



Simufact Joining Optimizer Installation guide

Installation, Troubleshooting, Support and
Licensing

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Patents:

U.S. Patent No. 10,740,910

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1

Installation instructions



Before installing **Simufact Joining Optimizer 2021**, please carefully read the "Release Notes" and the "What's New". They contain additional information which is not included in this installation guide. In particular:

- the system requirements for installing this software,
- known issues that may occur during installation and usage of this software.



Please keep in mind that **administrative rights** are required for a successful installation!



Before starting the installation make sure that you have a valid **license file** for the products you like to install. The recommended steps of the installation are:

- 1) get a valid license file
- 2) install the license server (see notes below)
- 3) install **Simufact Joining Optimizer** (described in this manual)

Only in rare special cases, which are explicitly instructed in the delivery letter of the license file, step 2) "Installation of the license server" is not needed.

For network licenses the installation of the license server software is only needed on the machine used as license server, this means on the machine with the host-ID specified in the license file. This machine may or may not be used to run the **Simufact Joining Optimizer**, too. For nodelocked licenses the license server software and the **Simufact Joining Optimizer** are installed on the same machine.

The required license server software is "MSC Licensing", a FLEXlm based licensing software. Please see the "Release notes" for the required version of MSC Licensing. Typically several version of the **Simufact Joining Optimizer** can be used with a constant version of MSC Licensing. Thus there may be no need to update an existing MSC Licensing.

MSC Licensing is not shipped with the **Simufact Joining Optimizer**. It is available as separate download in the MSC Solution Download Center (SDC) where you have downloaded the **Simufact Joining Optimizer**. MSC Licensing is not installed by the **Simufact Joining Optimizer** installer but has to be installed separately. For this please follow the instructions shipped with MSC Licensing. You need to remember the port number and host name of the license server shown respectively configured during the installation of MSC Licensing.

The installation of a license server is also not needed if you have the license server software "MSC Licensing" already running for other MSC products on the machine licensed for the **Simufact Joining Optimizer**. In this case the license files for the different products need to be combined, see Appendix A at the end of this document.

For more information about configuring and managing your licenses please see Appendix A at the end of this document.



Please note that there is a comprehensive **troubleshooting** chapter at the end of this installation guide.

1.1. Installation using Windows™

1.1.1. Attended installation

The **Simufact Joining Optimizer 2021** download package contains an easy-to-use installer: "Setup.exe". The installation needs to be done with administrative rights because the Microsoft™ C++ and Intel™ Fortran Redistrib-

utable packages included are installed as needed in the system directories as recommended by these software vendors. Thus right click on “Setup.exe” and select **Run as administrator ...** to open installation wizard that will guide you through the installation. Double-click on the executable is only appropriate if you are logged-in as administrator.

The installer checks whether it is run with the appropriate administrative rights and aborts with a message if this is not the case.

1.1.1.1. Language selection for installation

In the first step of the installation you can choose the language used during the installation. Select the language of your choice and click **Next**. Please note that this selection does not influence the language used in the Simufact Joining Optimizer. The language used in the Simufact Joining Optimizer can be chosen in the settings of the Simufact Joining Optimizer.

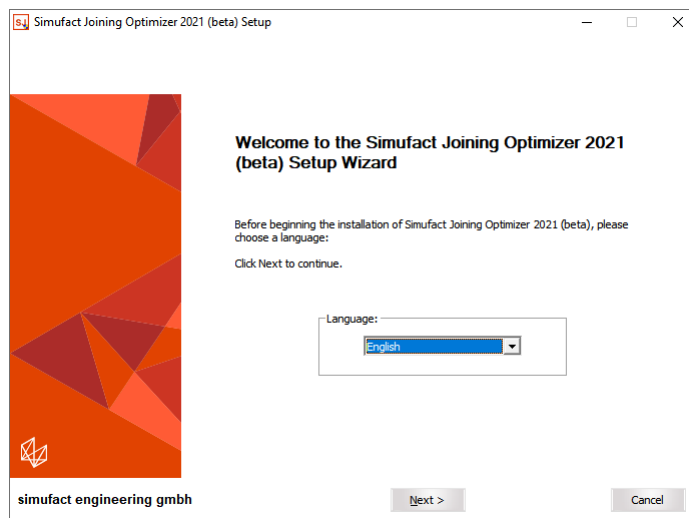


Figure 1.1. Language selection

1.1.1.2. License agreement

To continue the setup, you must confirm the copyright notice by selecting **Acknowledged**. If you do not accept the agreement, click **Cancel** to quit the setup.

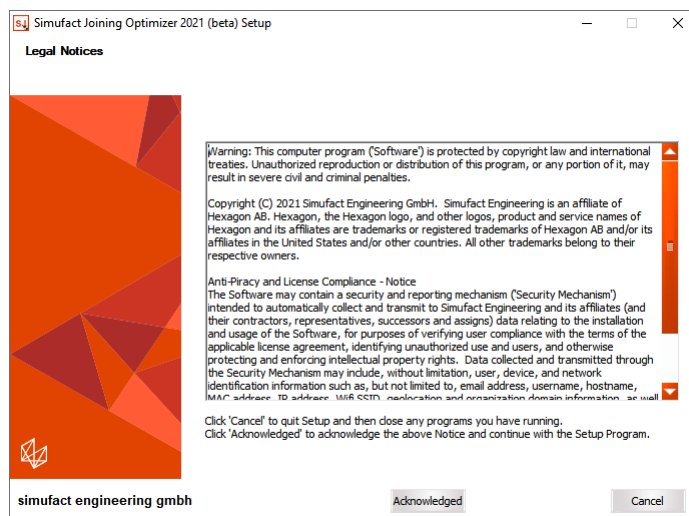


Figure 1.2. License agreement

1.1.1.3. Choose license location

You should have received a license file *before* running the setup or have a license server providing all necessary licenses. You need to specify the location of your license server you should have set up before. The location of the license is set in the system environment variable "MSC_LICENSE_FILE". On this page you can adapt the value of this variable.

For all counted licenses you have to set the right value to connect to your MSC Licensing license server. This is typically something like 'portnumber@hostname'. If you already have specified this with a previous setup you will see in the 'Current value' field previously entered data. If that is correct, you do not have to change anything. If the 'Current value' is empty or wrong, type in the correct value for MSC_LICENSE_FILE. If you do not have an MSC Licensing license server running on your system or in your network please install MSC Licensing on your machine used as license server or on your nodelocked licensed machine. MSC Licensing is a separate program, so a separate download and setup is necessary.

Only in rare special cases, which are explicitly instructed in the delivery letter of the license file, option 3) applies. **Only** in this cases use the **Browse...** button to directly select the license file on your system. The path and the name of the license file must not contain special characters like ; , : Å or ß, and must be shorter than 248 characters otherwise the license will not be found.

If the value of the environment variable MSC_LICENSE_FILE is not set correctly, you won't be able to start any Simufact program. If you're not sure what to do, consult your System Administrator. You can set the value also after the installation in the advanced system settings on your Windows™ operating system, compare Appendix C. For more information about configuring and managing your licenses please see Appendix A at the end of this document.

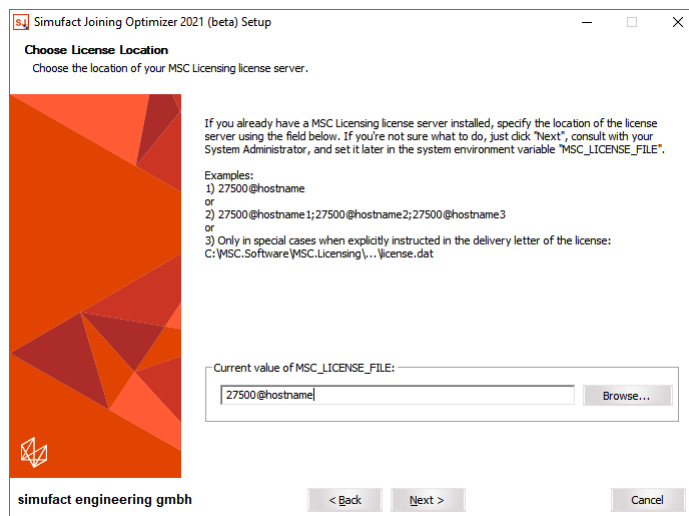


Figure 1.3. License location

1.1.1.4. Select target directory

Next you are asked to specify the location where you want to install the programs. If you have already installed an older version of the Simufact Joining Optimizer or other programs, then the destination folder is automatically set to the last installation directory. In this case, you should **not** change the folder to prevent conflicts.

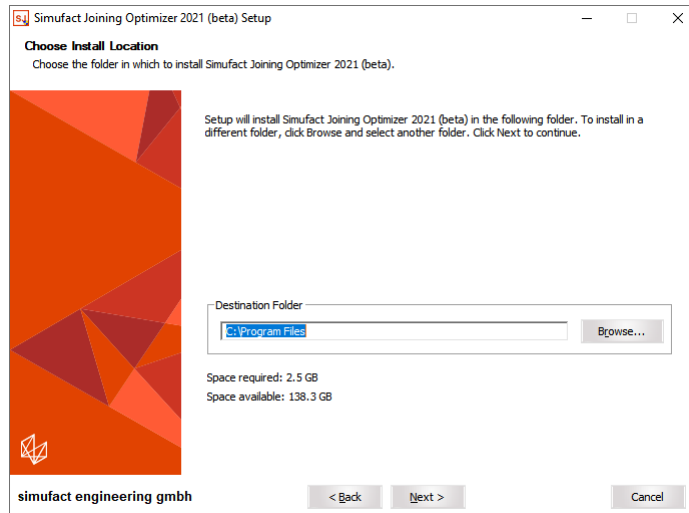


Figure 1.4. Installation location

You can select any folder on your computer. Spaces in the installation path are only supported if the optional additional 8.3 file names have been activated during the creation of the directory. If you see this message (Figure 1.5), please select another installation directory.

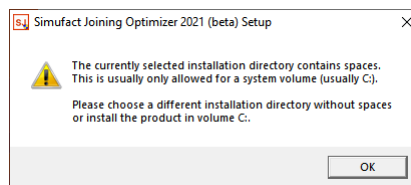


Figure 1.5. Spaces in installation path

1.1.1.5. Choose components to install

You will be asked which Simufact products you want to install.

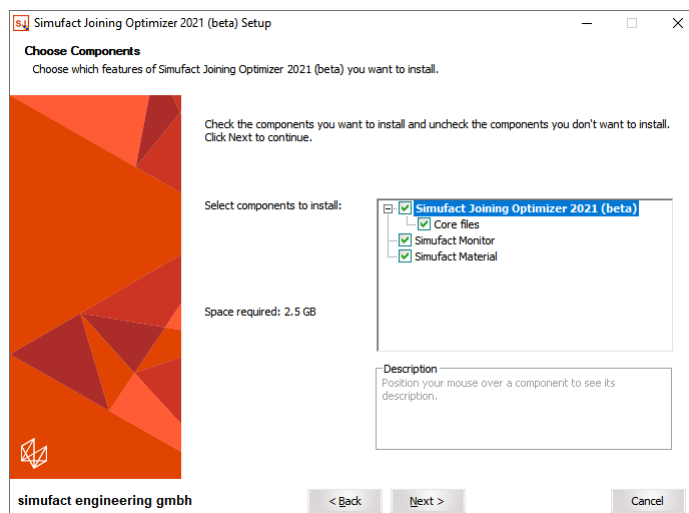


Figure 1.6. Choosing components

By default the following products are selected to be installed: Simufact Joining Optimizer, Simufact Material and all Simufact Utilities. Additional programs will not be installed if you deselect the corresponding option. After the installation the removal of specific components is possible as part of the uninstallation, see Section 1.1.3

The installation procedure will check if any programs are running that would conflict with the installation and will display a list of these programs. If you get this, close the mentioned programs before continuing the setup. Once the list of blocking programs is empty, press **Install** to start the installation.

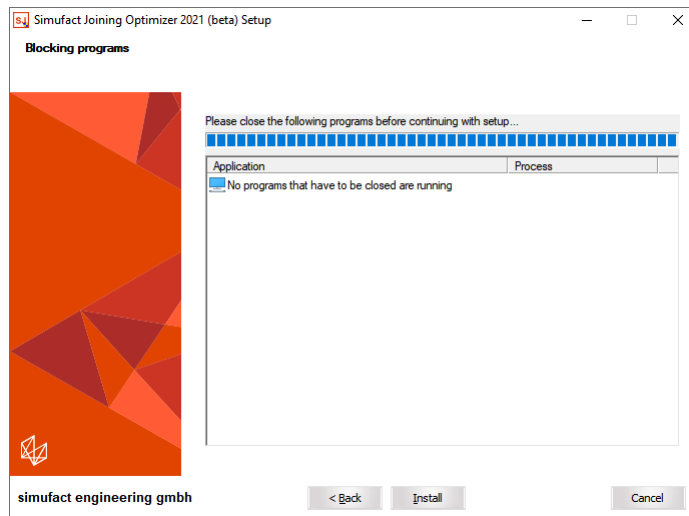


Figure 1.7. (Empty) list of blocking programs

Older versions of Simufact Material and Simufact Monitor in the same installation path are updated during the installation procedure. You will see a message about this, select **Yes** to continue. These utilities are shared between all Simufact programs and all versions of them. You should always use only the latest version. Do not try to run different versions of these utilities in parallel as this may result in different kinds of mal functionality.

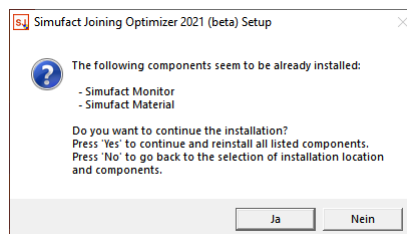


Figure 1.8. Reinstallation of utility program components

The Simufact Joining Optimizer 2021 can be used in parallel with previous versions. Please note that you cannot run different versions of Simufact Material and, Simufact Monitor in parallel. Here we recommend using the latest version.

If you want to change something, you can go back to your previous selections by clicking **Back**. Otherwise start the installation by clicking **Install**. By clicking **Cancel** you can quit the installation.

1.1.1.6. Confirming the installation

The installation is fully automatic – the completion bar will inform you about the installation progress. The installation cannot be canceled anymore at this point.

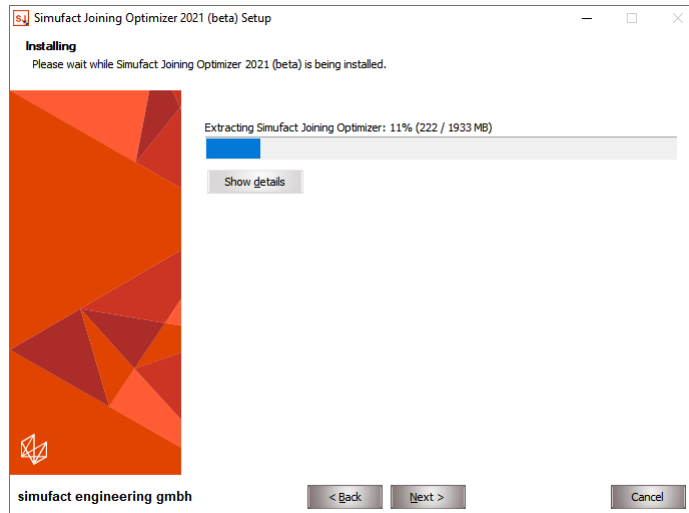


Figure 1.9. Installation progress

By default, the file extension `.sjproj` is associated with the Simufact Joining Optimizer.

1.1.1.7. Complete setup

At the end of the installation you will be informed accordingly by the setup program. You only have to press **Finish** to end the setup.

The installation wizard closes and you can use the installed Simufact products. If the required Microsoft™ C++ and Intel FORTRAN™ Redistributable Packages have not already been installed on the machine before, the installer has installed them. **In this case you may be asked to reboot the machine once the installation has finished.**

If the required Intel FORTRAN™ Redistributable Packages have not already been installed on the machine before, the setup may not be able to perform all configurations completely. In this case a pop-up message will tell you "The installation of the Simufact Joining Optimizer finished. For further configuration please start the Simufact Joining Optimizer from the desktop after the setup is completed." If you get this message start the Simufact Joining Optimizer as administrator after the setup and potentially the reboot are completed and perform the settings described in Section 1.1.1.9 below for all users.



Figure 1.10. Installation finished

1.1.1.8. Show the What's new document

In case you haven't actively deselected the option **Show What's new**, the document *What's New* is shown after clicking **Finish**. It shows the fundamental program improvements. Enjoy reading!

1.1.1.9. User settings

When the Simufact Joining Optimizer or Simufact Material are started for the first time, they will ask you to perform initial setup actions. If you want to transfer the configuration of the previous version, just check the corresponding check box and the application will copy the existing settings into the .ini file of the new version.

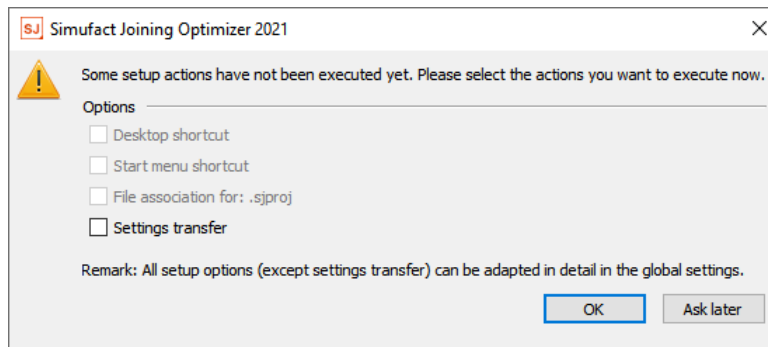


Figure 1.11. Setup options

Please note that version-dependent settings will be excluded. For example the location of a solver executable cannot be copied from the previous settings. The settings can be changed later in the global options of the Simufact Joining Optimizer, which may require to start the GUI as administrator to change or overwrite settings done for all users.

1.1.2. Silent installation

In order to install the software without any user interaction, for example on multiple machines using a script, the setup supports a silent installation mode. To use the silent mode, please open a command line and type the name of the setup followed by `/S` and the following valid parameters:

Table 1.1. Allowed parameters

Accept license notice	<code>/AcceptLicenseNotice=yes</code>
To install the Simufact Joining Optimizer	<code>/Joining=yes</code>
To install Simufact Material	<code>/Material=yes</code>
To install Simufact Monitor	<code>/Monitor=yes</code>
Installation path (must be the last parameter)	<code>/D=c:\some folder</code>

If the installation path is not provided, `C:\Program Files` will be used by default. If the parameter for a program is not specified, it will not be installed. The Microsoft Visual Studio™ and Intel FORTRAN™ Redistributable Packages will always be installed. Please note that the destination folder (for example `C:\Program Files`) must exist before the setup is started.

You must confirm the following copyright by adding `/AcceptLicenseNotice=yes` to install the software:

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Examples:

- To install all programs to user dir:

```
setup.exe /S /AcceptLicenseNotice=yes /Joining=yes  
          /Material=yes /Monitor=yes  
          /D=C:\Users\\Program Files
```

- To only install Simufact Material:

```
setup.exe /S /AcceptLicenseNotice=yes /Material=yes
```

- To only install Simufact Utilities:

```
setup.exe /S /AcceptLicenseNotice=yes /Monitor=yes
```

Normally the process `setup.exe` will return immediately if started from a script. You can circumvent that by starting it as follows:

```
start /WAIT setup.exe
```

with the options as given above.

A log file named `setupSimufact.log` will be created in your temporary directory (typically `C:\Users\\AppData\Local\Temp`) where the steps of the installation/uninstallation are recorded.

After the silent installation you need to review resp. set the environment variable `MSC_LICENSE_FILE` to configure your license. Typically it points to `portnumber@hostname`. See introduction remarks and Section 1.1.1.3 above as well as the Appendix A. To do so in a script you can use

```
setx /m MSC_LICENSE_FILE portnumber@hostname
```

to set this environment variable system wide (option `/m` requiring administrator privileges).

Another useful environment variable is `SF_LANGUAGE` which sets the language used in the graphical user interface. You may want to preset this for the user in the same way. Depending on the Simufact application used the following values may be supported: EN, DE, JA, PL, RU, TR, ZH-CN, ZH-TW.

Simufact applications have several configuration options, including for example the preferred unit system, custom databases used, colors, color legends, user defined result values or the possibility to display your company logo in the results. These and numerous other user preferences can be set in the graphical user interface and will be stored in ini-files in `%PROGRAMDATA%\Simufact` and in `%APPDATA%\Simufact`. Before you rollout the Simufact application you may want to configure a master installation manually and save the adapted ini-files to a template directory. The complete silent installation of the Simufact Joining Optimizer as part of your software rollout will then be done with a script that includes the following steps:

1. Run `setup.exe` in the silent mode.
2. Set `MSC_LICENSE_FILE`
3. Set `MSC_LICENSE_SF_WAITINGTIME` (compare Section 2.1.2)
4. Set `SF_LANGUAGE`
5. Copy the saved ini-files from your template directory to `%PROGRAMDATA%\Simufact` and `%APPDATA%\Simufact`.

1.1.3. Uninstallation

You can use the Windows Control Panel to uninstall the **Simufact Joining Optimizer**. Alternatively you can use the generated uninstaller `Uninstall Simufact Joining Optimizer 2021.exe` located in the installation folder directly. You can select the components to be uninstalled.

The uninstaller supports a silent mode, too. For the silent mode start the uninstaller with the option `/S` using the command line. Please note that all components installed before will be removed. There are no options to select certain components in the silent mode of the uninstall.

Example:

```
"Uninstall Simufact Joining Optimizer 2021.exe" /S
```

1.1.4. Queueing

If no more licenses are available, the simulations will not start or continue but reach the status "Waiting for License", see Section 2.1.2. This may be used to implement a simple, short-term quasi batch mode in all situations where licenses are shared between different users or machines. Note that this is *not a traditional queue*. The waiting simulations are collected in a pool and will be started in a random order that can not be influenced once a license is available again.

In a single user, single workstation environment the **Simufact Monitor** offers a simple but flexible batch queue for simulations, which is - in this environment - a better choice than using the status "Wait for license" as quasi batch mode.

2

Troubleshooting



A list of known issues of this version of the Simufact Joining Optimizer is given in the [Release Notes](#). Please review this list as part of your troubleshooting activities.



For troubleshooting license issues, please see [Appendix A](#) which describes the configuration, managing and troubleshooting of MSC Licensing, the license system used for the Simufact Joining Optimizer.

2.1. Troubleshooting on Windows™

2.1.1. General hints

2.1.1.1. Issues with the display of the graphics, e.g. missing colors

As stated in the [Release Notes](#), the Simufact Joining Optimizer needs OpenGL to work correctly, otherwise different malfunctions of the graphical display may occur, for example missing colors, windows not opening, missing texts in the graphics windows, and similar. If you experience this issues, check the specification of your display adapter and check and update its driver. If your computer has multiple display adapters ensure that the `simufact.joining.exe` is always completely handled by the correct display adapter. In Windows 10™ this is configured under [Settings / System / Display / Graphics settings / Graphics performance preference](#). The software of your display adapter may have additional settings.

Intel™ (U)HD onboard / onchip graphic adapters, which are frequently used in laptops, are known to cause various errors and are strictly not supported. The errors are frequently well hidden and hard to detect for new users. Beside other, the menus after right mouse click can be shorted not offering all options and the picking of points can be blocked. If you can not remove the Intel adapter from your system or deactivate it in the BIOS of the machine and you have a second display adapter in your system, configure it to be used (see above).

Typically the Simufact Joining Optimizer works smooth in Remote Desktop environments, in particular with the standard Windows Remote Desktop. However issues with the display of graphics are more likely to happen and harder to debug in these environments, especially when combined with virtual machines. Please contact your local IT when you experience issues in these environments.

If you can not solve the display issues by other means, you can try whether it helps to set the environment variable `QT_OPENGL` to `angle` (in small letters). This will enable an internal conversion of OpenGL to DirectX. Please expect a significant performance decrease with this. An alternative value of `QT_OPENGL` is `desktop`. Please see [Appendix C](#) for setting environment variables.

2.1.1.2. Firewall, ports and MPI

The firewall blocks some ports which are needed for Simufact™ services such as the remote service, licensing and the MPI service. So if you do not want not deactivate the firewall completely, please make sure that the port 9985 (Simufact Monitor) as well as the ports used for MSC Licensing are not blocked. Compare, [Appendix B](#) too.

2.1.1.3. Antivirus software

Antivirus software sometimes can hinder some subprograms of Simufact™ to be installed, so it is strongly recommended to deactivate all antivirus software during the installation.

Antivirus software may slow down simulations considerably. Especially avoid that all files read and written on the local disk are scanned for viruses. The solvers and the GUI have a huge file I/O.

Some times antivirus software blocks files while they are checked. This may lead to random crashes of the Simufact Joining Optimizer, in particular of the solvers. If you experience such problems, deactivate your antivirus software.

2.1.1.4. Energy saving mode

Some calculations can sometimes take place over night. So if the energy saving mode is activated, the machine will go into standby mode after a certain time before the calculation has finished and thus the job is aborted. The suspend energy saving mode may not abort simulations as they will recover once the computer wakes up again. But for sure there will be no progress of the simulation during the suspend mode. The energy saving modes are triggered only by the user activity, not by the CPU activity. It is recommended to deactivate the energy saving mode completely on a machine used to run simulations.

2.1.1.5. Dell™ backup and recovery

Beside its high usage of CPU, the Dell backup stops some services (possibly the remote service or the license server) during the backup process, so it is recommended to deactivate this software.

Some versions of the Dell backup and recovery software conflict with Simufact applications causing these to crash, especially during "file open ..." dialogues. It is recommended to uninstall the Dell software in this case. See the [Release Notes](#) for more details.

2.1.1.6. Windows™ updates

It is recommended to disable automatic system updates, because the related reboot aborts all running Simufact simulations. In Windows 10 Pro™ you can use the Group Policy Editor for this:

1. Press Windows™ key + R to gain access to the Run dialog and type gpedit.msc.
2. Navigate to the following directory: Computer Configuration \ Administrative Templates \ Windows Components \ Windows Update.
3. Double-click on "Configure Automatic Updates" in the right hand panel.
4. Set the configuration to Enabled on the left-hand side and then choose "Notify for download and notify for install" from the drop-down list under the Options header.

2.1.1.7. INI files

INI files are created for Windows™ in

- C:\Users\\AppData\Local\Simufact (%localappdata%),
- C:\Users\\AppData\Roaming\Simufact\ (%appdata%),
- C:\ProgramData\Simufact\ (%programdata%).

They contain paths (e.g. for your company logo to be displayed in the results window), settings and other information. In case of problems with these settings, please check the contents of these INI files and - if necessary - edit them manually. If your setting files have been seriously corrupted for some reason, you can delete them or rename them to keep copies. If the Simufact Joining Optimizer is started without INI files, INI files with all default settings will be created.



The INI files are not deleted during un-installation and will not be reset during a re-installation of the Simufact Joining Optimizer. Thus, if you consider re-installing the Simufact Joining Optimizer to fix some issues, consider deleting the INI-files, too.

2.1.2. Status "Waiting for License"

If a license can not be granted the Simufact Joining Optimizer and especially the solver will frequently not exit with a license failure, but go into the status "Waiting for license". The environment variable

MSC_LICENSE_SF_WAITINGTIME is used to control the maximum duration of this status. The value of this variable is the time in minutes after which the solver exits with license failure if no license is granted in the meantime. The permissible range are integers between 0 and 43200 minutes (30 days). The default is 4320 minutes (3 days). See Appendix C for how to set and change environment variables.

While this prevents from simulations to abort for example in the case of network troubles and while this may be used as a simple batch queue, it may prevent license problems to become obvious at once. In the status line of the GUI the status "Waiting for license" will be displayed. The log-file of the solver will show repeated messages about the license query. In the working directory of the solver a file named `jobname_pid.loc` will indicate the status "Waiting for license". The content of this files shows the required licenses. Deleting `jobname_pid.loc` will stop the simulation. This is done during a smart stop from the GUI, too.

In a single user, single workstation environment the Simufact Monitor offers a simple but flexible batch queue for simulations, which is - in this environment - a better choice than using the status "Wait for license" as quasi batch mode.

2.1.3. Problems with Shared Libraries (DLLs)

Simufact applications rely on Microsoft™ C++ and Intel™ Fortran Redistributable packages providing a wide range of DLLs. These redistributable packages are installed during the installation of the Simufact Joining Optimizer. If you experience problems that mention some DLL, it is likely that this installation has failed or that the redistributables have been overwritten by the later installation of a 3rd-party application.

Note: Not in all cases error messages mentioning DLL related problems may be displayed if internally subprograms, like the meshers, are called. You can call the subprograms as stand-alone programs to check on this. Or you just proceed with the hints given below if you suspect issues related to DLLs.

The Microsoft C++ Redistributables install into the system directories.

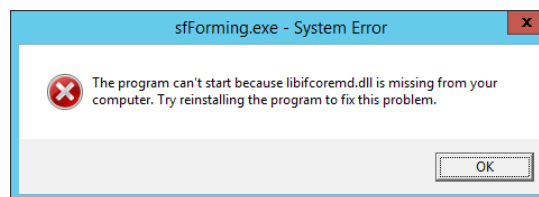


Figure 2.1. Error due to not found Fortran Redistributables

Figure 2.1 shows a typical error message occurring when the Simufact Joining Optimizer is started but the required Intel Fortran Redistributables can not be found. Frequently this is not because the installation failed, but due to configuration issues with the search PATH for programs and libraries. The Intel Fortran Redistributables install in a special directory and are referenced by the environment variable PATH. PATH is defined using the environment variable INTEL_DEV_REDIST set by the installer. The directory with the redistributables is not included literally in the definition of PATH. If the expansion of the nested variables fails, the Fortran Redistributables will not be found. You can test this if you execute `set` on the command prompt: INTEL_DEV_REDIST must not be contained in PATH literally, but must be expanded to its value. Some times a reboot helps to archive this. If not, check the definition of the environment variables in the system control. It may help if both, PATH and INTEL_DEV_REDIST, are either user or system variables. If this does not help, redefine PATH in the system control by replacing `%INTEL_DEV_REDIST%` with its value. Reinstalling the redistributables or even the Simufact Joining Optimizer, will *not* help. See Appendix C for the review and configuration of environment variables.

The directory `3rd-party` of the Simufact Joining Optimizer download contains the needed redistributables. If needed, you can reinstall them from there directly without re-installing the Simufact Joining Optimizer.

Some times 3rd-party applications install their DLLs in the system directories, but this DLLs conflict with DLLs the Simufact Joining Optimizer includes within its installation. As the system directories are checked first, errors can occur. In this case delete the DLLs from the system directories and place them in the installation of the 3rd-party application. One example for this is the `tbb.dll`.

2.1.4. The GUI does not appear after launching the program

- Make sure that the license feature to open the GUI on your machine is available and valid. You should get an error message with the possibility to review the licenses if no licenses are available for the GUI.



During start-up the Simufact Joining Optimizer will query all license servers specified in the environment variable `MSC_LICENSE_FILE` for all potentially existing license features to be able to configure it self based on the available licenses. If one of the license server is not available or responds very slow, it may take very long before the GUI either opens based on the found licenses or displays an error message about missing licenses. If you suspect this issue, check the connection to all your license servers or reduce `MSC_LICENSE_FILE` to include only one license server known for fast response. The solver is not affected by this as it checks only for the licenses actually needed and stops when getting the first license.

If it takes more than 5 seconds for a license server to respond, an informative warning message is displayed.

- Make sure that the target `"...\\simufact\\joining\\2022\\bin\\simufact.joining.exe"` of the shortcut to launch the program is correct.
- Open a command prompt, navigate to the installation directory and start `...\\simufact\\joining\\2022\\bin\\simufact.joining.exe` from within the command prompt. Watch for errors.
- Check in the Windows™ Taskmanager whether `simufact.joining.exe` is running. Note: The Windows™ pop-up messages indicating an application crash may be disabled on your system.

2.1.5. Windows error dialog "Program has stopped working"

If an application aborts unexpectedly resp. crashes Microsoft Windows™ typically displays an error dialog indicating this. While this is useful in most cases because it shows that the application was not closed by the user unintentionally or reminds that the application was running on an unwatched computer (for example over night) and generally indicates a major issue, the error dialog can prevent fall back mechanisms to work correctly. For example the meshers of Simufact will retry a failed remeshing during the analysis with settings a couple of times before giving up. If the mesher crashes during one of this trails, the "Program has stopped working" dialog needs to be confirmed before the next fall back is done. Similar issues may occur during automated optimization runs or in other batch operations. Thus you may want to turn off or on this Windows error dialog as needed.

To switch off the Windows error dialog "Program has stopped working" you need to change in the Windows Registry in the key `HKEY_CURRENT_USER\\Software\\Microsoft\\Windows\\Windows Error Reporting` the setting `DontShowUI` from 0 to 1. You may have to create this setting first.

2.2. Log files

The software writes several log files that provide additional information that might be helpful in case of problems:

- **Solver:** The solver write extensive information in the `log-` and `out-`files in the `_Run_` directory of each simulation. These files contain logging information of the **meshers**, too. They are the first place to check about not starting or aborting simulations. They can be used to judge the simulation progress, too.
- **Simufact Joining Optimizer GUI:** Keeps track of what the user does and what the program does internally.
- **License client:** keeps track of granted and denied licenses.
- **Simufact Joining Optimizer memory dump:** If the GUI or an auxiliary program crashes, this file contains detailed information that might help our programmers to locate and fix the causes that led to the crash.

Generally the log files will clean up them self. Only a limited number or a limited size is stored. Normally no user interaction is needed to delete old log files.

2.2.1. Simufact Joining Optimizer GUI

Path: %localappdata%/Simufact/log

Contents: Keeps track of what the user does and what the program does internally.

```

USE 1026 13:05:55.530463 1292 General Check license
USE 1026 13:05:55.746558 1292 General Open main window
USE 1026 13:05:58.052950 1292 General Create new project
DET 1026 13:05:58.055965 1292 General Units: mm, ton, C, s, deg., kN, MPa, J, kg/m3, rotation/min, mm/s, J, mm3
USE 1026 13:05:58.071094 1292 General Show object catalog
USE 1026 13:05:58.072685 1292 General Insert new process
USE 1026 13:06:01.509454 1292 Settings Created process type in application module 'Cold forming' and with proces
WAR 1026 13:06:02.233372 1292 General QFileInfo:abaolutePath: Constructed with empty filename
USE 1026 13:06:02.238461 1292 General Create new process preview for 'FormingFe3D'
DET 1026 13:06:02.239461 1292 General Create frame 0x9b00ef0
DET 1026 13:06:02.248467 1292 General Create view 0x9b24840
USE 1026 13:06:02.259164 1292 General Created new Qt view wrapper (FormingFe3D - Model view): (ID 4056)
WAR 1026 13:06:02.258664 1292 General QLayout: Attempting to add QLayout "" to QGroupBox "", which already has
PRO 1026 13:06:13.201246 1292 General QLayout: Attempting to add QLayout "" to vi:AnimationToolBar "animationT
PRO 1026 13:06:13.201246 1292 General Create autohshape cube (xyz = 0.002 / 0.003 / 0.005, refine = yes, minimal
PRO 1026 13:06:15.298223 1292 General Insert new item into object catalog: Cube
PRO 1026 13:06:15.298724 1292 General Assign item in tree view: item Cube, parent Workpiece
USE 1026 13:06:54.586088 1292 General Process tree: rename Workpiece as Cube
DET 1026 13:07:02.835882 1292 General Open the <Translate> dialog
DET 1026 13:07:02.835882 1292 General New transformation matrix of Cube:
DET 1026 13:07:02.835882 1292 General      1      0      0      0
DET 1026 13:07:02.835882 1292 General      0      1      0      0
DET 1026 13:07:02.835882 1292 General      0      0      1      0
DET 1026 13:07:02.835882 1292 General      0.0023      0      0      1

```

Figure 2.2. Simufact Joining Optimizer GUI log file

Format:

- message type (USE = user, WAR = warning, PRO = progress, DET = details)
- date
- time (with microseconds)
- thread ID
- topic
- message

2.2.2. License client

The messages of the license client get part of the messages in the log- and out-files of the solver and of the meshers. The GUI does not log this.

Note: The MSC Licensing license server has its own log-file `lmgrd.log` showing useful information and among this the granted licenses.

2.2.3. Simufact Joining Optimizer memory dumps

Path: %LOCALAPPDATA%\CrashDumps (the standard Windows™ location), may differ if old versions have been installed before.

Contents: If the GUI or an auxiliary program crashes, this file contains detailed information provided by the operating system (error message, call stack etc.) that might help our programmers to locate and fix the causes that led to the crash. You may be asked by our support for this file. The memory dump files contain no personal or model specific information and indicate only the internal routine that crashed. Additional information about what was done when the crash happened is needed. A maximum of 10 files is kept.

Memory dumps are only created if the Windows Registry keys for the respective Simufact executable shown in the figure below exist. They are created during the installation of the respective Simufact application, but may become deleted by Windows Updates or other means. You may have to recreate them manually.

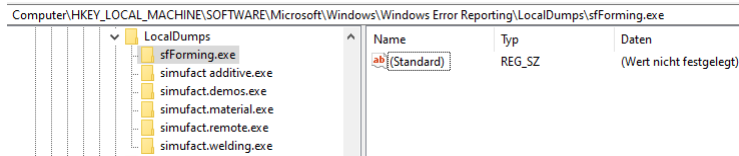


Figure 2.3. Window Registry keys needed for memory dumps

2.3. Support

Although the simple and intuitive use of our software is one of our main focuses, the design of some complex processes requires additional training courses. Troubleshooting can also become difficult and time-consuming for unexperienced users. Generally it makes a lot of sense that the user solves these problems by himself in order to gain experience, but often a tight schedule does not allow this. For this reason Simufact offers an extensive support to our customers.

Please note that only the current version and the previous main version of the product in question can be supported.

Please direct your support requests always to your local Simufact or MSC representative where you bought the software. For our global sales & support network please see: <https://www.simufact.com/global-sales-support.html>

In the help section of the Simufact Joining Optimizer menu you can find an Infosheet that describes how to contact the Simufact support and what information needs to be provided to enable a efficient solution of your problem.

Appendix A. MSC Licensing: Configuring and managing licenses



MSC Licensing, the FLEXlm based licensing software used for Simufact and MSC products, is shipped with its own documentation. A lot of additional information is available, too. This appendix is not intended to be a comprehensive information about MSC Licensing, only the most common tasks and situations when configuring and managing licenses are described and some more in depth topics are shortly mentioned. In case of deviations between this documentation and the MSC Licensing resp. FLEXlm documentation the later shall prevail.



The license system consists of a client, this is the Simufact application you want to run, and a server, that is the software service that provides the licences based on a license file. Additionally there are graphical and command line utilities for configuration and status information purposes.



If you are using Simufact Remote (Simufact Forming only) you need to to stop and start again the Simufact Remote service ("Local server") after you have changed the license configuration or after you have updated the license file (do not use the "restart" option of the operating system for this, use stop and then start). Otherwise the license changes may not be recognised by Simufact Remote, which may result in unexpected errors.

A.1. Configuring the license client

The license client is configured only using the environment variable `MSC_LICENSE_FILE`. This variable tells the Simufact application where to look for the license. `MSC_LICENSE_FILE` is typically something like `'portnumber@hostname'` pointing to a license server, which applies to nodelocked licenses, too. Only in rare special cases, which are explicitly instructed in the delivery letter of the license file, `MSC_LICENSE_FILE` directly points to the license file. `MSC_LICENSE_FILE` may be a list with multiple entries separated by ";" (Windows™) or ":" (Linux™). These entries are queried in the order given.

Please note that `MSC_LICENSE_FILE` may be a system wide environment variable - recommended in most cases - or a user specific environment variable. For the configuration of environment variables please see Appendix C.

The value of `MSC_LICENSE_FILE` is displayed in the settings dialog of the Simufact application under Licenses and in all cases of a license failure. Further more it can be reviewed using the means provided by our operation system. Frequently using the command line is simple and fast for this: `set` shows a list of all environment variables, `echo %MSC_LICENSE_FILE%` (Windows™) resp. `echo $MSC_LICENSE_FILE` (Linux™) display just this variable.

`MSC_LICENSE_FILE` can be set during the installation (Windows™) or configuration (Linux™, only Simufact Forming) of your Simufact application, but changing it afterwards is not supported within the Simufact applications or within MSC Licensing. Use the means provided by our operation system for this, see Appendix C.

A.2. Firewall considerations

The license server of MSC Licensing uses two services: The FLEXlm main service called "lmgrd" and the vendor service called "MSC". Both use different ports. Thus if you have a firewall between license server and client, you need to open both ports. The port used by the main service is configured during the installation of MSC Licensing and is specified on the clients within the environment vari-

able `MSC_LICENSE_FILE`. As default the port used by the vendor service is randomly chosen during startup. But it can be configured in the license file, which enables a constant firewall configuration.

To configure the port to be used by the vendor service, add `port=your_number` to the end of the `DAEMON` line in the top of the license file (see example blow) and restart the license server service either using the buttons provided in the graphically `MSC Licensing Utility (LMTOOLS)` on the **Start/Stop/Reread** tab or using the means provided in the service control of your operating system.

The port to be used by the main service is given as last argument in the `SERVER` line in the top of the license file, thus it can be reviewed and changed there. Please see Appendix B for how to open ports on a firewall.



Resulting from this and other configurations there are differences between the license file as it is shipped to you and as it is used by the license server.

```
SERVER ING08 1813731e3d93 27500
DAEMON MSC "C:\Program Files\MSC.Software\MSC Licensing\Helium
\msc.exe port=27501
#
# MSC License Reference ID: WXYZ
#
# Simufact
#
FEATURE SF_FORM_GUI MSC 2018.0309 09-mar-2018 2 F92DAC800190 \
VENDOR_STRING=PID:10653 ISSUED=11-mar-2017 ck=103 \
```

A.3. Updating the license file

After a renewal of your maintenance or lease period and on other occasions you will receive an updated license file. Please note that you will typically not receive a new license file once a new release of your Simufact applications has been published. To update the license file used by your license server, follow the following steps:

1. Locate the used license file in the installation directory of `MSC Licensing` - typically `license.dat` in `C:\Program Files\MSC.Software\MSC Licensing\Helium` - and create a backup copy of it.
2. Stop the license server service, either using the button provided in the graphically `MSC.Licensing Utility (LMTOOLS)` on the **Start/Stop/Reread** tab or using the means provided in the service control of your operating system.
3. Copy the received new license file `license.dat` into the installation directory of `MSC Licensing` replacing the old already existing file.
4. Manually edit the new `license.dat` as shown below. The automatic configurations done in the license file during the installation of `MSC Licensing` have to be reproduced, potential manual configurations in the license file (for example for a firewall, see above) have to be reproduced, too.
5. Restart the license server service, either using the button provided in the graphically `MSC.Licensing Utility (LMTOOLS)` on the **Start/Stop/Reread** tab or using the means provided in the service control of your operating system.

The top of a license file as it is shipped typically looks like:

```
SERVER this_host 1813731e3d93 27500
DAEMON MSC /your_path/msc
#
# MSC License Reference ID: WXYZ
#
```

```
# Simufact
#
FEATURE SF_FORM_GUI MSC 2018.0309 09-mar-2018 2 F92DAC800190 \
VENDOR_STRING=PID:10653 ISSUED=11-mar-2017 ck=103 \
```

If for example your license server machine has the IP-name ING08, you have chosen to use port 1700 for the main license service, you have installed in the default location and you have - which is optionally - manually set a port for the vendor service, you have to edit the new license file to look like this:

```
SERVER ING08 1813731e3d93 1700
DAEMON MSC "C:\Program Files\MSC.Software\MSC Licensing\Helium
\msc.exe" port=1701
#
# MSC License Reference ID: WXYZ
#
# Simufact
#
FEATURE SF_FORM_GUI MSC 2018.0309 09-mar-2018 2 F92DAC800190 \
VENDOR_STRING=PID:10653 ISSUED=11-mar-2017 ck=103 \
```

Please note that the above modifications are an example which has to be adapted to your local settings. **It is recommend to review the old, working license file to check which adaptations are needed in the new license file.**

A.4. Releasing Licenses

If the Simufact application or the Simufact solver ends, the license is released and can be used for the next simulation or GUI. This works pretty reliable, even if the application or solver has no clean exit resp. crashes. However in rare circumstances, especially when the operating system crashes or if the network connection is changed back and forth between LAN and WLAN or if VPN is (dis-)connected, licenses may not be released correctly. Because of this it can be useful to configure the license server in a way that licenses are released after a certain timeout if the connection to the license client is lost.

For this create a file `msc.opt` and place it in the installation directory of the license server where the license file `license.dat` is located, too. The content of `msc.opt` is for example:

```
TIMEOUTALL 1000
```

1000 is the configurable time in seconds after which the license server will release licenses when there is no contact with the license client any more. Timeouts below 900 seconds will be ignored, thus the license will never be released. Additionally this option file needs to be referenced in the DAEMON line in the license file:

```
SERVER ING08 1813731e3d93 27500
DAEMON MSC \
"C:\Program Files\MSC.Software\MSC Licensing\Helium\msc.exe" \
"C:\Program Files\MSC.Software\MSC Licensing\Helium\msc.opt" \
port=27501
#
# MSC License Reference ID: WXYZ
#
# Simufact
```

Note that the DAEMON line is one logical line with the \ as line wrap character to keep the text line together. `port=...` is optionally, see Section A.2. **Restart the MSC Licensing service after these changes to activate the usage of the option file.**

To release individual licenses the command line utility `lmutil.exe` shipped and installed with MSC Licensing can be used. This should work on the license server and if the access to `lmremove` and

lmdown has not be restricted to the host or user running the license server (there is an option for this in the graphically MSC Licensing Utility (LMTOOLS)) from every host for every user that has access to lmutil.exe. The syntax to release an individual license is:

```
lmutil lmremove -c port@License_server_name LicenseFeature User  
ClientMachine ClientDisplay
```

The required information for this can be gathered using:

```
lmutil lmstat -a -c port@License_server_name -f LicenseFeature
```

The output will generally be User, ClientMachine, ClientDisplay, version, For the LicenseFeature names see the license file license.dat. For their current usage see the license overview in the settings of the Simufact application. For more options of lmutil.exe see Section A.8.

A restart of the license server service will release all licenses. The Simufact application and the Simufact solver normally recover from this when they can contact the license server again and can re-checkout the required licenses.

A.5. Combination with other MSC products

If you have licensed Simufact and other MSC products on the same license server, MSC Licensing is needed only once on this machine, actually it must only be used once on this machine. But you will receive separate license files for Simufact and other MSC products at separate times and from separate senders. You have to combine these license files for the usage by the license server.

The recommended method to do so is:

1. Install and configure MSC Licensing either for the Simufact application or for the MSC application in the normal way using only the corresponding license file. Test your installation.
2. Stop the license server service, either using the button provided in the graphically MSC.Licensing Utility (LMTOOLS) on the **Start/Stop/Reread** tab or using the means provided in the service control of your operating system.
3. Open the license file in the installation directory of MSC Licensing - typically license.dat in C:\Program Files\MSC.Software\MSC Licensing\Helium - with a text editor and copy all FEATURE lines of the 2nd license file into it. Additionally you may add some comment lines starting with # to separate the licenses for the different products. Please note that one FEATURE line typically consists of several lines of text. The \ at the end of a line of text indicate that the FEATURE line continuous in the next line of text. Please take care to copy all FEATURE lines complete and unchanged. Do not copy the SERVER and the DAEMON line of the 2nd license file.
4. Restart the license server service, either using the button provided in the graphically MSC.Licensing Utility (LMTOOLS) on the **Start/Stop/Reread** tab or using the means provided in the service control of your operating system.

Once you receive an updated license file for one of your Simufact or MSC products, repeat the steps above, but do not add FEATURE lines during copying but replace the existing FEATURE lines with the updates lines. Frequently 1st deleting all FEATURE lines of a product in the license file in the installation directory and then copying the new lines will be a good approach.

As an alternative advanced users may configure and maintain separate license files for different products. See the tech article KB8021145 in the MSC SimCompanion Knowledge Portal for details.

A.6. Combination with 3rd party products

MSC Licensing is based on the FLEXlm license management software of Flexera Software (www.flexerasoftware.com). FLEXlm is widely used of a lot of applications of different software

vendors. Typically no special care is needed when running applications of different vendors that use the FLEXlm license management system. Conflicts are rare. Nevertheless here some hints about this.



Try to avoid the usage of the general FLEXlm environment variable `LM_LICENSE_FILE`. In rare conditions of license server and license client machines cross referencing each other for different applications this may result in conflicts including non-functionality. Use the vendor specific environment variables like `MSC_LICENSE_FILE`, `HPQ_LICENSE_FILE` or similar instead. If conflicts can not be solved with this, encapsulate the concerned license server and / or applications into their own environment.

If the same machine is used as license server for both, Simufact and MSC applications as well as for a 3rd party application that uses a FLEXlm based licensing system, we recommend to keep the installations separate and to run each vendors FLEXlm license server as a separate process on the same machine. The resources needed for this are very little. Keeping the installations separate simplifies the maintenance of the licenses and avoids conflicts, for example resulting from different required FLEXlm versions.

However, if desired, a common "lmgrd" main license service can be used. In this case the license files of all vendors would need to be combined including the required `DAEMON` and `VENDOR` lines as well as the other options that may be present. For more information, documentation and help for this option, please see the relevant FLEXlm resources. This is outside of the scope of the support of Simufact and MSC.

A.7. Restrictions

Within one license file each `FEATURE` can only be included once. Within one license file shipped to you all features will be of the same type (nodelocked or networking) and will have the same maintenance end date and the same expiry date. Furthermore a license file shipped to you may not include all your licensed features, but only the latest additions and changes. Thus, in case you purchase or lease additional Simufact products or modules during your maintenance or lease period, you will have to combine the new license file shipped to you and the already running licenses manually similar to the procedure explained in Section A.5 above.

In cases like a short term lease of additional simulation capacity or a test of the effectivity of for example more parallel options where the additional licenses expire before your regular license, you will probably receive a license file with `FEATURE` lines containing the sum of your licensed quantity, but expiring at the earliest date. In this case you first have to backup your used license file. Then you have to delete these features from your used license file and to add the new received `FEATURE` lines with the sum of your licensed quantity. After the expiry of the short term licenses you have to switch back to using your original backed-up license file.

Remember to stop and to start your license server service after each change of your license file.

A.8. Troubleshooting

- If a license can not be granted, Simufact applications frequently do not exit with a license failure, but go into status "Waiting for license", see Section 2.1.2.
- The license server service writes a log file, typically `C:\MSC.Software\MSC Licensing\Helium\LOG\lmgrd.log`. This file contains useful debugging information. Read it carefully if there is a license issue. Besides information about the license server, every client request should be echoed in this file.
- During start-up the GUI will query all license servers specified in the environment variable `MSC_LICENSE_FILE` for all potentially existing license features to be able to configure it self based on the available licenses. If one of the license server is not available or responds very slow,

it may take very long before the GUI either opens based on the found licenses or displays an error message about missing licenses. If you suspect this issue, check the connection to all your license servers or reduce `MSC_LICENSE_FILE` to include only one license server known for fast response, exclude license servers that serve only other MSC products. The solver is not affected by this as it checks only for the licenses actually needed and stops when getting the first license.

If it takes more than 5 seconds for a license server to respond, an informative warning message is displayed. This may be because a license server is unavailable, invalid or responding very slow.

- Take care that the value of `MSC_LICENSE_FILE` does not contain any spaces, including spaces at the end of the license server name.
- MSC Licensing is shipped with the powerful command line debugging tool `lmutil`. Check `lmutil -help` for the available options. Some typical tasks are:

`lmutil lmhostid` to get a list of valid host-IDs of the machine used. In rare circumstances this may deviate from the output of `getmac /v` or `ipconfig /all` (both on Windows™) that are typically used when determining the host-ID before applying for a license.

`lmutil lmcksum -c license.dat` to check the syntax and the checksum of the license file, which is useful if issues due to the transmission or the editing of the license file are suspected.

`lmutil lmstat -a -c portnumber@hostname` to check the status of the license server and the vendor services including a list of license features that can be served. As the output may be bigger, you may want to redirect it to a file by adding `> status.txt` at the end of the command line.

`lmutil lmdiag -c portnumber@hostname -n > diag.txt` to review diagnostic information about all license features served including whether they can be checked out and reasons why they can not be checked out. As the output of this command is typically quite large, it is recommended to redirect it to a file.

- Some times network license servers respond too slow to license requests causing license failures without obvious reasons. “Too slow” is some thing in the internal communication, the license failure appears (for the GUI) nearly quite as fast as a denied license, much faster than it appears if the network connection is gone. These issues got more relevant starting with Simufact Welding 8.0, Simufact Additive 4.0 and Simufact Forming 16.0. The same license server may work for one client, but not for an other. The typical error message is: `FlexNet Licensing error:-96,...` Setting the environment variable `FLEXLM_TIMEOUT` on the license client to for example 500000 can help in these cases. The value may have to be increased further. It is in microseconds. For the configuration of environment variables see Appendix C.

A.9. Miscellaneous

- The license server service writes a log file, typically `C:\MSC.Software\MSC Licensing\Helium\LOG\lmgrd.log`. This file shows `OUT:` and `IN:` messages of the license usage. This can be used to monitor the license usage. For more advanced usage reporting Flexera Software offers extra-cost tools directly to end-users. This is outside of the scope of the support of Simufact and MSC.
- Network licenses can be served by redundant license servers where one out of three may be offline. A special license file is needed for this. If needed, please ask your local Simufact sells representative about this. Please note: While new license queries will be very stable in this configuration, long running license occupancies (like solver runs) may still show some instability when a license server goes offline. See the tech article KB8020361 in the MSC SimCompanion Knowledge Portal for details how to configure this set-up.
- MSC Licensing offers a lot of advanced configurations. For example the access to network licenses can be restricted and controlled flexibly including reserving features for certain users. This is done

using an additional option file. Please see the relevant FLEXlm resources. This is outside of the scope of the support of Simufact and MSC.

Appendix B. Firewall: New rules for opening ports

Here you can read how to change the firewall settings under Windows 10™ to allow messages through the network to the port 9987 for the *Transmission Control Protocol (TCP)*. In an environment with firewalls you need to open the ports needed for MSC Licensing (see Section A.2), the Simufact Monitor uses port 9985, Simufact Remote uses ports 9987, 9988 and 9990.

1. Open the **Control panel** and then **Windows Defender Firewall with Advanced Security**. The dialog displayed in Figure B.1 will open.

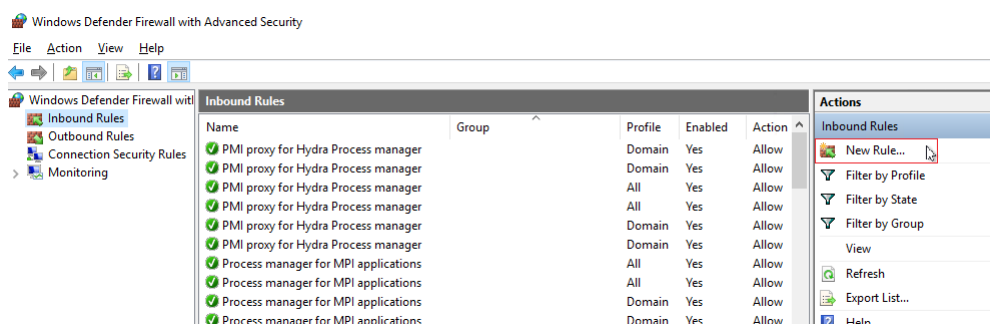


Figure B.1. New firewall rules for incoming messages

2. Select **Inbound Rules** and then **New Rule...**. A new dialog appears (Figure B.2).

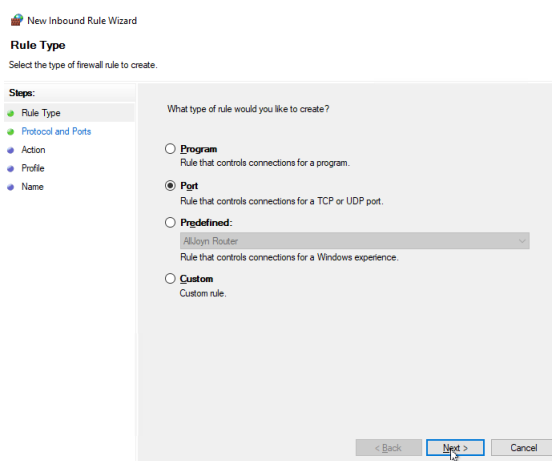


Figure B.2. New firewall rule: rule type

3. Then choose **Port** and click **Next**. The next dialog page Figure B.3 will appear.

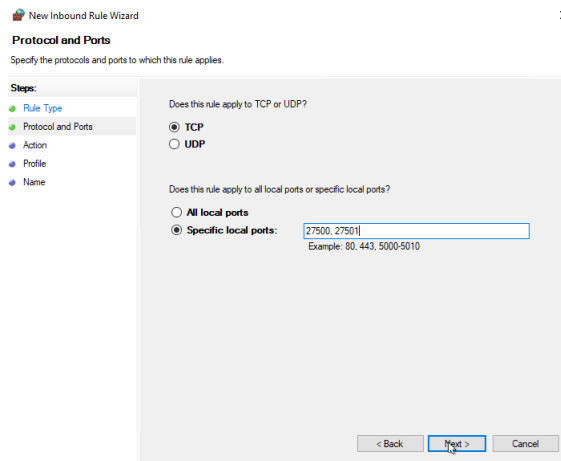


Figure B.3. New firewall rule: protocol and port number

4. Select the protocol **TCP** and enter the desired port numbers (here shown for typical port numbers for MSC Licensing) in the input field **Specific local ports** and click **Next**. The next dialog page Figure B.4 will appear.

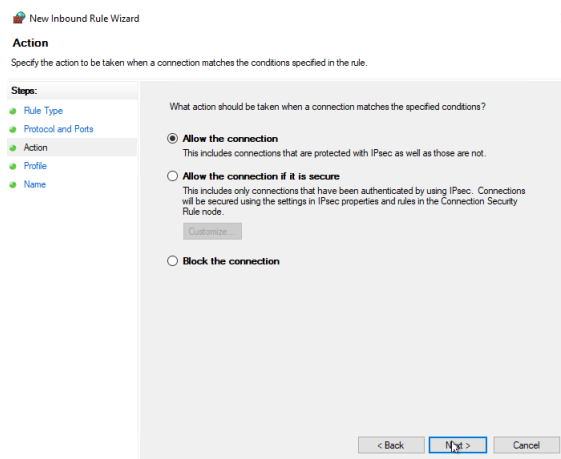


Figure B.4. New firewall rule: action

5. Select **Allow the connection** and **Next**. The next dialog page Figure B.5 will appear.

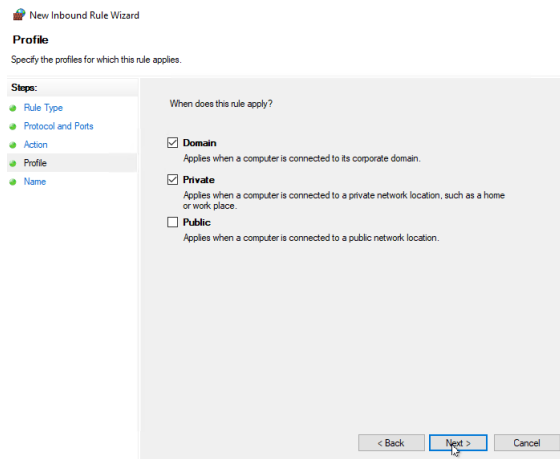


Figure B.5. New firewall rule: profile

- Depending on your environment, select **Domain** or **Private** and click **Next**. The last dialog page Figure B.6 will appear.

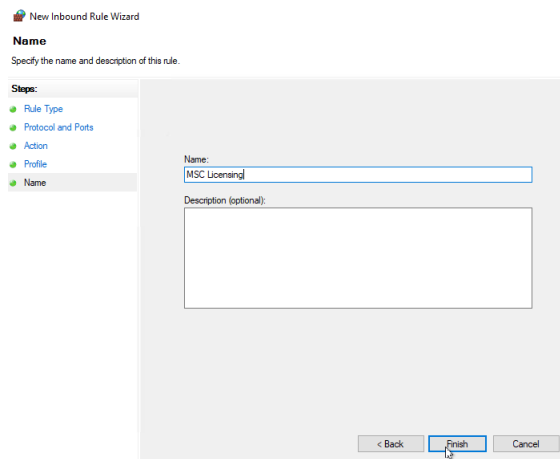


Figure B.6. New firewall rule: name

- Enter a name for the rule (e.g. *MSC Licensing*) and click **Finish**.

Appendix C. Maintaining Environment Variables

Here you can read how to review, set, and change environment variables using the means provided by your operating system. Besides registry settings and ini-files, environment variables are used to configure applications. Environment variables are passed from the calling application to the called applications, thus for example from the operating system to the Simufact Joining Optimizer GUI and from there to the solver. Or from the command line to the program started from there. Applications can only read environment variables, but never set or change change them to become effective immediately. After a change of a environment variable the application always needs to be restarted to get the change active. This is true for services resp. daemons, too.

Environment variables can be configured separately for each user or as system wide variables. The usage of system wide variables is preferred. Environment variables can be nested.



Always restart the Simufact Service (part of Simufact Remote (Simufact Forming, only)) after `MSC_LICENSE_FILE` or any other environment variable was changed! Always restart the Simufact applications after environment variables have been changed! A reboot of the machine is typically not needed, but in doubt, do it.

Besides the usual system environment variables like `PATH`, Simufact uses the following environment variables:

- `SF_LANGUAGE`
- `MSC_LICENSE_FILE`
- `MSC_LICENSE_SF_WAITINGTIME`

For debugging or in special cases more environment variables may be applicable.

C.1. Microsoft Windows™ 10

Starting with Microsoft Windows™ 10 the configuration of environment variables can not be accessed using the Windows menus only. The configuration of environment variables can now be accessed using the following alternative methods:

- In the Windows Search (Windows Key + S), search for `environment variables` and pick the first and most relevant hit. The correct search result leads directly to the **Environment Variables** configuration window shown below. The search may need to be done using your local language.
- Open the run program prompt (Windows Key + R) and start `sysdm.cpl`. This opens the **System Properties** dialogue, where you select the **Advanced** tab and there **Environment Variables ...** to access the **Environment Variables** configuration window shown below.
- For those who still think about Windows 7: Windows Search (Windows Key + S), search for `control panel` and open the **Control Panel**. There select **System** and then **Advanced system settings** to open the **System Properties** dialogue and proceed like before.
- For those who like the command prompt: `set` and `setx` are your friends.

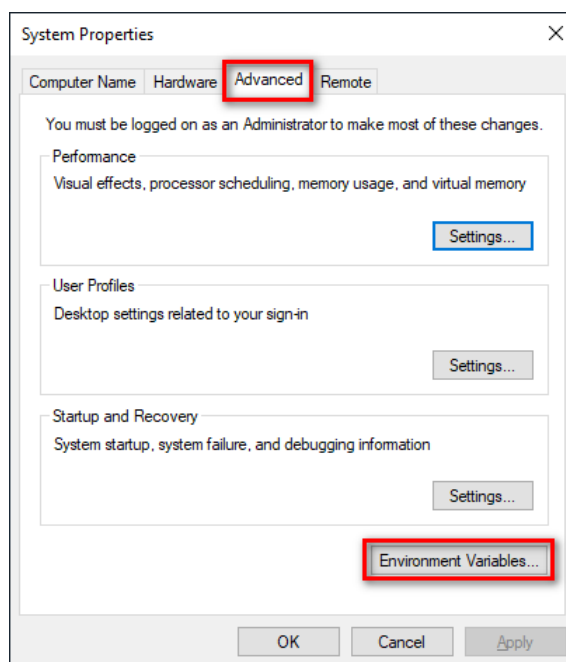


Figure C.1. System Properties

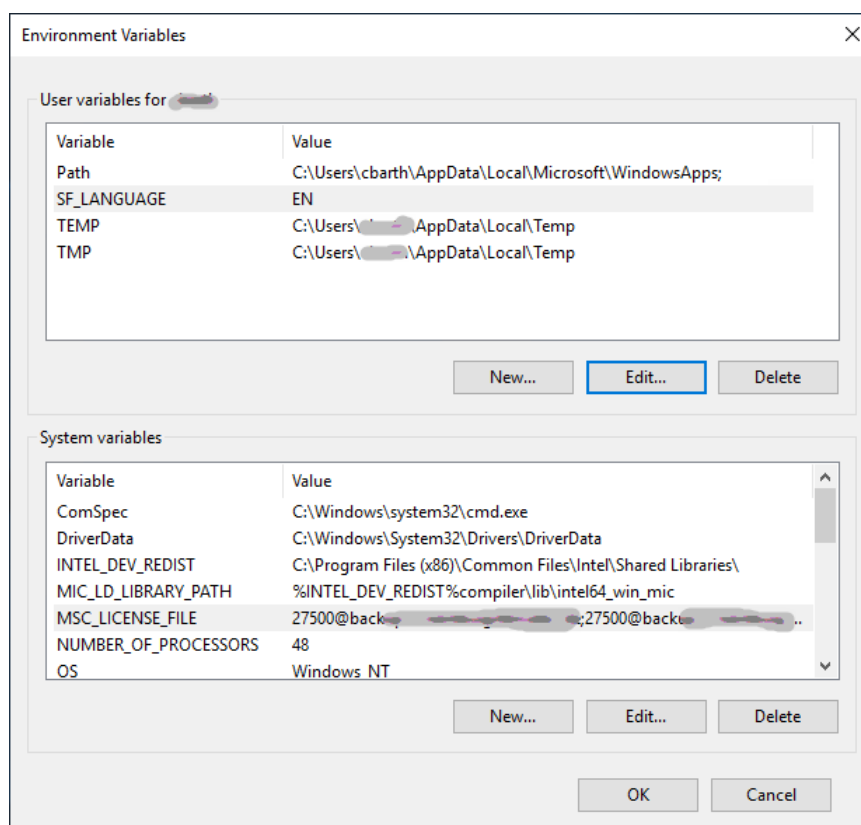


Figure C.2. Configuration of Environment Variables

In the **Environment Variables** configuration window select the variable to be changed and press **Edit ...**. Preferably use only **System variables**. Avoid to define the same variable twice as **User variable** and **System variable**. If needed select **New ...** to define a new environment variable.

To review the effective environment variables, open a command prompt and execute `set`.



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