Power Macintosh: Enable Virtual Mem for Best RAM Usage (2/95)

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TOPIC ---

When Excel is launched from a local hard drive, it increases the System Memory by about 4.5 MB. In contrast, the native PhotoShop increases the System Memory by 100K, and the native ClarisDraw doesn't increase it at all! Why is this happening?

DISCUSSION ---

This question has been around before and we saw a response from Microsoft to it. The reason the Power Macintosh behaves so much differently from the 680x0-based computers is because of the way memory and applications are handled by the Power Macintosh.

680x0-based applications stored the executable code in the resource fork of the file as resources of type CODE. The application can load and unload CODE resources as needed. This allowed applications to limit the memory needed since unused code could be removed from RAM. For example, the code for printing a document only needs to be in RAM when printing. When the print job is finished, the code can be removed from RAM.

Power Macintosh applications have the code stored in the data fork as one big code fragment. This eliminates the ability to remove unused code since the application only has one fragment and the whole fragment is loaded into memory. The work around to this problem is to turn on virtual memory. Virtual memory on the Power Macintosh uses what is called file-mapped virtual memory. What this does is allow the code fragment to be divided up into 4k blocks and only code that is executing is in RAM. If the program branches to code that is not in RAM, it is read in from the disk. This is the reason Apple recommends enabling virtual memory on Power Macintosh computers. This is also the reason that Excel takes 6500K less RAM when virtual memory is turned on. Excel's code fragment is 6500K in size.

The growth of the system heap is also due to the new architecture of the Power Macintosh. Excel and other applications install what are known as shared libraries. These are code fragments that can be executed by any application. These code fragments are stored in the Extensions folder. Since these extensions can be shared by different applications, their code fragments are loaded into the system heap. This is done because one application can not access another

application's memory and the system heap is open to everyone. Excel installs seven shared libraries for a typical install.

We believe the reason Microsoft installs so many shared libraries is to decrease application size. Code common to more than one application can be loaded into memory only once in the system heap instead of once for every application that needs to access it. For example, let's say the code is common to PowerPoint, Excel and Word. If the user has all three applications open, there is only one copy of the shared library code in the system heap. If the code was not in a shared library, all the applications would need their own copy of the code and therefore, the code would be loaded three times, once into each applications partition. This would involve increasing the size of each applications partition to make room for the extra code and the end result would be a big waste of memory.

Microsoft has made an effort to minimize the RAM they need. Microsoft applications are just large.

In conclusion, virtual memory should be enabled on all Power Macintosh computers. All large Power Macintosh applications will behave this way. The native version of PhotoShop requires a 5 MB smaller partition when virtual memory is turned on.

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