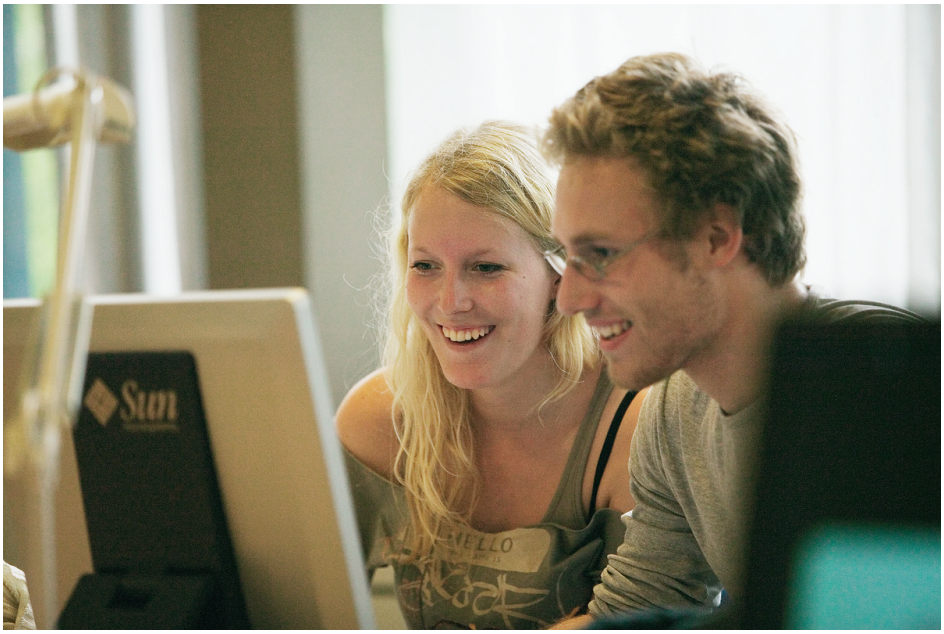
G-Databar Introduction

September 2017



This compendium goes through a series of exercises and descriptions, that will give new users of the G-databar (G-bar) an opportunity to learn the different computer systems in use at DTU. Knowing how to use the systems can help you through your time at DTU, and give you tools that help you throughout your study here. The exercises assume little to no knowledge beforehand and goes through:

- Logging onto the Internet using eduroam
- Printing documents from your own computer and by using ThinLinc
- Downloading programs from `http://downloads.cc.dtu.dk`
- Running programs from the G-bar using ThinLinc
- Transferring files from and to your DTU-drive via SFTP using FileZilla

Contents

1 Introduction

A short description of the G-bar: The G-bar is a collection of study and research related tools gathered in one system. The G-bar offers a wide variety of software and services, all of which is given access to from day one.

The system consists of a centrally-controlled Linux environment which the user can access in various ways, e.g. via ThinLinc from your own computer.

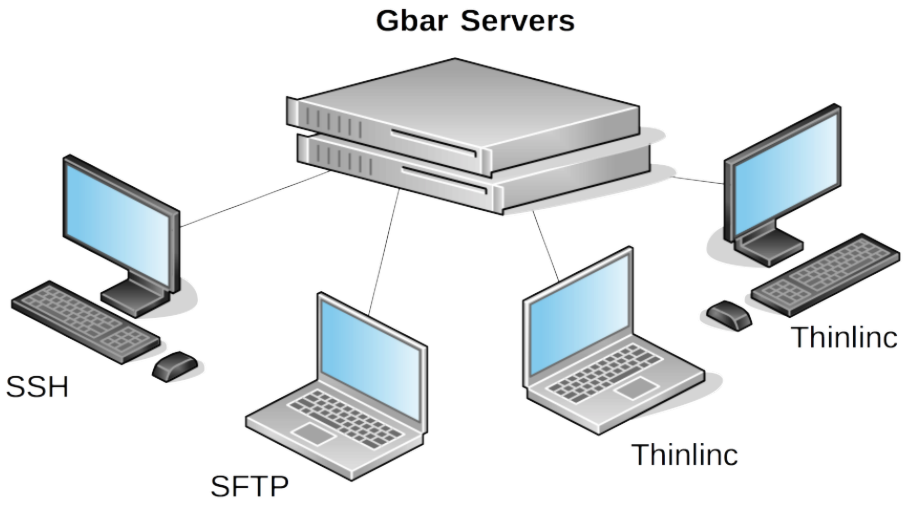


Figure 1: You can connect to the G-bar services and programs using a ThinLinc client from your own computer

Check out the G-bars website at `http://gbar.dtu.dk`.

2 Wireless Internet and eduroam

At DTU there are a couple of different networks to choose from, when you turn on your computer. Amongst these are "dtu" wireless and eduroam. As a student, you will mainly use these two to access the Internet.

2.1 Connecting to DTU wireless

- Connect to "dtu" wireless
- Open a browser. You will now get redirected to a login site, where you put in your DTU credentials and click login.
- You are now connected to the Internet

DTU wireless has a few shortcomings, such as lack of encryption and the fact that you have to login every time you connect to the network. Because of this, eduroam is greatly preferred compared to the other networks.

Figure 2: Eduroam logo

Education Roaming (eduroam) is a service which offers flexible access to the Internet. On your own computer, eduroam will appear as any other wireless network. One of the advantages with eduroam, besides the encryption and one-time setup, is that you have access to it at a lot of major universities throughout the world.

Basically, this means that you can use your DTU login to access the Internet from e.g. University of Copenhagen and ÃĚrhus University, since they are a part of the eduroam collaboration. So far over 70 countries are a part of the collaboration.

2.2 Setting up eduroam

Setting up eduroam is a mostly automated process:

- Go to `http://cat.eduroam.org/`
- Choose 'Technical University of Denmark' under 'institution'.

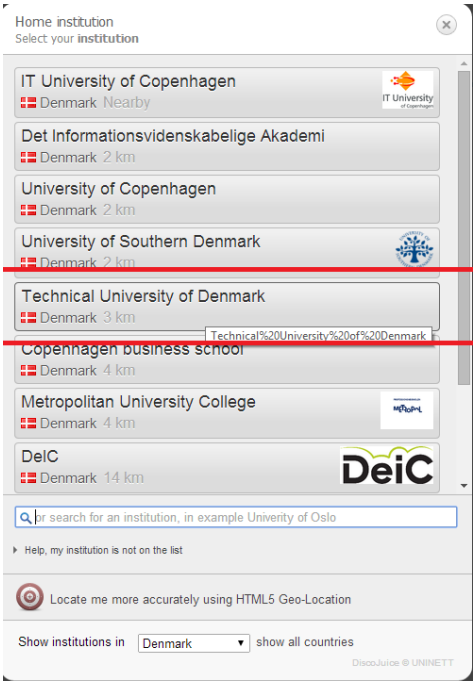


Figure 3: Choose Technical University of Denmark

- Choose your operating system

Figure 4: Choose your operating system

- Follow the install instructions and use the following credentials:
  - username: sxxxxxx@dtu.dk
  - password: DTU-password

There are also installation instructions for Linux, Windows XP, Vista, 7,8 and 10, OS X from Lion and newer; as well as phones and tablets.

3 Access to the G-bar

As mentioned earlier, the G-bar is a service to all students at DTU, offering a wide variety of tools and services. In recent years the primary method of access has changed from physical terminals (these have now completely been removed) to a *Remote Desktop* (RM) way of accessing the system. RM simply means that you connect to the Internet and then get a remotely running desktop shown locally on your computer. There are other ways of accessing the G-bar such as a direct SSH connection, but by using RM one gets a more familiar graphical interface, which is well suited to less seasoned Linux users. The G-bar uses ThinLinc, from a company named Cendio, as their RM solution.

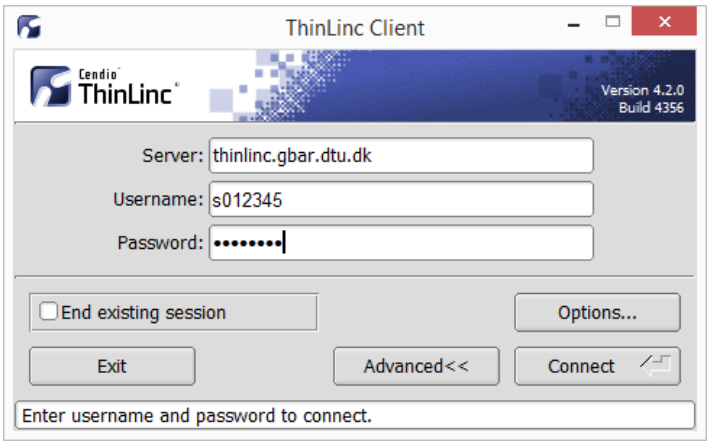
3.1 Via ThinLinc

To use ThinLinc you first need to download and install the client

- Download the program from `https://www.cendio.com/thinlinc/download/`
- A page with clients for the different operating systems is shown. Download the client that matches your operating system.

You log on to the G-bar using ThinLinc by doing the following:

- Start ThinLinc. In Windows, ThinLinc is launched by clicking the ThinLinc icon. In Linux you can run the command `tlclient` in a terminal.
- When the program is running, you should be shown a window looking like this:



- Fill out the information with the following details:
  - Server: thinlinc.gbar.dtu.dk
  - Name: sxxxxxx
  - Password: DTU-password

- Click on Connect to connect to the G-bar. You are now logged in, and can choose a desktop environment. The desktop environment defines how your desktop looks after you are logged into the system. Three main options are available:
  - XFCE - Lightweight desktop
  - LXDE - Lightweight desktop
  - E17 - Experimental desktop
- If you don't have any preferences, or don't know what to choose, simply go with XFCE which is the more popular of the three.

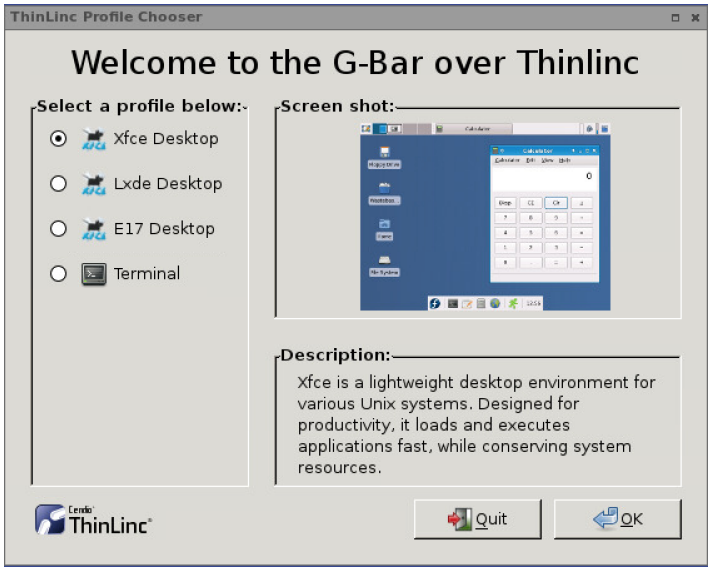


Figure 5: Choose a desktop environment

- Once you have chosen a desktop environment, your desktop will appear. From here you can launch programs, start a terminal session and log into the HPC clusters etc.

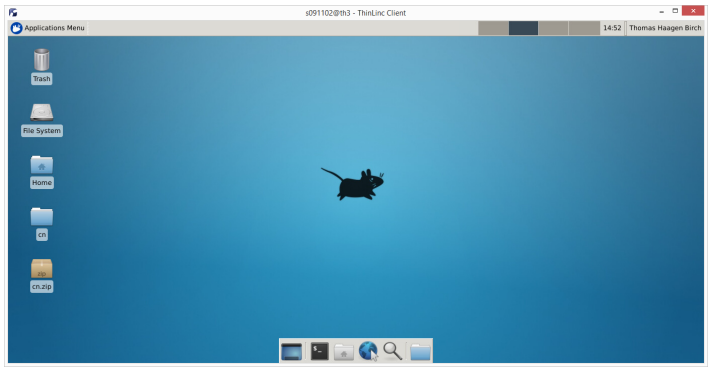


Figure 6: XFCE desktop in ThinLinc

4 Studentmail

E-mail is probably the most used and integrated part of the Internet. At DTU you get, along with your CampusNet login, access to an e-mail account. This account has a unique name, like `s012345@student.dtu.dk` where `s012345` is your student number.

4.1 Why do I need a studentmail?

You could ask:

Why do I need a studentmail?

A lot of important information regarding courses, projects etc. are distributed on CampusNet and via studentmail. This means that, as a student, you have an *obligation* to check your mail often. Furthermore, the studentmail is an excellent means of verification, and showing that you are indeed from DTU.

But, I already have a hotmail/gmail, why can't that be used?

By having DTU administer the studentmails, the administrative burden is lessened significantly, since all students have a mail address directly tied to their student number. If the administration wanted to contact a specific student, they simply need to know their student number. Imagine if the administration had to keep track of +8000 different email addresses which a constant addition of about 500-1000 new addresses each year.

5 Printing and printers

5.1 General information about printers at DTU

At DTU there are numerous printers available, and as a student you can print in black/white for free. The printers are located at different places on campus, like the databars and the library. If you want to print something in colour, large format or something else, that can be done in the library in building 101. You can also find staplers, scanners etc in 101. You can read more about all this at `http://www.bibliotek.dtu.dk/`.

It is important to highlight that the G-bar is *not* responsible for all printers at DTU. For example, the printers in building 341 are administered by the Win-bar. For that reason, you have to be aware of what databar you are in, to know how to print.

6 Software in the G-bar

6.1 Software

The G-bar offers a wide variety of software and programs that is free to download and use. The list of software available includes:

- ANSYS
- Comsol
- KeyShot
- LabVIEW
- MagicDraw
- Maple
- Mathematica
- Matlab
- Origin
- PTC Creo
- S-plus
- SolidWorks
- ThinLinc
- WPS

These programs are located on the G-bar server and you can access them using your DTU login, either directly from `http://downloads.cc.dtu.dk` or via CampusNet and under the tab **Software**. You can get access to the programs in two ways:

- Download them to your own computer.
- Run them using ThinLinc.

First we go through how to download and install a program on your own computer.

6.2 Download Maple 2016

In this exercise the goal is to download the latest version of Maple and install it. Maple is, briefly told, a piece of software for mathematical calculations. Maple is capable of solving equations and also contains other powerful tools for graphical presentation of data, statistical analyses and much more. You will probably get to know Maple, primarily through the introductory mathematics courses such as "Diplo-mat" and "Mat1".

To download Maple for Windows, you do the following:

- Go to `http://downloads.cc.dtu.dk`. You now see a list of software in the left side of the browser.
- Click on the Maple folder

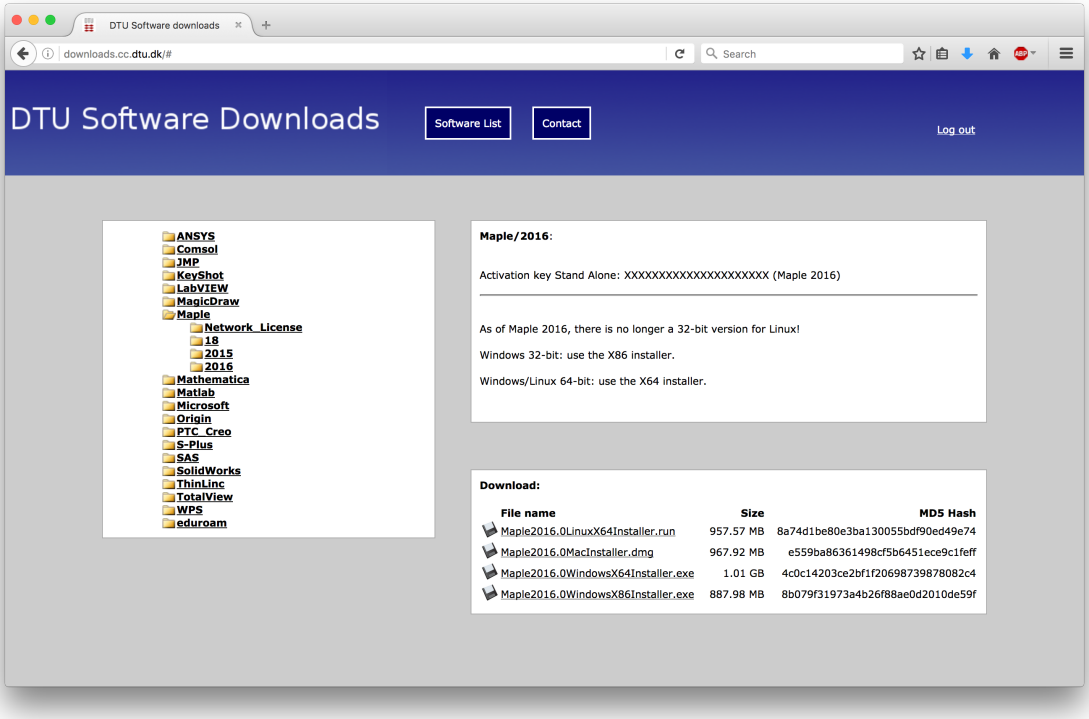


Figure 7: Find the latest version of Maple

- Click on the latest version. In this case that is **2016**. You will now see a list with Maple versions. The different versions go with the different operating systems (Windows, OS X etc.) so you have to choose the file that fits your operating system.

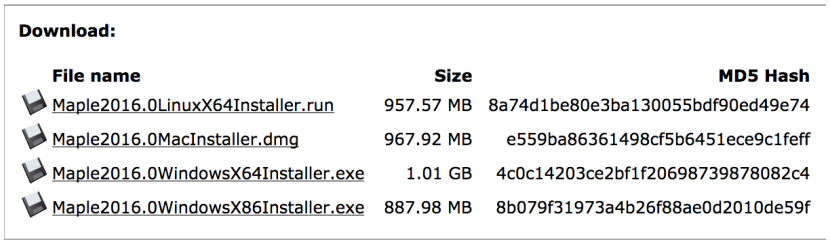


Figure 8: Find the latest version of Maple

- Right-click on the file **Maple2016.0WindowsX64Installer.exe** (or the one suitable for your computer) and choose **Save target as...**.
- Choose a suitable place to save the file and click on **Save**.

The installation file is downloaded and stored locally. Now the program itself needs to be installed. Maple comes in a ready-to-install package, which will take you through the steps needed. During the installation you need to input an activation code. This code is found in the top of the side from where the installation file was downloaded, marked with the title **Activation key Stand Alone:**.

- Double click the installations file.
- Follow the instructions on the screen
- When activating, input the **stand alone** Key/Purchase Code, which is found on the top of the page where you downloaded Maple.

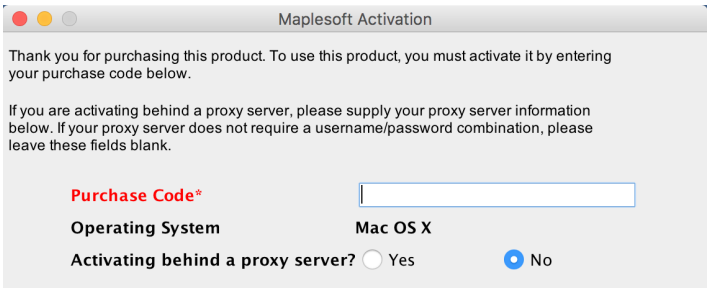


Figure 9: Locate the activation key

Now Maple is installed and activated. The key that is used to activate Maple lasts for about a year. This means that you might have to renew the key every year to continue using the latest version of Maple.

This might sound a little inconvenient, but this is due to the license that DTU gets only lasts for a year, so that it is only students that have the license, and you are not able to run Maple indefinitely after having been to DTU once.

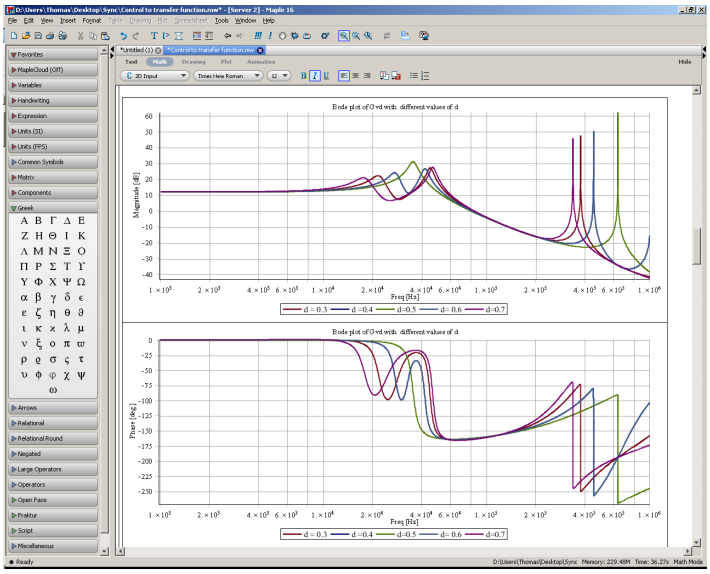


Figure 10: Screenshot of Maple 2016

7 Running Maple through ThinLinc

If you want to, you can run Maple directly on the G-bar servers. To do this, follow these steps:

- Start a ThinLinc session (see section 3).
- Right-click the desktop. This will bring out a menu from where you can choose what program to start.
- Go into **Applications** → **DTU** → **Mathematics** → **Maple (GUI)**.

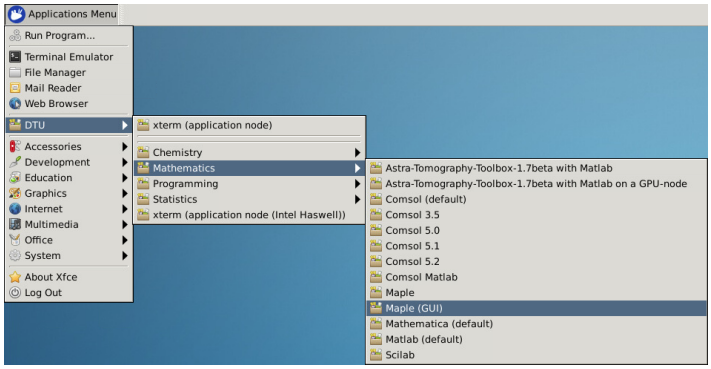


Figure 11: Choose Maple in the menu

- Maple will start shortly after.

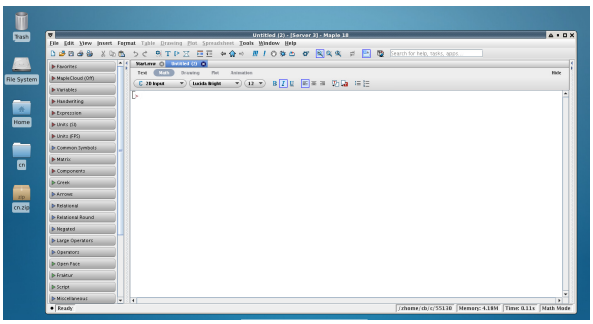


Figure 12: Maple starting in the ThinLinc XFCE environment

Note: that because of the limitations of the G-bar server, you can only run a program/process for 24 hours at a time. That is to say, you can have Maple open in 24 hours, after which it will be cleaned up by the server (i.e. shut down). To avoid this, remember to log out when exiting ThinLinc or simply restart your program once in a while. And remember to save often! The reason for this, is that the resources on the G-bar server are shared, and users often forget to close programs or log off, which results in a lot of unused programs taking up resources.

8 SFTP and the home drive in the G-bar

In the G-bar we offer 30 GB of online storage for you to use. This storage space (or drive) is well suited for saving your reports, code, lab results etc.. If you put something on your drive, you can access it from all the programs that are installed in the G-bar. Transferring files to the drive is done via SFTP.

8.1 What is SFTP?

SFTP (Secure File Transfer Protocol) is what you call a *protocol* for transferring files between computers. You can use SFTP to access online storage space from your local computer. Such a system typically consists of a server that provides the space to the clients. Superficially SFTP is divided into two parts:

- A command connection.
- A data connection.

The command connection is used to send commands between the server and client and also used to verify your identity. The data connection is used to exchange files and data.

We will now take a look at how you set up access to this drive.

8.2 Installation and configuration

The first thing you need to do is to download an SFTP client. In this instance we are using the program called FileZilla. FileZilla is a free SFTP client that works on Windows and OSX. Alternatives exist like CyberDuck and OpenSSH/scp for OSX and WinSCP for Windows. Most Linux distributions come with a built-in SFTP service, which you can use from a terminal.

- Go to FileZillas homepage `https://filezilla-project.org/download.php?type=client`
- Download the FileZilla client. Make sure to download the right version for you operating system.
- Follow the install instructions on the screen.
- Start FileZilla.

8.3 Transferring files via SFTP using FileZilla

To demonstrate how to use SFTP, the following is a step-by-step of how you transfer your files from the drive at DTU or the other way around.

- When you start FileZilla, you get a window with the name **FileZilla**. In the top of the window there are a couple of fields, this is where you put in the connection details.
  - **Host**: **transfer.gbar.dtu.dk**
  - **Username**: **Student ID**.
  - **Password**: **DTU password**.
  - **Port** 22.

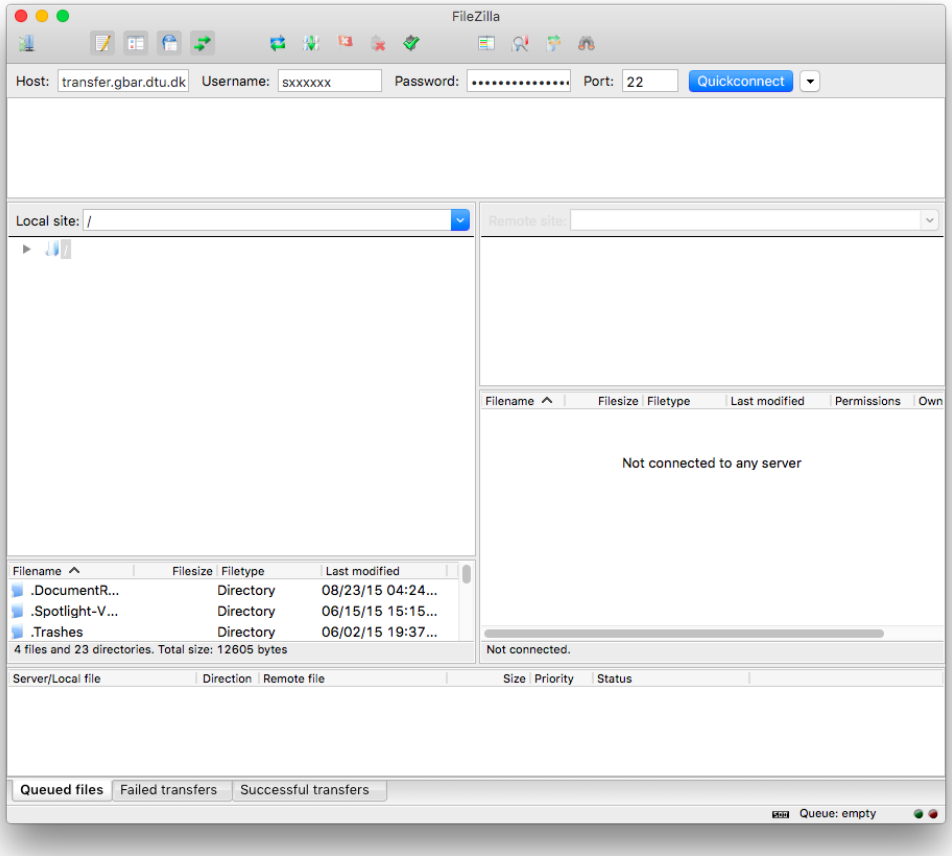


Figure 13: Configuration of a session in Filezilla

- Click on **Quickconnect**. If you are asked if you want to save the password for the connection just press "Yes", and the same if it asks if you want to accept the connection. Do **not** save passwords on shared systems.
- The client will now connect to the DTU server.

When the connection has been established, you will be presented two filesystems separated vertically. The one to the left is the local filesystem, that is to say the files on your computer, and the one to the right is the files on the DTU drive.

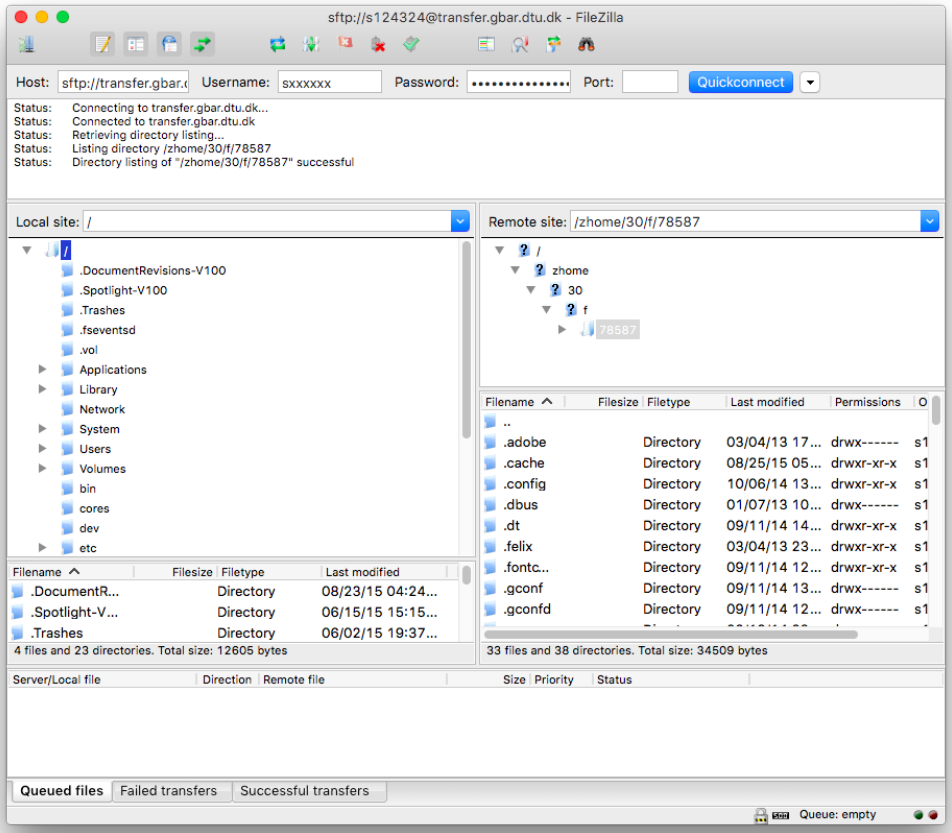


Figure 14: Two filesystems. Left is the local, right is the DTU drive

The address that is shown in the DTU drive will have the format */zhome/xx/x/CWIS*, where xx is an indexingletter and CWIS is a five numbered identification number, i.e. not your studentnumber. To transfer files to the DTU drive, you do the following:

- Find a file in the filesystem on the left.
- Right-click and choose **Upload**, or drag the file from the left side to the right side where you want to save it.
- The file will now be transferred to the DTU drive

The procedure is much the same when you download files from the DTU drive.

- Find a file in the filesystem on the right.

- Right-click and choose **Download**, or drag the file from the right side to the left side where you want to save it.
- The file will now be transferred to the local computer from DTU drive

9 Other G-bar services and recommended resources

In addition to what has been presented so far, the G-bar offers a couple of services and tools that deserve to be mentioned.

- **LaTeX**. LaTeX is a document preparation system which is specifically useful for scientific reports. LaTeX is able to handle mathematical formulas and references in a safe and effective way. LaTeX is much like a programming language, so the learning curve can be a bit steep, coming from normal word processors (like Microsoft Word), but it pays off in the long run. LaTeX compilers can be installed on your own computer, but are also installed on the G-bar systems. Recently, DTU has also acquired licenses for ShareLaTeX, which is an online environment for LaTeX, very much like Google Docs. You can read more about LaTeX using the following links:
  - `http://www.LaTeX.dtu.dk`
  - `http://en.wikibooks.org/wiki/LaTeX`
  - `http://www.LaTeX-project.org/`
  - `https://www.shareLaTeX.com/`
  - `http://gbar.dtu.dk/faq/91-sharelatex`
- **Git**. Git is a tool for sharing and updating data among many users, mainly code/text. In short, Git offers a way to store files and file changes in something called a *repository*, where you can have documents, code or pictures. The advantage of using a version control system really shines when many users are working together on the same documents and files. It allows sections of files to be altered by multiple users and merged together without overwriting previous contributions. You can read more about Git using the following links:
  - `https://gitlab.gbar.dtu.dk` (The G-bar GitLab server)
  - `http://gbar.dtu.dk/faq/41-git`
  - `https://en.wikipedia.org/wiki/Git_(software)`
  - `https://git-scm.com/download/gui/linux` (Different Git GUI clients)
  - `https://github.com/` (very popular service for open-source/public repositories)

- **High Performance Computing (HPC)**. As the name implies, the HPC cluster handles tasks or processes which require a large amount of calculation power. DTU offers use of these so called 'clusters' to all students, and you can run long running resource intensive simulations. These are particularly used in physics and chemistry, but also has applications in other technical areas. Read more about the HPC systems at:
  - `http://www.hpc.dtu.dk/`
- **Other databars**. There are numerous other databars at DTU:
  - `http://www.databar.dtu.dk/` (General overview)
  - `http://www.winbar.dtu.dk/` (Win-bar)
  - `http://gbar.dtu.dk/` (G-bar)
- **Linux.** Since the G-bar runs Linux systems, it can be an advantage to read up on how to use Linux. A couple of resources are given here:
  - `http://www.tecmint.com/useful-linux-commands-for-newbies/`
  - `http://en.wikipedia.org/wiki/Linux`http://en.wikipedia.org/wiki/Linux
  - `http://ryanstutorials.net/bash-scripting-tutorial/bash-script.php`