn* member *member* RC:*rc* RSN:*rsn***

Explanation:
Failed to open the ACB for the specified data set.

System action:
The utility terminates.

Programmer response:

Check the reason code returned by the OPEN macro for more information.

Detecting CSECT:
GBQSUMRY

GBQ0332E **Failed to generate ACB for *dsn* member *member* RC:*rc* RSN:*rsn***

Explanation:
Failed to generate an ACB for the specified data set.

System action:
The utility terminates.

Programmer response:
Check the reason code returned by the GENCB macro for more information.

Detecting CSECT:
GBQSUMRY

GBQ0333E **Failed to generate RPL for *dsn* member *member* RC:*rc* RSN:*rsn***

Explanation:
Failed to generate an RPL for the specified data set.

System action:
The utility terminates.

Programmer response:
Check the reason code returned by the GENCB macro for more information.

Detecting CSECT:
GBQSUMRY

GBQ0334E **Failed to modify access mode for *dsn* RC:*rc* RSN:*rsn***

Explanation:
Failed to modify an ACB for the specified data set.

System action:
The utility terminates.

Programmer response:
Check the reason code returned by the MODCB macro for more information.

Detecting CSECT:
GBQSUMRY

GBQ0335E **Failed to locate data set records in *dsn* RC:*rc* FDBK:*fdbk***

Explanation:
Failed to locate data set records in MCDS.

System action:
The utility terminates.

Programmer response:
Check the reason code returned by the POINT macro for more information.

Detecting CSECT:
GBQSUMRY

GBQ0336E **Failed to locate volume records in *dsn* RC:*rc* FDBK:*fdbk***

Explanation:
Failed to locate volume records in MCDS.

System action:
The utility terminates.

Programmer response:
Check the reason code returned by the POINT macro for more information.

Detecting CSECT:
GBQSUMRY

GBQ0337E **Failed to read VSAM record in *dsn* RC:*rc* FDBK:*fdbk***

Explanation:
An error occurred performing a VSAM read.

System action:
The utility terminates.

Programmer response:
Check the reason code returned by the READ macro for more information.

Detecting CSECT:
GBQSUMRY

GBQ0338E **Member *member* does not exist in *dsn***

Explanation:
A data set member that is required by GBQSUMRY is not present in the specified data set.

System action:
The utility terminates.

User response:
Ensure the specified member exists within the control data set.

Detecting CSECT:
GBQSUMRY

GBQ0350I **Summary Utility Starting**

Detecting CSECT:
GBQSUMRY

GBQ0351I **Processing MCDS *dsn***

Detecting CSECT:
GBQSUMRY

GBQ0352I **Read *count* data set records**

Detecting CSECT:
GBQSUMRY

GBQ0353I **Read *count* volume records**

Detecting CSECT:

GBQSUMRY

GBQ0354I **Summary Utility completed successfully**

Detecting CSECT:
GBQSUMRY

GBQ0355W **Summary Utility completed with errors**

Detecting CSECT:
GBQSUMRY

GBQ8990S **GBQMAIN is terminating because the program is not APF-authorized.**

Explanation:
DFSMScdm is terminating due to a lack of APF authorization.

System action:
DFSMScdm execution terminates.

User response:
Ensure that the STEPLIB or the load library containing the DFSMScdm system is an authorized load library.

Detecting CSECT:
GBQMAIN

GBQ8991E **Command parse failed, RC= *return-code*, RS= *reason-code*, REX= *extended-RC***

Explanation

The command failed due to a parse error. The type of error is indicated by the reason code:

01
Storage obtain failure

09
Maximum commands queued

13
Command not compliant

14
Duplicate member name

15
Member name not found

16
No devices in range

19
Command not found

25
Invalid parameters

29
Group not found

30
No devices in range

31
Syntax error

32
Group name in use

33
Device state error

34
Processing error

35
Data base open failed

36
Data base read failed

39
Dynamic allocation failure

40
Caller not TSO user

40
SMSG read failure

41
SMSG find failure

41
SMSG open failure

System action:
The command fails, DFSMScdm processing continues.

User response:
For reason codes 13-32, correct and reissue the command. For all other reason codes, contact IBM Support for assistance.

Detecting CSECT:
GBQSSLM

GBQ9900E **Message number *n* was not found.**

Explanation:
The indicated message number *n* was not found in the message table.

System action:
DFSMScdm execution continues.

Programmer response:
Contact IBM Support for assistance.

Detecting CSECT:
GBQCMSG

Appendix A. Accessibility

Accessible publications for this product are offered through IBM Documentation (https://www.ibm.com/docs).

If you experience difficulty with the accessibility of any z/OS information, send a detailed message to the Contact the z/OS team web page (https://www.ibm.com/systems/campaignmail/z/zos/contact_z) or use the following mailing address.

IBM Corporation
Attention: MHVRCFS Reader Comments
Department H6MA, Building 707
2455 South Road
Poughkeepsie, NY 12601-5400
United States

Notices

This information was developed for products and services that are offered in the USA or elsewhere.

IBM may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

IBM may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not grant you any license to these patents. You can send license inquiries, in writing, to:

IBM Director of Licensing
IBM Corporation
North Castle Drive, MD-NC119
Armonk, NY 10504-1785
United States of America

For license inquiries regarding double-byte character set (DBCS) information, contact the IBM Intellectual Property Department in your country or send inquiries, in writing, to:

Intellectual Property Licensing
Legal and Intellectual Property Law
IBM Japan Ltd.
19-21, Nihonbashi-Hakozakicho, Chuo-ku
Tokyo 103-8510, Japan

The following paragraph does not apply to the United Kingdom or any other country where such provisions are inconsistent with local law: INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

This information could include missing, incorrect, or broken hyperlinks. Hyperlinks are maintained in only the HTML plug-in output for IBM Documentation. Use of hyperlinks in other output formats of this information is at your own risk.

Any references in this information to non-IBM websites are provided for convenience only and do not in any manner serve as an endorsement of those websites. The materials at those websites are not part of the materials for this IBM product and use of those websites is at your own risk.

IBM may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Licensees of this program who wish to have information about it for the purpose of enabling: (i) the exchange of information between independently created programs and other programs (including this one) and (ii) the mutual use of the information which has been exchanged, should contact:

IBM Corporation
Site Counsel
2455 South Road

Poughkeepsie, NY 12601-5400
USA

Such information may be available, subject to appropriate terms and conditions, including in some cases, payment of a fee.

The licensed program described in this document and all licensed material available for it are provided by IBM under terms of the IBM Customer Agreement, IBM International Program License Agreement or any equivalent agreement between us.

Any performance data contained herein was determined in a controlled environment. Therefore, the results obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurements may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

All statements regarding IBM's future direction or intent are subject to change or withdrawal without notice, and represent goals and objectives only.

This information contains examples of data and reports used in daily business operations. To illustrate them as completely as possible, the examples include the names of individuals, companies, brands, and products. All of these names are fictitious and any similarity to the names and addresses used by an actual business enterprise is entirely coincidental.

COPYRIGHT LICENSE:

This information contains sample application programs in source language, which illustrate programming techniques on various operating platforms. You may copy, modify, and distribute these sample programs in any form without payment to IBM, for the purposes of developing, using, marketing or distributing application programs conforming to the application programming interface for the operating platform for which the sample programs are written. These examples have not been thoroughly tested under all conditions. IBM, therefore, cannot guarantee or imply reliability, serviceability, or function of these programs. The sample programs are provided "AS IS", without warranty of any kind. IBM shall not be liable for any damages arising out of your use of the sample programs.

Trademarks

IBM, the IBM logo, and ibm.com are trademarks or registered trademarks of International Business Machines Corp., registered in many jurisdictions worldwide. Other product and service names might be trademarks of IBM or other companies. For a current list of IBM trademarks, refer to the *Copyright and trademark information* at https://www.ibm.com/legal/copytrade.

GC28-3275-00