Setting up your
Linux
computer before
Course Work Modules

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What do I need to do?

This document is for Engineering Science Students in the University of Oxford that want to use a personal Linux computer for Course Work Modules (CWMs). There is a separate document for if you are using a Mac/Windows. Following the steps in this document will require you to **install new software** on your computer. You will need a computer with permissions to install new software. This may be an issue if you are using a borrowed computer/internet café/public library.

Step 1: Access Teams

Most Course Work Modules will use **Teams**. TDSG (the Teaching Support Group) will also be using this to help you if you get stuck setting up your computer. Start by reading **Useful Applications** which details how to use Teams on **pages 1-3.**

Step 2: Work out if you need VPN

VPN (Virtual Private Network) allows you to connect to the University Network as if your computer was within the University. It is needed for any CWM that uses computers within the University that you **access remotely** from home. Read the table on the next page to find out if you need VPN for your CWMs. If it does, follow the instructions on **pages 4-5.**

Step 3: Work out if you need Remote Desktop

Read the table on the next page to find out if you need Remote Desktop for your CWMs. This allows you to take over the desktop of a Departmental Computer from home and use it as if you were sat in front of the PC. If your CWM needs this, follow the instructions on **pages 6-9.**

Step 4: Work out if you need Remote Login

If you are doing **Computational Fluid Dynamics** or **High Performance Computing**, you will need Remote Login. This allows you to send commands from your computer to a Departmental PC. Follow the instructions starting on **page 10.**

Table of CWM requirements

Course Work Module	VPN	Remote Desktop	Remote Login	Other
Mechanical CAD	✓	✓		
Turbomachinery CAD	✓	✓		
3D Printing CAD	✓	✓		
Civil Engineering	✓	✓		
Chemical Engineering	✓	✓		
Finite Elements for Solids and Structures	✓	✓		
High Performance Computing	✓		✓	
Computational Fluid Dynamics	✓		✓	
Lego Football				Simulink

The following CWMs use Amazon Web Services (AWS):

FPGA

Formula 1

At the time of writing, we do not know what you will need. However, we suggest that you prepare for Remote Login. You will not need to use the University VPN server to use AWS, but to test Remote Login, using the computers in the Department, you will need VPN.

For the other CWM (**Business Laboratory, Optical Engineering of Biomedical Microscope, AI & Python, Biomedical Engineering),** your module organiser will advise you on what to do. Please see the individual sections in Canvas A5 Course Page.

Contents

Useful Applications

Nexus 365

The Oxford University Office 365 system. A cloud based working environment. Many of you will already be using Nexus 365 to access your email through a browser. If you are not already using Nexus 365, then follow the instructions here to get started: https://help.it.ox.ac.uk/nexus365/getting-started

Here you will find :-

Outlook

The Microsoft email client to view your Oxford University emails.

One Drive

A cloud based filing system. You can share files with other people.

Word

The Microsoft word processor.

- You can save files as a Word document(.docx) to **One Drive** or your own computer.

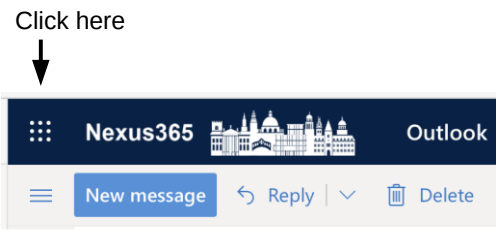
Excel

The Microsoft spreadsheet.

- You can save files as an Excel spreadsheet(.xlsx) to **One Drive** or your own computer.

If you create a file on OneDrive using Word or Excel, don't worry if you can't delete it. You will be able to delete it tomorrow.

When running one of the applications, you can select other applications by clicking on the dotted icon on the left of the banner.

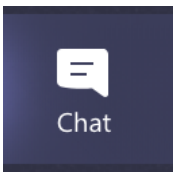


For more information on Nexus 365 see https://help.it.ox.ac.uk/nexus365/index

Microsoft Teams

Teams is an online chat and conferencing tool. Teams lets you message, talk to and see other members of the University. It will be used by many of the Course Work Modules. It is a part of Nexus 365 and you start teams like any other Nexus 365 application.

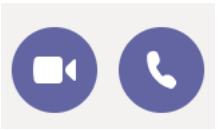
Testing Teams



You need the help of a friend in Oxford.

Right click on the **Chat** icon and select **New chat.**

Then enter the name of your friend.



Enter a message in the box at the bottom.

Try out the Video and Audio call. If you have problems, try installing the **Teams App**.

Installing the Teams App

On Windows and Mac you can install Teams as an application. This is not officially supported for Linux.

Using a Teams Classroom

Some Coursework Modules will be using Classroom features in Teams.
Please see the separate guide on Canvas, under MCAD.

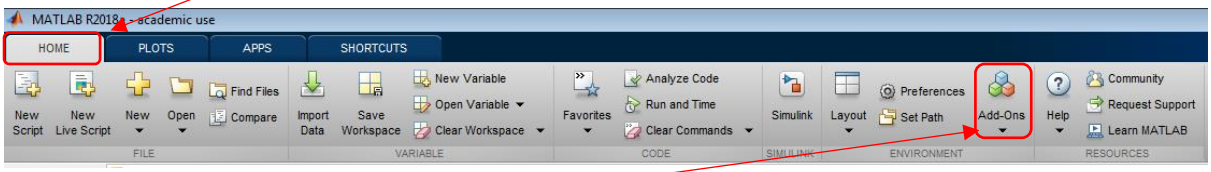
MATLAB Toolboxes including Simulink

Most of you will have already installed MATLAB on your personal computer. If not, see : http://www2.eng.ox.ac.uk/~labejp/TAH/MATLAB_Install.pdf

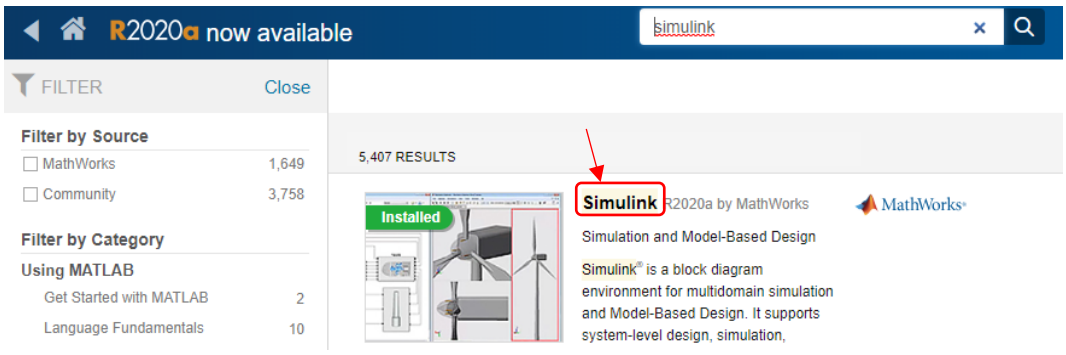
Once installed you can find out what Toolboxes you already have installed with the command **`ver`**. If there is something missing from the list produced, you can install more Toolboxes, including Simulink, using the **Add-ons** button in the ribbon.

Installing Add-ons (e.g. Simulink)

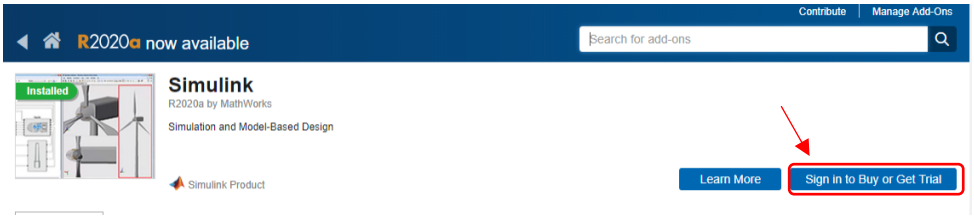
- ⇨ Navigate to the **Home** Ribbon.



- ⇨ Click on the **Add-Ons** icon.
- ⇨ **Search** for Simulink in the Add-On Explorer.
- ⇨ Click **Simulink**



- ⇨ Click on **Sign In** to Install



- ⇨ You will be prompted to sign into your **MathWorks account**.
  This is your University e-mail.

- ⇨ When you have signed in, click on **Install**.

Connecting to University VPN

Most computer systems within the University are not accessible from networks outside the University for security reasons. Using a VPN (Virtual Private Network) allows you to connect to the University Network as if your computer was connected within the University. Some Internet Service Providers may block the use of VPN (typically not an issue inside the UK). If you cannot proceed, please contact your coursework module organiser who can recommend alternative arrangements.

Install a VPN Client

If you have never connected to the University VPN, you will need to install a VPN Client called **Cisco AnyConnect.** Follow the instructions under "**Configuring Linux to Access the VPN Service**" at on the University IT website:
https://help.it.ox.ac.uk/network/vpn/linux/index
They are extensive and contain many screenshots to guide you through the steps.

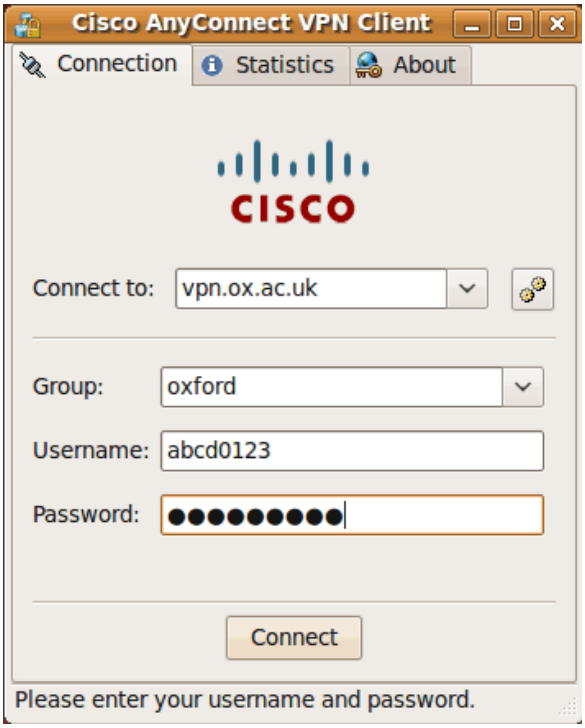
Connecting to the VPN

Once successfully installed,
launch the program **Cisco AnyConnect.**
It is listed under **Applications>Internet.**

Ensure the VPN is **vpn.ox.ac.uk**

Enter your
- **Single Sign On (SSO) username**
- **Remote Access Password.**

This is **different** to your SSO password!



You can self-register or **reset** your **Remote Access Password** at
https://register.it.ox.ac.uk/self/remote_access

Testing the VPN

Check that the VPN is working by looking at the Department of Engineering Science webpage at www.eng.ox.ac.uk. Click on **Intranet** on the right of the banner. A new page should load. You can only see the intranet if VPN is working. Without VPN you will be **Forbidden** from accessing this page.

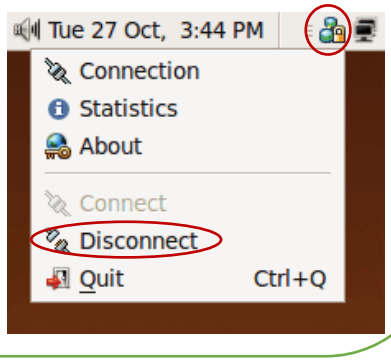
Was it successful?

All your web activity is now going through the University Network. Do not do anything that you would not do on the University Network. A refresher of the rules of using the University Network can be found at: https://governance.admin.ox.ac.uk/legislation/it-regulations-1-of-2002 (Point 7 in particular sets out things you can/cannot do on the network)

Disconnect from the VPN

Once you are finished working on University activities for the day:

- Right-click the VPN icon
- Select **Disconnect**



Check you have entered the **VPN address** and **Remote Access password** correctly.

If you have previously installed other VPN client software (e.g. NordVPN, TunnelBear), **disconnect** before attempting to connect to the University VPN server. The VPN connection to the University will not work if there are other active VPNs on your computer.

You cannot use the VPN if your Internet Service Provider, or Country of Residence, blocks the use of VPN. The local networks at some other educational and commercial establishments also block VPN access.

You can get help by visiting: https://help.it.ox.ac.uk/help/request

Remote Desktop Connection to Lab Computer (e.g. Software Lab A/DO/3DP)

Follow these instructions if you need to connect a computer in one of the laboratories in the Engineering Department. Using a remote desktop allows your mouse and keyboard to become the remote computer input, you can use it as if you were sat in front of it. You will be allocated a computer in one of the teaching Laboratories in the Department: Design Office (DO), 3D Printing Lab or Software Lab A. You will be allocated this for some period in week 3 or 4 of trinity term for testing your set up.

You will need to have already connected to the VPN, as per page 4.

IMPORTANT

Once connected by following the instructions on the next page

Do not just close the connection! *Do not shut down the computer!*

When you have finished using the remote computer,

you must **Sign Out** and **NOT shutdown the computer**

Install Remmina

You will need a **Remote Desktop Client**, such as **Remmina**. Check if you have Remmina installed by searching your applications. If not, an installation guide is given here: https://remmina.org/how-to-install-remmina/

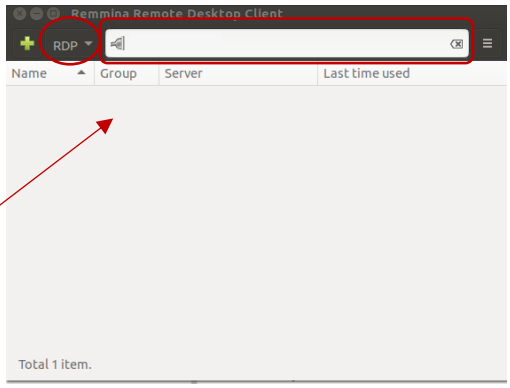
Starting a Remote Desktop

Open Remmina, type in the **IP or server address** you wish to connect to into the white box.

e.g. **engs-dopc00.eng.ox.ac.uk**[1]

Ensure the dropdown option is

RDP (for Remote Desktop Protocol)



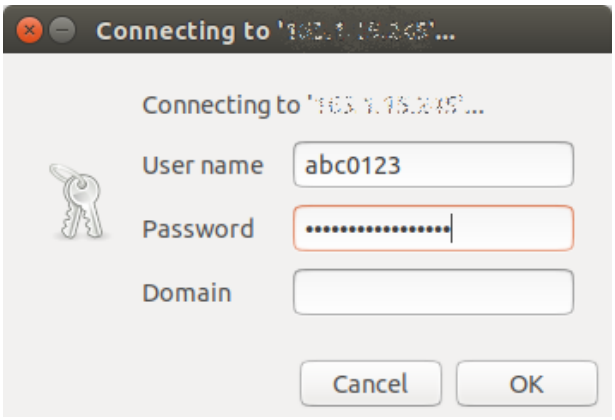
[1] This is a fake address as an example. You should be given a real address from your lab organizer.

Press **Enter**

Then enter your **Username**
(as per your Single Sign On
e.g. abc0123)

Use your **Departmental Password**[2]

Click **OK**



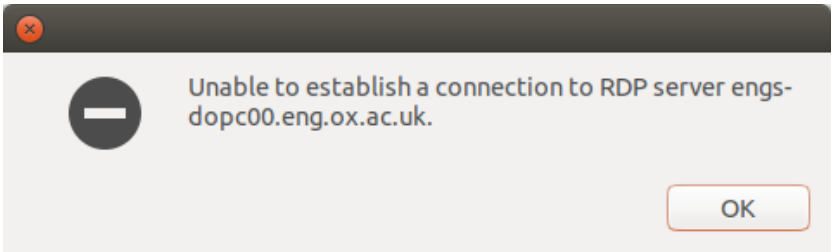
The screen of the remote computer should open.

Potential Problems

If you receive the error **Unable to find address of RDP server**:

It means that you have typed the **name of the server incorrectly**.
In the example above we have missed the 'o' from .ox.ac.uk.

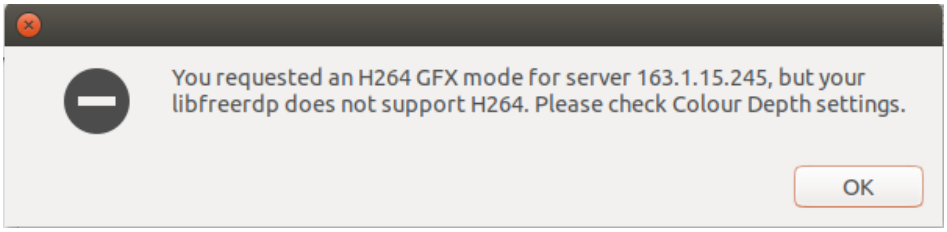
If you receive the error **Unable to establish connection to RDP server**:



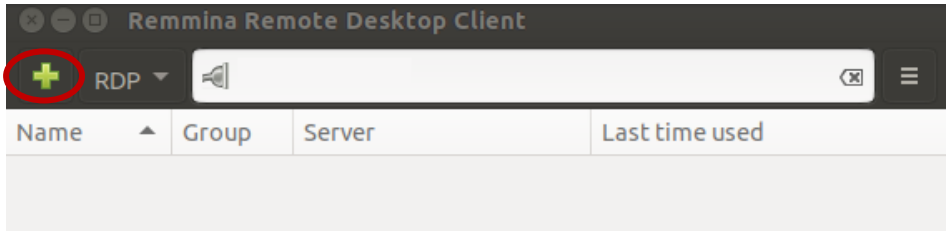
Instead of using the server name (e.g. engs-dopc00.eng.ox.ac.uk), try using a direct **IP address instead**. This should be available from your lab organiser.

[2] Password used when logging onto computers for labs in the Design Office/Software Lab A. Different to your SSO password. It can be reset by a member of TDSG (Teaching Support) or IT.

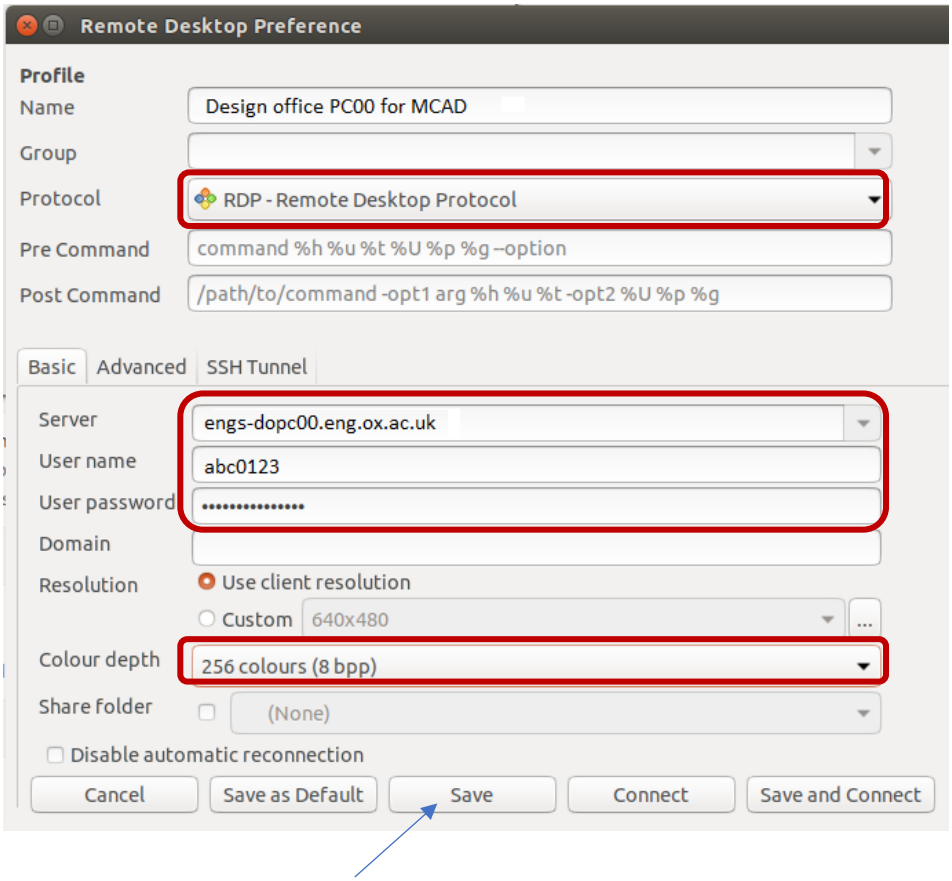
If you receive the error **You requested H264 GFX mode for server, but libfreerdp does not support H264**:



Use the advanced settings to change the colour depth settings. Click the Green +



Put in the same settings as you had above, but change the **Colour Depth to 256.**



Notice if you want, you can **save the profile** with a name for quick re-connection.

Ending your Session

IMPORTANT

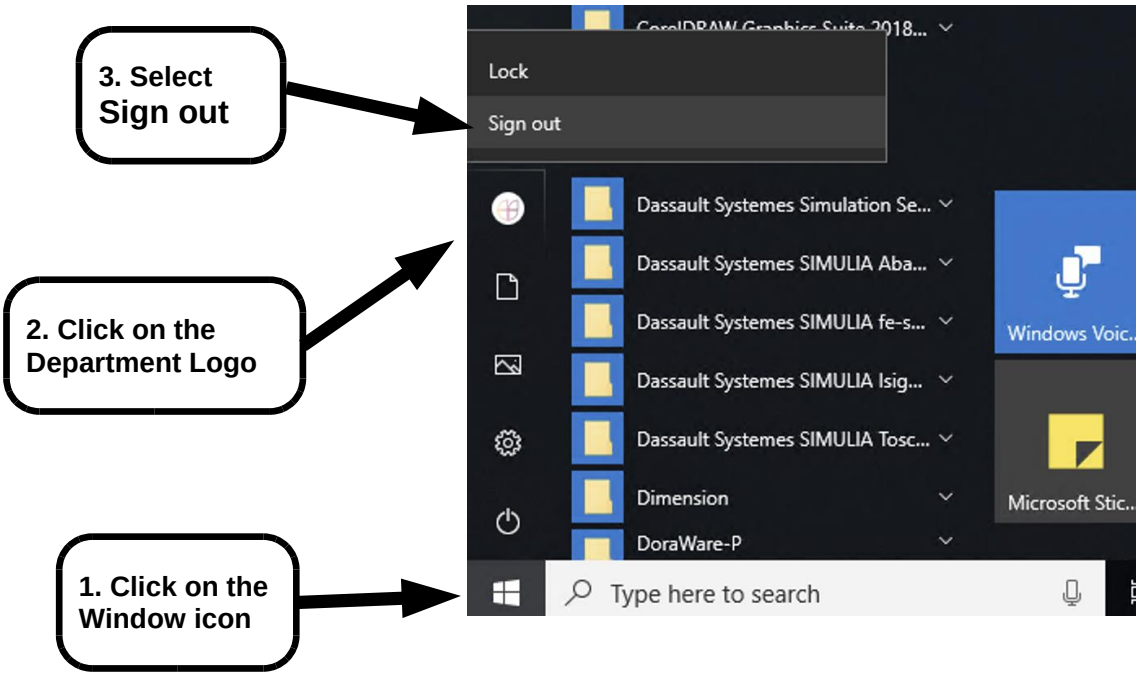
Do not just close the connection! *Do not shut down the computer!*

When you have finished using the remote computer,

you must **Sign out** and NOT shutdown the computer (see next page)

Just closing the connection does not sign you out properly.

Follow these steps:



DO NOT SHUT DOWN THE PC. If you shutdown the PC, somebody has to go into the Department to turn the computer on again.

Only one person can remote desktop to a windows PC at any one time. When you use remote desktop in a Course Work Module you will be allocated a windows PC.

Only use the PC you have been allocated in the week of your module.

In other weeks the PC will be allocated to another student.

Remote Login to Lab Computer (e.g. Software Lab B)

Follow these instructions if you need to remotely send commands to a computer for execution. You send commands over the terminal and see the result on your own computer. For example, if you want to connect a Linux Machine in Software Lab B. First you must connect to the VPN, as per the instructions on page 4.

Use Terminal

From your desktop, Open the **Terminal.**

Search Applications

Or

Click the shortcut

Terminal Commands

Type `ssh -X abc0123@RemoteHost`

Replace **abc0123** with **your Departmental username** (same as SSO)

Replace **RemoteHost** with the **server name or IP address**.

e.g. ***engs-station99.eng.ox.ac.uk*** *to log into fictitious PC 99 in Software Lab B*

You will be given a server name or IP by your CWM organiser.

If you successfully connect, you will be prompted for your **password.** Use your **Departmental Password**[3]**.** For security, it will not be shown as you type.

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[3] Password for logging onto computers in the Design Office/Software Lab A. Different to your SSO password and can be reset by a member of TDSG (Teaching Support) or IT. More information available (when using VPN) at www2.eng.ox.ac.uk/intranet/it-eng/knowledge-base/username-and-password-guidance

Launching Software from the Terminal

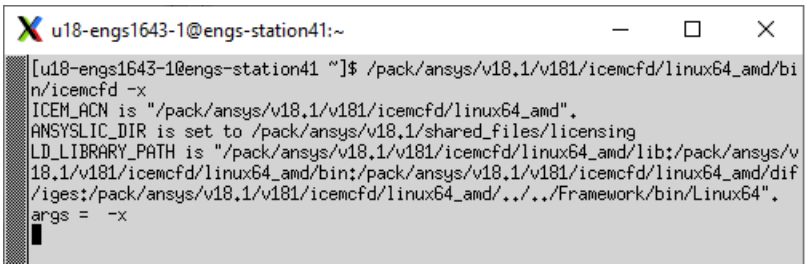
After you have successfully logged onto one of the machines, you won't see the full desktop. Use the **terminal** to launch applications. For example, the command **`matlab &`** launches MATLAB 2019b. A brief overview of key **commands** is given below. If you want more details, see the P5 Computing notes (on Canvas).

Launching Ansys (For CFD CWM)

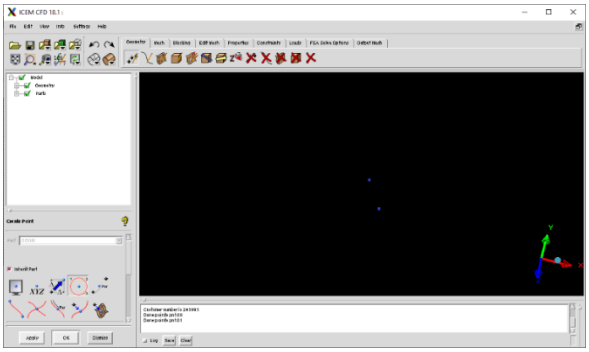
For the CFD Coursework Module, you will need Ansys. The command **`start_ansys &`** launches a terminal with Ansys executables[4].

In the terminal, type

`icemcfd -x &`



To launch ICEMCFD



You can also launch Fluent with the command **`fluent &`**

Putting the "**&**" sign after the **command**, will allow you to type other commands in the terminal after the software has launched. If you forget this, you will need to close the terminal and reconnect to get a new terminal.

[4] If you receive a "**`Command not found`**" message, then your config files need correcting. Contact Eric.peasley@eng.ox.ac.uk for support.

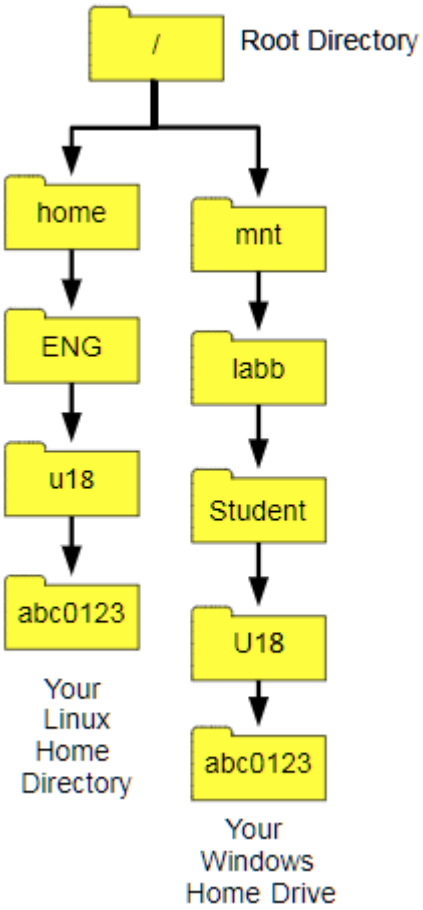
File Storage

If you want to store or access files in a specific location, you will need to use terminal commands to navigate as you will not be able to see a File Explorer Window. All students are given a Home Directory: an area to store files, sometimes called the H Drive. To start with you will be in this area:

home\ENG\u18\abc0123

where **abc0123** is **your username**

Use the command **`pwd`** to show where you are.



The command **`ls`** will display the contents of your current location. You may see something like:

```
Desktop     Downloads       java.log.31856  Pictures  Templates
Documents   java.log.30721  Music           Public    Videos
```

To access a folder, use the command **`cd`** (**c**hange **d**irectory). For example:

`cd Documents`

To move to a higher folder, use **`cd ..`**

As you can see in the top right image, there are two separate areas: one for Linux and one for Windows. The location **home\ENG\u18\abc0123 is the Linux Area.**

Mounting Your Home Directory (Documents Drive)

In order to access the Windows area, you must **mount** the drive before you can see it. Use the commands:

`kinit`

Type your Departmental password, it will **not** be shown as you type.

`mount /mnt/labb`

Navigate to your area using the command:

`cd ../../../../mnt/labb/Student/U18/abc0123`

where **abc0123** is **your username.**

Logging out

If you have mounted your Home Directory (as per the previous section) then before logging off, you must **unmount the drive**. To do this follow the steps below:

1. **Navigate out of /mnt/labb:**

   Work out where you are by typing **`pwd`** to “print working directory”

   (i.e. list the location you are in). If you are in the mounted area, e.g.

   `/mnt/labb/[followed by anything!]`

   you will need to move up, through the directories before you can unmount**.**

   If you are in the location

   `/mnt/labb/Student/U18/abc0123/MyFolder`

   then type **`cd ../../../../../../`**

2. **Unmount the drive:**

   Use the command:

   `umount /mnt/labb` (Note: this is NOT uNmount. It is umount.)

   If you receive the message

   `umount: /mnt/labb is not mounted (according to mtab)` this means you either

   i) Did not do Step 1 so are still on the mounted drive and therefore cannot unmount

   ii) Never mounted the drive to begin with

3. **Log out using command `logout`**