

Instructions to Download & Install FRANC3D Version 8.5

Sept 2024

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Section 1: Downloading

This document assumes that you will download files to your "downloads" folder.

If not already at: <https://fracanalysis.com/software.html> in your web browser, go there now, and click on the **Download Files** button, Fig 1.

This will prompt you to enter a Username and Password, Fig 2, which you should have received already (via email). The username and password should be obtained from Process Optimization, or from the other distributors listed on the FAC home page.

Once you enter the username and password, click Sign In and you will see a list of folders, Fig 3.

Fracture Analysis Consultants, Inc

Sept 3 2024

FRANC3D 8.5.2 executable packages are available. Version 8.5 requires an updated license file. Changes for Version 8 are listed here.

FRANC3D Documentation

- Download & Install Instructions
- Brochure
- Reference Manual
- Tutorial for ABAQUS Users
- Tutorial for ANSYS Users
- Tutorial for NASTRAN Users
- Tutorial for SIERRA Users
- Tutorials 2-14
- User's Guide
- Command Line & Python Interface
- Benchmark Reference
- Training Slides (download)
- Download Files**

Contact **Process Optimization Corp** for information regarding licensing or to obtain the FRANC3D software; send email to: info@processopt.com

For technical questions or information, send email to: support@fracanalysis.com

FRANC3D development started in the late 1980's at Cornell University. The FRANC3D/Classic (boundary element based) software is still available from the **Cornell Fracture Group**, but it has not been updated since 2007, it is restricted to 32bit, and it requires XWindows graphics.

An all new version of FRANC3D was started in 2005 by FAC, and commercial licensed copies have been shipping since 2010. The development history is shown here:

FRANC3D Development History

Year	Version / Feature
1988	FRANC3D v1. BEM only
1996	FRANC3D v2. BEM & Thin Shell FEM (STAGS)
2003	FRANC3D v3. BEM, Thin Shell & Solid FEM (ANSYS)
2005	FRANC3D/NG Solid FEM only (ANSYS & ABAQUS)
2010	Commercial Licenses
2010	FRANC3D Version 5
2011	FRANC3D Version 6
2012	FRANC3D Version 7
2013	FRANC3D Version 8

Figure 1 FAC software web page

Sign in to access this site

Authorization required by <https://fracanalysis.com>

Username

Password

Figure 2 Download Files user name and password

Index of /downloads







Name	Last modified
 Parent Directory	
 pdfs/	2024-06-20 09:04
 Tutorials/	2024-06-20 09:06
 TestSuite/	2024-03-08 09:26
 Executable/	2024-06-20 09:01
 Benchmarks/	2022-09-12 08:16

Figure 3 List of folders in downloads

Step 1: Click on the **Executable** folder. You can read the *readme.txt* file if you are not familiar with it; this file gives a summary of the operating systems that are supported.

Click on the folder for the latest FRANC3D version, Fig 4. This will give you a list of file names, Fig 5. The *.zip* and *.exe* files are for MS Windows, and the *tar.gz* (or *.tgz*) files are for Linux. We support only 64bit operating systems. If there are questions about which file to download, send us email.

Index of /downloads/Executable









Name	Last modified	Size	Description
 Parent Directory		-	
 readme.txt	2024-07-26 08:10	1.2K	
 Version 8.5/	2024-07-26 08:09	-	
 Version 8.4/	2024-05-14 12:44	-	
 Version 7.5/	2022-09-13 12:00	-	
 Rlm16/	2024-05-22 14:08	-	
 Rlm15/	2024-05-22 14:08	-	
 Rlm14/	2024-05-22 14:09	-	

Figure 4 List of franc3d version folders

Index of /downloads/Executable/Version 8.5

Name	Last modified	Size	Description
 Parent Directory		-	
 cs/	2024-09-03 13:35	-	
 verify.sh	2024-09-03 13:35	626	
 sandia-8.5.2-RH_9.4.tgz	2024-09-03 13:35	25M	
 sandia-8.5.2-RH_8.10.tgz	2024-09-03 13:35	37M	
 sandia-8.5.2-RH_7.9.tgz	2024-09-03 13:35	35M	
 franc3d_8.5.2_win11_setup.exe	2024-09-03 13:34	11M	
 franc3d_8.5.2_win11.zip	2024-09-03 13:34	15M	
 franc3d-8.5.2-Ubuntu_24.04.tar.gz	2024-09-03 13:34	36M	
 franc3d-8.5.2-Ubuntu_22.04.tar.gz	2024-09-03 13:33	36M	
 franc3d-8.5.2-Ubuntu_20.04.tar.gz	2024-09-03 13:33	37M	
 franc3d-8.5.2-SUSE_15.6.tar.gz	2024-09-03 13:33	33M	
 franc3d-8.5.2-SUSE_15.5.tar.gz	2024-09-03 13:32	33M	
 franc3d-8.5.2-RH_9.4.tar.gz	2024-09-03 13:32	36M	
 franc3d-8.5.2-RH_8.10.tar.gz	2024-09-03 13:31	35M	
 franc3d-8.5.2-RH_7.9.tar.gz	2024-09-03 13:31	33M	
 chksum.sh	2024-09-03 13:30	1.0K	
 chinese.mo	2024-09-03 13:30	172K	

Figure 5 List of franc3d executable packages

Step 2: Select the file for your OS, right-click on the file name, and select "Save link/target as..." to download and save the file to your "downloads" folder.

Note that if you download a *tar.gz* using a Windows PC, the extension (file type) might be changed automatically; compare the size of the downloaded file to the size on the FAC site.

You can use the sha512 checksum in the cs subfolder to verify the download file is okay. For example, the Linux command to check franc3d-8.5.1-RH_8.10.tar.gz is:

➤ `sha512sum -c franc3d-8.5.1-RH_8.10_CSUM.txt`

Step 3: If you will be using a floating license with a license server, download the `fracanals.set` file from the Rlm15 or Rlm16 folder. You can download the latest version of the RLM server software directly from RLM: <https://reprisesoftware.com/support/admin/>

Section 2: License Installation

FRANC3D can be used with a node-locked license or with a server-based floating license.

A node-locked license is configured for a single client PC based on its MAC hardware or IP address.

A floating license is installed on a server that is running the RLM executable. Client PCs are configured to use the license server to check out a license. This allows multiple PCs to access a single license as opposed to a node-locked license where the license is tied to a single PC.

The license file (`franc3d.lic`) will be sent (via email) after you send us the relevant information as described below.

Section 2.1: Node-lock License

A node-lock license file can be placed in the same folder as the `franc3d` executable.

Note that our temporary trial license file can serve as a generic node-lock or floating license.

Step 1: Choose the client PC where `franc3d` will be installed and determine the MAC or IP address. One way to do this is to start a command or terminal window and execute `"ipconfig /all"` for MS Windows or `"ifconfig -a"` for Linux. Then send us the Physical Address (for MS Windows) or the `ether/hwaddr` (for Linux) information.

You can also use the `rlmhostid` (or `rlmutil`) executable. You can download this from the Rlm15 or Rlm16 folder (see Step 3 of Section 1).

You run rlmhostid from a MS Windows command line using:

- .\rlmhostid.exe ether
- .\rlmhostid.exe internet

to obtain the MAC or IP address, respectively.

For Linux, you run rlmutil from a bash command line using:

- ./rlmutil rlmhostid ether
- ./rlmutil rlmhostid internet

Step 2: Send the information from Step 1 to us so that we can generate a *franc3d.lic* file that is locked to the client PC.

Step 3: Place the *franc3d.lic* file that we send into the folder that contains the franc3d executable (see Section 3).

Section 2.2: Floating License

In Step 3 of Section 1, you downloaded the fracanalys.set file.

Note that most servers will have dedicated folders for licensing software. If not, you can create a folder for the RLM executable. You will need to place the *fracanalys.set* file with rlm.exe, or you can configure RLM to find the *.set* file.

You should review the RLM license administration guide:

<https://reprisesoftware.com/docs/admin/basics-admin.html>

This document describes how to run RLM as a service (that will run in the background and automatically start on reboot) and how to configure log files.

Step 1: Choose the server where RLM will be installed and determine the server's name, the MAC or IP address, and the tcp/ip port. Review the **License File** portion of the **RLM** guide. You can use the same commands as described in Step 1 of Section 2.1.

Step 2: Send us the server name, ID and tcp/ip port #. Note that we will use the default port 5053 if none is specified. We will generate a *franc3d.lic*, which is required for Step 3.

We will also need to know if the server is virtual and if a roll-over server is required.

A separate port # for the ISV `fracanalsys` line in the `.lic` file might also be required.

Step 3: Place the `rlm.exe`, `fracanalsys.set` and `franc3d.lic` file (that we will send via email) in a folder and start RLM.

For MS Windows, from a CMD line:

➤ `rlm.exe -c franc3d.lic`

For Linux, from a terminal/bash window:

➤ `rlm -c franc3d.lic`

This starts RLM interactively. RLM reads the `franc3d.lic` and `fracanalsys.set` files, and starts the service, Fig 6.

```
C:\bruce\Reprise\rlm_16\rlm.v16.0BL1-x64_w4\x64_w4>.\rlm.exe -c franc3d.lic
06/17 12:40 (rlm) RLM License Server Version 16.0BL1

    Copyright (C) 2006-2024, Reprise Software, Inc. All rights reserved.

06/17 12:40 (rlm) License server started on rodin
06/17 12:40 (rlm) Server architecture: x64_w4
06/17 12:40 (rlm) License files:
06/17 12:40 (rlm)     franc3d.lic
06/17 12:40 (rlm)
06/17 12:40 (rlm) Using SSL certs ./rlm-cert.pem and ./rlm-key.pem
06/17 12:40 (rlm) Web server starting https://localhost:5054
06/17 12:40 (rlm) Using TCP/IP port 5053
06/17 12:40 (rlm) ... adding UDP/IP port 5053
06/17 12:40 (rlm) Starting ISV server fracanalsys on port 8379
06/17 12:40 (rlm) New thread created to watch ISV fracanalsys
06/17 12:40 (rlm) Clock jumped by +28644040 minutes
06/17 12:40 (fracanalsys) RLM License Server Version 16.0BL1 for ISV "fracanalsys"
06/17 12:40 (fracanalsys) Server architecture: x64_w4

    Copyright (C) 2006-2024, Reprise Software, Inc. All rights reserved.

    RLM contains software developed by the OpenSSL Project
    for use in the OpenSSL Toolkit (http://www.openssl.org)
    Copyright (c) 1998-2008 The OpenSSL Project. All rights reserved.
    Copyright (c) 1995-1998 Eric Young (eay@cryptsoft.com) All rights reserved.

06/17 12:40 (fracanalsys) Using options file fracanalsys.opt
06/17 12:40 (fracanalsys) Setting TIMEOUT for all products to 3600 secs.
06/17 12:40 (fracanalsys)
06/17 12:40 (fracanalsys) Server started on rodin (hostid: f4939fef9329) for:
06/17 12:40 (fracanalsys)     franc3d
06/17 12:40 (fracanalsys)
06/17 12:40 (fracanalsys) License files:
06/17 12:40 (fracanalsys)     franc3d.lic
06/17 12:40 (fracanalsys)
06/17 12:49 (fracanalsys) OUT: franc3d v8.5 by bruce@rodin
06/17 12:49 (fracanalsys) IN: franc3d v8.5 by bruce@rodin
```

Figure 6 RLM service started for FRANC3D

Step 4: Test the RLM server by starting a web browser and entering your "server_name":5054 in the URL. Fig 7 shows the webpage with the license status displayed. Note that 5054 is the default port, but this can be changed also. For RLM 16, the web service uses <https://server name:5054> and the interface is different, Fig 8.

Reprise License Server Administration
Copyright (c) 2006-2015, Reprise Software, Inc. All Rights Reserved.

Status for "rlm" on pilsner (port 5053)

RLM software version	v12.1 (build:2)
RLM comm version	v1.2
debug log file	_stdout_
license files	franc3d.lic

rlm Statistics	Since Start	Since Midnight	Recent
Start time	04/17 17:21:57	04/17 17:21:59	04/17 17:21:59
Messages	1 (0/sec)	1 (0/sec)	1 (0/sec)
Connections	1 (0/sec)	1 (0/sec)	1 (0/sec)

EDIT rlm Options
SHOW rlm Debug Log

ISV Servers											
Name	port	Running	Restarts	Server Status	License Usage	Debug Log	REREAD	OPTIONS	TRANSFER	SHUTDOWN	
fracanals	65496	Yes	0	fracanals	fracanals	fracanals	fracanals	fracanals	fracanals	fracanals	fracanals

Figure 7 RLM 15 server web page

reprise SOFTWARE

Home Activate Diagnostic Documentation

License Server Status on rodin (port 5053)

Server Action: Reread / Restart All Servers Shutdown All Servers

Total Servers: 1

fracanals Port: 8379 Start Time: Jun 17, 2024 12:40:03 PM

Pool	Product	Version	Expiration	Count	Soft Limit	In-Use	Roam	Reserved	Hostid	Timeout	Share	Total Checkouts	Named User List
1	franc3d	8.5	Dec 31, 2025	9	9	1	0	0	ANY	3600	None	321	N/A

Figure 8 RLM 16 server web page

Step 5: To have RLM start automatically on restart/reboot, read **The License Server** portion of the **RLM** guide.

Section 3: FRANC3D Installation

You should have already downloaded the appropriate file for the client PC where FRANC3D will be installed (see Section 1). If you have not already, unzip the files into a folder. The folder location will depend on the installation process at your site.

For this document, we have created a folder on the C: drive for MS Windows called "C:\f3d". The folder should contain the files shown in Fig 9. If you use the Windows installer, the default folder location is "C:\Program Files (x86)\franc3d".

Note that for MS Windows, you can create a shortcut for the *franc3d.exe* file and pin it to the taskbar or desktop. If you use the Windows installer, this can be done during the installation.













 CrackData.pyd	Python Extension Module
 CrackView.exe	Application
 Fcl2Py.exe	Application
 franc3d.exe	Application
 freetype.dll	Application extension
 Maximize.pyd	Python Extension Module
 PyF3D.pyd	Python Extension Module
 python312.dll	Application extension
 rlm1601.dll	Application extension
 vcruntime140.dll	Application extension
 vcruntime140_1.dll	Application extension
 Vec3D.pyd	Python Extension Module

Figure 9 List of files for MS Windows.

For Linux, we have created a folder in the user's home folder called "/home/bruce/f3d". The folder should contain the files shown in Fig 10; some of the .so files are optional.

Name
CrackData.so
CrackView
Fcl2Py
franc3d
libFOX-1.6.so.0
libpng16.so.16
libpython3.12.so.1.0
Maximize.so
PyF3D.so
Vec3D.so

Figure 10 List of files for Linux.

Section 3.1: FRANC3D with a Node-lock License

Step 1: Define the environment variable: **FRANC3D_PATH**
 This must point to the folder that contains the franc3d executable.

- For MS Windows, this must be defined as a system-wide environment variable. Right-click on MyComputer (or ThisPC), select Properties, select the Advanced tab, and then select the Environment Variables button. Select the New button under System Variables and fill in the dialog, Fig 11.

Replace the folder in Variable value: with your folder name.

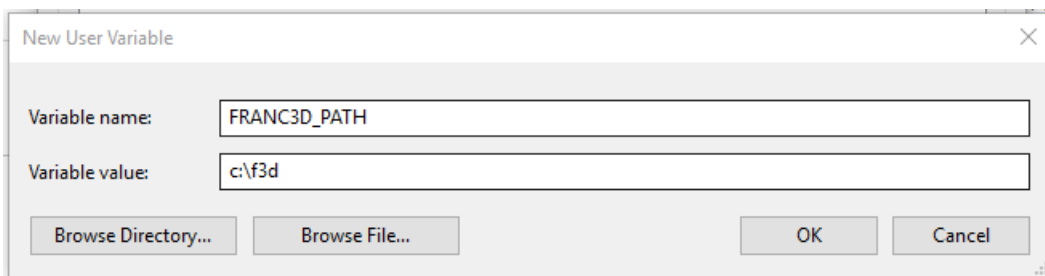


Figure 11 MS Windows FRANC3D_PATH environment variable

- For Linux, the environment variable can be defined in a system-wide or user-specific resource/profile file (i.e., /etc/bash.bashrc or \$HOME/.bashrc). You can also define

this from the command line from a terminal window; using the bash shell, this would be:
export FRANC3D_PATH=/home/user/f3d
For persistence, it should be added to your .profile or .bashrc file.

Step 2: Start the franc3d executable to verify that the license is checked out and that FRANC3D starts.

- For MS Windows, double click on the *franc3d.exe* icon (or start it from the command line in a CMD window).
- For Linux, start franc3d from a terminal window; in the folder where franc3d is located, type `./franc3d`.

Section 3.2: FRANC3D with a Floating License

Step 1: Define the environment variable: **fracanalys_LICENSE**.

- For MS Windows, this must be defined as a system-wide environment variable. Right-click on MyComputer (or ThisPC), select Properties, select the Advanced tab, and then select the Environment Variables button. Select the New button under System Variables and fill in the dialog, Fig 12.

Replace the `server_name` and port # with your server information (see Section 2.2).

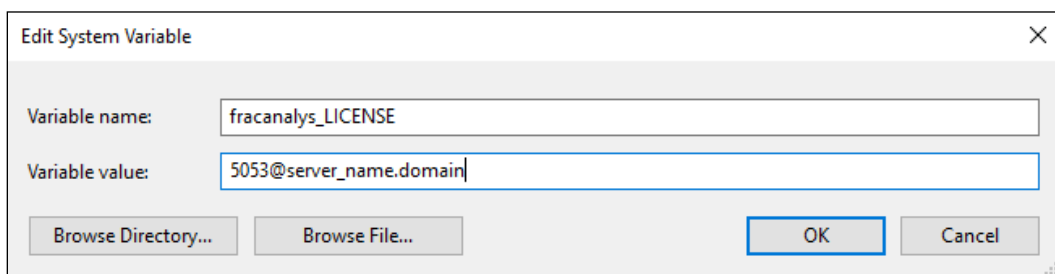


Figure 12 MS Windows fracanalys_LICENSE environment variable

- For Linux, the environment variable can be defined in a system-wide or user-specific resource/profile file (i.e., /etc/bash.bashrc or \$HOME/.bashrc). You can also define

this from the command line from a terminal window; using the bash shell, this would be:

```
export fracanalys_LICENSE=5053@server_name.domain
```

For persistence, it should be added to your `.profile` or `.bashrc` (or similar resource settings) file.

Step 2: Define the environment variable: **FRANC3D_PATH**

This must point to the folder that contains the `franc3d` executable.

- For MS Windows, you need to create the environment variable in the Advanced System Properties (see Step 1 of Section 3.1); this should point to `C:\f3d`.
- For Linux, you can add the environment variable to your `.profile` or `.bashrc` file (see Step 1 of Section 3.1); this should point to `/home/user/f3d`.

Step 3: Start the `franc3d` executable to verify that the license is checked out and that FRANC3D starts.

- For MS Windows, double click on the `franc3d.exe` icon (or start it from the command line in a CMD window).
- For Linux, start `franc3d` from a terminal window; in the folder where `franc3d` is located, type `./franc3d`.

Special Note for Linux installation:

You can move the FOX (and any other) `.so` file, which is included in the packaged `.tar.gz` file, from the `/home/user/f3d` folder to a system folder, such as `/usr/local/lib`.

You might need to export the `LD_LIBRARY_PATH` to include the folder location of the FOX `.so` file.

You will need to have Python 3.6 (or later) if you use the PyF3D module or the Python user-extensions.

FRANC3D is built using many "system" libraries, in addition to Python. You might need to install packages that are required but missing from your system. You can determine which libraries are required by running the `ldd` command, type `ldd ./franc3d`.

Section 4: Extra Downloads

The FRANC3D documentation is available from:

<https://fracanalysis.com/software.html>

You can click on the menu buttons on the left side (see Fig 1) to view the pdf file; the pdf file can be saved to your PC. The files can also be downloaded from the "pdfs" folder (see Fig 3).

Tutorial and Benchmark example files are available from the "downloads" folder also.

You can click on the **Tutorials** or **Benchmarks** folder (see Fig 3) to get to the sub-folders for each Tutorial or Benchmark example. Inside the various subfolders, you can right-click and select "Save link (or target) as..." to download a file; choose the files corresponding to the FE analysis code that you will be using. You can also download all files as a single .zip file.

The **TestSuite** folder contains a *readme.txt* file that describes the folder contents. There are Windows *.bat* files that will extract all the Tutorial and Benchmark models from the .zip and run the analyses.

Section 5: Switching From an Earlier Version

There are often differences in the GUI preferences between versions. One should check (and set) preferences when first starting FRANC3D or when switching versions. The Preference tabs are described in Section 5 of the Reference document.

Version 8.5 includes support for OpenGL 4.5. See Section 2.2 of the Reference document for details. OpenGL 1.1 can be used if 4.5 causes display issues in the GUI.

Version 8.5 also requires an updated *franc3d.lic* file.