

# Supported Platforms and Hardware Requirements & Recommendations

## GT-SUITE V6.2

This document is intended to inform potential customers and current users about what software and hardware is needed to run GT-SUITE. The first section on Supported Platforms covers what platform the GT-SUITE GUI and solver will run on, as well as what platforms may be used as a license server for GT-SUITE. The second section on GT-SUITE Hardware Performance Factors gives typical recommendations for what to consider when buying a new computer for a GT-SUITE workstation. The third section on Operating System and Hardware Requirements presents general information about what hardware is required to run the software on each operating system. Also included in this section are windowing environments and compiler requirements for each operating system. The correct compiler version is required for using User Subroutines. Finally the fourth section on Video Card Support explains recommended and required video card hardware and drivers, and a troubleshooting guide for diagnosing and fixing video card problems.

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## Supported Platforms for GT-SUITE v6.2 and the License Server

Below is a list of supported platforms for GT-SUITE v6.2 and the License Server. An up-to-date list of supported platforms for GT-SUITE v6.2 is available on our website at <http://www.gtisoft.com/platform.html>. If a platform is listed as "Yes" for GT-SUITE, but "No" for the License Server, then it cannot be the license server, and must checkout a license from a supported License Server platform. We do not support GT-SUITE or the license server on a virtual machine.

Platform	Operating System	Version	Architecture	GT-SUITE V6.2	License Server
PC	Windows	2000	x86, 32 bit	Yes	Yes
		NT 4.0	x86, 32 bit	Yes (A,B)	No
		2000/2003 Server	x86, 32 bit	Yes (C)	Yes (E)
			x86, 64 bit	Yes (C)	Unofficially (E,F)
		XP Pro	x86, 32 bit	Yes	Yes
			x86, 64 bit	Yes (C,J)	Unofficially (F)
		Vista	x86, 32 bit	Yes (C,I)	Yes (E)
			x86, 64 bit	No (C,I)	Unofficially (E,F)
Linux	RedHat	7.2-7.3	x86, 32 bit	Yes (A)	No
		8	x86, 32 bit	Yes (A)	No
		9	x86, 32 bit	Yes (A)	Yes
		Fedora Core 9	x86, 32 bit	Yes (G)	Yes
	RedHat Enterprise Server	3	x86, 32 bit	Yes	Yes
			x86, 64 bit	Yes	Unofficially (F)
			IA_64 (Itanium)	Yes (D,K)	Yes
		4	x86, 32 bit	Yes	Yes
			x86, 64 bit	Yes	Unofficially (F)
			IA_64 (Itanium)	No	Yes
		5	x86, 32 bit	Yes	Yes
			x86, 64 bit	Yes	Unofficially (F)
			IA_64 (Itanium)	No	No
	SuSE	8.2	x86, 32 bit	Yes	Yes
			x86, 64 bit	No	Unofficially (F)
		9.0-9.2	x86, 32 bit	Yes	Yes
			x86, 64 bit	No	Unofficially (F)
		10.0-10.2	x86, 32 bit	Yes (G)	Driver issue (L)
			x86, 64 bit	Yes (G)	Driver issue (L)
		10.3	x86, 32 bit	Yes (G,H)	Driver issue (L)
x86, 64 bit			Yes (G,H)	Driver issue (L)	
SuSE Enterprise Server	9	x86, 32 bit	Yes	Yes	
		x86, 64 bit	Yes	Unofficially (F)	
		IA_64 (Itanium)	Yes (D,K)	Yes	
	10	x86, 32 bit	Yes (G)	Yes	



			x86, 64 bit	Yes (G)	Unofficially (F)
			IA_64 (Itanium)	No	Yes
Sun	Solaris	2.8 (8)	SPARC	Yes (A)	Yes
		2.9 (9)	SPARC	Yes	Yes
		2.10 (10)	SPARC	Yes	Yes
IBM	AIX	5.1	-	Yes (A)	Yes
HP	HP-UX	11.00	PA-RISC	Yes (A)	Yes
		11.i v1 (11.11)	PA-RISC	Yes	Yes

- (A) The following platforms will not be supported in v7.0: Windows NT, RedHat V7.2 -9, Solaris 2.8, HP\_UX 11.00, AIX 5.1 (migrating to AIX 5.3). Please plan accordingly. If your migration path is to Fedora Core, please let us know.
- (B) See Installation on Windows NT below for NT limitations of GT-SUITE.
- (C) Windows Vista 32/64 bit, XP Pro 64 bit, 2000/2003 Server 32/64 bit - GT-SUITE must be installed from a Build 6 or higher CD. Sun says Java3D may have problems with these operating systems, but our tests do not show these compatibility issues. GT-SUITE has not been tested on Vista 64 bit. However, some customers are successfully using this operating system.
- (D) The status of Linux IA\_64 for v7.0 of GT-SUITE is undetermined at this time because the Java 2 Platform Standard Edition (J2SE) 5 Itanium port is not available. (<http://java.sun.com/javase/downloads/index.jsp>). If GT-SUITE is important to you on this platform, please contact Sun, Intel, and/or your Itanium provider and indicate that you would like the J2SE 5 Itanium port.
- (E) License server software for Windows 2000/2003 must be installed from a Build 8 or higher CD. License server software for Windows Vista must be installed from a Build 9 or higher CD, or downloaded and installed from the GTI website at <http://www.gtisoft.com/download.html>.
- (F) 32 bit drivers are used and have been trouble free, but cannot be 100% guaranteed.
- (G) Must be installed from Build 6 or higher CD.
- (H) Requires system patch xorg-x11-libxcb 7.2-51.2 or later.
- (I) Distributing computing services on Vista must be installed as an administrator, and after installation the services must be set to run as a user. Please see the section on distributed computing for more information.
- (J) CFD Coupling is supported on Windows XP Pro 64 bit for Build 9 and higher.
- (K) Itanium 64 does not support advanced graphical features such as GEM. Please see the section on video card support for more information.
- (L) The drivers depend on a USB setting that is not enabled by default on SuSE 10.3 (and some later builds of 10.2). There is a work-around, but there is a security risk, please see below.



## **GT-SUITE Hardware Performance Factors (Which computer should I buy?)**

There are several factors that can affect the performance of GT-SUITE, which are addressed below. Also see the next section *Operating System and Hardware Requirements*

**CPU:** The most important factor is the CPU. CPU's have evolved to such a state that the clock speed is no-longer the only important factor in determining its processing power. However, when comparing within a processor family, the simulation times will roughly scale inversely with the clock speed. The speed of our simulations can roughly be correlated to the floating point math operations of the system. As of November, 2006 **we have found the fastest CPU for GT-POWER on PC's to be the Intel Core 2 Duo and Intel Core 2 Quad** (multi-core Opterons were not tested.). For other types of hardware, a comparative listing of computation speed can be found at <http://www.spec.org/cpu2000/results>. Please see our webpage <http://www.gtisoft.com/platform.html> for our currently supported platforms.

**Multiple Processors or Cores:** Each case of a simulation must be run on a single processor/core. Thus, multiple processors will not decrease computation time for a single case. A multiple-case model may be divided into single cases or packets of cases, and sent to multiple processors for solving by using our distributed computing feature. However, each processor will require its own solver license. Additionally, with a multiple processor system other software applications will have improved responsiveness while a simulation is running.

**RAM (Memory):** The amount of RAM may limit the responsiveness of the GUI, but has not been found to limit the computational speed. 1 GB of RAM is the minimum requirement. However, we recommend you have at least 2 GB of RAM. More may be desirable if other memory intensive applications are being concurrently used or on dual processor machines. The RAM should be increased if significant memory paging is found to occur.

**Hard Disk:** GT-SUITE does not rely heavily on I/O, so the disk choice has a minimal effect.

**Video Card:** The video card performance is only important for the 3D parts of GT-SUITE, such as: GEM, Discretizer, 3D Flowsplit Viewer in GT-POWER, and 3D Plots in GT-POST. We recommend that you use a stand-alone video card rather than one that is built into the computer's motherboard. Please see the section below for full requirements.

**Monitor:** There are no specific monitor requirements. However, it may be a benefit to use a fairly large monitor (ideally at least 19", but 20" or 22" widescreen are even better). It also may be efficient to use two monitors since most stand-alone video cards now support two monitors.



## **Operating System and Hardware Requirements (PC and UNIX)**

All systems must have 1024x768 or more screen resolution, 600 MB Free Disk Space for an install of a single platform (800MB of additional temp space to install on Linux/UNIX); CD-ROM Drive and 1 GB RAM (2 GB recommended) unless otherwise specified. Please note that the GT-SUITE directory will only take about 300 MB of disk space, but several hundred MB of unused disk space always needs to be available for memory “swap space” (also known as “Virtual Memory Paging File”) for the database. Additionally, to use the new graphical features in v6.2, the system must have a modestly powerful video card. System specific details and video card information are listed later in this section. Platform and OS requirements for coupling GT-SUITE with CFD codes are shown later in this manual. Below are platform hardware requirements.

<b>Platform</b>	<b>Hardware Requirement</b>	<b>Windowing Environment</b>	<b>Compiler (required only to build user subroutines)</b>
PC / Windows	400 MHz+ Pentium III+, CoreXDuo, Athlon, or Opteron	-	Intel Fortran 9.1 & Visual Studio 2005 (std or pro) or Compaq Visual Fortran 6.6
Linux, 32 bit, RedHat	400 MHz+ Pentium III+ or Athlon	KDE / Gnome	Absoft ProFortran v8.0/gcc
Linux, 32 bit, RedHat Enterprise Server, SuSE, and SuSE Enterprise Server	400 MHz+ Pentium III+, CoreXDuo, Athlon, or Opteron	KDE / Gnome	Intel Compilers v9.1 (ifort/icpc/icc)
Linux, 64 bit (using 32 bit executables)	Opteron	KDE / Gnome	Intel Compilers v9.1 (ifort/icpc/icc)
Linux IA_64	1.0 GHz Itanium 2	KDE / Gnome	Intel Compilers v9.1 (ifort/icpc/icc)
Sun	SPARC	X11R5 / Motif 1.2 CDE	Sun Studio 11 (Required to Run)
HP	9000, 700, or 800	X11R6 / Motif 1.2 CDE	HPF90(B.11.01.80) / aCC(C.03.55) / ansic(B.11.02.10)
IBM	RS/6000	X11R6/ Motif 1.2 CDE	xIC 6.0 / xlf 8.0



## Video Card Support

GTsuite 6.2 has many new features (GEM, GTise 3D viewer, GTpost 3D viewer, etc.) related to 3D graphics. In order to make these new features function properly, the video card hardware AND the driver for the system must meet specific requirements described below. If the requirements are not met, the graphics intensive parts of GT-SUITE may not work, but the remainder of the product will function. In summary, the card must generally have a minimum of 64 MB of dedicated video memory and the driver must support GLX 1.3+ and OpenGL 1.2+. Please see below for details.

**Note:** OpenGL and Java 3D are not supported on the Itanium 64 platform. Therefore the features that use Java 3D (GEM, 3D viewer, dynamic plots, run-time monitors, etc.) will not be available on Itanium.

## Video Card Hardware

A modestly powerful video card is required which is supported by Java3D. In general, newer video cards have adequate support for 3D graphics. We recommend using video cards newer than 2 years. Below are the hardware requirements for the video card:

1. Video cards integrated on the computer's motherboard are not recommended.
2. The video card should have at least 64M (128M is suggested) of dedicated video card memory.
3. The latest video card driver from the video card vendors should be used and the video card's hardware acceleration should be fully enabled. See the section below for specific requirements for the driver.

Below is a list of video cards known to be compatible with GTsuite V6.2, but only a limited number of cards have been tested and so this list is not complete. If your video card is not on this list, we recommend trying it before investing in a new video card. Based on our testing of V6.2 of GT-SUITE, NVIDIA cards work well more often than other brands.

<b>NVIDIA Graphic Cards:</b>	<b>ATI Graphic Cards:</b>
- GeForce 6200V+	- Radeon 9600
- GeForce 6200TC	- Radeon 9250 (works ok, but 9600 and up is recommended)
- GeForce FX5900XT	- Mobility Radeon 7000 IGP
- GeForce FX5700 Ultra	- Mobility Radeon x300
- GeForce FX5500	
- GeForce FX5200 Ultra	

## Video Card Drivers

For the graphically intensive features, the video driver must have a GLX version of at least 1.3 and OpenGL version as shown below. A driver from the video card manufacturer is more likely to meet the requirements than a generic one from the operating system, especially on Windows. Red Hat v7.2 through RH Enterprise Linux 3.0 does not come with GLX 1.3 and an updated version is only known to be available through video card manufacturers.

<b>Platforms requiring OpenGL 1.2 or higher</b>	<b>Platforms requiring OpenGL 1.1 or higher</b>
- Win32/x86 - Linux/x86,x86_64 - Solaris/Sparc	- HP-UX - IBM AIX



Please note that while HP-UX and IBM AIX are supported in V6.2 of GT-SUITE, they may not be supported in future versions of GT-SUITE because the JAVA 3D libraries utilized by GT-SUITE are currently not being developed for these two platforms. They are already behind the other platforms today, and there is no evidence that SUN (the makers of JAVA) is working with HP or IBM to make future versions available.

### Remote X-Windows

When using X-Windows to display the graphics on another machine's display, both the client and server's GLX version must be at least 1.3 and have the required OpenGL version shown above. The hardware on the machine displaying the graphical image is the one that is important for the speed of updating the image. Network traffic or speed limitations may also affect the frame rate.

We do not officially support any third-party X-Windowing software. However, as a service to our users we have tested the following: Cygwin, Exceed and Exceed Power Suite 2006. We have found that the base Exceed package does not support GLX 1.3 and does not work with the advanced 3D features. The Exceed 3D add-on which was tested as found in "Exceed Power Suite 2006" does meet the minimum requirements, however it gives ~20% slower frame rates compared to displaying graphics generated locally on the same machine. The option "GLX 1.3 Support" must be enabled from Start> Exceed Tools> XConfig> Exceed 3D and GLX. Cygwin only has a GLX version of 1.2, so it does not work with most machines. It was found to work with a remote machine with a GLX version of 1.4 (RHEL4.0), but its frame rate is 50% slower than compared to the local machine. Again, the above products are not supported or endorsed.

### Testing the video card

The script **gttestj3d**, located in the \$GTIHOME/bin directory, may be used to test whether OpenGL and GLX is installed and working properly on your machine. If the required versions are not installed, it can typically be upgraded by installing the latest graphics driver for the video card from the graphics card manufacturer, not Microsoft (in the case of Windows operating system).

### Troubleshooting 3D Issues

If you are experiencing problems with our 3D applications, please read through the "Video Card Support" section first. There are many details above that will more than likely resolve your problem. If the above information does not help, please follow the steps below.

- I. Check that your video card meets the minimum requires as stated above.
  - a. If you do not meet these requirements, please update your card. Refer to our list of recommended cards that are known to work well with our 3D applications.
- II. Update the video card driver from the video card vendor.
  - a. The driver must be provided by the vendor and not the OS default driver.
  - b. This is necessary to ensure that you are using the proper version of OpenGL and GLX (refer to the information above). Using an outdated video driver with an older version of OpenGL or GLX will prevent our 3D applications from running.
- III. Run our **gttestj3d** script, located in the \$GTIHOME/bin directory and read the instructions. This will check that you are running the required version of OpenGL.
  - a. Select the "Test J3D Support" button.
    - i. This will test if your video card OpenGL and GLX version is acceptable.
  - b. If the above succeeds, then select the "Test J3D Performance" button.
    - i. This will test if your video card's performance meets the expectations for our



- 3D applications. If not, it will be suggested for you to upgrade your card.
- c. As long as the "J3D Support" test passes, then your system will be enabled for running our 3D applications.
    - i. Even if your performance isn't great, you should at least be able to use the minimal features of the 3D applications.
  - IV. Another option is to test with upgraded video card. Install and test 3D on your machine, but with an upgraded video card. Make sure that this new card meets the minimum requirements we specify. Run the gtestj3d script as mentioned in Step 3.
  - V. If you are still not successful after trying all the methods above, including upgrading your video card, then there is one more option. **Note: This method will give you limited functionality. GEM and GTpost dynamic view may be unstable. This method is not recommended and should only be used as a last resort.**
    - a. First verify that 3D applications worked in v6.1.0 (If you do not have v6.1.0 installed, then you cannot perform the following steps).
      - i. This can be done by first opening up the standard 4cyl example model in GTise v6.1.0.
      - ii. Single-click on a "FsplitGeneral" part.
      - iii. Select "Edit 3DView" from the "Edit" menu.
      - iv. Ensure that the 3D object appears in the 3D Flowsplit viewer.
      - v. If a 3D object does not appear, then please do NOT perform the following step.
    - b. If the above step (a.) passed, then you can attempt to roll back your Java3D version. Please refer to the note mentioned in step V. before continuing.
      - i. If you would like to attempt to roll back your Java3D version, open a command prompt window.
      - ii. `cd %GTIHOME%\GTI\v6.2.0\GTsuite\bin` on Windows or `$GTIHOME\GTI\v6.2.0\GTsuite\bin` on UNIX/Linux
      - iii. Run `revertJ3dLib.bat` on Windows or `./revertJ3dLib` on UNIX/Linux.
      - iv. Make sure that the screen outputs that some files were copied.
      - v. You may now attempt to run 3D applications taking note of the limited functionality.

