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Version
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Siemens Digital Industries Software
Simcenter STAR-CCM+
Installation Guide
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Contents

Simcenter STAR-CCM+ Installation Guide

This guide contains instructions on how to install Simcenter STAR-CCM+ and the CAD Clients on Windows, and Simcenter STAR-CCM+ on Linux.

Contents:

Installation Changes in Simcenter STAR-CCM+ 2020.2

This section describes changes to the current Simcenter STAR-CCM+ installation.

Java Upgraded to OpenJDK Version 11.0.5

The Java SDK (Software Development Kit), which is required to compile the Java macros, has been upgraded to OpenJDK v11.0.5 in the current release.

Previous versions of the JDK will not work, but later versions of JDK 11 will be allowed (both OpenJDK-based distributions and Oracle's JDK).

Changes to Support for MPI and Operating System Versions in Current Release

Beginning with the current release, support has changed for the following MPI versions:

MPI Vendor	Added Versions	Discontinued Versions
Intel MPI	2019.5	2018.1
Microsoft MS MPI	10.1.1	10.0, 8.1.1
Open MPI	3.1.5, 4.0.2	3.1.3

Microsoft MS MPI 10.1.1 is now distributed with Simcenter STAR-CCM+.

Beginning with the current release, support has changed for the following operating system versions:

Operating System	Added Versions
CentOS	7.7
Red Hat Enterprise Linux (RHEL)	7.7

Changes to CAD Client Support

For Simcenter STAR-CCM+ Client for NX, support is added for

- NX 2019.2 (1872 series) and NX 2020.1 (1899 series)
- Simcenter 3D 2019.2 and Simcenter 3D 2020.1

Support for some other CAD clients has been removed. For more details, see the latest list of supported versions of CAD clients in the Simcenter STAR-CCM+ Release Notes (CAD Packages > CAD Packages for CAD Clients).

Web Monitor Support Added to Job Manager Installation

When you install Job Manager with the current release, you also install support for Web Monitor, a web-based client that you can access from any compatible browser.

For more details about requirements, see Web Monitor: Supported Platforms and Browsers.

Simcenter STAR-CCM+ Viewer: Upgraded Graphics Library Requirements

In the current release, Simcenter STAR-CCM+ Viewer requires the libraries `xkbcommon` and `xkbcommon-x11` to be installed when using Linux. These are standard system libraries that are typically already installed.

What Gets Installed?

Several software components are installed for Simcenter STAR-CCM+ and the CAD Clients.

These components are:

- Simcenter STAR-CCM+ module
- CAD Clients (Windows only)
- Java SDK
- MPI libraries (platform dependent)
- FlexNet utilities and user guide

Some of these components are optional and you can choose whether or not to install them while installing Simcenter STAR-CCM+.

When the installation process is complete, you have the following directories under the initial target location:

- 15.04.###/STAR-CAD15.04.### contains the constituent applications of the CAD Clients (Custom Install on Windows only).
- 15.04.###/STAR-CCM+15.04.### contains the Simcenter STAR-CCM+ module.
- 15.04.###/Simcenter STAR-CCM+ Viewer15.04.###
- 15.04.###/STAR-CCM+VR_15.04.### (Custom Install on Windows only)
- 15.04.###/FLEXlm (Windows) or FLEXlm_11.14 (Linux) contains the FLEXlm 11.14 Utilities. This directory contains platform specific licensing tools, including lmutil, lmgrd, and cdlmd. The Licensing Administration Guide is also included as a PDF file.
- 15.04.###/jdk

What Are the Requirements?

Before you install Simcenter STAR-CCM+, make sure that your system meets the various requirements.

Contents:

Hardware

These are the recommended hardware requirements to run Simcenter STAR-CCM+ and the CAD Clients. You can improve performance by using better specifications than those listed.

Hardware Component	Workstations	Laptops
Processor	2.4 GHz CPU with at least 4 cores per CPU (to allow client and server to work in separate spaces and to run in parallel).	No minimum speed for the CPU. However, you are advised to have at least 2 cores per CPU (so that the client and server to work in separate spaces). Higher number of cores permit running in parallel.
Memory	4 GB of memory per core.	2 GB of memory per core.
Disk Space	9 GB of free disk space (more space is required to save simulations).	9 GB of free disk space (more space is required to save simulations).
Graphics Card	Dedicated graphics hardware that has 3D capability, z-buffer and translucency. Minimum screen resolution of 1024x768 pixels is recommended.	Dedicated graphics hardware that has 3D capability, z-buffer and translucency. Integrated graphics chipsets are not recommended. Minimum screen resolution of 1024x768 pixels is recommended.

CPU Notes

- The current version of Simcenter STAR-CCM+ is supported on Intel Xeon (Cascade Lake, Skylake, Broadwell, Haswell, Ivybridge, Sandybridge) CPUs.
- The current version of Simcenter STAR-CCM+ is supported on AMD Ryzen, Zen, Naples CPUs with supported Linux Operating Systems only.
- The current version of Simcenter STAR-CCM+ is supported on Intel Xeon Phi (Knights Landing) CPUs with supported Linux Operating Systems only.
    - Intel Xeon Phi Processor Software for Linux (XPPSL) is required for Platform MPI 9.1.4.3.

IMPORTANT NOTE: Always follow the recommendations of your CPU, hardware and Operating System (OS) vendors on OS updates and patches.

Contents:

Typical Memory Requirements for Simcenter STAR-CCM+

This topic contains typical memory requirements for building and running a case in Simcenter STAR-CCM+.

The following examples are rough estimates only and may vary significantly between models with different characteristics.

Memory requirements for meshing:

- Surface meshing: approximately 0.5 GB per million surface triangles
- Volume meshing (polyhedral): approximately 1 GB per million cells
- Volume meshing (trimmed cells): approximately 0.5 GB per million cells.

As an example, a workstation with 48 GB of memory can build a 50 million cell model (polyhedral) or a 100 million cell model (trimmed cells). The memory requirements for solving in serial with a two-equation turbulence model are displayed below. On average, polyhedral cells require roughly twice the amount of memory per million cells.

Type of Simulation	Polyhedral Cells	Trimmed Cells
Segregated	1 GB per million cells	0.5 GB per million cells
Coupled Explicit	2 GB per million cells	1 GB per million cells
Coupled Implicit	4 GB per million cells	2 GB per million cells

Certified Platforms for Simcenter STAR-CCM+ 2020.2

Certified platforms are combinations of hardware and software that are subjected to thorough testing.

The supported Java version is 11.0.5. The required Flex LM version is 11.14.0.2.

Platform	OS	CAD Clients	Compiler	Glibc
Linux x86_64	RHEL Workstation 6.10	-	gnu 7.1	2.12
	RHEL Workstation 7.4, 7.5, 7.6, 7.7	-	gnu 7.1	2.17
	RHEL Workstation 8	-	gnu 7.1	2.28
	CentOS 6.10	-	gnu 7.1	2.12
	CentOS 7.4, 7.5, 7.6, 7.7	-	gnu 7.1	2.17
	CentOS 8	-	gnu 7.1	2.28
	SUSE Linux Enterprise Server 12 SP3, SP4	-	gnu 7.1	2.19
	SUSE Linux Enterprise Server 15, 15.1	-	gnu 7.1	2.26
	openSUSE Leap 15, 15.1	-	gnu 7.1	2.22
Windows x86_64	Windows 10 October 2018 Update	-	Intel 18.3	-
	Windows 10 May 2019 Update	-	Intel 18.3	-
	Windows Server 2012 R2 Standard	-	Intel 18.3	-
	Windows Server 2012 R2 HPC Pack	-	Intel 18.3	-
	Windows Server 2016	-	Intel 18.3	-
	Windows Server 2019	-	Intel 18.3	-

Simcenter STAR-CCM+ is available on all supported and certified platforms in mixed and double precision.

A minimum LSB (Linux Standard Base) level of LSB 3.0 is required to run licensing components on Linux machines.

Virtual Machines

Simcenter STAR-CCM+, the CAD Clients, and Simcenter STAR-CCM+ Viewer are not certified for use on virtual machines. It is expected that most features will function correctly, but there have been reports of some specific problems.

Supported Platforms for Simcenter STAR-CCM+ 2020.2

Supported platforms are combinations of hardware and software where some testing has been performed and/or compatibility is expected.

The supported Java version is 11.0.5. The required Flex LM version is 11.14.0.2.

Platform	OS	CAD Clients	Compiler	Glibc
Linux x86_64	Scientific Linux 7	-	gnu 7.1	2.17
	Cray Linux Environment (Cluster Compatibility Mode) 7 - SLES 12	-	gnu 7.1	2.19

Simcenter STAR-CCM+ is available on all supported and certified platforms in mixed and double precision.

A minimum LSB (Linux Standard Base) level of LSB 3.0 is required to run licensing components on Linux machines.

Supported MPI Implementations

Regardless of whether you use a local multi-core workstation, remote machines, or a remote cluster to run your parallel server, all approaches require an implementation of the Message Passing Interface (MPI).

The default MPI for Windows and Linux is IBM Platform MPI and is supplied with Simcenter STAR-CCM+. In addition, Simcenter STAR-CCM+ ships with MS-MPI for Windows and Intel MPI for both Windows and Linux. For Windows Server 2012 R2 and later with HPC Pack 2012 R2 or later, you are advised to use Microsoft MPI.

You can select an alternative implementation of MPI using the `-mpi` argument on the command line. For example:

```
-mpi ms
```

selects the Microsoft MPI distribution on Windows. Command line options for supported distributions are given in the tables below.

Windows

MPI	Version	Supplied with Simcenter STAR-CCM+	Command line option
IBM Platform MPI (default)	9.1.4.4	Yes	`platform`
Intel MPI	2018.1	Yes	`intel`
Microsoft MPI	10.1.1	Yes	`ms`

Linux

MPI	Version	Supplied with Simcenter STAR-CCM+	Command line option
IBM Platform MPI (default)	9.1.4.3	Yes	`platform`
Open MPI	3.1.5	Yes	`openmpi, openmpi3`
Open MPI	4.0.2	Yes	`openmpi4`
Intel MPI	2019.5	Yes	`intel`
HPE MPI	MPT 2.17 and newer	No	`hpe`
Cray MPI	7	No	`crayxt`

Some notes on these distributions are as follows:

- IBM Platform MPI is a commercial product and is considered one of the best MPI distributions on the market. It supports many different Interconnects such as Infiniband (using different drivers OFED, QLogic,

PSM) and Myrinet. IBM Platform MPI uses the fastest network channel that it detects without any use specification.

- Open MPI is an actively developed and widely used open source MPI distribution. Open MPI supports a range of interconnects. Simcenter STAR-CCM+ provides a mechanism to use locally installed Open MPI installations that are built to support specific hardware.
- Intel MPI is a mature MPI that has become more competitive in recent years. Resident memory usage with Intel MPI is 40-50% less compared to other MPIs.
- HPE MPI was previously known as SGI MPI.
- Cray MPI is required when running on Cray clusters.
- Using Microsoft MPI with Simcenter STAR-CCM+ is only supported for simulations on local workstations and on Windows Server 2012 R2 with HPC Pack 2012 R2. Newer Windows Server and HPC Pack versions are also expected to work.

Some additional points must be noted when using IBM Platform MPI on Windows Server 2012 machines for distributed simulations on multiple nodes.

- You must launch Simcenter STAR-CCM+ from within a PowerShell command window.
- You must define the current working directory as a UNC path that includes the name of the head node on which you are launching Simcenter STAR-CCM+.

  An example of a UNC path is:

  ```
  \\hpcmachine\WORKAREA\fluidsims\case1
  ```

- The working directory must be shared and accessible from all compute nodes.

Software

This section contains the software requirements for running Simcenter STAR-CCM+.

Compilers

All Linux ports of Simcenter STAR-CCM+ are built with the gnu 7.1 compiler. All Windows ports are built with the Intel 18.3 compiler and Visual Studio 2013. The compiler and its libraries do not need to be installed unless you are implementing User Code, and then only on the node(s) where the `libusr.so` file is created.

Java

Simcenter STAR-CCM+ and the CAD Clients require the Java SDK (Software Development Kit), or JDK, Version 11.0.5. OpenJDK is provided with the Simcenter STAR-CCM+ installation.

The JDK is installed automatically by the Simcenter STAR-CCM+ installer, unless you deactivate the option that is available when you choose a custom installation. If you would like to use an alternate version of JDK, be sure to see Installing an Alternate Version of JDK Manually.

OpenGL

Simcenter STAR-CCM+ requires that you have OpenGL 3.3 or higher installed on your machine. Simcenter STAR-CCM+ Viewer also requires OpenGL 3.3 as minimum.

Simcenter STAR-CCM+ Viewer

This section contains the requirements for installing and using Simcenter STAR-CCM+ Viewer.

Requirements for Windows

- Windows 64-bit
- OpenGL 3.3 or higher

Requirements for Linux

- Linux 64-bit
- OpenGL 3.3 or higher
- GNU C library version 2.12 or greater
- GIMP Toolkit (GTK+) version 2.20 or greater
- `xkbcommon` and `xkbcommon-x11` libraries

Simcenter STAR-CCM+ Licensing Requirements

Simcenter STAR-CCM+ is licensed software. Installing and configuring the license is part of the installation process. You cannot run the software until you configure the licensing correctly.

There are two licensing servers available for Simcenter STAR-CCM+:

- FlexNet License Server
- Power-on-Demand License Server

FlexNet License Server

The licensing operates through a license server, which is a separate process that runs continuously on a machine you choose. In general, only one machine on your network is required to act as a license server, although you can set up multiple machines to provide redundancy in case of machine failure. The FlexNet license server uses licensing data that is stored in a text file called the license file, (`license.dat`), which Siemens Digital Industries Software creates for you. You must obtain a license file from your Siemens Digital Industries Software representative before you can configure the FlexNet license server correctly. Your Siemens Digital Industries Software representative requires a hostid identifier which you get by running a downloadable utility program. More information on obtaining a license file is provided in the following sections:

- Obtaining the License File on Linux
- Obtaining the License File on Windows

Once you have the license file, you can proceed to setup the license server. For sole-user installations on a single machine, the installation process can automatically configure and run the license server for you (Windows only). If you intend to share licenses among several users, you are advised to choose one machine as the license server and install the license server in advance. See the following sections for guidance:

- Setting up a License Server using LMTOOLS on Windows
- Setting up a License Server using lmgrd on Linux

See also Additional Licensing Information.

Power-on-Demand License Server

The Power-on-Demand licensing model allows you to use a Simcenter STAR-CCM+ Power Session from a Siemens Digital Industries Software public license server rather than a license server on your own network. Your organization can purchase credit to use with the Siemens Digital Industries Software license server. Individual users are provided with Power-on-Demand keys for their sessions. For more information, refer to the *Power-on-Demand Licensing* section of the Simcenter STAR-CCM+ user guide (Using Simcenter STAR-CCM+ > Simcenter STAR-CCM+ Licensing > Power-on-Demand Licensing). You can access the Simcenter STAR-CCM+ user guide by clicking the **Documentation** tab in Support Center. If you do not

have your Support Center account information, contact your Siemens Digital Industries Software representative.

Note: The Siemens Digital Industries Software Power-on-Demand license server is located outside your firewall. Ports 1999 and 2099 must be open to allow communication traffic between your machine and the Power-on-Demand license server. For more information on how to check whether these ports are open, refer to the *Which Ports Are Used in a Power-On-Demand Session?* section of the Simcenter STAR-CCM+ user guide (Getting Started > Simcenter STAR-CCM+ Licensing > Power-on-Demand Licensing > Which Ports Are Used in a Power-On-Demand Session?).

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Obtaining a License File on Linux

To obtain a license file on Linux:

1. Download **lmutil** from https://s3.amazonaws.com/cd-adapco_public/lmutil/lmutil.
2. In a terminal window, navigate to the folder containing **lmutil** and enter the following:

   ```
   % ./lmutil lmhostid
   ```

   The host ID of the machine is displayed in the command prompt:

   ```
   The FlexNet host ID of this machine is "1803054gf548"
   ```

3. In the command prompt, enter:

   ```
   % ./lmutil lmhostid -hostname
   ```

   The host name of the machine is displayed in the command prompt:

   ```
   The FlexNet host ID of this machine is "HOSTNAME=entelea"
   ```

4. Send the host ID and the host name of the machine to your Siemens Digital Industries Software sales representative.

   You will receive a license file.

5. Place the license file in a directory of your choice.

Obtaining a License File on Windows

To obtain a license file on Windows:

1. Download **lmutil** from https://s3.amazonaws.com/cd-adapco_public/lmutil/lmutil.exe.
2. Launch a command prompt in the directory that contains **lmutil**.

   Note: To open a command prompt in a specified directory:
   1. In Windows Explorer, navigate to the directory that contains **lmutil**.
   2. While holding down the <Shift> key, right-click on a blank area in the directory and select **Open command window here**.
3. In the command prompt, enter:

   ```
   > lmutil.exe lmhostid
   ```

   The host ID of the machine is displayed in the command prompt:

   ```
   The FlexNet host ID of this machine is "1803054gf548"
   ```
4. In the command prompt, enter:

   ```
   > lmutil.exe lmhostid -hostname
   ```

   The host name of the machine is displayed in the command prompt:

   ```
   The FlexNet host ID of this machine is "HOSTNAME=entelea"
   ```
5. Send the host ID and the host name of the machine to your Siemens Digital Industries Software sales representative.

   You will receive a license file.
6. Place the license file in a directory of your choice.

Setting up a License Server Using LMTOOLS (Windows)

When a set of licenses are to be shared among users running on multiple machines, you must create a license server on one machine. On Windows, the LMTOOLS utility provides a convenient method that creates and runs the necessary service.

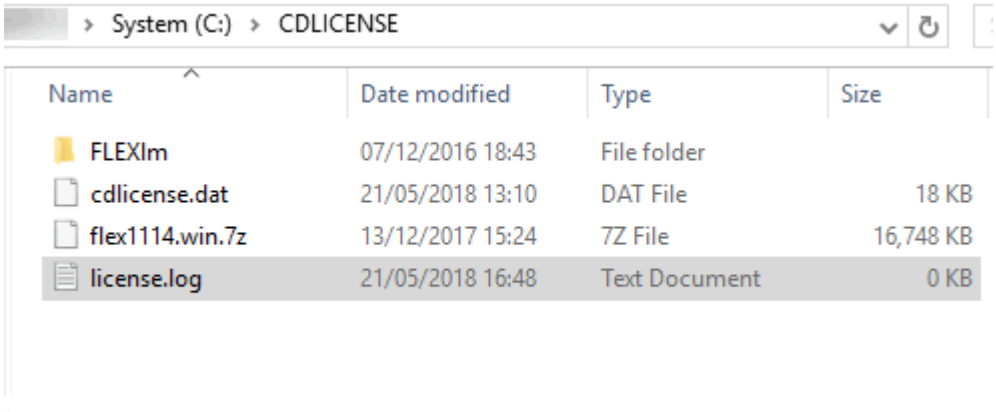
Follow this procedure if you intend to configure a license server manually. Before creating the license server, obtain the license file from your customer representative. In the following procedure, this file is referred to as `license.dat`.

To set up a license server on Windows using the LMTOOLS utility from Flexera:

1. Download the FLEXlm license manager:
   a) Navigate to https://support.sw.siemens.com/en-US/product/226870983/downloads.
   b) Within the *Additional Downloads* panel, click the **FLEXlm Server** tile.
   c) Within the download area, select the version you require, then select the **Windows** folder.
   d) To begin the download, click the link with the name of the product.

The license manager does not have its own installer. The compressed file contains a set of executable programs that you can extract anywhere you wish.

2. Unpack the contents of the compressed file in a designated location:
   a) On the filesystem, create a folder in which you intend to place the license tools—henceforth referred to as `[LICENSEROOT]`.
      For example, `C:\CCMLICENSE`
   b) In this folder, unpack the contents of the `flex1114.win.7z` file.
      This action creates the folder, `FLEXlm`.
3. Place the license file into `[LICENSEROOT]`.
4. Create a text file to which the license server can write logging information:
   a) In a *File Explorer* window, navigate to the `[LICENSEROOT]` folder.
   b) Right-click in a blank area of the window and choose **New** > **Text Document**.
   c) Name this file, `license.log`.

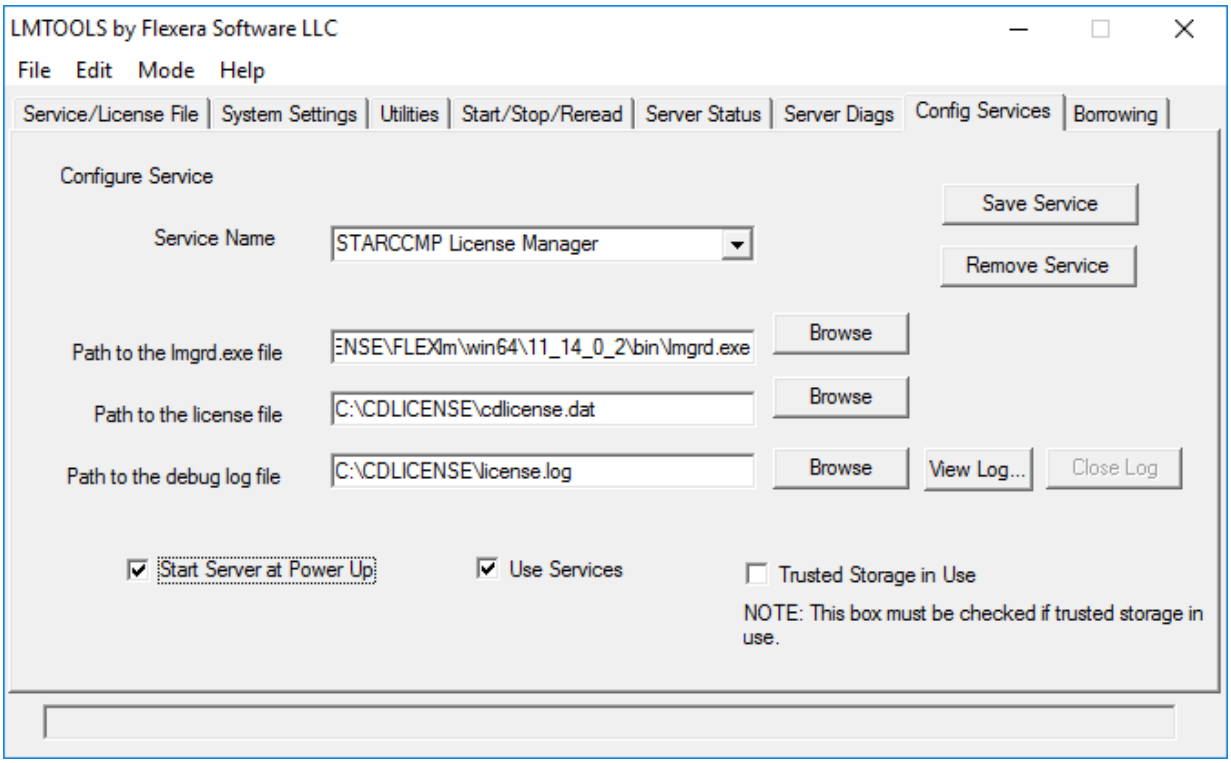


5. Launch LMTOOLS:
   a) In *File Explorer*, navigate to `[LICENSEROOT]\FLEXlm\win64\11_14_0_2\bin`.

b) Right-click `lmtools.exe` and choose **Run as administrator**.

When setting up a license server for the first time, you can use LMTOOLS to configure and launch the service. If you want to read a new license file, you can use the *Start/Stop/Reread* panel instead of the *Config Services* panel.

6. To configure the license service for the first time:
   a) In LMTOOLS, click the *Config Services* tab.
   b) If you see an existing service that you want to remove, select the service and click **Remove Service**.
   c) In **Service Name**, enter an appropriate name for the service, for example, `STARCCMP License Manager`.
   d) For **Path to the lmgrd.exe** file, click **Browse** and select `[LICENSEROOT]\FLEXlm\win64\11_14_0_2\bin\lmgrd.exe`.
   e) For **Path to the license file**, click **Browse** and select `[LICENSEROOT]\license.dat`.
   f) For **Path to the debug log file**, click **Browse** and select `[LICENSEROOT]\license.log`.
   g) Activate **Use Services**.
   h) Activate **Start Server at Power Up**.



   i) Click **Save Service**.
   Accept any warnings that appear.
7. Start the license service:
   a) In LMTOOLS, click *Start/Stop/Reread*.
   In the list, you should see the service that you configured in the previous step.
   b) Click **Start Server**.
   If the server is already running, LMTOOLS issues an error message in the status bar at the bottom of the dialog. However, you can take this message as confirmation that the server is running.
8. Exit LMTOOLS

You now have a license server running on the machine. When you install Simcenter STAR-CCM+, choose the Network license type and enter the name of this machine for the hostname. By default, the port number is 1999.

Other licensing configurations are possible, such as providing redundant license servers in the case of failure. For information on setting up other configurations, see the `LicenseAdministration.pdf` file in `[LICENSEROOT]\FLEXlm\win64\11_14_0_2`.

Setting up a License Server using lmgrd on Linux

On Linux the product installer does not set up licensing for you. Instead, you must download the FLEXlm licensing tools and set up the installer manually.

Before you install the license server, obtain the license file as described in Obtaining a license file on Linux. The license file must match the machine on which you install the license server.

1. Download the FLEXlm license manager:
   a) Navigate to https://support.sw.siemens.com/en-US/product/226870983/downloads.
   b) Within the *Additional Downloads* panel, click the **FLEXlm Server** tile.
   c) Within the download area, select the version you require, then select the **Linux** folder.
   d) To begin the download, click the link with the name of the product.
2. Unpack the contents of the compressed file in a designated location:
   a) On the filesystem, create a folder in which you intend to place the license tools—henceforth referred to as `[LICENSEROOT]`.

      For example, `/opt/CCMLICENSE` or `/opt`.
   b) In this folder, unpack the contents of the `flex1114.lin.7z` file.

      This action creates the folder, `FLEXlm`. You can find the FlexNet Publisher administration guide within the folder, `FLEXlm/linux-x86_64-2.5/11_14_0_2/`.
3. Place the license file into `[LICENSEROOT]`.

   For example, `/opt/CCMLICENSE/license.dat`
4. Change the permissions of the installation folder using the following command:

   ```
   chmod -R u+x,g+x,o+x [LICENSEROOT]
   ```
5. Start the license server using the command:

   ```
   [LICENSEROOT]/FLEXlm/linux-x86_64-2.5/11_14_0_2/bin/lmgrd -c [LICENSEROOT]/
   license.dat -l [LICENSEROOT]/license.log
   ```

On completion, the license server runs on the license machine and listens for license requests through port 1999 by default.

If the license machine restarts, you must ensure that the license server is also relaunched. You can set up a three-machine redundancy to avoid problems when if a license server fails. For details, see the FlexNet Publisher License Administration Guide.

Product Excellence Program

The Product Excellence Program collects information about how our customers use Siemens Digital Industries Software products. This information helps us improve our product features and functionality to better meet customer needs. No personal or intellectual property information is collected or shared. Product performance is not affected and participation in the program is voluntary.

Privacy statement

The Product Excellence Program helps Siemens Digital Industries Software understand how customers use our products and assists us in improving our products. The program is anonymous and participation is voluntary.

The Product Excellence Program is designed to protect the privacy of the user and the intellectual property created through the use of Siemens Digital Industries Software products.

How does it work?

The Product Excellence Program is used to collect data about your installation, the features you use and how you use them. The data is sent to Siemens Digital Industries Software for analysis. By examining usage patterns from a large number of people, we gain insight into how the products are used and how to improve the software in future releases. Data collection occurs in the background as you use the software and does not affect performance or functionality.

What data is sent?

The data collected can vary by product and by release as we gain more insight or add new capabilities. The Product Excellence Program may collect information on the functions utilized, the operating environment (e.g. OS, RAM, graphics, etc.), product version, or other indications of user interaction. The data may also include the company name that is using the product. This data is solely for use by Siemens Digital Industries Software to improve our products and is never shared with any third party.

There is no contact information in the data and Siemens Digital Industries Software will not contact you by phone or email as a result of the data collected. Absolutely no information about the data you create or manage is collected.

Participation is optional.

You can control your participation during installation or reinstallation of the software by using the *Product Excellence Program* option in the interactive installer.

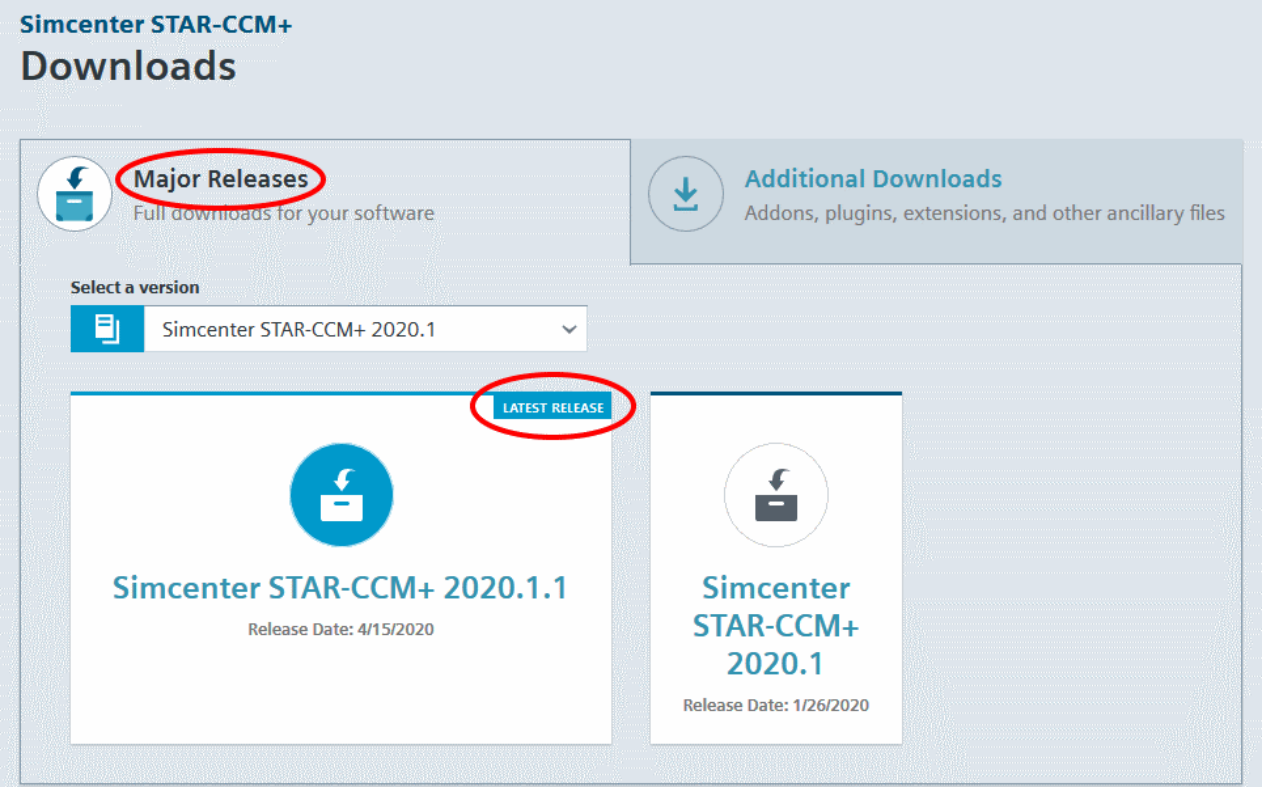
Downloading Simcenter STAR-CCM+

You can download Simcenter STAR-CCM+ by accessing Support Center at https://support.sw.siemens.com/.

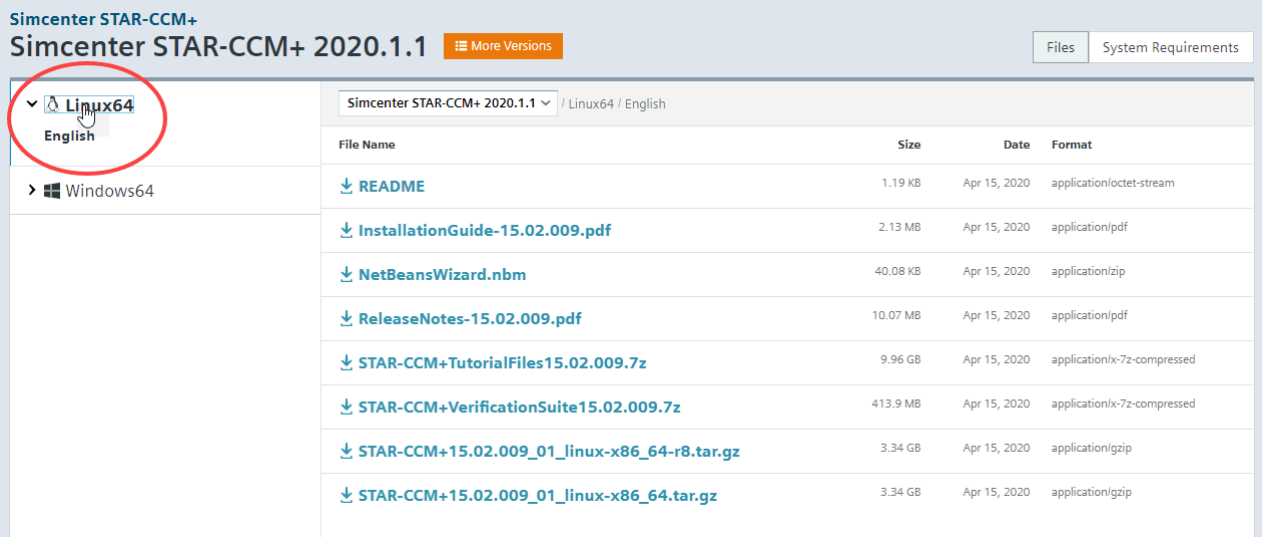
To download Simcenter STAR-CCM+:

1. Navigate to https://support.sw.siemens.com/en-US/product/226870983/downloads.

   If you do not have your account information, contact your Siemens Digital Industries Software representative.
2. Within the *Major Releases* panel, click the tile corresponding to the version you require, which is typically the Latest Release.



3. Within the download area, select the **Windows** or **Linux** folder.



4. Download the following files:
   - Product installer relevant to your platform, either mixed or double precision (see note below)
   - STAR-CCM+ Tutorial Files
   - STAR-CCM+ Verification Suite

   The double precision version of Simcenter STAR-CCM+ is generally intended for cases that involve physical phenomena of vastly differing scales. Examples include wave propagation in water, three-dimensional microstructure battery modeling, electrodynamics simulations, and multiphase flows.

   The STAR-CCM+ Tutorial Files and Verification Suite are essential resources for end-users of the software, and must be deployed in a shared location on the machine or network to which all users have access.

Installing Simcenter STAR-CCM+

This section contains instructions for installing Simcenter STAR-CCM+ on Linux and Windows platforms.

Contents:

Installing Simcenter STAR-CCM+ on Linux

This section contains information on installing Simcenter STAR-CCM+ on Linux.

Extracting the Installer

Once you download the compressed file from Support Center, you must extract the contents before you can run the installer.

To extract and run the installer:

1. In a terminal window, enter the following command to extract the installer components from the compressed file:

   ```
   % tar -zxvf STAR-CCM+15.04.###_[OS].tar.gz
   ```

   where `[OS]` is the name of the operating system.
2. Change to the extracted folder and run the installer:

   ```
   % cd starccm+_15.04.###
   % ./STAR-CCM+15.04.###_[OS].sh
   ```

   When the installer launches correctly, you are presented with a series of screens to guide you through the process. These steps are itemized in the next section.

   Note: Remember to export the `DISPLAY` of the server to your workstation if you require a GUI-based installation. If the display variable is not set, the installer defaults to a console (non-GUI) installation.

Contents:

Installing Simcenter STAR-CCM+ Using the Interactive Installer

There are two installation methods that you can use to install Simcenter STAR-CCM+:

- Express Install - installs Simcenter STAR-CCM+ on a single machine with the most common options including Simcenter STAR-CCM+ Viewer and the documentation. Also sets the `PATH` and `CDLMD_LICENSE_FILE` environment variables. Choose this option when you do not have access to an existing network license manager. Also use this option for Power-on-Demand licensing.
- Custom Install - installs Simcenter STAR-CCM+ with advanced options.

Express Install

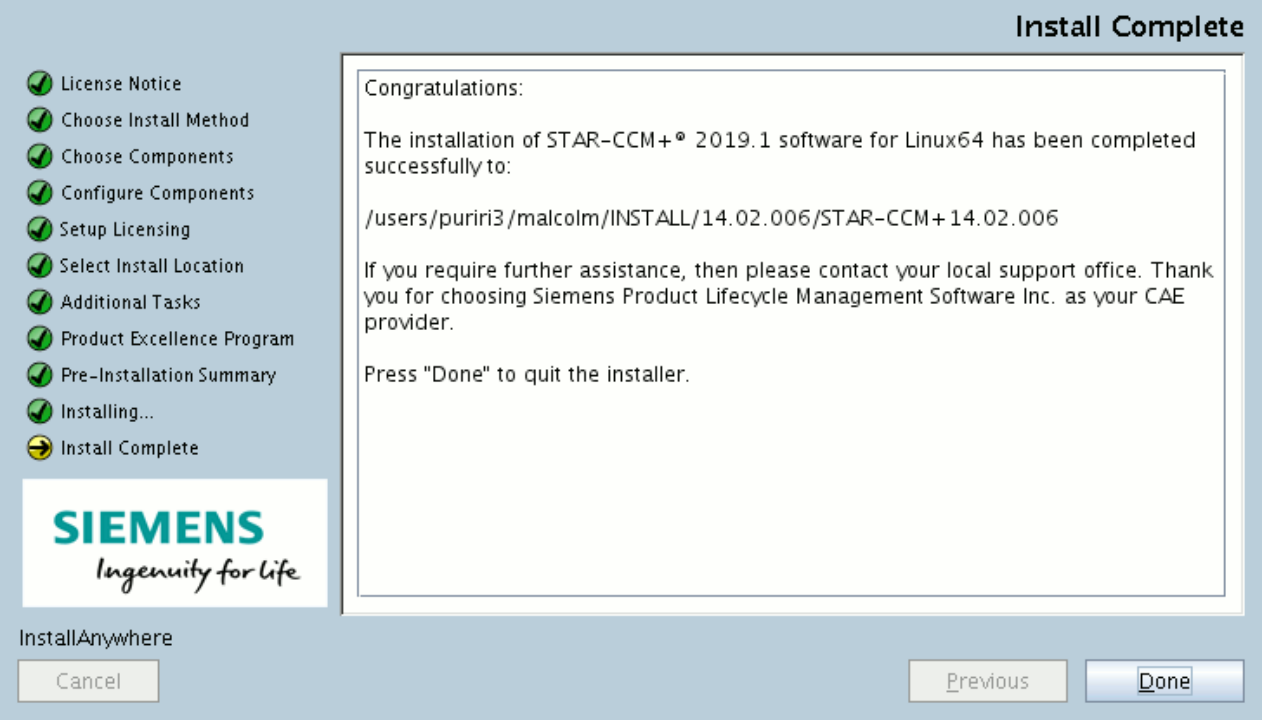
The express installation uses the most common options to install Simcenter STAR-CCM+ on a single machine.

To perform an express installation:

1. *Select Setup Language*: choose your required language from the list shown and click **OK**.

   This option gives you the choice to run the Simcenter STAR-CCM+ installer either in English or in your native language.
2. *License Notice*: read the agreement and choose to accept. Click **Next** to continue.
3. *Choose Installation Method*: select the **Express (Recommended)** option. Click **Next** to continue.
4. *Choose License Type*: this screen presents two licensing options:
   - *Power-on-Demand*: configures the machine to use Siemens Digital Industries Software's Power-on-Demand license server.
   - *Local*: deposits the FLEXNet license tools on the local machine and sets the associated environment variable (CDLMD_LICENSE_FILE).
5. *Select license file*: this screen appears if no existing licensing information is found on the current machine. If you require a license file, you must get this from Siemens Digital Industries Software after obtaining the necessary hostid. Browse to the license file and when complete, click **Next**.
6. *Select Installation Location*: click **Next** to accept the default location, otherwise enter a custom directory location. Note that when creating a new folder in Linux, you must include the whole path. You may also need to press <**Enter**> to create the folder.
7. *Product Excellence Program*: This feature collects information about how our customers use Siemens Digital Industries Software products (for details see Product Excellence Program). To decline participation, deactivate the checkbox in the screen.

   Note: When you make a choice about whether to participate, that choice is applied to the installation of Simcenter STAR-CCM+ Viewer as well as Simcenter STAR-CCM+.
8. *Pre-Installation Summary*: this screen shows a summary of what will be installed on your machine. Click **Next** to proceed with the installation.
9. *Installing*: this screen shows the current progress of the installation process.
10. *Install Complete*: this final screen indicates the end of the Simcenter STAR-CCM+ installation process. If any errors were encountered during installation, a message is displayed here prompting you to check the installation log file.



After the express installation, the following changes are made to your computer:

- The full versions of Simcenter STAR-CCM+ and Simcenter STAR-CCM+ Viewer are installed.
- The FLEXlm licensing software components are deposited within the installation directory.
- The PATH variable is set.
- The CDLMD_LICENSE_FILE is set.

Proceed with:

1. Deploying the tutorial files and verification suite. See Deploying the Tutorial Files and Verification Suite.
2. Setting up the license server. See Setting Up Licensing Manually.

Custom Install

The custom installation lets you customize the installation and licensing to your needs.

To perform a custom installation:

1. *Select Setup Language*: if you have a Chinese, Japanese, or Korean operating system, choose your required language and click **OK**.
   This option gives you the choice to run the Simcenter STAR-CCM+ installer either in English or in your native language.
2. *License Notice*: read the agreement and choose to accept. Click **Next** to continue.
3. *Choose Installation Method*: select the **Custom (Advanced)** option.
4. *Choose Install Type*: this screen presents the components that are available for installation on your system. Select the desired components and click **Next**.
   The following options are available:
   - **STAR-CCM+ and related components** > **Install STAR-CCM+ on local or shared NFS location**: installs Simcenter STAR-CCM+ on the current machine or in a location of your choice.

- **FLEXNet License Manager**: choosing this option will provide two further options in a subsequent step where you can choose to either use an existing license server on the network, or to deposit the FlexNet license tools on the host machine.

  Note: To activate a license server on the local machine, you must follow the steps in Setting up a License Server using lmgrd.

  Note: If you want to use PoD (Power-on-Demand) licensing, activate this option.

  Note: To install only the Java SDK (in the following screen), make sure this option is deactivated.

5. *Choose STAR-CCM+ Components*: choose the components to install.

   The following components are available:

   - **STAR-CCM+**: installs Simcenter STAR-CCM+ on your system.
   - **STAR-CCM+ Documentation**: installs the Simcenter STAR-CCM+ documentation on your system.
   - **Simcenter STAR-View+**: installs Simcenter STAR-CCM+ Viewer.
   - **Java SDK**: activated by default, this installs the Java SDK (Software Development Kit), or JDK. You can use this option for the following objectives:
     - Installing an alternate version of JDK—deactivate this option to exclude the default version of the JDK that is installed automatically with Simcenter STAR-CCM+. Before you do so however, see Installing an Alternate Version of JDK Manually.
     - Installing the supplied JDK only—for example, if JDK was excluded previously from a Simcenter STAR-CCM+ installation.

6. *Choose License Type*: select the licensing method that you want to use and click **Next**.

   ► **Network**: configures the current machine to access a network license server. If you want to connect to the Siemens Digital Industries Software Power-on-Demand license server, also activate the option, **Configure this machine to access Power-On-Demand License Server**.

   - *FlexNet Client Configuration*: enter the hostname and port number of your organization's license server using the format: `port@host`. You can add additional redundant servers if your network is set up to support this. You also can use the option, **Three machine redundant license server**:
     - When activated, the three servers are considered as one license server (triad), and so their names are separated by commas.
     - When deactivated, the servers are separated by colons.
   - Click **Next** to continue.

   ► **Local**: deposits the FlexNet license tools on the current machine. If you choose this option, follow the relevant steps below:

   - *FlexNet License Server Configuration*: update the License Port Number or click **Next** to keep the default value.
   - *Select license file*: browse to the license that you obtained from Siemens Digital Industries Software and click **Next**.

7. *Select Install Location*: enter a custom directory for the Simcenter STAR-CCM+ installation, otherwise click **Next** to accept the default location.

8. *Select Additional Tasks*: select the additional tasks you want the installer to perform:

   The following tasks are available:

- **Add application directories to your system path**: activate this option if you generally launch software from a command prompt window, and you only wish to use this latest version of Simcenter STAR-CCM+. If you want to run Simcenter STAR-CCM+ by typing the full path, deactivate this option.

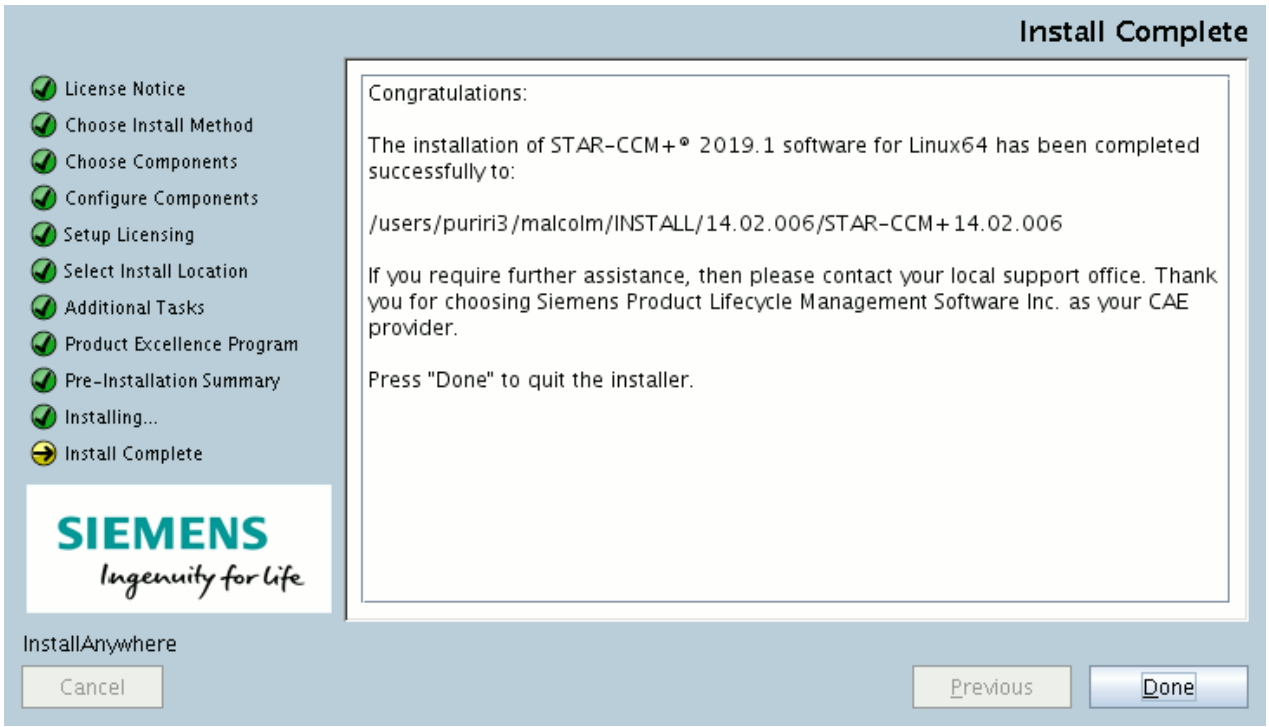
9. *Product Excellence Program*: This feature collects information about how our customers use Siemens Digital Industries Software products (for details see Product Excellence Program). To decline participation, deactivate the checkbox in the screen.

   Note: When you make a choice about whether to participate, that choice is applied to the installation of Simcenter STAR-CCM+ Viewer as well as Simcenter STAR-CCM+.

10. *Pre-Installation Summary*: this screen shows a summary of what will be installed on your machine. Click **Next** to proceed with the installation.
11. *Installing*: this screen shows the current progress of the installation process.

    Note: You may see additional windows appearing during the installation process, depending on the selections you made.

12. *Install Complete*: this final screen indicates the end of the Simcenter STAR-CCM+ installation process. If any errors were encountered during installation, a message is displayed here prompting you to check the installation log file.



Proceed with:

1. Deploying the tutorial files and verification suite. See Deploying the Tutorial Files and Verification Suite.
2. Setting up the license server. See Setting Up Licensing Manually.

Installing from the Command Line

You can run the Simcenter STAR-CCM+ installer from the command line to allow for an unattended installation.

This type of installation supports the following arguments:

- `-i console` runs the installer in console mode, which installs Simcenter STAR-CCM+ with the default settings (as used in the Express install). Output from this installation is shown in the console window. Note that you are required to accept the license agreement and choose the location for the installation in the console.

  In console mode, a description appears for the *Product Excellence Program*, which collects information about how our customers use Siemens Digital Industries Software products (for details see Product Excellence Program). Below this description is a prompt for you to decide whether to participate:

  ```
  Participate in the Product Excellence Program? Y / N
  ```

  To accept press `Y`, or to decline press `N`.
- `-i silent` performs a silent installation. No console or dialog windows appear. Information on installation process is stored in the log file.

  Note: Participation in the Product Excellence Program will occur by default. There will be no presentation of the description of this feature.

  To opt-out of the Product Excellence Program during a silent installation:
  - Add `-DPRODUCTEXCELLENCEPROGRAM=0`, for example:

    ```
    -i silent -DPRODUCTEXCELLENCEPROGRAM=0
    ```

  Any value other than `0` (such as `-DPRODUCTEXCELLENCEPROGRAM=FALSE`) would be interpreted as continuing to participate in the program.
- `-f "filename"` instructs Setup to load the settings from the specified file after having checked the command line. Use quotes if the filename contains spaces.
- `-r "filename"` instructs Setup to save installation settings to the specified file. Use quotes if the filename contains spaces.
- `-DINSTALLDIR=<path>` provides an alternative location for the Simcenter STAR-CCM+ installation.
- `-PCMPIINSTALLDIR=<path>` provides an alternative location for the IBM Platform MPI installation.
- `-D<PARAMETER>=true/false` provides additional installation options, where `<PARAMETER>` can be:
  - `INSTALLFLEX` controls whether the license server is installed and configured. If you do not want to install the license server, set this argument to `false`.
  - `ADDSYSTEMPATH` adds the application directories to your system path. If you generally launch software from a shell, and you only wish to use this latest version of Simcenter STAR-CCM+, set this argument to `true`. Note that by default this value is set to `true` and your user profile file (`.cshrc` or `.profile` files, for example) are modified. If you do not want your profile to be modified, set this argument to `false`.
  - `NODOC` controls whether or not the Simcenter STAR-CCM+ documentation is installed. If you do not want to install the Simcenter STAR-CCM+ documentation, set this argument to `true`.

An example command is provided below. Using this command, Simcenter STAR-CCM+ is installed in console mode without installing the FlexNet license server.

```
% ./STAR-CCM+15.04.###_[OS].sh -i console -DINSTALLFLEX=false
```

where `[OS]` is the is the name of the operating system.

After installing from the command line, proceed to deploy the tutorial files and verification suite as described in Deploying the Tutorial Files and Verification Suite.

Problems with Disk Space

By default, the Linux installer can use up to 4Gb of space in `/tmp`. Make sure that there is enough disk space available. If space is not available on the root of the physical drive, use the `IATEMPDIR` environment variable to change the location of the temporary directory to a drive with sufficient free space:

- For Bourne shell (sh), ksh, bash, and zsh, enter the following command:

```
% IATEMPDIR=/your/free/space/directory
% export IATEMPDIR
```

- For C shell (csh) and tcsh, enter the following command:

```
% setenv IATEMPDIR /your/free/space/directory
```

If there is not enough free disk space, you will receive a warning message.

Also, note that the auto mounting utility, `autofs`, that is supplied with certain Linux distributions can cause the disk space check to fail, and raise the "not enough free disk space" error. If this happens, turn off the disk space check using the following environment variable:

- For Bourne shell (sh), ksh, bash, and zsh, enter:

```
% CHECK_DISK_SPACE=OFF
% export CHECK_DISK_SPACE
```

- For C shell (csh) and tcsh, enter:

```
% setenv CHECK_DISK_SPACE OFF
```

Launching Simcenter STAR-CCM+ on Linux

Once the installation is complete, you can launch Simcenter STAR-CCM+.

To launch Simcenter STAR-CCM+:

1. From the working directory, enter:

```
% starccm+
```

   For reference, the full path to the Simcenter STAR-CCM+ executable is: `/[install]/STAR-CCM+[version]/star/bin/starccm+`.

Simcenter STAR-CCM+ is ready for you to use. If you are using Simcenter STAR-CCM+ for the first time, work through the introductory tutorial.

Installing Simcenter STAR-CCM+ on Windows

Administrator privileges are required for the standard installation of Simcenter STAR-CCM+ and the CAD Clients on Windows. Alternatively, you can use the `-DNOADMIN=true` option from the command line to install without administrator privileges.

Extracting the Installer

Once you download the compressed file from Support Center, you must extract it before you can run it.

To extract and run the installer:

1. Open Windows Explorer and navigate to the folder that contains the downloaded zip file.
2. Right-click the zip file and select **Extract All...**.
3. Type the destination directory and click **Extract**.
4. Delete the zip file.
5. Navigate to the `STAR-CCM+_CadClients-15.04.###` sub-directory and double-click on `STAR-CCM+_CadClients15.04.###_[OS].bat`, where `[OS]` is the name of the operating system.

When the installer launches correctly, you are presented with a series of screens to guide you through the process. These steps are itemized in the next section.

Contents:

Installing Simcenter STAR-CCM+ Using the Interactive Installer

There are two installation methods that you can use to install Simcenter STAR-CCM+:

- Express Install - installs Simcenter STAR-CCM+ on a single machine with the most common options. Select this option if you have a license file or if you want to set up Power-on-Demand licensing.
- Custom Install - installs Simcenter STAR-CCM+ with advanced options.

Express Install

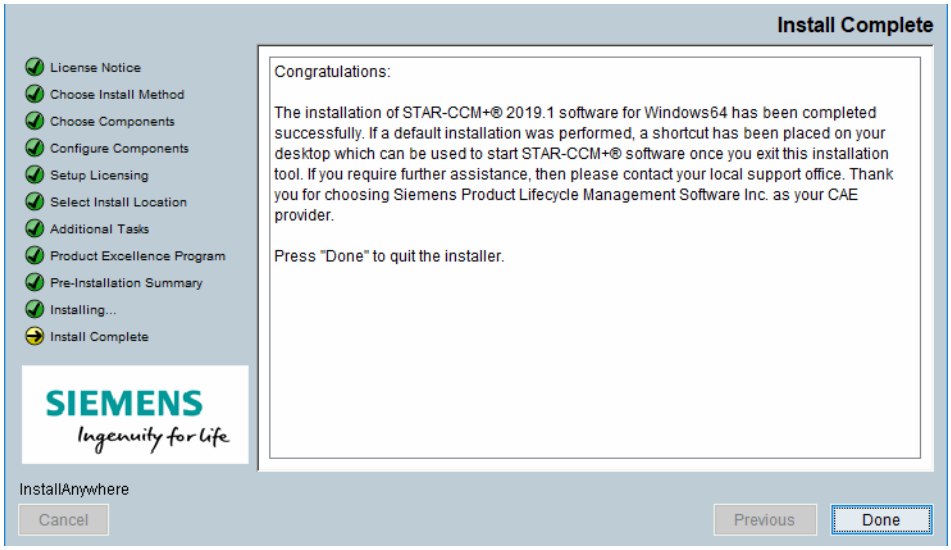
The express installation uses the most common options to install Simcenter STAR-CCM+ on a single machine, and to configure the license server. Select this option if you have a license file or if you want to set up Power-on-Demand licensing.

To perform an express installation:

1. *Select Setup Language*: if you have a Chinese, Japanese, or Korean operating system, choose your required language and click **OK**.

   This option gives you the choice to run the Simcenter STAR-CCM+ installer either in English or in your native language.
2. *License Notice*: read the agreement and choose to accept. Click **Next** to continue.
3. *Choose Installation Method*: select the **Express (Recommended) option.** Click **Next** to continue.
4. *Choose License Type*: this screen presents two licensing options:
   a) *POD*: configures the machine to use Siemens Digital Industries Software's Power-on-Demand license server.
   b) *Local*: installs and configures a local license server on the current machine.
5. *Setup Licensing*: this screen appears if no existing licensing information is found on the current machine. Browse to the license file and when complete, click **Next**.
6. *Product Excellence Program*: This feature collects information about how our customers use Siemens Digital Industries Software products (for details see Product Excellence Program). To decline participation, deactivate the checkbox in the screen.

   Note: When you make a choice about whether to participate, that choice is applied to the installation of Simcenter STAR-CCM+ Viewer and Simcenter STAR-CCM+ Virtual Reality as well as Simcenter STAR-CCM+.
7. *Pre-Installation Summary*: this screen shows a summary of what will be installed on your machine. Click **Next** to proceed with the installation.
8. *Installing*: this screen shows the current progress of the installation process.
9. *Install Complete*: a final screen appears to indicate the end of the Simcenter STAR-CCM+ installation process. If any errors were encountered during installation, a message is displayed here prompting you to check the installation log file.



10. You may need to restart your system, click **Done** when ready.

After the express installation, the following changes are made to your computer:

- The full versions of Simcenter STAR-CCM+, Simcenter STAR-CCM+ Viewer, and FLEXlm licensing software are installed.
- If supported CAD packages are installed on Windows, the associated CAD client is installed.

- No PATH variable is set; rely on your desktop shortcut.
- The CDLMD_LICENSE_FILE is set.
- The installation directory is not set for sharing.
- IBM Platform MPI service is set up on Windows machines as long as they are not part of a Windows HPC cluster.

Proceed with deploying the tutorial files and verification suite. See Deploying the Tutorial Files and Verification Suite.

Custom Install

The custom installation lets you customize the installation and licensing to your needs.

To perform a custom installation:

1. *Select Setup Language*: if you have a Chinese, Japanese, or Korean operating system, choose your required language and click **OK**.

   This option gives you the choice to run the Simcenter STAR-CCM+ installer either in English or in your native language.
2. *License Notice*: read the agreement and choose to accept. Click **Next** to continue.
3. *Choose Installation Method*: select the **Custom (Advanced)** option.
4. *Choose Install Type*: this screen presents the components available for installation on your system. Once the desired components have been selected click **Next**.

   The following options are available:
   - **Simcenter STAR-CCM+ and related components**: Two following options are available:
     - **Install Simcenter STAR-CCM+ on this machine or a network location**: installs Simcenter STAR-CCM+ on the current machine or on a location of your choice.
     - **Configure this machine to use an existing Simcenter STAR-CCM+ network installation**: configures the current machine to use an existing installation of Simcenter STAR-CCM+ from a shared network directory. This option does not install Simcenter STAR-CCM+. Use this option for a compute node on a cluster, for example. The installer asks you to locate the Simcenter STAR-CCM+ and STAR-View+ installation directories. These directories must be shared. For each case, point to the folder that contains the Simcenter STAR-CCM+ or Simcenter STAR-CCM+ Viewer (STAR-View+) executables:

       ```
       > \\[server_path]\[version_directory]\STAR-CCM+15.04.###
       > \\[server_path]\[version_directory]\STAR-View+15.04.###
       ```

       Note: Simcenter STAR-CCM+ Viewer must be installed in order for you to use this option.
   - **FLEXNet License Manager**: choosing this option presents two further options in a subsequent step where you choose to either use an existing license server on the network, or to install and configure a FlexNet license server on the current machine.

     Note: If you do not activate this option, you must set up and configure the license server manually. Refer to the licensing guide.

     Note: If you want to use PoD (Power-on-Demand) licensing, activate this option.

     Note: To install only the Java SDK (in the following screen), make sure this option is deactivated.

5. *Choose Simcenter STAR-CCM+ Components*: choose the components to install.

   The following components are available:

   - **Simcenter STAR-CCM+**: installs Simcenter STAR-CCM+ on your system.
   - **Simcenter STAR-CCM+ Documentation**: installs the Simcenter STAR-CCM+ documentation on your system.
   - **STAR-CAD Clients**: installs the CAD Clients for the CAD packages that the installer detects on your system. This option does not install Simcenter STAR-CCM+.

     The following CAD Clients are available:

     - **STAR-CAT5 Client**
     - **STAR-NX Client**
     - **STAR-Creo Client**
     - **STAR-Inventor Client**
   - **Simcenter STAR-View+**: installs Simcenter STAR-CCM+ Viewer.
   - **Simcenter STAR-CCM+ VR**: installs the virtual reality client.
   - **Java SDK**: activated by default, this installs the Java SDK (Software Development Kit), or JDK. You can use this option for the following objectives:
     - Installing an alternate version of JDK—deactivate this option to exclude the default version of the JDK that is installed automatically with Simcenter STAR-CCM+. Before you do so however, see Installing an Alternate Version of JDK Manually.
     - Installing the supplied JDK only—for example, if JDK was excluded previously from a Simcenter STAR-CCM+ installation.

6. *Choose License Type*: select the licensing method that you want to use and click **Next**.

   ► **Network**: configures the current machine to access a network license server. If you want to connect to the Siemens Digital Industries Software Power-on-Demand license server, also activate the option, **Configure this machine to access Power-On-Demand License Server**.

   - *FlexNet Client Configuration*: enter the hostname and port number of your organization's license server using the format: `port@host`. You can add additional redundant servers if your network is set up to support this. You also can use the option, **Three machine redundant license server**:
     - When activated, the three servers are considered as one license server (triad), and so their names are separated by commas.
     - When deactivated, the servers are separated by semi-colons.
   - Click **Next** to continue.

   ► **Local**: installs and configures FlexNet on the current machine. If you choose this option, follow the relevant steps below:

   - *FlexNet License Server Configuration*: enter the License Port Number (or accept the default, 1999) then click **Next**.
   - *Select license file*: browse to the license that you obtained from Siemens Digital Industries Software and click **Next**.
   - *Service Configuration*: configures the License Manager service. A default name, `CCM_License_server`, is provided for this service. If this service already exists, enter a new name. Activate the **Start license server now** option if you want this service to start automatically once the installation completes. Click **Next** to continue.

   If you receive warning messages during these steps, you can choose to continue the process. If the installer fails to configure the License Manager service, use the FlexNet tools to set up the service manually. See Setting up Licensing Manually.

7. *Select Install Location*: enter a custom directory for the Simcenter STAR-CCM+ installation, otherwise click **Next** to accept the default location.
8. *Select Additional Tasks*: select the additional tasks you want the installer to perform.

   The following tasks are available:

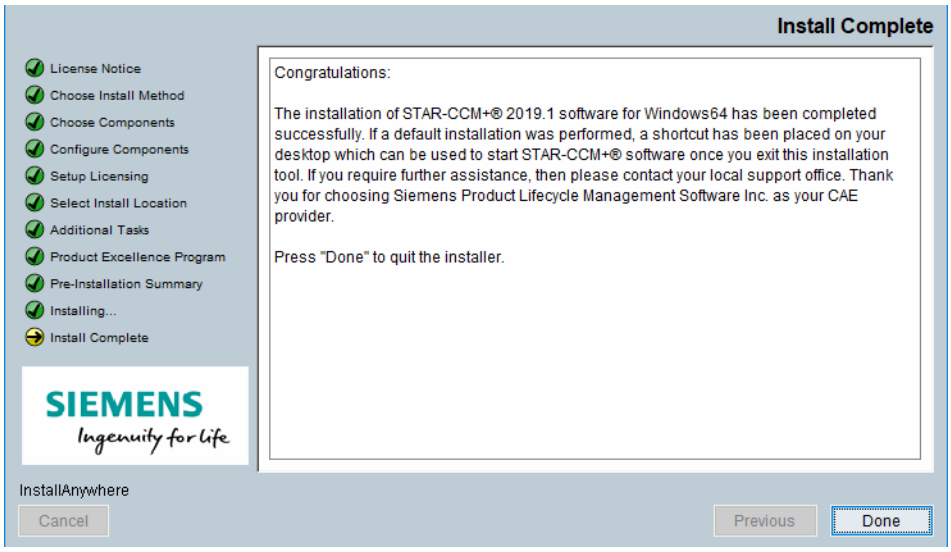
   - **Update Windows firewall to allow Simcenter STAR-CCM+ to run**: adds a rule to the Windows firewall to permit socket communication on the specified ports. By default, the Windows firewall may block this communication.

     Note: You must manually add exceptions to third-party firewall software.

   - **Share install directory**: shares the installation directory so that others can access it. This option is useful for parallel runs.
   - **Create a desktop icon**: creates a desktop icon on the current machine.
   - **Create shortcuts for current user only**: creates shortcuts to Simcenter STAR-CCM+ for the current user only.
9. *Product Excellence Program*: This feature collects information about how our customers use Siemens Digital Industries Software products (for details see Product Excellence Program). To decline participation, deactivate the checkbox in the screen.

   Note: When you make a choice about whether to participate, that choice is applied to the installation of Simcenter STAR-CCM+ Viewer and Simcenter STAR-CCM+ Virtual Reality as well as Simcenter STAR-CCM+.
10. *Pre-Installation Summary*: this screen shows a summary of what will be installed on your machine. Click **Install** to proceed with the installation.
11. *Installing*: this screen shows the current progress of the installation process.

    Note: You may see additional windows appearing during the installation process, depending on the selections you made. Respond to the prompts as appropriate.
12. *Install Complete*: this final screen indicates the end of the Simcenter STAR-CCM+ installation process. If any errors were encountered during installation, a message is displayed here prompting you to check the installation log file.



13. You may need to restart your system, click **Done** when ready.

Proceed with deploying the tutorial files and verification suite. See Deploying the Tutorial Files and Verification Suite.

Installing from the Command Line

You can run the Simcenter STAR-CCM+ installer from the command line to allow for an unattended installation. This type of installation supports the following arguments:

- `-i console` runs the installer in console mode, which installs Simcenter STAR-CCM+ with the default settings (as used in the Express install). Output from this installation is shown in the console window. Note that you are required to accept the license agreement and choose the location for the installation in the console.
  In console mode, a description appears for the *Product Excellence Program*, which collects information about how our customers use Siemens Digital Industries Software products (for details see Product Excellence Program). Below this description is a prompt for you to decide whether to participate:

  ```
  Participate in the Product Excellence Program? Y / N
  ```

  To accept press `Y`, or to decline press `N`.
- `-i silent` performs a silent installation. No console or dialog windows appear. Information on installation process is stored in the log file.

  Note: Participation in the Product Excellence Program will occur by default. There will be no presentation of the description of this feature.

  To opt-out of the Product Excellence Program during a silent installation:
  - Add `-DPRODUCTEXCELLENCEPROGRAM=0`, for example:

    ```
    -i silent -DPRODUCTEXCELLENCEPROGRAM=0
    ```

  Any value other than `0` (such as `-DPRODUCTEXCELLENCEPROGRAM=FALSE`) would be interpreted as continuing to participate in the program.
- `-f "filename"` instructs Setup to load the settings from the specified file after having checked the command line. Use quotes if the filename contains spaces.
- `-r "filename"` instructs Setup to save installation settings to the specified file. Use quotes if the filename contains spaces.
- `-DINSTALLDIR=<path>` provides an alternative location for the Simcenter STAR-CCM+ installation.
- `-PCMPIINSTALLDIR=<path>` provides an alternative location for the IBM Platform MPI installation.
- `-DCOMPUTE_NODE=<true>` only installs the dependencies that are required to run Simcenter STAR-CCM+. Does not install the full package. This option is intended for use in cluster installations where the full package is installed on the head node only.
- `-D<PARAMETER>=true/false` provides additional installation options, where `<PARAMETER>` can be:
  - `INSTALLFLEX` controls whether the license server is installed and configured. If you do not want to install the license server, set this argument to `false`.
  - `CURRENTUSERONLY` creates a desktop shortcut for the current user only. If you want to create shortcuts for the current user only, set this argument to `true`. This applies to Simcenter STAR-CCM+ only.

- SHARE controls whether to share the installation directory so that others can access it. This is useful for parallel runs. The installation directory is shared by default. If you do not want to share the installation directory, set this argument to false.
- FIREWALL controls whether to add an exception to the Windows firewall to allow Simcenter STAR-CCM+ to run. The Windows firewall may attempt to block socket communication. By default, a rule is added by the installer to permit this communication. If you do not want this to happen, set this argument to false. Note that you must manually add exceptions to third-party firewall software.
- DESKTOPICONS controls whether to create desktop icons for the installed components. By default, the installer creates desktop icons. If you do not want the desktop icons, set this argument to false.
- NOADMIN allows the installation and execution of Simcenter STAR-CCM+ without administrator privileges. You must choose an installation location that is not protected by administrator privileges. If you set this argument to true, additional directories are created in the Simcenter STAR-CCM+ server directory which contain all required Microsoft run-times. Systems administrators can use the NOADMIN mode to install Simcenter STAR-CCM+ on a central server and run on Windows clients without installing additional components. Note that only sequential or shared memory IBM Platform MPI parallel runs are supported when you perform a NOADMIN installation.
- NODOC controls whether or not to install the Simcenter STAR-CCM+ documentation. If you do not want to install the Simcenter STAR-CCM+ documentation, set this argument to true.

An example command (within the STAR-CCM+_CadClients-15.04.### sub-directory) is provided below. Using this command, Simcenter STAR-CCM+ is installed in console mode without installing the FlexNet license server.

```
> STAR-CCM+_CadClients15.04.###_[OS].bat -i console -DINSTALLFLEX=false
```

where [OS] is the is the name of the operating system.

Installing on a Windows Cluster

For running in parallel on a cluster, you only have to install the full Simcenter STAR-CCM+ package on the head node. Compute nodes only require the necessary dependencies for running the Simcenter STAR-CCM+ executable.

To install Simcenter STAR-CCM+ on the head node, use the interactive or command line installer. Ensure that the installation directory is shared amongst all compute nodes. Also make sure that the CDLMD_LICENSE_FILE environment variable is configured correctly on all compute nodes.

- To view a list of all environment variables, enter the following command:

  ```
  > cluscfg listenvs
  ```

- If no CDLMD_LICENSE_FILE environment variable is defined, enter the following command:

  ```
  > cluscfg setenvs CDLMD_LICENSE_FILE=<port>@<licserver>
  ```

Installing on Compute Nodes

Note: This installation is not required for Windows Server 2012.

To install Simcenter STAR-CCM+ on compute nodes, use either the `clusrun` (Windows HPC Server) command or `psexec` command in conjunction with the `-DCOMPUTE_NODE=true` parameter.

An example `psexec` command is shown below:

```
> psexec @machinefile -accepteula -u username -p password  "\\netshare\path\
STAR-CCM+_CadClients15.04.###_win64_intel12.1.bat" -i silent -
DCOMPUTE_NODE=true
```

where `@machinefile` contains a list of host names or network addresses. You can use the `-DINSTALLDIR` parameter to override the default installation directory.

An example of the `clusrun` command would be:

```
headnode> clusrun /all "\\netshare\path\
STAR-CCM+_CadClients15.04.###_win64_intel12.1.bat" -i silent -
DCOMPUTE_NODE=true
```

On Windows HPC Server, you can also use the HPC Cluster Manager to select the compute nodes:

1. Start an **Action**, and choose to **Run Command**.
2. Run the Simcenter STAR-CCM+ installer with the `-i silent` option:

```
> "\\netshare\path\
STAR-CCM+_CadClients15.04.###_win64_intel12.1.bat" -i silent -
DCOMPUTE_NODE=true
```

Finding the Log File

The package installer creates a log file, `STAR-CCM+15.04.###_InstallLog.log`, in your Simcenter STAR-CCM+ installation directory.

The information contained in the log file is technical in nature, but may be of use when contacting Siemens Digital Industries Software support about installation problems.

Note: The log file is only created after you click the **Finish** button in the Simcenter STAR-CCM+ Installer.

Launching Simcenter STAR-CCM+ on Windows

Once the installation is complete, you can launch Simcenter STAR-CCM+.

To launch Simcenter STAR-CCM+:

1. Double-click the Simcenter STAR-CCM+ icon that was created on your Windows desktop.
   Simcenter STAR-CCM+ launches.
2. Alternatively, from the **Start** menu, click the Simcenter STAR-CCM+ icon in **All Programs** > **SiemensPLM**.

Simcenter STAR-CCM+ is ready for you to use. If you are using Simcenter STAR-CCM+ for the first time, work through the introductory tutorial.

Starting the CAD Clients

To run the CAD clients, follow the steps outlined below. If you are having trouble starting the CAD clients, refer to the CAD client user guide (*CAD Clients > Using CAD Clients > Working With [CAD client] > Introducing [CAD client] > Getting Started > Launching [CAD client] Manually*)

- CATIA -- During installation a **STAR-CAT5 R XX Y YY YYY** icon is created on the desktop, or in the **CATIA** folder in the **All Programs** menu. Double click this icon to start STAR-CAT5. Open a CATPart or CATProduct and start STAR-CAT5 from the **Analysis and Simulation** menu.
- NX -- STAR-NX loads automatically when you launch NX. A **STAR-NX** menu appears in the NX menu bar.
- Creo -- STAR-Creo is an Auxiliary Application extension that launches automatically when starting Creo. The **STAR-Creo** ribbon appears in the Creo user interface.
- Inventor -- STAR-Inventor loads automatically when you launch Inventor. The **STAR-Inventor** ribbon appears in the Inventor user interface.

If you wish to use CAD Clients with Power Session or Lite Session licenses, open the *Preferences Dialog* within your CAD client interface and select the appropriate option. Instructions on doing this are provided in the Simcenter STAR-CCM+ User Guide.

Deploying the Tutorial Files and Verification Suite

The STAR-CCM+ Tutorial Files and Verification Suite provide essential resources for Simcenter STAR-CCM+ users. If you are a system administrator, be sure to download and share these files with all end-users.

To obtain the necessary packages (if not already downloaded):

1. Log into Support Center as described in Downloading Simcenter STAR-CCM+.
2. Download the following files:
   - STAR-CCM+TutorialFiles15.04.###.7z
   - STAR-CCM+VerificationSuite15.04.###.7z
3. Move these files within the top-level numbered folder (containing the Java Development Kit and other products) of the Simcenter STAR-CCM+ installation and unzip them.
4. Assign permissions that permit read access to the contents of the tutorial files and verification suite folders for all users.

Installing an Alternate Version of JDK Manually

While it is strongly recommended to rely on the automatically installed version of JDK, there are steps you can take to install an alternate version manually should you wish to do so.

The automatically installed JDK is Version 11.0.5 from AdoptOpenJDK. The version of your replacement JDK must be at a *patch level* equal to or greater than the version we include in the installer.

1. When using the interactive installer, choose your alternate version of JDK using one of the following techniques:
   - Accept the automatic installation of JDK and then follow the instructions below for removing and replacing it. This technique is the recommended choice because it ensures that you will use an appropriate location for the JDK.
   - Deactivate the checkbox to decline the automatically installed version of JDK. See the section on the Interactive Installer.
2. After accepting the automatic JDK installation, delete the existing `jdk11.0.5` folder from `jdk\win64` (Windows) or `jdk/linux-x86_64` (Linux). (The `jdk` folder should be at the same level as the STAR-CCM +15.04.### install folder.)
3. Download and extract the updated version of the JDK to the `jdk\win64` or `jdk/linux-x86_64` folder.
4. Rename the extracted folder if necessary to remove the hyphen, match the existing naming pattern, and start with `jdk11.0`, for example `jdk11.0.5`, but not `jdk-11.0.5`.
5. Launch Simcenter STAR-CCM+.

To verify that the correct version of JDK is in use, check the Java details in the *About Simcenter STAR-CCM+* dialog (available through the **Help** > **About** menu item). If you did not install the new version of JDK successfully, it is possible that Simcenter STAR-CCM+ accesses JDK from another location (such as a previously installed version).

Installing Simcenter STAR-CCM+ with Job Manager

This section contains instructions for installing Simcenter STAR-CCM+ with Job Manager on Linux platforms.

Job Manager is a web service that provides a human-machine interface to a set of compute resources. For end-users of Simcenter STAR-CCM+, Job Manager provides an automated approach for user authentication, file transfer, job submission, and resource allocation and management.

A system administrator installs Job Manager alongside Simcenter STAR-CCM+ and configures it using the Administrator Web UI. Job Manager is part of the Simcenter STAR-CCM+ installer and does not require specific licensing.

End-users can monitor the status and progress of simulations submitted with Job Manager using the Web Monitor. Web Monitor is a web-based client that can be accessed from any compatible browser. Web Monitor is installed alongside Job Manager.

Contents:

See Also:

Deploying the Tutorial Files and Verification Suite

Hardware Requirements

For running Job Manager, your system must meet the following hardware requirements:

Hardware Component	Requirement
Memory	500 MB of memory on the Job Manager host. Note that Job Manager can utilize up to 100% of memory of one core.
Disk Space	• Installation: Job Manager is installed alongside Simcenter STAR-CCM+ and requires no additional disk space for its runtime. For information on the disk space requirements for Simcenter STAR-CCM+, see What are the Requirements?. • File transfer: for the upload and download of files between a client and the cluster, Job Manager uses the temporary folder of the Job Manager system account. This folder must be large enough to accommodate several temporary files for several users. See Temporary Folder Considerations.

Web Monitor: Supported Platforms and Browsers

The following web browsers, on the following platforms, are supported for the Web Monitor of Job Manager jobs. *Supported* in this context means that some testing has been performed or compatibility is expected.

Note: This information pertains exclusively to the web browser with which you would connect remotely to a Job Manager job, for example from a mobile device or a home computer. No representation is made here about these platforms' use with Job Manager or Simcenter STAR-CCM+. For information about which platforms are supported for these products, see the appropriate sections in the Simcenter STAR-CCM+ Installation Guide.

Platform	Browser and Minimum Supported Version
Linux	Chrome 64
	Firefox 57.0.4
Windows	Chrome 64
	Firefox 57.0.4
Android	Chrome 64
iOS	Safari 10.0.1

Installation Prerequisites

Before you install Job Manager, consider the following aspects:

Note: In the context of installation of Job Manager, "you" refers to the Job Manager administrator.

- **Authentication mode**—you must decide on the authentication mode for Job Manager—OS User Authentication or Job Manager Internal Authentication. See Authentication Modes.
- **Installation location**—the installer requires a path to both the Simcenter STAR-CCM+ and Job Manager installation on your compute resources. See Installation Location.
- **Job Manager system account**—you must specify a system account under which Job Manager runs as a daemon process. You are advised to create and assign a specific system account to Job Manager, such as `jmadmin`. Make sure that this account has a large enough temporary directory assigned to it (see Temporary Folder Considerations) and password-less SSH set up for itself. Additionally, this account must be able to get the status of all the jobs on the cluster.
- **Database location**—Job Manager uses a database file (`*.db`) to store the users, the groups, the user-group memberships and permissions, and other configuration information. You specify the name and the directory of the database file during installation of Job Manager. The directory for the database file must be accessible and writable by the Job Manager system account.

  Note: Installing the database file on a Lustre file system is not supported.

  Job Manager uses the embedded file-based database engine SQLite to store the data. After installation, you are advised to set up a backup procedure for this file.
- **SSL/TLS certificate**—for encrypted HTTPS communication between a Job Manager client, and the Job Manager web server, you must provide a SSL/TLS certificate file and the private key file associated with the certificate. See Client-Web Server Communication.
- **Job Manager as a system service**—with Job Manager as a system service, Job Manager automatically restarts on a server reboot. This allows you to ensure that Job Manager is always available to proceed incoming requests. See Job Manager as a System Service.
- **Grid Engine configuration**—when a running job exceeds its permitted walltime, the Grid Engine `qdel <jobid>` command sends a SIGKILL signal to the job by default. This signal causes an immediate exit of the job without any cleanup actions. To prevent that orphaned job processes remain running, you are strongly advised to configure the queues for Job Manager in such a way as to send a SIGTERM signal. This signal cleans up the resources before it exits the job. To send the SIGTERM signal, you must set the `terminate_method` property for the queues to `SIGTERM`.

Contents:

Authentication Modes

User authentication allows Job Manager to verify the identify of the users who connect to the target compute resources. Two different user authentication modes are available—OS User Authentication and Job Manager Internal Authentication.

OS User Authentication

In OS User Authentication mode, Job Manager delegates authentication to the operating system of the host. When you log in to Job Manager, you provide the same credentials as you would if logging in to the login node using SSH. Job Manager retains the credentials for the duration of your login and continues to use the same credentials to execute your actions such as submitting jobs.

- SSH must be configured to allow password authentication.
- Any user that wants to login to Job Manager (including the administrator) must have a corresponding SSH account on the login node.
- Usernames in the Job Manager database must correspond to the SSH usernames.
- Passwords are not stored in the database. The change of an OS password is reflected immediately.

Job Manager Internal Authentication

In Job Manager Internal Authentication mode, you log in to Job Manager with a specific password. Job Manager uses its own database to store these passwords and authenticates you against that database. When Job Manager executes an action on your behalf, such as submitting a job, Job Manager uses SSH with your login name only. Job Manager assumes that SSH is set up for password-less mode so that no password is required when executing actions.

In this mode, the administrator account does not need to have a corresponding SSH account (provided that the administrator will never submit jobs).

- Usernames in the Job Manager database must correspond to the SSH usernames.
- Job Manager-specific passwords are stored in the Job Manager database in an encrypted form. The initial passwords for the users are set by the Job Manager administrator.
- The system account under which the Job Manager service is running must have password-less SSH access to the login node set up for all users in the database.
- The public key of the Job Manager system account must be imported in the authorized keys files of the users on the login node. The public key of the system account, such as `jmadmin`, is stored in the `~jmadmin/.ssh/id_rsa.pub` file. The authorized keys for a user are usually stored in the `~/.ssh/authorized_keys` file in the home directory of the user.

Regardless of the authentication mode, the system account under which Job Manager runs must be able to run any commands required to retrieve the status of all jobs submitted through Job Manager. This is typically `qstat` or a similar command that is executed through password-less SSH.

Installation Location

You install and run Job Manager on a host inside of the target HPC cluster environment.

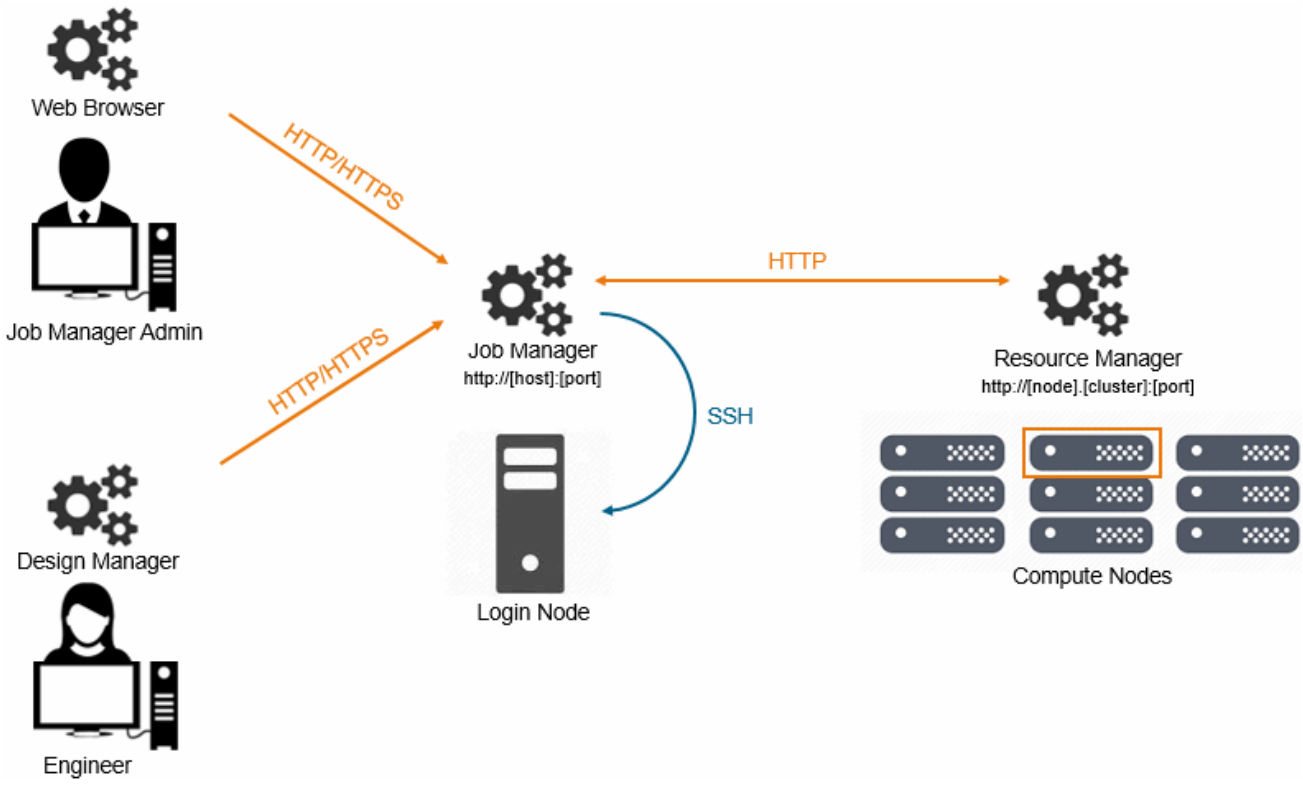
When running compute jobs on an HPC cluster using Job Manager, a Simcenter STAR-CCM+ Resource Manager application is launched on the compute resources that are allocated to the compute job by the queuing system. The Resource Manager keeps track of the tasks that are launched as part of the compute job and the compute resources assigned to them. The Resource Manager organizes the resources, provides an interface for

launching tasks, and makes sure the overall compute job does not exceed the allocated resources. The Resource Manager application persists for the lifetime of the compute job.

The requirements for the host of Job Manager are:

- For security reasons, the host of Job Manager must not be accessible from the public internet but only from a corporate private network.
- Clients of Job Manager, such as Simcenter STAR-CCM+, Design Manager or a web browser, must be able to establish an HTTP/HTTPS connection with the host of Job Manager. If Job Manager runs behind a firewall, then ports must be opened to satisfy this requirement.
- Job Manager must be able to connect to the login node of the cluster using SSH.
- Job Manager must be able to establish a HTTP connection to Resource Manager, which can run on any cluster node within the cluster, and vice versa.

If you install Job Manager on the login node of the cluster, then many of the requirements are satisfied automatically:



Temporary Folder Considerations

Job Manager automatically handles the file transfer—upload and download—between the client and the cluster it represents. While the file transfer is in progress, Job Manager uses the temporary folder of the Job Manager system account that you specify during installation.

Job Manager takes advantage of the usual environment variables to get the temporary folder path: `TMPDIR`, `TEMP`, or `TMP`. If more than one of these variables are specified, Job Manager uses the first one specified.

The temporary folder must be large enough to accommodate several temporary files for several users. Note that for every simulation file (`*.sim`) that a user transfers, Job Manager also transfers a backup file (`*.sim~`) of the same size.

Example: For 5 users who simultaneously upload simulation files of 2 GB size, the temporary folder must have a size of at least 20 GB, which equals `number_of_users * size_of_simulation_file * 2`.

If the default temporary folder is not large enough, you must provide alternative temporary storage space for Job Manager. To do this, you must set the respective environment variable for the Job Manager system account to point to the desired location.

Client-Web Server Communication

The communication between a Job Manager client and the Job Manager web server can be unencrypted (HTTP) or encrypted (HTTPS).

The following clients can communicate with the Job Manager server:

- **Simcenter STAR-CCM+**
  This client allows the end-user to run Simcenter STAR-CCM+ simulations with Job Manager.
- **Design Manager**
  This client allows the end-user to run design studies with Job Manager.
- **Web Browser**
  For the Job Manager administrator, this client allows the setup of Job Manager using the Administrator Web UI. For end-users, this client allows the monitoring of running simulations using the Web Monitor.

Security

With HTTP communication between a client and a web server, all data is sent in plain text. Malicious interception of data could reveal sensitive information including user passwords. HTTPS communication uses cryptographic protocols, such as Secure Sockets Layer (SSL)/Transport Layer Security (TLS), to encrypt the network packages sent between the client and the web server. Additionally, SSL/TLS provides identity verification of the web server to ensure that the client can trust the web server.

The following steps initiate a HTTPS connection:

1. The web server presents a certificate to the client.
2. The client decides if it trusts the certificate or if the certificate has been verified and trusted by a certificate authority.
3. The client and the server exchange keys in order to encrypt/de-crypt data.

Note: If implicit trust exists between a Job Manager client and the Job Manager web server, you can choose to use HTTP communication. However, to maximize security, you are strongly advised to use HTTPS communication. You specify the communication method during installation of Job Manager.

Certificate Generation and Signing

For HTTPS communication, you must generate a SSL/TLS certificate and an associated private key on the web server host in `*.pem` file format. To ensure that a client can trust the web server, a certificate authority (CA) must validate the identity of the web server and digitally sign the certificate.

For Job Manager, the following signed certificates are supported:

- Commercial publicly-trusted certificate—a paid certificate signed by a commercial certificate authority. This certificate is usually already established as trusted for the client.
- Certificate issued by a local CA—a certificate signed by a local in-company authority. This certificate is suitable when your company has its own certificate authority with the certificate established as trusted for all the users in the company.

You must place the signed certificate and its associated private key in a secure directory on the Job Manager host with access permission set for the Job Manager system account under which the Job Manager process runs. You provide the paths to these files during the installation of Job Manager.

Chain of Trust

The web server certificate contains the web server public key and information about the web server identity. After validation of the web server identity, the CA signs the certificate with its private key. The client typically stores a local root certificate of the CA that signed the certificate. The root certificate contains the CA public key. On receipt of the web server certificate, the client verifies that the certificate was signed by the CA that the certificate claims is was signed by using Public Key Infrastructure (PKI). As the CA has previously validated the web server identify, and the client trusts the CA, the client can trust the identify of web server.

Contents:

Generating a Trusted Certificate

To generate a trusted certificate, you must submit a certificate signing request to a Certificate Authority. This authority can be a commercial Certificate Authority or a local (in-company) Certificate Authority.

The main steps required for generating a trusted certificate (in a Linux environment) are:

1. Generating a Certificate Signing Request (CSR)
2. Verifying the CSR
3. Submitting the CSR to a Certificate Authority (CA) and Verifying the CA Signed Certificate

After generating the trusted certificate, you can proceed with installing Job Manager. When the Job Manager installation is complete, proceed with the following post-installation steps:

1. Importing the CA Root Certificate into the Client Trust Stores
2. Verifying the HTTPS Connection from the Web Browser

Contents:

Generating a Certificate Signing Request (CSR)

To obtain a signed certificate, you generate a certificate signing request on the Job Manager host and send it to the Certificate Authority.

To generate a CSR:

1. Log into the host where you intend to run Job Manager.
2. Obtain the Fully Qualified Domain Name (FQDN) of the host:
   a) Enter the following line in the command prompt: `hostname -f`.

      This returns the FQDN of the system.
   b) For systems with multiple networks cards, ensure that the obtained FQDN is resolvable from all hosts where you intend to run a Job Manager client.

      Example: the Job Manager host is configured with an internal domain. In this situation, `hostname -f` may resolve the default hostname to the internal address (host.internal.cluster), which is not resolvable from external systems, rather than the external address (host.company.com).
3. Create the CSR and the private key associated with the CSR:
   a) Write a text file with the following configuration information and fill in appropriate values for each `<value>`:

```
[ req ]
distinguished_name = req_distinguished_name
req_extensions = req_ext

[ req_distinguished_name ]
countryName = Country Name (2 letter code)
countryName_default = <value>
stateOrProvinceName = State or Province Name (full name)
stateOrProvinceName_default = <value>
localityName = Locality Name (eg, city)
localityName_default = <value>
organizationalUnitName = Organizational Unit Name (eg, section)
organizationalUnitName_default = <value>
# If you place a DNS name here then you must also include
# the DNS name in the alternate_names
commonName = Common Name (e.g. server FQDN or YOUR name)
commonName_default = <value>
emailAddress = Email Address
emailAddress_default = <value>

# Used when creating a CSR
[ req_ext ]
# Extensions to add to a certificate request
subjectKeyIdentifier = hash
basicConstraints = CA:FALSE
keyUsage = keyEncipherment, digitalSignature
extendedKeyUsage = serverAuth
subjectAltName = @alternate_names

[ alternate_names ]
DNS.1 = <value>
# Additional alternate names are optional
# DNS.2 = <value>
```

   b) In the command prompt, enter the following line:

      `openssl req -new -newkey rsa:2048 -nodes -sha256 -config <file> -out server.csr.pem -keyout server.key.pem`

      where:

      - `req` specifies that openssl operates on a CSR
      - `-new` generates a new request

- `-newkey rsa:2048` generate a new RSA key of 2048-bits size
- `-nodes` specifies to not use a passphrase when generating the key
- `-sha256` specifies the message digest to sign the request with
- `-config <file>` specifies the configuration file as created in Step 3a.
- `-out server.csr.pem` specifies the filename for the CSR
- `-keyout server.key.pem` specifies the filename for the new private key

c) This command prompts you for the following information:

- Country Name
- State or Province Name
- Locality Name
- Organization Name
- Organization Unit Name
- Common Name: here you enter the FQDN of the system obtained in Step 2.
- E-mail Address

By default, the values that you specified in the configuration file are applied.

After the command completes, the following files are available in the current working directory:

- `server.csr.pem`—the CSR that you submit to the Certificate Authority. The CSR contains the responses to the prompted questions and a public key. The CSR does not contain your private key.
- `server.key.pem`—the private key associated with the CSR. Keep this key secure and DO NOT share it. You specify this key as **SSL Private Key** when installing Job Manager.

Verifying the CSR

Before you send the CSR to the Certificate Authority, verify your CSR and check that the private key associated with the CSR is valid.

To verify your CSR:

1. On the Job Manager host, open a command prompt and enter the following line:
   ```
   openssl req -verify -in server.csr.pem -noout -text
   ```
   where:
   - `-verify` verifies the signature on the CSR
   - `-in server.csr.pem` specifies the CSR file
   - `-noout` prevents output of the encoded version of the CSR
   - `-text` prints out the CSR in text form

   If your CSR is valid, the command prints `verify OK` and the content of the CSR.

To check the validity of the private key associated with the CSR:

2. In the command prompt, enter the following line:
   ```
   openssl rsa -in server.key.pem -check
   ```
   where:
   - `-in server.key.pem` specifies the key file
   - `-check` verifies the consistency of the private key

Note: Keep the private key secure and DO NOT share it. For this reason, only validate the key on the Job Manager host.

Submitting the CSR to a Certificate Authority (CA) and Verifying the CA Signed Certificate

You submit the CSR that you generated on the Job Manager host to a commercial or local (in-company) certificate authority.

After verifying the identity of the Job Manager host, the CA adds a digital signature to the submitted certificate. You receive the signed certificate from the CA in `*.pem` or `*.pfx` file format. The signed certificate does not contain private information. However, you are advised to keep the file in a safe directory on the Job Manager host. You specify the signed certificate as **SSL Certificate** when installing Job Manager.

To display the content of the signed certificate in human readable from:

1. On your Job Manager host, open a command prompt and enter the following line:
   ```
   openssl x509 -in <signed certificate file> -noout -text
   ```
   where:
   - `-in <signed certificate file>` specifies the signed certificate file
   - `-noout` prevents output of the encoded version of the file
   - `-text` prints out the file in text form

To verify the certificate chain:

2. Enter the following line:
   ```
   openssl verify -verbose -CAfile <CA root certificate file> <signed certificate file>
   ```
   where:
   - `-verbose` prints extra information
   - `-CAfile <CA root certificate file>` specifies the CA root certificate file

   If the verification is successful, the command prints `<server host>: OK`.

Job Manager as a System Service

You can install Job Manager as a system service so that it is always available to receive incoming requests.

As a system service, Job Manager runs continuously in the background and automatically restarts on a server reboot. For managing the service, the following service managers are supported:

- SysVinit
- systemd

You require superuser permissions to install Job Manager as a service. During installation, you must choose a working directory for the service. By default, Job Manager uses the `/var/log/Siemens/jobmanager` directory. You can start the service as part of the installation. Alternatively, you can start and manage the service using the following service manager commands:

SysVinit

Start service: `service jobmanager start`
Stop service: `service jobmanager stop`
Query status of service: `service jobmanager status`

systemd

Start service: `systemctl start jobmanager`
Stop service: `systemctl stop jobmanager`
Query status of service: `systemctl status jobmanager`

where `jobmanager` is the installed service.

During an upgrade of Job Manager, the installed service stops and the service files are updated to reference the new version. Afterwards, the service is restarted automatically.

Installing Simcenter STAR-CCM+ with Job Manager on Linux

You install Job Manager as a component of Simcenter STAR-CCM+ using the Custom Install method of the interactive Simcenter STAR-CCM+ installer. You do not require specific licensing to launch Job Manager.

Note: Currently, the installation of Job Manager is supported only on Linux clusters. The supported queuing systems are Torque, Open Grid Engine, Univa Grid Engine, PBSPro, Slurm, and LSF.

To install Simcenter STAR-CCM+ with Job Manager:

1. Retrieve the downloaded installation file and move it to the Job Manager host.
2. In a terminal window, enter the following command to extract the installer components:

   ```
   % tar -zxvf STAR-CCM+15.04.###_[OS].tar.gz
   ```

   where `[OS]` is the name of the operating system.
3. Change to the extracted folder and run the installer:

   ```
   % ./STAR-CCM+15.04.###_[OS]/STAR-CCM+15.04.###_[OS].sh
   ```

   When the installer launches correctly, you are presented with a series of screens to guide you through the process.

   Note: Remember to export the `DISPLAY` of the server to your workstation.
4. *Select Setup Language*: choose your required language from the list shown and click **OK**.

   This option gives you the choice to run the Simcenter STAR-CCM+ installer either in English or in your native language.
5. *License Notice*: read the agreement and choose to accept. Click **Next** to continue.
6. *Choose Installation Method*: select the **Custom (Advanced)** option.
7. *Choose Install Type*: this screen presents the components that are available for installation on your system. Select the desired components and click **Next**.

   The following options are available:

   - **Simcenter STAR-CCM+ and related components** > **Install on local or NFS shared location**: allows you to install Simcenter STAR-CCM+ on the current machine or in a location of your choice. To install Job Manager, you must install Simcenter STAR-CCM+.
   - **FLEXNet License Manager**: choosing this option will provide two further options in a subsequent step where you can choose to either use an existing license server on the network, or to deposit the FlexNet license tools on the host machine.

     Note: To activate a license server on the local machine, you must follow the steps in Setting up a License Server using lmgrd.

     Note: If you want to use PoD (Power-on-Demand) licensing, activate this option.
8. *Choose Simcenter STAR-CCM+ Components*: choose the components to install.

   The following components are available:

   - **Simcenter STAR-CCM+**: installs Simcenter STAR-CCM+ on your system.

- **Job Manager**: installs Job Manager. To install Job Manager, you must also install Simcenter STAR-CCM+.
- **Simcenter STAR-CCM+ Documentation**: installs the Simcenter STAR-CCM+ documentation.
- **Simcenter STAR-View+**: installs Simcenter STAR-CCM+ Viewer.

9. *Simcenter STAR-CCM+ Job Manager Configuration*: choose the installation and authentication methods for Job Manager and click **Next**.

   The following options are available:

   - **Configure new Job Manager**: installs a new instance of Job Manager on your system.
     - **Using operating system authentication**: Job Manager delegates authentication to the operating system.
     - **Using internal authentication**: Job Manager authenticates itself using passwords stored for the users in its own database.
     - **Configure email server**: allows Job Manager to communicate with an SMTP server for sending notifications and password reset messages. Choosing this option provides further dialogs in subsequent steps where you set up the *Email specification* and the *SMTP port number*.
     - **Install as a Linux service**: installs Job Manager as a system service managed by the service manager. To install Job Manager as a service, you must be a superuser. Choosing this option provides a further dialog in a subsequent step where you configure the *Linux service*.
   - **Upgrade existing Job Manager**: stops an existing Job Manager on your system and upgrades to a new version. This type of installation preserves the database data (users, groups, permissions, resource groups, and submission templates) and the configuration settings of the existing installation. To upgrade an existing Job Manager, you must be a superuser. Choosing this option provides a further dialog in a subsequent step where you *Select existing Job Manager location*.

10. *Create database file*: enter a custom directory for the Job Manager database file, otherwise click **Next** to accept the default location.

    Note: Installing the database file on a Lustre file system is not supported.

11. *Server selection*: configure the Job Manager web server and the application server for web monitoring and click **Next**.

    - **Hostname**: enter the Fully Qualified Domain Name (FQDN) of the Job Manager host as visible from outside the cluster. This hostname is used for the Job Manager URL. Jobs running on the cluster nodes also use this hostname to communicate back to Job Manager, such as when reporting the status of the job.

      If the Job Manager host has multiple network adapters, Job Manager must listen on all of the adapters. In this case, enter the meta-address of the host.
    - **Internal Hostname**: enter the FQDN of the Job Manager host, as visible from within the cluster. If the specified **Hostname** is resolvable from both outside and within the cluster, leave this text-box empty.
    - **Job Manager Port Number**: enter the number of an available port on the Job Manager host. Job Manager listens on this port for HTTP/HTTPS communication. If Job Manager is the only HTTP/HTTPS server running on the host, you can use the default port (80 for HTTP, 443 for HTTPS).
    - **Application Server (Web Monitor) Port Number**: enter the number of an available port on the Job Manager host. The Application Server (Web Monitor) listens on this port for HTTP/HTTPS communication.

12. *Admin user name*: specify the Job Manager administrator and click **Next**.

    - **Admin User Name**: enter the user name of the Job Manager administrator. For operating system authentication, you must enter the name of an existing SSH user on the cluster.

13. *Login Node*: specify the login node and the name of the represented compute resources and click **Next**.
    - **Login Node**: enter the FQDN of the login node. Job Manager communicates with the login node using SSH and uses the login node to run all the cluster job commands.
    - **Resource Group Name** (only for operating system authentication): enter a name for the represented compute resources. Note that you CANNOT change the name after installation.
14. *SSL certificate selection*: for HTTPS communication with Job Manager, specify the files that contain the SSL certificate and the associated private key and click **Next**. The supported file formats are `.pem` and `.pfx`. If you do not specify any files, HTTP communication is used (not recommended for security reasons).
    - **SSL Certificate**: browse to the file that contains the SSL certificate.
    - **SSL Private Key**: browse to the file that contains the private key associated with the certificate.
15. *Email specification* (if chosen): configure the outgoing email server settings and click **Next**.
    - **Display name**: enter the name of the email sender, such as `Job Manager`.
    - **Email address**: enter a valid email address for the email sender, such as a `Job Manager` specific email address.
    - **SMTP server**: enter the FQDN of the SMTP server.
    - **Username** (optional): if the specified SMTP server requires user authentication, enter the username of an existing user account.
    - **Password** (optional): enter the password associated to the specified **Username**.
16. *SMTP port number* (if chosen): specify the number of the SMTP server port, decide on communication security, and click **Next**.
    - **SMTP Port number**: enter the port number used for SMTP communication.
    - **TLS**: when activated, uses the Transport Layer Security (TLS) protocol to provide secure communication with the SMTP server.
17. *Linux service* (if chosen): specify the Job Manager system server settings and click **Next**.
    - **Service User Name**: enter the username of an existing user account on the Job Manager host under which the system service runs.
    - **Service group**: enter the user group that includes the specified user account. When left empty, sets the user's primary group.
    - **Service working directory**: enter the directory in which the system service launches and where the service `.log` files are created.
18. *Choose License Type*: select the licensing method that you want to use and click **Next**.
    - **Network**: configures the current machine to access a network license server. If you want to connect to the Siemens Digital Industries Software Power-on-Demand license server, also activate the option, **Configure this machine to access Power-On-Demand License Server**.
      - *FlexNet Client Configuration*: enter the hostname and port number of your organization's license server using the format: `port@host`. You can add additional redundant servers if your network is set up to support this. You also can use the option, **Three machine redundant license server**:
        - When activated, the three servers are considered as one license server (triad), and so their names are separated by commas.
        - When deactivated, the servers are separated by colons.
      - Click **Next** to continue.
    - **Local**: deposits the FlexNet license tools on the current machine. If you choose this option, follow the relevant steps below:

- *FlexNet License Server Configuration*: enter the Web Port Number and License Port Number, otherwise click **Next** to keep the default values.
- *Select license file*: browse to the license that you obtained from Siemens Digital Industries Software and click **Next**.

19. *Select Installation Location*: enter a custom directory for the Simcenter STAR-CCM+ and Job Manager installation, otherwise click **Next** to accept the default location.
20. *Select existing Job Manager location* (if chosen): enter the directory of the existing Job Manager installation, otherwise click **Next** to accept the default location.
21. *Select Additional Tasks*: select the additional tasks you want the installer to perform and click **Next**.
    - **Add application directories to your system path**: activate this option if you generally launch software from a command prompt window, and you only wish to use this latest version of Simcenter STAR-CCM+. If you want to run Simcenter STAR-CCM+ by typing the full path, deactivate this option.
22. *Product Excellence Program*: collects information about how our customers use Siemens Digital Industries Software (for details, see Product Excellence Program). To decline participation, deactivate the checkbox in the screen.

    Note: When you make a choice about whether to participate, that choice is applied to the installation of Simcenter STAR-CCM+ Viewer as well as Simcenter STAR-CCM+.

23. *Pre-Installation Summary*: shows a summary of what will be installed on your machine. Click **Next** to proceed with the installation.
24. *Installing*: shows the current progress of the installation process.

    Note: You may see additional windows appearing during the installation process, depending on the selections you made.

25. *Install Complete*: indicates the end of the Simcenter STAR-CCM+ installation process. If any errors were encountered during installation, a message is displayed here prompting you to check the installation log file.

On completion, the Job Manager configuration file `[STAR-CCM+_INSTALL_DIR]/star/bin/jobmanager.cfg` is populated with the settings specified during the installation process, such as:

- Host of the application
- Port number on which the application listens
- Database file path
- E-mail notification settings
- SSL certificate and key file paths
- Logging settings

If you modify the configuration file, you must restart Job Manager to apply the new configuration settings.

To uninstall Job Manager together with Simcenter STAR-CCM+, you use the Simcenter STAR-CCM+ installer. For more information, see Uninstalling Simcenter STAR-CCM+.

See Also:

Problems with Disk Space

Launching Simcenter STAR-CCM+ on Linux

Job Manager Post-Installation Steps

After the Simcenter STAR-CCM+ with Job Manager installation is complete, you can verify the connection using a web browser on another machine. When using HTTPS communication, you must ensure that the same CA Root certificate is available on other clients from which you access Job Manager.

There are three types of client that can access Job Manager:

- Web browser for the Job Manager Administrator Web UI and Web Monitor
- Simcenter STAR-CCM+ on client machines, for submitting simulations
- Design Manager processes on client machines, for running design studies

Contents:

Importing the CA Root Certificate into Client Trust Stores

For secure HTTPS communication between a Job Manager client and the Job Manager web server, the root certificate of the CA must be installed in the trust store of the client.

For commercial CAs, the root certificate is usually already installed in the trust stores. However, for local in-company CAs, you usually must explicitly import the CA root certificate into the trust stores.

Depending on the client that communicates with the Job Manager web server, you add the CA root certificate to the following trust stores:

Job Manager Client	Client Trust Store
Simcenter STAR-CCM+ (client process)	Java JDK
Design Manager (server process)	Operating system (OS)
Web browser	OS / Web browser *

* On Windows, most web browsers use the OS trust store, which allows a centralized administration. Firefox uses its own trust store by default. You can either configure Firefox to use the OS trust store or add the CA root certificate to the Firefox trust store. Linux does not support a single trust store that all applications use. Different applications can use their own trust stores or they can use trust stores installed from Linux packages.

To import the CA root certificate into the Java JDK trust store:

1. Find the correct instance of Java JDK:
   a) Launch Simcenter STAR-CCM+ and select **Help** > **About**.
   b) In the *About Simcenter STAR-CCM+* panel, look for the entry **Java Home**.

      On Windows, an example of this entry is:

      ```
      C:\Program Files\Siemens\15.04.002\jdk\win64\jdk11.0.5
      ```

      In subsequent steps, this location is referred to as `[JAVADIR]`.

2. Open a command prompt (Windows) or terminal window (Linux) and navigate to the Java security folder (replacing `[JAVADIR]` with the path you determined previously):
   - On Windows (you must have administrator provileges in order to access the `Program Files` folder):
     ```
     cd [JAVADIR]\lib\security
     ```
   - On Linux:
     ```
     cd [JAVADIR]/lib/security
     ```

   This folder contains the Java trust store, `cacerts`. This store is the target into which you must import the CA root certificate.
3. Import the CA root certificate into `cacerts`:
   a) Issue the keytool command as follows:
      - On Windows:
        ```
        [JAVADIR]\bin\keytool.exe -import -trustcacerts -alias [your name for the certificate] -file "[file directory]\[signed certificate file]" -keystore cacerts
        ```
      - On Linux:
        ```
        [JAVADIR]/bin/keytool.exe -import -trustcacerts -alias [your name for the certificate] -file "[file directory]\[signed certificate file]" -keystore cacerts
        ```
        where:
        - `[your name for the certificate]` specifies the name that you want to give to the certificate.
        - `[file directory]` specifies the directory that contains the signed certificate file.
        - `[signed certificate file]` specifies the name of the signed certificate file.

   b) When prompted to enter the keystore password, enter `changeit`.
   c) When prompted to trust this certificate, enter `yes`.

To import the CA root certificate into the OS trust store:

4. Depending on your OS, follow one of the following procedures (for other OS versions, similar procedures apply):

OS	Procedure
Windows 10	1. Open the Microsoft Management Console (MMC). 2. In MMC, click **File** > **Add/Remove Snap-in...**. 3. Within the *Add or Remove Snap-ins* dialog, in the *Available snap-ins* box, select **Certificates** and click **Add**. 4. In the *Certificates snap-in* dialog, select **Computer account** and click **Next**. 5. In the *Select Computer* dialog, select **Local computer** and click **Finish**. 6. In the *Add or Remove Snap-ins* dialog, click **OK**. 7. In the object tree, right-click **Console Root** > **Certificates (Local Computer)** > **Trusted Root Certification Authorities** and select **All Tasks** > **Import...**. The *Certificate Import Wizard* opens, which navigates you through the process of importing the CA signed certificate.

Red Hat Enterprise Linux 6 and 7 Based Systems(including CentOS, Fedora, and Scientific Linux)	1. Ensure that the `ca-certificates` package is installed:
	a. Open a command prompt.
	b. Enter the following line:
	`yum install ca-certificates`
	2. Copy the CA root certificate to the following directory:
	▪ For Red Hat Enterprise Linux 6 Based Systems: `/usr/local/share/ca-certificates`
	▪ For Red Hat Enterprise Linux 7 Based Systems: `/etc/pki/ca-trust/source/anchors`
	3. To update the certificate authority file, enter the following line in the command prompt:
	`/bin/update-ca-trust`

To import the CA root certificate into the trust store of a web browser:

5. Depending on the web browser, follow one of the following procedures (for other web browser versions, similar procedures apply):

Web Browser	Procedure
Firefox 68	1. Open Firefox. 2. Click **(Open menu)** and select one of the following menu item: ▪ On Linux, select **Preferences**. ▪ On Windows, select **Options**. 3. In the *Preferences* / *Options* tab, click **Privacy & Security**. 4. In the **Security** section, click **View Certificates...**. 5. In the *Certificate Manager* dialog, click the **Authorities** tab. 6. Click **Import...**. 7. In the *Select File containing CA certificate(s) to import* dialog, navigate to the directory that contains the CA root certificate, select the certificate, and click **Open**. 8. In the *Downloading Certificate* dialog, activate **Trust this CA to identify websites** and click **OK**. 9. In the *Certificate Manager* dialog, click **OK**. 10. Close the *Preferences* / *Options* tab.
Google Chrome 76	On Windows, Google Chrome uses the OS trust store. On Linux, use the following procedure: 1. Open Google Chrome. 2. Select **(Customize and control Google Chrome)** > **Settings**. 3. In the *Settings* tab, click **Advanced** > **Privacy and security**. 4. In the **Privacy and security** section, click **Manage certificates**. 5. In the *Manage certificates* dialog, click the **Authorities** tab. 6. Click **Import...**.

7. In the *Open File* dialog, navigate to the directory that contains the CA root certificate, select the certificate, and click **Open**.
8. In the *Certificate authority* dialog, activate **Trust this certificate for identifying websites** and click **OK**.
9. Close the *Settings* tab.

Verifying the HTTPS Connection from the Web Browser

After adding the CA root certificate to the trust store of the web browser on a client machine, and having installed Job Manager with your signed certificate and key, you can connect to Job Manager using an HTTPS connection.

During installation, you specify the **SSL Certificate** and the **SSL Private Key**. For more information, see Installing Simcenter STAR-CCM+ with Job Manager on Linux.

To verify the HTTPS connection to Job Manager after installation:

1. Use your web browser to navigate to Job Manager, such as https://[hostname]:[portnumber].

   If the HTTPS connection is set up correctly, the Job Manager Administrator Web UI opens without any warnings.

Uninstalling Simcenter STAR-CCM+

You can uninstall Simcenter STAR-CCM+ using the Simcenter STAR-CCM+ installer.

Contents:

Uninstalling Simcenter STAR-CCM+ From Linux

To uninstall Simcenter STAR-CCM+:

1. Enter the following command:

   ```
   % [DIR]/STAR-CCM+15.04.###/Uninstall STAR-CCM+15.04.###
   ```

   where `[DIR]` is the installation directory you used during installation.

The uninstaller automatically detects the installed components and launches the uninstallation wizard. In this page, you can choose to keep the license manager.

During uninstallation, the entire contents of the `STAR-CCM+` and `STAR-View+` folders are removed. All contents are removed even if you made changes within the folders since the time of installation. Any version of Java JDK is also removed from the installation folder regardless of whether it was installed automatically or manually; it would be skipped only if it resides outside the installation folder.

If you encounter an “out of memory” error while uninstalling Simcenter STAR-CCM+, refer to Increasing the Java Heap Size for information on how to resolve this.

On some Linux systems the `STAR-CCM+15.04.###` folder may remain after uninstallation completes. This folder typically contains a log file as well as an empty `jre` sub-folder. You can remove this folder by using the following command:

```
% rm -rf STAR-CCM+15.04.###
```

Uninstalling Simcenter STAR-CCM+ from Windows

You can uninstall Simcenter STAR-CCM+ using the *Programs and Features* panel. The CAD clients are also uninstalled when you uninstall Simcenter STAR-CCM+.

To uninstall Simcenter STAR-CCM+:

1. Click <**Start**> and enter `Add or remove programs` in the search field.
2. Select **Add or remove programs** from the search results.
3. In the dialog that appears, locate the Simcenter STAR-CCM+ and CAD Clients entry and click **Uninstall/Change**.

The uninstaller automatically detects the installed components and launches the uninstallation wizard.

During uninstallation, the entire contents of the `STAR-CCM+`, `STAR-View+`, and `STAR-CAD` folders are removed. All contents are removed even if you made changes within the folders since the time of installation. The related Java JDK and the license manager are also removed. Any version of Java JDK is removed from the installation folder regardless of whether it was installed automatically or manually; it would be skipped only if it resides outside the installation folder.

If you configured your machine to use an existing Simcenter STAR-CCM+ network installation, the shortcuts may remain on the desktop and **Start** menu of your machine after uninstalling. In this case, delete the shortcuts manually. You may need to do this to remove the `SiemensPLM` group, after removing all existing Simcenter STAR-CCM+ installations.

If you encounter an “out of memory” error while uninstalling, refer to Increasing the Java Heap Size for information on how to resolve this.

Increasing the Java Heap Size

When uninstalling Simcenter STAR-CCM+, you may receive an “out of memory” error as shown in the following example:

```
Invocation of this Java Application has caused an InvocationTargetException.
This application will now exit. (LAX)

Stack Trace:
java.lang.OutOfMemoryError: Java heap space
```

To fix this issue:

1. Navigate to the uninstallation directory of Simcenter STAR-CCM+:

   ```
   [INSTALL]/STAR-CCM+15.04.###/Uninstall_STAR-CCM+15.04.###
   ```

   where `[INSTALL]` is the installation directory.
2. Locate and open the `Uninstall STAR-CCM+15.04.###.lax` file with a text editor of your choice.
3. Locate the following line in the `.lax` file:

   ```
   lax.nl.java.option.java.heap.size.max=250331648
   ```

   Note: The value in your file may be different.
4. Increase the value.
5. Save the changes you made.
6. Run the uninstaller again.

Additional Licensing Information

Simcenter STAR-CCM+ uses the FlexNet Publisher Licensing Toolkit 11.14 from Flexera Software to manage end-user licensing.

The basic setup for a floating license configuration with a single license server using lmgrd is covered initially. Understanding the basics of licensing at the end of this section provides a more technical overview of FlexNet licensing system.

You can also search for relevant articles on Support Center.

Contents:

Setting up a License Server using lmgrd

This section describes the steps necessary to set up a basic floating license configuration using a single server.

1. Stop the existing license server if it is running. See Stopping the License Server.
2. Select the machine on which to run the license server.
   This is referred to as the license server host. Guidance on how to choose an appropriate machine can be found in the License Administration Guide (`LicenseAdministration.pdf` which is copied to the FlexNet utilities directory during installation).

   Note: Linux platforms must be LSB Certified to a minimum of LSB 3.0.
3. If this machine is not the one used during the previous installation steps, or if the FLEXlm 11.14 Utilities were not selected during installation, you must re-run the Simcenter STAR-CCM+ installer on this machine and choose to install the FLEXlm 11.14 Utilities.
   On Windows, these utilities are typically installed in `C:\Program Files\SiemensPLM\FLEXlm \11_14_0_2\bin`.
   On Linux, these utilities are installed in `[DIR]/FLEXlm_11.14/[Platform]/bin`, where `[Platform]` corresponds to the particular Linux platform.
4. Get the host id of the license server host. This is a unique identifier that the Siemens Digital Industries Software licensing department use to generate the license file for the license server.
   For more information on obtaining a license file, refer to Obtaining a License File on Linux and Obtaining a License File on Windows. When you have the necessary information, e-mail it to your Siemens Digital Industries Software sales representative and wait for the license file to be returned.
5. When you receive the license file, copy it to your system, typically into the same directory where you installed the FLEXlm 11.14 Utilities (see Step 3).
6. You can now configure and launch the license server. Follow the instructions in the section Starting the License Server.
7. With the license server running, you can now set up each client machine to point to the license server and begin using Simcenter STAR-CCM+. Follow the instructions in the section, Setting up Client Machines.

For more complex licensing arrangements, such as managing license files from multiple vendors, refer to the Flexera License Administration Guide.

Stopping the License Server

If you are upgrading the license server, or if you want to remove it, you must first stop it.

Stopping the License Server on Linux

To stop the license server, enter the following in the command line:

```
[INSTALL_DIR]/FLEXlm/[FLEXlm_Version]/bin/lmutil lmdown -c port@host
```

Stopping the License Server on Windows

In a typical case, the license server is set as a service in the *Windows Services* control panel during the installation process. The default service name is `CCM_License_server` and automatically starts when the machine turns on. If you gave this service a different name during the installation, in the following example, replace `CCM_License_server` with the name of your service.

To stop the license server:

1. Click <Start> and enter `services.msc` in the search field.
2. In the search results, select **services.msc**.
3. In the *Services* window, locate the service:
   `CCM_License_server`
   or the name of your service.
4. Right-click on this service and select **Stop**.

Starting the License Server

Typically, you want the license server to start every time the license server host machine is restarted.

The procedure is different for Linux and Windows.

Starting the License Server on Linux

To start the license server:

1. Run the `lmgrd` command with the license file:

```
[INSTALL_DIR]/FLEXlm/[FLEXlm_Version]/bin/lmgrd -c [license file].dat -l
[log file]
```

Alternatively, add a line to the start up script. For more information on how to do this, refer to Chapter 9 of the *Flexera License Administration Guide*.

Starting the License Server on Windows

In a typical case, the license server will be set as a service in the *Windows Services* control panel during the installation process. The service name is `CCM_License_server` (unless a custom name was chosen during installation), and is automatically started when the machine is turned on.

To manually start the license server:

1. Click <Start> and enter `services.msc` in the search field.
2. In the search results, select **services.msc**.
3. In the *Services* window, locate the service:
   `CCM_License_server`
4. Right-click on the service and select **Start**.

Manually setting license server details on client machines

Each software product that accesses the license server must know the hostname and port number of the license server. The installer generally configures this information for you, but you can provide the information manually.

There are a number of ways to provide this information on each client, but the simplest are as follows:

Linux

For Linux:

1. Create a `.flexlmrc` file in each user's home directory with a single line of the form:
   `CDLMD_LICENSE_FILE=<port>@<server>`
   where:
   - `<port>` is the port number through which communication takes place.
   - `<server>` is the name or TCP/IP address of the machine on which the license server is running.

Windows

For Windows, create an environment variable called `CDLMD_LICENSE_FILE` and set its value to the `<port>@<server>` for the license server.

To create an environment variable:

1. Click <**Start**> and enter `environment variables` in the search field.
2. From the search results, select **Edit the system environment variables**.
3. In the *System Properties* dialog, click **Environment Variables...**
4. In the *System Variables* section of the dialog, click **New...**
   The *New System Variable* dialog appears.
5. Set *Variable name* to `CDLMD_LICENSE_FILE`.
6. Set *Variable value* to `<port>@<server>`.
   Where:
   - `<port>` is the port number through which communication takes place.
   - `<server>` is the name or TCP/IP address of the machine on which the license server is running.
7. Click **OK** to close the *New System Variable* dialog.
8. Click **OK** to close the *Environment Variables* dialog.
9. Click **OK** to close the *System Properties* dialog.

Checking the Status of Licenses

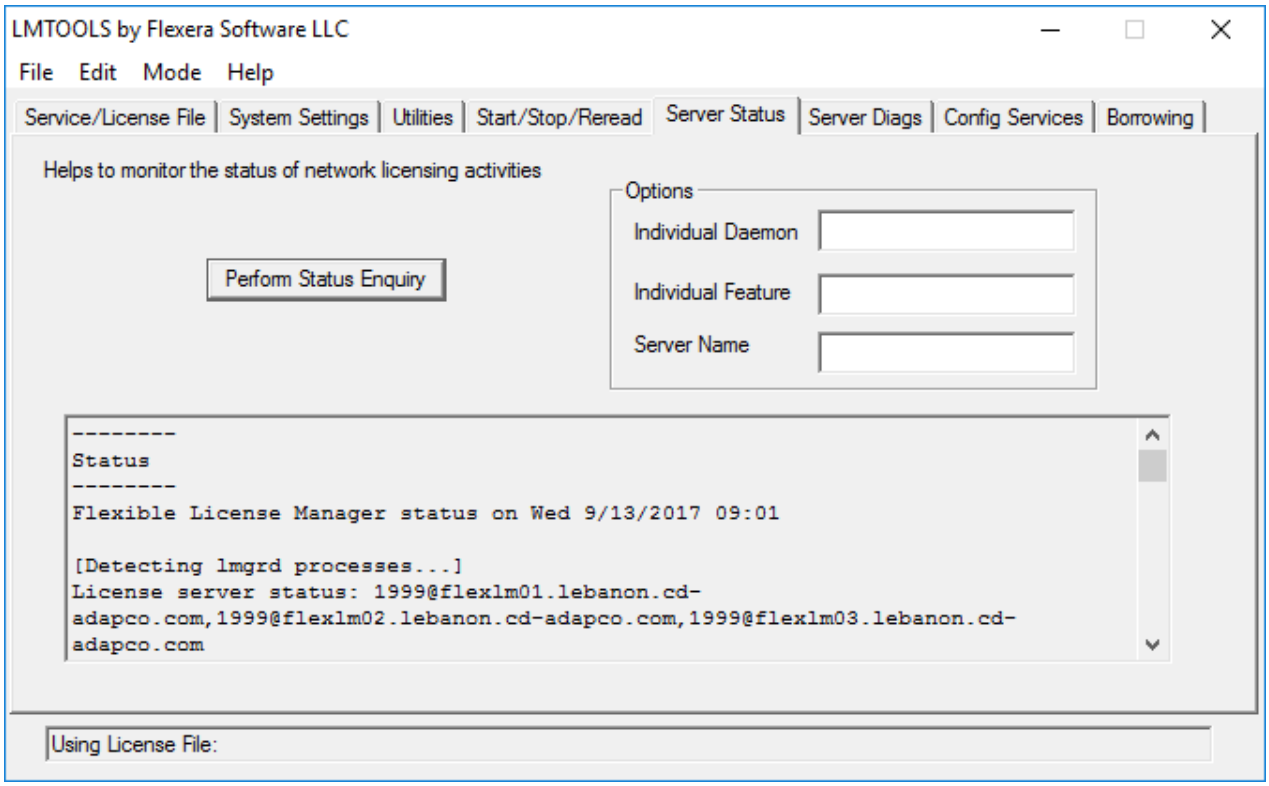
To check the status of the licenses using `lmgrd`, follow the steps outlined below.

To check the status of licenses using line commands for `lmutil`:

1. Use either of the following line commands on Windows or Linux:
   - `lmutil lmstat -c license.dat`
   - `lmutil lmstat -c port@host`

Alternatively, on Windows, use the LMTOOLS UI:

2. Launch LMTOOLS (for example, in 14.02, `C:\Program Files\SiemensPLM\14.02.008\FLEXlm\11_14_0_2\bin\lmtools.exe`).
3. In LMTOOLS, click the **Server Status** tab and click the **Perform Status Enquiry** button for a list of registered licenses.



   The text displayed in the output window should confirm that the server is running, and will also display the number of licenses available and in use.

4. In the event of problems, see Troubleshooting. Alternatively, please send the following pieces of information to your Siemens Digital Industries Software representative:
   - The output of step 2
   - The output of the application (such as Simcenter STAR-CCM+) that you are attempting to run
   - The value of your `CDLMD_LICENSE_FILE` and `LM_LICENSE_FILE` system environment variables.

Upgrading the FlexNet License Server

The best approach to upgrading a FlexNet license server is to stop the old license server, remove it if you want to, and then start the new license server.

Upgrading the License Server on Linux

To upgrade the license server on Linux:

1. Stop the old license server by entering the following in the command line:

   ```
   [INSTALL_DIR]/FLEXlm/[FLEXlm_Version]/bin/lmutil lmdown -c [port]@[host]
   ```

   where `[port]` and `[host]` are the specific values for the running license server.
2. Install the new version of the FlexNet license server using the product installer.
3. Start the new license server by running `lmgrd`:

   ```
   [INSTALL_DIR]/FLEXlm/[FLEXlm_Version]/bin/lmgrd -c [license file].dat -l
   [log file]
   ```

Upgrading the License Server on Windows

To upgrade the license server on Windows:

1. Open the command prompt.
2. Enter the following in the command line:

   ```
   > sc stop <OLD_LICENSE_SERVER_NAME>
   ```

   Where, `<OLD_LICENSE_SERVER_NAME>` is the name of your old license server. The default name is `CCM_License_server`.
3. Delete the stopped service by entering:

   ```
   > sc delete <OLD_LICENSE_SERVER_NAME>
   ```
4. Install the new version of the FlexNet license server using the product installer.
5. Start the new license server by entering:

   ```
   > sc start <NEW_LICENSE_SERVER_NAME>
   ```

Understanding the Licensing System

This section will help you understand more about the FlexNet system as used by Simcenter STAR-CCM+ and the CAD Clients.

This information is largely a simplified version of parts of the Flexera License Administration Guide.

FlexNet Components

For served licenses, there are four required FlexNet components:

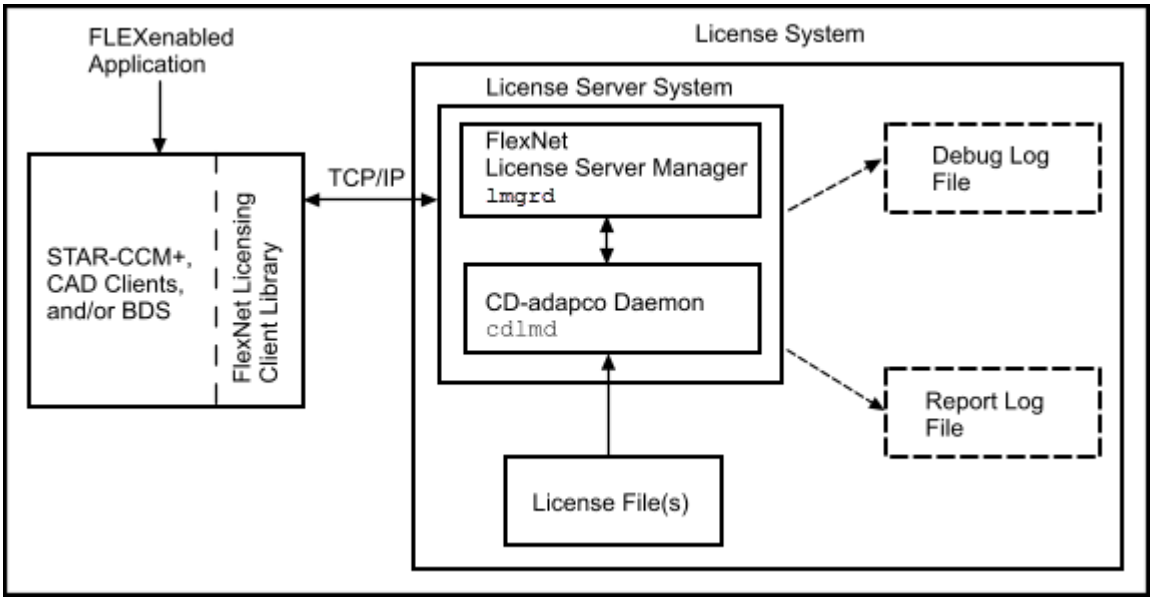
- The Simcenter STAR-CCM+ application, with the FlexNet static client library linked into it
- The License File (`license.dat`)
- The License Server Manager (`lmgrd`)
- The Simcenter STAR-CCM+ daemon (`cdlmd`)

The last two components comprise the license server system.

In addition to these four FlexNet components, there are three optional components that you can configure:

- Debug Log File, created and written by `lmgrd`
- Report Log File, created and written by `cdlmd` for use by FlexNet Manager
- End-User Administration Options File, created and maintained by you

The diagram below shows the relationship between these components, which are expanded upon in the Component Overview.



Typically, the license server system components (`lmgrd` and `cdlmd`) reside on a machine in the network but can optionally reside on the same machine as the Simcenter STAR-CCM+ application.

Component Overview

The License Server Manager (lmgrd)

The license server manager (`lmgrd`) handles the initial contact with the Simcenter STAR-CCM+ applications, passing the connection on to `cdlmd`. It also starts and restarts `cdlmd`.

The Simcenter STAR-CCM+ Daemon (cdlmd)

Counted (floating) licenses are granted by `cdlmd`, which keeps track of how many licenses are checked out, and who has them.

Simcenter STAR-CCM+ communicates with `cdlmd` through TCP/IP network communications. The application and the daemon processes (`lmgrd` and `cdlmd`) can run on separate machines on your network, across any size of heterogeneous wide-area network. This means the license server system and the computer running an application can be different hardware platforms or even different operating systems.

If `cdlmd` terminates for any reason, all users lose their licenses, although this does not mean the applications suddenly stop running. Users normally regain their license automatically when `lmgrd` restarts `cdlmd`, though they may exit if `cdlmd` remains unavailable.

The License File

Licensing data is stored in a text file called the license file (`license.dat`), which is created by Siemens Digital Industries Software, and edited and installed by your license administrator. It contains information about the server machines and Simcenter STAR-CCM+ daemons, and a line of data for each Simcenter STAR-CCM+ "feature". One product may have multiple features to access different aspects of the application, or a product may look for one of several features before starting.

Typical content of a license file is covered in the format overview, and there are multiple ways of specifying the location of the license file.

The FLEXenabled Simcenter STAR-CCM+ Product

Simcenter STAR-CCM+ and the CAD Clients are linked with the FlexNet Licensing client library that provides the communication with the license server system (`lmgrd` and `cdlmd`). During execution, the application communicates with `cdlmd` to request a license.

FlexNet Licensing Components Shipped with Simcenter STAR-CCM+

The following table provides a list of the essential components that come with Simcenter STAR-CCM+:

Component		Description
Windows	**Linux**	
`lmgrd.exe`	`lmgrd`	Required for served license models--the license server manager and vendor daemons.
`cdlmd.exe`	`cdlmd`	
`lmutil.exe`	`lmutil`	Optional FlexNet component used for license server system management and administration. Also available from www.flexera.com.

How Does the License Request Process Work?

When you run a counted (floating) Simcenter STAR-CCM+ session, the following occurs:

1. The license module in Simcenter STAR-CCM+ finds the license file, which includes the host name of the license server machine and TCP/IP port number of the license server manager, `lmgrd`.
2. The application establishes a connection with the license server manager (`lmgrd`) and tells it that it needs to talk to `cdlmd`.
3. `lmgrd` determines which machine and the TCP/IP port correspond to `cdlmd` and sends that information back to Simcenter STAR-CCM+.
4. Simcenter STAR-CCM+ establishes a connection with `cdlmd` and sends its request for a license.
5. `cdlmd` checks in its memory to see if any licenses are available and sends a grant or denial back to the application.
6. The license module in the application grants or denies use of the feature or entire application, as appropriate.

After successfully checking out a license, Simcenter STAR-CCM+ spawns a threaded heart beat which is essentially a tiny process that fires a signal to the license server every minute to say that Simcenter STAR-CCM+ is alive. If the license server doesn't hear from Simcenter STAR-CCM+ in 150 seconds then the license server assumes that Simcenter STAR-CCM+ is dead and retracts the license (unless you specify the `STARNOTIMEOUT` environment variable, in which case the license server waits forever).

Conversely, if there is no acknowledgement from the license server (as would happen if the server failed or was stopped), the Simcenter STAR-CCM+ client will note the time and keep trying for 1 hour. Simcenter STAR-CCM+ will stop iterating if no response is received by then. When this happens, you will still be able to save results and exit, but you will not be able to start iterating again until a license is found.

Using Redundant License Servers

As with all computer systems, it is impossible to ensure that any specific computer is available all the time, and this may result in license denial if the license relies on a single computer. To address this issue, Simcenter STAR-CCM+ supports redundant license servers which means that a number of computers are involved in the license server process and the process is tolerant to some of the servers being down.

Using the Three-Server Redundancy Approach

With three-server redundancy, the "server" is in fact three machines. As long as any two of the three servers are up, they have a quorum and can issue licenses. This is a good system for a single site and has the advantage that even if one of the triad is down, the full number of licenses are still available. This has been supported since the first release of Simcenter STAR-CCM+ with FlexNet and is a standard FlexNet option.

Using a Simple License File List

With a simple license file list, there is a list of servers, such as one in London, one in Detroit, and one in Tokyo. When the license is checked out, each server is tried in turn on the list. Typically users in London will check out from the London server but if the London server is down, they can check out from another server on the list. This is a good system for multiple sites but has some disadvantages:

1. When one machine is down, the pool of licenses is reduced. So if each machine has 10 copies of `ccmpsuite`, when London is down, there are only 20 copies of `ccmpsuite` to share between three sites instead of 30.
2. If a dead machine has a unique feature, applications requiring that feature cannot run.
3. By default, once a job has successfully checked out a license from one server, all subsequent checkouts must be satisfied from the same server. If the application requires more than one license, this could result

in a license denial when the license is available on another server. This also means that even with 30 copies of `ccmpsuite`, the largest single job can only use a maximum of 10.

Using an Enhanced License File List

To address point 3 of the simple license file list, the license routines have been recoded so that each license request is fulfilled by one or more FlexNet jobs. The advantage of this is that each FlexNet job can be from a different server, so an application can mix and match license requests across the whole license file list.

This is a Simcenter STAR-CCM+ specific development and is supported by license codes dated 09-Oct-2004 or later.

Setting up a Two Server Fail Over Mechanism

Using an example of two license servers:

- `1999@offal` with 2 `hpcdomains`
- `1999@heraclitus` with 1 `ccmpsuite` and 1 `hpcdomain`

and starting a simulation using `-np 4`:

```
Starting Simcenter STAR-CCM+  parallel server
MPI Distribution : Platform Computing MPI-09.01.04.02
Host 0 - marlinhead - Ranks 0-3
Process rank 0 marlinhead 26177
Total number of processes : 4

STAR-CCM+ 15.04.### (linux-x86_64-2.5/gnu4.8)
License build date: 10 February 2015
This version of the code requires license version 2016.10 or greater.
Checking license file: 1999@marlin
1 copy of ccmpsuite checked out from 1999@marlin
Feature ccmpsuite expires in 288 days
Thu Sep 15 10:12:30 2016
Server::start -host marlinhead.cm.cluster:47830
Loading simulation database: /offal2/philip/polymanifold/polymanifold.sim
Loading module: KeTurbModel
..
2 copies of hpcdomains checked out from 1999@offal
Feature hpcdomains expires in 258 days
1 copies of hpcdomains checked out from 1999@heraclitus
Feature hpcdomains expires in 45 days
Partitioning from Serial into 4 partitions
...
```

Simcenter STAR-CCM+ succeeded because of the fail over mechanism which allows it to build up its total request over a number of servers.

Contents:

Understanding the Floating License File Format

This section provides details of the most common options in a typical license file provided for Simcenter STAR-CCM+. The full reference can be found in Chapter 8 of the Flexera License Administration Guide.

License files usually begin with a `SERVER` line followed by one or more `VENDOR` lines, followed by one or more `FEATURE` lines.

An example of a license file that provides floating licenses is:

```
SERVER lulu 17007ea8 1999
# If the following is uncommented, none of the following lines will be
processed
# USE_SERVER
# you may need to append the full path to cdlmd if it is not on you path
# e.g. VENDOR cdlmd /usr/star/version/license/cdlmd
VENDOR cdlmd
FEATURE ccmpsuite cdlmd 1.0 15-jan-2005 20 24D76447DB45 \
vendor_info=3722006928dd6ae3e1d6501005a96cd75fe0f1c50c8340ba31237cd6579dc16989f
da96607caef3f5f8d3d352c831afa9a54ac80d89d91cc4744a6d808857a68313b3c55bbad5f72b6
29a42d941a3f12a0289a
```

This license file specifies that:

- 20 licenses for `ccmpsuite`

are available anywhere on the network that can access the license server machine lulu. `lmgrd` uses the TCP/IP port 1999.

You can modify the following elements in the license file:

- Host names on the SERVER line(s)
- TCP/IP port numbers on the SERVER line(s)
- Paths on the VENDOR line(s)
- Options file paths on the VENDOR line(s)
- Optional TCP/IP port numbers on the VENDOR line(s) for firewall support only
- USE_SERVER line
- Values in keyword=value pairs on FEATURE lines, if keyword is specified in lowercase, except `vendor_info`.

SERVER Lines

The `SERVER` line specifies the hostname and hostid of the license server system and the TCP/IP port number of the license server manager (`lmgrd`). Normally a license file has one `SERVER` line. The absence of a `SERVER` line means that every `FEATURE` line in the license file is uncounted.

The hostids from the `SERVER` lines are computed into the license key or signature on every `FEATURE` line. For this reason, make sure you keep `SERVER` lines together with any `FEATURE` lines as they were sent from the vendor.

The format of the `SERVER` line is:

```
SERVER host hostid [port] [PRIMARY_IS_MASTER] [SERVER_TIMEOUT=seconds]
```

where:

- `host` is the system host name or IP address. On Linux, this is the name returned by the `hostname` or `uname -n` command. On Windows, `ipconfig /all`.
- `hostid` is usually the string returned by the `lmhostid` command. This is set by Siemens Digital Industries Software.
- `port` is the TCP/IP port number to use. A valid number is any unused port number between 0 and 64000. On Linux, choose a port number greater than 1024, since those less than 1024 are privileged port numbers. If no TCP/IP port number is specified, one of the default ports in the range of 27000 and 27009 is used. Flexera recommends using port numbers outside the range of 27000 through 27009.

VENDOR Lines

The VENDOR line specifies the daemon name and path. `lmgrd` uses this line to start the vendor daemon, and the vendor daemon reads it to find its options file. The format of the VENDOR line is shown below.

```
VENDOR vendor [vendor_daemon_path][[OPTIONS=]options_file_path] [[PORT=]port]
```

where:

- `vendor` Name of the vendor daemon used to serve some feature(s) in the file. This name cannot be changed by the administrator.
- `vendor_daemon_path` is an optional path to the executable for this daemon. Generally the license administrator is free to install the daemon in any directory. (It is recommended, however, that it be installed in a local directory on the license server machine.) If omitted, `lmgrd` looks for the vendor daemon binary in:
  - The current directory
  - The path specified in `lmgrd`'s $PATH environment variable
  - in the directory where `lmgrd` is located
- If `vendor_daemon_path` is blank, then any options or TCP/IP port number specifications require the `OPTIONS=` and `PORT=` strings.
- `options_file_path` is the full path to the end-user options file for this daemon. FLEXnet does not require an options file. If omitted, the Simcenter STAR-CCM+ daemon looks for a file called `cdlmd.opt` that is located in the same directory as the license file.
- `port` is the vendor daemon TCP/IP port number. The default, if the port number is not specified, it is chosen by the operating system at run-time. Sites with Internet firewalls need to specify the TCP/IP port number the daemon uses. If a TCP/IP port number is specified on the VENDOR line, there may be a delay when restarting the vendor daemon.

USE_SERVER Line

The `USE_SERVER` line takes no arguments and has no impact on the server. When the application sees `USE_SERVER`, it ignores everything in the license file except preceding `SERVER` lines and transfers checkout validation to the vendor daemon. `USE_SERVER` is recommended since it improves performance when a license server system is used.

FEATURE Lines

A `FEATURE` line describes the license required to use a product.

Only the first FEATURE line for a given feature is processed by cdlmd. The basic FEATURE line format is:

```
{FEATURE} feature vendor feat_version exp_date num_lic  vendor_info=...
[optional_attributes]
```

The six fields after the FEATURE line keyword are required and have a fixed order:

- feature Name given to the feature by the vendor.
- vendor Name of the vendor daemon; also found in the VENDOR line. The specified daemon serves this feature.
- feat_version Version of this feature that is supported by this license.
- exp_date Expiration date of license in the format dd-mmm-yyyy, e.g., 07-may-2005. If exp_date is the string permanent or the year is 0 (or 00, 000, 0000) then the license never expires.
- num_lic is the number of concurrent licenses for this feature.
- vendor_info= is additional information provided by Siemens Digital Industries Software.

Specifying the License File Location

The license server must know where the license file is located and looks in a number of places. Simcenter STAR-CCM+ also looks in these locations to find the path to the license server (or to use the license file directly in the case of node-locked licenses). The locations are as follows:

- A default location for a file in one of 2 formats:
  - Full license file
  - use_server format
- The value of an environment variable (LM_LICENSE_FILE or CDLMD_LICENSE_FILE) that can be specified in two ways:
  - A regular environment variable
  - The content of a file (Linux) or registry key (Windows) in the VARIABLE=value format

Using the Default Location

On Windows the default location for the license file is:

```
C:\Program Files\FLEXnet Publisher License Server Manager\licenses\cdlmd
\license.dat
```

and on Linux it is:

```
/usr/local/flexlm/licenses/license.dat
```

The license.dat file can be in one of two formats:

- The full license file as received from Siemens Digital Industries Software
- A pointer to a license file on the license server using the format:

  ```
  SERVER server hostid port
  USE_SERVER
  ```

  where hostid is the same as the hostid in the original license file

Using Environment Variables

The environment variable can be defined in a number of ways:

- On Linux
  - Using the `setenv` command at the command line or in your shell startup script
  - Defining the variable in a `~/.flexlmrc` file that contains a single line in the `CDLMD_LICENSE_FILE=value` format
- On Windows
  - Using the `set` command at the command line
  - Setting a variable using `Start > Settings > Control Panel > System > Advanced > Environment Variables` dialog
  - Defining a key in the `HKEY_LOCAL_MACHINE\SOFTWARE\FLEXlm License Manager` registry branch, where the variable will be the name of the key and the value will be stored in the value of the key

In addition to the multiple ways of setting up the environment variable, there are two variables that can be used to hold a value pointing to the license file:

- `LM_LICENSE_FILE`
- `CDLMD_LICENSE_FILE`

All these environment variables will take the form:

```
VARIABLE=value
```

where `VARIABLE` is one of the two options above and `value` can be the pointer to the license file in one of three formats:

- A directory containing one or more license files with a `.lic` extension
- The full path to the license file
- A port@host setting, where port and host are the TCP/IP port number and host name from the SERVER line in the license file

For backward compatibility, Simcenter STAR-CCM+ also recognize the STAR_DIR environment variable expecting to find a license file at:

```
$STAR_DIR/license/license.dat
```

See *Managing Multiple License Files* for more information about LM_LICENSE_FILE and Appendix D, FlexNet Licensing Environment Variables in the FlexNet End User Guide for more information.

What if More Than One Method is Used?

If you use more than one of the methods mentioned in the previous two sections to point to a license file, then all of the files will be scanned, and Simcenter STAR-CCM+ will scan all the options in the following sequence and check out the first valid license:

- The `CDLMD_LICENSE_FILE` environment variable
- The `CDLMD_LICENSE_FILE` registry entry (Windows) or content of the `~/.flexlmrc` file (Linux)
- The `LM_LICENSE_FILE` environment variable
- The `LM_LICENSE_FILE` registry entry (Windows)or content of the `~/.flexlmrc` file (Linux)

- The `STAR_DIR` environment variable
- The default directory location

Known Issues

This section contains a list of known issues that affect Simcenter STAR-CCM+ licensing.

Flexera Publisher 2019 R2 Recommended to Avoid Security Vulnerabilities New

Kaspersky labs have identified four possible vulnerabilities in versions of FlexNet Publisher version 2018 R3 (11.14) and earlier. While there are no known exploits of these vulnerabilities, it is possible they could result in a DoS (Denial of Service) attack if they were to be exploited. If the Simcenter STAR-CCM+ license server is running on a secure network, as is recommended, then there is no way of exploiting these vulnerabilities except from within the firewall.

To mitigate any possible concerns over this issue FlexNet Publisher 2019 R2 (11.16.4) is available for download from the support center. To patch your existing Simcenter STAR-CCM+ license server simply replace your existing `lmgrd` executable with the new one and restart your server.

Troubleshooting

This section contains resolutions to common problems encountered while setting up licensing.

Vendor daemon can't talk to lmgrd (Linux)

Some users may encounter the error, `Cannot connect to license server system, -15.xxx (Operation now in Progress)`. There are two possible approaches to resolving this problem.

Solution 1

As this error is usually caused by a DNS or hosts file issue, you should first verify that your IP address is correctly mapped to your hostname in the `/etc/hosts` file on your machine. Also ensure that the host name in the `/etc/hosts` file is the exact hostname in the `license.dat` file.

To find the correct hostname and IP address for your machine, do the following:

1. In a terminal window, enter the command, `hostname` followed by `<Return>`
2. Using the returned value, enter the command, `ping <hostname>` followed by `<Return>`

This should return information of the form:

```
PING hostname.company.com (IP_ADDRESS)
```

The IP_ADDRESS returned above should be the correct IP address for your system. If the error, `unknown host <hostname>`, is returned, it will be necessary to check the contents of your hosts file. To do this, change directory to `/etc` and open the hosts file. It should contain at least the following lines:

```
127.0.0.1 localhost
IP_ADDRESS hostname.domainname hostname
```

If this is not the case, add these lines (with the assistance of your Systems Administrator) and save the file. You should then open a new terminal window and try launching Simcenter STAR-CCM+ again.

To verify the IP address, enter

```
/sbin/ifconfig -a
```

or

```
nslookup hostname
```

and verify that the return value is the same as that contained in the `/etc/hosts` file.

Solution 2

Another approach is to comment out or delete all IPV6 information in the `/etc/hosts` file and restart the network services. In the following file, for example, the lines containing `ipv6` could be commented out by inserting `#` at the start of each line.

```
# special IPv6 addresses
::1  localhost ipv6-localhost ipv6-loopback
```

```
fe00::0  ipv6-localnet

ff00::0  ipv6-mcastprefix
ff02::1  ipv6-allnodes
ff02::2  ipv6-allrouters
ff02::3  ipv6-allhosts
```

License server checks for licenses before the network is configured (Windows)

It is possible that you may encounter FlexNet error -97 when starting your Windows machines. This error occurs when the license server attempts to check a license before the network on the machine has completed the configuration.

A value is added to the registry when the Simcenter STAR-CCM+ installers installs the license server. This value can add a delay before the license server checks for licenses, giving the machine time to configure the network. By default this value is set to 0 seconds (no delay).

To resolve the above issue, introduce a delay of 15 seconds:

1. Click **Start** and type `regedit` in the search field.
2. Select `regedit.exe` from the search results.
   The *Registry Editor* dialog appears.
3. Navigate to **HKEY_LOCAL_MACHINE > SOFTWARE > Wow6432Node > FNPlm > License Server > [Your_Lic_Server]**.
4. Right-click **delay** and select **Modify...**
   The *Edit DWORD (32-bit) Value* dialog appears.
5. Set *Base* to **Decimal**.
6. Set *Value data* to `15`.
7. Click **OK**.

License server returns "Unknown Host" error (Linux and Windows)

You may encounter the `Unknown Host: <hostname>` error.

Typically, this error appears when the host name that is specified in the SERVER line of the license file does not match the host name of the license server. If you have a static IP address, you may still get this error even if the host name of your machine does match that specified in the license file.

To resolve this issue, manually add the IP address and host name to the `hosts` file:

1. Open the `hosts` file in a text editor of your choice.
   a. On Linux, this file is located in:

      ```
      /etc/hosts
      ```

   b. On Windows, this file is located in:

      ```
      %SystemRoot%\system32\drivers\etc\hosts
      ```

   The contents of the file should contain something like:

   ```
   127.0.0.1           localhost localhost.localdomain localhost4
   localhost4.localdomain4
   ::1                 localhost localhost.localdomain localhost6
   localhost6.localdomain6
   ```

2. Add the IP address and the fully qualified domain name of your machine to this file, for example:

```
192.168.148.134     linuxbox.london.company-name.com
```

3. Restart the license server.

Simcenter STAR-CCM+ Specifics

This section helps you understand more about the FLEXnet licensing system as used by Simcenter STAR-CCM+ and the CAD Clients:

What Licenses Are Checked Out?

The names of the features that Simcenter STAR-CCM+ and the CAD Clients check out are detailed below.

What License Features are Used by Simcenter STAR-CCM+?

Simcenter STAR-CCM+ checks out the licenses as follows:

- The client does not require any license. Connecting or disconnecting clients to or from the server has no effect on license consumption—the job is still running and consuming a server license.
- In serial, the Simcenter STAR-CCM+ server uses a `ccmpsuite` license. It does not use a `starsuite` license.
- In parallel, the master process requires a `ccmpsuite` to launch and run. Additional processes created by the controller require an `hpcdomains`, a `ccmpsuite`, or a `DOEtoken` license to start and continue solving. As an example, a two-worker parallel job on a dual CPU machine would require one `ccmpsuite` license and one `hpcdomains` license.
- If the Power Session license option is chosen, the `ccmppower` license is used regardless of whether the session is serial or parallel, and without any limit to the number of worker processes that can be launched.
- If the Lite Session license option is chosen, the `ccmplite` license is used if it is available; otherwise the `ccmpsuite` license is used.
- For battery modeling, Simcenter STAR-CCM+ requires a `batterysim` license in addition to the other license features. Simcenter STAR-CCM+ requires a `batterydesignstudio` license.
- For DARS model solving, Simcenter STAR-CCM+ requires a `dars-cfd` or `dars-cfd-hpc` license.
- For importing geometry into Simcenter STAR-CCM+, you require a `JTOpen` license for `.jt` geometries, or a `cadexchange` license for all other supported CAD formats.

What License Features are Used by the CAD Clients?

When a CAD Client is started, it checks out one license, of the form:

```
star-<cadpackage>
```

where `<cadpackage>` is one of:

- cat5
- nx
- creo
- inventor

A second license is checked out at the start of the meshing or simulation stage. This is a `ccmplite` license (or a `ccmpsuite` license if `ccmplite` is not available).

These licenses remain checked out as long as the product is active.

What is the Vendor Daemon Name?

The FlexNet documentation refers to the vendor daemon name. For Simcenter STAR-CCM+, the vendor daemon is `cdlmd`. This name is used in the license file and the environment variable `CDLMD_LICENSE_FILE` is used to locate the license file if set.

What Environment Variables Can I Use?

The following variables can be set to adjust the behavior of the license manager. Unless otherwise stated, setting the variable to `1` will turn the behavior on, setting it to `0` or not setting it at all will turn it off.

- `STARLICENSELOG` When the license routines run, they will write to the file that this is pointing to as well as to standard out. This can be useful if license messages do not appear. This has to be set to the file.
  - For Windows:

    ```
    > set STARLICENSELOG=c:\log.txt
    ```

  - For Linux:

    ```
    % setenv STARLICENSELOG /tmp/log.txt
    ```

- `STARLICENSEVERBOSE` Causes more verbose messages to be displayed to both the screen and log file.
- `STARNOFLEXLMRC` FlexNet will not write to the `~/.flexlmrc` file (Linux) or the `HKEY_LOCAL_MACHINE\SOFTWARE\FLEXlm License Manager` registry key (Windows).
- `STARNOTIMEOUT` FlexNet normally times out after two hours of inactivity. This means that if a machine crashes with a license checked out, the license will return to the server after this time. In cases where no activity for two hours is normal (a queuing system that suspends a job during the day) then this will release the license and the job may fail to get the license when it progresses (another user may have the license). If this variable is set, FlexNet will never time-out and so will avoid this. However, be aware that this may cause licenses, which would otherwise be returned, to remain checked out. Use `lmremove` to deal with checked out licenses that have not been returned as expected.
- `STARWAIT` Normally, FlexNet will return if a license is unavailable and the code will exit. If `STARWAIT` is set, then FlexNet will wait until a license becomes available. This may be of use in queue or batch systems.

Getting Support

When you need assistance with using Simcenter STAR-CCM+, you can first check for resources on Support Center.

Support Center lets you search for existing information in documentation and knowledge base articles. When these resources are not sufficient, you can open a support case from the portal. Access Support Center at:

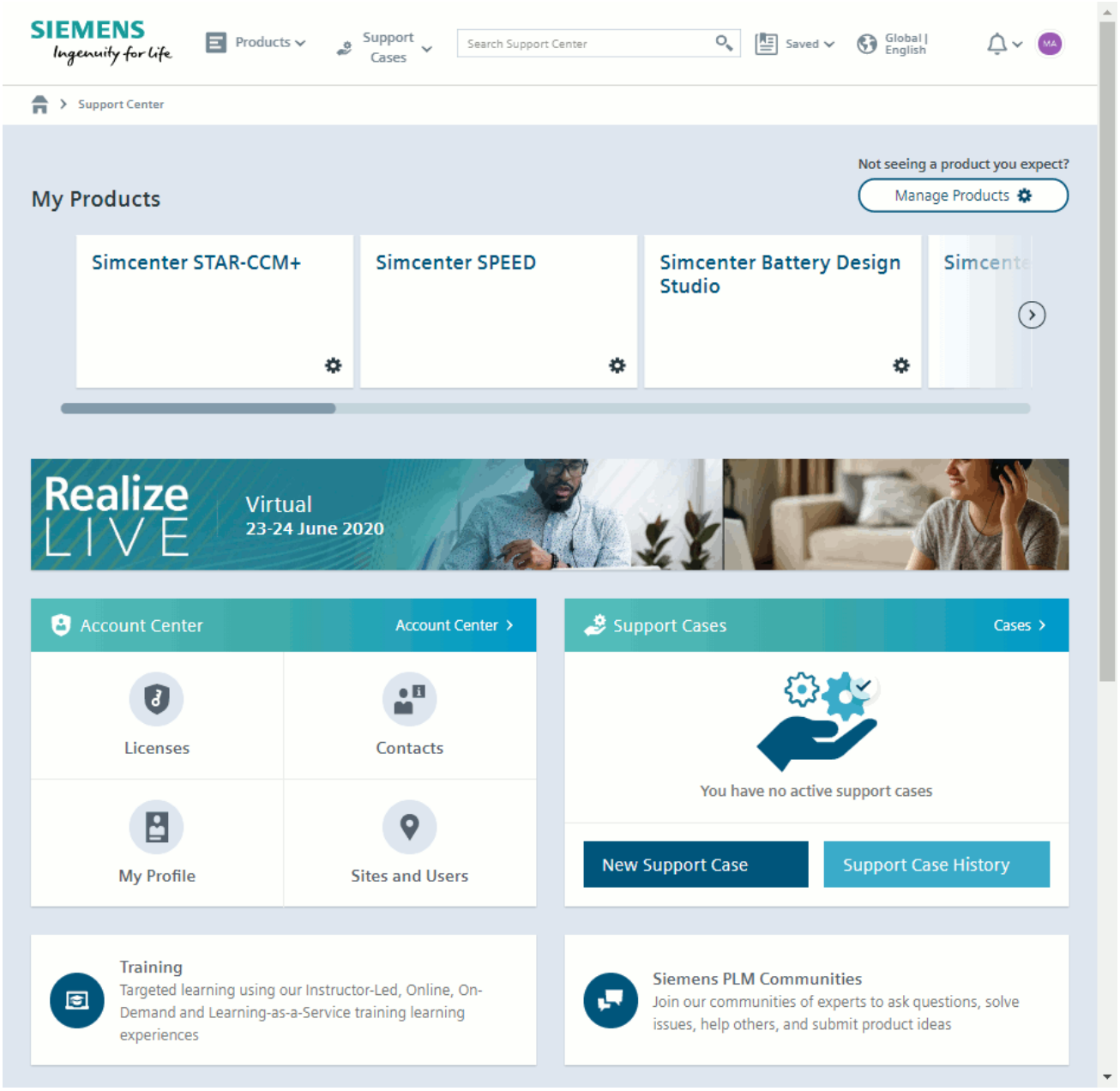
https://support.sw.siemens.com/

Choose from among the following features on this site:

- A Knowledge Base of Frequently Asked Questions, Videos, Best Practices, and other types of articles that cover a wide range of topics. You can search thoroughly for materials that relate to your problem. Perhaps your question has already been answered.
- A searchable library of documentation and training materials.
- Link to IdeaStorm for suggesting new features, and to vote on others that are submitted by the community.
- Access the status of your Power-on-Demand license.
- Tools for opening and tracking support cases.

  Support Center can guide you through the process of opening a support case. In addition, it can suggest possible solutions that are based on the details of your case, and help you to track the progress of the case through to resolution.

The screenshot below shows the Home page of the Support Center portal. To find resources specific to Simcenter STAR-CCM+, click its tile beneath *My Products*. If you want to look at licensing information related to your account, then within the *Account Center* panel on the Home page, click **Licenses**.



If you cannot find the answer to your question by searching the Support Center resources, you can open a support case for your support representative by clicking **New Support Case** within the *Support Cases* panel on the Home page.

To help your Siemens Digital Industries Software support representative, please prepare appropriately for reporting the issue.

Contents:

Gathering Information on the Issue

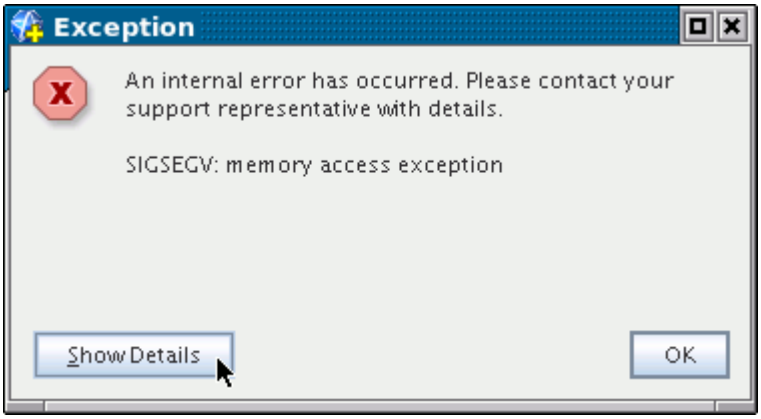
Accurate information is vital for dealing with your issue effectively. Your affected simulation file, if you can provide it, would be a key source of this information. However, due to the large size of the file, the best way to send it is using FTP (file transfer protocol). Discuss the details of this file transfer with your local Siemens Digital Industries Software support contact.

In addition, there are three ways to obtain information, depending on the issue:

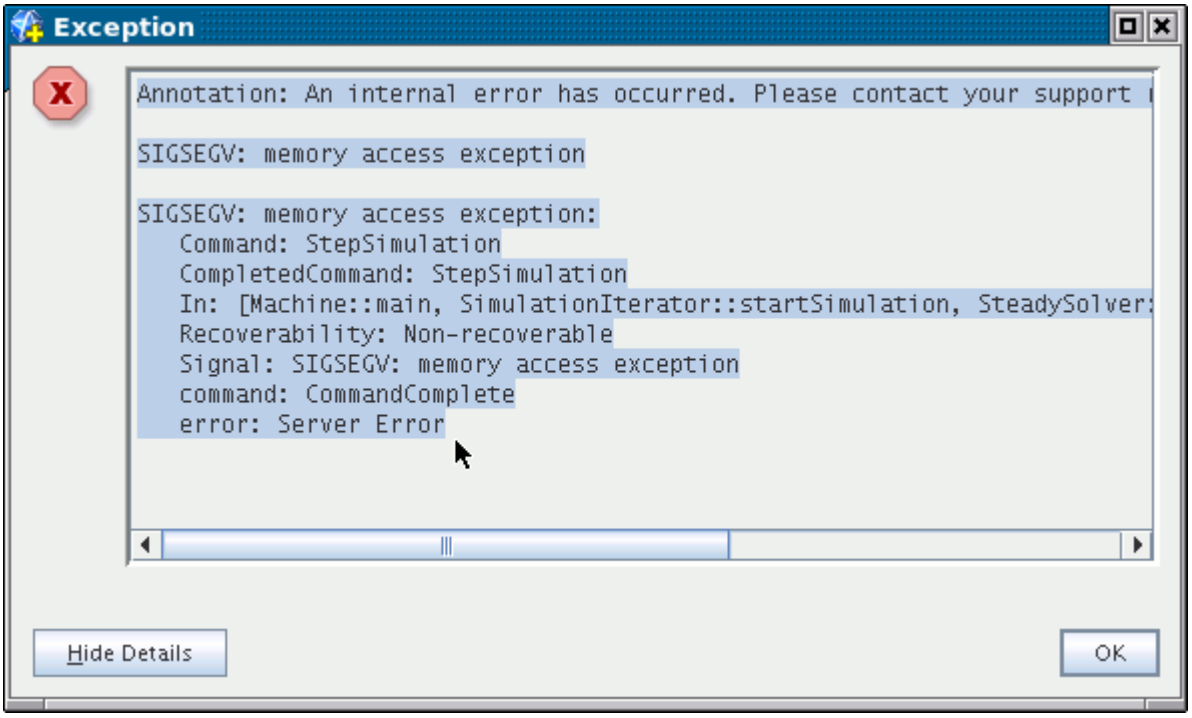
- Copying data from the workspace
- Getting an external data file
- Retrieving graphics driver information

Copying Data from the Workspace

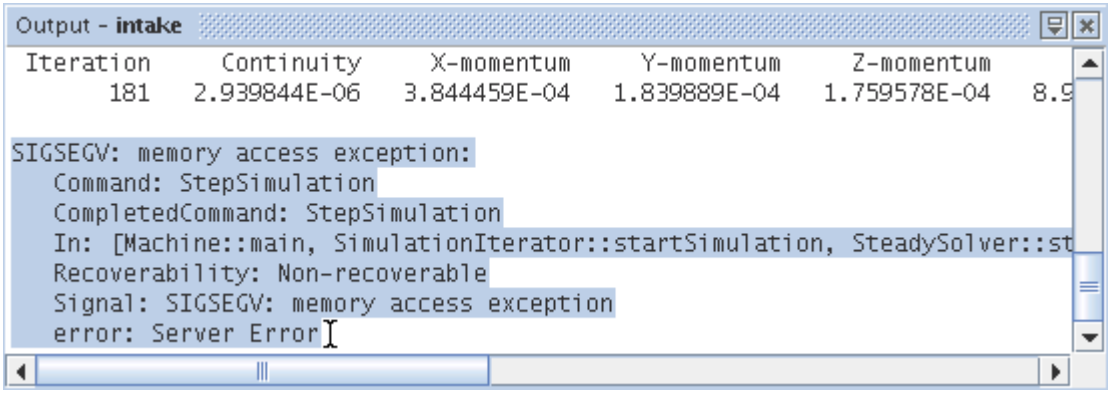
Error messages in Simcenter STAR-CCM+ commonly appear in an exception dialog, which contains extensive information. To access this information, click the **Show Details** button.



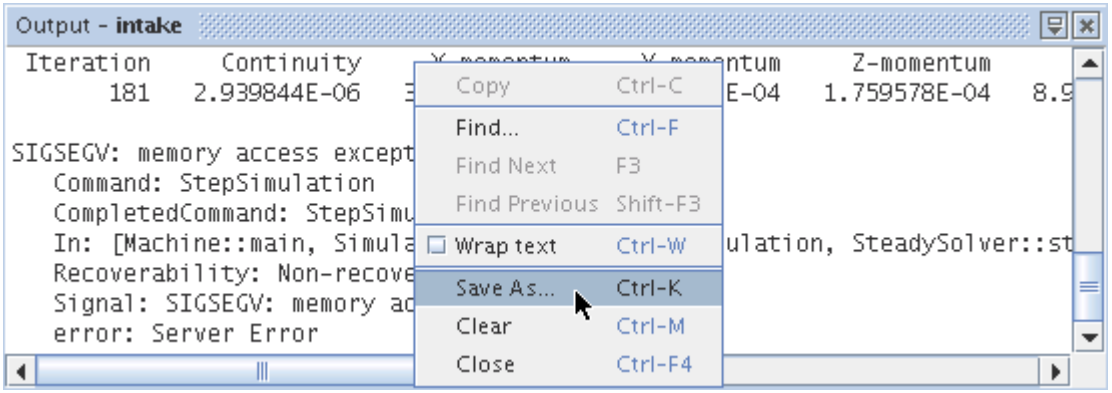
The details appear in the dialog. Highlight the information with your cursor and, when you have reached the end of the text, copy it to the clipboard and paste it into an e-mail message.



In some cases, the error message also appears in the *Output* window, where you can also highlight and copy information.



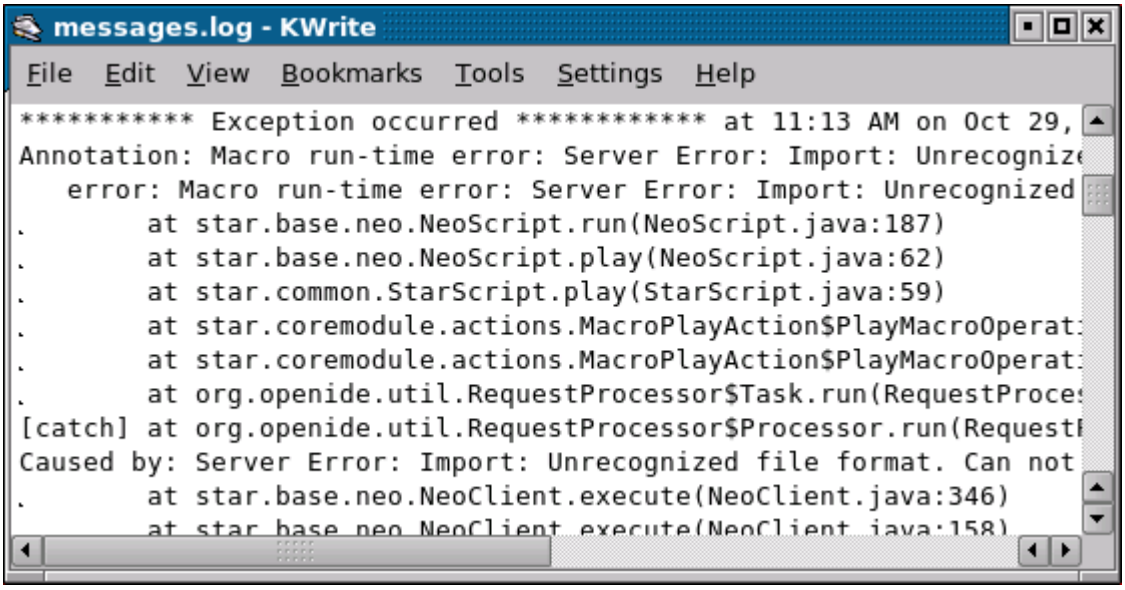
Alternatively, you can use the pop-up menu of the *Output* window to save the full content as a text file.



Getting an External Data File

Various errors cause Simcenter STAR-CCM+ to generate separate reports. You should send these reports to Siemens Digital Industries Software support along with your query. The details they contain can help resolve your issue much sooner.

The most common external source of information on Simcenter STAR-CCM+ errors is the `messages.log` file.

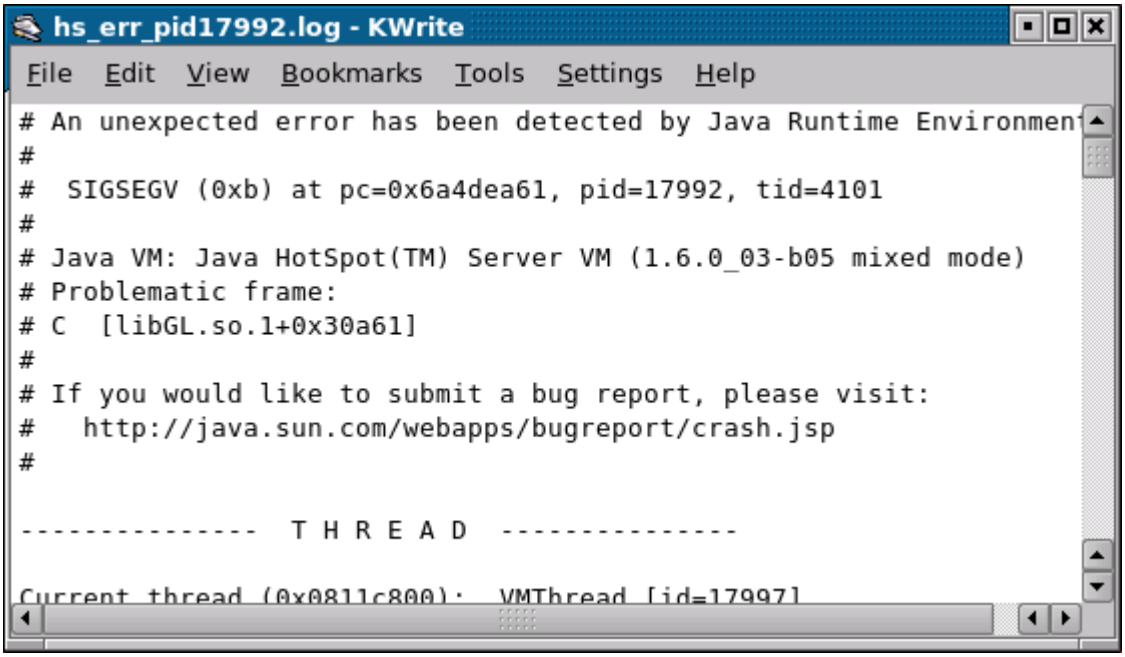


This file can be found in the following locations:

- On Linux: `~/.star-X.XX.XXX/var/log/messages.log`, where ~ is your `home` directory and `X.XX.XXX` is the version of Simcenter STAR-CCM+ , for example 7.04.006
- On Windows: `C:\Users\username\AppData\Local\CD-adapco\STAR-CCM+ X.XX.XXX\var\log\`

The file also contains prior error messages, so you may want to delete the earlier material for brevity.

Some errors are known as Java HotSpot errors because they are related to the Java functionality. As a result, a special log file may be generated called `hs_err_pidXXXX.log`, where `XXXX` is the process ID.



Look for the report in your main directory:

- Your `home` directory on Linux
- `C:\Users\user\Documents\` on Windows

Unlike `messages.log`, this type of report is generated one time due to a single error. Therefore all of its information pertains to that event.

Retrieving Graphics Driver Information

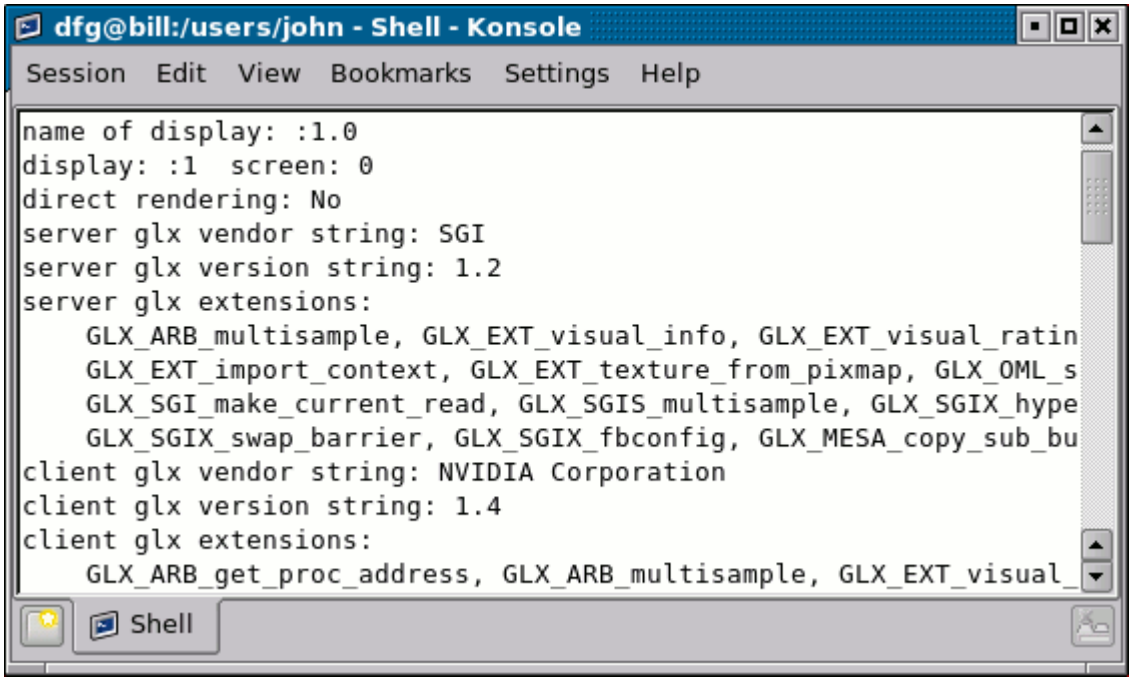
Some issues may originate with your graphics driver. You may want to get detailed information about that driver and send it to Siemens Digital Industries Software support. At a minimum you should provide the driver version, card model, and operating system.

The technique for obtaining this information depends on your operating system:

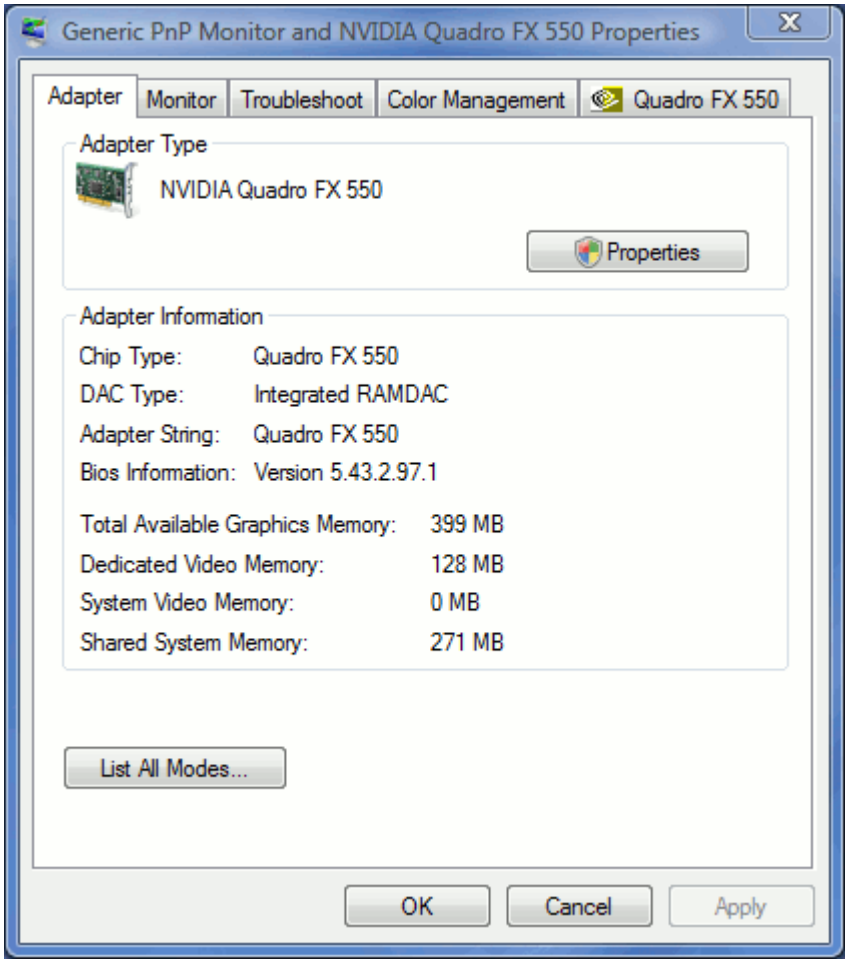
- On Linux, use the line command:

  ```
  % glxinfo
  ```

  This results in detailed output, which you can either paste in the body of your e-mail message or save as a separate text file.



- On Windows, some drivers might have a special all-in-one interface. To access it, right-click the desktop and selecting **NVIDIA Control Panel**.
- Alternatively on Windows, right-click the **Desktop** icon in the object tree of Windows Explorer and select **Properties**. In the separate dialog that appears, click **Display Settings** in the list of options under the *Personalize appearance and sounds* heading. In the separate *Display Settings* dialog, click the **Advanced Settings...** button. This activates another dialog with tabs that provide detailed information on the graphics hardware and drivers.


Generic PnP Monitor and NVIDIA Quadro FX 550 Properties
Adapter
Monitor
Troubleshoot
Color Management
Quadro FX 550
Adapter Type
NVIDIA Quadro FX 550
Properties
Adapter Information
Chip Type: Quadro FX 550
DAC Type: Integrated RAMDAC
Adapter String: Quadro FX 550
Bios Information: Version 5.43.2.97.1
Total Available Graphics Memory: 399 MB
Dedicated Video Memory: 128 MB
System Video Memory: 0 MB
Shared System Memory: 271 MB
List All Modes...
OK
Cancel
Apply

Finding Additional Information

The original download includes this installation guide and the release notes (new features, known issues, and requirements) for Simcenter STAR-CCM+ and the CAD Clients. The html version of those files is located in the `STAR-CCM+_CadSeries15.04.###` sub-directory where you unpacked the downloaded zip file (Windows) or tarball (Linux).

Glossary

This section describes some of the terminology that may be unfamiliar to new users of Simcenter STAR-CCM+ .

- *Path*: a path is the name generally used to identify the location of a directory or file in a file system. Some examples of paths are as follows:
  - On Windows:

    `C:\Program Files\SiemensPLM\14.02.008\STAR-CCM+14.02.008\star\bin\starccm+.exe`: this is the full path to the Simcenter STAR-CCM+ executable. If this path is entered into a command prompt window, Simcenter STAR-CCM+ will launch.

    `C:\Workarea\My Simulations\tutorials`: this path could represent the directory used to save Simcenter STAR-CCM+ tutorial simulations.
  - On Linux:

    `/usr/local/14.02.008/STAR-CCM+14.02.008/star/bin/starccm+`: this is the full path to the Simcenter STAR-CCM+ executable. If this path is entered into a command prompt window, Simcenter STAR-CCM+ will launch.

    `/usr/atilla3/mysims/tutorials`: this path could represent the directory used to save STAR-CCM+ tutorial simulations.
- *System path*: the system path is a collection of paths that point to those directories (or folders) that contain program executables.
- *Executable*: a file that contains program instructions, as opposed to a file that contains only data. Entering the path to an executable file into a command prompt window, and pressing `<Return>`, will cause the computer to run the program instructions contained within the file.

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