

# Connecting to the HPC

The following document lays out the necessary steps to connect from home to the HPC systems of the RRZE, in particular the Emmy cluster, which will probably be the most important for the exercises. Connections to other clusters of the RRZE are established in an analogous way. More informations can be found on the user page of the RRZE, under <https://www.anleitungen.rrze.fau.de/hpc/getting-started/>

## HPC account

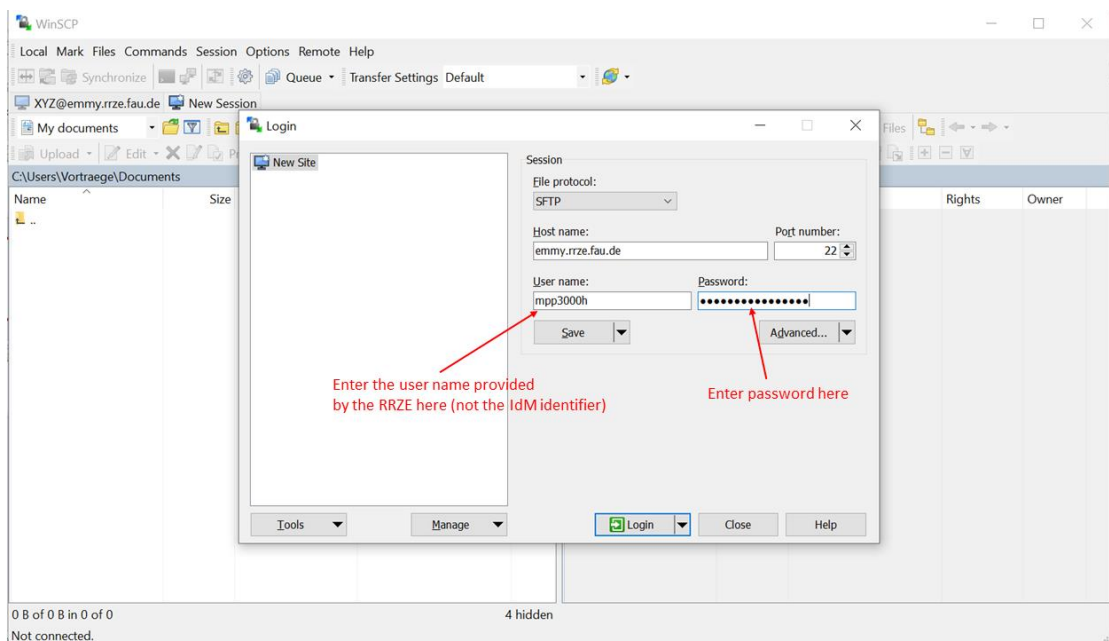
The username of your HPC account has the format “phyv\*\*\*h” and can be found in your profile at the IdM user portal (<https://www.idm.fau.de/go>). There, you can also change the password to your account from the initial one (probably the IdM password) to something of your choice. Use this password to log in.

## Windows

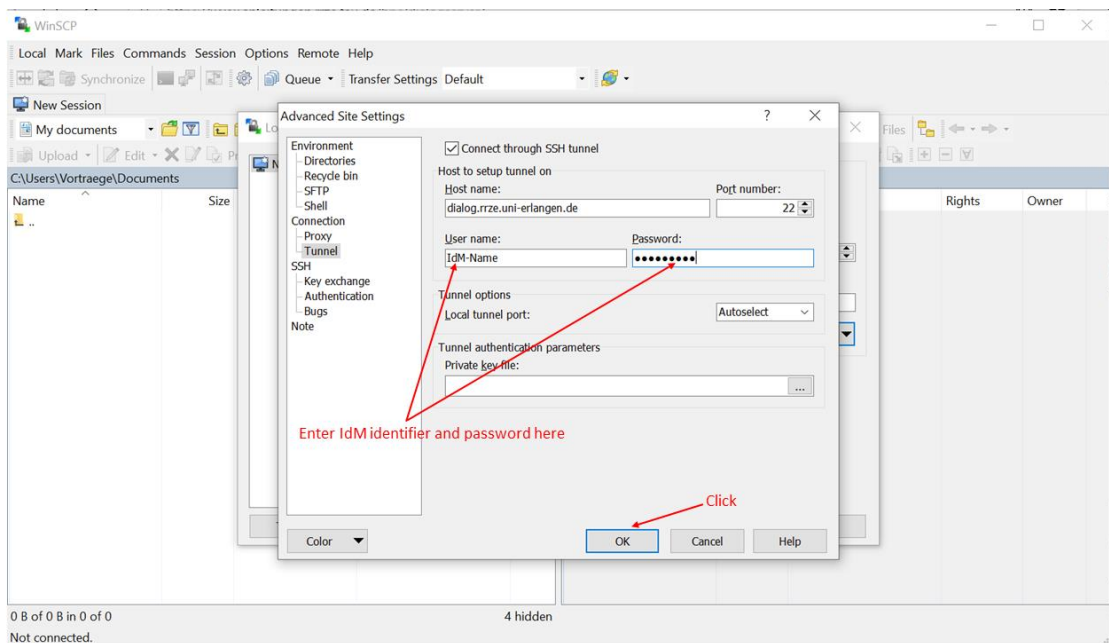
### WinSCP

In the following, we will install a viewer client that can be used to display the folders on the HPC. Several such viewer applications are available, I will use WinSCP for the following steps

- First, download WinSCP from <https://winscp.net/eng/index.php> and install it to a folder of your choice.
- Running the installed WinSCP will open the following window:



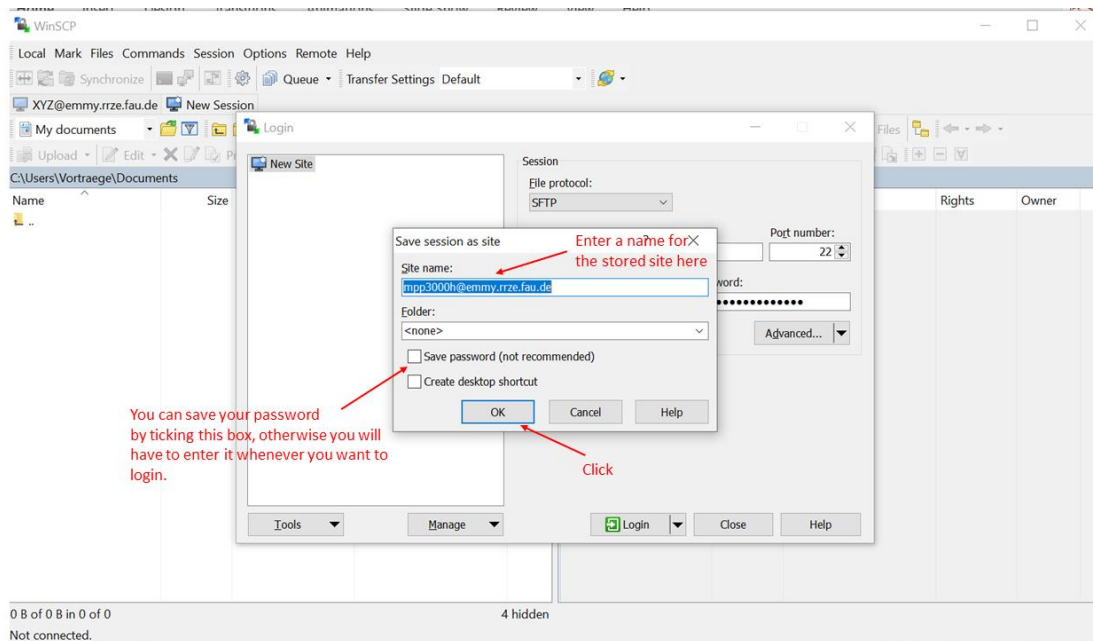
- We will now create a new “site” that stores a profile for establishing connections to Emmy. For this, give `emmy.rrze.fau.de` as host name and fill in the name and password of your HPC account.
- If you don’t connect through VPN or directly from the university network, you can make WinSCP establish a ‘tunnel’, i.e. WinSCP first connects to a computer in the university network and then to Emmy. To do this, click on Advanced and then go to Connection -> Tunnel, like in the following picture.



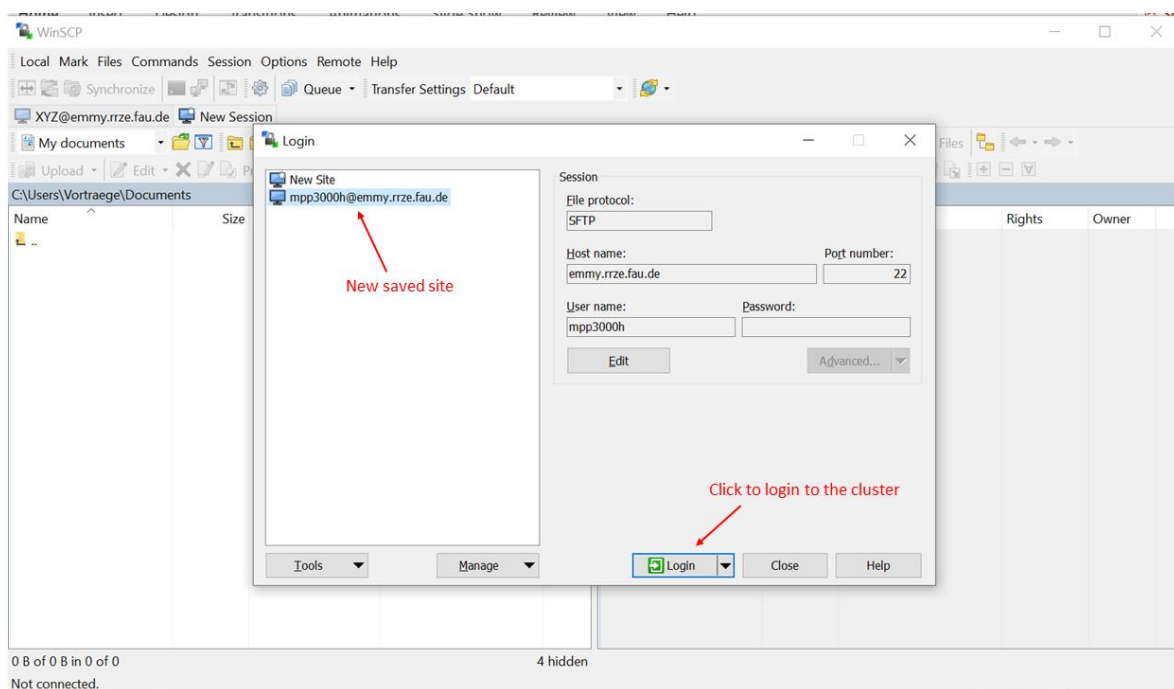
You can either the RRZE dialog server `dialog.rrze.uni-erlangen.de` here, together with your IdM username and password.

Alternatively, you can use the HPC cluster’s own ‘gate’ server (`cshpc.rrze.fau.de`), which is visible from outside the university network as well. In this case, use your HPC username and password. Click ok to close the window.

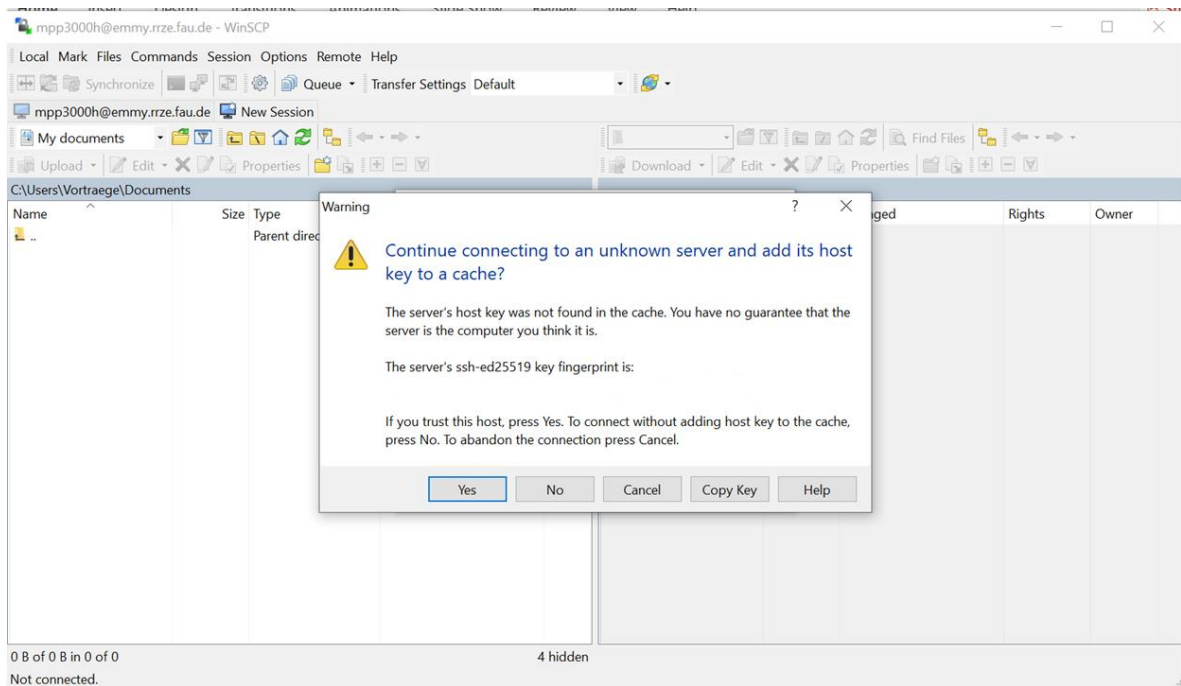
- You can now save the created profile by clicking on “Save”. You can choose a site name for the profile and save the password into the profile in encrypted form. Otherwise, you have to retype the password at every login attempt:



- Now login to your HPC account by marking the saved profile on the left side (if you chose to save it) and clicking on the “Login” button.



- At the first login, WinSCP will welcome you with the following security warning, asking you whether you are sure that you are connecting to the correct (trusted) server:

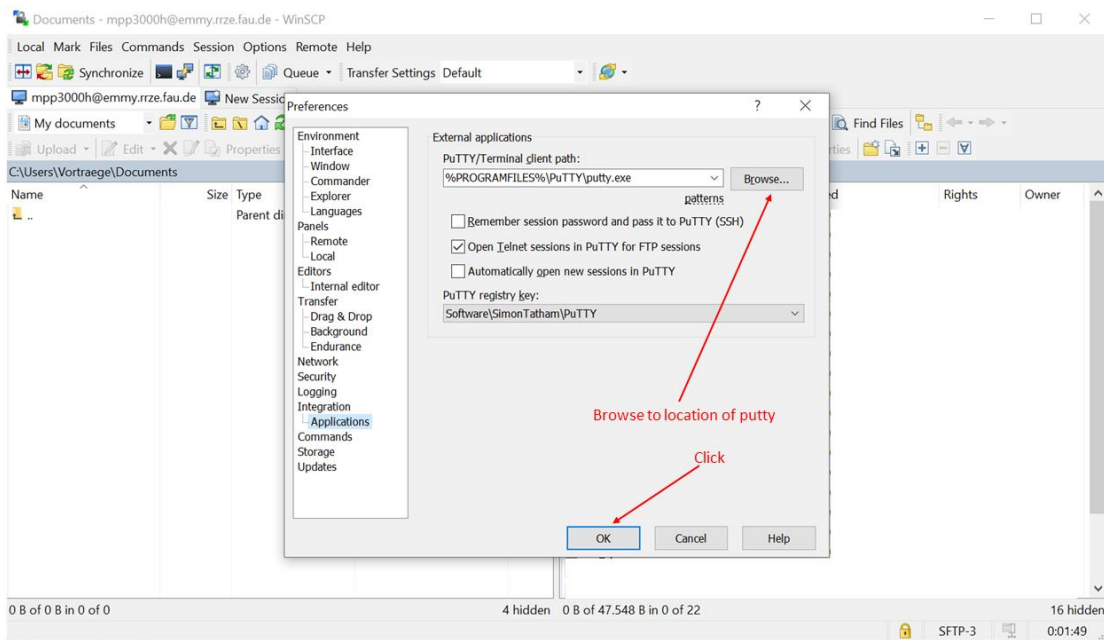


This is probably the case, so you can click yes. If you click “No”, it will probably ask you again at every login attempt.

- After this, you will be presented with a ‘commander’-like view, with a folder of your local computer on the left side and a view your home directory on the cluster (in this case Emmy) on the right side. You can now freely create folders and text files on the cluster by right-click -> New and can move files and folders between your local computer and the cluster by drag and drop.
- So far, we can use WinSCP to create and manipulate folders and files. Additionally, WinSCP offers a way to open a window such that one can run commands on the HPC (you will use this for the exercises).

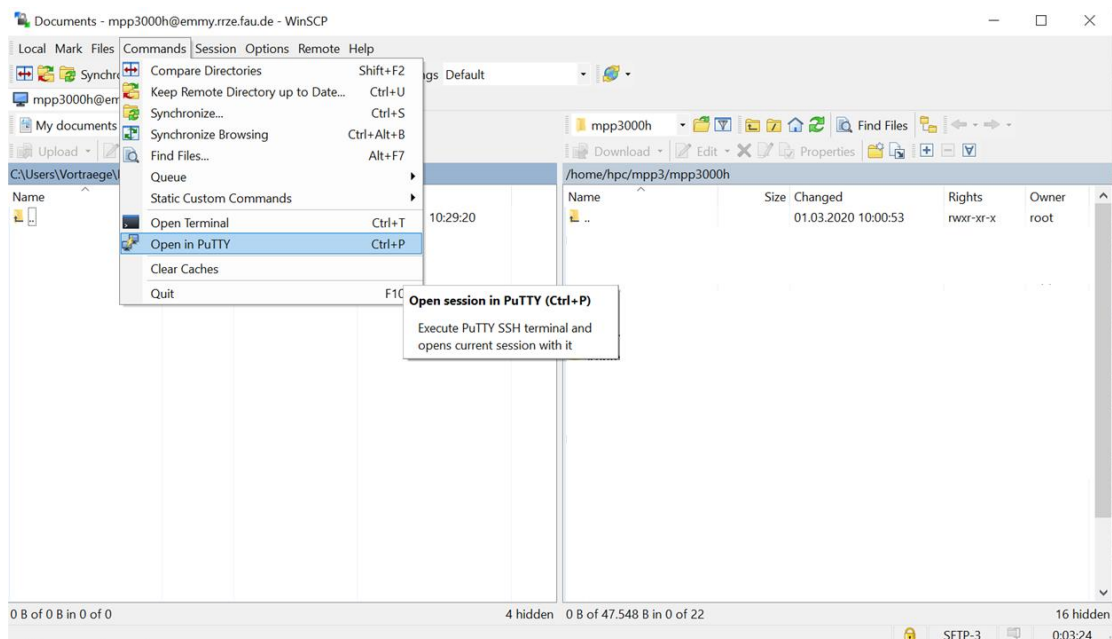
For this, first download PUTTY from <https://www.putty.org/> and install it to a preferred location.

- Now go to Options->Preferences. You will then be presented with the following window:

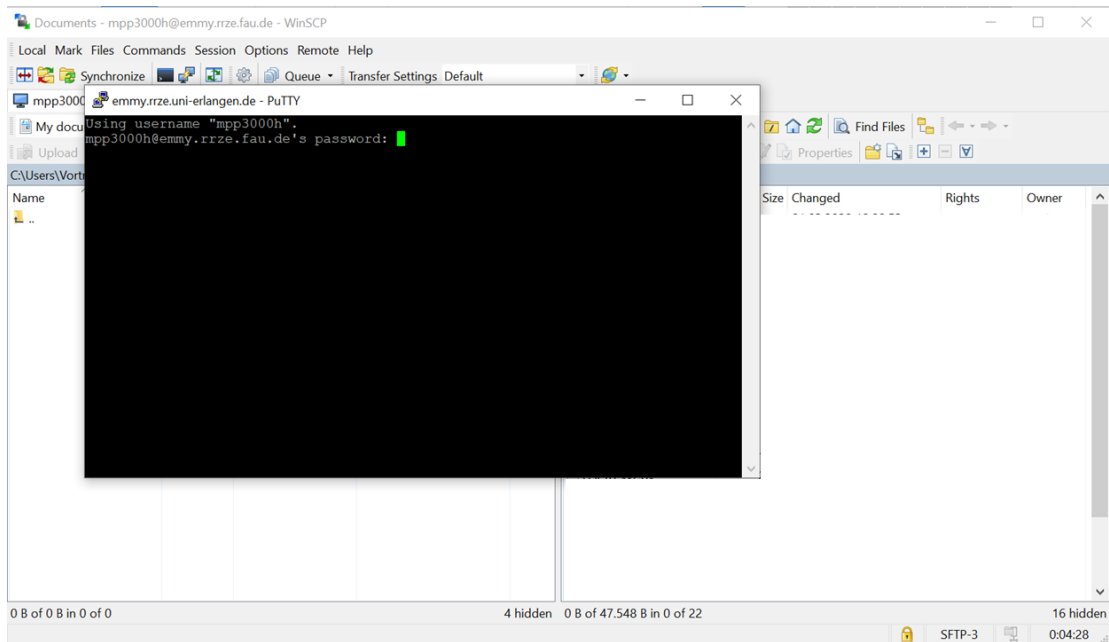


Under Integration -> Application, you can tell WinSCP the location of PUTTY.

- You can then start PUTTY in the following menu:



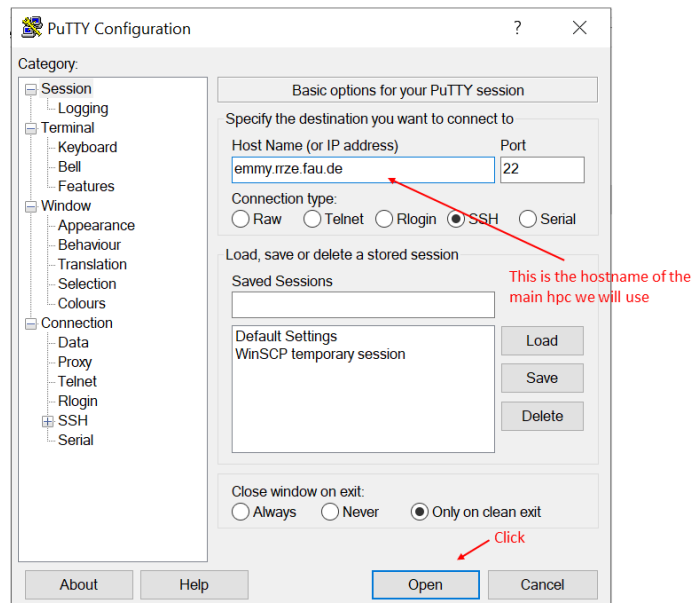
- This will then open a PUTTY window, prompting you for your password



Of course, you can also have start and have several PUTTY windows open at the same time.

### PUTTY without WinSCP

- Of course you can also run PUTTY without going through WinSCP. In this case, you can run command from the command line and manipulate files on the cluster. But you cannot upload or download file between cluster and your home computer
- Starting PUTTY from the location you installed it to opens a window, where the destination hostname of the to-be-established connection has to be defined. We want to connect to the Emmy cluster (emmy.rrze.hpc.fau.de), which is only accessible through the university network. There are two ways to establish this connection:
  1. If your computer uses the university's internet or you have a VPN connection to the university network, you can directly connect to Emmy:

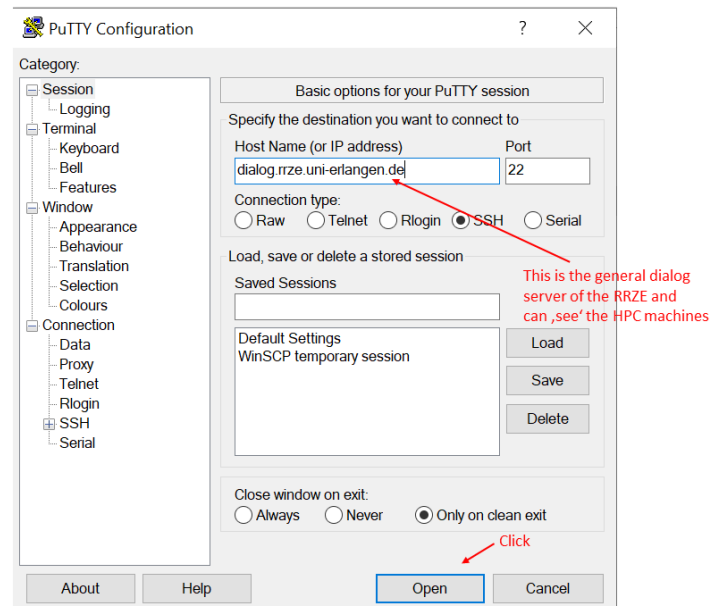


Clicking on “Open” will then open the following window:



Use the account name provided by the RRZE and the password to your account to log in.

2. Instead of a VPN (or being on campus), you can also use the dialup server of the RRZE to connect to Emmy. In this case, follow these steps:



This will open a prompt, where you can log in using your IdM identifier and password. After login, you will be presented with the following view:

```

dialog.rrze.uni-erlangen.de - PuTTY
login as: fi59heli
fi59heli@dialog.rrze.uni-erlangen.de's password:
dialog.rrze

Welcome to Ubuntu 18.04.4 LTS (Bionic Beaver) 4.15.0-99-generic
Location: Rack 5 / IV 3-12

System load:  0.03 0.16 0.25   Up time:      14:56 hours
Memory usage: 1 % of 128891Mb  Swap usage:   0 % of 7719Mb
Usage of /:   9% of 450G       Processes:   430
Local users:  2
IPs:          131.188.2.109,2001:638:a000:1001:131:188:2:109

Last login: Fri May 15 10:47:11 2020 from 37.4.229.248
fi59heli@dialog[ ~ ]$ ssh -l XYZ emmy.rrze.fau.de

```

Use this line to log into the emmy cluster from the dialog server. Replace XYZ with the user name provided by the RRZE

Now connect to Emmy by typing the command shown in the picture where you replace XYZ with the username of your HPC account. This will then ask you for your HPC password.

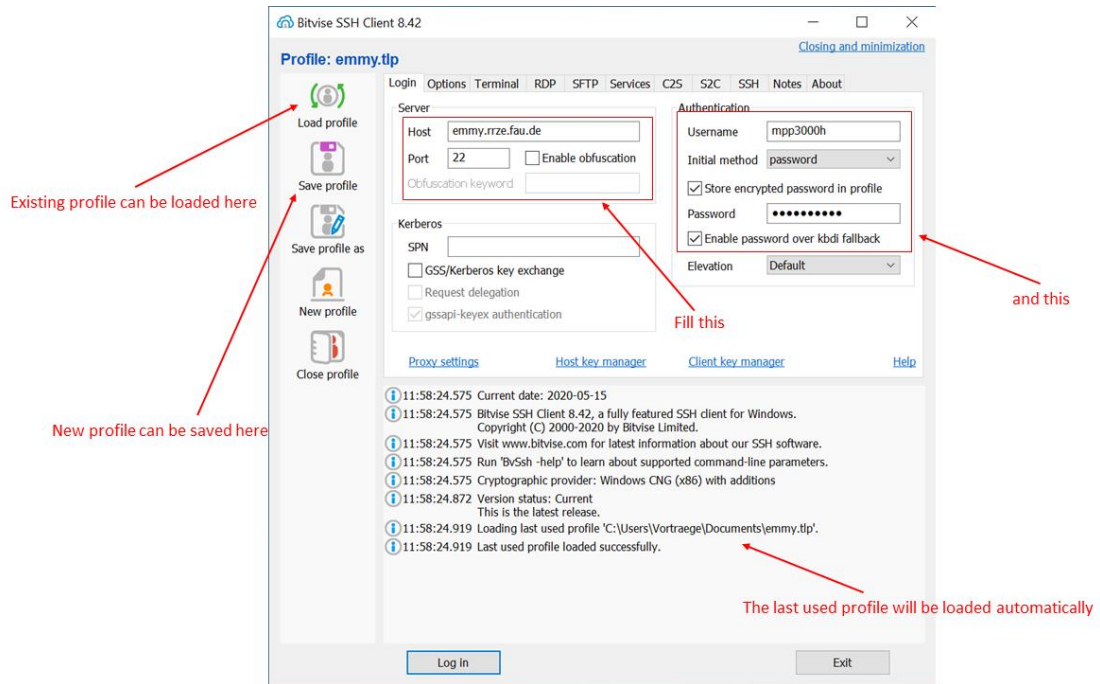
Instead of using the dialog server, you can also use `sshpc.rrze.fau.de` together with your HPC credentials.

- In any case, you should now be logged into Emmy with a working account name and password and presented with a command line.



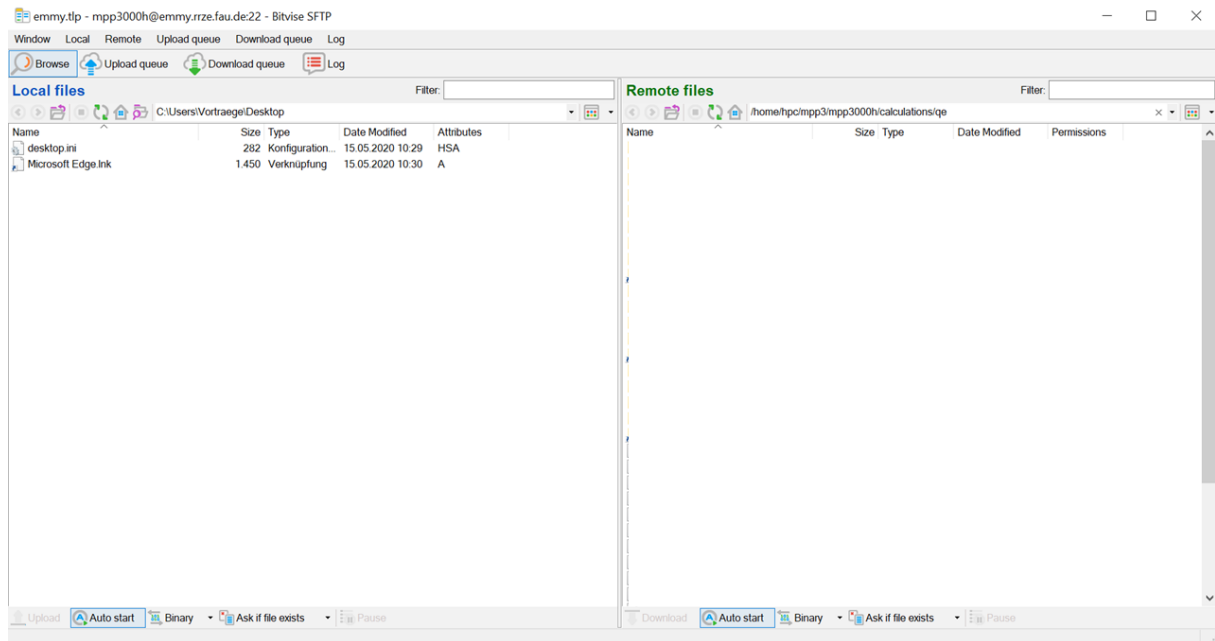
## Alternative to WinSCP: Bitvise

- There are several alternatives to WinSCP, with similar functionality. One such alternative is Bitvise, which can also be downloaded from <https://www.putty.org/> as well.
- Installing and running Bitvise opens the following window:



Simply give the address of Emmy and your HPC credentials and save your profile with the buttons on the left. The next time you run Bitvise, the profile last used will be already loaded.

- Clicking the "Log In" button will open a window that looks very similar to WinSCP. It will also automatically open a terminal window (this behaviour can be switched off in the profile):



- Bitvise offers similar capabilities to WinSCP, but does not seem to have an integrated text editor. You will then have to define an editor for every file ending you want to open.
- I was not (yet) able to get tunneling to run with Bitvise, so I would advise using a VPN to connect to Emmy from outside of the university network.

## Linux (and Mac)

- Connections from Linux (and Mac) systems work similarly to the steps shown for Windows-Systems. In this case, PUTTY is not needed. Simply open a terminal and connect either directly to Emmy through the command

```
ssh -l XYZ emmy.rrze.fau.de
```

or indirectly through

```
ssh -l IdM-name dialog.rrze.uni-erlangen.de (or to cshpc.rrze.fau.de)
```

with subsequent

```
ssh -l XYZ emmy.rrze.fau.de
```

In principle, one can combine the two steps of the indirect option, but I have not yet been able to do it successfully.

- On Linux, one can in principle directly copy files from the HPC using SCP, but that is not really practical in most cases. WinSCP and Bitvise are both Windows programs. There are a few alternatives for Linux, such as FileZilla or gFTP. The configuration of those is similar to the steps shown above for Windows.