

directly from level 0 to ML2 tape. (If the data set has already migrated to ML1 before the attribute was set to 0, it migrates to the specified ML2 device, either DASD or tape.) A value of NOLIMIT specifies that the data set migrates to ML1 and is not to migrate to ML2.

If the value of LEVEL 1 DAYS NON-USAGE has been met and the data set still resides on level 0, it will migrate directly to ML2.

The default for this attribute is 60.

The LEVEL 2 DAYS NON-USAGE attribute allows migrations to be directed to cloud storage. It has two values, 0 and NOLIMIT. When NOLIMIT is specified (or defaulted to because blank), the data set will migrate to the ML2 tier based on the value of LEVEL 1 DAYS NON-USAGE. When 0 is specified, the data set will be migrated to the cloud specified in the CLOUDNAME field as long as the PRIMARY DAYS NON-USAGE value is met and the data set still resides on Level 0. The LEVEL 1 DAYSNON-USAGE value does not apply in this case. The default value for LEVEL 2 DAYS NON-USAGE is NOLIMIT.

**Restriction:** DFSMSHsm does not support movement of migration copies from ML1 to cloud storage.

The data set must reside on a volume that is connected to cloud storage. Additionally, the SMS Cloud construct named or CDA provider file must exist and the password for the cloud must be defined to DFSMSHsm.

### Specifying class transition attributes

The class transition attributes allow you to specify:

- When a data set is eligible to transition
- Which copy technique to use to move the data set
- What action to take when there is a serialization error

There are three defined class transition attributes that can be used to specify if and when data sets should transition:

- TIME SINCE CREATION indicates the YEARS, MONTHS and/or DAYS that must elapse relative to the date that a data set was created. If left blank (the default value), this indicates that no transitions should occur based on these criteria.
- TIME SINCE LAST USE indicates the YEARS, MONTHS and/or DAYS that must elapse relative to the date that a data set was last referenced or used. If left blank (the default value), this indicates that no transitions should occur based on these criteria.
- PERIODIC indicates a MONTHLY, QUARTERLY or YEARLY cycle for which a data set should transition. If left blank (the default value), this indicates that no transitions should occur based on these criteria.

TRANSITION COPY TECHNIQUE specifies whether a point in time copy technique should be used. The available parameters are:

- STANDARD (STD)
- FAST REPLICATION PREFERRED (FRP)
- FAST REPLICATION REQUIRED (FRR)
- PRESERVE MIRROR PREFERRED (PMP)
- PRESERVE MIRROR REQUIRED (PMR)
- FC XRCPRIMARY (FCX)

These parameters function as follows:

- STANDARD (STD) specifies that only standard I/O should be used to perform the data movement. This is the default.
- FAST REPLICATION PREFERRED (FRP) specifies that fast replication should be used when possible. If fast replication cannot be used, then it is acceptable to use standard I/O to perform the data movement.
- FAST REPLICATION REQUIRED (FRR) specifies that fast replication is required. If fast replication cannot be used, then the transition fails.

## Other space management considerations

- A sequential extended-format data set that was multiple-stripe when it was migrated could be recalled as a multiple-stripe or single-stripe sequential extended-format data set, depending on the storage class SUSTAINED DATA RATE value and the availability of the required volumes.
- Conversely, a sequential extended-format data set that was single-stripe when it was migrated could be recalled as a multiple-stripe or single-stripe sequential extended-format data set, depending on the storage class SUSTAINED DATA RATE value and the availability of the required volumes.
- A data set that was not sequential extended-format when it was migrated is always recalled as a data set that is not sequential extended-format. DFSMSHsm does not convert a data set that is not sequential extended-format to a sequential extended-format data set through recall processing.
- A sequential extended-format data set can be recalled as a data set that is not sequential extended-format on a non-SMS-managed volume by specifying FORCENONSMS on the RECALL command.
- A data set that was sequential extended-format when migrated is recalled as a non sequential extended-format but still SMS-managed data set if no SMS volumes supporting sequential extended-format data sets are available.

Recall fails if the ACS filter routines are modified to direct a data set that was sequential extended-format when it was migrated to a non-SMS-managed volume.

**Note:** If reblocking is required for a sequential extended-format data set, the reblocking is performed.

## Object storage in the cloud

---

DFSMSHsm can use object storage in the cloud as a destination for migrated data set images. When data movement is offloaded to the storage controller, other management functions are performed directly using the z/OS Client Web Enablement Toolkit. Using object storage in the cloud allows DFSMSHsm to avoid extra processing such as RECYCLE.

## System set up to use the cloud

For DFSMSHsm to use the cloud, you must first set up your system. You can find a full list of the requirements in *z/OS DFSMS Using the New Functions*.

- DASD volumes in a DS8700 or higher with transparent cloud tiering need to be attached to the system. Only data sets that reside on a device with transparent cloud tiering can be migrated to the cloud through DFSMSHsm.
- To configure SMS, create an SMS cloud attribute entry with the same name that was configured in the DS8700, along with the endpoint, and other cloud attributes. Or create a CDA provider file with the same name and cloud attributes inside.

## DASD volumes

Ensure that the first volume in an LSS that other volumes are attached from is attached to the system. Failure to do this can lead to attention messages from the DS8000 being missed.

## SETSYS

When DFSMSHsm is enabled, it reconnects eligible data sets without performing data movement. If SETSYS CLOUDMIGRATION(RECONNECT(NONE)) is in effect, a subsequent migration of a data set that was otherwise eligible to be reconnected, causes the previous migration copy to be deleted and a new migration copy created.

## Cloud password

The SETSYS CLOUD command is used to give the cloud password for the user ID that is defined in the SMS network connection construct to DFSMSHsm. Great care needs to be taken with this password. DFSMSHsm keeps the password in encrypted form for later use. Anyone with access to this password can access the cloud directly and delete the migration copies, thus making DFSMSHsm unable to recall those

Subparameter	Explanation
<b>AUTOREUSE</b>	<b>DUMPCLASS(AUTOREUSE)</b> specifies that when DFSMSHsm initiates the invalidation of a dump copy, the dump volumes are automatically made available for reuse.
<b>NOAUTOREUSE</b>	<b>DUMPCLASS(NOAUTOREUSE)</b> specifies that when DFSMSHsm initiates the invalidation of a dump copy, the dump volumes are marked unavailable for selection by DFSMSHsm. The ADDVOL command can be used to identify to DFSMSHsm that the volume is available for reuse. The use of NOAUTOREUSE is dependent upon using the SETSYS TAPEDELETION option of HSM TAPE for the dump category.

**Defaults:** If AUTOREUSE or NOAUTOREUSE are specified, the default is NOAUTOREUSE when a dump class is being defined for the first time.

If a dump class is already defined and certain characteristics are being changed, and if AUTOREUSE or NOAUTOREUSE are specified, then the previous specification remains unchanged unless the retention period is NOLIMIT. In this case, the dump class is set for NOAUTOREUSE.

**Note:**

1. You can use the DELVOL command with the PURGE parameter to invalidate the only valid dump copy.
2. NOAUTOREUSE must be specified if volumes for this dump class are to leave the confines of the data processing center and the SETSYS TAPEDELETION option of HSM TAPE has been specified for this dump class. The NOAUTOREUSE parameter prevents mount requests for volumes that are not immediately available. These volumes must be identified to DFSMSHsm by issuing the ADDVOL command, but not until they are returned from their off-site storage location. If AUTOREUSE is used in this environment, then DFSMSHsm might call for a specific mount for output of a recently released tape before the tape is again physically present in the data processing center.
3. The disposition of tapes automatically made available for reuse depends on the TAPEDELETION parameter of the SETSYS command. If you are using the TAPEDELETION option of SCRATCH, then the tape is released from DFSMSHsm when invalidated and DFSMSHsm does not know of it to consider it for subsequent use.
4. If you use NOLIMIT, you can use only the NOAUTOREUSE subparameter.
5. AUTOREUSE and NOAUTOREUSE are not applicable when CLOUD subparameter is also designated.

## DUMPCLASS(CLOUD | TAPE): Specifying where the dump copies to reside

**Explanation:** **CLOUD(*cloud\_network\_connection\_name*) | TAPE** is an optional parameter of DUMPCLASS specifying the device category where the dump copies are to be stored.

Subparameter	Explanation
<b>CLOUD(<i>cloud_network_connection_name</i>)</b>	<b>DUMPCLASS(CLOUD(<i>cloud_network_connection_name</i>))</b> specifies the associated volumes are to be dumped directly to the specified cloud object storage. The <i>cloud_network_connection_name</i> is the name of the SMS network connection construct or the CDA provider file (when OA66197 enabled). If the specified name does not match what is in the SMS construct or the CDA provider file (when OA66197 enabled), the DEFINE DUMPCLASS fails.  To remove <b>DUMPCLASS(CLOUD)</b> designation for the dump class, ensure all associated dump copies have been deleted, then specify <b>DUMPCLASS(TAPE)</b> .
<b>TAPE</b>	<b>DUMPCLASS(TAPE)</b> specifies that the associated primary volumes are to be dumped to tape volumes.

- If a data set being recalled is associated with a data set pool, the candidate volumes are selected from the data set pool.
- If the volume from which the data set migrated is part of a volume pool, the candidate volume is selected from the volume pool.
- If a volume is defined in multiple volume pools, the first definition is used. For example, if a data set was migrated from volume VP0001 and is recalled, it is recalled to volume pool SAMPLE1:

```
DEFINE VOLUMEPOOL(SAMPLE1 VOLUMES(VP0001 VP0003))
DEFINE VOLUMEPOOL(SAMPLE2 VOLUMES(VP0001 VP0002 VP0003))
```

- If the volume from which the data set migrated is not part of a volume pool, the candidate volumes are selected based upon the SETSYS RECALL values of ANYSTORAGEVOLUME or PRIVATEVOLUME.

## DUMPCLASS(TAPE | CLOUD): Specifying where the dump copies to reside

**Explanation:** **TAPE | CLOUD(*cloud\_network\_connection\_name*)** is an optional parameter of DUMPCLASS that specifies the device category where the dump copies are stored.

Subparameter	Explanation
<b>TAPE</b>	<b>DUMPCLASS(TAPE)</b> specifies that the associated primary volumes are dumped to tape volumes.
<b>CLOUD(<i>cloud_network_connection_name</i>)</b>	<b>DUMPCLASS(CLOUD(<i>cloud_network_connection_name</i>))</b> specifies that the associated volumes are dumped directly to the specified cloud object storage. The <i>cloud_network_connection_name</i> is the name of the SMS network connection construct or the CDA provider file (when OA66197 enabled). If the specified name does not match what is in the SMS construct or the CDA provider file (when OA66197 enabled), the DEFINE DUMPCLASS fails.  To remove the DUMPCLASS(CLOUD) designation for the dump class, ensure that all associated dump copies are deleted, then specify DUMPCLASS(TAPE).

**Defaults:** If you do not specify this parameter, the default is TAPE for a new dump class, or the previous dump device category for an existing dump class.

**Note:** The following DEFINE DUMPCLASS parameters are not applicable when the dump copy is resides in the cloud object storage:

- AUTOREUSE | NOAUTOREUSE - These settings apply to dump tape volumes.
- DATASETRESTORE | NODATASETRESTORE - Neither parameter settings are applicable to dump copies residing in cloud storage. Data set recovery from full volume dump copy residing in cloud object storage is not supported as of z/OS V2R5.
- ENCRYPTION - These settings are not applicable in transparent cloud tiering.
- FRRECOV(AFM( NO | YES)) - These settings apply to dump tape volumes.
- HWCOMPRESS(NO | YES) - These settings are not applicable in transparent cloud tiering.
- STACK | MAXSTACK, MINSTACK - These settings apply to dump tape volumes.
- TAPEEXPIRATIONDATE - These settings apply to dump tape volumes.
- UNIT(*unitname*) - These settings apply to dump tape volumes.

When the CLOUD(*cloud\_network\_connection\_name*) parameter is specified to an existing dump class, DFSMSHsm does the following:

- Fails the DEFINE DUMPCLASS command if one or more dump tape volumes that are assigned to the class contained part of a valid dump copy. Any dump volumes containing valid data in the class remain unchanged. Any dump volumes that do not contain part of a valid dump copy might become unassigned.

**CLOUD(*cloud\_network\_connection\_name*)**

specifies the name of an SMS construct, or a CDA provider file that describes cloud storage to list the DFSMSHsm containers currently existing in the specified cloud.

**CONTAINER(*ctname*)**

specifies a particular container name within the cloud storage to list the pseudo-directories or prefixes that are found within the requested container. A pseudo-directory is the first part of the object name ending with a forward-slash character (/).

**PREFIX(*objprefix*)**

specifies to list all of the objects found under a specific prefix or pseudo-directory. It is a maximum 44-byte prefix that can match to specific objects contained within the specified container. Fragment A indicates that output can be written to SYSOUT, OUTDATASET, and TERMINAL.

## COPYPOOL: Listing information for each version of a copy pool

**Explanation:** COPYPOOL is a mutually exclusive required parameter in which you can specify a single copy pool name (*cpname*) or no copy pool name, for a list containing all copy pools.

**COPYPOOL**

Specify COPYPOOL to request a list of information for each version of each copy pool that has at least one fast replication backup or dump version.

**COPYPOOL(*cpname*)**

Specify COPYPOOL(*cpname*) to request detailed information for each version of the specified copy pool. This information includes source volume to target volume pairings, DASD versions, dump versions, and catalog information.

**Defaults:** None.

## COPYPOOLBACKUPSTORAGEGROUP: Listing copy pool information for each volume in the specified copy pool backup storage group

**Explanation:** COPYPOOLBACKUPSTORAGEGROUP is a mutually exclusive required parameter that you specify to request copy pool information for each volume in the specified copy pool backup storage group.

Specify COPYPOOLBACKUPSTORAGEGROUP(*cpbsgname*) to request a list of volumes in the copy pool backup storage group that DFSMSHsm has assigned as a target volume. The corresponding source volumes are also listed.

**Defaults:** None.

## DATASETNAME and LEVEL: Listing data set entries

**Explanation:** DATASETNAME and LEVEL are mutually exclusive, required parameters that you specify to request a list of data set entries.

**DATASETNAME(*dsname*)**

is specified to request a data set entry with a specific data set name. For *dsname*, substitute the fully qualified name of the particular data set you want listed. You can specify a data set name of up to 44 characters.

**LEVEL(*qualifier*)**

is specified to request a list of all data set entries that have the same set of initial characters of the data set name. For *qualifier*, substitute the set of initial characters of the data set name for the data sets you want listed. The set of initial characters can contain imbedded periods. The *qualifier* can end with a period if LEVEL is the first keyword on the command. You can specify a *qualifier* of up to 44 characters.

**Defaults:** If you specify DATASETNAME without *dsname*, DFSMSHsm lists all data set entries.

**Note:**

**Defaults:** None.

## Optional parameters of the MIGRATE command for SMS-managed data sets

---

This topic describes the optional parameters of the MIGRATE command.

### **BOTH: Specifying that transition or migration of data sets should be processed**

**Explanation:** **BOTH** is an optional parameter that you use to migrate SMS-managed data sets from a level 0 volume to a migration level 1 or migration level 2 volume, or transition to another level 0 volume. Data sets eligible for migration will be migrated, while data sets eligible for transition only will be transitioned. If a data set is eligible for both migration and transition, it will be migrated.

This parameter can be specified only with MIGRATE VOLUME or MIGRATE STORAGEGROUP command.

**Defaults:** None.

### **CONVERT: Specifying movement of data sets from one volume to another**

**Explanation:** **CONVERT** is an optional parameter that you use to migrate all data sets, or a specific data set, from a level 0 volume to a migration level 1 volume and then immediately recall those data sets to another level 0 volume. You can use this parameter when you want to remove a volume from the system. The automatic class selection routines select the volume to which the data sets should be recalled.

The management class attribute PRIMARY-DAYS-NON-USAGE is not used for a MIGRATE CONVERT request. All eligible SMS-managed data sets are migrated to a migration level 1 volume. Before an SMS-managed data set is migrated, DFSMSHsm determines whether or not the data is eligible to be expired.

**Defaults:** Automatic class-selection routines choose the volume and type of unit to which SMS data sets are recalled.

**Note:**

1. The management class attribute, LEVEL-1-DAYS-NON-USAGE, are not used when processing a MIGRATE CONVERT request. All eligible data sets are migrated to a migration level 1 volume.
2. If you specify the DAYS(*days*) parameter with the CONVERT parameter, the *days* value must be zero. The default is zero, and the only value allowed is zero.

### **CLOUD: Specifying migration of a data set directly to cloud**

**Explanation:** **CLOUD**(*cloud\_network\_connection\_name*) is an optional parameter that is used to specify that a data set migrates from an SMS-managed volume to the specified cloud storage. The *cloud\_network\_connection\_name* is the name of the SMS network connection construct or the CDA provider file (when OA66197 enabled). When *cloud\_network\_connection\_name* is specified, the data set is migrated to the requested cloud storage, regardless of the data set's management class attributes, with the exception of migration not being allowed.

The CLOUD parameter cannot be specified with the following parameters: MIGRATIONLEVEL1, MIGRATIONLEVEL2, and CONVERT.

**Note:**

The following DFSMSHsm SETSYS settings do not apply to CLOUD(*cloud\_network\_connection\_name*):

**COMPACT, COMPACTPERCENT – COMPACT(ALL)**

Migrating a data set to cloud storage ignores any current COMPACT setting. If the data set is being migrated to a cloud object storage that supports transparent cloud tiering compression, then the data

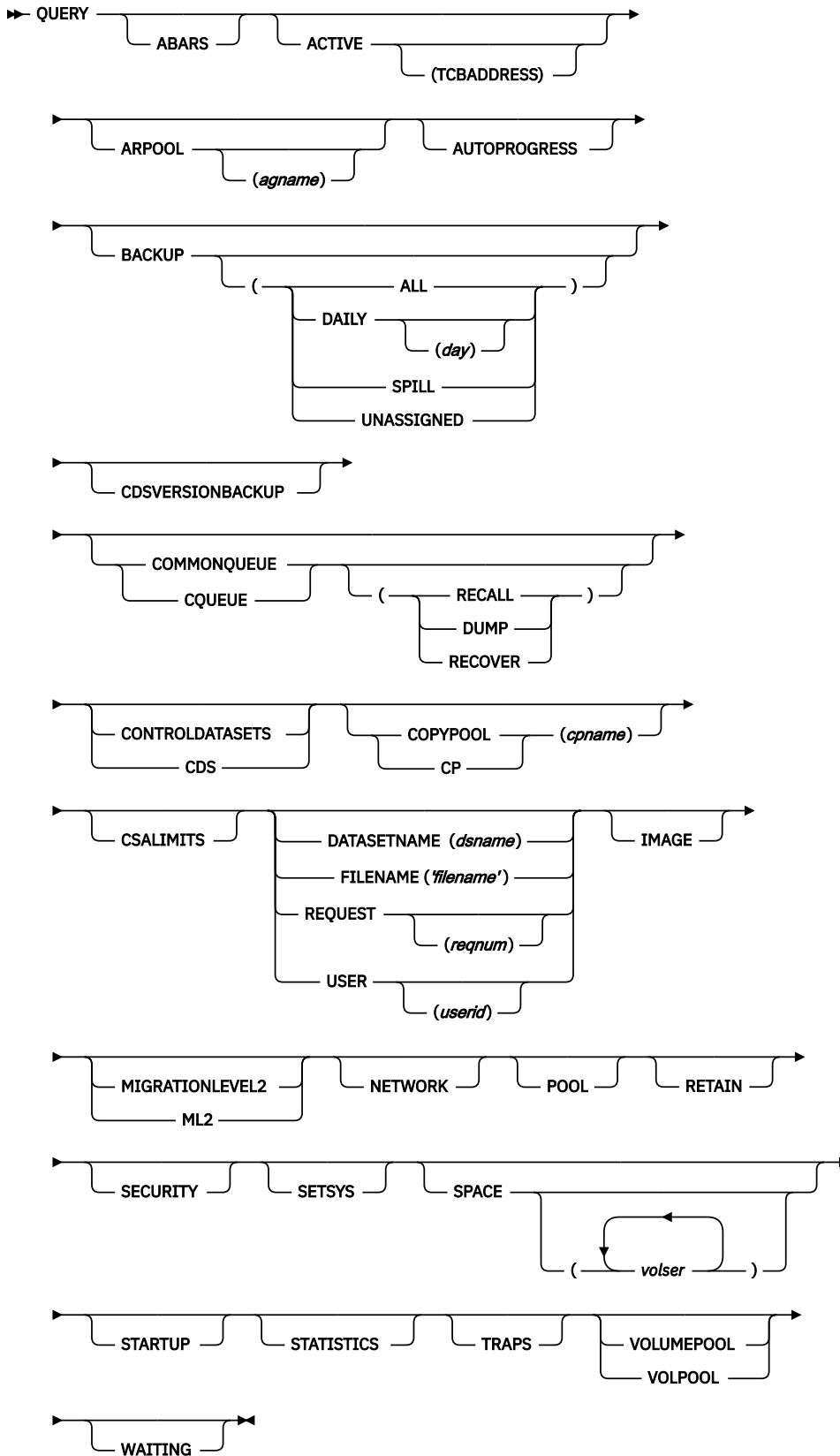
## Chapter 58. QUERY command: Displaying the status of parameters, statistics, and requests

The QUERY command can do the following tasks:

- Determine the DFSMSHsm control parameters (SETSYS).
- Determine the DFSMSHsm control parameters that apply to aggregate backup and recovery (ABARS).
- Request a list of DFSMSHsm statistics (STATISTICS).
- Determine the status of pending DFSMSHsm requests (WAITING).
- Request volume space-use information (SPACE).
- Request control data set space-use information (CONTROLDATASETS).
- Determine whether multiple backup data set support is enabled (CDSVERSIONBACKUP).
- Request the common service area storage limits (CSALIMITS).
- Request the status of each DFSMSHsm volume and data set subtask, each long-running command, and what each active one is doing (ACTIVE).
- Request a list of recall pools (POOL).
- Request a list of volumes defined to be used during aggregate recovery processing (ARPOOL).
- Request a list of the backup parameters and backup volumes (BACKUP).
- Request a list of the source volume serial numbers for any volumes in a specified copy pool that have an outstanding FlashCopy relationship (COPYPOOL).
- Request a list of selected DFSMSHsm requests (DATASETNAME|REQUEST|USER).
- Request a list of the DFSMSHsm address spaces that are active on the z/OS image (IMAGE).
- Request a list of key ranges and associated DASD ML2 volumes, and tape ML2 volumes (MIGRATIONLEVEL2).
- Request a list of the first qualifiers of data sets excluded from space management (RETAIN).
- Determine whether access to DFSMSHsm commands is controlled using the RACF FACILITY class or the AUTH command (SECURITY).
- Determine the parameters specified when DFSMSHsm was started (STARTUP).
- Request a list of trap requests specified with the TRAP command (TRAPS).
- Request a list of current volume pools (VOLUMEPOOL).
- Request a list that indicates the number of volumes that have not been processed and the total volumes eligible to be processed. This list can be used to indicate how much work remains to be done for an automatic function currently in progress (AUTOPROGRESS).
- Request percent full information for the common queue (COMMONQUEUE).
- Request percent full, outstanding recall requests, and recall requests that are currently being processed in the common recall queue (COMMONQUEUE(RECALL)).
- Request outstanding and active dump or recover requests that are being processed in a common dump queue or common recover queue.
- Request information concerning cloud endpoints DFSMSHsm knows about (NETWORK).

For more information about the messages associated with the QUERY command, see [Chapter 77, “Using the QUERY command,”](#) on page 1373.

## Syntax of the QUERY command



**Note:**

1. You must specify at least one of the optional parameters to have anything displayed.



**Defaults:** If you specify USER without *userid*, DFSMSHsm lists requests for all users. If you specify REQUEST without *reqnum*, DFSMSHsm lists information for all requests.

**Note:**

1. DFSMSHsm does not handle partitioned data set members individually. If you specify a partitioned data set with a member name, DFSMSHsm displays the entire partitioned data set.
2. In a common recall, dump, or recover queue environment, recall requests from only the host that is issuing the QUERY DATASETNAME|REQUEST|USER command are returned.

## IMAGE: Displaying information for the DFSMSHsm address spaces active within a single z/OS image

**Explanation:** **IMAGE** is an optional parameter requesting information on the DFSMSHsm address spaces that are active within a single z/OS image. Information displayed includes the host identifier, procedure name used to start the address space, the job identifier, the address space identifier, and the host mode (MAIN or AUX). The information is displayed in message ARC0250I.

**Defaults:** None.

## MIGRATIONLEVEL2: Displaying key ranges and migration level 2 volumes

**Explanation:** **MIGRATIONLEVEL2** is an optional parameter requesting a list of key ranges and the DASD migration level 2 volume associated with each key range as specified with the DEFINE command. This parameter also displays the tape migration level 2 volumes currently selected for use by the migration functions that output to tape if migration tapes are used in the requesting DFSMSHsm host.

**Defaults:** None.

## NETWORK: Displaying cloud endpoint statistics known to DFSMSHsm

**Explanation:** **NETWORK** is an optional parameter requesting DFSMSHsm to output informational statistical data about known cloud endpoints.

**Defaults:** None.

## POOL: Displaying recall pools

**Explanation:** **POOL** is an optional parameter requesting a list of the recall pools as specified with the DEFINE command.

**Defaults:** None.

**Note:** An SMS-managed volume may be displayed on the output listing if the volume was converted from non-SMS-managed to SMS-managed since the last time the pool was defined.

## RETAIN: Displaying data set levels prevented from space management

**Explanation:** **RETAIN** is an optional parameter requesting a list of the first qualifiers of data sets prevented from space management with the SETMIG command. Data set names and volumes prevented from migrating with the DATASETNAME or VOLUME parameters of the SETMIG command are not listed.

**Defaults:** None.

## SECURITY: Displaying the type of command authorization in effect

**Explanation:** **SECURITY** is an optional parameter that you specify to request information about the type of command authorization in effect. When you specify this command, DFSMSHsm issues a message that indicates whether RACF profiles or the DFSMSHsm AUTH command protects DFSMSHsm commands.

**Defaults:** None.

## CLOUDMIGRATION: Specifying the type of migration to CLOUD

CLOUDMIGRATION is an optional parameter specifying that you want DFSMSHsm to attempt to use fast subsequent migration when migrating to the CLOUD.

The following are required and optional keywords for the CLOUD parameter:

### RECONNECT

Data sets eligible for fast subsequent migration can be reconnected to the CLOUD from which they were recalled. A data set can be reconnected if all fast subsequent migration requirements are satisfied. For more information about these requirements, see [Fast Subsequent Migration \(reconnection\) eligibility requirements](#).

### NONE

Data sets are not eligible for fast subsequent migration and are not reconnected to the CLOUD from which they were recalled.

### ALL

All data sets that are eligible for standard migration and satisfy fast subsequent migration eligibility requirements are reconnected to the CLOUD that the data set was recalled from; including data sets that would have otherwise been migrated to an ML1 or ML2 volume.

Alias: CLM

## CLOUD: Specifying CLOUD properties

CLOUD is an optional parameter that allows specification of properties specific to a particular Object Storage that DFSMSHsm uses to store full volume dump and migration copies of data sets. If specified in a DFSMSHsm parmlib member, this parameter is ignored.

The following are required and optional keywords for the CLOUD parameter:

### NAME(*cloud\_network\_connection\_name*)

*cloud\_network\_connection\_name* is the name of a defined SMS Cloud Construct or a CDA provider file. This is a required parameter.

If the named network connection construct does not exist in the current SMS configuration, the command does not succeed.

### CDACREDENTIALS

is an optional parameter that specifying this optional keyword requests that DFSMSHsm obtain the password for the *cloud\_network\_connect\_name* from the CDA (cloud data access) where the password is entered by the security administrator. A *cloud\_network\_connection\_name* previously defined by CCREDS is transitioned to use a password obtained from CDA with the issuance of this command with the CDACREDS keyword.

Also, the reissuance of the command with this keyword for an existing *cloud\_network\_connect\_name* refreshes the stored cloud properties entry with the credentials that are reobtained from CDA. Refreshing these stored entries also have the stored credentials reencrypted. This technique is used to update the DFSMSHsm stored cloud properties when the cloud password is changed by the security administrator or when a cloud network connection name is added to the SMS configuration.

CDACREDS option stores up to 248 *cloud\_network\_connection\_name* entries and CCREDS option stores 7 entries, the combination allows 255 *cloud\_network\_connection\_name* entries to be stored by DFSMSHsm.

Aliases: CDACREDSTORE, CDSCREDS

### CLOUDCREDENTIALS

Specifying this optional keyword requests that DFSMSHsm request the password associated with the Object Storage account from the storage administrator using WTOR. The reply to the WTOR is suppressed on the console. If the password is mixed case, and the system has a dual-case console, enclosing the password in single quotation marks ensures that it is passed as-is to DFSMSHsm. DFSMSHsm will store the password for future requests to the Cloud Storage. The cloud password must

Table 81. Output labels when you request MCDS information for data sets (continued)		
Printer Output Label (OUTDATASET or SYSOUT)	Terminal Label	Description
MIGRATED DATE	MIG	This field contains the date when the data set was last migrated.
TRKS ALLOC	TRKS	If the data set is currently migrated, this field contains the number of tracks allocated for the data set on the primary volume from which the data set migrated. If the data set is recalled, this field is the number of tracks allocated for the recalled data set.
QTY 2K BLKS	2K BLKS	This field contains the size, in 2 KB blocks, of the data set on the migration volume. This field does not apply to tape.  If the quantity exceeds 99,999,999, it is represented in units of K (1000 bytes) instead.
TIMES MIG	TIMES MIG	This field contains the number of times DFSMSHsm has migrated the data set. If migration cleanup has deleted the data set record, this is the number of times DFSMSHsm has migrated the data set since the record was deleted.
DS ORG	DSO	This field contains the type of data set organization: PE (partitioned data set extended) PS (physical sequential), PO (partitioned), DA (BDAM), VS (VSAM), PSL (large format sequential) or *** if the data set organization is unknown.
SDSP DS	SDSP	A YES under this heading indicates that the data set resides in a small-data-set-packing data set.
QTY 16K BLOCKS	16K BLOCKS	This field contains the size, in 16 KB blocks, of the data set on the tape migration level 2 volume. If the data set is recalled, but might be eligible for reconnection during a subsequent migration, this value contains the size, in 16 KB blocks, that the data set would be on the tape migration level 2 volume. This field does not apply to DASD migration volumes, or cloud..
LAST MIG VOLUME	LAST MIGVOL	This field contains the volume serial number of the last tape migration level 2 volume if the data set spans more than one tape volume. *NONE* indicates that the data set does not span more than one tape volume. This field does not apply to DASD.
	CLOUD	SMS Cloud construct name or CDA provider file for target cloud storage.
	CONTAINER	Name of container where the migration copy was placed.
	OBJECT PREFIX	Pseudo-directory name for the migration copy. It is a common unique prefix for all objects that make up a migration copy.
ENCRYPTION TYPE	ENCRYPTION TYPE	This data set is encrypted using the type: '0100'X - AES-256 XTS protected key. It will not be displayed if the data set is not encrypted and the field will contain only ****...
KEYLABEL	KEYLABEL	This data is encrypted with the key label displayed. It will not be displayed if the data set is not encrypted and the field will contain only ****...
A field containing only **** is not applicable (see individual field descriptions in the sample lists).		

Figure 121 on page 1338 is a sample of a printer list from the MCDS for all data sets. If you request information for a specific data set, the list contains only the entry for that data set.

Table 85. Output labels when you request dump class information (continued)

Printer Output Label (OUTDATASET or SYSOUT)	Terminal Label	Description
<b>MINSTACK</b>	MINSTACK	This field indicates the minimum number of dump copies that should be stacked onto a tape before starting another dump task with this dump class. If not specified, the MAXSTACK specified or defaulted value will be used for MINSTACK.
<b>STACK</b>	STACK	This field indicates the maximum number of dump copies to be written to a dump volume in this dump class. The value is set from the STACK or its alias MAXSTACK keyword on the DEFINE DUMPCLASS command.
<b>DUMP DEVCAT</b>	DUDEVCAT	<b>Value Meaning</b> <b>CLOUD</b> Indicates the dumps in the dump class reside in the cloud object storage. <b>TAPE</b> Indicates the dumps in the dump class reside on tapes.
<b>CLOUD</b>	CLOUD	This field contains the name of the SMS cloud network connection construct or the CDA provider file.

Figure 131 on page 1347 is a sample printer list of the dump classes when you specify the DUMPCLASS parameter. If you specify the parameter DUMPCLASS(class), only dump volumes of class are listed.

```

---- DFSMSHsm CONTROL DATASET -DUMP CLASS-BCDS--- LISTING ----- AT 10:14:52 ON 14/03/19 FOR SYSTEM=3090
DUMP   UNIT   AUTO  DATASET  RESET  CLASS  CP  FRR
CLASS  TYPE   REUSE RESTORE  CHANGE DISABLE REQ AVA DAY  FREQ  RETPD  TAPE  VTOC
0DCLAS10 3480  NO    NO       NO    NO    ** YES ** 007  000030  *****  ***  *****
                                     HWCOMP ENCRYPT  ENCTYPE  ICOUNT  RSAKEY/KPWD
                                     NO      NONE   *****  ****   *****
RECOVER
RESET  ZCOMP  MINSTACK  STACK
YES    NO    100      255
---- END OF - DUMP CLASS - LISTING -----

```

Figure 131. Sample Printer List of Dump Classes of Dump Volumes when You Specify DUMPCLASS

Figure 132 on page 1347 is a sample printer list of dump classes when you specify the DUMPCLASS parameter.

```

--- DFSMSHSM CONTROL DATASET -DUMP CLASS-BCDS--- LISTING --- AT 15:55:25 ON 18/10/12 FOR SYSTEM=3090
DUMP   UNIT   AUTO  DATASET  RESET  CLASS  CP  FRR
CLASS  TYPE   REUSE RESTORE  CHANGE DISABLE REQ AVA DAY  FREQ  RETPD  TAPE  VTOC
DCL0   3490  NO    YES      NO    NO    YES YES ** 000  000030  *****  002  *****
                                     HWCOMP ENCRYPT  ENCTYPE  ICOUNT  RSAKEY/KPWD
                                     NO      NONE   *****  ****   *****
RECOVER
RESET  ZCOMP  MINSTACK  STACK  DUMP
YES    NO    001      001  DEVCAT  CLOUD
                                     TAPE *****
----- END OF - DUMP CLASS - LISTING -----

```

Figure 132. Sample Printer List of a specific dump class when you specify the DUMPCLASS parameter

## Dump volumes

Table 87. Output labels when you request dump content information for dump volumes (continued)		
Printer Output Label (OUTDATASET or SYSOUT)	Terminal Label	Description
IDRC	IDRC	<p><b>Value Meaning</b></p> <p><b>Y</b> Volume contains data in the Improved Data Recording Capability format.</p> <p><b>N</b> Volume does not contain data in the Improved Data Recording Capability format.</p> <p><b>**</b> Volume is empty - not assigned the Improved Data Recording Capability format.</p>
LIBRARY	LIB	<p>This field contains the tape library information for the volume. The field can be:</p> <p><b>Value Meaning</b></p> <p><i>library name</i> the library with which the tape volume is associated.</p> <p><b>*NO LIB*</b> the tape volume is not associated with a tape library.</p> <p><b>*ERROR**</b> an error occurs when the library information is retrieved. Check the command activity log for additional messages.</p>
PCT FULL	PCT FULL	<p>This field contains the percentage of the dump volume used by all its dump copies. A value of '100' means the last dump copy spans to another volume. A value of '***' means that the percentage is unknown.</p>
SET OF DUMP VOLSERS	DUMPVOLS	<p>This field contains a list of volume serial numbers for the tape volumes that are used to dump the source volume.</p> <p><b>Note:</b> Only one VTOC copy data set is kept for a given dump copy. The above entries are given for a single volume serial number. The following entries are repeated once for each data set that has been dumped to the dump volume. The values shown represent the data set names as they appear in the data set VTOC entry for the data sets.</p>
SOURCE VOLUME	SOURCEVOL	<p>This field contains the volume serial number of the source volume.</p>
DUMP COPY DATA SET	DUMP COPY DATA SET	<p>This field contains the data set name of the dump copy where the contents are listed below.</p> <p>If DUMP VOLSER = %CLOUD, this field contains the object prefix which is the pseudo-directory name for the full-volume dump copy residing in cloud object store. It is a common unique prefix for all objects that make up a full-volume dump copy.</p>
CLOUD	CLOUD	<p>The name that is defined in the SMS cloud network connection construct or the CDA provider file where the full-volume dump copies reside.</p>
CONTAINER	CONTAINER	<p>This field contains the name of the container.</p>
DATASET NAME	DSN	<p>This field contains the list of data sets on the dumped volume.</p>

Create a RACF (or equivalent) profile to ensure that only authorized users have access to these members.

## Alter configuration file

The CDA configuration file, *config.json*, contains settings that alter CDA behavior. Currently, the only value is related to logging and error capture.

Use the default value, NONE, for the log-level setting. If necessary, DFSMSShm or CDA support requests that this value be changed to assist with problem diagnosis.

## Alter cloud provider definition file

The cloud provider definition file, *IBMCOS.json*, contains fields and values which describe settings and supported operations that are related to the cloud storage provider. There can be multiple provider definition files which might be used to define different cloud storage providers or multiple versions of the same provider (for example, an east and west region of the same provider). The following keys and values are described in detail below:

### name

Required. The name of the cloud provider that is used by the cloud key entry panel and DFSMSShm and must match the file name.

### host

Required. The endpoint URL for the cloud provider.

The multiple endpoints support for TCT TS7700 advanced object store (OA66197) uses a DFSMSdfp CDA support enhancement for the "host" key in the provider file. The usage explanation of this key is in [Provider file in z/OS MVS Programming: Callable Services for High-Level Languages](#).

### port

Required. The endpoint URL port number. If multiple endpoints support for TCT TS7700 advanced object store (OA66197) is enabled, the 'port' key in that TS7700 cloud provider file can be optional if all of URLs in the 'host' values have port number included.

### region

Required. Region for AWS4 authentication models. The name of the region name to be used.

### httpMechanism

Required. Only HTTPS is supported.

### sslVersion

Optional. Valid values are TLSV12, TLSV11, TLSV10, and SSLV3. Set the highest version supported by the cloud storage provider. If no key pair is specified, SSL is used but no security version is sent on requests.

### sslCiphers

Optional. A string value that represents the specification of the cipher suites to be used by SSL. Ensure to remove this key pair, unless a specific cipher suite is required by the cloud storage provider.

### sslKey

Optional. The name of the RACF key ring that holds the Root Certificate Authority certificate for that server and overrides the default virtual key ring name of \*AUTH\*/\*. If multiple endpoints support for TCT TS7700 advanced object store (OA66197) is enabled, the 'sslKey' key in that TS7700 cloud provider file is required unless all of URLs in the 'host' values have sslKey value embedded.

### receiveTimeout

Optional. The number of seconds an open SSL socket waits for incoming requests. Default value is 300.

### sendTimeout

Optional. The number of seconds an open SSL socket waits for outgoing requests. Default value is 300.

## Setting the maximum wait time for disk controller resource during transparent cloud tiering full volume dump

You can set the maximum wait time in seconds to get a disk controller cloud data movement thread lock. Full volume dump or restore processing for a volume will terminate if a disk controller cannot be reserved within the allotted time. When the wait time is exceeded, message ARC0650I is issued for dump, message ARC0752I is issued for restore, and full volume processing is terminated.

The following PATCH can be used to tune the maximum wait time:

```
PATCH .DGCB.+26 X'nnnn'
```

Where *nnnn* is the time in seconds.

If this value is set to X'7FFF', no interval checking will be executed and full volume dump and restore for a volume will not be terminated.

The default value is X'0258' (600 seconds).

## Allowing CLOUD CDACREDENTIALS and full volume dump restore using an object storage cloud (OA60278)

SETSYS CLOUD(NAME(cloud\_network\_connection\_name) CDACREDENTIALS) option specifies DFSMSShsm obtain the password for the cloud\_network\_connection\_name from the CDA (z/OS cloud data access) where the password is entered by the security administrator.

When CLOUD CDACREDENTIALS and transparent cloud tiering (TCT) full volume dump restore is enabled, DFSMSShsm creates a new CDS type S Cloud Provider (XC) record. The key is the constant XC followed by a dash (-), and the name of the cloud provider.

The following change is necessary to enable CLOUD CDACREDENTIALS and TCT full volume dump restore:

When the CDACREDS and TCT full volume dump support has been installed on all systems in the HSMplex, include the following patch in the DFSMSShsm's parmlib member ARCCMDxx for every DFSMSShsm host, and restart DFSMSShsm. Specify this patch before issuing new command parameters that require new support.

```
PATCH .ARCCVT.+5D7 BITS(1.....)
```

To disable this enhancement, clean up the new TCT environment (for example, delete any cloud dump copies and cloud provider records), then remove the enablement patch or specify the following patch in the ARCCMDxx member for every DFSMSShsm host in the HSMplex and restart DFSMSShsm.

```
PATCH .ARCCVT.+5D7 BITS(0.....)
```

With APAR OA60278, the patch is disabled by default.

## Allowing multiple endpoints support for TCT TS7700 advanced object store (tape object) (OA66197)

When multiple endpoint support for TCT TS7700 advanced object store is enabled, DFSMSShsm allows you specifying multiple endpoints in a CDA provider file for TCT TS7700 advanced object store and provides failover function. If one endpoint failed with HWTHCONN or HTTP 500-511 Internal Server Error, DFSMSShsm can get a new endpoint for this cloud and retry the failed cloud process.

The following changes are necessary to enable multiple endpoints support for TCT TS7700 advanced object store:

First, you need to specify the configurations previously in the SMS network connection construct in a CDA provider file with keys including 'host', 'port', 'tctType', 'sslKey', 'sslVersion'. The 'host' key allows specifying multiple end points within 'preferred' or 'backup' JSON objects.

```

"host": {
  "preferred": [
    "sample.url.1",
    "sample.url.2"],
  "backup": [
    "https://sample.url.3:8000,*AUTH",
    "https://sample.url.4"]
},
"port": "8000",
"tctIdentity": "userid",
"tctType": "TAPE-OBJECT",
"sslKey": "*AUTH*/*",
"sslVersion": "TLSV12"
}

```

A similar sample CDA provider file with required DFSMSdss JSON key/value pairs can be found in /usr/lpp/dfsms/dss/samples where 'cloudName', 'enableDFSMSdss', and 'supportedOperations' are not required for DFSMSShsm. That is provided as a simple example; the files in /usr/lpp/dfsms/cda/ should be used as prevailing examples for future enhancements.

The keys, 'host', 'tctIdentity', 'tctType' and 'sslVersion' are required. 'port' and 'sslKey' are optional only when all of URLs specified in 'host' have them embedded. All the keys and values are case-sensitive.

This support needs CLOUD CDACREDENTIALS and TCT full volume dump restore being enabled through their patch, i.e.

```
PATCH .ARCCVT.+5D7 BITS(1.....)
```

When the CDACREDS, TCT full volume dump, and multiple endpoints support have been installed on all systems in the HSMplex, include the following patch in the DFSMSShsm's parmlib member ARCCMDxx for every DFSMSShsm host, and restart DFSMSShsm.

```
PATCH .ARCCVT.+5D7 BITS(1.1.....)
```

After DFSMSShsm restarts, issue SETSYS CLOUD(NAME(*cloud\_name*) CDACREDENTIALS) on one DFSMSShsm host. If 'tctType' in the provider file is 'TAPE-OBJECT', this new support for this cloud will be enabled after creating or updating the cloud provider record based on the corresponding CDA provider file. If the provider file is empty, or the 'tctType' is 'TCT', DFSMSShsm will continue to search for clouds definition in SMS network connection constructs. Then issue SETSYS CLOUD(NAME(*cloud\_name*) REFRESH) on all other DFSMSShsm hosts that will creates or updates the definition of this cloud on all hosts.

To disable this support, issue SETSYS CLOUD(NAME(*cloud\_name*) REFRESH) on all other DFSMSShsm hosts, and then specify the following patch in the ARCCMDxx member for every DFSMSShsm host in the HSMplex and restart DFSMSShsm.

```
PATCH .MCVT.+5D7 BITS(..0.....)
```

With APAR OA66197, the patch is disabled by default where SMS network connection construct will be used as the source for the tape object cloud definition.

## Setting the maximum retry times for retrieving a new endpoint during failover process of multiple endpoint support for TCT TS7700 advanced object store (OA66197)

You can set the maximum retry times of getting a new endpoint for a TCT TS7700 advanced object store which is defined using CDA provider file. Multiple endpoint support for TCT TS7700 advanced object store allows users specifying multiple endpoints in a CDA provider file. If one endpoint failed, DFSMSShsm can get another new endpoint and retry the failed cloud process. When there are no more endpoints available, the message ARC1593I is issued. When the maximum retry times is reached or there are no more endpoints available, the corresponding cloud process will continue with the last failed endpoint.

```
PATCH .MCVT.+5DC X'nn'
```



The default value is X'08' (8 times of RETRY, total 9 endpoints can be used).

Optionally, users can dictate the preference DFSMSHsm uses when connecting to TCT TS7700 endpoints marked as 'Preferred', or 'Backup' in the CDA provider file with the following:

```
PATCH .MCVT.+24F BITS(. . . . .1)
```

The default is OFF, meaning DFSMSHsm will only use the endpoints dictated by the system symbol TCTREGION=PROD | DR (Where PROD indicates to use Preferred endpoints, and DR indicates to use Backup endpoints). When turned ON, DFSMSHsm may use both types of endpoints (Preferred or Backup), but will favor the type indicated by system symbol TCTREGION=PROD | DR.

## Allowing cloud credentials provisioned from z/OS CDA (cloud data access) to be used where the crypto express card in the processor is not installed

You might want to use the CDA support, but do not have a crypto express card that is installed in the processor. The patch below can be set to indicate that it is accepted that the cloud credentials are less protected by not having the encryption key that is wrapped by the main AES key in the crypto express. By patching this flag, it indicates that you can have the encryption key stored in the clear in the ICSF CKDS.

To request allowing encryption key to be stored in the clear in the ICSF CKDS, issue the following PATCH command:

```
PATCH .MCVT.+597 BITS(. . . . .1.)
```

The patch to revert this option is:

```
PATCH .MCVT.+597 BITS(. . . . .0.)
```

## z/OS UNIX file backup copy data set naming technique Version 2

DFSMSHsm normally creates unique data set names for its z/OS UNIX file backup data sets that uses the form: *prefix.function.Tcccch.user1.user2.Xydd* Where,

*prefix* is the backup or migration-defined prefix.

*function* is BACK.

*Tcccch* is a timestamp.

*user1* is the last 8 characters of the last directory in the absolute path for the file.

*user2* is the first 8 characters of the file name.

*Xydd* is a date.

When creating backups of z/OS UNIX files, DFSMSHsm uses up to 8 characters from the end of the name of the lowest directory for the *user1* qualifier, and up to 8 characters from the file name for the *user2* qualifier. This can be problematic when creating backups of files that use the NEWNAME keyword with DATE keyword that has the same first 8 characters in the file name when they are all in the same directory. That is because the *user1* and *user2* qualifiers are the same as other backup copy names, and the only differentiator is the timestamp.

An alternate naming technique for z/OS UNIX file backups might be requested when specifying the NEWNAME keyword with the DATE keyword (or **-N** with **-D**), where the *user1* and *user2* qualifiers are derived from the DFSMSHsm internal key that is associated with the z/OS UNIX file name. This enhanced functionality might be enabled by the following PATCH:

```
PATCH .ARCCVT.+597 BITS(. . . . .1)
```

The functionality might be disabled, resulting in the z/OS UNIX file backup copy data set name utilizing the original method for choosing the *user1* and *user2* qualifiers by the following PATCH:

```
PATCH .ARCCVT.+597 BITS(. . . . .0)
```

Table 3. Entries that pass error codes to ARCERP (continued)

Error Code	Process Level	Description of Problem
400	Debug	Input parameter contains a value that is not valid. The parameters are the wrong length.
<b>ARCDTVSV</b>		
400	Debug	OEVSE pointer is zero.
401	Debug	MVT pointer is 0.
<b>ARCDUDVL</b>		
4	Debug	I/O error reading or writing DVL record or error adding the volume to RACF.
4nn	Debug	Parameter list is not valid.
<b>ARCDUUM</b>		
4nn	Debug	Parameter list is not valid.
EIOPTION	Debug	Called each time that ARCDUUM is entered when this module has been patched to request debug messages. (From module ARCDIUM1.)
EIOPTION	Abend	ARCDUUM returns an option to DFSMSdss that is not valid. (From module ARCDIUM2.)
EIOPTION	Abend	The DDNAME passed to this installation exit does not match any of the DDNAMEs that DFSMSshsm has recorded in the output MVT records. (From module ARCDIUM3.)
EIRETCOD	Debug	Called each time that ARCDUUM is exited when this module has been patched to request debug messages. For an explanation of EIOPTION and EIRETCOD (from module ARCDIUM4), see <i>z/OS DFSMSdss Storage Administration</i> .
98	Debug	Volume count in DGN record invalid.
<b>ARCDVBEG</b>		
4nn	Debug	Parameter list is not valid.
<b>ARCDVCLN</b>		
4nn	Debug	Parameter list is not valid.
900	Debug	The dump volume processing ends abnormally.
<b>ARCDVOL</b>		
4nn	Debug	Parameter list is not valid.
Return code from DVL read	Abend	Error reading DVL record.
<b>ARCEPCAC</b>		
4nn	Debug	Parameter list is not valid.
<b>ARCESTAE</b>		
nn	Debug	The SDWA abend code is not a X'37' type, and the force re-entry flag is on.

Table 3. Entries that pass error codes to ARCERP (continued)

<b>Error Code</b>	<b>Process Level</b>	<b>Description of Problem</b>
<b>ARCZACER</b>		
4nn	Debug	Parameter list is not valid.
<b>ARCZALAT</b>		
8	Debug	Alternate tape not allocated.
16	Debug	GETMAIN failed for ALT MVT.
20	Debug	Failure checking STGCLASS.
4nn	Debug	Parameter list is not valid.
<b>ARCZAL2V</b>		
4nn	Debug	Parameter list is not valid.
<b>ARCZAPF</b>		
4nn	Debug	Parameter list is not valid.
<b>ARCZBDST</b>		
8	Debug	Greater than 5 I/O errors.
10	Debug	DVL record positioning fails.
52	Debug	Failed to obtain storage for dump volume table.
<b>ARCZCAT</b>		
400	Debug	Parameter list is not valid.
<b>ARCZCDAI</b>		
4nn	Debug	Parameter list is not valid.
<b>ARCZCDQR</b>		
4nn	Debug	Parameter list is not valid.
<b>ARCZCELL</b>		
8	Snap	A double FREECELL was attempted.
<b>ARCZCLNI</b>		
400	Debug	Parameter list is not valid.
<b>ARCZCKES</b>		
4nn	Debug	Parameter list is not valid.
<b>ARCZCKST</b>		
4nn	Debug	Parameter list is not valid.
<b>ARCZCOMP</b>		
400	Debug	Error in parameter list. Macro ID or DSNAME pointer is not valid.
<b>ARCZCP31</b>		
4nn	Debug	Parameter list is not valid.
<b>ARCZCDP</b>		

Table 112. MCVT—Management Communication Vector Table (continued)

Offsets Decimal (Hex)	Type	Length	Name	Description	
	1... ..		MCVTF_ALLOW_ARC1334	When set to 1, issue ARC1334I file not backed up because not changed message.	
	.1... ..		MCVTF_SUPP_UNIX_ICH70001I	When set to 1, suppress RACF messages for UNIX requests.	
	..1. ....		MCVTF_ALLOW_ARC1426	When set to 1, ARC1426I messages for files excluded from processing (EXCLUDE list criteria) are issued.	
	...1 ....		MCVTF_CLOUD_TRACE	When set to 1, threads checking and reservation traces are issued.	
	.... xx..		Reserved		
	.... ..1.		MCVTF_CTL_FIXUFN	Enhanced BDELETE/EXPIREBV	
	.... ....1		MCVTF_TCT_ENDPOINT_SELECT_BOTH	OFF = Default. OFF = Use only PREFERRED when TCTREGION=PROD and only use BACKUP when TCTREGION=DR, but never allow mixing of the two when selecting an endpoint.	
592	(250)	ADDRESS	4	MCVTMTB	Address of the migration task control block.
596	(254)	CHARACTER	8	*	The next 8 bytes contain addresses of first and last level 2 DASD MVT entries:
596	(254)	ADDRESS	4	MCVTML2H	Address of the first level 2 DASD MVT entry.
600	(258)	ADDRESS	4	MCVTML2T	Address of the last level 2 DASD MVT entry.
604	(25C)	FIXED	4	MCVTRDKN	The next 4 bytes contain information on how often the MCDS key is recorded in the MCR during the automatic secondary space management. It is also used to determine how often DFSMSShm resources should be freed and reacquired when held for extended periods of time.
608	(260)	ADDRESS	4	MCVTPUUT	Address of pseudo user unit table if a user-specified user unit table does not exist.
612	(264)	FIXED	2	MCVTLC80	The default amount of data which represents 100% of a 3480/3480X tape volume. The value 216 when multiplied by 1024 equals 226 MB, which is the capacity of a 3480/3480X tape volume.
614	(266)	FIXED	1	MCVTTU80	The default value for SETSYS TAPE UTILIZATION for a 3480/3480X tape volume.
615	(267)	FIXED	1	MCVTPNUM	Maximum repoint count for 3590 after point failure.
616	(268)	ADDRESS	4	MCVTMVQS	Address of the last MVT on the MVT chain at the time DFSMSShm initialization ended.
620	(26C)	ADDRESS	4	MCVTRLES	Address of the RLE or RLE chain at the time DFSMSShm initialization ended.
624	(270)	ADDRESS	4	MCVTVACH	Address of the first in-storage volume activity count record.
628	(274)	ADDRESS	4	MCVTVACT	Address of the last in-storage volume activity count record.
632	(278)	FIXED	4	MCVTTMRT	Maximum number of tape recall tasks.
636	(27C)	FIXED	2	MCVTRTRY	Number of retries ARCRCTL will try to get a volume for recall before notifying the operator.
638	(27E)	FIXED	2	MCVTRTM1	Frequency of the retry interval, in minutes (see MCVTRTRY).
640	(280)	FIXED	2	MCVTRTM2	Delay in seconds before rescan of recall queue when waiting for the possibility of another recall to arrive that will use the same tape that is already mounted.
642	(282)	BITSTRING	1	*	Reserved
643	(283)	BITSTRING	1	MCVTFDIS	This byte contains the following disaster backup processing flags:

Table 112. MCVT—Management Communication Vector Table (continued)

Offsets Decimal (Hex)	Type	Length	Name	Description
1456 (5B0)	SIGNED	4	MCVTMSTM	Minimum time between MIGRATE SG() command with DAYS(0) or MOVE parameter (binary number in seconds).
1460 (5B4)	SIGNED	4	MCVT_ADECD_PTR	Address of cloud information area for empty container deletion processing.
1464 (5B8)	SIGNED	4	*(2)	Reserved for service.
1472 (5C0)	ADDRESS	4	MCVT_DVGCB_PTR	Address of Dynamic Volume global control block
1476 (5C4)	ADDRESS	4	MCVT_FRGCB_PTR	Address of fast replication global control block.
1480 (5C8)	FIXED	2	MCVTFUIM	Controls tracing of the fast replication user-interface module. When set to 1, ARCERP is called each time ARCFUIM is entered. When set to 2, ARCERP is called each time ARCFUIM is entered and exited.
1482 (5CA)	FIXED	1	MCVT_MTDSR	Maximum number of fast replication tape recover tasks (0-64).
1483 (5CB)	FIXED	1	MCVT_MRD_MAX_TASKS	Max tape DS Recover tasks.
1484 (5CC)	ADDRESS	4	MCVT_CPCTS_TCB	Pointer for TAPECOPY data movement task.
1488 (5D0)	ADDRESS	4	MCVT_CATBU_TCB	Pointer for ARCCATBU task.
1492 (5D4)	CHARACTER	4	MCVT_TRACEFLG	Trace flags plus
			MCVTF_TRTTOC	When set to 1, enable TTOC debug traces
			1... ..	
			MCVTF_AUDE45	When set to 1, enable AUDIT ERR45.
			.1... ..	
			MCVTF_TVT_NSA	When set to 1, tasks wait during TVT rebuild
			..1. ....	
			MCVTF_MCBR_IS	When set to 1, allow MCBR insert date time
			...1 ....	
			MCVTF_CAT_RSTOR_VS	Enable cataloging of a single-volume VSAM data set restored from dump
			.... 1..	
			MCVTF_WEBTKDBG	Enable Web Toolkit Verbose messages
			.... ..1..	
			MCVTF_WEBTKDBGU	Enable items that are normally redacted to be logged
			.... ..1.	
			.... ...X	*
1495 (5D7)	BITSTRING	1	*	This byte defines startup patch enablement flags.
			MCVTF_TCTFVD	When set to 1, enable TCT full volume dump and CDACREDS new function.
			1... ..	
			MCVTF_MULEP_TO	When set to 1, enable multiple endpoints support for Tape-Object cloud
			..1. ....	
			...	*
			...X xxxxx	Reserved startup patch enablement flags
1496 (5D8)			.... ...x	*
			.... ...x	Reserved
1500 (5DC)	FIXED	4	*(4)	Reserved.
1500 (5DC)	FIXED	1	MCVT_EPTRYNUM	The maximum retry number when requesting cloud endpoint
1501 (5DD)	FIXED	1	*(3)	Reserved
1504 (5E0)	FIXED	4	*(3)	Reserved
1516 (5EC)	ADDRESS	4	*(10)	Reserved.

Table 112. MCVT—Management Communication Vector Table (continued)

Offsets Decimal (Hex)	Type	Length	Name	Description
1516 (5EC)	ADDRESS	4	MCVT_CDSBU_TCB	Pointers for CATBE or CATBE tasks: 1-4 for the MCDS 5-8 for the BCDS 9 for the OCDS 10 for the journal.
1556 (614)	CHARACTER	24	*	Reserved.
1556 (614)	ADDRESS	4	MCVT_NET_CACHE	Head anchor of all Cloud end points
1560 (618)	CHARACTER	20	*	Reserved
1580 (62C)	CHARACTER	20	MCVTEDMQ	Event Driven Migration Quiesce control block information.
1580 (62C)	BITSTRING	2	MCVTEDMQ_FLAG	Flags for Event Driven Migration Quiesce.
			MCVTF_EDMQ_TW1	When set to 1, time window 1 is valid.
			MCVTF_EDMQ_TW1_CROSSMIDNIGHT	When set to 1, time window 1 crosses midnight.
			MCVTF_EDMQ_TW2	When set to 1, time window 2 is valid.
			MCVTF_EDMQ_TW2_CROSSMIDNIGHT	When set to 1, time window 2 crosses midnight.
			MCVTF_HEDM	When set to 1, hold Event Driven Migration indefinitely.
1582 (62E)	CHARACTER	2	*	Reserved.
1584 (630)	FIXED	4	MCVTEDMQ_TW1_START	Start time of window 1.
1588 (634)	FIXED	4	MCVTEDMQ_TW1_END	End time of window 1.
1592 (638)	FIXED	4	MCVTEDMQ_TW2_START	Start time of window 2.
1596 (63C)	FIXED	4	MCVTEDMQ_TW2_END	End time of window 2.

The [Table 113 on page 303](#) area is based on the address of MCVT\_CLD@ and contains Global Cloud control block information about the Cloud servers that we know about.

Table 113. MCVT\_CLD@.

Offsets Decimal (Hex)	Type	Length	Name	Description
0 (0)	STRUCTURE	*	MCLD	
0 (0)	CHARACTER	8	MCLD_ID	Header portion
0 (0)	CHARACTER	12	MCLD_HDR	Control block eyecatcher
8 (8)	SIGNED	2	MCLD_ENTRY#	Number of cloud entries
10 (A)	BITSTRING	2	MCLD_FLAGS	Flags
12 (C)	STRUCTURE	116(7)	MCLD_ENTRY(*)	Cloud name/pw entries
12 (C)	CHARACTER	30	MCLD_NM	cloud_network_connection_name
42 (2A)	UNSIGNED	2	MCLD_NM#	cloud_network_connection_name length
44 (2C)	BITSTRING	4	MCLD_FLG	Flags for entry
			MCLD_VALID	ON-This entry is valid
			1... ..	
48 (30)	STRUCTURE	80	MCLD_PW_	Encrypted Password area
48 (30)	CHARACTER	4	MCLD_PW_PRE	Prefix area
52 (34)	CHARACTER	64	MCLD_PW_PW	Password
116 (74)	SIGNED	2	MCLD_PW_PW#	Length of password

Table 113. MCVT\_CLD@. (continued)

Offsets Decimal (Hex)	Type	Length	Name	Description
118 (76)	CHARACTER		*	
842 (338)	CHARACTER	28	MCLD_SUFFIX	Cloud suffixes
842 (338)	CHARACTER	4	MCLD_CONT_SUFFIX(7)	Array of cloud suffixes
852 (354)		0	MCLD_END	End of MCLD base

The MCLD extension (MCLDX) contains global control block information about Cloud servers that are defined to DFSMSHsm with passwords provisioned from z/OS CDA (SETSYS CLOUD CDACREDS). This extension supports up to 255 different cloud servers. Each cloud provider name is further defined to have specific cloud properties for each DFSMSHsm function supporting cloud. It supports up to 8 functions. Currently supports: Slot 1 is Migration, Slot 2 is Dump.

Table 114. MCLDX

Offsets Decimal (Hex)	Type	Length	Name	Description
0 (0)	STRUCTURE	*	MCLDX	
0 (0)	CHARACTER	12	MCLDX_HDR	Header portion
0 (0)	CHARACTER	8	MCLDX_ID	Control block eyecatcher
8 (8)	SIGNED	2	MCLDX_ENTRY#	Highest entry used
10 (A)	CHARACTER	14	*	Unused
24 (18)	STRUCTURE		MCLDX_ENTRY(255)	Entries
24 (18)	CHARACTER	30	MCLDX_NM	Cloud network connections
54 (36)	UNSIGNED	1	MCLDX_NM#	Cloud network connection name length
55 (37)	BITSTRING	4	MCLDX_FLAGS	Flags
			MCLDXF_VALID	ON-Cloud entry valid
			MCLDXF_PW_CDA	ON- Password from CDA
			*	Reserved
			MCLDXF_CDATAPE	ON-Tape-Object cloud defined with CDA provider file
			*	Unused
59 (3B)	CHARACTER	80	MCLDX_CLDPW	Password area
59 (3B)	CHARACTER	16	MCLDX_CLDPW_VECTOR	Init vector area
75 (4B)	CHARACTER	64	MCLDX_CLDPW_PW	Encrypted password
139 (8B)	UNSIGNED	1	MCLDX_FUNC#_MAPPED	High function mapped
Each entry corresponds to a specific DFSMSHsm function.				
Slot 1 – Migration				
Slot 2 – Dump				
140 (8C)	STRUCTURE	232(8)	MCLDX_DATA(8)	Cloud provider/function entry
140 (8C)	BITSTRING	2	MCLDX_DFLAGS	Function data entry flags
			MCLDXF_DVALID	ON- Function data is valid
			*	Unused
142 (8E)	UNSIGNED	1	MCLDX_FUNC	Number value of function

Table 115. MCVT Data Area Cross-Reference Table (continued)

Name	Hex Offset	Hex Value	Struct Level
MCVTF_MQ	297	20	3
MCVTF_MULEP_TO	5D7	20	3
MCVTF_TCT_ENDPNT_SELECT_BOTH	24F	01	4
MCVTF_NIJ_DISABLE	3D5	10	3
MCVTF_NO_CAPTURE_UCB	286	01	4
MCVTF_NOEXCL_NSPLOCK	3D5	01	3
MCVTF_NO_MSG30I	3D5	40	3
MCVTF_NO_PARTREL_SM_COMP_DS	287	04	4
MCVTF_NO_RECOV_TAPE_OPT	53	02	4
MCVTF_NO_UPDT_MIG	4C3	08	3
MCVTF_NOCHK_DEV	4F1	01	3
MCVTF_NOENQ_GDG	4C3	02	3
MCVTF_NOMIGALTSYNC	196	20	3
MCVTF_NOTIFY_CLONE	3C3	01	3
MCVTF_OCDS	4F3	20	3
MCVTF_OMVS_DUBBED	24E	40	4
MCVTF_ORDER_OF_PRIORITY_ENABLE	596	01	3
MCVTF_PCOMP	595	80	3
MCVTF_PERF_TS	D8	40	4
MCVTF_PRESEL_LIB_TAPE	287	08	4
MCVTF_PROCESS_EMPTY	287	20	4
MCVTF_PROCESS_UNDEF	287	10	4
MCVTF_PROHIBIT_LIST_DSN	286	02	4
MCVTF_PROVX	4C3	04	3
MCVTF_RCLFBID	597	80	3
MCVTF_RCLPROC_OTHERMWE	C9	10	4
MCVTF_RCVFBID	597	40	3
MCVTF_RECREATE_CONTAINER	287	80	4
MCVTF_RECREATE_CONTAINER_DMP			
MCVTF_RETPD_CHG	1B5	04	3
MCVTF_RNAMEDSN	4F2	01	3
MCVTF_RPEXT	3D5	20	3
MCVTF_RTТА_MARKFULL_NO	53	01	4
MCVTF_SERLZOK	4F2	04	3



Table 115. MCVT Data Area Cross-Reference Table (continued)

Name	Hex Offset	Hex Value	Struct Level
MCVTUSR2	3DC		2
MCVTUSR3	3E0		2
MCVTUSR4	3E4		2
MCVTUUDT	1D0		2
MCVTVACH	270		2
MCVTVACT	274		2
MCVTVBUF	3BD		2
MCVTVSAH	104		2
MCVTVSAT	108		2
MCVTVSCR	3D6		2
MCVTVSLK	50		3
MCVTVSQH	160		2
MCVTVSQT	164		2
MCVTVTLK	38F		2
MCVTVLIM	12C		2
MCVTVLST	4E0		2
MCVTXMEM	432		3
MCVTXTTC	1BC		2
MCVTYBDE	313		2
MCVTYBUN	300		2
MCVTYDCB	240		2
MCVTYGCB	4C4		2
MCVTYMDE	314		2
MCVTYMUN	308		2
MCVTYPCT	1B6		2
MCVT4FLG	294		2
MCVT80MX	EC		2
MCVT_EPTRYNUM	5D8	2	
MCVT_NET_CACHE	614		

# Chapter 64. XC - Cloud Provider Record

The cloud provider record (XC) is a migration control data set record that describes cloud provider related information for each DFSMSShsm supported cloud function.

Cloud provider name records are 2040 bytes long.

The record type is S.

The key for a type S cloud provider name record is the constant XC followed by a dash (-), and the name of the cloud provider. An example of the key used with a S cloud provider name record for provider IBMCLLOUD is:

```
FIXCDS S XC-IBMCLLOUD
```

Table 182. XC - Cloud Provider Record

Offsets Decimal (Hex)	Type	Length	Name	Description
0 (0)		44	MCK	Cloud provider record – The key for a type S cloud provider properties record is the constant XC followed by a dash (-), and the name of the cloud provider appended with blanks.
44 (2C)		20	MCH	Control data set record header. (See MCK for details.)
64 (40) 0 (0)	STRUCTURE	1976	XCPRD	Data portion of the cloud provider properties record
The Cloud provider record contains global control block information about Cloud servers that were defined to DFSMSShsm with the SETSYS CLOUD(NAME(<cloudname>) CCREDS   CDACREDS). Each cloud provider name is further defined to have specific cloud properties for each DFSMSShsm function supporting cloud. Supports up to 8 functions. Currently supports Slot 1 – Migration, Slot 2 – Dump				
64 (40) 0 (0)	STRUCTURE	120	XCPR_HDR	Common/header data
64 (40) 0 (0)	UNSIGNED	1	XCPR_NM#	Cloud provider name length.
65 (41) 1 (1)	UNSIGNED	1	XCPR_FUNC#	Number of functions supported when record was created.
66 (42) 2 (2)	CHARACTER	2	*	Unused.
68 (44) 4 (4)	BITSTRING	4	XCPR_FLAGS	Flags
			XCPRF_VALID	ON- Record valid
			XCPRF_CDA_PW	ON- Password from z/OS CDA. OFF- Password from WTOR.
			XCPRF_PW_WTO	ON- Password from WTOR
			XCPRF_CDA_TAPE	ON- Tape-Object cloud defined with provider file.
			*	Reserved
/* Password area for when PW_WTOR is set (CCREDS) */				
72 (48) 8 (8)	STRUCTURE	80	XCPR_CLDPW	Encrypted password area.
72 (48) 8 (8)	CHARACTER	4	XCPR_CLDPW_PRE	Password prefix area.
76 (4C)	CHARACTER	64	XCPR_CLDPW_PW	Encrypted password
140 (8C)	UNSIGNED	2	XCPR_CLDPW_PW#	Length of password.
142 (8E)	CHARACTER	10	*	Reserved.
/* Password area for when PW_CDA is set (CDACREDS) */				
72 (48) 8 (8)	STRUCTURE	80	XCPR_CLDPW_CDA	Encrypted password area.

## System action

Processing of the data set fails. DFSMSHsm processing continues.

## Programmer response

Determine if the DFSMSHsm copy of the data set is corrupted.

## Source

DFSMSHsm

---

**ARC1330I** DATA SET NOT CATALOGED, AND VOLUME NOT SPECIFIED

## Explanation

The data set identified in message ARC1001I is not cataloged, and the VOLUME parameter was not specified. If the data set is not cataloged, the VOLUME parameter must be specified.

## System action

The backup operation ends. DFSMSHsm processing continues.

## Programmer response

Reissue the command with the VOLUME parameter specified.

## Source

DFSMSHsm

---

**ARC1590** CLOUD *cloud\_name* ENDPOINTS AND STATISTICS

## Explanation

DFSMSHsm is gathering statistics on usage of the given *cloud\_name* for output.

## System action

DFSMSHsm processing continues.

## Programmer response

None.

## Source

DFSMSHsm

---

**ARC1591I** ENDPOINT=*endpoint*, PORT=*port*, PREFERENCE=PREFERRED|BACKUP, STATUS=GOOD|BAD|UNKNOWN. ACTIVE CONNECTIONS=*number of active connections*

## Explanation

DFSMSHsm presents the information and statistics for the given *endpoint* that is currently defined to the *cloud\_name* for the ARC1590I message.

Endpoint- URI of endpoint in specified provider file.

Port- Port number of endpoint in specified provider file.

Preference- PREFERRED or BACKUP endpoint.

Status- Current known status of endpoint: BAD, GOOD, UNKNOWN.

Active Connections- Current number of active connections from this DFSMShsm instance to the given endpoint.

### System action

DFSMShsm processing continues.

### Programmer response

None.

### Source

DFSMShsm

---

**ARC1592I** CDA CLOUD PROVIDER FILE *cloud\_name* ERROR - {INVALID HOST VALUE | INVALID PORT VALUE | INVALID SSLKEY VALUE | KEY NOT FOUND OR INVALID VALUE}

### Explanation

DFSMShsm found error in the cloud information that was retrieved from a CDA cloud provider file. This message indicates what type of error was encountered.

### System action

DFSMShsm processing continues.

### Programmer response

None.

### Source

DFSMShsm

### Storage Administrator Response

Check and modify the CDA cloud provider file of *cloud name* accordingly.

---

**ARC1593I** NO ENDPOINT AVAILABLE FOR CLOUD *cloud name*

### Explanation

DFSMShsm found all endpoints for cloud *cloud name* are not available for DFSMShsm cloud functions.

### System action

DFSMShsm cloud process stops.

### Programmer response

None.

### Source

DFSMShsm

## Storage Administrator Response

Check the network status of the endpoints of *cloud name*

---

**ARC1331I**

**EXTENSION RECORD MISSING IN T RECORD**

### Explanation

1

While a tape table of contents record is being scanned, it is discovered that an extension record that was previously available is missing. The accompanying ARC0358I message gives the record key.

### System action

Updating of the volume record ends. DFSMSHsm processing continues.

### Programmer response

Determine, if possible, the cause for the missing record and take corrective action.

### Source

DFSMSHsm

---

**ARC1332I**

**REQUEST FOR BACKUP OF AN UNCATALOGED DATA SET FAILED, ONLY  
A CATALOGED DATA SET WAS FOUND ON THE SPECIFIED VOLUME**

### Explanation

A BACKDS command has been issued to back up a data set. The VOLUME and UNIT parameters have been specified on the BACKDS command, which implies that the data set to be backed up is an uncataloged data set. However, an uncataloged data set with the specified name does not exist on the volume indicated in the command.

In message ARC1001I, the values for *reason-code* are:

4

The computing system catalog indicates that a non-VSAM data set with the specified name exists on the volume.

8

The computing system catalog indicates that a VSAM data set with the specified name exists on the volume. Also, the data set VTOC entry for the data set has not been found in the VTOC.

12

An OBTAIN for the data set VTOC entry in the VTOC has been successful. The data set VTOC entry has indicated that the data set organization is VSAM. This data set VTOC entry could be for a VSAM base cluster not cataloged in the integrated catalog facility (ICF) or for a component of a VSAM data set cataloged in the ICF. In either case, an uncataloged data set does not exist on the volume.

### System action

The backup of the indicated data set ends. DFSMSHsm processing continues.

### Programmer response

If the intent is to back up a cataloged data set, reissue the command without specifying the VOLUME and UNIT parameters. If the intent is to back up an uncataloged data set, ensure that the correct volume serial number is specified. For information about the use of the BACKDS command, see [z/OS DFSMSHsm Storage Administration](#).