

# SERVICE BULLETIN

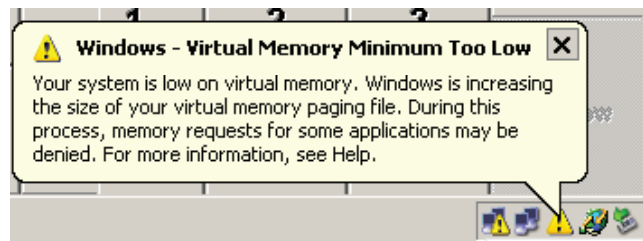
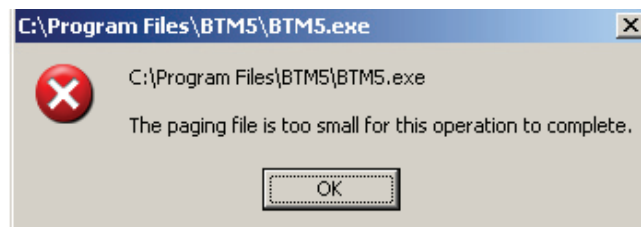
**Subject: Computer System Low on Virtual Memory****Date: 6/5/13****Bulletin No. SB13-7**

## Purpose

Some centers may experience a 'Low Virtual Memory' error at any given time on the server and client computers. This is not a fatal error, but a computer that is low on virtual memory will operate slowly or may stop responding for extended periods of time and may require a reboot during peak operating times. To ensure that Windows runs properly, it will be necessary to increase the size of your virtual memory paging file.

## Explanation

If your virtual memory isn't configured appropriately to match your workload, you may receive an error from Windows saying that you have too little virtual memory or that your virtual memory is too low. This can result in a blue screen and/or a loss of access to all data on the computer.



Virtual memory is a technique utilized by the Windows operating system to supplement the RAM (physical memory) in which it takes a portion of your hard drive and uses it as temporary memory. The programs you are running don't know the difference between physical memory and virtual memory, so it doesn't really matter that you run out of RAM, so long as you have adequate hard drive storage to create a virtual memory (Paging File) large enough to handle the processing for any software application actively running on the computer. Essentially, you can choose to allocate as much free disk space as you have, to be used for virtual memory. However, a hard drive is much, much slower than physical memory and therefore, not as efficient in running applications as physical memory. But it is a cost effective way to increase your workload without

purchasing additional RAM. You may contact the Brunswick Technical Support for guidance as to what type of RAM and size is needed to accommodate the processing between the computer and Brunswick systems applications.

Memory is used to store data for programs on a temporary basis. The maximum amount of memory that your system can use is actually limited in two ways — not only is there a maximum amount of memory that your computer motherboard can accept, there is also a maximum amount of memory that your operating system (OS) can accept.

You want to maximize the total physical memory and control the settings to maximize your virtual memory. If virtual memory didn't exist, once you filled up the available RAM, your computer would not allow you to open additional programs.

## Solution

### **RAM reset:**

RAM is allocated to applications as they are opened and used. This RAM may remain allocated to the application even after it is closed. If a program crashes or does not close properly, then RAM may remain in use for a period of time after the program crashed. However, even then the o/s will eventually detect the problem and free up the memory. Rebooting resets the RAM to its initial state and frees up the RAM for use in applications as needed. The frequency of rebooting depends on the number of applications running on the computer as well as activity levels. If the center is busy, daily rebooting is encouraged. If rebooting does not alleviate the Virtual Memory alerts, you will need to increase the amount of RAM or increase the virtual memory per the following instructions.

### **Increase the virtual memory on the computer(s) displaying the error:**

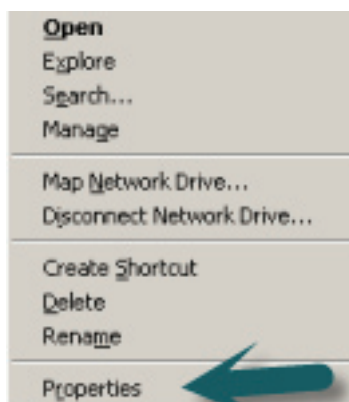
Please use the following instructions to increase the size of your virtual memory paging file. This can be completed on any Server or Client computer. Brunswick has not seen this error on a scoring computer, but any computer can experience the error.

The following will assist you in finding the location and size of the page file as configured in System Properties for Windows 2003, XP, Windows 2000 and Windows NT.

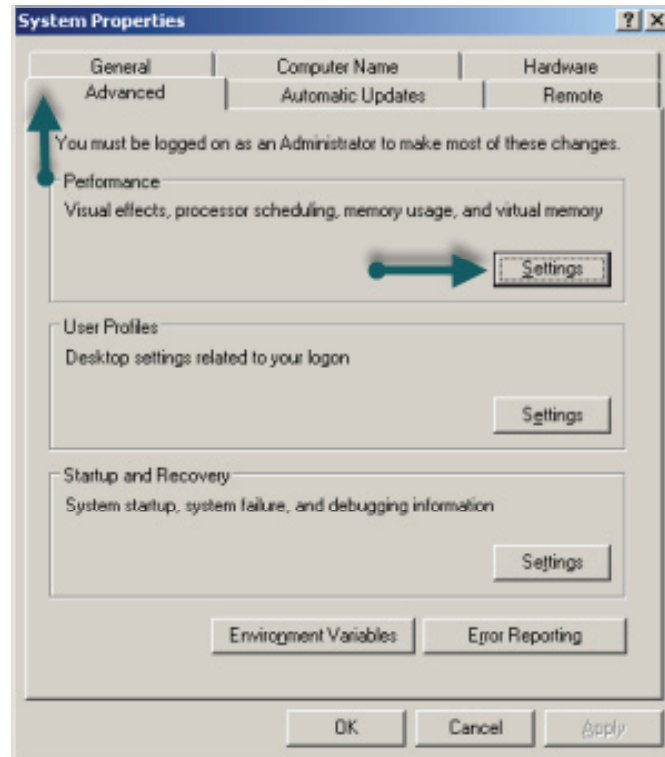
You must be logged on as an administrator or as a member of the administrator's group to complete this procedure.

### **For Windows 2003 and XP OS Computers**

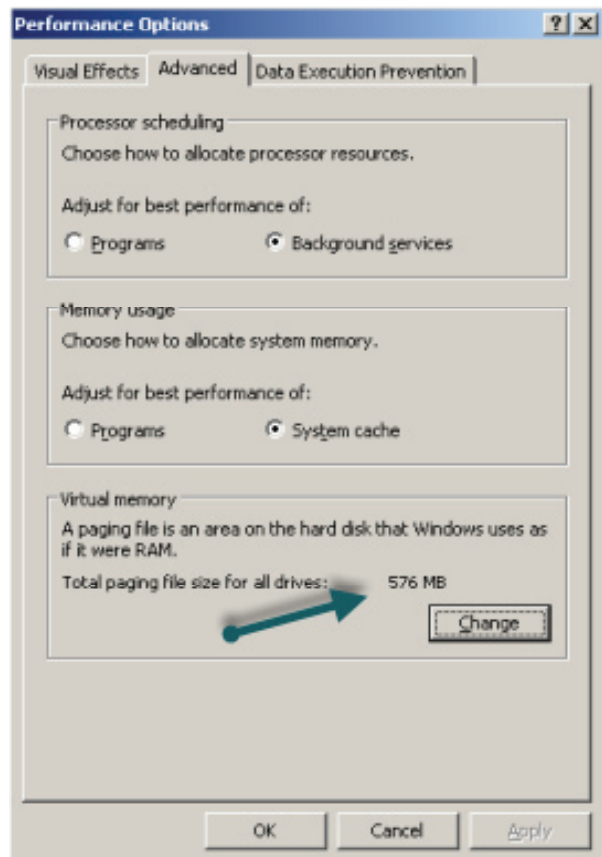
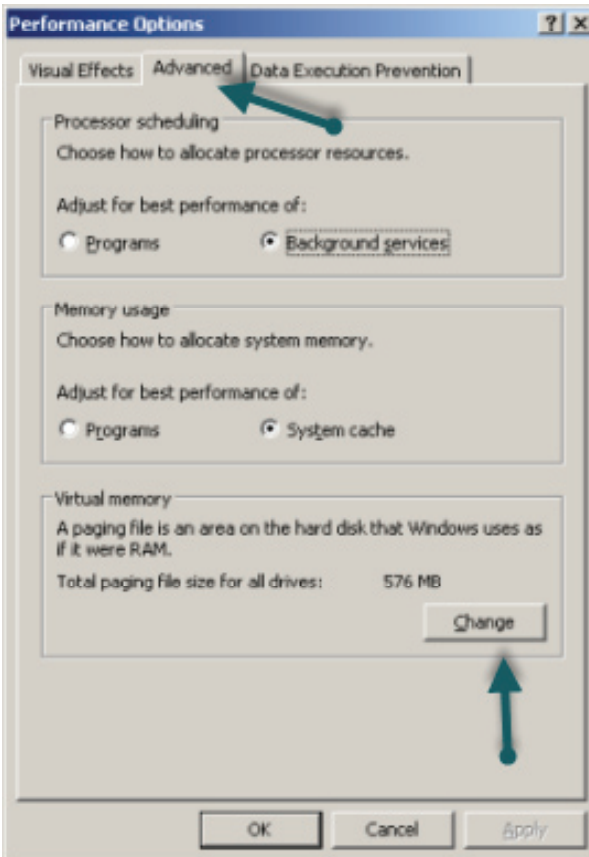
1. Right click "My Computer" on the desktop, and select "Properties."



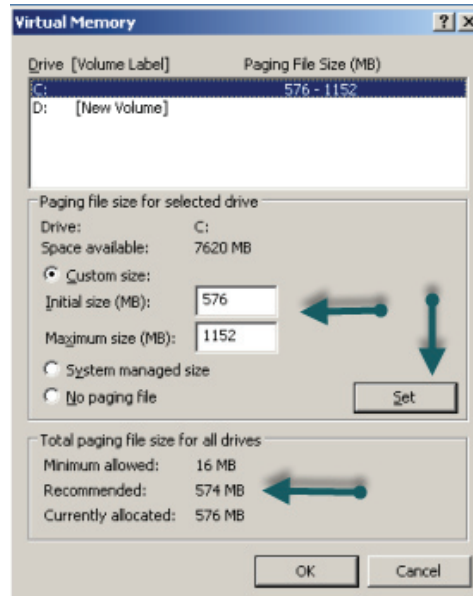
2. Select the “Advanced” tab, and click “Settings” within the “Performance” section.



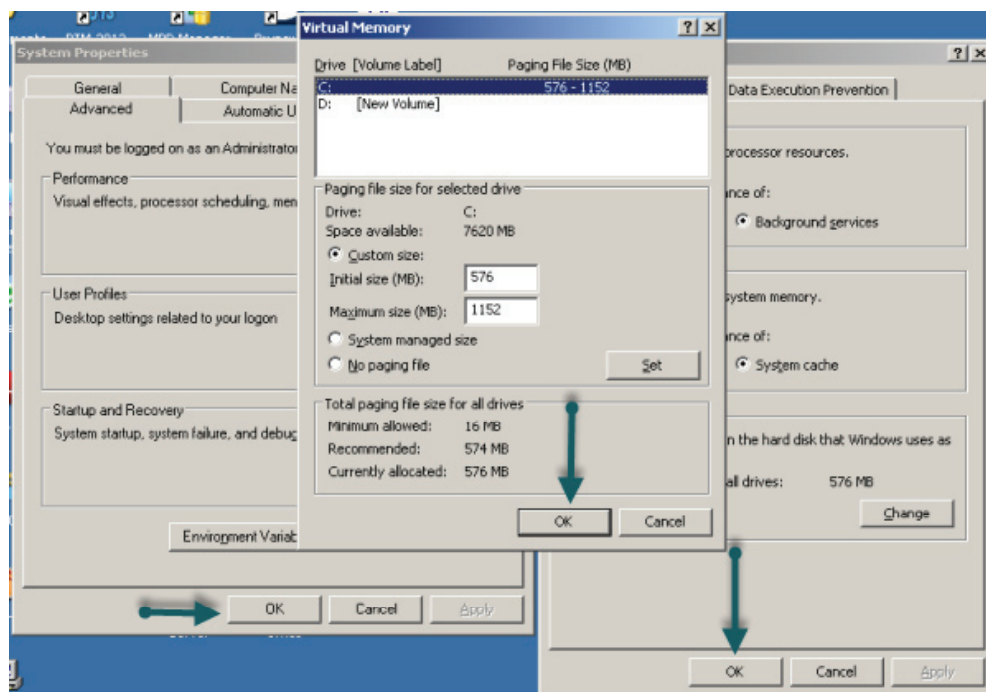
3. Select the “Advanced” tab and click the “Change” button. Take note of the “Recommended” size given under the section named “Total paging file size for all drives:”



4. Enter the recommended size amount into the “Initial size (MB)” and “Maximum size (MB)” and click “Set.” If the recommended size is larger than 4095 MB, just enter 4095 for “Initial size (MB)” and “Maximum size (MB).” (This limit is imposed by the page mapping that we use on x86 processors. These processors cannot handle more pages per page file.) Another way to consider the Initial and Maximum size is to use 1.5 times the physical RAM in the terminal. For example, 1 GB of RAM = 1024 MB. If you have 2 GB of RAM, take  $2048 \times 1.5 = 3072$  MB. This would be your Initial size and Maximum size in MB.

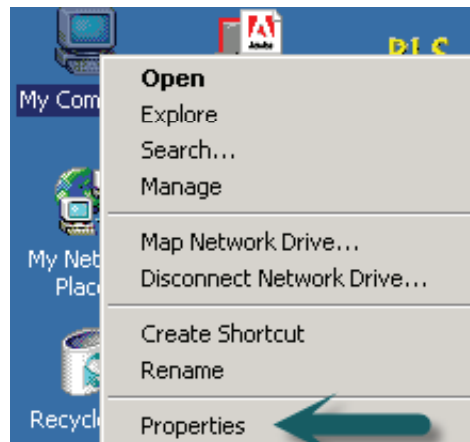


5. Click “OK” all the way out until the windows associated with this task are gone. A manual reboot of the computer is needed to apply changes.

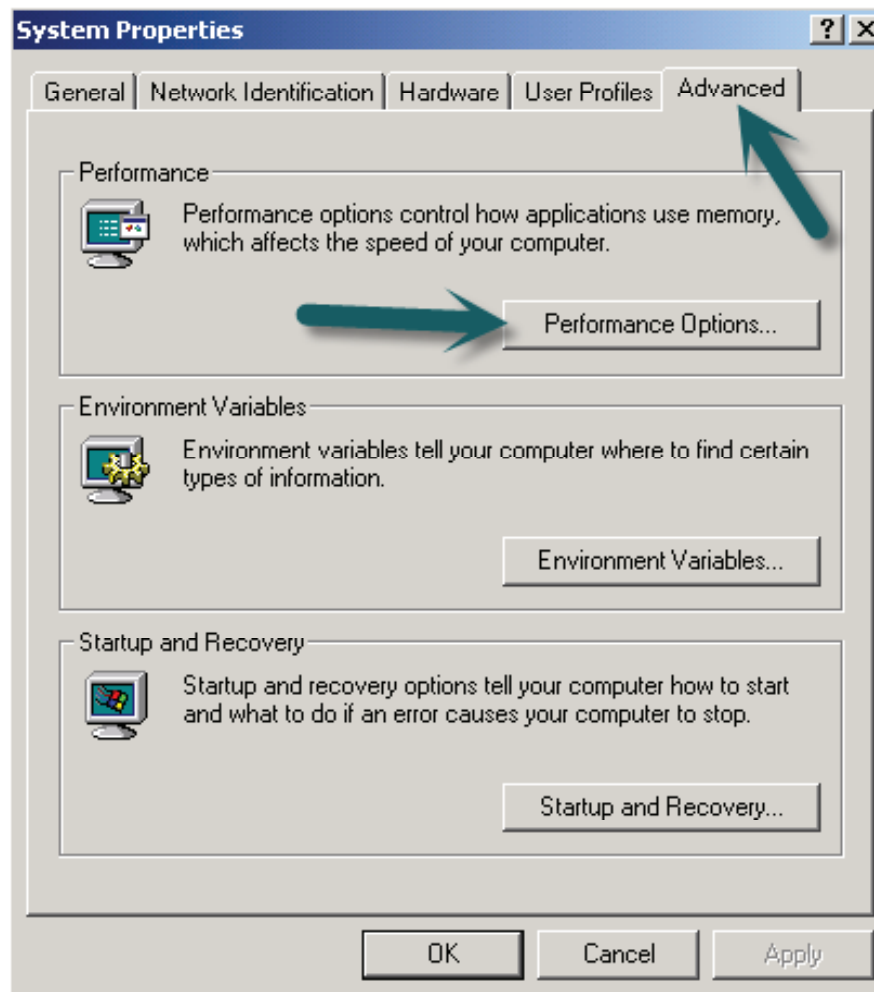


**For Windows 2000 OS Computer:**

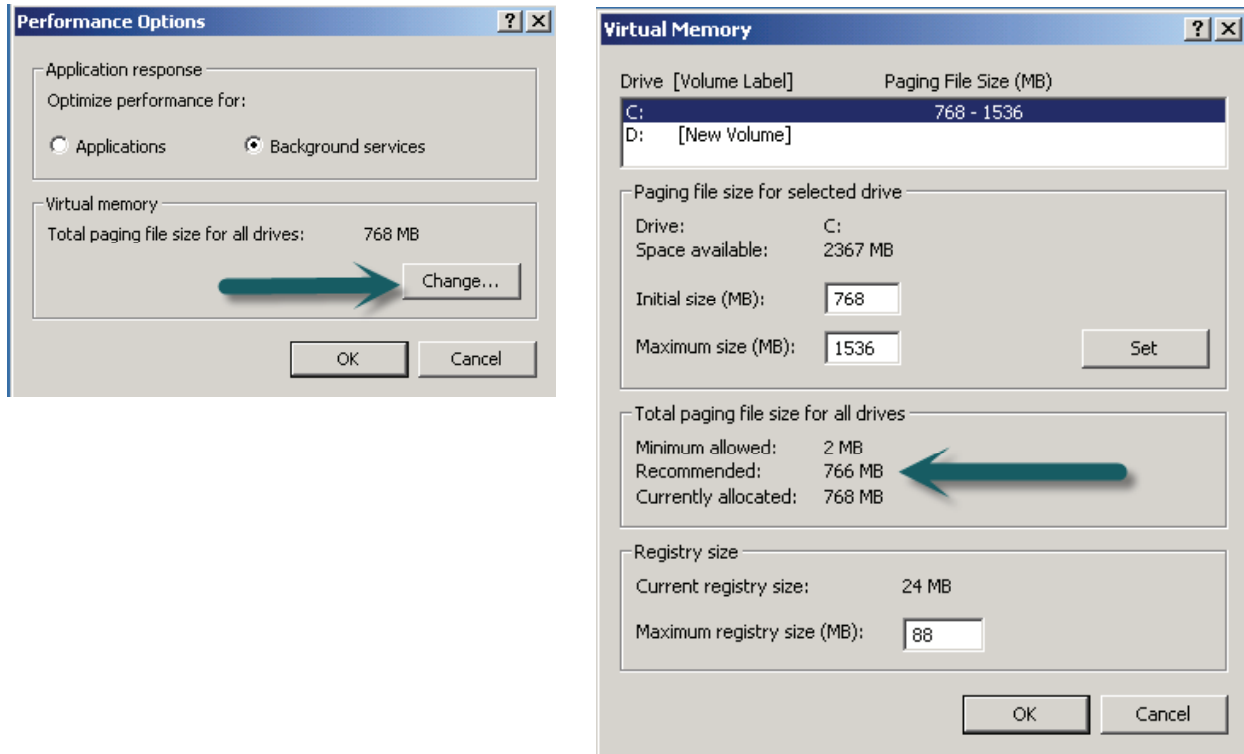
1. Right click “My Computer” on the desktop, and select “Properties.”



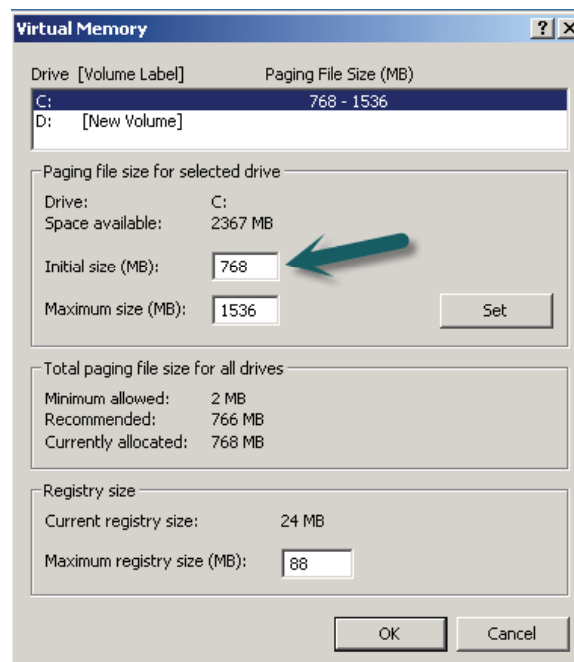
2. Click on the “Advanced” tab, and select “Performances.”



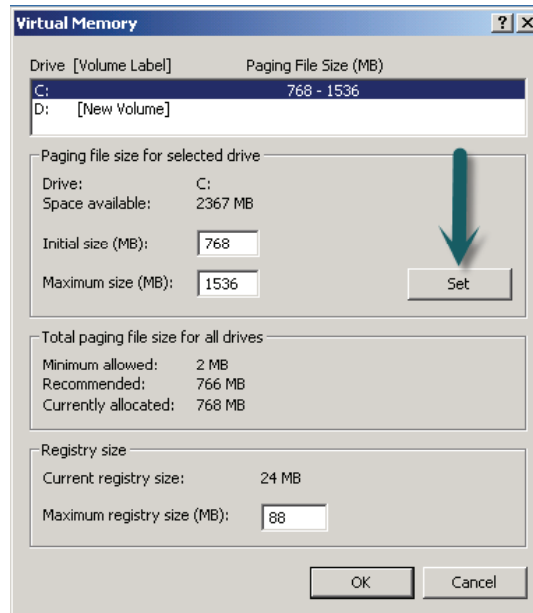
3. Click the “Change” button and take note of the “Recommended:” size given under the section named “Total paging files for all drives.”



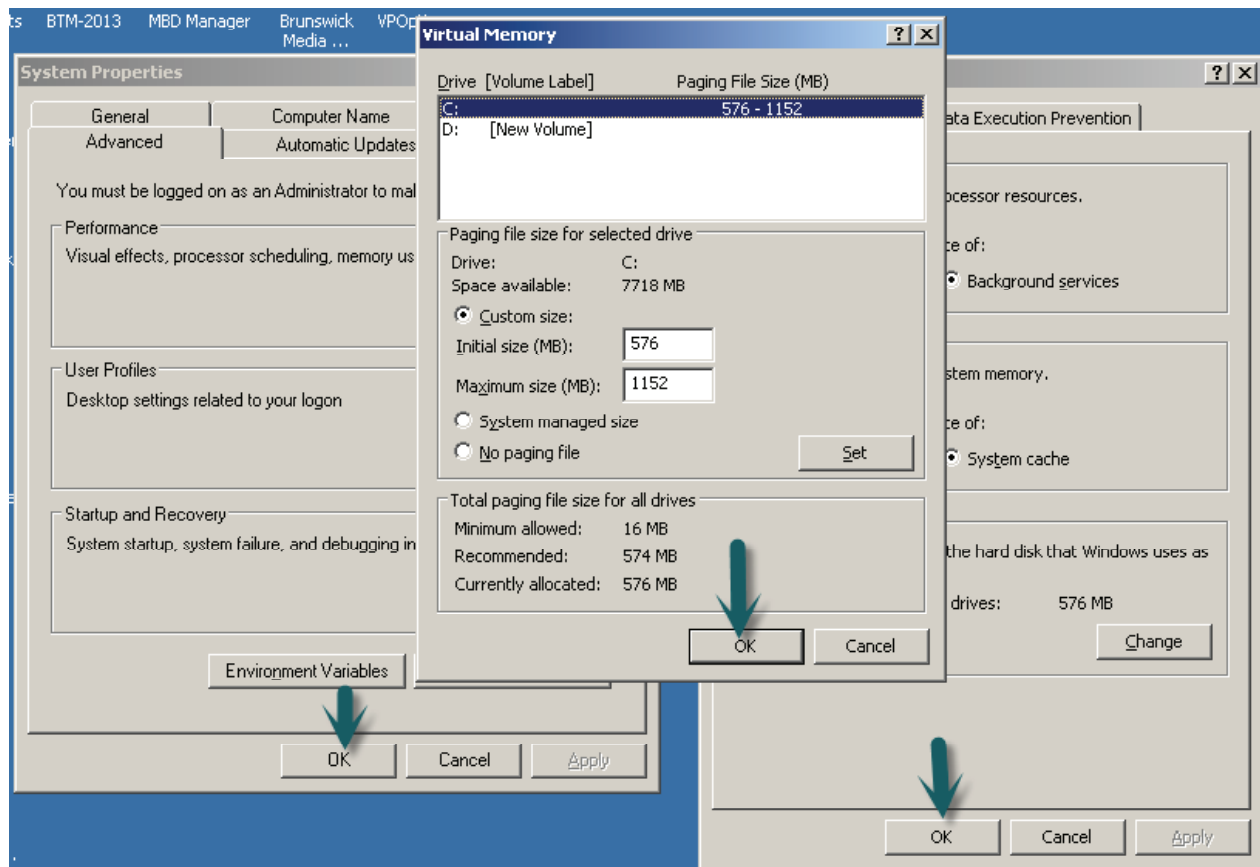
4. Enter the recommended size amount into the “Initial size (MB)” and “Maximum size (MB).” If the recommended size is larger than 4095 MB, just enter 4095 for “Initial size (MB)” and “Maximum size (MB).” (This limit is imposed by the page mapping that we use on x86 processors. These processors cannot handle more pages per page file.) Another way to consider the Initial and Maximum size is to use 1.5 times the physical RAM in the terminal. For example, 1 GB of RAM = 1024 MB. If you have 2 GB of RAM, take  $2048 \times 1.5 = 3072$  MB. This would be your Initial size and Maximum size in MB.



5. Click the “Set” button to set and accept the amount.

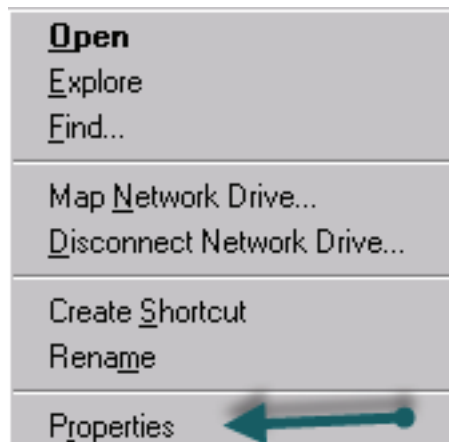


6. Click “OK” all the way out until the windows associated with this task are gone. A manual reboot is required to apply the changes.

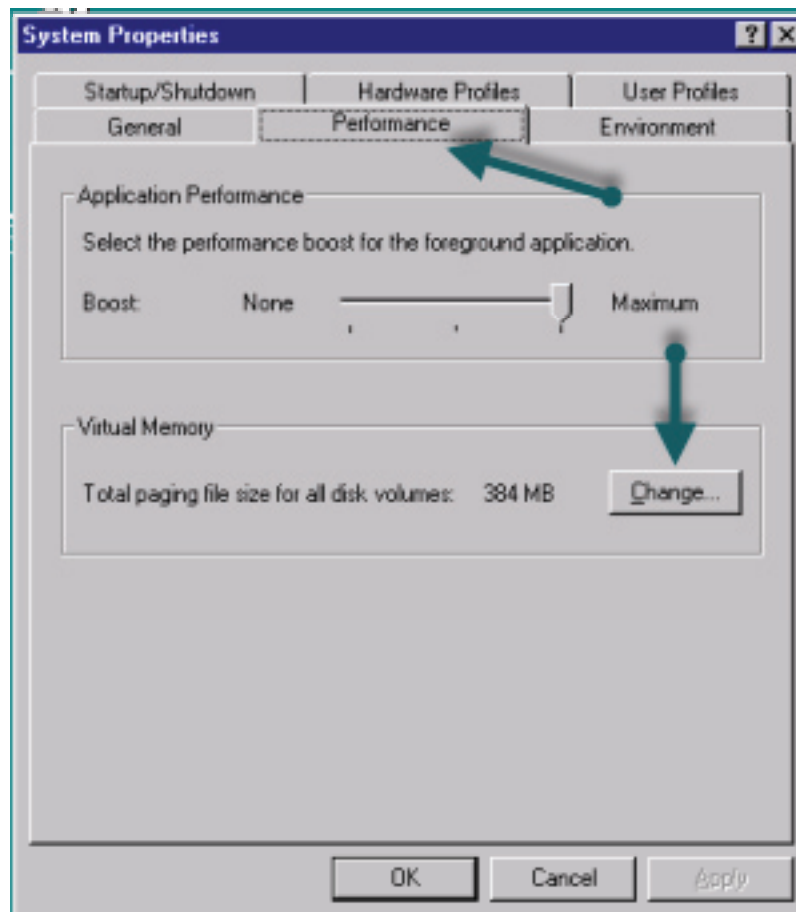


**For Windows 2000 OS Computer:**

1. Right click “My Computer” on the desktop, and select “Properties.”

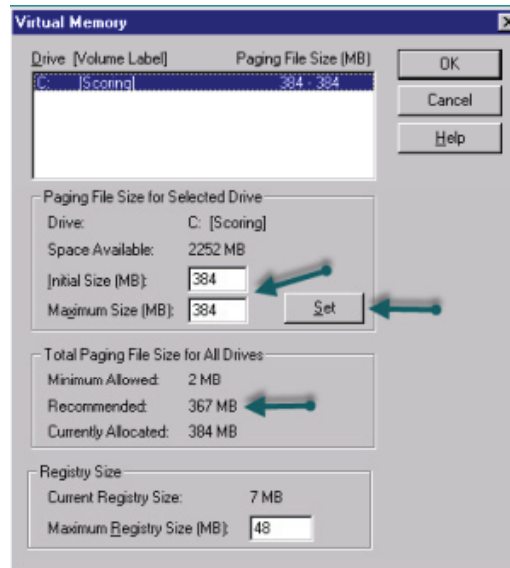


2. Select “Performance” and click on “Change.”

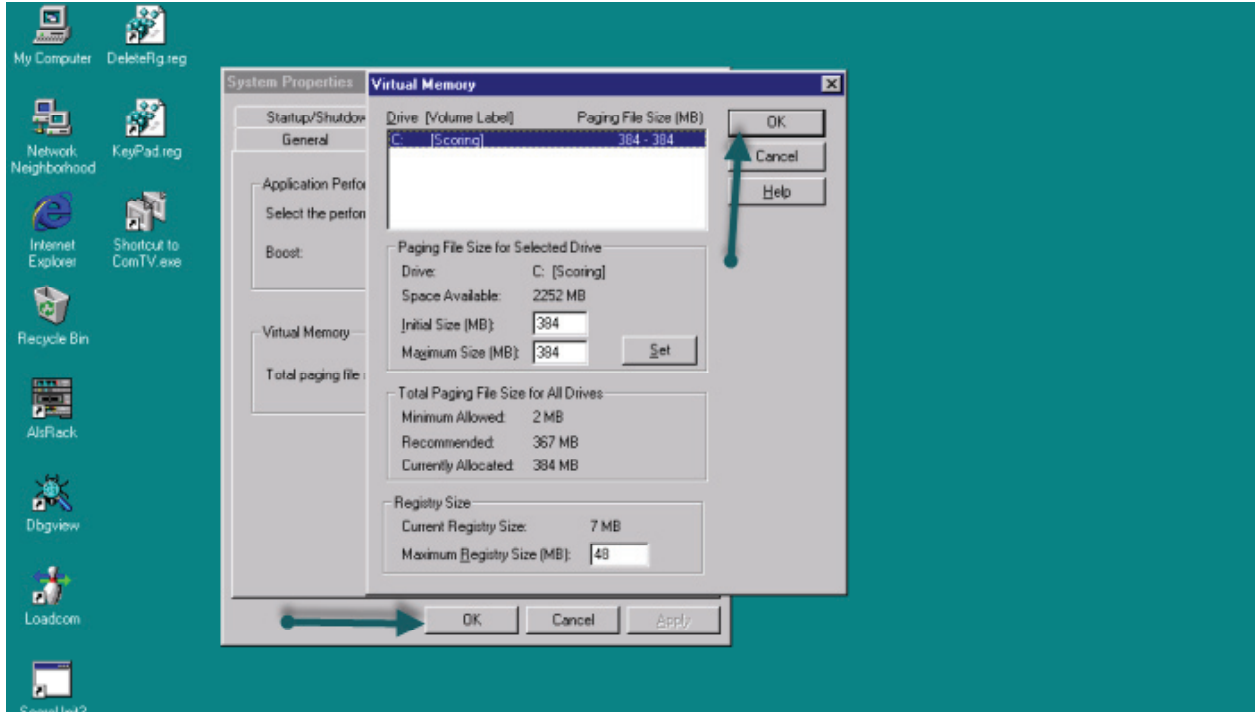




3. Enter the “Recommended” “Total Paging File Size for All Drives” in the “Initial Size” and “Maximum Size” of selected drive. Click “Set” to save your settings. Another way to consider the Initial and Maximum size is to use 1.5 times the physical RAM in the terminal. For example, 1 GB of RAM = 1024 MB. If you have 2 GB of RAM, take  $2048 \times 1.5 = 3072$  MB. This would be your initial size and maximum size in MB.




4. Click “OK” to close all open boxes. A manual reboot of the computer is required to apply the changes.



If you have questions regarding the information contained in this Service Bulletin, please contact Brunswick Technical Support at 1-800-937-2695 or 231-725-4966, FAX 231-725-4667, or Email [techsupport@brunbowl.com](mailto:techsupport@brunbowl.com) Visit <http://www.brunswickbowling.com/service-support/tech-support/> for electronic files of this and other Service Bulletins.



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