Practical 1: Using `ssh` to connect to the CSF, running some basic commands and opening a GUI notepad

Overview

We're going to:

- Connect (login) to the CSF using a `ssh` (*s*ecure *sh*ell) program from your desktop.
- Run some basic commands
- Check we can run a GUI notepad directly on the CSF (important later in the course!)

Note:

- **Classroom-based courses**: Please ensure you have a charged-up working laptop (running Windows, MacOS or Linux.) An iPAD-like device is ***not*** suitable.
- **PC Cluster-based courses**: You can use your laptop if you prefer (e.g., Mac owners) but we don't have time today to give technical support for *your* equipment. If it isn't set up correctly, use the training room PCs. Follow the Windows, MacOS or Linux instructions as required.
- **Zoom courses**: We expect that in most cases you will be using your own laptop/PC. We will do our best to ensure you can complete the exercises, but time for technical support in relation to your PC/laptop is limited.
- Commands to be entered at the command line are in `monospace` with text in ***`bold italics`*** to be replaced as described.
- On the CSF, the Linux **`man`** command shows manual pages for a command, e.g., enter `man sbatch` to see the manual pages for the `sbatch` command (use `space` for next page, `q` to quit.)
- Tip: On the CSF, the up and down arrows can be used to scroll through previously entered commands. Press `tab` while entering a command or filename (or folder name) to auto complete it.
- **It is usually possible to paste into a terminal window**, e.g., by using the middle mouse button (sometimes the right mouse button.)

- IMPORTANT: If you are **OFF CAMPUS** - you MUST have the University GlobalProtect VPN installed and running before you start this exercise.
  - University laptops already have it installed.
  - If using your own PC/laptop and you've not already installed GlobalProtect, please visit https://www.itservices.manchester.ac.uk/ourservices/popular/vpn/

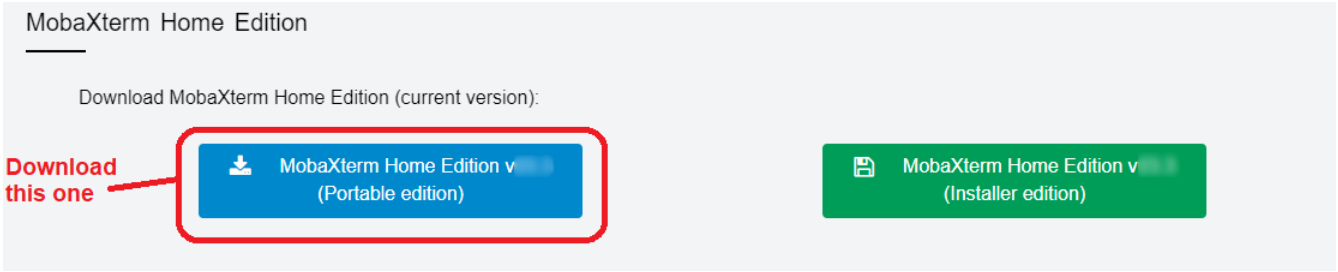
Instructions (please note: some parts are for everyone, and some are for Windows, Linux or Mac)

1. **Everyone: Open a *Terminal* application on your PC**

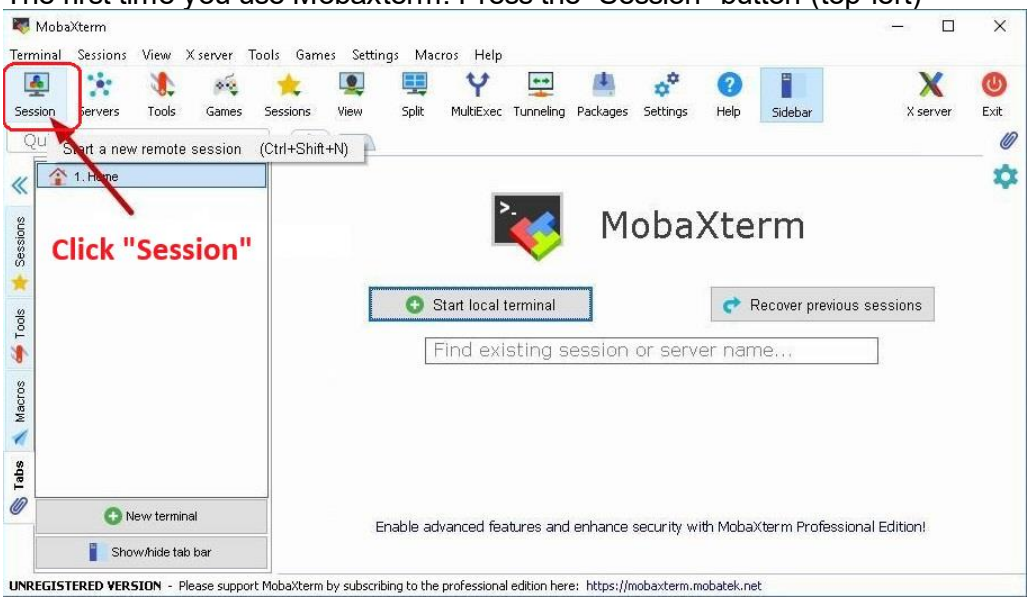
   Please follow the instructions below carefully for your preferred OS (some sections are specific to Windows, Linux or MacOS, some are for *everyone* to do):

   Windows users only: If you have not done so in advance, please download and install MobaXTerm (portable edition) on your laptop/PC via the **blue button** here:

   https://mobaxterm.mobatek.net/download-home-edition.html



   - This is a free "Terminal and SSH" program for Windows, and can be installed **without Administrator access**:
   - Unpack the `MobaXterm_Portable_vXX.X.zip` file (right-click, **Extract all…**). We recommend you can unpack it in your P-Drive or Downloads folder.
   - Go into the `MobaXterm_Portable_vXX.X` folder created during unpacking.
   - Run the `MobaXterm_Personal_XX.X.exe` program.
     i. The first time you use Mobaxterm: Press the "Session" button (top-left)



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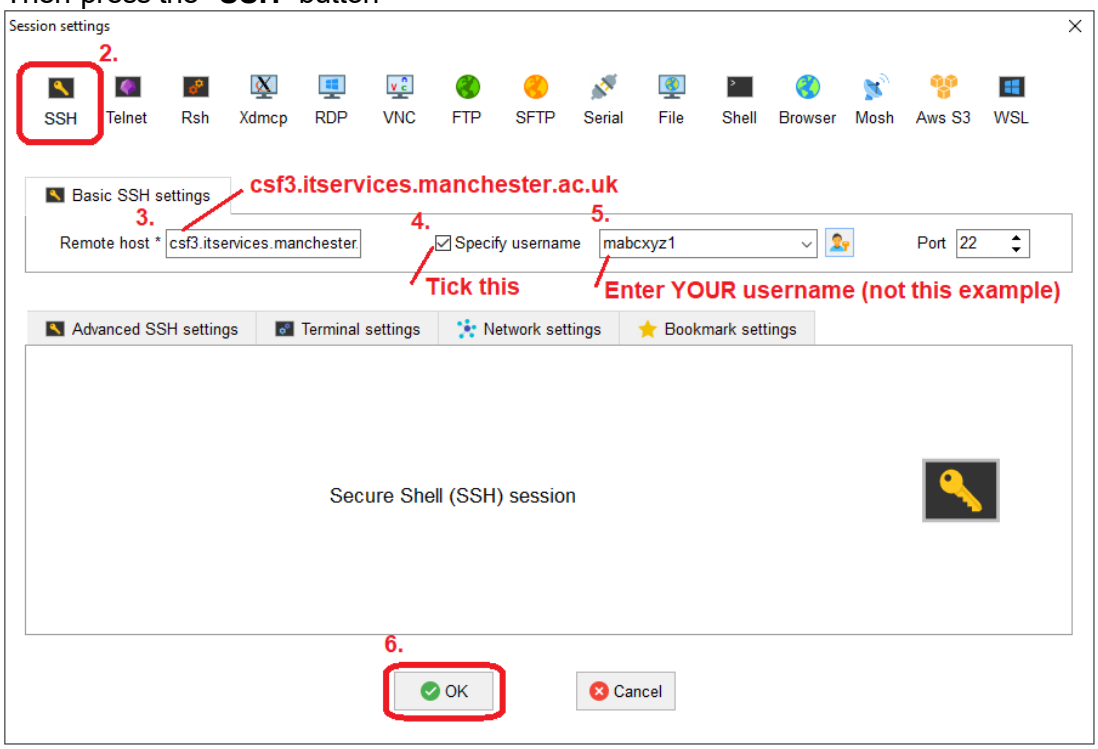
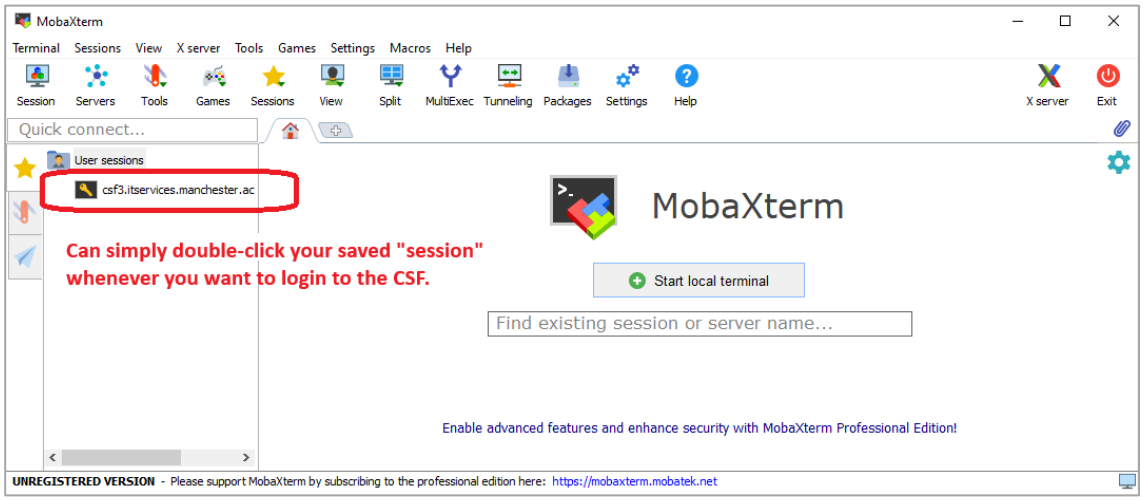
ii. Then press the "**SSH**" button



iii. Fill in the details:
Remote host: `csf3.itservices.manchester.ac.uk`
`Tick:` `Specify username`
`Type in` **YOUR** username in the box (this is NOT your email address, but your username which is usually about 8 characters – like `mabcxyz1`)

Press OK to save the "Session" - this saves the CSF address and your username. It then begins to log you in to the CSF (see below.)

Note: For ***future*** **logins** to the CSF, you simply need to **double-click** the "**csf3.itservices.manchester.ac.uk**" session in the list of saved sessions:



Linux and Mac users only:

- **Linux users only**: Open a Terminal using the menu: Applications > System Tools > Terminal.

- **MacOS users only**: If you don't already have it, download the free XQuartz program from https://www.xquartz.org/ (this is an X-server that used to be supplied in MacOS but has been open-sourced.) Get the `XQuartz-2.8.5.pkg` file and install using the defaults in the installer. Then **reboot**!!

  Then: Open a Terminal using the menu: Go > Utilities > Terminal,
  or if that's not available, right-click on the XQuartz icon and select the Xterm.

2. **Everyone: Continue from here. Use your ssh program to connect to the CSF**

   - **Windows:** In MobaXterm, during the "session" setup, it will begin to log you in. In future uses of MobaXterm, double-click on the **CSF3** session in the left-hand menu (see image above.)
   - **Linux:** In your Terminal window (see above) enter:

     `ssh -X username@csf3.itservices.manchester.ac.uk`
     replacing ***username*** with your University IT username, and press return (don't forget the **-X** flag where X is UPPERCASE.)
   - **MacOS:** In your Terminal window (see above) enter:

     `ssh -Y username@csf3.itservices.manchester.ac.uk`

     replacing ***username*** with your University IT username, and press return (don't forget the **-Y** flag where /Y is UPPERCASE.)
     - **Everyone**: If asked:
       `Are you sure you want to continue connecting (yes/no)?`

       Enter: yes
     - **Everyone**: Type your ***central IT password*** when asked. **Note: characters are not displayed** while typing your password – this is for security so nobody can look over your shoulder - so you **must type carefully**!

       If asked for DUO, press 1 ↵ (and Enter) to select your phone number.

```
Password:     TYPE CAREFULLY – YOU WON'T SEE ANY CHARACTERS!!!
Enter a passcode or select one of the following options:

1. Duo Push to +XX XXXX XXX555

Passcode or option (1-1):1 ↵    PRESS 1 THEN CHECK YOUR PHONE
```

3. **Everyone**: You should now be logged in to the CSF *remote* login node, via ssh.

Let's run a command. Type the following and press Return/Enter [↵]:

`hostname`

to verify you are interacting with the CSF, the response should be
`login1.csf3.man.alces.network` or
`login2.csf3.man.alces.network` or
`login3.csf3.man.alces.network`
(the CSF will put you on one of three login nodes to help spread the load).

You can also tell you are connected to a CSF login node as it is displayed in your prompt, e.g.

`[username@login1[csf3] ~]$`

This *prompt* is a good way of distinguishing between a terminal on the CSF and another one you might have open that is not connected to the CSF, which you use for interacting with your PC.

IF YOU DO NOT SEE ONE OF THE ABOVE HOSTNAMES, PLEASE ASK FOR HELP!

4. **Everyone:** Run some basic commands on the login node (more on Linux commands later):
   - Which folder ('directory') am I in?

     `pwd`
   - **Get a copy of the training files** – **DO THIS**!!! it will copy some files:

     `module load training/mace`
   - Go to this course's examples folder and see where we are:

     `cd ~/mace-course`

     `pwd`
   - See what files we have (note the letter `l` below is a lowercase `L`, not a number one):

     `ls`

     `ls -lh` (can you work out what the columns tell you?)

     `ls -lh python-example`

     `ls -lh pyt[PRESS THE TAB KEY TO COMPLETE THE NAME!]`

   We are not going to use, or change, any of these files in this exercise – they will be used in other practical sessions.

   IF YOU DON'T SEE THE TRAINING FILES, PLEASE ASK FOR HELP!
   PTO

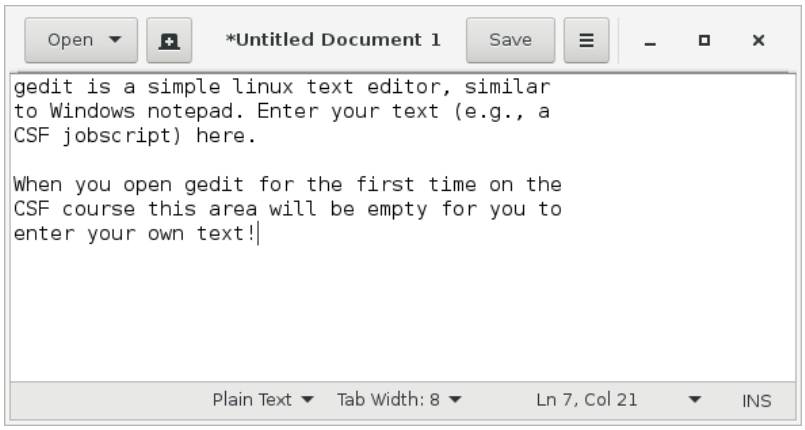
5. **Everyone:** You need to be able to run a GUI on the CSF for creating files. Let's test that now as it will be important for the next exercise.

   - Run the command:

     `gedit &` (The **&** lets you carry on typing at the command-line.)

     Ignore any warnings displayed at the command-line by gedit (it prints out some junk warning messages.)

     You should get a small notepad displayed (see below). We'll use this editor in the course.



IF IT FAILS TO OPEN, PLEASE ASK FOR HELP!

If you can't see gedit on your desktop, check that it is not behind other windows. You could also check for a new icon in the Windows taskbar or in the dock at the bottom of your screen.

You can now exit from gedit using the [x] at the top right (we'll use it later in the course to write some small text files called jobcsripts.)

Note 1: You can ignore any warning messages printed by gedit on the command-line.

Note 2: The **&** at the end of the command (`gedit &`) means you can carry on typing commands in the terminal window. This is useful if you want to check the name of a file, for example, that you might use in your jobscript, by running the `ls` command. Without the `&`, the command-line does not respond to commands until you exit from gedit..