

## Data Management

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The main topic of data management in 1987 was the removal of all former methods of authorization checking since RACF (Resource Access Control Facility) now covers this function.

At first PCF (Programm Control Facility) in TSO (Time Sharing Option) had to be replaced by a dynamic allocation exit. Its purpose is to direct dynamic allocations of certain users to a set of certain DASD (Direct Access Storage Devices) volumes, so called volume pooling. A volume pool table is loaded into main storage at IPL (Initial Program Load) time and certain userids are associated with a volume pool number in a system data set. Then for every TSO allocation request the exit checks if a volume pool is defined for this userid, and if so, it is assured that the data set is only allocated on a volume within this pool.

Next in the operating system preallocation exit the authorization checks were removed. By this way a table driven control system of DASD space usage based on this exit was developed. Beside the default allocation limit of 40 MB of real DASD space for each userid, it is now possible to allow individual (higher) limits for certain projects for a limited period of time.

With RACF it is possible to associate the VSAM (Virtual Sequential Access Method) data sets 'RSOV.userid.rest' with a user data set profile 'userid.RSOV.rest' by means of a naming convention table. Tailoring this feature made it possible to drop the need for logging on under userid RSOV to maintain VSAM data sets. Additionally a set of ISPF (Interactive System Productivity Facility) panels as interface to DFP AMS (Data Facility Product Access Method Services) commands was developed to make VSAM data sets easier to handle by users. The panels give detailed information on VSAM data sets. It is possible to allocate, rename or copy VSAM data sets, furthermore DFHSM commands can be used to migrate, recall or condense VSAM data sets.

Beside these conceptual changes new disk and tape hardware arrived and was integrated into data management. The replacement of IBM 3380 Model E disks by IBM 3380 Model K disks (with capacity of 1,8 Giga-Byte) and the replacement of IBM 3380 Model D disks by IBM 3380 Model J disks has been started.

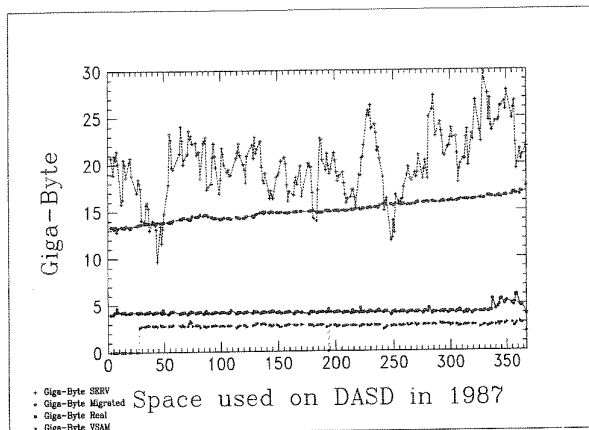
Disk and tape usage at the end of 1987 was as follows:

| No. | Volumes      | capacity in GB | space mgmnt. | backup |
|-----|--------------|----------------|--------------|--------|
| 9   | USERxx       | 9,00           | mig          | yes    |
| 4   | VSAMxx       | 5,40           | mig          | yes    |
| 40  | SERVxx       | 31,80          | dba          | no     |
| 47  | system disks | 31,80          | no           | yes    |
| 4   | VM disks     | 4,80           | no           | no     |
| 2   | EARNxx disks | 2,40           | no           | no     |
| 2   | VERWxx disks | 3,00           | no           | no     |
| 3   | HSMxxx disks | 1,80           | no           | yes    |
| 18  | mig l1 disks | 21,00          |              |        |
| 2   | mig l2 disks | 2,40           |              |        |
| 107 | mig l2 tapes | 21,00          |              |        |
| 40  | backup disks | 52,80          |              |        |
| 266 | backup tapes | 53,20          |              |        |

mig = migration, dba = delete by age, l1 = level 1, l2 = level 2.

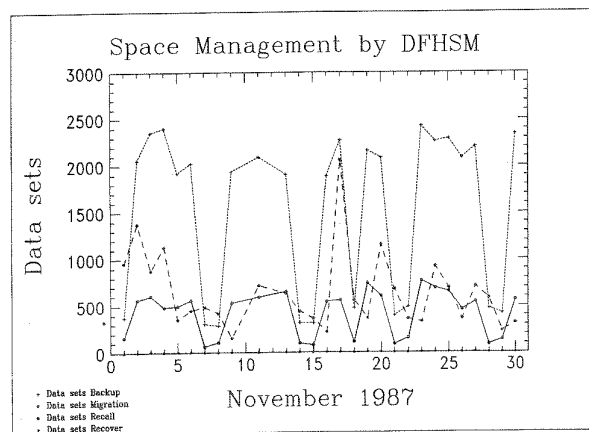
Computing system's catalogs contained 112079 NonVSAM and 3720 VSAM data set entries at the end of 1987. 85 per cent NonVSAM and 82 per cent VSAM data sets are migrated. The

growth in the number of data sets compared to 1986 is 13 per cent.



The figure shows the used space during 1987. Space allocation is kept constant during long periods on USERxx and VSAMxx disks (see the lower two polygons: 'Giga-Byte Real' and 'Giga-Byte VSAM') The amount of migrated data space is constantly growing about 32 per cent during 1987 (see the upper polygon: 'Giga-Byte Migrated'). Allocation of temporary data sets varies according to the experimenters' needs (see the middle polygon: 'Giga-Byte SERV').

The average work load of DFHSM per day in a typical month is as follows:



About 2000 backup copies are taken every day except weekends. Recovery of damaged data sets is necessary only a few times a day. Usually we have a recall and migration rate of about 500-800 data sets per day.

In 1988 a new concept for storing experiment data sets is required. Probably the tedious ONLTADI jobs will become partly obsolete and the bulk of this work will be carried out by DFHSM's integrated disk and tape management facility.