

Supported Platforms and Hardware Requirements & Recommendations

GT-SUITE V2019

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 Hardware Recommendations gives typical recommendations for what to consider when buying a new computer for a GT-SUITE workstation. The third section on Minimum System Requirements presents general information about what hardware is required to run the software on each operating system. 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.

- 1.1 Supported Platforms for GT-SUITE and the License Server..... 2
- 1.2 Hardware Recommendations (Which computer should I buy?) 5
- 1.3 Minimum System Requirements (PC and UNIX) 7
- 1.4 Virtual Machines..... 7
- 1.5 Video Card Support 8
- 1.6 Coupling GT-SUITE with 3rd Party Software (CFD/Simulink)..... 11

1.1 Supported Platforms for GT-SUITE and the License Server

Below is the most recent list of supported platforms for GT-SUITE and the License Server at the time that this build was released. 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.

Please see the minimum system requirements section for more information on the minimum requirements to run GT-SUITE software. Please refer to the hardware recommendations section for recommendations when purchasing new hardware.

Platform	Operating System	Version	Architecture	GT-SUITE 2019	License Server
Windows	Windows	2008 R2 2012 R2, 7, <u>8*</u> , 10	Any x86_64	Yes	Yes
Linux See below for important "Change in supported Linux" RHEL 6 and OpenSUSE 12 in v2020	RHEL /Centos	6.0*** – 7.5		Yes	Yes
	Open SuSE/SuSe	12.1*** – 42.3 (11.3+**)		Yes	Yes
	SuSE Enterprise Server	12 (11SP2+**)		Yes	Yes
License Server Only	Any above	RHEL 6.7+, OpenSuSE 12.3+		N/A	Yes
<u>Virtual Machines</u>	Any	-	-	No Official Support	NO

1.1.1 Windows Operating Systems Notes

Windows 8 Licensing – Older USB dongles which are 52mm in length will not work with Windows 8. Please contact support@gtisoft.com for a replacement dongle.

***Windows 8 GT-SPACECLAIM** - GT- SPACECLAIM is no longer be supported on Windows 8 starting in v2018. However, it is supported on Windows 8.1.

GT Services - All Windows - An account with administrator rights must be used to install either of the following optional services on Windows 7/8/10: FLEXnet license services & distributed computing services. Additionally, if the distributed computing services will be used to run models with version 7.1 or earlier solvers, they must be set to run as a specified user. Please see the DistributedComputing.pdf

document in the %GTIHOME%\<version>\documents\DistributedComputing directory for more information.

1.1.2 Linux Operating Systems General Notes

CentOS is also applicable where RHEL is noted below.

****Linux Minimum System** – The minimum system requirements for basic GT-SUITE functionality are RHEL6/openSUSE12.1/SLES12 (glibc >= 2.12) with the additional the 32 bit **glibc.*.i686 package must be installed**.

Please see the sections below for additional requirements with specific GT-SUITE features on Linux and for platform specific notes.

Distributions with glibc = 2.11, such as SLES11SP2+, are generally able to run the solver, but Gamma Technologies will be in a limited position to provide technical support and some features will not be available on this operating system.

***** Change in supported Linux v2020 – RHEL 6 / OpenSUSE 12 / SUSE 11.3+** -We will discontinue support for these platforms in v2020, or shortly thereafter. If you currently use RHEL 6, OpenSUSE 12 or SUSE 11.3 please e-mail support@gtisoft.com and let us know how this change would impact your GT workflow. Please also let us know your planned migration path, OS specifics, when you intend to update to v2020, the number of affected machines and if they are Workstations or a Cluster.

Linux 3D graphics in v2020+ – Starting in v2020, 3D graphical operations on Linux will require gcc >= 6.3.1. Platforms not meeting this minimum requirement will not be able to run 3D graphical applications such as GEM and COOL3D, however, the solver and conventional graphics will continue to function. SuSE is not officially supported by the third-party 3D engine but it is expected to work if the minimum gcc revision is met. Thus RHEL 7.1 or later is required for 3D graphical applications.

Linux required packages for legacy versions – Additional 32 bit compatibility libraries are required when running older versions of GT-SUITE, please see the older documentation for specific details if necessary. v7.3-v2017 requires /usr/lib/libstdc++.so.6 and V7.2 or older require libstdc++.so.5.

Linux SVN Integration: In order to run features of GT-SUITE that use SVN libraries, zlib for the corresponding architecture must be installed. Typically this is installed by default, but depending on installation options of the distribution may not include this package.

Linux GT-SPACECLAIM - GT-SPACECLAIM is a Windows only application and is not available on Linux. It is used for translating 3D geometry between formats, modifying 3D geometry before importing to GT-SUITE, and some 3D plots in GT-ISE and GT-POST.

Linux CONVERGE Lite - The CONVERGE Lite graphical pre-processor tool which can be launched from GT-ISE has additional library dependencies on Linux. Depending on the operating system, libgfortran other additional packages may be required, e.g. Streaming-Media Framework Runtime libgstreamer-0_10* and icui18n.

OpenSUSE 12.3 - There are problem with JAVA on this OS and it is not recommended. Run Time monitors are disabled on this platform due to a bug in this version of SuSE which would cause the solver to crash when using run time monitors. Also the machine has been known to become unresponsive while using the GUI. This is not reproducible enough to have been corrected.

OpenSUSE Leap 42.1+ ncurses- There may be an additional library needed to be installed depending on package settings of Leap 42.1+. The shared library libncurses.so.5 must be installed in order to run GT-SUITE. It can be installed through zypper utility.

JavaFX – GT-ISE uses JavaFX by default, but this may not be supported by all Linux operating systems. To launch GT-ISE without using JavaFX, please use the option: *-javafx:off* . GT-ISE will automatically disable JavaFX as needed in a future build. For details on which systems support JavaFX, please see the “notes” in <http://www.oracle.com/technetwork/java/javase/certconfig-2095354.html>. An unsupported system which attempts to use JavaFX might fail with errors about libprism_es2.so or libpng16.so.

1.1.3 Linux License Server Specific Notes

General Linux License Servers: To run the license server on a Linux machine it must minimally have LSB 4.0 compliance and GLIBC-2.7 and Kernel 2.6.2 and the **32 bit glibc.*.i686 package** for the hardlock driver.

1.2 Hardware Recommendations (Which computer should I buy?)

There are several factors that can affect the performance of GT-SUITE, which are addressed below.

CPU: The most important factor is the CPU. CPUs 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. Larger memory caches can also reduce runtimes. The speed of our simulations can roughly be correlated to the floating point math operations of the system. As a reference to help in deciding on new hardware, the following will describe the hardware that Gamma Technologies is using internally as of 2019. We are not endorsing these products, but rather they are provided as a reference. Our *desktops* are running Intel® Core™ i7-7700 (Quad Core 3.6GHz, 8MB Cache, w/ HD Graphics 630) with 16 GB RAM, and *laptops* are running Intel® Core™ i7-7820HQ (Quad Core, 3.9GHz, 8MB Cache) 16GB RAM and *cluster machines* are running dual Intel® Xeon™ E5-2650 v4 (12 Cores each, 2.2GHz, 30MB Cache) with 64GB RAM. For other types of CPU, a comparative listing of computation speed can be found by viewing the latest benchmarks from <http://www.cpubenchmark.net>. Please see our webpage <https://www.gtisoft.com/gt-suite/supported-platforms-and-hardware/> for our currently supported platforms.

32/64 bit: Starting in v2018 the operating system must be 64-bit, as most 32-bit GT applications have been discontinued. However, Linux is still required to install the 32-bit compatibility packages as per the [Linux Operating Systems General Notes](#). If you have a special circumstance which requires you to link/cosim the GT solver with a 32-bit 3rd party tool, please contact support@gtisoft.com.

Multiple Processors or Cores: There are two ways in which GT-SUITE simulations can take advantage of multi-processor/core systems, distributed computing or parallel processing.

In distributed computing, each case of a simulation may be run on a single processor/core. As a result, multiple processors will not decrease computation time for a single case. A multiple-case model will be divided into single cases or packets of cases, and sent to multiple processors for solving by using the distributed computing feature. Additionally, with a multiple processor system other software applications will have improved responsiveness while a simulation is running.

A solver license will be required for each core which is simultaneously processing a simulation. A multi core machine will function with a single solver license, but it will be limited to only solve one model/packet at a time.

In parallel processing, selected parts of the code can be branched into multiple threads that can be run on different processors or cores at the same time. A single case of a simulation can be run in this manner to reduce the run-time of a simulation. Parallel processing is supported on the same hardware that is supported for serial (single processor) calculations. GT-SUITE will use only one solver license for a parallel calculation, no matter how many processors are used. More information on realistic expectations of speedup can be found in the GT-ISE help for the Run Simulation Wizard.

RAM (Memory): The amount of RAM may limit the responsiveness of the GUI, but has not been found to limit the computational speed. The minimum recommended amount of installed RAM is 16 GB. More may be desirable if other applications concurrently used with GT-SUITE. The RAM should be increased if significant memory paging is found to occur.

Hard Disk: Locating your database directory and GT-SUITE installation (if possible) on a Solid State Drive (SSD) will improve GUI performance, especially in GT-POST.

Video Card: The video card performance is only important for the 3D parts of GT-SUITE, such as: GEM3D, COOL3D, 3D Flowsplit Viewer in GT-ISE, 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 [Video Card Support](#) for full the full requirements.

Monitor: The absolute minimum is 1280x768. This is true for projectors as well because a widescreen projector is recommended. Dual monitors are recommended for maximum productivity, especially when working with GT-POST.

1.3 Minimum System Requirements (PC and UNIX)

This section describes the bare minimum. **Please see the section above which describes the specifications for good performance.** All systems must have 1280x768 or more screen resolution, an x86_64 processor, 14 GB free disk space (+additional working space), DVD-ROM drive (if installing from DVD), and 8 GB RAM. The computation time is highly dependent on the CPU and the above is simply a minimum which has the necessary instruction set to run. It is highly recommended that a better CPU is used. Please see the section [Hardware Recommendations \(Which computer should I buy?\)](#) for recommendations. Additionally, to use the 3D graphical features, the system must have a modestly powerful video card. Platform and OS requirements for coupling GT-SUITE with CFD codes are shown later in this manual.

Compilers (optional) : To create custom user code it may be desirable to also install a compiler. Currently all the use routines are available in Fortran the controls component is available in C. For details see the Co-Simulation_And_UserCode document.

1.4 Virtual Machines

Virtual machines of any sort are officially unsupported. We do not plan to support virtualization as there are too many possibilities. Furthermore, if the visualization product is working correctly, there should not be any issues over those from the base operating system. GT-SUITE clients (GT-ISE, solver, GT-POST, etc...) might run on virtual machines, but Gamma Technologies will not be able to assist with issues specific to a virtual machine.

A license server will require the use of a USB hardlock and as such a license server should be run on physical hardware, not on a virtual machine.

1.5 Video Card Support

GT-SUITE has many features (GEM3D, GT-ISE 3D viewer, GT-POST 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.

It is strongly recommended to keep the video card driver current. Using outdated video drivers can cause troubles with JAVA applications, such as GT-SUITE. If your driver is over two years old, please update to the latest provided by the manufacturer to prevent any compatibility issues.

A stand-alone video card is highly recommended. Integrated graphics cards on the motherboard are typically inferior to stand-alone graphics cards for 3D applications and are not recommended. A few high-end laptops have an expensive, high performance video card integrated on the motherboard for purposes of minimizing battery consumption that may prove acceptable. The video card should have a minimum of 64MB of dedicated video card memory, but more is recommended. 256 MB minimum is recommended for GT-SpaceClaim. Please see some additional details in the next section.

The video card driver from the video card manufacturer is more likely to meet the requirements than a generic one from the operating system and is highly recommended. The video driver must support:

- GLX 1.4+
- OpenGL 2.0+ (much of the 3D capability will function properly with OpenGL 1.2+, but some of the more advanced rendering capabilities will not be available without OpenGL 2.0.)
- DirectX 9c (for GT-SpaceClaim)
- Shader Model 3.0 (for GT-SpaceClaim)

Note that those using a X-Windows or remote access tool to view graphics from another workstation must also have all participants in the graphics process meeting these same standards. Please see the X-Windows section below for more details.

1.5.1 Video Card Setup and Details

In addition to the video card requirements listed above, here are some additional details on setup and configurations that have been encountered by the GT-SUITE support staff:

1. **Note on laptops:** Some laptops that include NVIDIA graphics cards may try to maximize battery life by automatically selecting the integrated video processor instead of the NVIDIA card for applications that it does not think are graphics intensive. Please make sure that all GT-SUITE applications are forced to use the NVIDIA card, rather than use the “automatic detection” algorithm (the automatic detection will use the weaker integrated processor and may result in graphical issues).
2. **Note on LINUX:** It is not recommended to use AMD video cards on Linux 64-bit platforms. There are known driver and compatibility issues with AMD video card drivers and Linux operating systems that can cause 3D application to fail. Depending on the exact configuration, this may work, but no guarantees can be made.

3. The graphics card driver should be kept updated for use with GT-SUITE. Using outdated video drivers can cause troubles with JAVA applications, such as GT-SUITE. Updating to your video card manufacturer's latest driver is strongly recommended to prevent any compatibility issues.
4. The video card's hardware acceleration should be fully enabled.

We have tested a number of video cards in-house, using both NVIDIA and AMD graphics processors. Based on our testing of GT-SUITE, NVIDIA cards work well more often than other brands, but recent cards that meet the memory and driver requirements should be sufficient for GT-SUITE 3D applications.

Recent generations of Intel integrated graphics cards have been tested with GT-SUITE. The Intel HD 3000 and higher provide basic 3D graphics support for GT-SUITE, but performance is reduced when compared to a dedicated graphics card. Therefore, these cards are not recommend for regular use with GT-SUITE 3D applications.

1.5.2 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 1.4 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 (v2019), Xming (v2019), Exceed (v2017), and Exceed PowerSuite (v2017). Please be sure to use the latest release of the clients, as some older clients were found to be insufficient. Also, for some clients the standard/basic version did not meet the minimum graphics driver requirements and did not function properly for 3D applications. Some do offer support, but only when upgrade or add-in versions are installed, often for a surcharge. In our tests with very idealized conditions and latest upgrades, the remote access still gave a 20% to 50% reduction in frame rate, and so a local workstation is the preferred mode of operation.

1.5.3 Testing the video card

The script `gttestj3d`, located in the `$GTIHOME/bin` directory, may be used to test whether the required versions of OpenGL and GLX are 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).

1.5.4 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 the test program `gttestj3d` script, located in the `$GTIHOME/bin` directory and read the on screen instructions. This will report the relative performance of the graphical system. 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 `gttestj3d` script as mentioned in Step 3.

1.6 Coupling GT-SUITE with 3rd Party Software (CFD/Simulink)

The follow sections contain information regarding coupling of GT software with other software code. Please note the versions which are supported as well as licensing considerations.

1.6.1 Coupling GT-SUITE with CFD Codes

The following table provides a summary of the supported versions of CFD codes that are confirmed compatible with released versions of GT-SUITE.

Confirmed incompatibilities are indicated. **Absence from the below table does not imply incompatibility**, but rather lack of compatibility testing performed by Gamma Technologies at the time this document was released. Please contact support@gtisoft.com (or the CFD software support if the CFD version is new) if it is desired to use a combination not that is listed.

Italicized version numbers in the below table indicate a version with no planned future verification for the next major release of GT-SUITE. Please contact support@gtisoft.com if any of the planned removals are problematic.

Verified Compatibility: General flow CFD coupling using 'CFDComponent' and GT-SUITE/GT-POWER/GT-SUITE-MP

	GT-SUITE v2019	GT-SUITE v2018	GT-SUITE v2017
STAR-CCM+	v13.06 ^v v13.04 ^{†v} v13.02 [†] v12.06 ^v v12.04 ^v v12.02 ^m Incompatible: v11.06* v11.04 ^v v11.02 ^v	v13.06 ^v v13.04 ^{†v} v13.02 [†] v12.06 ^v v12.04 ^v v12.02 ^m Incompatible: v11.06* v11.04 ^v v11.02 ^v	v12.02 ^m Incompatible: v11.06* v11.04 ^v v11.02 ^v v10.06 ^{††v} v10.04 ^{††v} v10.02 ^{††v} v9.06 ^{†††v} v9.04 ^{†††v} v9.02 ^{††v}
STAR-CD	v4.30 ^v v4.28 ^v v4.26 ^v v4.24 ^v	v4.30 ^v v4.28 ^v v4.26 ^v v4.24 ^v	v4.28 ^v v4.26 ^v v4.24 ^v v4.22 ^v
CONVERGE	v2.4.13 v2.3.9 ^v	v2.4.13 v2.3.9 ^v	v2.3.18 ^v v2.3.14 ^v v2.3.9 ^v
FLUENT	R19.1*** Incompatible: R19.0** Incompatible: R18.2** R18.1 ^{•v} R18.0 ^v R17.2 ^v R17.1 ^v R17.0 ^v R16.2 ^v	R19.1*** Incompatible: R19.0** Incompatible: R18.2** R18.1 ^{•v} R18.0 ^v R17.2 ^v R17.1 ^v R17.0 ^v R16.2 ^v	Incompatible: R19.0** Incompatible: R18.2** R18.1 ^{•w} R18.0 ^v R17.2 ^v R17.1 ^v R17.0 ^v R16.2 ^v R16.1 ^v

	<i>R16.1[∇]</i>	<i>R16.1[∇]</i> <i>R16.0[∇]</i> <i>R15.0[∇]</i>	<i>R16.0[∇]</i> <i>R15.0[∇]</i> <i>R14.5[∇]</i> <i>R14.0[∇]</i>
OpenFOAM (Linux only)	<i>v1.4.1-dev[∇]</i>	<i>v1.4.1-dev[∇]</i>	<i>v1.4.1-dev[∇]</i>
FIRE**	2017 [∇]	2017 [∇]	2017 [∇]
scFLOW	v14	v14	
SC/Tetra (SCRYU/Tetra® in Japan)	v14 [∇] v13 [∇]	v13 [∇]	v13 [∇] v12 [∇] (<i>July 2015 update module</i>)

[∇] - CFD products versions marked with this superscript do not support mass-based coupling with GT-SUITE, which is recommended for systems involving a CFD coupling component that is part of a closed circuit. [Special note, STAR-CCM+ 13.02 does support mass-based coupling even though STAR-CCM+ v13.06, v13.04, and v12.06 and lower does not.]

† - Coupled restart simulations have been found to fail with internal STAR-CCM+ v13.02 errors if the STAR-CCM+ .sim file for the first simulation is not saved using STAR-CCM+ v11.02 or newer. Siemens reports this problem will be corrected in STAR-CCM+ v13.06 and newer. In the meantime, to avoid this irrecoverable error when using STAR-CCM+ v13.02 and v13.04, it is necessary to save the .sim file using v11.02 or newer prior to running any STAR-CCM+ v13.02 or newer simulation coupling with GT.

* - Due to a critical bug in STAR-CCM+ v11.06, GT-SUITE coupling was not supported (for all GT-SUITE versions). This is fixed for STAR-CCM+ v12.02 and higher.

** - Due to a bug in FLUENT R18.2 and FLUENT R19.0, simulations coupled with GT-SUITE are prone to FLUENT results being corrupted. It is therefore not recommended to use these versions. ANSYS reports this problem is repaired for R19.1.

*** - Due to a bug in FLUENT R19.1, scripted FLUENT R19.1 jobs coupling with GT-SUITE may fail to execute the end of a FLUENT script after an otherwise successful GT coupling simulation. This problem may result in a severe hang problem for environments where the end of the FLUENT script terminates FLUENT itself as part of a job submit to a queuing system. ANSYS reports this problem should be repaired in a future version of FLUENT.

''' - A subset of regression testing models failed using STAR-CCM+ v12.02 (for all GT versions). Siemens identified an algorithm change between STAR-CCM+ v11.04 and v12.02 that appears responsible for the relatively less robust performance using STAR-CCM+ v12.02. The previous algorithm was restored in STAR-CCM+ v12.04. Despite this change, most regression tests models succeeded using STAR-CCM+ v12.02 with adequate results.

† - These STAR-CCM+ versions can not use the "default" option its "GT-SUITE Root" field when coupling to GT-SUITE v2016 and newer installations. This can be readily corrected with installation changes using a STAR-CCM+ macro provided courtesy of Gamma Technologies, as described in the STAR-CCM+ coupling tutorial. Execution of this macro will not be necessary for future versions of STAR-CCM+.

• - FLUENT R18.1 is known to feature a non-ideal initial calling sequence with GT-SUITE which can cause otherwise stable models to be unstable if the simulation meets both of the below criteria:

- i) The GT circuit containing the CFD component is solved using a GT implicit flow solver
- ii) A 'CFDFlowConn' part of type Liquid or Advanced is used with the pressure-relaxation feature activated.

This issue has been communicated to ANSYS and a preferable startup sequence is being pursued.

^w - Windows FLUENT R18.1 and GT v2017 coupling is supported and verified, but is incompatible when using v2017 gmlink libraries older than to build 3. This requirement is caused by Windows FLUENT R18.1 software specifically and does not apply to FLUENT R18.0 or older versions or Linux FLUENT R18.1.

[‡] - STAR-CCM+ v9.04 and v9.06 has been tested, but a coupled restart test using Linux OpenSUSE v12.1 resulted in a STAR-CCM+ failure without workaround (this failure was not observed with the same model when run using a RHEL 6.0 installation). With identical model setup, previous versions of STAR-CCM+ (e.g. v9.02) do not fail for coupled restart using OpenSUSE v12.1. If using OpenSUSE it is recommended to avoid using STAR-CCM+ v9.04-v9.06. We have received notice that future STAR-CCM+ v10 will not be subject to this problem.

** - Other FIRE versions are likely supported, but only compatibility with the listed versions have been verified at GT.

When coupling GT-SUITE with CFD codes, the applied CFD software does NOT necessarily need to be run on the same machine that runs the GT software. The user has the option to run both codes on separate machines OR on the same machine. If using different machines, the CFD software only needs to be installed on one machine.

Although the GT-SUITE solver does not have any dependence on MPI libraries, when GT-SUITE is used to couple with a separately licensed parallel version of CONVERGE™ Lite the MPI CONVERGE™ Lite solvers installed with GT-SUITE do require MPI library installation.

While MPI CONVERGE™ Lite solver MPI library compatibility is not expected to be limited to particular versions of MPI libraries, a table of MPI library versions used to verify MPI CONVERGE™ Lite solvers is shown below.

Verified Compatibility: General flow CFD coupling using 'CFDCONVERGELite'

Platform	GT-SUITE/GT-POWER/GT-SUITE-MP v2019	
	MPI Library versions	
	CONVERGE Lite v2.4 (R2)	CONVERGE Lite v2.3 R3
64-bit Linux	OpenMPI 1.10.1 Intel v2017.0.098 MPICH 3.1.4	OpenMPI 1.6.5 HP-MPI 02.03.00.00 MPICH 3.1.4
64-bit Windows	Microsoft MPI (HPC Pack 2012) Intel v2017.0.098	Microsoft MPI (HPC Pack 2012) <i>MPICH2 1.4.1p1</i>

If a GT-SUITE installation is used for parallel CONVERGE™ Lite coupling, all MPI libraries must be obtained and installed separately. Microsoft MPI HPC Pack 2012 MS-MPI is a free redistributable available from Microsoft. Intel MPI run-time libraries are similarly available from the Intel website for free after registration. Both MPICH2 and OpenMPI are also freely available under BSD-like licenses. HP-MPI libraries can be downloaded from one's local CONVERGE™ support office.

**Verified Compatibility: Aftertreatment Device CFD coupling using 'CFDInterfaceAT'
and GT-SUITE/GT-POWER**

	GT-SUITE v2019	GT-SUITE v2018	GT-SUITE v2017
CONVERGE	v2.4.21	v2.4.13	v2.3.18

**Verified Compatibility: General CFD FSI coupling using
GT-SUITE/GT-SUITE-MP**

	GT-SUITE v2019	GT-SUITE v2018	GT-SUITE v2017
CONVERGE	'CFDMechConn' (1D translational): v2.4.23	'CFDMechConn' (1D translational): v2.4.14	'CFDMechConn' (1D translational): v2.2.061915

**Verified Compatibility: Mechanical Turboshaft CFD coupling using 'CFDComponent'
and GT-SUITE/GT-POWER/GT-SUITE-MP**

	GT-SUITE v2019	GT-SUITE v2018	GT-SUITE v2017 build 2+	GT-SUITE v2017 build 1-
FLUENT	R18.1	R18.1	R18.1	{file-based coupling only}
STAR-CCM+	{file-based coupling only}	{file-based coupling only}	{file-based coupling only}	
CONVERGE				
SC/Tetra (SCRUYU/Tetra® in Japan)				

**Verified Compatibility: CFD Cylinder coupling using 'EngCylinderCFD'
and GT-SUITE/GT-POWER**

	GT-SUITE v2018	GT-SUITE v2017	GT-SUITE v2016
CONVERGE	v2.0 (Linux 090214)	v2.0 (Linux 090214)	v2.0 (Linux 090214)

1.6.2 Coupling GT-SUITE with Simulink

Coupling of GT-SUITE with Simulink is currently supported for below Matlab/Simulink versions, depending on the role of GT-SUITE:

	GT-SUITE as Master	GT-SUITE s-function	Compiled GT-SUITE MEX
Windows	2011b-	2006b-	2011b-
Linux	2014a-	2014a-	2014a-

Coupling is performed via a GT supplied S-Function Block in the Simulink model or compiled MEX exported from GT-SUITE and through the use of either a 'SimulinkHarness' or 'CoSimInterface' object in the GT-SUITE model. For additional information regarding coupling with Simulink, please refer to the Controls Coupling Manual, which is accessible from GT-ISE under Help → Manuals → Co-Simulation And User Routines → ControlsCouplingAndRealTime.pdf .

From v2019, Compiled GT-SUITE MEX functionality is no longer supported for Windows 32-bit applications.

1.6.3 Coupling GT-SUITE via Functional Mock-up Interface (FMI)

GT-SUITE is an FMI capable tool for both FMIv 1.0 and FMI v2.0. The below table shows all FMI variants that are supported by GT-SUITE:

	Export for Model Exchange	Export for Co-Simulation	Import for Model Exchange	Import for Co-Simulation
Windows	-	<i>Supported</i>	<i>Supported</i>	<i>Supported</i>
Linux	-	<i>Supported</i>	<i>Supported</i>	<i>Supported</i>

For additional information regarding coupling with Simulink, please refer to the Controls Coupling Manual, which is accessible from GT-ISE under Help → Manuals → Co-Simulation And User Routines → ControlsCouplingAndRealTime.pdf .

From v2019, building GT-SUITE models as FMUs functionality is no longer supported for Windows 32-bit applications.

1.6.4 Other coupling to GT-SUITE using the GTLINK coupling library

Support of CAE client software using the gmlink library provided by Gamma Technologies is required to be built with glibc version 2.11 or higher.