

**OMCS/MVS Hardware Support for Database File Crushing****Overview**

PTF ASP0698 adds support for database file compression using the ESA/390 compression facility (hardware compression). The use of hardware compression will significantly reduce the CPU time cost of compressing/decompressing OMCS database files while achieving the same DASD savings as software compression.

On machines with the ESA/390 compression facility, hardware compression instructions will be used whenever database file compression is requested. When a file is decompressed, hardware instructions will be used to decompress the file if it was created after PTF ASP0698 was applied. If the file was compressed prior to applying PTF ASP0698, existing software routines will be used to decompress it.

On machines without the ESA/390 compression facility, software routines will be used to compress and decompress files. If the database contains files that were created on a machine with the ESA/390 compression facility then software emulation routines will be used to decompress the files.

**Typical CPU Savings**

The following table shows a comparison of CPU time required to compress/decompress a file using hardware and software compression.

Number of lines	Hardware Compression				Software Compression			
	No of Database blocks	Comp CPU time	Decomp CPU time		No of Database blocks	Comp CPU time	Decomp CPU time	Reduction in decomp CPU time
130593	102	12.50	1.5		102	16.35	6.39	76%
122672	119	10.45	1.47		137	14.35	6.83	78%
100000	148	7.24	1.30		172	11.40	6.77	80%

From the table it can be seen that hardware compression produces the same size or smaller output file while using 25% less CPU time. Hardware decompression uses 75% less CPU time than software decompression. As a single file may be accessed and decompressed many times per day, hardware decompression will reduce the CPU usage significantly.

**Invoking Hardware Compression**

Once PTF ASP0698 is installed, hardware compression will be the default compression technique used by OMCS. Compression can be invoked in a number of ways:

### Job Processing Rules.

By specifying 'C' for the Sysout Dataset Construction Method variable (**JPVASDCM**) the database files created by the OMCS writer will be crushed as they are created.

```
OMCS/V2 JOB PROCESSING RULE VARIABLE SELECTION LIST - TPMD* ----- UP 5
COMMAND ==> LINE 26 OF 33
USE LINE COMMANDS S(ELECT),D(ELETE),I(NSERT)
lc variable t description and value
JPVAMXCC A 0 MAXIMUM COND CODE ALLOWED IN ANY STEP IN THE JOB
==>
JPVANTFU A BLANK USERIDS TO NOTIFY LIKE "TGSG=E "
==>
JPVAPGSZ A 0 PAGESIZE FOR FORCED PAGINATION (0-32767 OR BLANK)
==>
JPVASDCB A (0000-2300,BLANK) SDS CONSTRUCTION BASE HOUR
==>
JPVASDCM A BLANK SDS FILE CONSTRUCTION METHOD
==> C
JPVASDRP A 1 SDS FILE RETENTION PERIOD IN DAYS
==>
JPVASMRR# A 0 SMF RECORD TYPE IF PSEUDO TYPE 6 REQD
==>
JPVAUCLL A 100 USER CHKING LOG LIMIT
==>
```

### OMCSTSSJ DIR command

A 'C' line command can be used to crush a file that already exists in the database. The 'T' line command can be used to determine if a database file is crushed. A 'H' in the C column indicates that the file is already crushed using hardware compression. A 'S' in the C column indicates that the file is crushed using software compression.

```
OMCS/V2 - DATABASE DIRECTORY -- TPMD.DB3.ECXATEST TPMD 14:56 910102 -----
COMMAND ==>
TPMDCOMP #0000019 --(I)nformation request
lc filename filetype #recs-- c #blks mxblk created----- last modified----
TPMDCOMP #0000017 19103 S 42 32767 901217-164918-MON 901217-165014-MON
TPMDCOMP #0000018 19103 H 42 32767 970217-165057-MON 970217-165139-MON
c TPMDCOMP #0000019
TPUS PROFILE
USERMAST /IRM
USERPEND /IRM
USERVIEW /IRM
USRBYREP /IRM
```

### Space reclaim

The **Crunch** keyword can be specified on space reclaim control cards to cause the selected files to be compressed instead of deleted. This will free up space in the database while still leaving the files available to be accessed.

**ECL DBCRUSH command**

The **DBCUSH** statement of **ECL** can be used to have a database file crushed when it is closed. The file to be crushed needs to be open with **UPDATE** access prior to issuing the **DBCUSH** statement. When the file is closed it will be crushed using hardware compression.

The following example crushes file PRODDATA BACKUP.

```
DBOPEN A PRODDATA BACKUP UPDATE
IF# &RETC>0
      LOG OPEN FAILED FOR PRODDATA BACKUP
      EXIT 8
DBCUSH A ON
DBCLOSE A
```

**Co-existence with existing software crushed files**

Prior to applying PTF ASP0698, OMCS used a software algorithm to compress files. This algorithm is different to the algorithm used by hardware compression and therefore the hardware features of the S/390 cannot be used to decompress these files. These files can still be decompressed by the access method but there will be no difference in the CPU time required to decompress the file.

**Selecting Files to be crushed.**

Files that are crushed cannot be updated. Therefore you should be careful when selecting files to be crushed to ensure that the selected files will not be updated. Files containing job output (**SDS** files - filetype begins #) can be crushed. Control files used by **OMCS**, **IRM**, **JSF** or **PSF** should not be crushed.

**Support for decompression on machines without hardware compression support.**

The ESA/390 compression facility may not be available on all machines. To allow hardware compressed files to be decompressed on these machines PTF ASP0698 contains support to emulate hardware decompression. If you access an OMCS database from multiple machines, PTF ASP0698 must be installed on all machines in order to access hardware compressed files.

**Decompressing files**

Database files that have been compressed using hardware or software compression can be permanently decompressed by either using the **E(xpand)** line command on the **DIR** display of **OMCSTSSJ** or by using the **DBCUSH ECL** command. Once expanded the database file will occupy significantly more space in the database.

The following line command expands TPMDCOMP #0000018:

```
OMCS/V2 - DATABASE DIRECTORY -- TPMD.DB3.ECXATEST TPMD 14:56 910102 -----
COMMAND ==>
TPMDCOMP #0000019 --(I)nformation request LINE 74
lc filename filetype #recs-- c #blks mxblk created----- last modified----
TPMDCOMP #0000017 19103 S 42 32767 901217-164918-MON 901217-165014-MON
e TPMDCOMP #0000018 19103 H 42 32767 970217-165057-MON 970217-165139-MON
TPMDCOMP #0000019
TPUS PROFILE
USERMAST /IRM
USERPEND /IRM
USERVIEW /IRM
USRBYREP /IRM
```

The following example expands file PRODDATA BACKUP.

```
DBOPEN A PRODDATA BACKUP UPDATE
IF# &RETC>0
LOG OPEN FAILED FOR PRODDATA BACKUP
EXIT 8
DBCRUSH A OFF
DBCLOSE A
```

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