

### Topic

This technical note contains valuable information on optimizations which will aid the performance of all Volocity systems running on Windows.

The information is divided into three sections, information relevant to all systems, information relevant to 32-bit Windows and information relevant to Windows XP Professional x64 edition.

### Discussion

#### **For All Windows Systems**

Disable real time protection in anti-virus software.

Any feature of anti-virus protection which scans files as they are saved or opened will seriously impair the performance of Volocity.

Symptoms include reduced acquisition speed and slowing down when opening and working with images.

#### **For 32-bit Windows**

The steps involve optimizing the Windows system virtual memory and the disc space available to Volocity's own virtual memory management for large files.

#### ***Set size of virtual memory page file to 4095MB***

This is done in the System Properties Control panel.

Click Advanced tab

Click Performance (Performance Settings for XP)

If initial and maximum paging file sizes are not already 4095MB click Change (Change Virtual Memory for XP) and set both initial and maximum sizes to 4095MB

#### ***Ensure at least 4GB of free hard disc space at all times***

#### ***Turn on /3gb Address Space Switch***

Please note this is effective for Windows XP only. Windows 2000 Professional does not make the additional 1GB address space available to applications.

**WARNING:** This step describes changes to be made to the boot.ini file. If this file is edited incorrectly, your machine may not start up. You should back up the boot.ini file and be prepared to recover this file from your backup. See below for a recovery procedure.

First install Windows XP Service Pack 2 or the q328269\_WXP\_SP2\_x86\_ENU hotfix.

This solves problems with machines not restarting after turning on /3gb as described in the Microsoft Knowledge Base article – 328269

"Windows XP SP1 May Not Start with the /3GB or /USERVA Switch"

View this article at <http://support.microsoft.com/default.aspx?scid=kb;en-us;328269>

If Service Pack 2 is not available Improvisation Support desks have been authorized to distribute the hotfix and we recommend that you obtain it before proceeding any further.

Back up, then edit, the boot.ini file in the root directory:

1. Open the C:\ drive in "My Computer".  
Click "Folder options" on the "Tools" menu, then click the "View" tab.
2. Select the "Show hidden files and folders" option, and deselect the "Hide protected operating system files" option.
3. Click "Yes" when the confirmation dialog pops up.
4. Click "OK".
5. A file called boot.ini (this file may just be called boot if you are using the "Hide file extensions for known file types" folder option) should now be visible in the root of the C: drive.  
Copy the boot.ini file to a new file on the C:\ drive. Rename this file from "Copy of boot.ini" to "boot-bak.ini" (or "Copy of boot" to "boot-bak" if you have file extensions turned off).
6. Right click the original boot.ini file, and open "Properties". If "Read-only" is selected unselect it now to allow you to make the following changes. Click "OK" to close the Properties dialog. Double-click boot.ini. It will open in Notepad. You should now see contents similar to this:

```
[BootLoader]timeout=30Default=multi(0)disk(0)rdisk(0)partition(1) \WINDOWS  
[Operating Systems]  
multi(0)disk(0)rdisk(0)partition(1)\WINDOWS="Microsoft Windows XP Professional"  
/fastdetect
```

7. Find the line that says XXXXXXXXXXXX="Microsoft Windows XP Professional" /fastdetect
8. Copy this line and paste it above the first.
9. Edit this new line to read:  
XXXXXXXXXXXX="Microsoft Windows XP Professional/3gb" /fastdetect /3gb
10. The file will now show contents similar to this:

```
[BootLoader]timeout=30Default=multi(0)disk(0)rdisk(0)partition(1) \WINDOWS  
[Operating Systems]  
multi(0)disk(0)rdisk(0)partition(1)\WINDOWS ="Microsoft Windows XP  
Professional/3gb" /fastdetect /3gb  
multi(0)disk(0)rdisk(0)partition(1)\WINDOWS="Microsoft Windows XP Professional"  
/fastdetect
```

After installation of Service Pack 2 this line might read:

```
XXXXXXXXXXXXX="Microsoft Windows XP Professional" /fastdetect  
/NoExecute=OptIn
```

In which case change the copy to read:

```
XXXXXXXXXXXXX="Microsoft Windows XP Professional/3gb" /fastdetect  
/NoExecute=OptIn /3gb
```

#### 11. Save the file, and reboot

During startup the choice of starting from Microsoft Windows XP Professional/3gb or Microsoft Windows XP Professional will be offered. The top option will be the default.

If Windows fails to start properly with /3gb enabled restart but select the option without /3gb. This will allow you to start Windows and make corrections to the boot.ini file. You may need to adjust the amount of memory assigned using userva as described below in the section 'Other Problems Encountered After Enabling /3gb'  
If the machine fails to start and the symptom is either a sudden restart or a "BAD\_SYSTEM\_CONFIG\_INFO" blue screen error, the q328269\_WXP\_SP2\_x86\_ENU hotfix has not been installed.

12. Once /3gb is successfully enabled and you are satisfied that the system works with this change you may delete the option in the boot.ini file to start without it and set the boot.ini file back to read only.

#### Other Problems Encountered After Enabling /3gb

Making an additional 1GB address space available to applications may deplete the address space available to the OS kernel causing the following symptoms:

1. Drivers for graphics card do not load. The graphics card is not correctly identified in the display properties and the features of that card are not available.
2. When working with Volocity an error message is shown: "The command could not be completed insufficient system resources exist to complete the requested service. 1450"

In these cases address space should be set to a value between 2 and 3GB to ensure sufficient resources for the kernel.

Follow the instructions above, including those for saving a back up of the boot.ini file but change the line:

```
XXXXXXXXXXXXX="Microsoft Windows XP Professional" /fastdetect /3gb
```

To read:

```
XXXXXXXXXXXXX="Microsoft Windows XP Professional" /fastdetect /3gb  
/USERVA=xxxx
```

Where, in the expression, 'USERVA=xxxx' xxxx is a value between 2048 (2GB) and 3072 (3GB).

The exact value will have to be determined by experimentation. First set userva value to userva=2900. If the problem persists, try again with a new value 100 MB lower than the last value (e.g., userva=2800). The smallest acceptable value is 2048MB.

### **Memory is Finite**

After a period of use Windows will have allocated and reserved blocks of system virtual memory reducing the size of contiguous blocks available to Volocity. This is a fact of working with Windows and cannot be avoided. Closing and reopening Volocity will free the memory and increase performance again.

### **Recover From Backup**

Note: this procedure relies on a backup copy of the boot.ini file made before editing it, as described above.

To recover from a bad change to boot.ini, the following procedure should be used:

1. Boot from your original Windows XP CD by inserting it in the drive, restarting the machine and pressing a key when prompted to "Boot from the CD?".
2. When the Windows Setup program has loaded, press "R" to load the recovery console.
3. Type in "1" and press the enter key to tell it to access your Windows installation.
4. Type in your administrator password when prompted.
5. Type: cd \
6. Type: copy boot-bak.ini boot.ini
7. Press Y for yes when asked if you want to overwrite this file.
8. Type "exit" and press enter.
9. The machine should now restart with your original boot.ini file.

### **For Windows XP Professional x64 Edition**

#### **Set Size of Virtual Memory Page File**

Virtual memory available to Volocity in 64-bit Windows is 8 terabytes however this will still be restricted by page file size. The operating system will try to adjust page file size automatically as demand increases although this may cause memory allocation operations to fail. It is advised to set the page file size to 20GB if hard disk space permits.

1. This is done in the System Properties Control panel.
2. Click 'Advanced' tab
3. Click 'Performance' Settings
4. If initial and maximum paging file sizes are not already appropriate click 'Change Virtual Memory'.

#### **/3gb Address Space Switch Has No Effect**

Increased virtual memory in 64-bit Windows removes the need to activate the /3gb option.