Accessing more than 2.0 GB of memory on Windows XP

This section describes necessary settings to get access to more than 2.0 GB of memory on Windows XP within a V5 process.

Background

By default, Version 5 processes on Windows can allocate up to 2.0 GB of memory for storing data and code. The 4 GB address space offered by the operating system being split in two areas of 2 GB each, first 2 GB for user mode, 2 other GB being reserved by the kernel. On Windows XP, it is possible to increase the default allocation capabilities up to 3.0 GB (3 GB for user mode, 1 GB reserved for kernel). Such capability requires additional tunings in order to be effective :

- From an operating system standpoint
- From a Version 5 standpoint

Operating System requirements

- Windows XP Professional is required.
- A modification of boot.ini file is needed to activate this capability at the system level. The boot.ini switch /3GB needs to be added in order to make 3 GB available for user mode applications. For example :
  [boot loader]
  timeout=30
  default=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
  Notes :
  - Improper modification of the boot.ini file can cause the operating system to be inoperable.
  - For testing purposes of a given hardware configuration, it might be preferable to create several entries in the [operating systems] stanza, as documented in above example, as well as leave a non zero timeout, to allow user selection at boot time between regular boot and boot with the /3GB option; this can allow easy recovery in case the /3GB option causes a problem described in section Additional Operating Considerations below.
  - Modification of the boot.ini file requires administrative privileges.
  - Do not add the /3GB switch if running Windows NT 4.0 Workstation or Windows 2000 Professional.
  - boot.ini file can me modified using bootcfg.exe utility delivered with Windows XP (see http://support.microsoft.com/default.aspx?scid=kb;EN-US;Q291980 for further details on bootcfg.exe utility) or by editing the file :
    1. boot.ini is generally found at the root of C: drive; in a command session (cmd.exe), make file editable :

attrib C:\boot.ini -r -s
2. edit, modify and save file
3. reset file attributes :
   attrib C:\boot.ini +r +s
4. reboot system to make the change effective

- Amount of Real memory and paging space should be sized accordingly.

Version 5 required customizations

The Version 5 main executable needs to be made "Large Address Space Aware" in order to effectively take advantage of 3 GB of address space. In order to do so, one should :

- locate and make a backup copy of the main executable (say, for example, CNEXT.exe, generally found in C:\Program Files\Dassault Systemes\B10\intel_a\code\bin; the same pattern is applicable for DMU.exe or Delmia.exe)
- run imagecfg.exe on CNEXT.exe
  - in a command session, execute imagecfg.exe -l CNEXT.exe
  - output of above command should be similar to :
    CNEXT.exe contains the following configuration information:
    Subsystem Version of 4.0
    Stack Reserve Size: 0x100000
    Stack Commit Size: 0x1000
    CNEXT.exe updated with the following configuration information:
    CNEXT.exe contains the following configuration information:
    Subsystem Version of 4.0
    Image can handle large (>2GB) addresses
    Stack Reserve Size: 0x100000
    Stack Commit Size: 0x1000
  - imagecfg.exe utility can be found on the Windows 2000 Server Resource Kit Supplement One, or from \support\debug\i386 folder of a Windows NT 4.0 CD-ROM.
- Customers having access to Microsoft Visual Studio 6 development environment can use editbin.exe as an alternative to imagecfg.exe. Using editbin.exe utility, generally found in C:\Program Files\Microsoft Visual Studio\VC98\bin, the syntax is as follows :
  editbin.exe /LARGEADDRESSAWARE CNEXT.exe

One can go back to initial behavior by restoring the original copy of CNEXT.exe (or original copy of main executable modified) and removing /3GB switch from the boot.ini file.

Additional Operating System considerations

- Some driver may not load correctly when **/3GB** switch is added to boot.ini. In such case, one would need to apply Service Pack 1 on Windows XP, and tune **/3GB** configurations with **/USERVA** switch in boot.ini file. See :
  Driver May Not Be Loaded with the /3GB Switch
  http://support.microsoft.com/default.aspx?scid=kb;EN-US;Q319043
- If you upgrade your computer to Windows XP Service Pack 1 (SP1) and you are using the **/3GB** switch or the **/USERVA** switch with the **/3GB** switch, Windows may not start. You may also receive an error message that states that one of the registry hives is corrupted. A supported fix is available from Microsoft through article

http://support.microsoft.com/default.aspx?scid=kb;EN-US;Q328269