FIT3143 on the University's HPC Cluster MonARCH

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The purpose of this document is to introduce you to the MonARCH, the university's production HPC cluster. MonARCH is available for access to Monash researchers (from professors, post-docs, PhD students and even honour students doing research work). Over the years, it has contributed towards advancing research in various fields including: Engineering, Physics, Chemistry, and IT.

IMPORTANT! You have been granted accounts to access MonARCH for calculations for the duration of the semester in relation to **FIT3143**. Please be advised that your usage is subject to **fair use**. This means:

- you may use your account for work relating to this unit only;
- you will limit the number of running jobs to **one**; and
- you are to limit your TOTAL file USAGE to **5 GB**.

UPDATED: Each account has a **`$HOME`** folder on MonARCH. Each user **`$HOME`** is capped to **200** MB soft and 400 MB hard quota. Store only source codes and other profiles here.

For job executions and other larger files, please use your **personal project folder** within:

```
/mnt/lustre/projects/fs19
```

Specifically, within **`/mnt/lustre/projects/fs19`** is a folder with your "**`fitXXX`**" username and this is your personal workspace. **Aim to keep the usage to < 5 GB.**

As MonARCH is a university facility, your access and usage is subject to the university's IT policies.

https://www.monash.edu/__data/assets/pdf_file/0009/1092699/Information-Technology-Acceptable-Use-Policy.pdf

Keep your account secure! Never share your HPC password with another person. Your tutors and lecturers will never need your password to access your account, as they have the ability to access your MonARCH account without using your password, if this is necessary. Misuse of your account will entail loss of access and may lead to appropriate disciplinary action.

Your MonARCH accounts will be disabled and deleted shortly after the end of the semester. Please ensure that you keep a copy of any important data within your MonARCH account.

How to access the MonARCH HPC system

Carefully read through the instructions below on how to get started with accessing the MonARCH cluster.

Step 1. Enable SSH access from your laptop or desktop

Depending on the OS that you use, you may need to download a tool for connecting to remote servers via the SSH protocol.

If you use **Windows**, you will need to download an **SSH** client, and there are two options:

- **putty**
  - 32-bit binary https://the.earth.li/~sgtatham/putty/latest/w32/putty.exe; or
  - 64-bit binary (recommended) https://the.earth.li/~sgtatham/putty/latest/w64/putty.exe
- **mobaXterm**
  - current version**:** https://download.mobatek.net/2032020060430358/MobaXterm_Portable_v20.3.zip

Place the executable within a convenient location (e.g., your desktop) and launch it. In the case of mobaXterm, you will need to unpack the ZIP file and drag the executable to the desktop, before launching.

For **Mac** or **Linux** users, you will need to open a terminal window and use the pre-installed "**`ssh`**" command. There is no need to download any third-party programs at this point. Optionally, ensure that XQuartz is installed.

Step 2: Retrieve your initial password

MonARCH uses a different username/password system than that for Monash University. You have been assigned an individual MonARCH account for the duration of this semester and you will need to use the procedure below to **retrieve** your initial MonARCH password.

SSH into this server:

> **`118.138.234.199`**

using your **Monash ID**, i.e., your Monash **`authcate`** username and password. Note that this username is **not** your email address, but usually is either of the format: **`abcd0001`** or **`abcd1`**. If you have a student email address, like: `abcd0001@student.monash.edu`; then your authcate username is **`abcd0001`**.

If you are using **putty**, put **`118.138.234.199`** on the "Hostname (or IP address)" text box; click "Open" and connect. You will be prompted for your username, simply put your **authcate** username followed by the **`[ENTER]`** key; putty will then prompt you for your authcate password. **Note** that while typing the password, nothing appears on the screen, but it is reading the characters you are typing. If successful, you will be asked (only during the first time you access this server via SSH) if you trust this server, and simply click "Yes".

On the other hand, if you are using MobaXterm, click on the **+** button at the top tab to make a **new connection**. Click the **'SSH'** button on the top panel of the pop-up window, and enter **`118.138.234.199`** as the address you are connecting to. Click 'Specify username' and enter your Monash authcate username and click 'OK'. The terminal will open and prompt you for your **authcate** password. You can also use **'Sessions'** > **'Saved sessions'** to log in so that MobaXterm stores your details in 'Saved sessions'. This feature is best used for Step 3.

On a Mac or Linux system, the command to run within a terminal window is:

> **`ssh`** *username*@**`118.138.234.199`**

replace "*username*" with your Monash username.

On successful login to this server, you will see a **welcome message** with information about your MonARCH username and password. At this point, please **take note** of your username, which starts with **`fit`** followed by three decimal digits. **Please refrain from writing down your password.** You may keep the session open while you proceed with the next step. If necessary, use the mouse to scroll up to see your password, if the message has disappeared.

Step 3: Sign into MonARCH with your initial password and change your password

Now you are ready to access MonARCH for the first time.

The hostname of the MonARCH login node is: **`monarch.erc.monash.edu`**

It is recommended that you open another putty instance or mobaXterm session for this. On the Mac or Linux system, simply open a new tab or a second Terminal window and use the **`ssh`** command.

Remember that your MonARCH username is of the form: **`fitXXX`** where **`X`** is a decimal digit and is **NOT** your Monash authcate. Refer to Step 2 on how to retrieve your initial password.

Use the following command:

```
passwd
```

to change your MonARCH password. When prompted for your current password, use the one you retrieved in Step 2 above.

Please refer to this page on how you may create a password that is impossible for a computer to crack but is easy for you to remember:

https://xkcd.com/936/

Once you have successfully changed your password, you are set to go! **Welcome to MonARCH!** You do not need to visit the **`118.138.234.199`** server from Step 2 again; In case you have forgotten your MonARCH password, request for a reset via contacting our HPC helpdesk at: **`mcc-help@monash.edu`**. **Please include in the subject line: [FIT3143] and your fit username.**

Step 4: Transferring data files between your system and MonARCH.

For uploading and downloading files, you will need an appropriate secure copy or secure FTP client. Please refer to: https://docs.monarch.erc.monash.edu/MonARCH/transferring-files.html

MonARCH is available for access AoE (anywhere on earth); and is online 24x7, unless there is an outage or scheduled maintenance. For September, MonARCH will be offline on the 9th for maintenance. Please see: https://docs.monarch.erc.monash.edu/scheduled-maintenance.html for the maintenance schedule for 2020.

PLEASE NOTE: The MonARCH login node is intended only for interactive tasks such as file and directory management, editing your code and other files, compiling, and running short test runs; as well as uploading/downloading files. Please refrain from running parallel jobs that are longer than five minutes on this login node, as it will impact other users.

For any questions and issues, please email the MonARCH Help Desk at: mcc-help@monash.edu Always remember to put **[FIT3143]** on the subject line and also include your `fitXXX` username.

Reminder: The MonARCH login nodes are for code development and debugging. Please do not run long calculations on these login nodes.

There is a sample MPI job with its C file, README, and job file within this zip file:

`/mnt/lustre/projects/fs19/tutorial/mpi_sample.zip`

Make a copy of this zip file into your respective `~/fs19/fitXXX` folder… unzip this, and follow the instructions on the `README` file on how to submit the `*.job` file.