z/OS V1R13

DFSMS catalog: VVDS expansion

Overview

- Each VVDS is a portion of the data set catalog.
- A VVDS exists on each SMS volume that contains data sets, and on each non-SMS volume that contains a VSAM data set. The VVDS contains a small number of internal control records (VVCR, VVCM, VVCN, etc.), VSAM Volume Records (VVRs), and Non-VSAM Volume Records (NVRs). The VVDS resembles a VSAM entry-sequenced data set that has 4 KB control interval (CI) size, which holds the above described record type or types.
- Problem Statement / Need Addressed
  - The VVDS is currently limited to roughly 65,000 CI's or 'FFFF' in hexadecimal.
- Solution
  - This line item will increase the maximum number of CI's to roughly 1,000,000 CI's or 'FFFFF' in hexadecimal.

Benefit / value

- The benefit to a greater number of CI's in the VVDS is that this bigger VVDS can hold more VVRs and NVRs, allowing a greater number of data sets on SMS volumes, and allowing a greater number of VSAM data sets on non-SMS volumes. With the trend of increasingly larger volumes, this line item anticipates the need for VVDSs to support larger numbers of data sets per volume and their VVR/NVR records.

Note on estimating maximum number of data sets per volume

- VVDS control records like VVCR, VVCMs, and other records fully occupy a VVDS CI, and typically make up less than 0.2% of the VVDS's CI's
- Data set VVRs and NVRs vary in size by type and within type categories.
  - Catalog data set VVRs are very large and can take up to an entire CI.
  - VSAM data sets vary greatly in VVR size. VSAM data sets with indexes, actually have two VVRs. Each VVR tends to get bigger if SMS, RLS or long data set name, and grows with number of extents in the data set. A loose rule of thumb (estimation) would be 6 to 12 VVRs per CI.
  - NVRs are the smallest record, and the NVR record seems to grow if the data set name is long. A loose rule of thumb would be 12 to 20 NVRs per CI in the VVDS.
- Example of estimating maximum number of data sets
  - Let assume an SMS volume which contains catalog, VSAM, and non-VSAM data sets.
  - Also assume that VVDS CI on average holds 8 records (NVR/VVR).
  - Maximum data sets per volume by release comparison.

Before release 13 - 8 ds/ci x 65k ci = ~520,000 data sets (ds)

Release 13 - 8 ds/ci x 1 mil = ~ 8,000,000 data sets (ds) - roughly a 16x improvement

Usage and invocation

- Example: IDCAMS JCL to define VVDS

This example will fail with a 50-32 in releases before R13. In R13 it will succeed

```
DEFINE CLUSTER(NAME(SYS1.VVDS.VEXMP01) -
       NONINDEXED                      -
       CYLINDERS(365  2)               -
       VOLUMES(EXMP01))
```

- The default size for implicit VVDS creation remains TRACKS(10 10).
- R13 VVDS's can be defined with either the Primary or Secondary allocation values as high as 5825 cylinders or 87375 tracks as the new limit.
- The previous limit releases R12 and down is 364 cylinders or 5460 tracks.
- If either the primary or secondary amount exceeds the release limit, a IDC3009I with return code 50 reason code 32 (50-32) occurs.
- An IDC3009I 50-32 will also occur if the VVDS attempts to extend beyond the release maximum CI limit.

Interactions and dependencies

- None

Migration and coexistence considerations

- There are no migration considerations.
- Coexistence of R13 release code or VVDSs with earlier releases has no impact when the R13 VVDS is smaller than the current VVDS CI limit (e.g. ~65,000 CI's which is roughly when the VVDS is less than 364 cylinders or 5460 tracks).
- R13 VVDSs that are greater than 364 cylinders or 5460 tracks will require coexistence APAR OA34940 (for example, CI's > 'FFFF'x)
  - The coexistence PTF allows earlier releases to add, delete, read/search, and modify all VVRs/NVRs in the larger VVDS.
  - Earlier releases with the coexistence PTF will not be able to create or extend an existing or R13 VVDS beyond the previous limit.

Installation

- None

Session summary

- The VVDS limit is expanding from roughly 65,000 CIs/VVDS to roughly 1,000,000 CIs/VVDS.
- The increase in the total number of CI's that a VVDS can contain affects the maximum number of VSAM data sets a volume can hold, and effects the maximum number of non-VSAM and VSAM data sets an SMS volume can manage.
- A coexistence PTF is needed on earlier releases ONLY when the volume being shared has an R13 VVDS greater than the previous release limit.

Appendix - References

- Publications - Updated to document the new maximum limits for the VVDS:
  z/OS DFSMS Managing Catalogs (SC26-7409-10)