How to Install WSL 2 on Windows 10 and more!

First of all, disable any existing hypervisors since WSL, although lightweight, uses the same virtualization hardware as the other hypervisors.

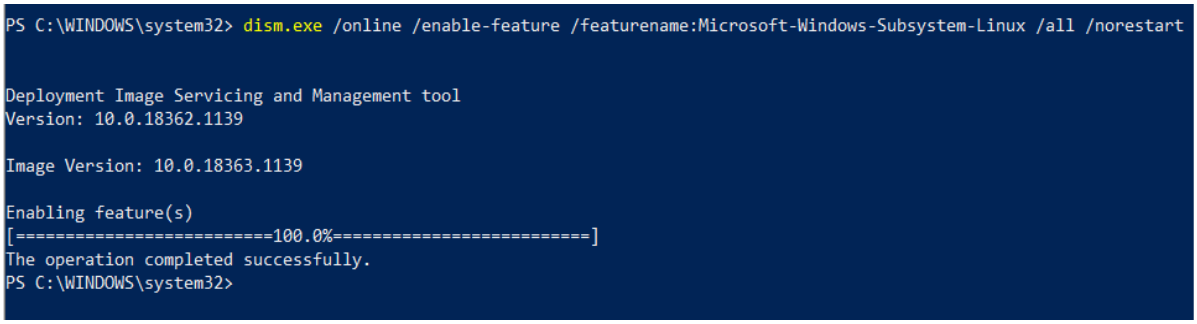
The process of installing WSL 2 on Windows 10 is this:

1. **Enable WSL**
2. **Enable 'Virtual Machine Platform'**
3. **Downloading and installing WSL 2**
4. **Install Ubuntu 20.04 LT**
5. **Set WSL 2 as default**

Step 1. Enable WSL

- First need to enable WSL. To do this **open the *PowerShell* tool as an Administrator and run the command below**.

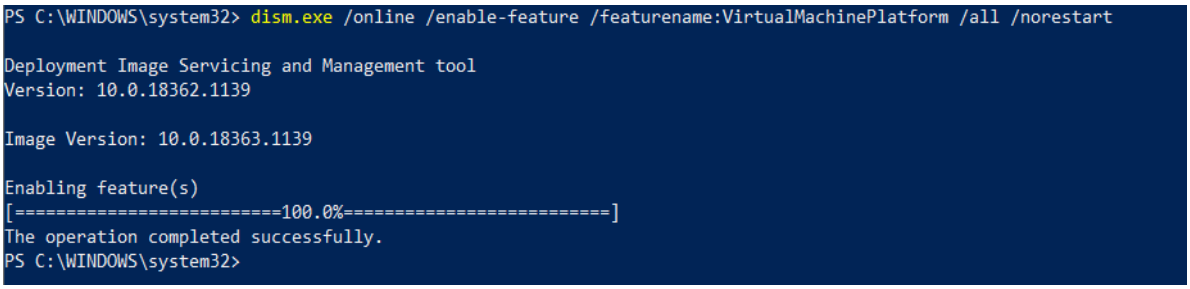
```
dism.exe /online /enable-feature /featurename:Microsoft-Windows-Subsystem-Linux /all /norestart
```



Step 2. Enable 'Virtual Machine Platform'

- WSL 2 requires Windows 10's "Virtual Machine Platform" feature to be enabled. To enable Virtual Machine Platform on Windows 10 (2004) open *PowerShell* as Administrator and run:

```
dism.exe /online /enable-feature /featurename:VirtualMachinePlatform /all /norestart
```



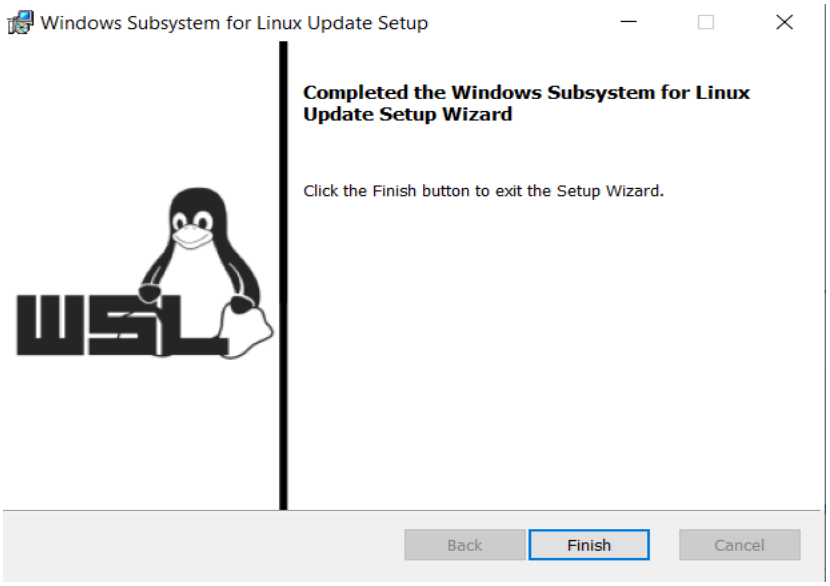
- Also, To enable Virtual Machine Platform on Windows 10 (1903, 1909) open *PowerShell* as Administrator and run:

```
Enable-WindowsOptionalFeature -Online -FeatureNa
VirtualMachinePlatform -NoRestart
```

- To ensure all of the relevant bits and pieces fall neatly in to place you should **restart your system** at this point or you may find that things don't work as intended.
- Now reboot your PC and move to **Step 3**.

Step 3. Downloading and installing WSL2

- Download the **WSL2 Kernel update**.
- Run the installer.
- When prompted for elevated permissions, click yes.



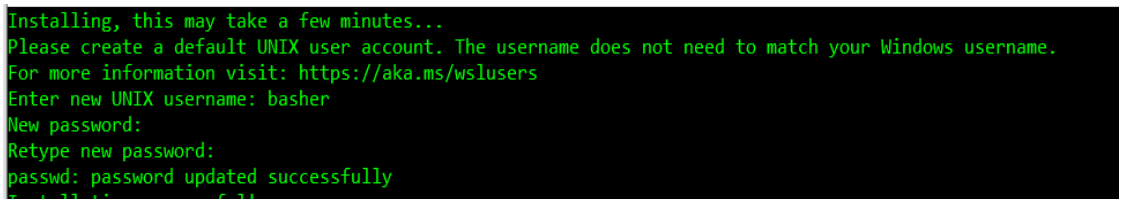
Once the installer has done its thing, you'll now have WSL2 successfully installed on your PC.

Step 4. Install Ubuntu 20.04 LTS

- To install Ubuntu on Windows 10, open the Microsoft Store app from the link below, or search for “Ubuntu 20.04”, and hit the “Get” button:

  https://www.microsoft.com/en-us/p/ubuntu-2004lts/9n6svws3rx71?rtc=1&activetab=pivot:overviewtab

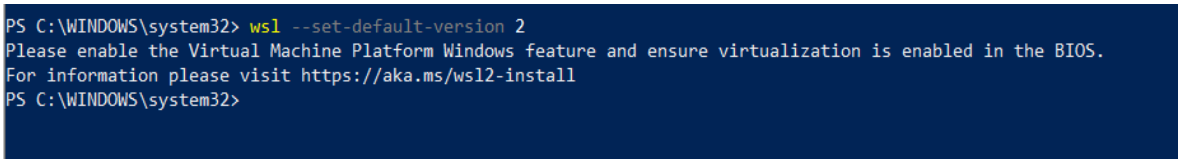
- When you installed Ubuntu a shortcut was added to the Start Menu. Use this to “open” Ubuntu.
- You will also **be promoted** to set a **username** and **password** for use on the Ubuntu. Try to pick something you won’t forget.



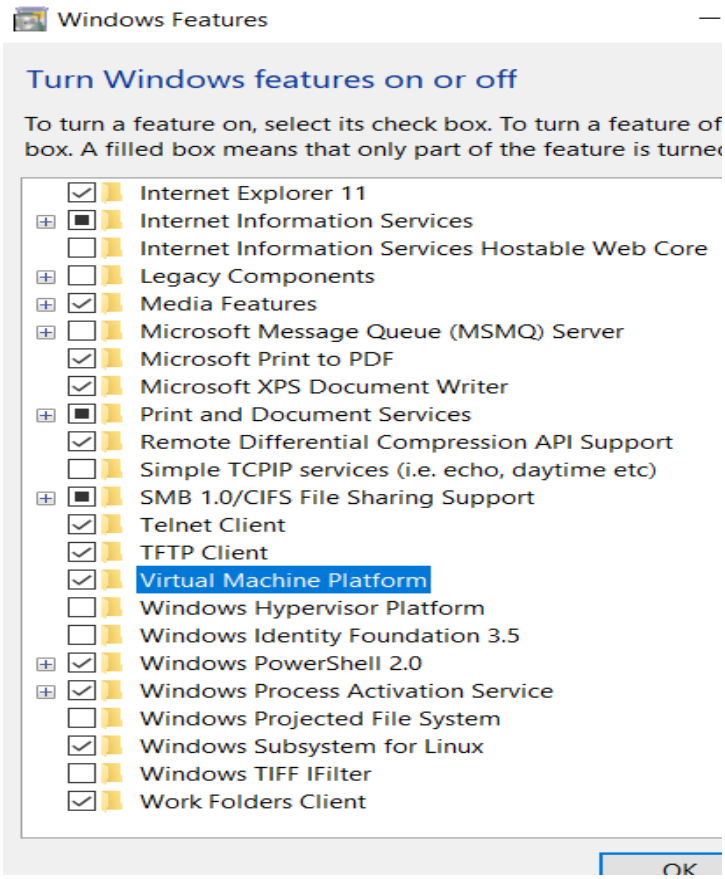
Step 5. Set WSL 2 as default for your Linux

- Open *PowerShell* as Administrator and run this command to set WSL 2 as the default version of WSL:

```
wsl --set-default-version 2
```



- To enable the Virtual Machine Platform Windows feature, open **Tun windows features on or off** from **Control Panel** and click it on.



- Then, again! Run:

```
wsl --set-default-version 2
```

```
PS C:\WINDOWS\system32> wsl --set-default-version 2
For information on key differences with WSL 2 please visit https://aka.ms/wsl2
PS C:\WINDOWS\system32>
```

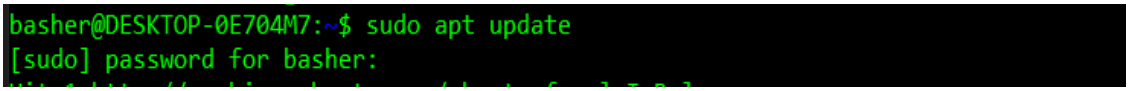
- You can easily check which version of WSL your installed Linux are using.

```
wsl --list --verbose
```

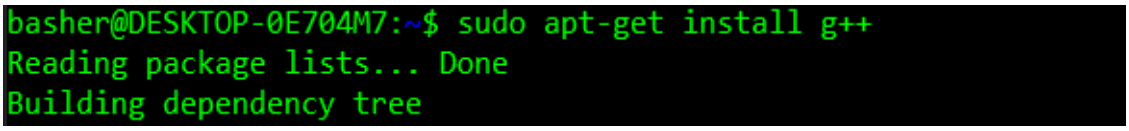
```
PS C:\WINDOWS\system32> wsl --list --verbose
  NAME            STATE           VERSION
* Ubuntu          Stopped         1
  Ubuntu-20.04    Running         2
PS C:\WINDOWS\system32>
```

Installing G++ Compiler on Ubuntu on Windows 10

1- Make a "`sudo apt update`" to update the repo packages.

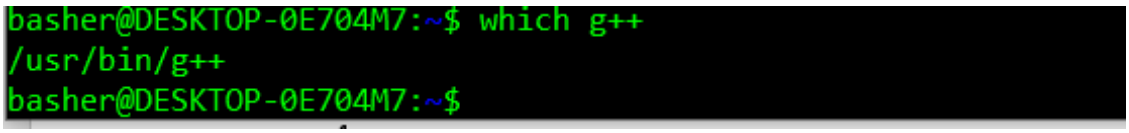


2- Then you can do "`sudo apt-get install g++`".



3- Make sure compiler is installed on your Windows 10 Bash. Type the following command to verify that g++ is installed by run command:

```
which g++
```



Write your first program on Ubuntu

1- Use a text editor such as *nano* to create a C++ program called *lab.cpp* :

```
nano lab.cpp
```

2- After writing your program, press Ctrl + O and hit Enter key to save your program. To exit *nano* press Ctrl + X.

3- To compile C++ program *lab.cpp*, and create an executable file called Lab, enter:

```
g++  lab.cpp -o lab
```

4- To execute program, enter:

```
./lab
```

Installing chrome on WSL 2

1. **Install Google Chrome on WSL**
2. **Installing ChromeDriver**
3. **Install and run an X server on Windows**

- Make sure your version of WSL is 2. You can check using powershell and running the command

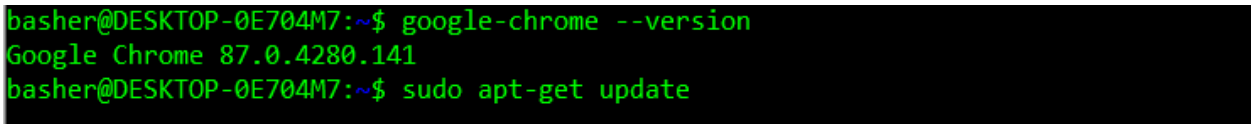
```
wsl -l -v
```

Step 1 Install Google Chrome on WSL by run these commands:

1. sudo apt-get update
2. sudo apt-get install -y curl unzip xvfb libxi6 libgconf-2-4
3. wget -q -O - https://dl-ssl.google.com/linux/linux_signing_key.pub | sudo apt-key add -
4. sudo sh -c 'echo "deb [arch=amd64] http://dl.google.com/linux/chrome/deb/ stable main" >> /etc/apt/sources.list.d/google.list'
5. sudo apt-get install google-chrome-stable

- Ensure it worked:

```
google-chrome –version
```



Step 2 Installing ChromeDriver

1. Find the URL of the ChromeDriver version that matches your Chrome version on the ChromeDriver website. in my case it's https://chromedriver.storage.googleapis.com/**87.0.4280.88**

2. Download, unzip, and put it in your bin directory:

```
wget
https://chromedriver.storage.googleapis.com/87.0.4280.88/chromedriver_l
inux64.zip
unzip chromedriver_linux64.zip
sudo mv chromedriver /usr/bin/chromedriver
sudo chown root:root /usr/bin/chromedriver
sudo chmod +x /usr/bin/chromedriver
```

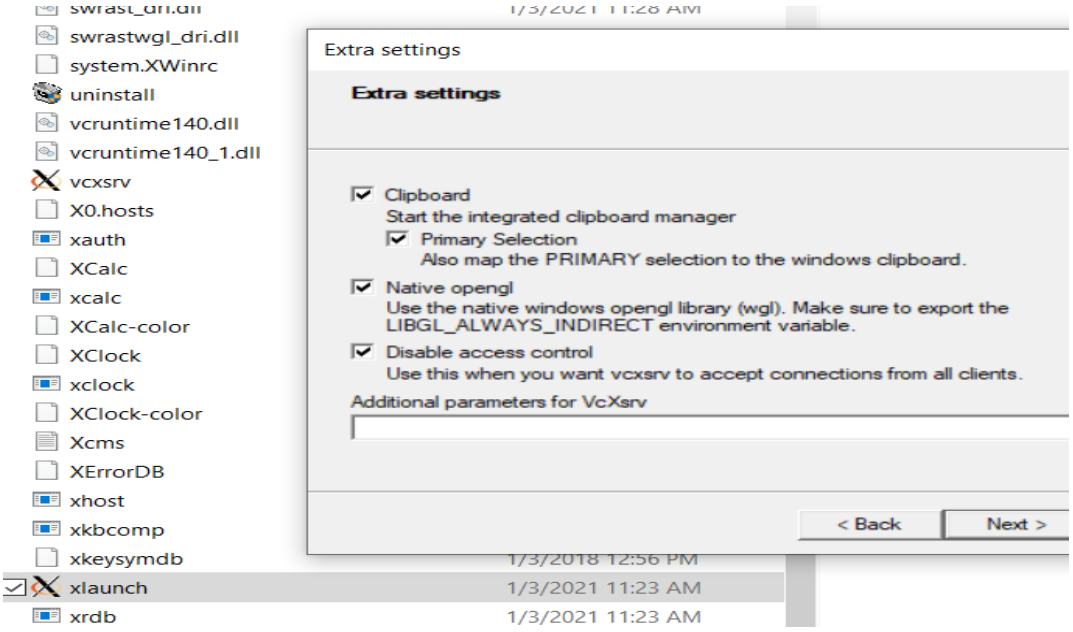
3. Double check it worked:

```
chromedriver --version
```

```
basher@DESKTOP-0E704M7:~$ chromedriver --version
ChromeDriver 87.0.4280.88 (89e2380a3e36c3464b5dd1302349b1382549290d-refs/branch-heads/4280@{#1761})
basher@DESKTOP-0E704M7:~$
```

Step 3 Install and run an X server on Windows. Use VcXsrv

1. Download and install VcXsrv **in Windows**. Once installed, run xlaunch.exe (from the VcXsrv folder in Program Files). You can leave most of the settings as default, but make sure to check “Disable access control”.



2. Since in WSL2 the IP address of Windows land is **not** localhost anymore, we need to set DISPLAY to the correct IP address:
   - On your **~/.bashrc** file, append the following line in the end:

```
export DISPLAY=$(cat /etc/resolv.conf | grep nameserver | awk
'{print $2; exit;}'):0.0
```

- Do **`nano ~/.bashrc`** and append the line above in the end.

```
basher@DESKTOP-0E704M7:~$ nano   ~/.bashrc
```

- Any changes you make to **bashrc** will be applied next time you launch terminal. If you want to apply them immediately, run the command below:

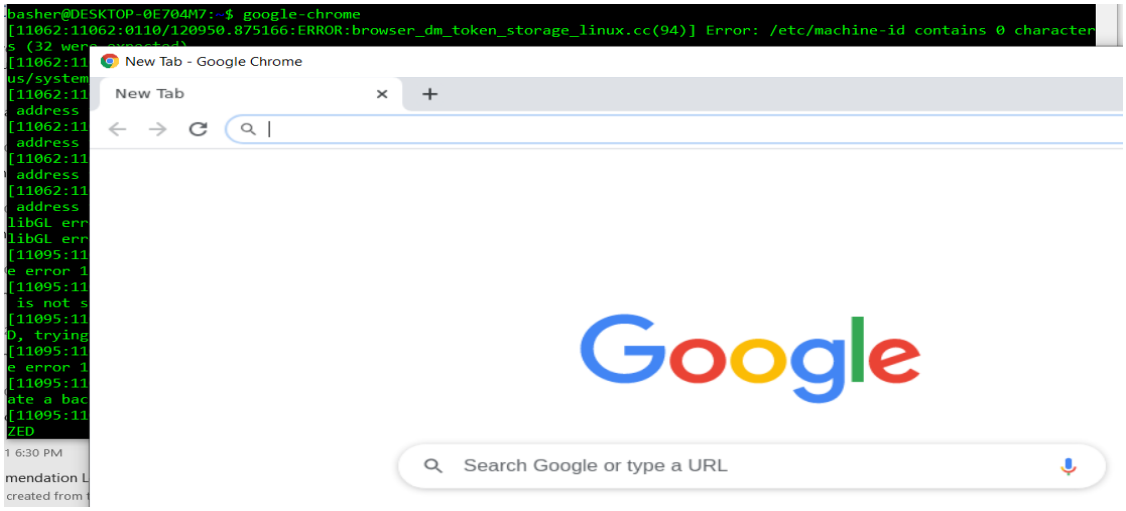
```
source ~/.bashrc
```

3. Now if you run **echo $DISPLAY** you should get something like 172.17.35.177:0.0.

```
basher@DESKTOP-0E704M7:~$ echo $DISPLAY
172.18.26.81:0.0
basher@DESKTOP-0E704M7:~$
```

4. If you run **google-chrome** the Linux-side Chrome should open inside an X server window in Windows!

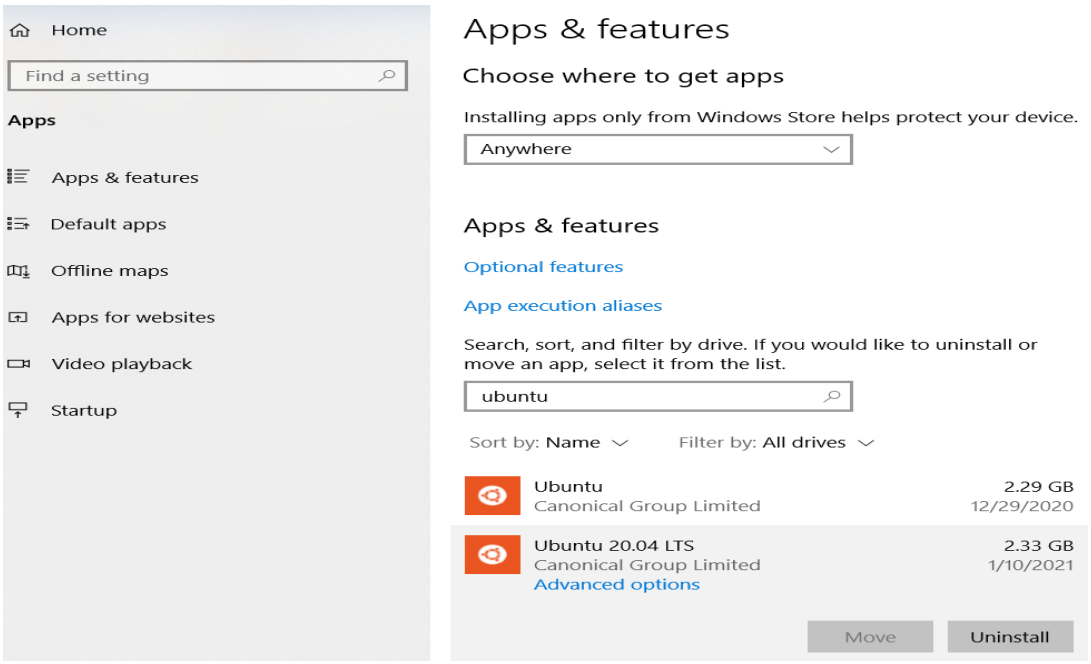
```
google-chrome
```



Uninstall a Linux Distribution (Ubuntu 20.04 TLS)

The instructions that follow can be used to uninstall any Linux distribution.

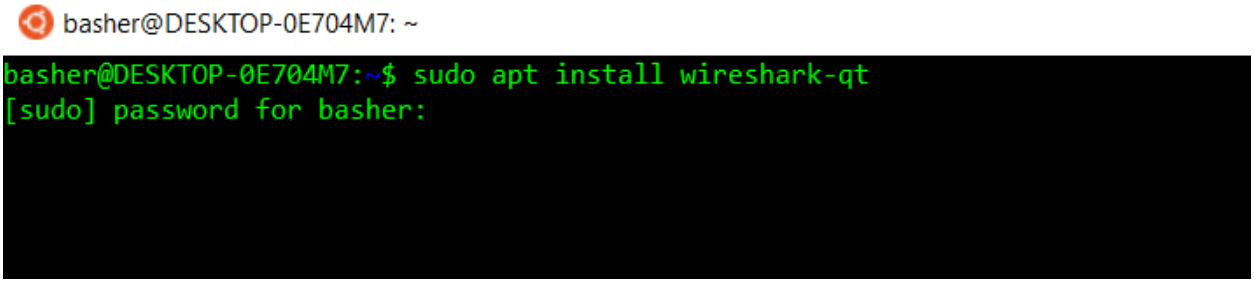
- Type ***apps &*** into the search box in the bottom left of the taskbar.
- Click **Apps & features** in the search results. The Settings app will open.
- On the *Apps & features* page in the Settings app, type **Ubuntu**, or the name of the Linux distribution you want to uninstall, in the 'Search this list' box.
- Ubuntu, or the name of your Linux distribution, will appear. Click it and then click **Uninstall**



How to run Wireshark

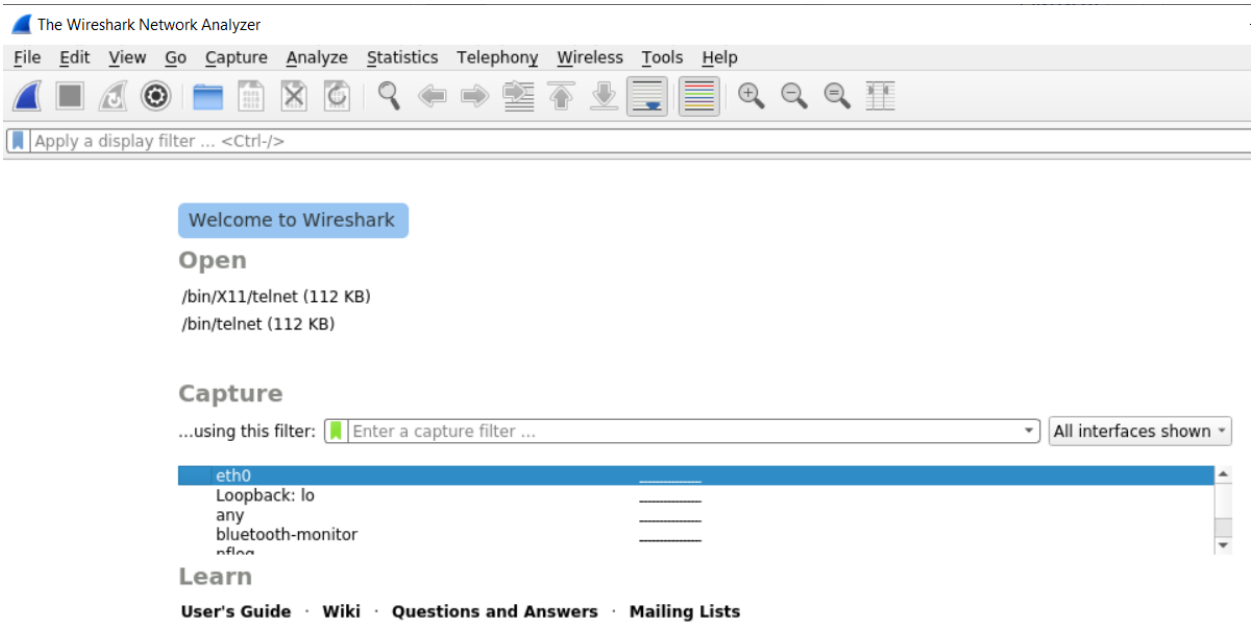
- Again, run xlaunch.exe (from the VcXsrv folder in Program Files). You can leave most of the settings as default, but make sure to check "**Disable access control**" again.
- Open Ubuntu 20.04 LTS (WSL2) from a shortcut was added to the Start Menu previously.
- Install Wireshark by running command below in the terminal:

sudo apt install wireshark-qt



- **To run Wireshark**. Once you installed Wireshark, type **wireshark** and hit enter. You should see a screen as the GUI as shown in following figure.

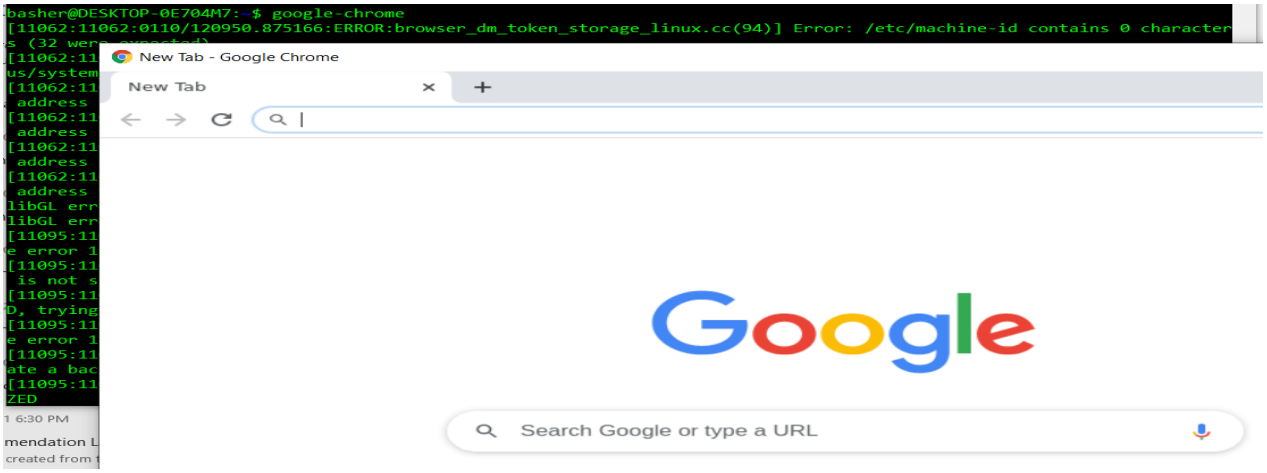
```
basher@DESKTOP-0E704M7:~$ wireshark
QStandardPaths: XDG_RUNTIME_DIR not set, defaulting to '/tmp/runtime-basher'
nl80211 not found.
libGL error: No matching fbConfigs or visuals found
libGL error: failed to load driver: swrast
```



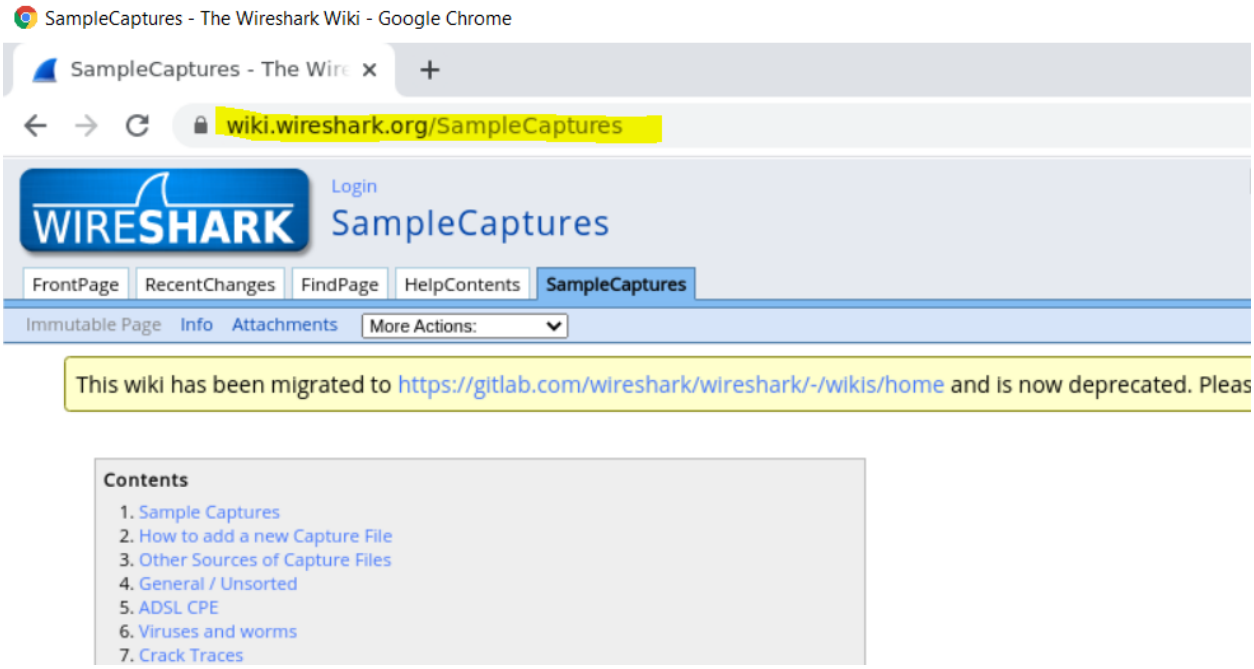
- Download trace files that are available online as following:
    - Run **google-chrome** in the terminal on WSL. The Linux-side Chrome should open inside an X server window in Windows!

google-chrome

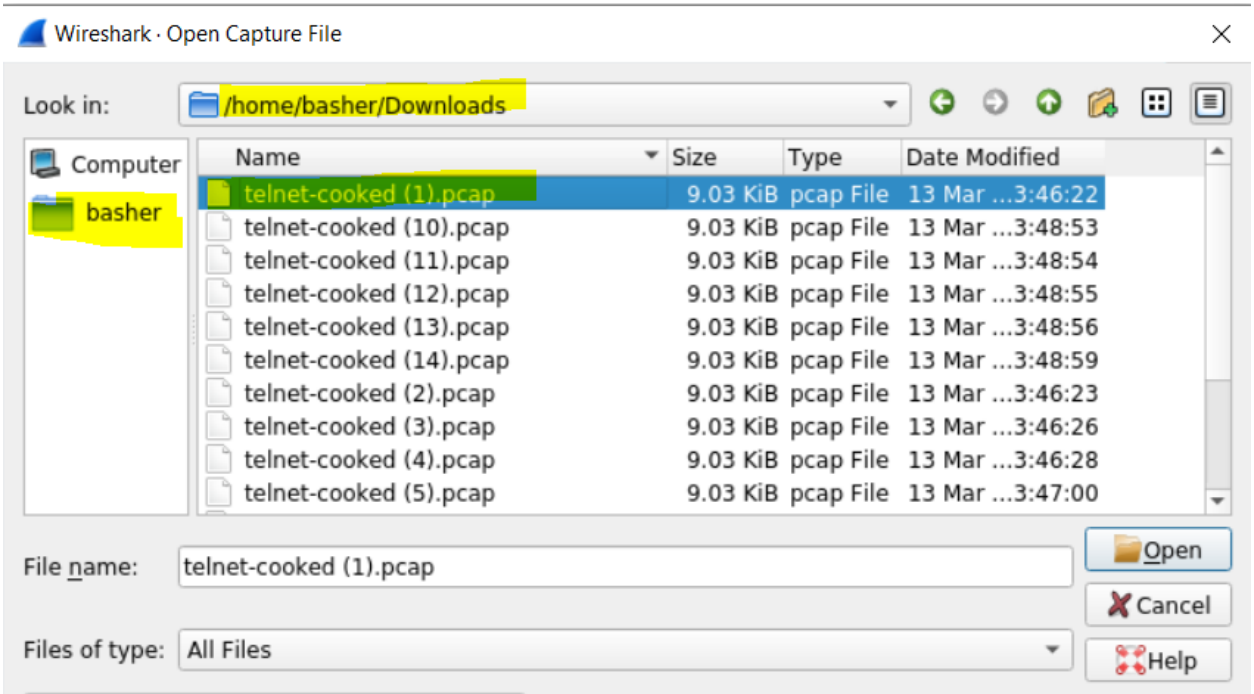
```
basher@DESKTOP-0E704M7:~$ google-chrome
[27:27:0314/115343.839685:ERROR:browser_dm_token_storage_linux.cc(94)]
were expected).
```



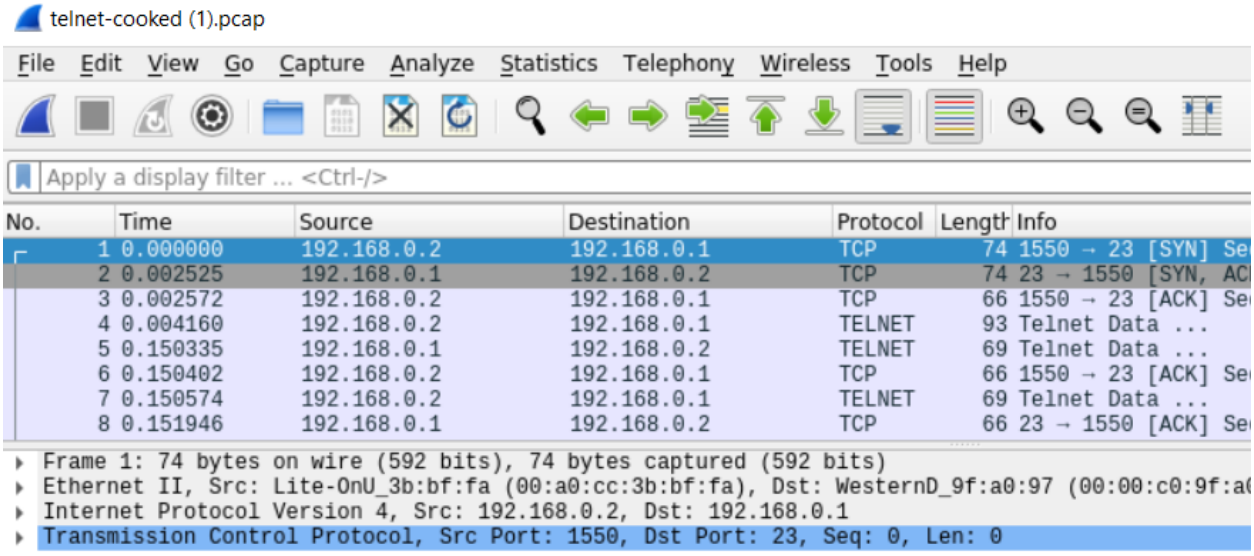
- Go to **https://wiki.wireshark.org/SampleCaptures.** This website contains list of sample trace files that are output of network capturing. From this, download your requested file and load it in wireshark and analyze it such as telnet file (Telnet-Cooket.pcap) under number 20 in the list. As shown below.

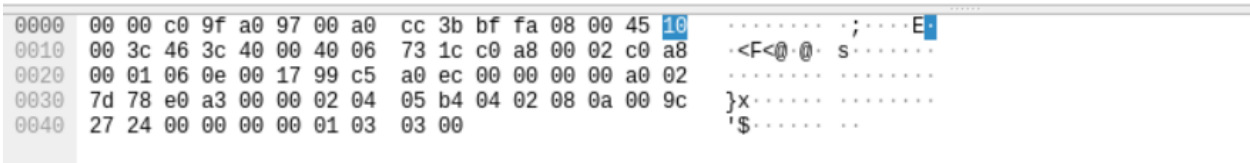


- To load it, on the wireshark window, select **File->Open** to open a dialog box that lets you choose the pcap file. Navigate and open the pcap file that you downloaded earlier.



- Once you select **Open**, you will see a window something like the following figure.





- Then, follow all **Subtasks** in lab-01 and make sure that you include screenshots of all the steps as you perform them as a proof of your work even if the assignment does not mention explicitly.