

Getting ready for the PURSUE training

During the PURSUE training sessions, you will be using mostly the CMS LPC computing resources or online resources like Google Colaboratory, and for part of it, you can also use a laptop.

You will receive instructions to get the required Fermilab computing credentials (Kerberos and Services username and password) and a Google Colab (<https://colab.google/>) and GitHub () accounts.

You will be provided with a laptop already set up.

If you want to use your personal laptop there are a few steps needed (*note in particular* the Fermilab network usage rules which applies even if you use your personal devices on guest WiFi and not for work).

Connect to the network and set up SSH for remote connections to Fermilab hosts

1. Register the laptop for the "fgz" WiFi network
 - a. Turn off randomized MAC addresses (at least for this network)
 - b. Check the MAC address of your WiFi card (should be under the WiFi configuration, sometimes called "hardware address" or "ether"). You can also use the `ifconfig` or `ipconfig` commands from a terminal (if there are many entries, look for an active one).
 - c. Use the MAC address in the form linked here:
https://fermi.servicenowservices.com/kb_view.do?sysparm_article=KB0011206#add
Direct form link:
https://fermi.servicenowservices.com/com.glideapp.servicecatalog_cat_item_view.do?sysparm_id=afd29c2dcc6dcd80f9e6f19b4c359c2a
Here is more info about registering to the Fermilab network:
https://fermi.servicenowservices.com/kb_view.do?sysparm_article=KB0010655
 - i. Note that end-of-life [operating systems](#) will be blocked on the Fermilab network. Also blocked: privacy VPN (university/college VPNs typically allowed), incoming SSH by plaintext password, screen sharing allowed. WhatsApp is blocked on-site except in the "byod" network in the Fermilab Village (far from Wilson Hall). For more details on what can get your personal devices blocked, see this article:
<https://publicdocs.fnal.gov/cgi-bin/RetrieveFile?docid=506&extension=pdf>

2. Set up Kerberos

- a. This page includes the files to download and instructions for Mac/Windows/Linux <https://authentication.fnal.gov/krb5conf/>
 - i. To install on AlmaLinux 9 see <https://linux-mirrors.fnal.gov/linux/fermilab/el/9/notes.html> (as pursue user):

```
sudo dnf install -y epel-release yum-utils sed wget && \
  dnf config-manager --set-enabled crb && \
  /bin/sed -i '/^enabled=1/a priority=99' /etc/yum.repos.d/epel.repo
sudo dnf config-manager --add-repo
https://cli.github.com/packages/rpm/gh-cli.repo
sudo dnf install -y yum git gh python3 bc jq jc vim zsh sudo psmisc
bind-utils mlocate
sudo dnf install -y
https://linux-mirrors.fnal.gov/linux/fermilab/el/9/yum-conf-fermilab.rpm
sudo dnf group install -y fermilab
mkdir -p ~/.ssh; cat > ~/.ssh/config << EOF
Host *.fnal.gov
  GSSAPIAuthentication yes
  GSSAPIDelegateCredentials yes
  StrictHostKeyChecking no
  UserKnownHostsFile /dev/null
EOF
```
 - b. Once you receive your Kerberos username and password from Fermilab service desk you can test it with (note that FNAL.GOV is all uppercase):

```
kinit user@FNAL.GOV
klist
```
 - c. More authentication info is at <https://authentication.fnal.gov/>

3. Prepare the ssh configuration on your laptop to use Kerberos

- a. Add to your ~/.ssh/config file the following lines:

```
Host *.fnal.gov
  GSSAPIAuthentication yes
  GSSAPIDelegateCredentials yes
  StrictHostKeyChecking no
  UserKnownHostsFile /dev/null
```

As explained in

https://uscms.org/uscms_at_work/physics/computing/getstarted/uaf.shtml#prerequisiteSSHConfig

Note that above there is "Host *.fnal.gov" instead of "Host cmslpc*.fnal.gov", to apply to all Fermilab nodes

- b. Once completed the client setup you should be able to use SSH. E.g. if you have access to the CMSLPC cluster:
`ssh user@cmslpc-el9.fnal.gov`
- 4. Some more info on authentication (<https://authentication.fnal.gov/>)
- 5. Some troubleshooting tips:
 - a. Kerberos error PROCESS_TGS - check your clock is synchronized
 - b. "no credential for unknown mech-code" - Kerberos is not working in a Conda environment
 - c. Connection refused - make sure to be in "fgz" (required for some hosts) and double-check for misspellings and capitalization
 - d. https://uscms.org/uscms_at_work/physics/computing/getstarted/uaf.shtml#troubleshooting

Have available or set up the following software or equivalent tools:

- SSH client
 - Available on Linux/Mac/modern Windows
 - Older Windows may require PuTTY
https://uscms.org/uscms_at_work/physics/computing/getstarted/uaf.shtml#windows
 - Make sure you complete the Kerberos configuration above for a working SSH to Fermilab hosts
 - A terminal with bash
 - Available in Linux/MacOS by default
 - On Windows you can use GitBash or WSL
 - Git Bash (<https://git-scm.com/downloads>)
 - Use WSL to have a Linux system on Windows
<https://learn.microsoft.com/en-us/windows/wsl/install>
- And here is AlmaLinux9
<https://apps.microsoft.com/detail/9p5rwlm70sn9?hl=en-us&gl=US>