

Instructions to Download & Install FRANC3D Version 8.1

April 2022

Contents

Contents	1
Section 1: Downloading.....	1
Section 2: License Installation.....	5
Section 2.1: Node-lock License.....	6
Section 2.2: Floating License.....	7
Section 3: FRANC3D Installation.....	9
Section 3.1: FRANC3D with a Node-lock License.....	10
Section 3.2: FRANC3D with a Floating License.....	11
Section 4: Extra Downloads.....	12
Section 5: Switching From Version 7 or 8.0.....	13

Section 1: Downloading

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

If you are not already at:

<http://www.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, you will see a list of folders, Fig 3.

Fracture Analysis Consultants, Inc

Apr 6 2022
FRANC3D 8.1 executable packages are now available. Documentation is updated for Version 8.1 changes. Changes and bug fixes from Version 8.0 through 8.4 are listed here.

FRANC3D Documentation

- Download & Install Instructions
- Brochure
- Reference Manual
- Tutorial for ABAQUS Users
- Tutorial for ANSYS Users
- Tutorial for NASTRAN Users
- Tutorials 2-12
- User's Guide
- Command Line & Python Interface
- Benchmark Reference
- Training Slides
- 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
1998	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

The server fracanalysis.com is asking for your user name and password. The server reports that it is from restricted area.

Warning: Your user name and password will be sent using basic authentication on a connection that isn't secure.

User name

Password

OK Cancel

Figure 2 Download Files user name and password

Index of /downloads

Name	Last modified
 Parent Directory	
 Benchmarks/	2021-11-29 11:39
 Executable/	2021-11-29 12:02
 TestSuite/	2021-11-29 11:34
 Tutorials/	2021-11-29 12:29
 pdfs/	2021-11-29 11:30

Figure 3 List of folders in downloads

Step 1: Click on the **Executable** folder, and then click on the folder for the latest version, Fig 4. If there are subfolders for minor version updates, click on the latest subfolder. This will give you a list of `.zip` and `.tgz` file names, Fig 5.

Inside the Executable folder (at the top level), there is a `readme.txt` file. This file gives a summary of the operating systems that are supported, and it indicates which Linux archive to download for your Linux flavor.

We support only 64bit operating systems. The `.zip` files are for MS Windows, and the `.tgz` files are for Linux. If you hover the mouse over the file name, the full name will be displayed at the bottom of the browser window.

Download the file for the flavor of Windows or Linux that you are running; see the "readme.txt" file (see Fig 4) if there are any doubts or you can contact us via email.

Index of /downloads/Executable

Name	Last modified	Size	Description
 Parent Directory		-	
 Version 7.5/	2021-12-02 20:18	-	
 Version 8.0/	2022-04-06 15:20	-	
 Version 8.1/	2022-04-06 14:29	-	
 fracanalys.set	2021-12-02 11:14	507	
 readme.txt	2022-02-07 18:50	1.0K	
 rlm_lnx.tgz	2021-11-29 11:28	1.5M	
 rlm_mswin.zip	2021-11-29 11:28	3.2M	

Figure 4 List of franc3d version folders

Index of /downloads/Executable/Version 8.1

Name	Last modified	Size	Description
 Parent Directory		-	
 franc3d-8.1-MSWin10.zip	2022-04-06 15:17	15M	
 franc3d-8.1-MSWin7.zip	2022-04-06 15:17	16M	
 franc3d-8.1.0-CentOS...>	2022-04-06 15:15	26M	
 franc3d-8.1.0-RH_8.5...>	2022-04-06 15:14	29M	
 franc3d-8.1.0-SUSE_1...>	2022-04-06 15:15	28M	
 franc3d-8.1.0-Ubuntu...>	2022-04-06 15:16	28M	
 franc3d-8.1.0-Ubuntu...>	2022-04-06 15:17	30M	
 franc3d_8.1_win10_se...>	2022-04-06 15:13	12M	
 sandia-8.1-CentOS_7...>	2022-04-06 15:18	27M	

Figure 5 List of franc3d executable packages

Step 2: Select the `.zip` or `.tgz` file for your operating system, 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 `.tgz` using a Windows PC, the `.tgz` extension might be changed automatically.

Step 3: If you will be using a floating license with a license server, you should download either the `rlm_lnx64.tgz` file for a Linux server or the `rlm_win64.zip` file for a MS Windows server, Fig 6. The `.zip` and `.tgz` files contain the RLM executable and the `fracanalys.set` files. We will refer to these files in Section 2.2.








Name	Size	Date modified
 Version 7.5/		3/26/22, 10:48:03 AM
 Version 8.0/		3/26/22, 10:48:05 AM
 Version 8.1/		4/5/22, 8:50:33 PM
 fracanalys.set	507 B	4/15/21, 11:09:45 AM
 readme.txt	1008 B	2/7/22, 6:36:32 PM
 rlm_lnx.tgz	1.5 MB	11/11/21, 11:56:56 AM
 rlm_mswin.zip	3.2 MB	11/11/21, 11:54:50 AM

Figure 6 RLM server software

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 files can serve as generic node-lock licenses.

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 HWaddr (for Linux) information.

You can also use the *rlmhostid* executable from the *rlm_win64.zip* or *rlm_lnx64.tgz* archive (see Step 3 in Section 1).

You run *rlmhostid* from a MS Windows command line using:

- `.\rlmhostid ether`
- `.\rlmhostid internet`

to obtain the MAC or ethernet address, respectively.

For Linux, you run *rlmutil* from a terminal/bash window 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 to you into the folder that contains the *franc3d* executable (see Section 3).

Section 2.2: Floating License

In Step 3 of Section 1, you should have downloaded either the *rlm_lnx64.tgz* file for a Linux server or the *rlm_win64.zip* file for a Windows server. The *.zip* or *.tgz* file contains:

```
fracanalys.set
rlm.exe (rlm for Linux)
rlmhostid.exe (rlmutil for Linux)
rlmutil.exe (rlmutil for Linux)
```

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* with the *rlm.exe* or you can configure RLM to find the *.set* file.

You should review the RLM End User license administration guide:

http://www.reprisesoftware.com/RLM_Enduser.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 such things as log files.

Step 1: Choose the server where RLM will be installed and determine the server name, the MAC or IP address, and the tcp/ip port. Review the **License File** portion of the **RLM End User** 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 *fracanalys* line in the *.lic* file might also be required.

Step 3: Place the *rlm.exe*, *fracanalys.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 fracanalys.set files, and should start the service, Fig 7.

```
09/21 14:57 (rlm) RLM License Server Version 13.0BL2

    Copyright (C) 2006-2019, Reprise Software, Inc. All rights reserved.

09/21 14:57 (rlm) License server started on renoir
09/21 14:57 (rlm) Server architecture: x64_w3
09/21 14:57 (rlm) License files:
09/21 14:57 (rlm)     franc3d.lic
09/21 14:57 (rlm)
09/21 14:57 (rlm) Web server starting on port 5054
09/21 14:57 (rlm) Using TCP/IP port 5053
09/21 14:57 (rlm) ... adding UDP/IP port 5053
09/21 14:57 (rlm) Starting ISV server fracanalys on port 33257
09/21 14:57 (rlm) New thread created to watch ISV fracanalys
09/21 14:57 (fracanalys) RLM License Server Version 13.0BL2 for ISV "fracanalys"
09/21 14:57 (fracanalys) Settings from RLM Version 13.0BL2 for ISV "fracanalys"
09/21 14:57 (fracanalys) Server architecture: x64_w3

    Copyright (C) 2006-2019, 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.

09/21 14:57 (fracanalys)
09/21 14:57 (fracanalys) Server started on renoir (hostid: 00d861464157) for:
09/21 14:57 (fracanalys)     franc3d
09/21 14:57 (fracanalys)
09/21 14:57 (fracanalys) License files:
09/21 14:57 (fracanalys)     franc3d.lic
09/21 14:57 (fracanalys)
```

Figure 7 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 8 shows the webpage with the license status displayed. Note that 5054 is the default port, but this can be changed also.

Step 5: Set up RLM to start automatically on restart/reboot. Read **The License Server** portion of the RLM End User guide (http://www.reprisesoftware.com/RLM_Enduser.html).

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	
fracanalys	65496	Yes	0	fracanalys	fracanalys	fracanalys	fracanalys	fracanalys	fracanalys	fracanalys	

Figure 8 RLM server web page

Section 3: FRANC3D Installation

You should have already downloaded the appropriate set of files for the client PC where FRANC3D will be installed (see Section 1). If you have not already, you can 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".

For Linux, we have created a folder in the user's home folder called "/home/bruce/f3d".

Note that for MS Windows, you can create a shortcut for the `franc3d.exe` file and pin it to the taskbar or desktop.

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 9.

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

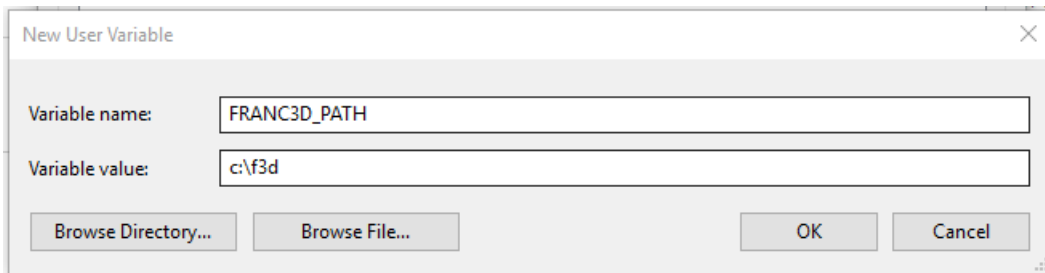


Figure 9 MS Windows FRANC3D_PATH environment variable

- 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 10.

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

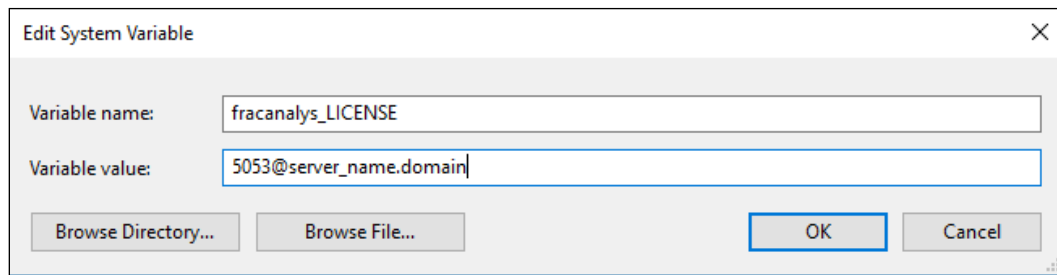


Figure 10 MS Windows fracanalys_LICENSE environment variable

- 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, that is included in the packaged `.tgz` 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.

The Python 3.# `.so` file is not included. You might need to install Python 3.# or add to your `LD_LIBRARY_PATH` (if you use the PyF3D module or the Python user-extensions).

FRANC3D is built using many "system" libraries, in addition to Python. You will need to install any 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:

<http://www.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.

Section 5: Switching From Version 7 or 8.0

There are differences in the GUI preferences between Version 7 and Version 8. One should check (and set) the preferences when first starting FRANC3D (or when switching Versions).

One of the main differences is the crack insertion & meshing library. Version 8.1 uses different Advanced Meshing parameters compared with prior versions.

The Preference tabs are described in Section 5 of the Reference document.