

Memory Management under Windows

1. What is the Total amount of Physical Memory (KB) available on your system?

There is a total of 785904 KB in the system.

2. Based on changes to the amount of Available memory, what is the apparent footprint (i.e. the full memory demand) of Firefox?

The footprint of Firefox is roughly 41,464 KB. It also decreases the system cache by 6,776 KB.

3. One of the measured components of Available memory is the Standby list. What memory management mechanism described in your textbook does the Windows Standby list implement?

Standby memory is memory removed from a process' physical memory, but is still available to be recalled. If the process needs that page it is returned immediately but if another process needs that memory it will be given to the other process. This is a form of LRU algorithm.

4. Note the changes in the reported amount of Available memory and in the measured value graphed in the display. Take a moment to refer back to your answer to question 2 above. Why is the apparent memory footprint of *two* instances of Firefox not exactly *twice* the memory usage of a single instance.

Start : 580000 KB
Running First Firefox: 542000 KB
Running Second Firefox : 535000 KB
Terminating First Firefox : 538000 KB
Terminating Second Firefox : 580000 KB

The process' share pages. When a second process is executed, it uses some of the same pages as the first process but it writes its own data to that page. By doing this the process can save a lot of space and the memory used is not doubled.

5. Locate the Notepad process; how much Total Virtual Memory does it use?

Notepad uses 244 pages and 976 KB of virtual memory space.

6. Based on the number of pages Notepad is using and the total amount of virtual memory it is addressing, what is the size of a page in Windows?

Each windows page is 4 KB.

$976000 \text{ KB} / 244 \text{ pages} = 4000 \text{ B} = 4 \text{ KB}$

7. Based on concepts discussed in class, what exactly is happening to produce the changes observed in the Performance graph? Quantify your answer.

Start : 0 page faults/sec

Start Typing : 1 page faults/sec

Opening Font Menu : 7 page faults/sec

Changing Font to Bold Italic : 1 page faults/sec

The pages needed are not in memory so those pages are being loaded into main memory. So when I first started typing (1 page faults/sec) it had to load the page to store input or load the font to display. When I launched the font menu (7 page faults/sec), notepad had to load multiple pages from virtual memory for the available fonts, font styles, and sizes. When I changed the font to bold and italic (1 page faults/sec) notepad loaded the page required to make this change.