This APAR enhances the 'V SMS,,VALIDATE' command to verify the integrity of the Volume Table of Contents (VTOC) on a z/OS device, identifying errors related to VTOC structures and their associated Data Set Control Blocks (DSCBs). You can run the command for a specific volume using 'V SMS,VOL(volser),VALIDATE' or for all volumes in a storage group using 'V SMS,SG(sgname),VALIDATE'. Detected issues will be reported through IEC602I, IEC605I, and IEC618x messages, as outlined in the *z/OS MVS System Commands* documentation. Several of the updated messages introduced by this APAR are listed below-refer to each message for instructions on correcting VTOC structure errors.

When validating all volumes in a storage group, the volume of messages may be excessive. In such cases, you can use the summary option with 'V SMS,SG(sgname),VALIDATE(SUMMARY)' to generate a concise report of all detected issues.

Additional command variations are available, such as 'V SMS,VOL(volser),REFVTOC' to refresh the VTOC for a single device, or 'V SMS,SG(sgname),REFVTOC' for all devices in a storage group. The REFVTOC option internally invokes the ICKDSF REFVTOC function. Refer to the z/OS MVS System Commands documentation for a full explanation of each option.

A> z/OS MVS System Messages, Vol 7 (IEB-IEE)

- a. Under IEC604I, change all references of 'SAME F3 WITH DUPLICATE F1' to 'F3/F9 IS MULTIPLY POINTED'.
- b. Consolidate and replace existing IEC618I and IEC618E messages with these changes:

IEC618I Message Descriptions

1.Volume and VVDS Indicators

Format:

IEC618I VOL=volser DS4VVDSA=x DS4VVDSR=y DS4VTOCI=xZZ VVDS=dsn(status)

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Explanation:
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This message displays various indicators from the Format-4 Data Set Control Block (DSCB).

- x (DS4VVDSA): 1 or 0 Indicates the presence of a VVDS on the volume.
- y (DS4VVDSR): 1 or 0 Indicates whether VVDS verification has performed.

xZZ (DS4VTOCI): A hexadecimal byte representing specific VTOC indicators from the Format-4 DSCB.

VTOC Indicator Breakdown (DS4VTOCI):

Bit-Position	Hex	Meaning
1xxxxxx	X'80'	DS4DOSBT - Invalid format 5 or indexed VTOC
x1xxxxxx	X'40'	DS4DVTOC - Index was disabled
xx1xxxxx	X'20'	DS4EFVLD - Extended free-space management
1*	X'10'	DS4DSTKP - VSE stacked pack
xxxx1xxx	X'08'	DS4DOCVT - VSE converted VTOC
xxxxx1xx	X'04'	DS4DIRF - Incomplete VTOC change
xxxxx1x	X'02'	DS4DICVT - DIRF reclaimed
xxxxxx1	X'01'	DS4IVTOC - Volume uses an indexed VTOC VVDS

VVDS=dsn: dsn is SYS1.VVDS.V'volser'

status (VVDS=SYS1.VVDS.V'volser'(Yes/No/NA))

Yes: The VVDS exists, and DS4VVDSA is set.

- No: Either the VVDS is missing while DS4VVDSA is set, or the VVDS data set exists while DS4VVDSA is not set.
- NA: If no VVDS data set is found and DS4VVDSA is not set, the volume is considered acceptable if it was initialized without a VVDS data set.

The message displays: "VVDS=NO VVDS DSN FOUND (NA)"

2. Informational Orphan Format-5 or Format-7 DSCBs

Format:

IEC618I ORPHAN Fn DSCB, DEV=nnnn, VOLSER, xx, (DSCBNO=xxxxxxx, DSCB=cccchhhhrr)

Explanation:

This message reports orphaned Format-7(F7) or Format-5(F5) DSCBs (Data Set Control Blocks).

Fn: F7/F5: Identifies the specific orphaned DSCB type.
DEV=nnnn: Device number.
VOLSER: Volume serial number associated with the device.
xx: IBM internal debugging code.
DSCBNO=xxxxxxx: DSCB offset in the DSCB map (for debugging).
DSCB=cccchhhrr: Address of the DSCB (for debugging).

System Action: None

Programmer Response:

If the DS4DVTOC bit is off, it indicates that the VTOC Index is disabled.

If orphaned Format-7(F7) or Format-5(F5) DSCBs are detected, rebuild the VTOC Index using the ICKDSF utility.

Source: DFSMSdfp

Module: IGG0425P

Routing Code: 4, 10

Descriptor Code: 4

IEC618E - VTOC Errors Detected Cases

Explanation:

A VTOC inconsistency has been detected, indicating potential errors in data set control structures. The issue falls into one of the following categories:

1. Incorrect Format-3 Count in Format-9 DSCB

Format:

IEC618E INCORRECT F3s COUNT IN F9=cccchhhhrr,DSN=dsn

Description:

The number of chained Format-3(F3) DSCBs does not match the count specified in the Format-9(F9) DSCB.

F9=cccchhhhrr: Address of the Format-9 DSCB (for debugging). DSN=dsn: data set name (up to 44 characters) 2. Incorrect extents in a data set.

Format:

IEC618E INCORRECT EXTENTS IN DSCB=cccchhhhrr,DSN=dsn

Description:

Data set that is described in the DSN= parameter is being detected with incorrect extents, where DSCB=ccchhhhrr is the CCHHR address of the format-1 or format-8 DSCB of the data set.

DSCB=cccchhhhrr: The address of the affected DSCB associated with the specified dataset (dsn).

DSN=dsn: data set name (up to 44 characters)

3.Multiple Pointers to a Single DSCB

Format:

IEC618E Fm=cccchhhhrr IS MULTIPLY POINTED BY MORE THAN ONE Fn DSCB

Description:

Multiple Format-8(F8) DSCBs (each representing a unique data set) points to the same Format-9(F9) DSCB.

Multiple Format-1(F1) DSCBs (each representing a unique data set) points to the same Format-3(F3) DSCB.

 $\mbox{Fm=cccchhhhrr: cccchhhhrr is an address of the affected Fm, where Fm is a Format-9(F9) or Format-3(F3) DSCB.$

Fn: Format-8(F8) or Format-1(F1) DSCB that incorrectly points to Fm which is F9 or F3 accordingly.

4. Format-8 DSCB points to Format-0 DSCB

Format:

IEC618E F8 DSCB=cccchhhhrr POINTS TO A F0 DSCB,DSN=dsn

Description:

A Format-8(F8) DSCB specifies a next DSCB address of Format-0 DSCB instead of a valid Format-9(F9) DSCB address.

DSCB=cccchhhhrr: Address of the affected Format-8(F8) DSCB. DSN=dsn: data set name (up to 44 characters)

5.Orphan Format-3 or Format-9 DSCBs

Format:

IEC618E ORPHAN Fn DSCB, DEV=xxxx, VOLSER, yy, (DSCBNO=xxxxxxx, DSCB=cccchhhhrr)

Description:

This message reports orphaned Format-3(F3) or Format-9(F9), Data Set Control Blocks, DSCBs.

Fn: F3/F9: Identifies the specific orphaned DSCB type.

DEV=xxxx: Device number.

VOLSER: Volume serial number associated with the device.

YY: IBM internal debugging code only.

DSCBNO=xxxxxxx: Offset of the DSCB in the DSCB map (for debugging).

DSCB=cccchhhhrr: Address of the DSCB (for debugging).

System Action:

The system may attempt to convert the VTOC based on the $\texttt{STAT011_PRESERVE_INDEX}$ setting:

NO: Converts to OSVTOC before retrying the allocation.

YES: Preserves the existing VTOC index.

SVC dumps may be generated to log the error state before retrying the failing operation.

If multiple pointers exist or the next DSCB address is zero, VTOC operations will fail.

Programmer Response:

If there is a mismatch between the Format-3 and Format-9 counts, errors are present in the VTOC. Verify the dataset associated with the Format-8, Format-9, and Format-3 DSCBs before reaching out to IBM Customer Support for assistance.

If incorrect extents are found in the reported data set, errors exist in both the data set and the VTOC. To prevent potential data corruption or loss, avoid making any modifications and immediately contact IBM Customer Support for assistance.

If multiple DSCBs reference the same DSCB, errors exist in the VTOC. Contact IBM Customer Support for further assistance.

If a Format-8 DSCB points to a Format-0 DSCB, errors are present in the VTOC. Check the dataset associated with the Format-8 DSCB to determine if a corresponding Format-9 DSCB exists elsewhere.

Orphaned Format-9 DSCBs may also be present. For further assistance, contact IBM Customer Support.

If orphaned Format-3 DSCBs are found, inspect the VTOC for any additional errors and confirm that they can be safely converted to Format-0 DSCBs. If the only issue is orphaned Format-3 DSCBs, you can refresh the VTOC and reclaim them using the ICKDSF

REFORMAT REFVTOC or V SMS, VOL(volser), REFVTOC option.

If an orphaned Format-9 (F9) DSCB is detected, it indicates errors in the VTOC. Verify whether any Format-8 DSCB points to a Format-0 DSCB within the VTOC. If such inconsistencies are found, contact IBM Customer Support for further assistance.

In all cases, gather diagnostic information such as SMF records, VTOC listings, and error messages to aid in troubleshooting and analysis before contacting IBM Customer Support for assistance.

Source: DFSMSdfp

Module: IGG0425P

Routing Code: 4, 10

Descriptor Code: 4

 $B\!\!>$ z/OS MVS Initialization and Tuning Reference

Under RETRY(STAT011) section, change all references of 'SAME F3 WITH DUPLICATE F1' to 'F3/F9 IS MULTIPLY POINTED'.

Under RETRY(STAT011) section, change all references of

'IEC618E SAME F3 WITH DUPLICATE F1=cccchhhhrr,DSN=Up to 44-byte datasetname' to

'IEC618E Fn=cccchhhhrr IS MULTIPLY POINTED BY MORE THAN ONE Fm DSCB'