# cache

***This syntax is specific to... Windows systems, Sprynt systems and workstations running Unix***

| | | | |
|---|---|---|---|
| **keys:** | **number** | *<number>* | number of cache buffers |
| | **size** | *<number>* | cache buffer size (bytes) |
| | **device** | *<number>* | if **flush**, **memory** or **free**, disc device number |
| **options:** | **flush** | | flush contents of cache buffer or specified device to disc |
| | **memory** | | allocate permanent memory buffer for specified device |
| | **free** | | free memory buffer assocated with specified device |
| | **show** | | list current settings for disc cache perameters |

Use the **cache** command to manage the way in which disc input/output is buffered in memory. This can lead to signifcant reductions in the amout of data traffic to and from the hard disc and it can reduce the total number of input/output requests. Data from a disc device can be buffered in a separate memory buffer allocated to that device or it can be buffered in Semper's disc cache. The disc cache is a collection of memory buffers which are shared between all the disc devices which are not separately buffered. With the **cache** command you can allocate and free separate memory buffers, display/change the number and size of cache buffers and you can force buffered data to be flushed out to disc.

## Examples

```
cache show
```

This command lists the current disc cache parameter settings: number of cache buffers, buffer size and total cache size.

```
cache number 200
```

This command changes the number of cache buffers to 200, keeping the buffer size the same.

```
cache number 20 size 65536
```

This command reconfigures the cache to consist of 20 buffers of 65536 bytes each giving a total cache size of 1310720 bytes.

```
cache number 0
```

This command frees all cache buffers, effectively turning off disc caching.

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```
cache flush
```

This command causes all data modified in the cache to be written to disc.

```
cache device 2 flush
```

This command causes all modified data associated with device 2 to be written to disc.

```
cache device 3 memory
```

This command causes all data in device 3 to be buffered in a separate dynamically allocated memory buffer.

```
cache device 3 free
```

This command flushes and frees the separate memory buffer associated with device 3.

## Description

Data can be buffered, either in one or more cache buffers which are drawn from a pool of cache buffers (the disc cache), or else in a buffer which is permanently allocated to the file with which the data is associated. The first approach allows you to make optimum use of limited memory resources by only caching data which needs to be accessed amongst all the disc files that are currently open. The second approach reduces actual disc input/output to an absolute minimum – data is read in once only, and written out when the buffer is flushed or freed. On systems which support virtual memory, you must always keep in mind the possibility that buffered data will be paged onto disc when the amount of allocated virtual memory exceeds the amount of real physical memory.

With the **cache** command you can, at any time, allocate and then free a separate memory buffer for any disc device which is currently assigned. You specify the device number with the **device** key and you allocate or free the memory buffer by specifying the **memory** or **free** options respectively. The device number is determined by the **assign** command when you open the disc file. When such a buffer is allocated, all the data on disc is read just once into memory. All subsequent access to the data is made via the memory buffer, thereby avoiding all disc input/output, until the buffer is freed or flushed.

There is no point in using the **memory** option with a temporary or scratched disc file unless you specifically intend to use the **free** option later during the same Semper session. If you do not intend to free the memory buffer before closing and deleting the file, you may as well use the **assign memory** command to open a memory-based device which will not tie up space on the hard disc.

The **cache** command allows you to control the number and size of cache buffers which make up the disc cache. The buffer size must be at least a multiple of 8 bytes and, on some systems, it may also have to be multiple of the operating system's page size or some other unit of size. The **cache show** command will list any constraints on the buffer size.

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Semper will automatically create a certain size of disc cache at the start of a session. The default size of the cache will vary according to the host system, but it should at least give reasonably good performance when processing medium sized images. Even when the cache is not large enough to hold all the data being processed by a particular Semper command, the disc cache can still provide some performance benefits because it reduces the number of input/output requests. On some systems, each input/output request can incur large operating system overheads.

If the number of buffers or the buffer size is set to zero, disc caching is disabled and disc data will be accessed directly from the hard disc. On systems which support virtual memory, the size of the disc cache needs to be managed so that it is not so large that it puts too heavy a burden on the operating system. If the size of the cache exceeds the amount of free physical memory, data will be swapped out of memory to make room. If this leads to the point where the code for active processes has to be swapped out, the performance of the whole system will suffer. Consult the on-line help entry for the **cache** command to find out how to get some indication of the demands being made for your system's memory. On systems which do not support virtual memory, the size of the disc cache will be limited by the amount of available memory. Also, allocating all of the available memory to the disc cache may cause problems elsewhere when further requests to allocate memory are refused.

With the **flush** option you can cause all modified data in the cache to be written to disc. With the **device** key, you can restrict the operation of the **flush** option to a specified disc device. Reconfiguring the disc cache causes its contents to be written to disc, as if the **flush** option had been specified. If the disc cache is large, this could take a noticeable length of time. Likewise, when a disc device is deassigned, its contents are flushed out to disc, except when the file is to be deleted (either because the **delete** option was specified in the **deassign** command or because the device is a temporary or scratch disc).

The **flush** command has the same effect as using the **cache flush** command.

The **show** option causes the current disc cache parameters to be listed on the console output stream.

## Notes

see also: **assign, deassign, flush**

## Defaults and Ranges

| keys/options | defaults | range |
|---|---|---|
| **number** | *current value* | zero or positive integer |
| **size** | *current value* | zero or positive integer |
| **device** | *none* | integer in range 2 to system limit (type **show system**) |