AGENT Portable Data Analysis Pipeline installation manual

Training of trainers to enable local dissemination of knowledge
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Inhoud

Introduction

This document is the installation manual for the AGENT Portable Data Analysis Pipeline, a ready-packaged tool pipeline to support the analysis of large-scale genotyping data, with a particular focus on the genomics of genebanks. It has been developed as part of the AGENT project (http://www.agent-project.eu). This Manual describes the necessary setup to enable its use under Windows, macOS, and LINUX.

Use

The PDAP can be downloaded from Fairdom: https://urgi.versailles.inrae.fr/fairdom/models/2
Once you have installed the software, please see the user guide (https://urgi.versailles.inrae.fr/fairdom/documents/70).

Test data Train the Trainer course

All the data needed for the hands on workshop can be downloaded here:
https://urgi.versailles.inrae.fr/fairdom/assays/109

Prepare working directive

Download the singularity container and the Train the Trainer data and but them (option 1) in a Windows folder which can be accessed in the Ubuntu terminal by entering:

- "cd /mnt/c/…" for a folder on your C drive
- "cd /mnt/d/…" for a folder on your D drive

Or on your Ubuntu distribution (option 2)

- "explorer. exe ." to open the Windows-Explorer in the current directory of the Linux-filesystem

Installation

PDAP has been implemented to run in the Singularity platform.The Singularity platform runs natively in Linux; to deploy PDAP on the Windows or Mac operating systems, it is necessary to first install Windows Subsystem Linux (WSL) or a virtual machine.

Installation of WSL on windows 10/11

An option for running Singularity containers on Windows is to use Windows Subsystem for Linux (WSL2). However a Linux distribution needs to be installed like Ubuntu 20.04. This can be done through the Microsoft store (see Figure 1) or by the command terminal in windows with the command.

Code block 1: bash code to view available Linux distributions and install Ubuntu-20.04.

```
wsl -install

wsl --install Ubuntu-20.04
```

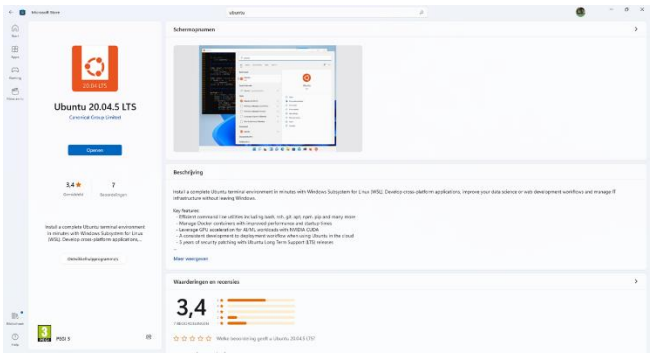


Figure 1. Installation of Ubuntu 20.04 (recommended Linux distribution).

Installation Singularity on windows 10/11 using WSL

When the Ubuntu app is opened for the first time the user will be asked to set his/her username and create a user and set his/her sudo password (see Figure 2).

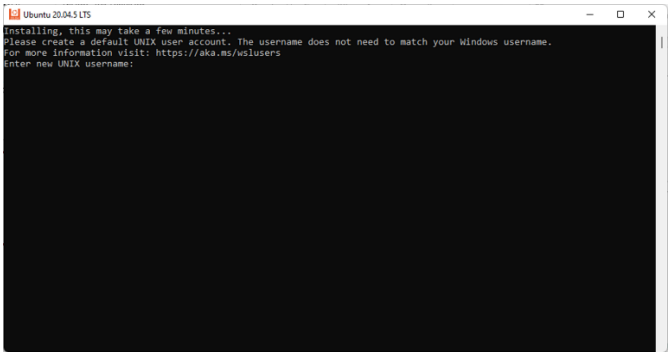


Figure 2. Set username and sudo password

Install system dependencies for Singularity by running the bash code of code block 2 in the Ubuntu terminal. When asked for your sudo password use the one set in Figure 2.

Code block 2: Update installed packages and install necessary packages.

```
sudo apt-get update

sudo apt-get install -y build-essential libssl-dev uuid-dev libgpgme11-dev squashfs-tools libseccomp-dev pkg-config
```

Use the bash code in code block 3 to download and install Singularity on your Ubuntu Linux distribution.

Code block 3: Download the Singularity installation package and install Singularity on WSL.

```
wget https://github.com/sylabs/singularity/releases/download/v3.9.7/singularity-ce_3.9.7-focal_amd64.deb

sudo apt install ./singularity-ce_3.9.7-focal_amd64.deb
```

Installation on Windows 10/11 or macOS using Vagrant Virtual Machine

Install Oracle VirtualBox, install Vagrant, and install Vagrant-manager and Git for windows. More information can be found here: https://sylabs.io/guides/3.5/admin-guide/installation.html#installation-on-windows-or-mac

Download and install Git.

- Windows: https://gitforwindows.org/
- macOS: https://git-scm.com/download/mac

Open the Git Bash terminal and create and enter a directory which will be used with your Vagrant VM (code block 4).

Code block 4: Create and enter a Vagrant virtual machine directory.

```
mkdir vm-singularity
```

```
cd vm-singularity
```

Issue the commands from code block 5 step by step to bring up the Virtual Machine.

Code block 5: Start a virtual machine with singularity installed

```
export VM=sylabs/singularity-3.5-ubuntu-bionic64
vagrant init $VM
vagrant up
vagrant ssh, this will make a connection to your VM.
```

Check the version of singularity (and that it has installed correctly) using the command "singularity --version".

Installation on Linux (Ubuntu)

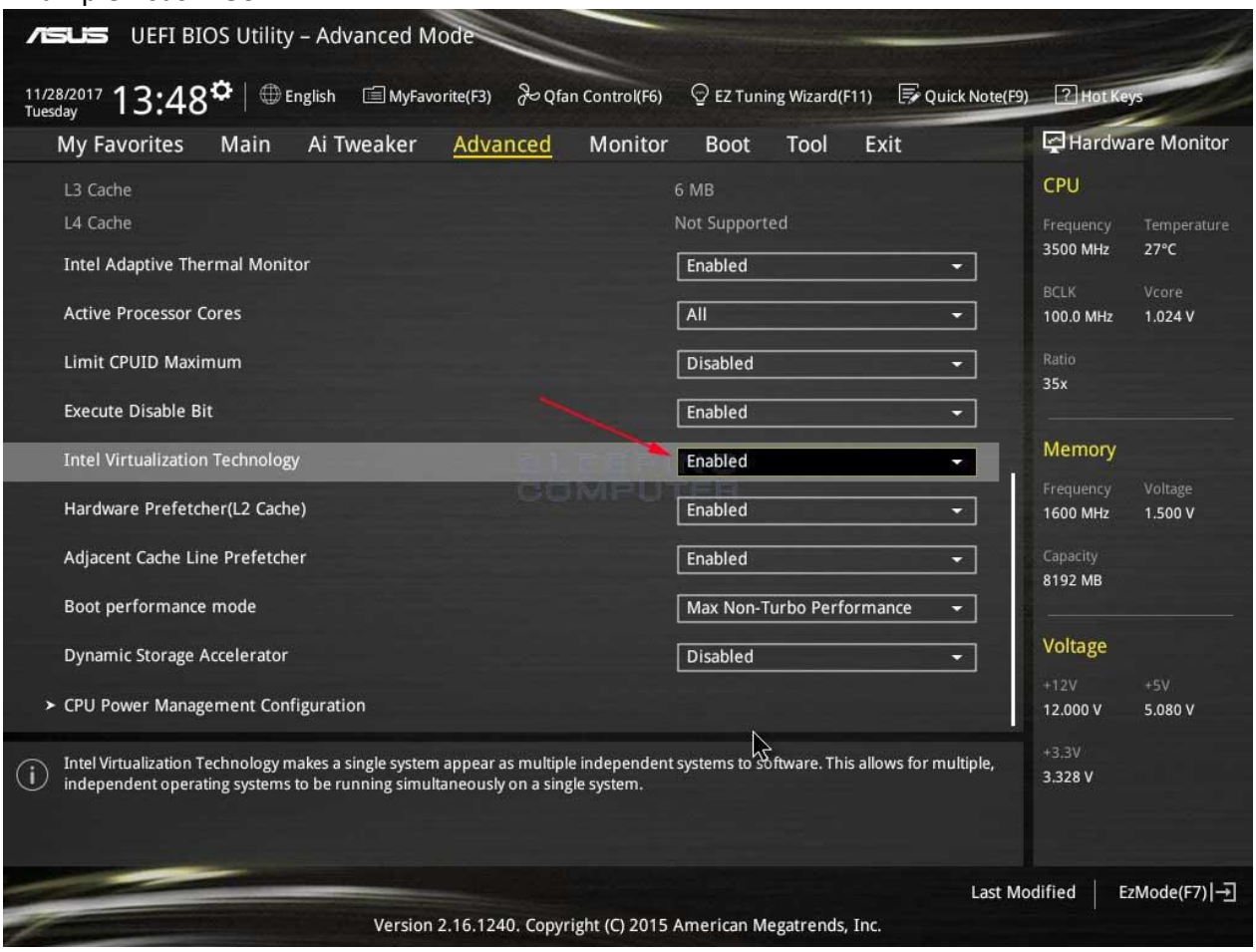
Please install the Singularity package, if it is not already installed with commands from **code block 3**. More information can be found here: https://sylabs.io/guides/3.5/admin-guide/installation.html#installation-on-linux

Appendix 1: Activate virtualization in BIOS

Tested with Windows 10 Enterprise LTSC 2019 (1809) and Ubuntu 20.04 LTS

Step 1: Activate Virtualization in BIOS

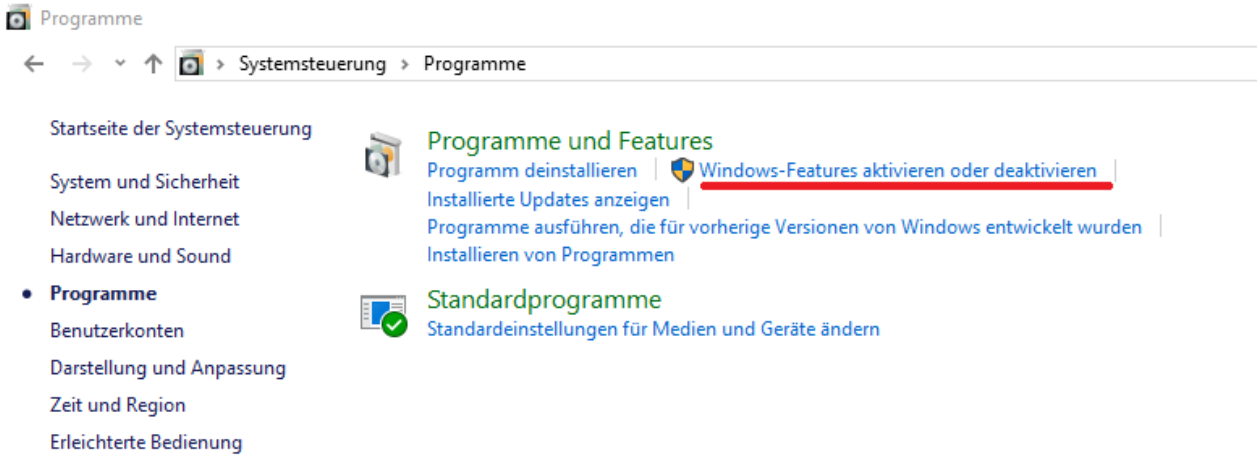
Example Asus BIOS



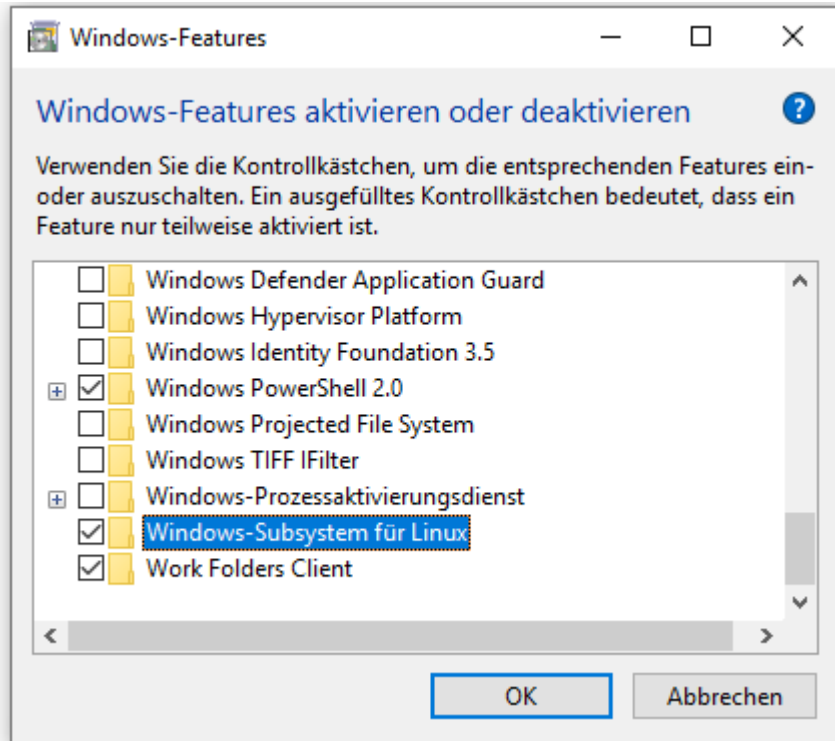
Appendix 2: Activate optional feature "Windows-Subsystem for Linux"
Choose Option 1 OR Option 2

OPTION 1: Activate Feature through Windows Settings

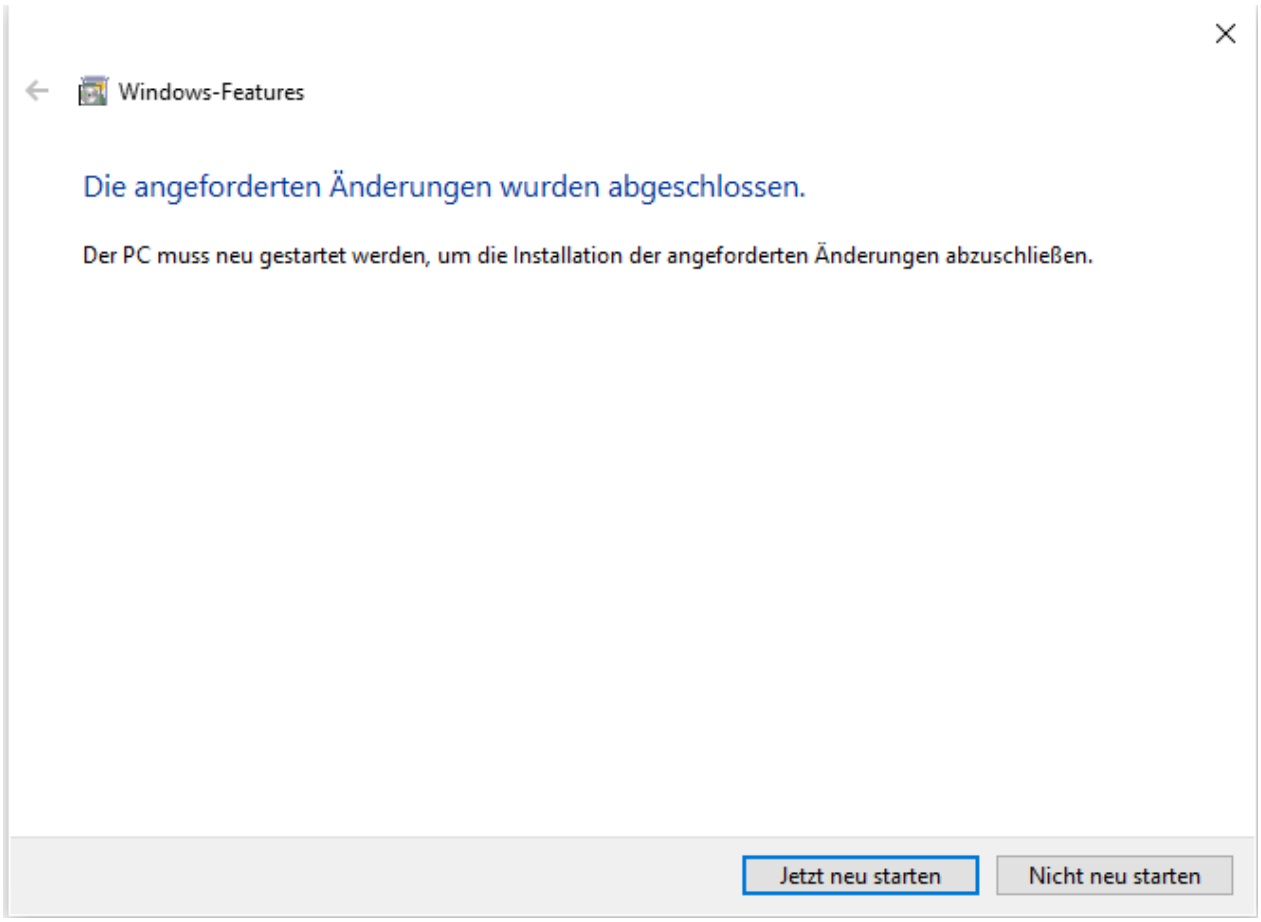
1. Navigate to Control Panel>Programs>activate or deactivate Windows-Features



2. Tick the box "Windows-Subsystem for Linux" and press "OK"



3. Press “Restart now” and continue with “Step 3: Install Ubuntu distribution”



OPTION 2:
Activate Feature through PowerShell-Script

- Open a Windows PowerShell prompt AS ADMINISTRATOR
- Execute the command in code block 6.

Code block 6.

```
Enable-WindowsOptionalFeature -Online -FeatureName Microsoft-Windows-Subsystem-Linux
```

- Restart your PC

Appendix 3: Installing WSL manually (without Windows Store)

Step 1: Install Ubuntu distribution

- Open a Windows PowerShell prompt (NOT AS ADMINISTRATOR)

Execute the following commands in code block 7

Code block 7.

```
Invoke-WebRequest -Uri https://aka.ms/wslubuntu2004 -OutFile Ubuntu.appx -
UseBasicParsing

Add-AppxPackage .\Ubuntu.appx
```

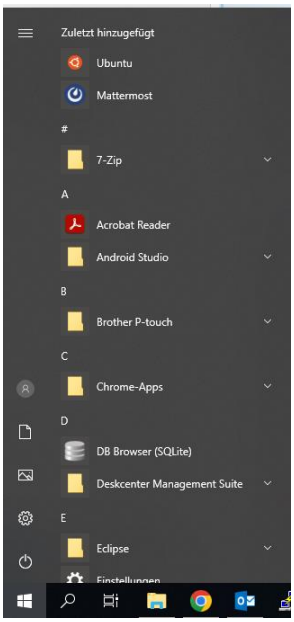
Hint:

Newer Windows Versions supports Ubuntu 22.04 LTS

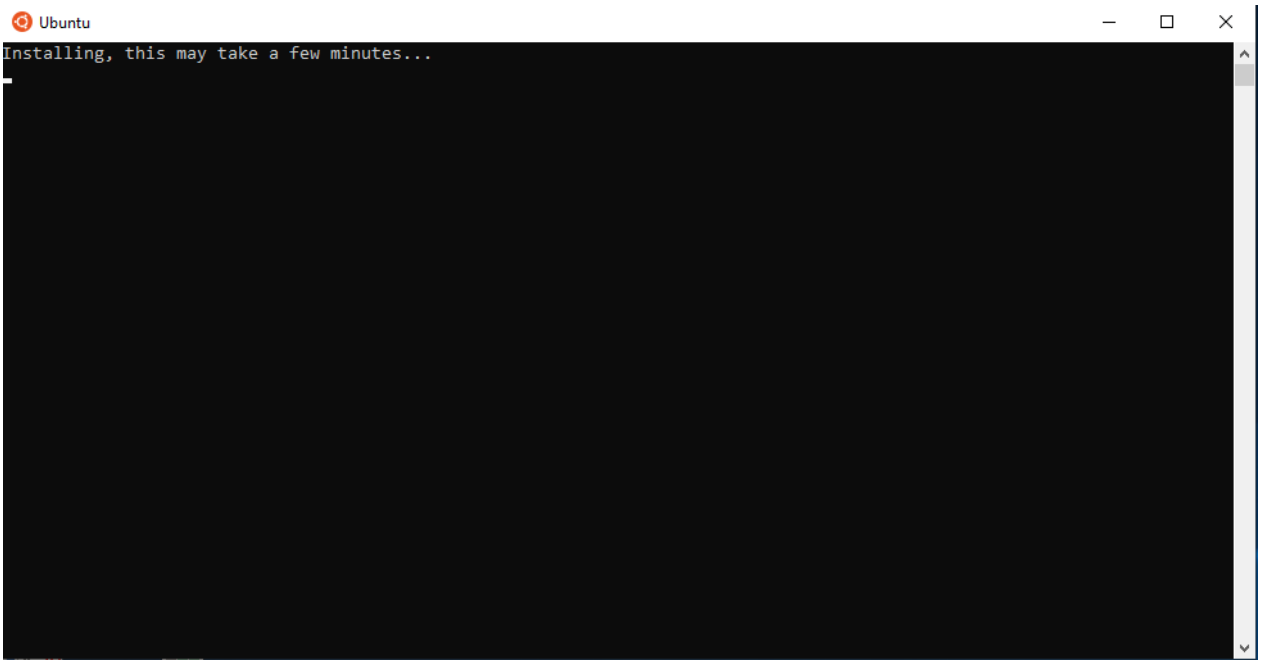
Invoke-WebRequest -Uri https://aka.ms/wslubuntu2204 -OutFile Ubuntu.appx -
UseBasicParsing

Step 2: Create Linux user and password

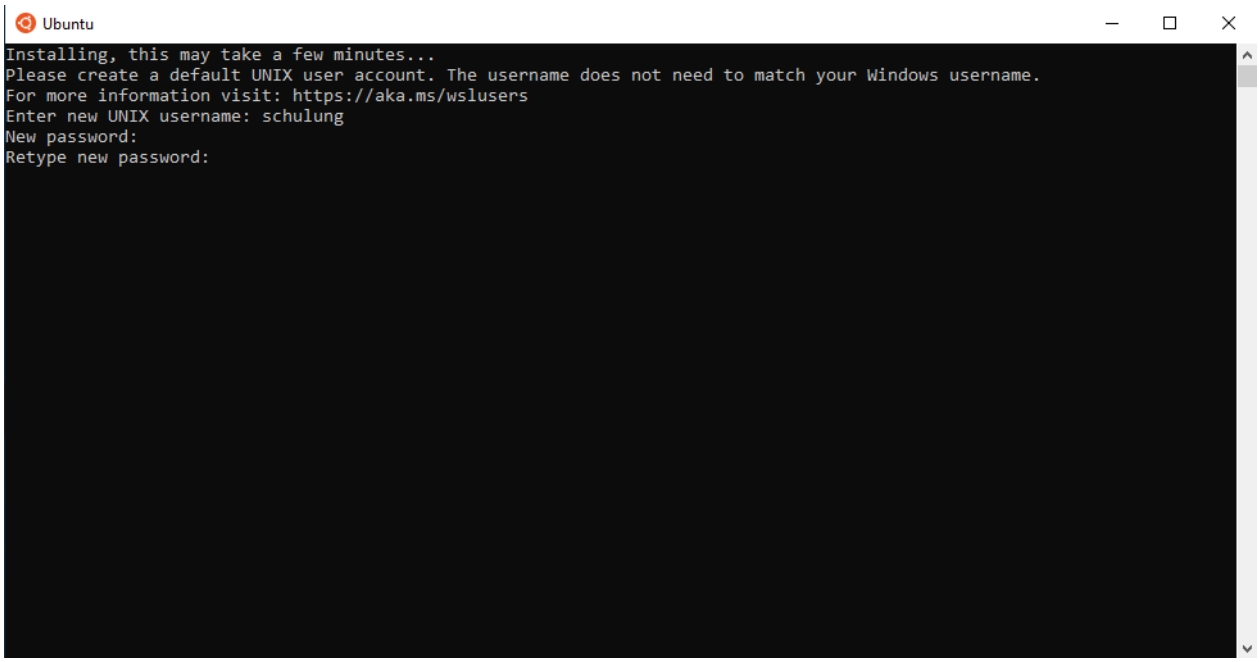
1. Open Ubuntu through the Start Menu



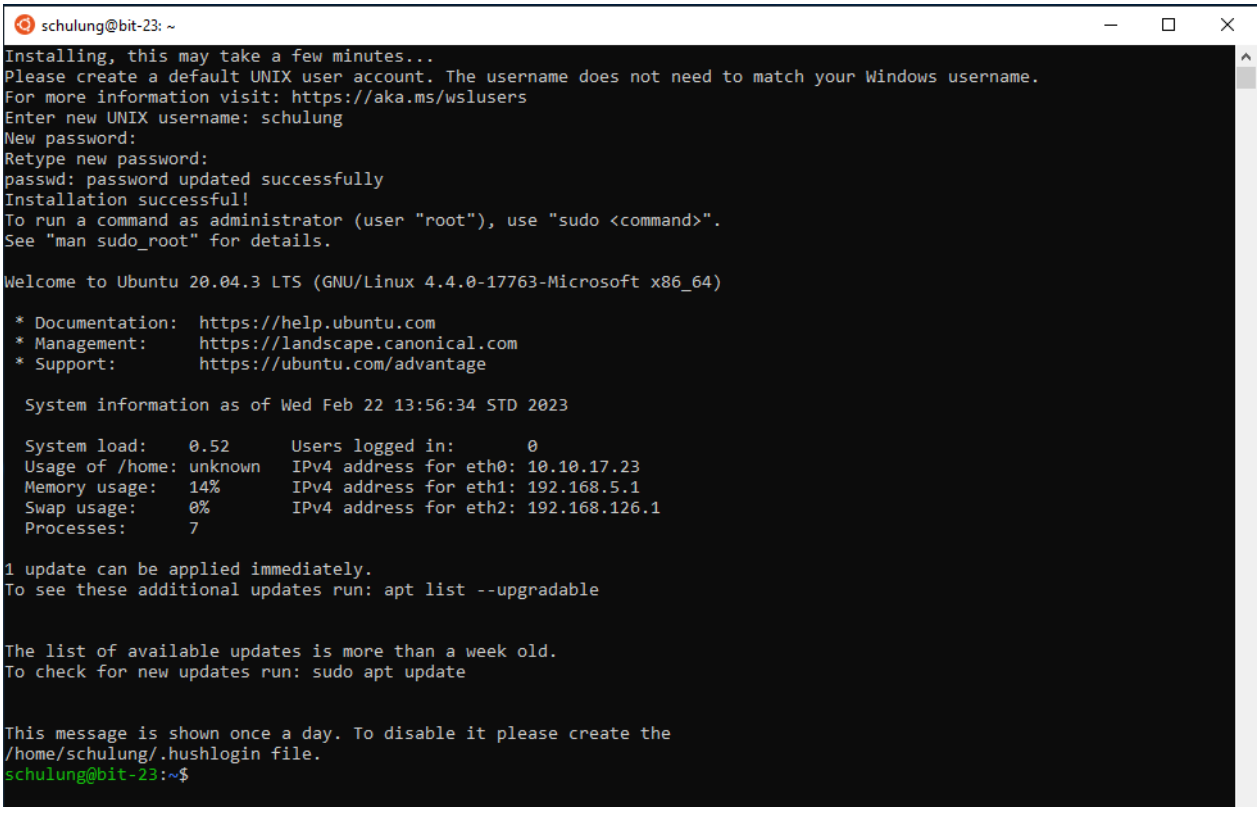
2. Ubuntu will start installing, this may take a while



3. You are now prompted to create a username and password, choose any username and password you would like. This will be the root-account in the WSL



4. If everything is successful your Linux-terminal will look somewhat like this:
5. As a final step we recommend running “sudo apt update” and “sudo apt upgrade” to make sure that your environment is ready for use.



Step 3: Find Linux user directory in Windows-Explorer

1. For moving files between your Windows environment and your Linux-environment you may want to know where your Linux filesystem is located in your Windows-filesystem
2. If you installed Ubuntu using the Windows Store, simply run “explorer. exe .” (note the extra .) from the WSL-terminal, this should open the Windows-Explorer in the current directory of the Linux-filesystem.
3. If you installed Ubuntu using the Powershell-Script from this guide or if the above command is not working for you, open up a PowerShell-prompt and type following command:

   ```
   (Get-ChildItem HKCU:\Software\Microsoft\Windows\CurrentVersion\Lxss | ForEach-Object {Get-ItemProperty $.PSPath}) | select DistributionName, @{n="Path";e={$.BasePath + "\rootfs"}}
   ```