

Instructions to Download & Install FRANC3D Version 7.1

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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 (Figure 1).

This will prompt you to enter a User Name and Password (Figure 2), which you should have received already (via email).

Once you enter the user name and password, you will see a list of folders (Figure 3).

Fracture Analysis Consultants, Inc

Apr 14 2017

FRANC3D 7.0.8 is available; this fixes a problem with unit conversion between FE model and crack growth

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FRANC3D

Contact [Process Optimization Corp](#) for information regarding licensing or to obtain the FRANC3D software.

FRANC3D has had a long development history starting in the late 1980's at Cornell University. The FRANC3D/Classic software is still available from the Cornell Fracture Group, but it is no longer supported and will not run on many current platforms as it is restricted to 32bit and XWindows graphics. An all new version of FRANC3D was started in 2005 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
1994	FRANC3D v2. BEM & Thin Shell FEM (STAGS)
2000	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

Figure 1: 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 user name and password

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Name	Last modified	Size	Description
 Parent Directory		-	
 Benchmark Models/	17-Nov-2017 13:48	-	
 Executable/	16-Nov-2017 13:15	-	
 Tutorial Models/	17-Nov-2017 13:46	-	
 pdfs/	21-Jul-2016 07:50	-	

Figure 3: list of folders in downloads

Step 1: Click on the **Executable** folder, and then click on the folder for the latest version (Figure 4). This will give you a list of .zip and .tgz file names (Figure 5). (If there are subversion folders, then click on the latest subversion folder to get to the files.)

We support 64bit operating systems. The .zip files are for MS Windows, and the .tgz files are for Linux. Download the file for the particular version of Windows or Linux that you are running. The "readme.txt" file briefly describes the files and operating systems that are supported.

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Name	Last modified	Size	Description
 Parent Directory		-	
 Version 7.0/	16-Nov-2017 13:24	-	
 Version 7.1/	16-Nov-2017 13:15	-	
 readme.txt	01-Aug-2017 15:36	969	
 rlm_lnx64.tgz	10-Nov-2016 19:48	1.3M	
 rlm_win64.zip	10-Nov-2016 19:48	1.8M	

Figure 4: list of franc3d version folders

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Name	Last modified	Size	Description
 Parent Directory		-	
 CentOs69_64.tgz	16-Nov-2017 13:31	21M	
 CentOs7_64.tgz	16-Nov-2017 13:31	18M	
 MSWin10_64.zip	16-Nov-2017 13:31	17M	
 MSWin7_64.zip	16-Nov-2017 13:31	18M	
 OpenSuse123_64.tgz	16-Nov-2017 13:31	19M	
 OpenSuse132_64.tgz	16-Nov-2017 13:31	20M	
 Ubuntu1404_64.tgz	16-Nov-2017 13:31	20M	
 Ubuntu1604_64.tgz	16-Nov-2017 13:31	22M	

Figure 5: list of franc3d executable packages

Step 2: Select the .zip or .tgz file for your operating system, and 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 the .tgz extension is changed when downloading, you should rename the file extension.

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 (Figure 6). The .zip or .tgz file contains the RLM executable and the fracanalys.set files. We will refer to these files in the **Floating License** Section 2.2.

Index of /downloads/Executable

<u>Name</u>	<u>Last modified</u>	<u>Size</u>	<u>Description</u>
 Parent Directory		-	
 Version 7.0/	16-Nov-2017 13:24	-	
 Version 7.1/	16-Nov-2017 13:15	-	
 readme.txt	01-Aug-2017 15:36	969	
 rlm_lnx64.tgz	10-Nov-2016 19:48	1.3M	
 rlm_win64.zip	10-Nov-2016 19:48	1.8M	

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 file.

A node-locked license file 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 this 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 should be placed in the same folder as the franc3d executable.

Note that our temporary trial license files are generic node-lock licenses and can be placed with the franc3d executable.

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

You can also use the rlmhostid executable that is provided in the rlm_win64.zip or rlm_lnx64.tgz files (see Step 3 in section 2.1). You can run this from a MS Windows command line using:

- .\rlmhostid ether
- .\rlmhostid internet

to obtain the MAC or ethernet address, respectively.

For Linux, you can run rlmutil from a terminal/bash window using:

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

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

Step 3: Place the franc3d.lic file, that we send to you, into the folder that contains the franc3d executable (see the **Client Installation** 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 and .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 and how to configure such things as log files, etc.

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 for **Node-Locked License**.

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 for use in the next step.

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 file and the fracanalys.set file, and should start the service (Figure 7).

```
04/17 17:21 (rlm) RLM License Server Version 12.1BL2
      Copyright (C) 2006-2016, Reprise Software, Inc. All rights reserved.
04/17 17:21 (rlm) License server started on pilsner
04/17 17:21 (rlm) Server architecture: x64_w3
04/17 17:21 (rlm) License files:
04/17 17:21 (rlm)     franc3d.lic
04/17 17:21 (rlm)
04/17 17:21 (rlm) Web server starting on port 5054
04/17 17:21 (rlm) Using TCP/IP port 5053
04/17 17:21 (rlm) ... adding UDP/IP port 5053
04/17 17:21 (rlm) Starting ISV server fracanalys on port 65496
04/17 17:21 (rlm) New thread created to watch ISV fracanalys
04/17 17:22 (fracanalys) RLM License Server Version 12.1BL2 for ISV "fracanalys"
04/17 17:22 (fracanalys) Settings from RLM Version 12.1BL2 for ISV "fracanalys"
04/17 17:22 (fracanalys) Server architecture: x64_w3
```

Figure 7: RLM service started for FRANC3D

Step 4: Test the RLM server by starting a web browser and entering the server_name:5054 in the URL. Figure 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 referenced above.

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	fracanalys

Figure 8: RLM 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 and run (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/user/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 (Figure 9).

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

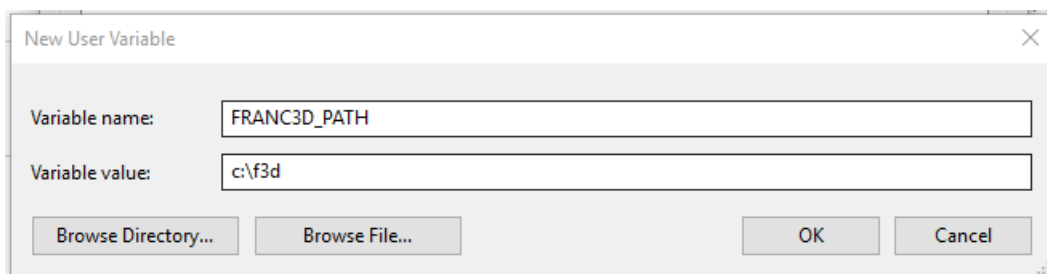


Figure 9: MS Windows FRANC3D_PATH environment variable

- 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 (Figure 10).

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

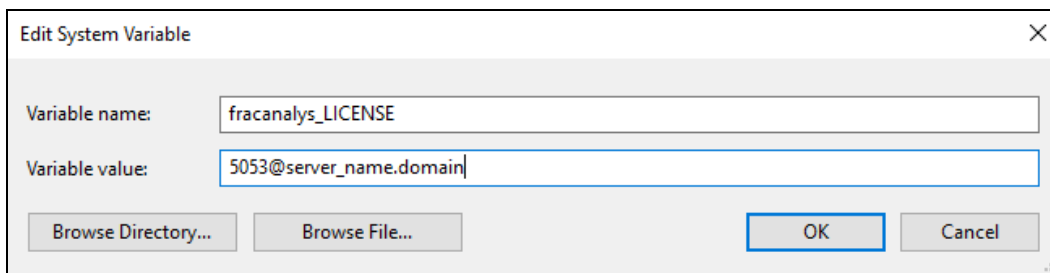


Figure 10: MS Windows environment variable

- 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@alt.cfg.cornell.edu`

For persistence, it should be added to your `.profile` or `.bashrc` 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 `.so` file, which 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.

For Version 7.1, the `libpython2.7.so` file is also included. You might need to rename the file to `libpython2.7.so.1.0` or create a logical link (`ln -s libpython2.7.so.0 libpython2.7.so.1.0`). Similar to the FOX `.so` file, you might need to add to the `LD_LIBRARY_PATH`.

FRANC3D is built using a number of "system" libraries. You will need to install any packages that are required but missing.

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 (Figure 1) to view the pdf file; the pdf file can be saved to your PC.

Tutorial example files and Benchmark example files are available from the "downloads" folder where you obtained the executable files.

You can click on the **Tutorial** or **Benchmark** folder to get to the subfolders for each Tutorial or Benchmark example. Inside the subfolder, right-click and select "Save link as..." to download a file; choose the file corresponding to the FE analysis code that you will be using.