Exercise 1B – The DTU Unix cluster

1.1 Log in to the DTU Unix systems with ThinLinc

ThinLinc allows you to get a Unix desktop from the central DTU Unix system (a.k.a. the G-databar) on your local laptop or computer. It's like Windows' Remote Desktop, but just for Unix. To get started, you have to install the ThinLinc client on your computer. If you haven't done that, yet, go to http://www.cendio.com/thinlinc/download, and download the client for your operating system.

When you start the client, you have to type in the name of our ThinLinc server, i.e. thinlinc.gbar.dtu.dk, and your usual username and password. Don't use the pre-filled server name! After a succesful connection, you need to choose a desktop layout — just accept the default (XFCE), and after a while you will see a desktop like the one in Fig. 1.1 to the right.

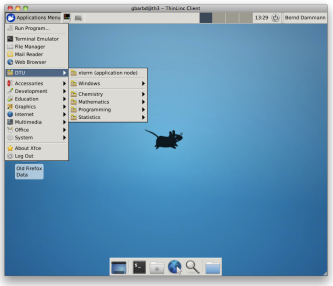

Figure 1: ThinLinc desktop

As a starting point for today's labs, create a Folder (call it e.g. 'ProjectWork' (note: no space in name!) or '02635'), on the desktop: start the 'File Manager' (from the bottom panel, or from the 'Applications Menu' on the top of the desktop), choose the Desktop, and then use either the 'File' menu or the right mouse button to create the folder.

Now start the web browser (from menu or panel), and download the ZIP file with today's lab material from Campusnet, into the folder created above. Unpack the ZIP file, e.g. by right-clicking on the file, and using the tool suggested. This should create the sub-folders 'CLI' and 'GUI', which contain the files needed to do the lab exercises.

1.2 Hello World — the command line way

Enter the folder 'CLI' — there should be a file called 'README'. As a first step, you'll have to create a C source file with the "Hello World!" program. This can be achieved in different ways — here is one of them: right-click on the folder background, choose "Create Document" and "Empty File". Give it a meaningful name, e.g. "hello.c". An icon with a "C" in it will appear. Right-click on the file, and choose an editor to open the file with, e.g. 'gedit' or 'leafpad'. Both editors are very simple, and easy to use.

Type your C code, and save the file. Now we have to compile (and link), and for that we need to open a Unix command line (sometimes also called 'a terminal'). Right-click again on the folder background, an choose "Open Terminal Here" — this will start a Unix shell in a terminal, located in this folder. If you type 'ls' at the command prompt, you should see the README and your C-source file in the output.

Compile (and link) the code into an executable program. Run it (from the command line)! Does it work?

1.3 Hello World — the GUI way (optional)

We will do the same exercise as above, again, but now using an IDE, i.e. 'Eclipse'. 'Eclipse' is a powerful tool, that was originally developed for Java programmers, but there are a number of plugins for other languages as well, and even some commercial software packages use 'Eclipse' as a GUI around their product (e.g. 'Comsol').

Start 'Eclipse 4.5' from the 'Applications Menu' (you can find it under 'DTU', and then 'Programming'). Make sure to use version 4.5!!! The first thing you get asked is, where to place your code. Click on 'Browse', and choose the 'GUI' folder from above. The IDE will now start!

Click on 'File' and 'New', and then choose 'Project' (not 'Java Project'!). This will open a 'Project Wizard'. Click on the 'C/C++' section, and then 'C Project'. Give the project a meaningful name, e.g. 'HelloWorld' (note: avoid spaces — 'good Unix style'). Since this is a new project, we choose 'Empty Project', and then 'Linux GCC' as the toolchain. That's it: 'Finish'! The project will be created for you — empty, of course!

Now we need to create the source file: click on the C/C++ source file icon in the task bar — and you will need to provide a name for the file. It's your creative day, today! A C source file wil be created (from a template), and you can now start typing in your source code.

While typing, you will see that the IDE is "helping" you, e.g. putting a closing paranthesis when you type an opening, etc.

After you have finished your source code, you will need to build the program. Click on the 'hammer' icon .... in the 'Console' part of the GUI, you can follow the build-process, and check for errors as well. To run the program, press the green icon with the 'Play'-symbol.

File transfer to/from the Unix systems

When you are on the DTU network, e.g. via eduroam, you can directly access your Unix home directory from your laptop, by mapping it as a network drive.

Windows: Go to 'This PC', 'Map Network Drive' and use
`\\home.cc.dtu.dk\<username>` in the address field.

Mac OS X: In the Finder, press `command-K`, and then type
`smb://home.cc.dtu.dk/<username>` in the 'Server address' field.

Linux: Most File Managers support the SMB protocal — just type
`smb://home.cc.dtu.dk/<username>` in the location field.

`<username>` above is a placeholder for your DTU account name, e.g. s123456.

Outside DTU, you can transfer files to and from the Unix system with tools like FileZilla (all platforms), or WinSCP (Windows). Use transfer.gbar.dtu.dk as the server for this purpose. More information can be found on the G-bar webpages http://gbar.dtu.dk (search for FileZilla or WinSCP).