CST STUDIO SUITE® 2019

Installation Guide - Linux Version

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Contents

Introduction

This document contains important information about the installation and usage of CST STUDIO SUITE® on Linux systems. Please read this manual carefully **before installing the software**. If you need further assistance installing and configuring the software please contact the CST support team (SIMULIA.CST.Hotline@3ds.com). We will be glad to help you.

Application Scenarios

This DVD contains three application scenarios for the software:[1]

1. You plan to drive Linux machines with the CST STUDIO SUITE® frontend from a computer running the Microsoft Windows® operating system either using CST Distributed Computing or MPI Computing.

   In the case of a **CST Distributed Computing system**, the "DC Solver Server" component must be installed on each of the Linux nodes. Using this scenario the Linux Solver Servers will be automatically updated by the Main Controller if the corresponding option is set (see the "Distributed Computing" section in the online help for details). In case one of the Linux nodes shall serve as the Main Controller, the "DC Main Controller" component must be installed as well on a single designated node. In order to use remote post-processing on the solver servers directly, please also install the "Graphical frontend and command line interface" component on the Solver Servers. The command line interface can also be used to update the Linux Main Controller node as is described in section 3.1.

   In the case of MPI cluster, please install the component "Graphical frontend and command line interface" on each of the Linux MPI compute nodes. The installation can be performed either on each node, or on a single node where the installation directory is shared among all nodes (refer to section 2.5 for further information about the shared installation).

   For the frontend component of either cluster computing technique only the installation of the "Graphical frontend and command line interface" is required for Linux. A typical installation is sufficient for Windows. Detailed information about the installation routines on Linux will be given in section 2 of this document.

2. You plan to run CST simulations or work interactively in the CST graphical user interface directly on an individual Linux system. This scenario simply requires the installation of the "Graphical frontend and command line interface" component

[1] The described scenarios might require additional license options, please refer to the licensing guide for more information.

on the Linux node. See section 3.2 for information about command line options for submitting simulations via batch mode and section 4.1 for information on how to use the command line for opening the graphical user interface.

3. You plan to build up a pure Linux environment/cluster system where you start CST simulations from the command line in batch mode without involving any machine running the Microsoft Windows® operating system. Systems which require this setup are typically Linux cluster systems which are isolated by a gateway machine from the rest of your LAN and which are controlled by queuing systems (e.g. LSF, OGE, Torque, PBS, HTCondor). This setup can make use of the CST Distributed Computing system and MPI Computing as well. A difference from option 1 is that there is no CST STUDIO SUITE® frontend running on Microsoft Windows® involved during the simulation run[2]. For this scenario, we recommend to install the "Graphical frontend and command line interface" component either on all nodes, or on a single node and sharing the installation directory on all nodes (refer to section 2.5 for further information about the shared installation) while using the Cluster Integration scripts available from FAQ 2944.

In case you want to use a USB dongle with your CST STUDIO SUITE® installation and the dongle drivers are not installed yet please refer to section B.

Supported Linux Distributions

The full list of supported operating system versions for CST STUDIO SUITE® is available as FAQ 1404. This version of CST STUDIO SUITE® is supported and continuously tested on RedHat Enterprise Linux 6.x and 7.x as well as SUSE Linux Enterprise Server (SLES) 11.4 and 12. Although CST can only guarantee compatibility on these specific distributions the software usually works on other Linux distributions as well and we know of working installations on e.g. CentOS 6.x, CentOS 7.x and Ubuntu 16.04 LTS (see appendix C for additional information).

Limitations of the Linux Version of CST STUDIO SUITE®

This version of the "Graphical frontend and command line interface" does not support the modules CST CABLE STUDIO® and CST PCB STUDIO®. CST DESIGN STUDIO™ can be operated in batch mode only. If you have an urgent need for one of these modules please let us know. We can take this into account when planning future releases, and if you desire you could help us make these modules more robust on Linux by participating in the beta testing.

[2] Although you do not need to have a machine running Microsoft Windows® in your cluster you will still need an installation of CST STUDIO SUITE® on a computer running Microsoft Windows® to create models using CST DESIGN STUDIO™ and/or System Assembly Modeling.

Nomenclature

The following section explains the nomenclature used in this document.

`$ command`	Commands you have to enter on a command prompt as a normal user (not root) are typeset using typewriter fonts and highlighted with a light blue box. The "$" sign in front of the command symbolizes your command prompt and **must not be entered**.
`# command`	Commands you have to enter on a command prompt as user root are typeset in red color. The "#" sign in front of the command symbolizes the root command prompt and **must not be entered**.
`<...>`	Within commands the sections you should replace according to your environment are enclosed in "<...>". For example "<CST_DIR>" should be replaced by the directory where you have installed CST STUDIO SUITE® (e.g. "/opt/cst/CST_STUDIO_SUITE_2019").

Installation

Prerequisites

Please make sure that your environment is configured as described below **before** you start the installation.

1. Some Linux distributions will automatically mount the installation DVD but with the `noexec` mount option which prevents the execution of the installer. Please mount the DVD manually or use the command

   ```
   # mount -o remount,exec /media/CST_STUDIO_SUITE_2019_Linux
   ```

   to circumvent this issue.

2. If you want to install a part of CST STUDIO SUITE® which needs a service running on your system (needed for Distributed Computing or license server) you must run the installer with root permissions. In case of security concerns please contact CST support for advice. FAQ 4253 (license server) on the CST support webpage describes the installation of a standalone license server.

   Superuser permissions are however not needed for the services to run: you can specify a user account for that purpose. Note that this user account must exist before you start the installation.

3. If you want to install a part of CST STUDIO SUITE® which needs a service running on your system or use MPI: Validate that in `/etc/hosts` the line with the loopback address does not map to the hostname. `/etc/hosts` should contain a

   ```
   127.0.0.1 localhost.localdomain localhost
   ```

   line and no further `127.0.0.1` lines. Additionally, if you plan to use MPI Computing, make sure that the names of your nodes can be resolved to IPv4 addresses (not to IPv6 addresses). You can use the command

   ```
   $ ping <hostname>
   ```

   to test whether `<hostname>` can be resolved properly.

4. If you plan to use MPI Computing: Please note that MPI Computing needs a DNS or appropriate entries in the `/etc/hosts` file in order to start up remote processes on compute nodes. Please refer to the MPI Computing Guide for further information on how to setup a Linux cluster with MPI.

5. CST STUDIO SUITE® requires that several software libraries are preinstalled on the target system. The installer checks only its own list of libs required to successfully execute the installer but not the CST software itself.

   After the installation has finished it is strongly recommended to execute the tool

```
$ "<CST_INSTALL_PATH>/cst_system_check"
```

which can test whether all libraries and tools required to use the CST software are present on your system.

Additionally you can find the full list of required packages for the supported distributions in section 6.

Installation with Graphical Installer

After mounting the DVD into your file system go to the root directory of the DVD and execute the installer by using the command

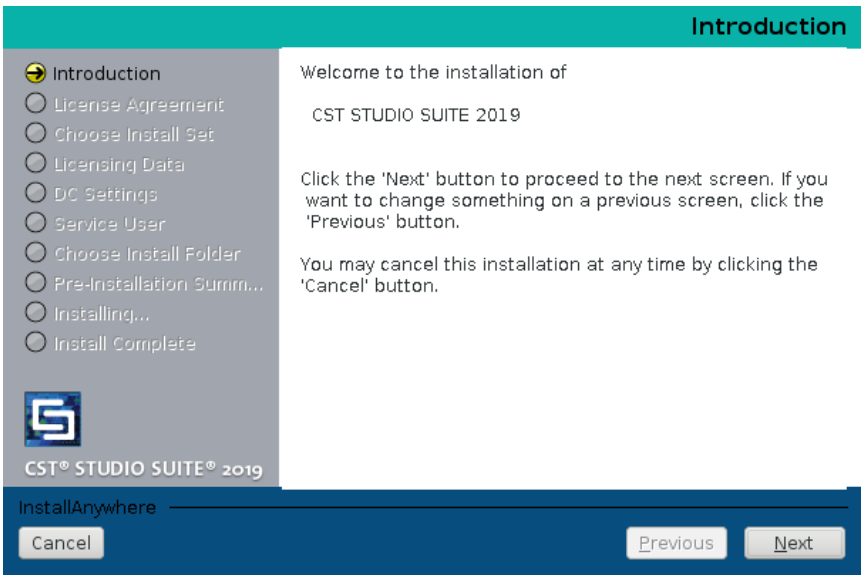
```
# ./install.sh
```

The command can also be run without root privileges. In this case the installation will only be available to the installing user. The installing user is then equal to the "Main User" later in this document. The installer will highlight if the installation of selected features requires root permission.

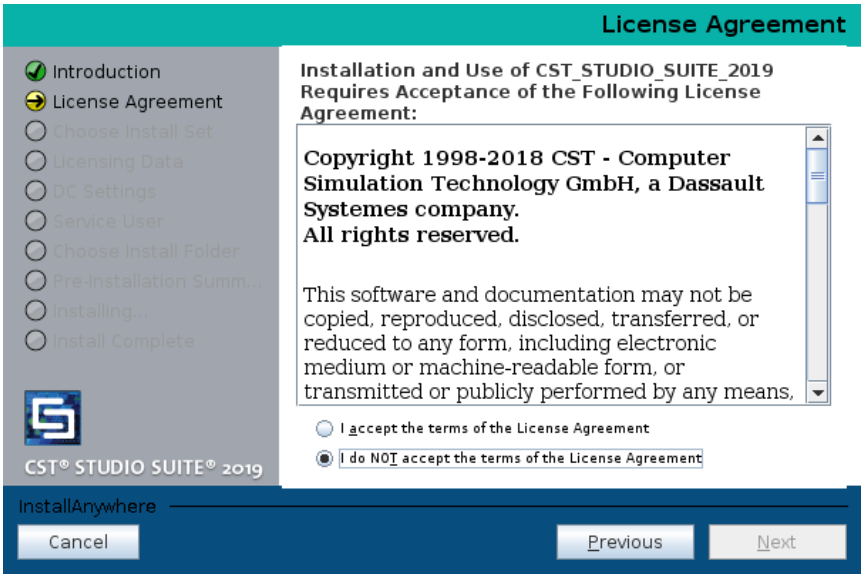
Note: If the machine you are installing on provides a desktop environment (a running X-server), the installer will be executed in the so-called GUI mode. If it does not provide a desktop environment please continue reading with section "Command Line Installation" (section 2.3). The console mode can also be selected manually by starting

```
# ./install.sh --nogui
```

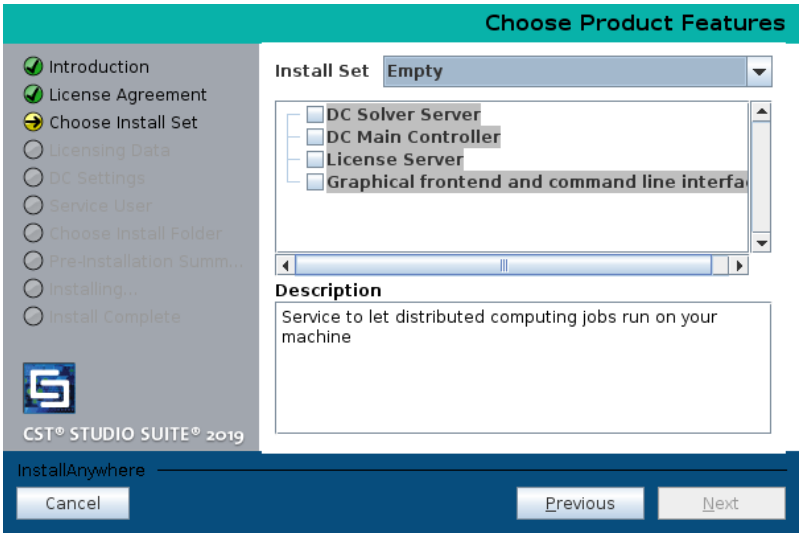
1. After you have started the installer you should see the following window. Just click on "Next" to proceed.



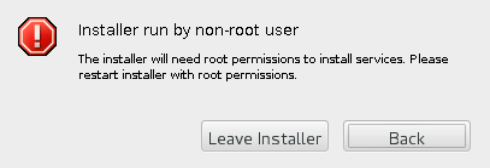
2. Please read the license agreement carefully. If you agree with the license terms select the option "I accept the terms of the License Agreement" and press "Next".



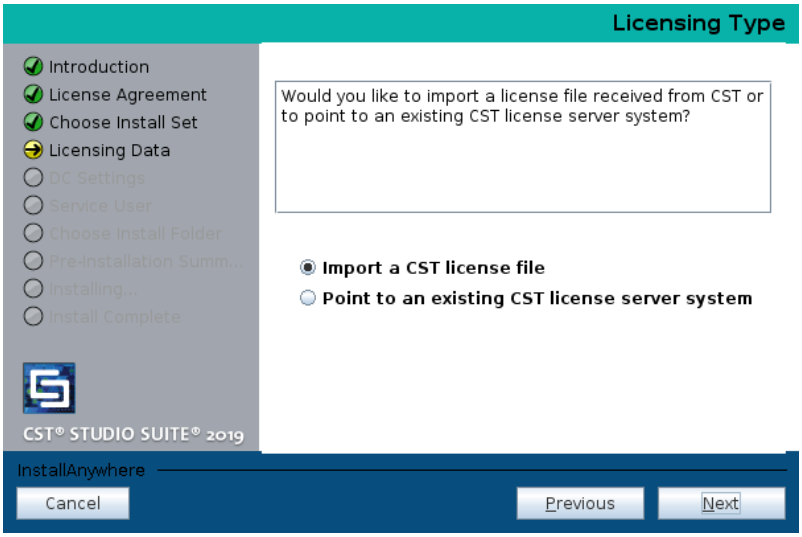
3. Please choose your installation set by selecting/unselecting the checkboxes. An overview of possible application scenarios is given in section 1.1. After the selection press "Next" to proceed.



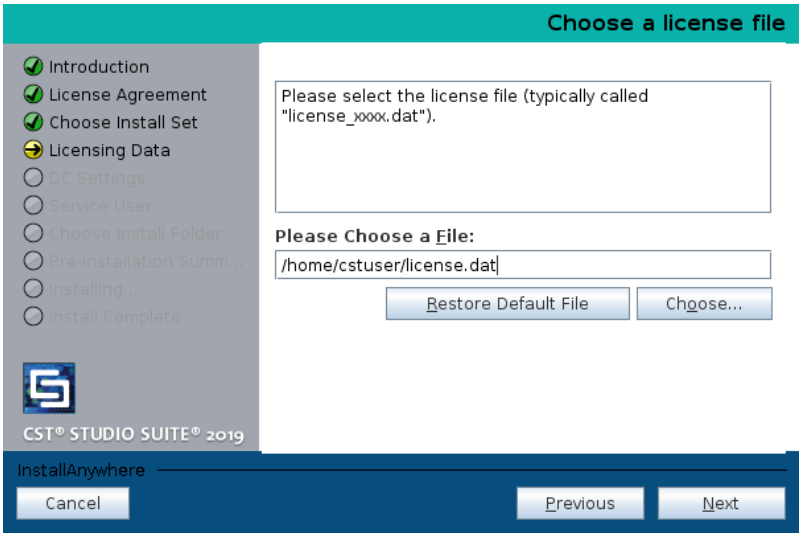
4. If you selected an installer feature that needs to run a service on your system (e.g. the Distributed Computing components or the license server) and the installation was not started with root permissions you will get the following warning. Either leave the installer and restart with superuser permissions or change the selection of features.



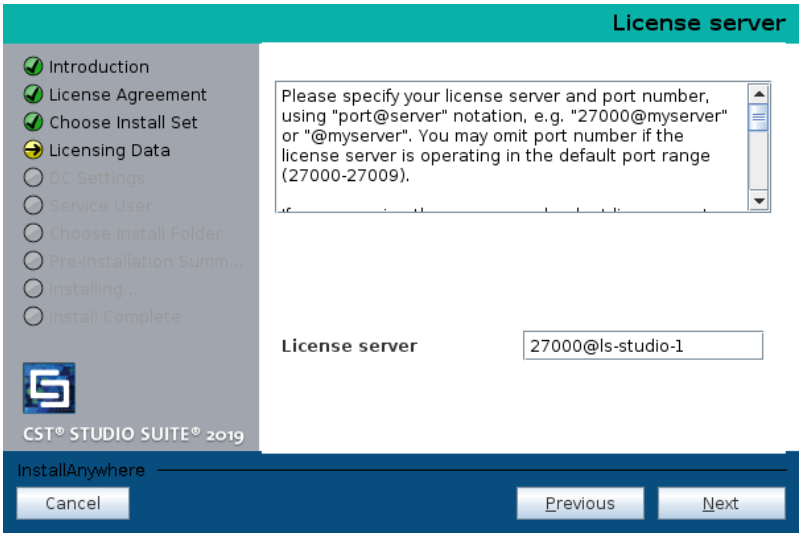
5. If you have selected the "Graphical frontend and command line interface" option you will be asked if you want to install a license file on the local machine.
Note: The license file should be installed only on the machine which is equipped with the hardware (MAC or dongle) for which the license file was issued.



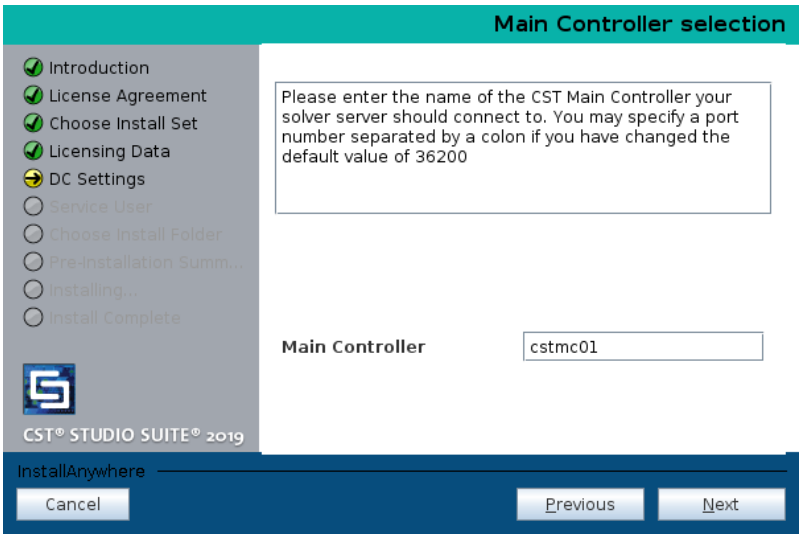
6. If you chose to install the local license server you will be asked for a license file. Please specify the full path to the license file.



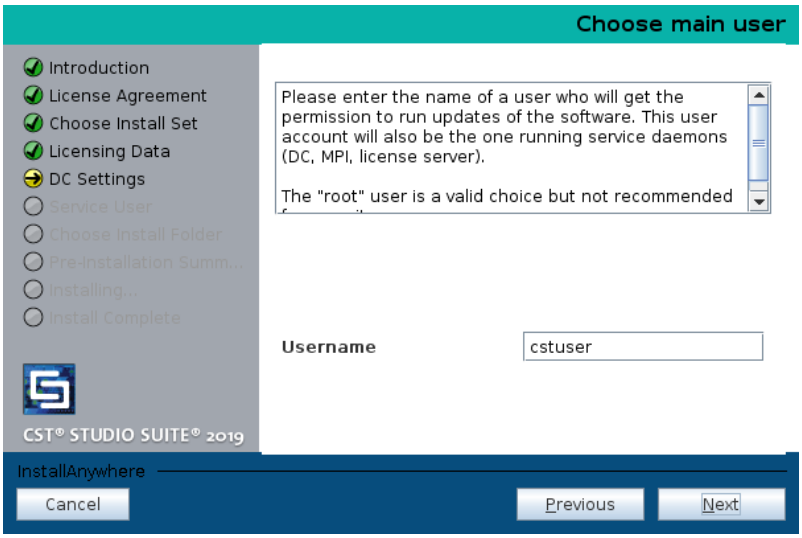
7. If you decided not to install a local license server you will need to specify the name of the remote license server and the port on which the license server is listening in the format `<port_number>@<computer_name>`. The `port_number` setting is optional.



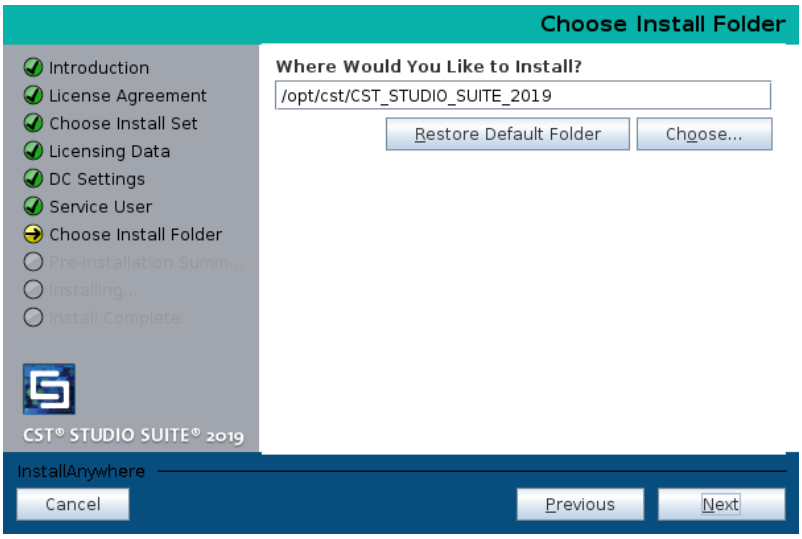
8. If you selected the DC Solver Server for installation you will be asked to which DC Main Controller this Solver Server should connect to.



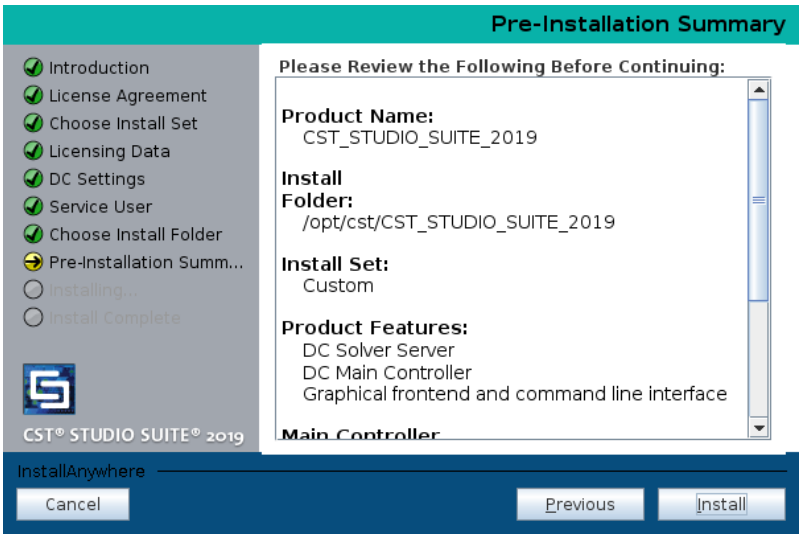
9. If you are installing with root permissions, you will now be asked for the so-called "Main User". This is the user account under which the CST services will be started. Additionally, only this user account (and root) has the permission to configure the CST services and to update the installation with service packs. The "Main User" needs to be a user account already existing on the system.



10. Choose the installation folder. **Please do not use spaces within this path.**



11. Check all the settings you made and start the installation.



Command Line Installation

If no running X server is found, the installer will automatically switch into a console mode. You can however override the detection logic by running

```
# ./install.sh --nogui
```

The command can also be run without root privileges. In this case the installation will only be available to the installing user. The installing user is then equal to the "Main User" later in this document. The installer will highlight if the installation of selected features requires root permission.

1. When you see the first page of the text based installer, just press enter to continue.

   Note: On any page of the installer you may go to the previous page by entering "back".

```
================================================================================
Introduction
------------

Welcome to the installation of

CST STUDIO SUITE 2019


Respond to each prompt to proceed to the next step in the installation.  If
you want to change something on a previous step, type 'back'.

You may cancel this installation at any time by typing 'quit'.

PRESS <ENTER> TO CONTINUE:
```

2. Please read the license agreement carefully. If you agree with the license terms enter "Y" and press "enter" to proceed.

```
DO YOU ACCEPT THE TERMS OF THIS LICENSE AGREEMENT? (Y/N): 
```

3. Choose your install set by entering the number of the features you would like to install as a comma separated list and press "enter" to proceed. An overview of possible application scenarios is given in section 1.1. **Please note that entering the number of a feature which is already selected will deselect this feature**.

```
================================================================================
Choose Product Features
-----------------------

ENTER A COMMA_SEPARATED LIST OF NUMBERS REPRESENTING THE FEATURES YOU WOULD
LIKE TO SELECT, OR DESELECT. TO VIEW A FEATURE'S DESCRIPTION, ENTER
'?<NUMBER>'.  PRESS <RETURN> WHEN YOU ARE DONE:

    1- [ ] DC Solver Server
    2- [ ] DC Main Controller
    3- [ ] License Server
    4- [ ] Graphical frontend and command line interface

Please choose the Features to be installed by this installer.: 
```

4. If you selected an installer feature that needs to run a service on your system (e.g. Distributed Computing or the license server) and the installation was not started with root permissions you will get the following warning. Either leave the installer and restart with superuser permissions or change the selection of features.

```
================================================================================
No administrative rights
------------------------

The installer will need root permissions to install services. Please restart
installer with root permissions.

  ->1- Back
    2- Leave Installer

ENTER THE NUMBER OF THE DESIRED CHOICE, OR PRESS <ENTER> TO ACCEPT THE
   DEFAULT: 
```

5. You will be asked if you want to provide a license file (the file must be issued for the local machine) or if you want to connect to a remote license server.

```
================================================================================
Licensing Type
--------------

Would you like to import a license file received from CST or to point to an
existing CST license server system?

    1- Import a CST license file
    2- Point to an existing CST license server system

ENTER THE NUMBER OF THE DESIRED CHOICE: 
```

6. If you chose to install the local license server you will be asked for a license file. Please specify the full path to the license file.

```
================================================================================
Input license file
------------------

Please enter the absolute path to the license file (typically called
"license_xxxx.dat").

License file (Default: ): 
```

7. If you decided not to install a local license server then you need to specify the name of the remote license server and the port on which the license server is listening in the format <port_number>@<computer_name>. The port_number setting is optional.

```
================================================================================
License server
--------------

Please specify your license server and port number, using "port@server"
notation, e.g. "27000@myserver" or "@myserver". You may omit port number if
the license server is operating in the default port range (27000-27009).

If you are using three-server redundant license system, you must enter all 3
port@server entries separated by commas, e.g. "27000@ls-studio-1,
27000@ls-studio-2,27000@ls-studio-3". You cannot omit port numbers in this
case.

By default, CST licenses use port 27000, but this can be changed by your
license administrator. If you are not sure which port number is used, please
ask your license administrator

NOTE: In the case of the three-server redundant system, specifying only one of
the servers is not recommended.

License server (Default: ): 27000@ls-studio-1
```

8. If you selected the DC Solver Server for installation you will be asked to which DC Main Controller this Solver Server should connect to.

```
================================================================================
Main Controller selection
-------------------------


Main Controller (Default: ): cstmc01
```

9. If you are installing with root permissions, you will now be asked for the so-called "Main User". This is the user account under which the CST services will be started. Additionally, only this user account (and root) has the permission to configure the CST services and update the installation with service packs. The "Main User" needs to be a user account already existing on the system.

```
================================================================================
Choose main user
----------------

Please enter the name of a user who will get the permission to run updates of
the software. This user account will also be the one running service daemons
(DC, MPI, license server).

The "root" user is a valid choice but not recommended for security reasons.

Username (Default: root): cstuser
```

10. Choose the installation folder. **Please do not use spaces within this path.**

```
================================================================================
Choose Install Folder
---------------------

Where would you like to install?

  Default Install Folder: /opt/cst/CST_STUDIO_SUITE_2019

ENTER AN ABSOLUTE PATH, OR PRESS <ENTER> TO ACCEPT THE DEFAULT
      :
```

11. Check all the settings you made and start the installation.

```
================================================================================
Pre-Installation Summary
------------------------

Please Review the Following Before Continuing:

Product Name:
    CST_STUDIO_SUITE_2019

Install Folder:
    /opt/cst/CST_STUDIO_SUITE_2019

Install Set:
    Custom

Product Features:
    DC Solver Server,
    DC Main Controller,
    Graphical frontend and command line interface

Main Controller
    cstmc01:36200

License info
    License server: 27000@ls-studio-1

Disk Space Information (for Installation Target):
    Required:  10.88 GigaBytes
    Available: 40 GigaBytes

PRESS <ENTER> TO CONTINUE:
```

Silent Mode Installation

It is possible to generate an installer configuration file which enables silent mode installation. This is useful if you want to deploy the software to several machines using the same installer settings. To generate such a file, start the installer with the option `--record`:

```
# ./install.sh --record <filename>
```

The installer will store a file with all settings you made during the installation process. This file can be used for later installations:

```
# ./install.sh --replay <filename>
```

The installer will now read all required settings from the configuration file and perform an unattended installation.

Installation on a Central Server

It is possible to install the CST STUDIO SUITE® on a central server, mount the installation directory on a client machine, and use the software on the client machine. If you choose this type of installation be aware that the installation directory on the server must have the same name as the mountpoint on the client machine, i.e. if you installed the software on the fileserver using `/opt/cst/CST_STUDIO_SUITE` as installation path then the folder must be mounted into the filesystem of the client such that it contains the same name (`/opt/cst/CST_STUDIO_SUITE`) on the client. We recommend to use the non-root installation in this case. Additionally, be aware that the CST services cannot be automatically installed on the client machine. This fact leads to the following limitations:

Limitations

The Distributed Computing system cannot be set up automatically using a central installation as described above. It is however possible to start the system manually. Please refer to FAQ 2944 in the support section of the CST website.

Usage Guideline for the Command Line Interface

This section contains information about the setup and use of the CST command line interface which enables you to start simulations in batch mode from a terminal or via a queuing system. If you have not installed the "Graphical frontend and command line interface" component you can skip this section.

Updating Your Installation using the Command Line Interface

You can also update your installation via the GUI, see section 4.2.

To update your installation of CST STUDIO SUITE® use the command

```
$ "<CST_INSTALL_DIR>/AutoUpdate" -i "<FULL_PATH_TO_SUPFILE>"
```

This command can be executed by the "Main User" you have defined during the installation process or by root (see installation step 10 in section 2.2 or 2.3, respectively). Replace the terms `<CST_INSTALL_DIR>` and `<FULL_PATH_TO_SUPFILE>` with the directory where you have installed CST STUDIO SUITE® and with the full path of the patch file you downloaded from the support section of the CST website, respectively. The quotes are mandatory.

For a complete list of command line options execute `AutoUpdate -h`.

Starting CST Simulations from the Command Line

Prior to starting any CST simulations please run the `cst_system_check` script at least once. The script will report missing packages and programs that are required to run a CST simulation.

```
$ "<CST_INSTALL_PATH>/cst_system_check"
```

To start your simulations please use

```
$ "<CST_INSTALL_PATH>/cst_design_environment" <OPTIONS> "<PATH_TO_CST_FILE>"
```

The quotes are recommended to prevent problems with special characters in the path. Note that at least two command line switches need to be specified: one to select the module (e.g. `--m` for CST MICROWAVE STUDIO®), and one to select the solver (e.g. `--r` for the transient solver). Please refer to the online help for all command line options. Currently neither CST CABLE STUDIO® nor CST PCB STUDIO® are running on Linux, therefore the corresponding command line options are not available on Linux. All options are displayed using the `--help` option of the "cst_design_environment" program.

Additionally for a list of Environment variables please consult the online help as well.

Uninstall

Go into the "<CST_INSTALL_DIR>/Uninstall CST_STUDIO_SUITE_2019" directory and run the command

```
# ./Uninstall\ CST_STUDIO_SUITE_2019
```

to uninstall the software.

Graphical User Interface

This section contains information about the setup and use of CST STUDIO SUITE® and CST BOARDCHECK®. CST BOARDCHECK® enables you to start a PCB analysis from a graphical user interface. If you have not installed the "Graphical frontend and command line interface" component you can skip this section.

Starting the Graphical User Interface

Prior to starting any CST simulations please run the `cst_system_check` script at least once. The script will report missing packages and programs that are required to run a CST simulation.

```
$ "<CST_INSTALL_PATH>/cst_system_check"
```

To start CST STUDIO SUITE® in graphical mode please use the following syntax:

```
$ "<CST_INSTALL_PATH>/cst_design_environment_gui"
```

Alternatively to start CST BOARDCHECK® use:

```
$ "<CST_INSTALL_PATH>/cst_boardcheck"
```

The quotes are recommended to prevent problems with special characters in the path. This command opens a graphical user interface where either CST STUDIO SUITE® or CST BOARDCHECK® can be started and used like the Microsoft Windows® version with the limitations lined out in section 1.3.

Updating Your Installation

To update your installation of CST STUDIO SUITE® please use the CST Update Manager located in the CST STUDIO SUITE® menu. Running the program as "Main User" or root allows the import and installation of a Linux patchfile downloaded from the support section of the CST website or automatic update of the installation from the internet.

Uninstall

Go into the `"<CST_INSTALL_DIR>/Uninstall CST_STUDIO_SUITE_2019"` directory and run the command

```
# ./Uninstall\ CST_STUDIO_SUITE_2019
```

to uninstall the software.

Troubleshooting

Installer reports "Previous version found in NULL"

If the installer shows the error message `Previous version found`, this likely means that the CST installation folder has been deleted without running the uninstall program. Reason is that there is a hidden registry of previous installations in a file called `.com.zerog.registry.xml`. It is either located in `/var` for root installations or the user home for non-root installations.

To fix the problem please delete the file

```
# rm /var/.com.zerog.registry.xml
```

or

```
$ rm ~/.com.zerog.registry.xml
```

respectively. Now you should be able to reinstall the software.

Please always use the uninstall program as described in section 4.3 if you want to remove the software from your system as it reverts all changes applied during installation and also clears this hidden file.

Installer Shows Java Errors

If the installer fails with a Java error this is most likely due to an incompatible Java version on your system. However, the installer has its own Java version and you can force the installer to use this built-in version using the option `--installerjava`.

Installation from DVD Fails

Typically, the automount of the RedHat Enterprise system will mount the DVD with the `noexec` flag which prevents starting programs from a DVD. Thus, if the installer fails to start from the DVD you might have mounted the DVD with incorrect options. In this case please unmount the DVD using the `umount` command and mount it again using the following command:

```
# mount -t iso9660 -o loop,ro,exec,map=off /dev/cdrom /media/cdrom
```

Please create the directory `/media/cdrom` if it does not exist.

Failed to Load Shared Library

The CST software package has as few dependencies as possible on external libraries. However, in some rare cases you may get an error about a missing library.

If you experience trouble please run the

```
$ "<CST_INSTALL_PATH>/cst_system_check"
```

to detect and optionally install missing dependencies from your installation medium or the predefined software repository.

Update of the Installation Fails

If the update of your installation fails please check the following points:

- The update can be performed by the "Main User" (defined during the installation process) or by root. It will fail for any other user account.
- The patch files for the Microsoft Windows® version of CST STUDIO SUITE® are incompatible with the Linux version. Please ensure that you used the correct patch file.

Installation of Required Packages Fails

If the installation of required packages with

```
# yum install ...
```

fails with errors like

```
Error: Protected multilib versions: ...
You could try using --skip-broken to work around the problem
You could try running: rpm -Va --nofiles --nodigest
```

please try to first update your system to the latest version with the command

```
# yum update
```

On RedHat systems please activate the optional packages using

```
# yum-config-manager --enable rhel-<VERSION>-<PLATFORM>-optional-rpms
```

where <VERSION> corresponds to your installed RedHat Version and <PLATFORM> represents your installation platform which might be either **workstation** or **server**.

`yum-config-manager` is available on most installations. If it should be missing please install it with

```
# yum install yum-utils
```

List of Required Packages

The binaries in CST STUDIO SUITE® need several packages preinstalled to run on the supported distributions. To keep the lists below compact the dependencies are optimized, i.e. packages which are implicitly installed by other packages are omitted.

RHEL 6.x (64-bit)

```
desktop-file-utils fontconfig libSM libXcomposite libXdmcp libXrender
libXtst libfontenc libpng libxslt mesa-libGLU redhat-lsb-core
xorg-x11-server-Xvfb
```

RHEL7.x (64-bit)

```
desktop-file-utils fontconfig libSM libXcomposite libXdmcp libXrender
libXtst libfontenc libpng12 libxslt mesa-libGLU net-tools
redhat-lsb-core xorg-x11-server-Xvfb
```

SLES 11.4 (64-bit)

```
dbus-1 desktop-file-utils libcurl4 libxslt lsb shared-mime-info
xkeyboard-config xorg-x11-libXdmcp xorg-x11-server-extra
```

SLES 12 (64-bit)

```
desktop-file-utils fontconfig libGLU1 libSM6 libXcomposite1 libXdmcp6
libXi6 libXrender1 libXtst6 libcurl4 libfontenc1 libgthread-2_0-0
libpng12-0 libsqlite3-0 libxslt1 net-tools shared-mime-info
xorg-x11-server
```

Technical Information

The CST Linux installer needs to install several files into system directories, e.g. to automatically start CST services with every system boot. Note that the uninstaller will undo all those changes.

Depending on the choice of features different files have to be written. In the following text the feature dependent steps will be marked as follows:

[MC] = CST DC Main Controller
[SS] = CST DC Solver Server
[FE] = Graphical frontend and command line interface
[LS] = License Server

1. The installation directory selected by the user will be created if it does not exist. None of the installed programs and libraries will get a setuid flag.
2. The following scripts will be installed in `/etc/init.d`:
   - [SS] `lsb-cst-solverserver2019`
   - [MC] `lsb-cst-maincontroller2019`
   - [LS] `lsb-cst-flexlm2019`

   and symlinks into the `/etc/rcN.d` directories for `N` = 3,4,5 will be created according to the usual Linux startup procedure depending on the features selected for installation.
3. For menu entries and icons the following files will be written:
   - `XDGDATA/applications/cst/*.desktop`
   - `XDGDATA/desktop-directories/cst-studiosuite2019.directory`
   - `XDGDATA/pixmaps/cst-*.png`
   - `XDGDATA/icons/hicolor/16x16/apps/cst-*.png`
   - `XDGDATA/icons/hicolor/24x24/apps/cst-*.png`
   - `XDGDATA/icons/hicolor/32x32/apps/cst-*.png`
   - `XDGDATA/icons/hicolor/48x48/apps/cst-*.png`
   - `XDGDATA/icons/hicolor/scalable/apps/cst-*.png`
   - `XDGCONFIG/menus/applications-merged/cst-studiosuite2019.menu`

   where `XDGDATA` and `XDGCONFIG` depending on whether the superuser or a normal user performed the installation:

Name	root install	user install
XDGDATA	/usr/share	~/.local/share
XDGCONFIG	/etc/xdg	~/.config

This is according to the

- "Desktop Entry Specification" and the
- "Desktop Menu Specification"

4. If [FE] is selected

   - `XDGDATA/mime/packages/cst-model.xml`

   will be created and

   - `update-mime-database`

   is called to register MIME types for CST project files. This is according to

   - "shared MIME database" and
   - "MIME run actions"

5. If the [MC] or [SS] option is selected, settings for Solver Server and Main Controller will be written to

   - `"/etc/xdg/CST AG/"`

   These settings can be changed from the menu with "CST DC Solver Control" or "CST DC Main Control" or a text editor. Please refer to the Online Help of CST STUDIO SUITE® for a detailed description of the distributed computing options.

6. Files in the installation directory and the configuration files in `/etc/xdg/CST AG/` will get the "Main User" (chosen during installation) as owner.

7. The installed services will be started via the `/etc/init.d` scripts. Both DC services will automatically generate working directories in `/tmp` if [MC] or [SS] was selected:

   - `/tmp/CSTMainControllerWork2019`
   - `/tmp/CSTSolverServerWork2019`

Installation of third party dongle drivers

1. Manually install the 32-bit support libraries (x86 compatibility packages) provided by your Linux distribution.
2. Disconnect your USB dongle from the computer
3. Change to directory containing the dongle drivers

   ```
   $ cd "<CST_INSTALL_DIR>/License Manager/Dongle Support/HASPInstaller"
   ```

4. Enter the command

   ```
   # ./dinst .
   ```

   Note that the final . in the command is required for the file location.

5. Change to directory containing the dongle libraries

   ```
   $ cd "<CST_INSTALL_DIR>/License Manager/Dongle Support/HASPLibs"
   ```

6. Copy additional libary files

   ```
   # cp *.so /usr/lib
   ```

7. Connect the USB dongle to your computer.
8. Change to directory containing the license manager

   ```
   $ cd "<CST_INSTALL_DIR>/License Manager/LinuxAMD64"
   ```

9. Verify that the dongle is visible

   ```
   $ ./lmutil lmhostid -flexid
   ```

   You should see an output containing something similar to this:

   ```
   The FLEXnet host ID of this machine is FLEXID=9-xxxxxxxx
   ```

Installation on Unsupported Distributions

CST officially supports RedHat Enterprise Linux (RHEL) version 6.x, 7.x and SUSE Linux Enterprise Server (SLES) 11.4 and 12. We strongly recommend using the CST software on these supported distributions. However, if you need to use the CST software on another Linux distribution this section of the document contains some information which may help you to setup the software successfully. The instructions apply to the 64-bit (x86_64) versions of the distribution

Ubuntu 16.04 LTS

Install the following dependent standard packages before running the installer using the `apt install` command:

```
desktop-file-utils libcurl3:amd64 libfontconfig1:amd64
libfontenc1:amd64 libglu1-mesa:amd64 libsm6:amd64 libxcb-xfixes0:amd64
libxcomposite1:amd64 libxi6:amd64 libxrender1:amd64 libxslt1.1:amd64
libxtst6:amd64 lsb-core net-tools shared-mime-info xkb-data xvfb
```