

INTRODUCTION TO COMMAND LINE AND VIRTUAL MACHINES



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What is Unix / Linux?

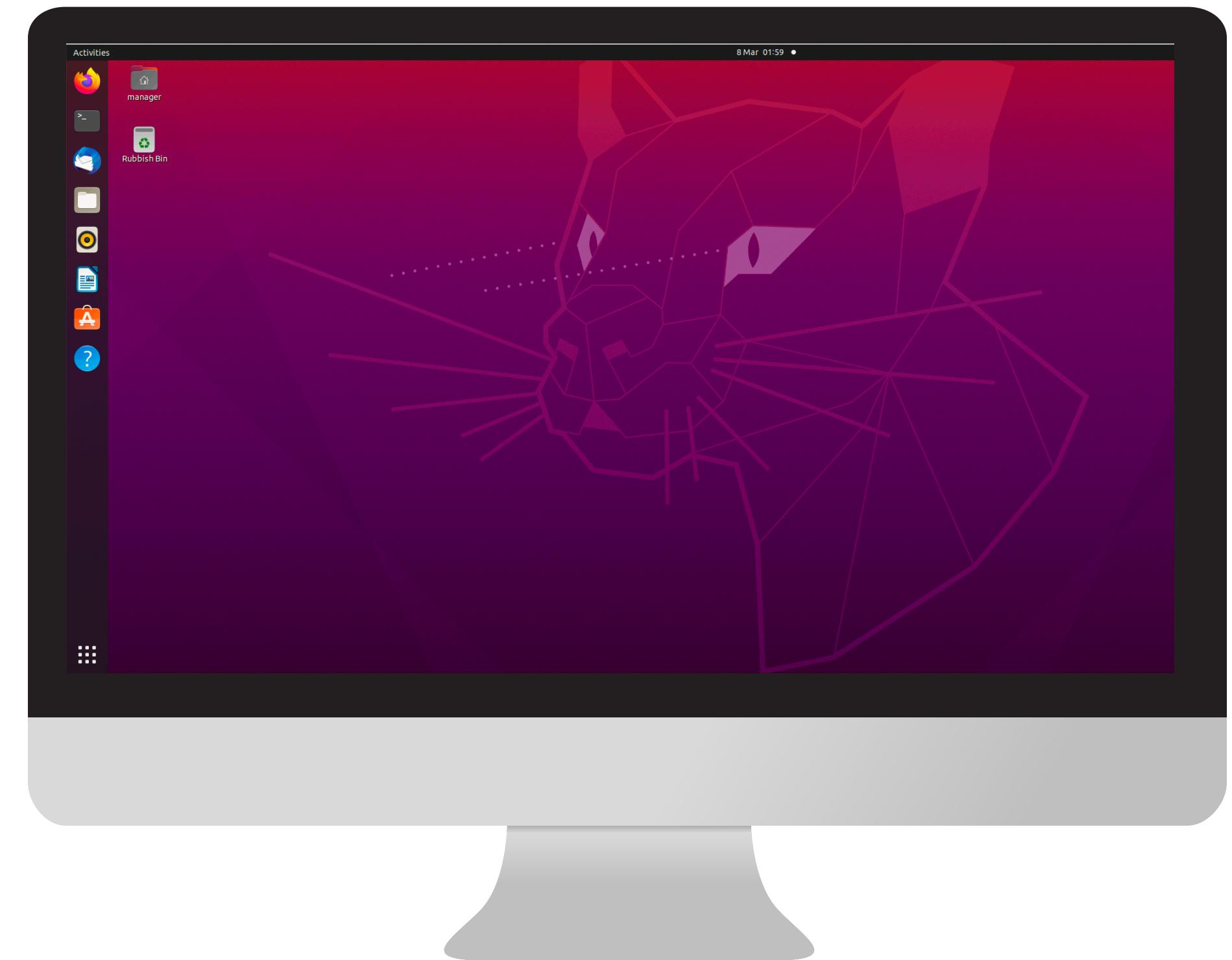
**Standard operating system
(alternative to MS Windows, Mac OS)**

**Provides a way for you to interact
with the computer**

Many ‘flavors’ of Unix, using Linux

- Ubuntu
- Centos
- Debian

Typically free



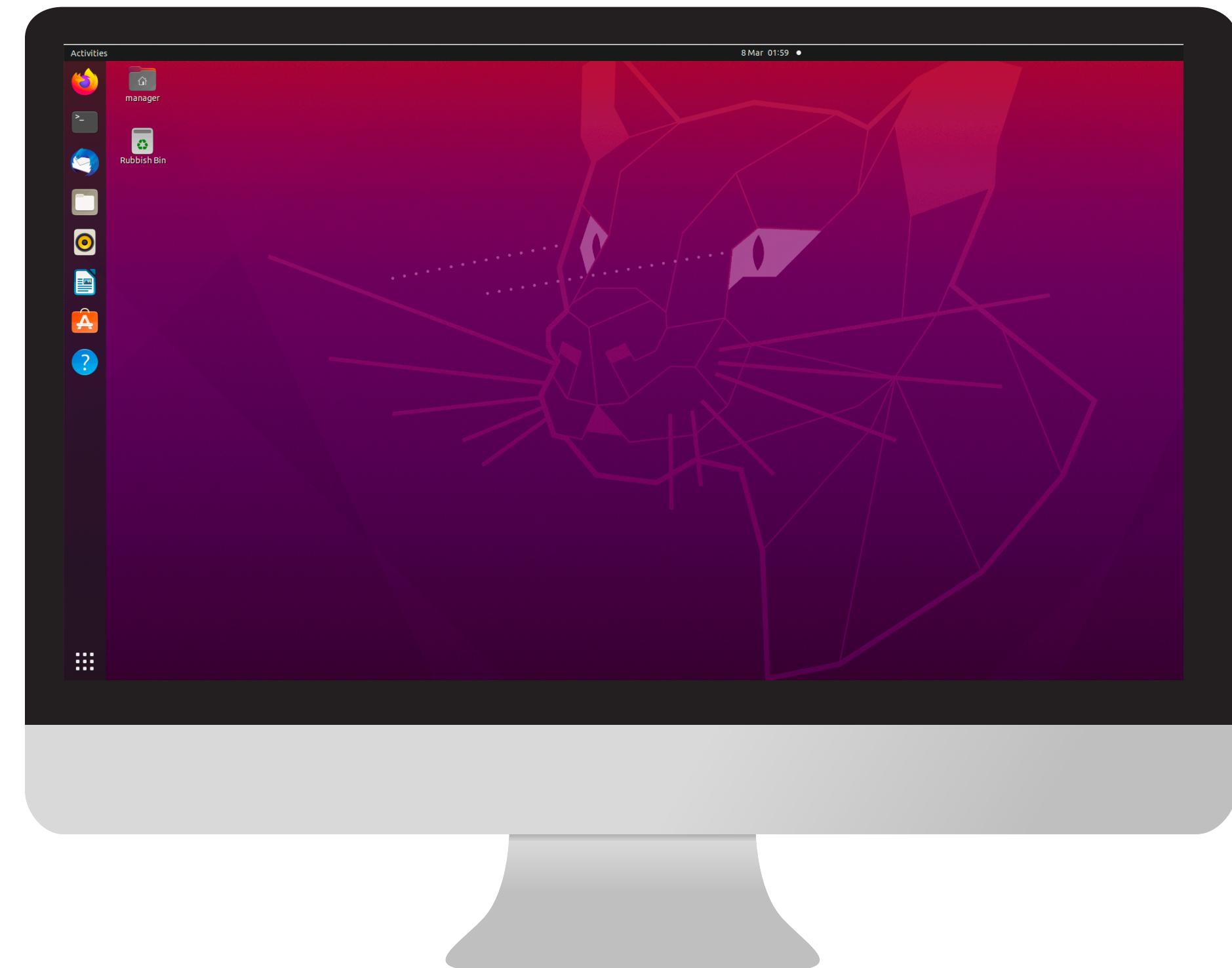
Why use Linux / Unix ?

**Many bioinformatics programs
produce outputs that are large text files**

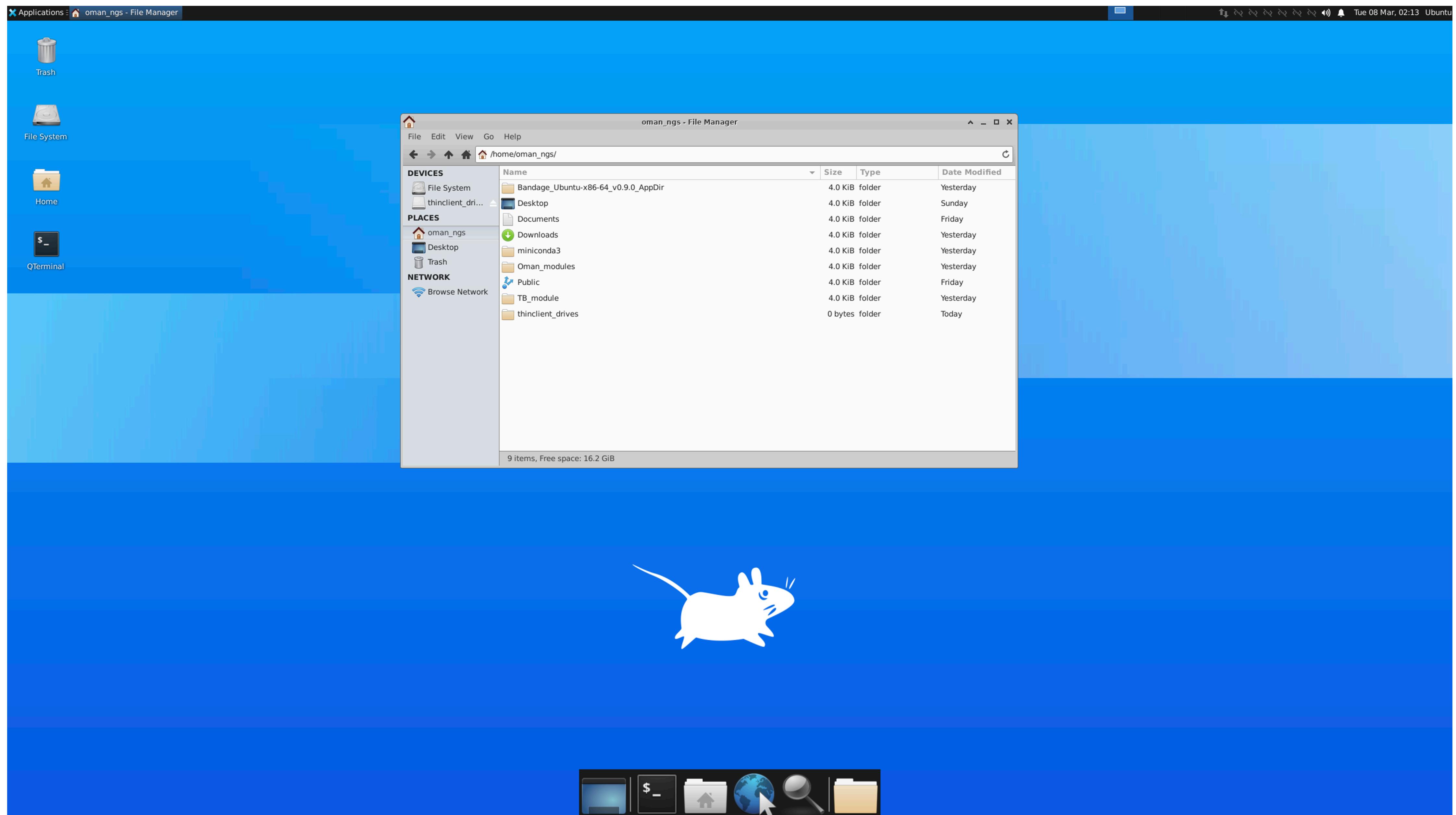
**Unix is very suitable for dealing
with such files**

**Powerful and flexible commands for
processing large text files**

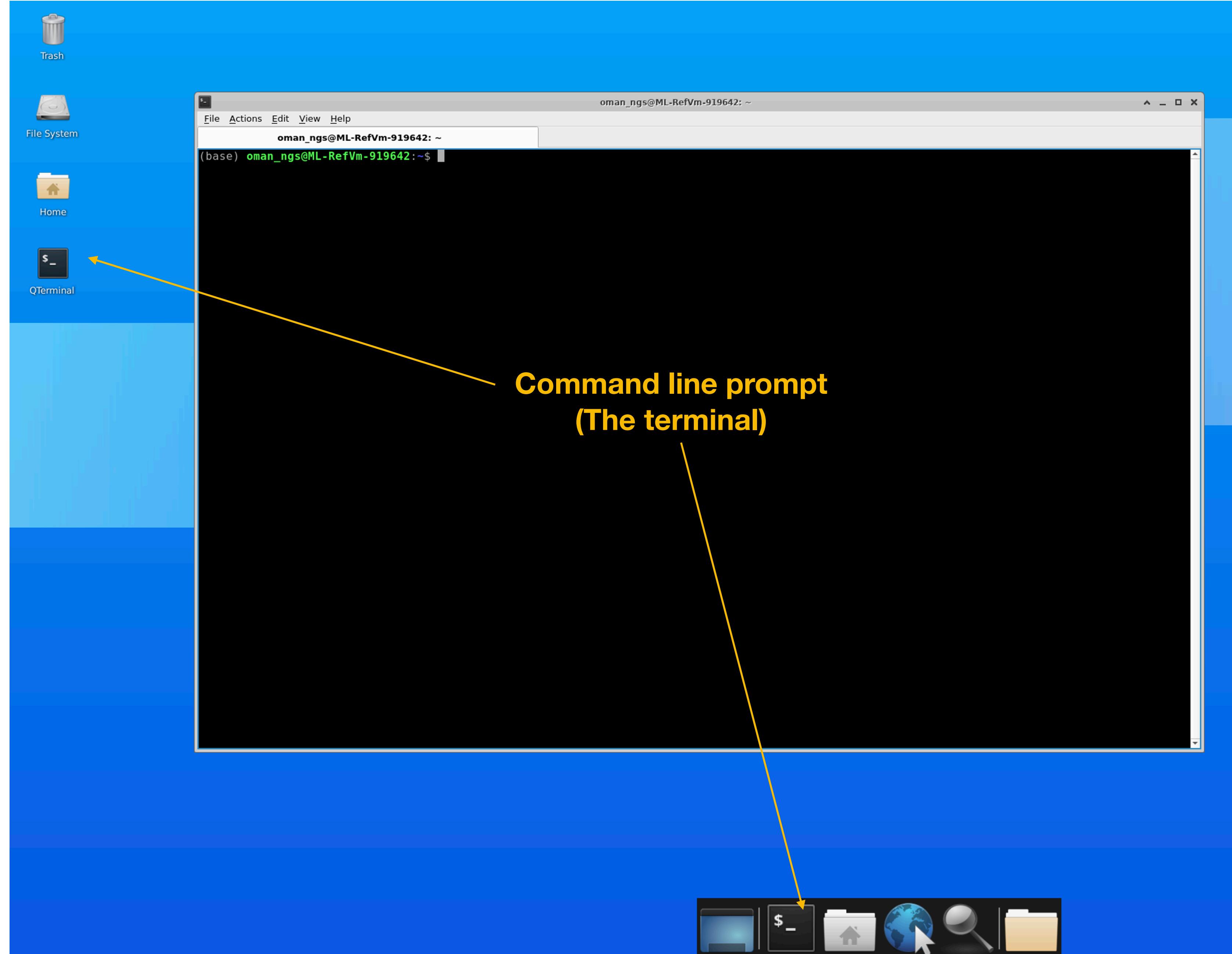
Widely used in scientific community



Using Linux



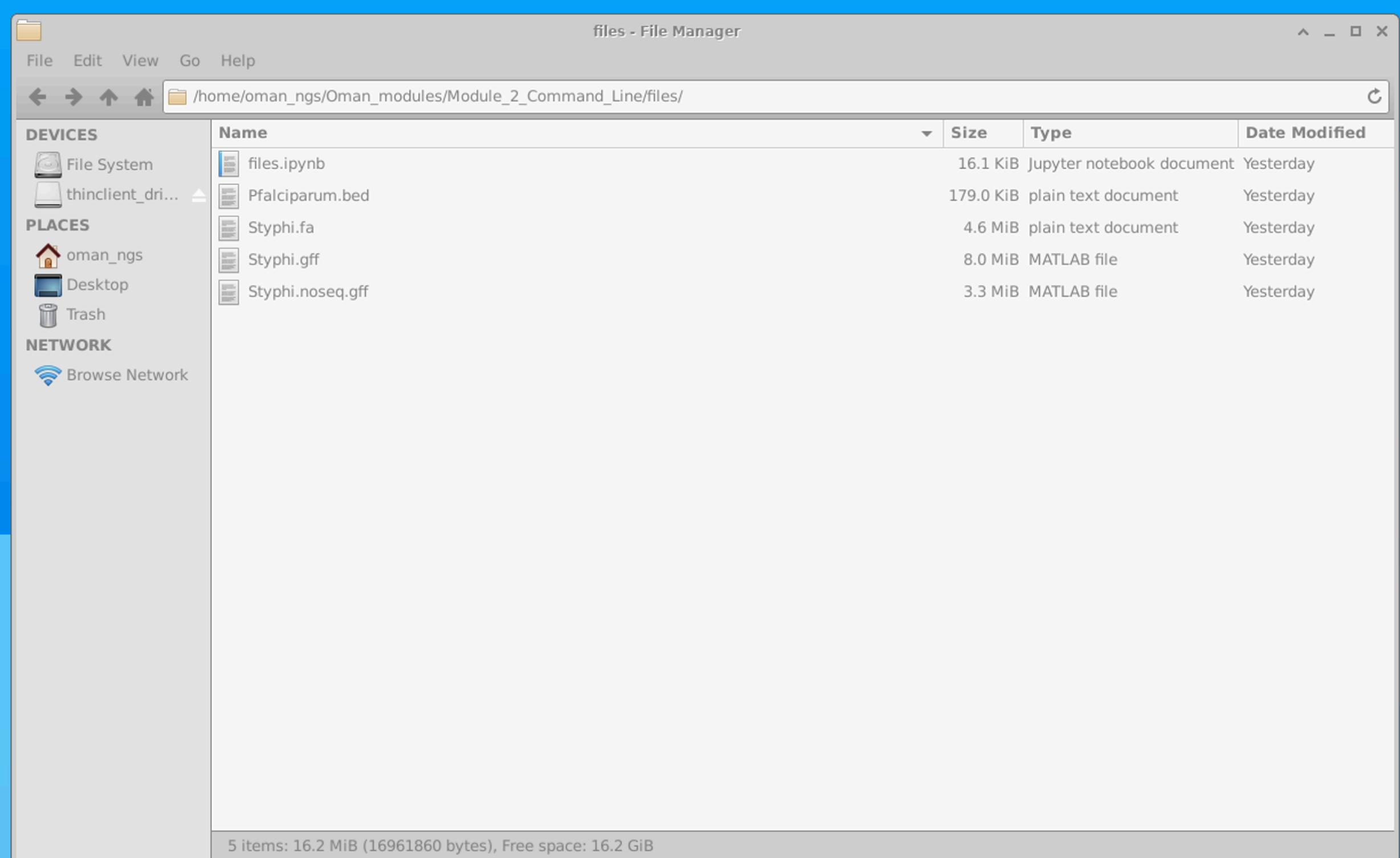
The Command Line



Common Commands

Command	What it does
ls	List the contents of the current directory
cd	Changes a directory
mv	Moves a file
cp	Copies a file
rm	Remove a file
less	Displays the contents of a file
head	Displays the first ten lines of a file
tail	Displays the last ten lines of a file
cat	Concatenate files together
pwd	Print working directory
mkdir	Make a new directory

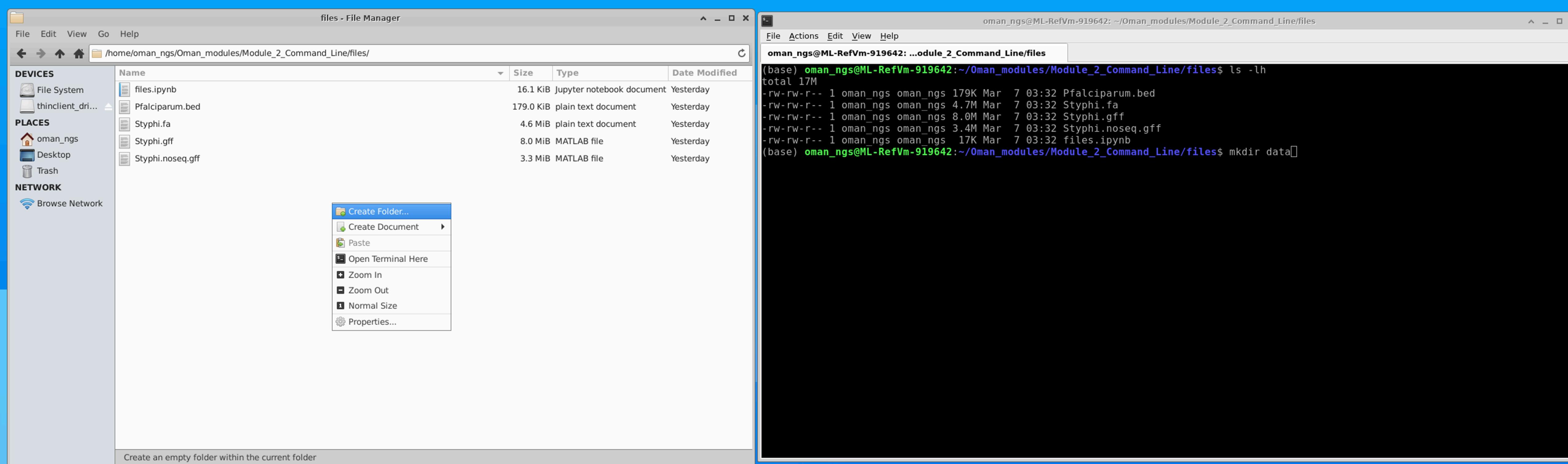
ls command



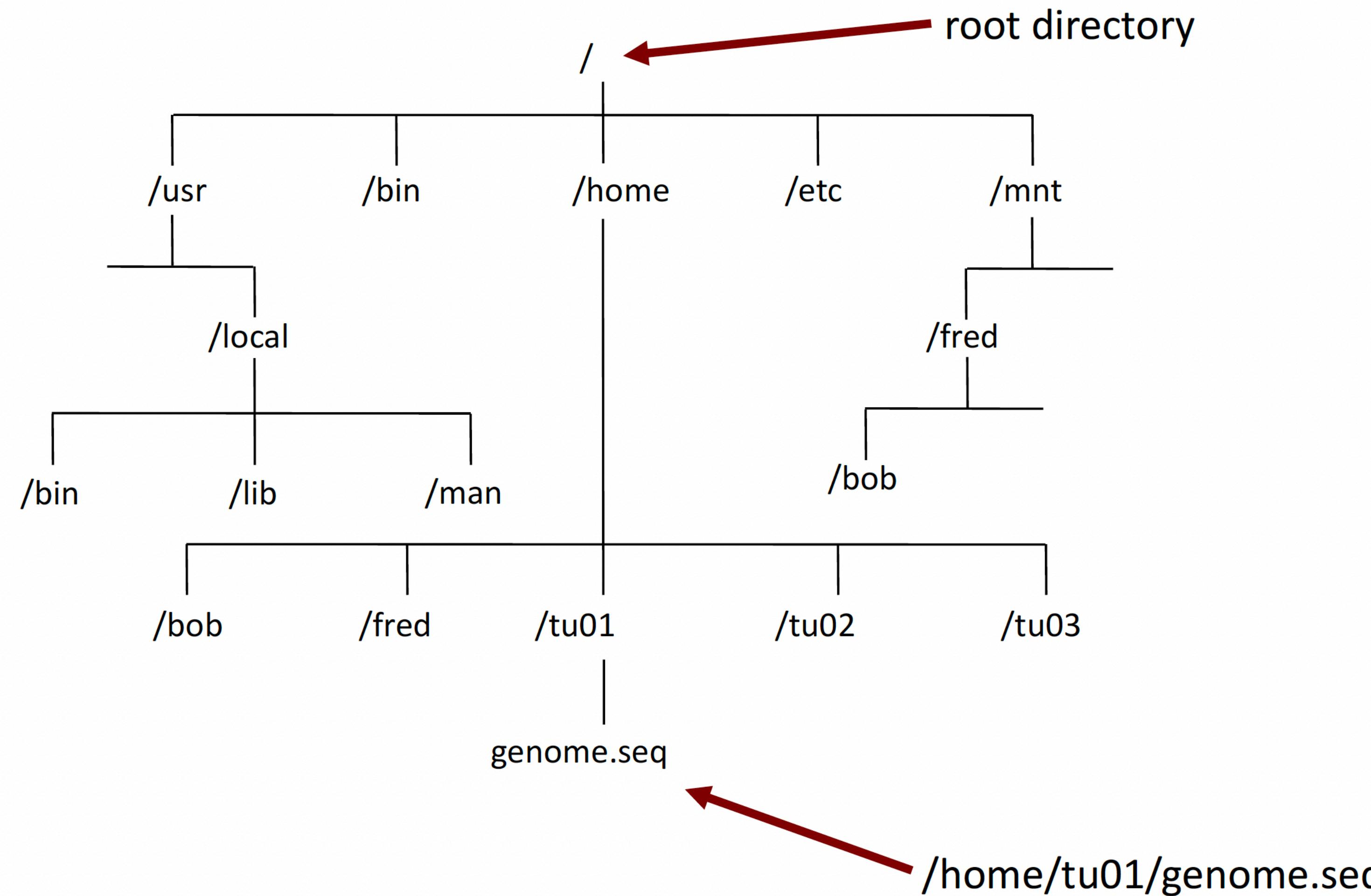
oman_ngs@ML-RefVm-919642: ~/Oman_modules/Module_2_Command_Line/files

```
(base) oman_ngs@ML-RefVm-919642:~/Oman_modules/Module_2_Command_Line/files$ ls -lh
total 17M
-rw-rw-r-- 1 oman_ngs oman_ngs 179K Mar 7 03:32 Pfalciparum.bed
-rw-rw-r-- 1 oman_ngs oman_ngs 4.7M Mar 7 03:32 Styphi.fa
-rw-rw-r-- 1 oman_ngs oman_ngs 8.0M Mar 7 03:32 Styphi.gff
-rw-rw-r-- 1 oman_ngs oman_ngs 3.4M Mar 7 03:32 Styphi.noseq.gff
-rw-rw-r-- 1 oman_ngs oman_ngs 17K Mar 7 03:32 files.ipynb
(base) oman_ngs@ML-RefVm-919642:~/Oman_modules/Module_2_Command_Line/files$
```

mkdir command



Directory structures



Unix tips and tricks



Unix is case sensitive

- Typing LS is NOT the same as typing ls

You need to put spaces between

- a command
- the values passed to the command

Unix is not psychic!

- If you misspell the name of command or a file it will not understand you

Error messages are often really informative. Read them carefully

Organization is key!

- File names, directory structure, commands use



VIRTUAL MACHINE



Step 1 : Email invite

Register for Lab - OmanNGS ➔ Inbox x 🖨️ 📎

 **Microsoft Azure** <azure-noreply@microsoft.com>
to me ▾ Sun, Mar 6, 9:42 PM (22 hours ago) ⭐ ↵ ⋮

 Microsoft Azure

**Daryl Domman invited you to the lab:
OmanNGS**

Register now to access the virtual machines in the lab.

[Register for the lab >](#)

[f](#) [t](#) [y](#) [in](#)

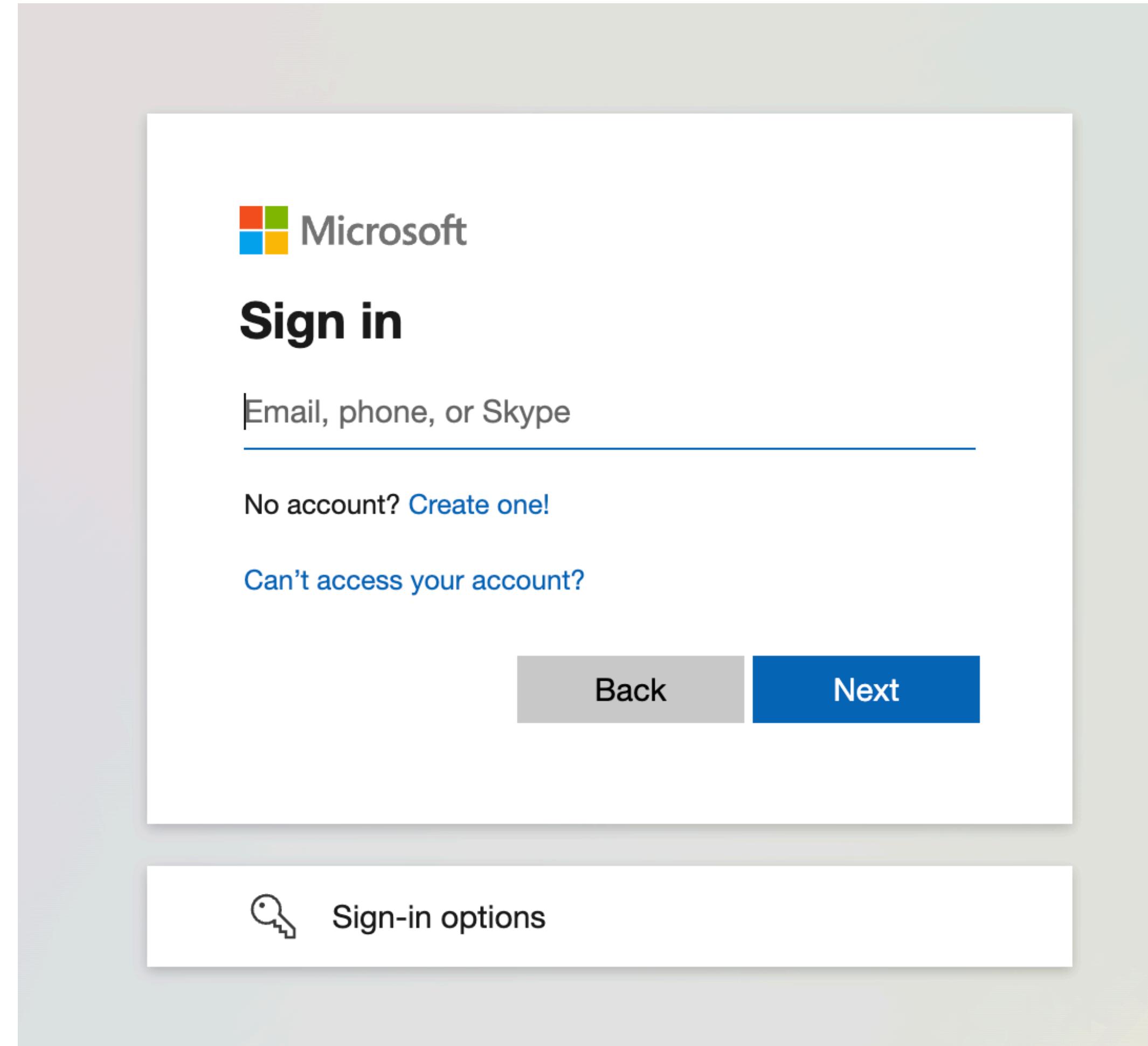
[Privacy Statement](#)

Microsoft Corporation, One Microsoft Way, Redmond, WA 98052

 Microsoft

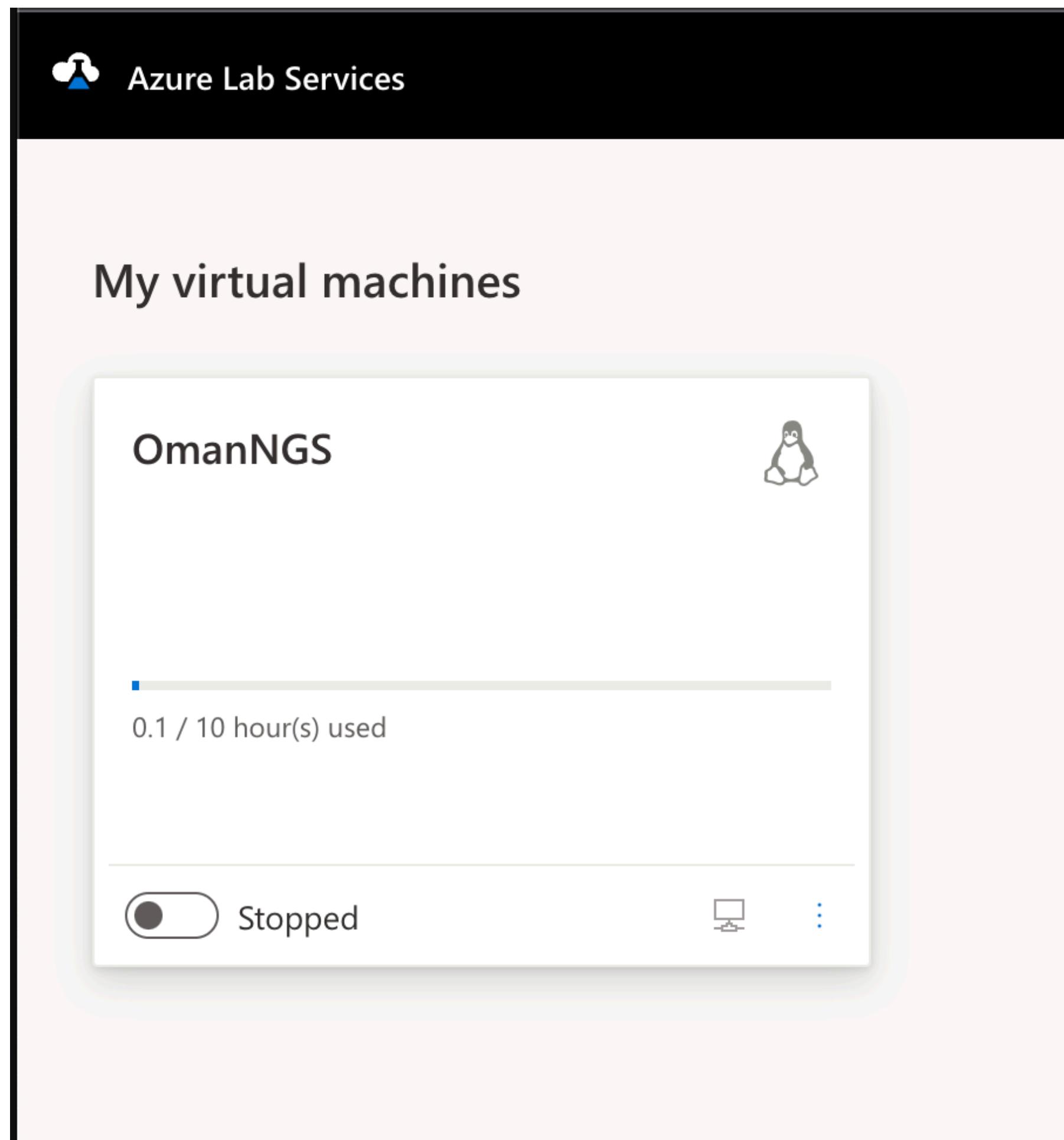
↳ Reply ↗ Forward

Step 2 : Microsoft Account

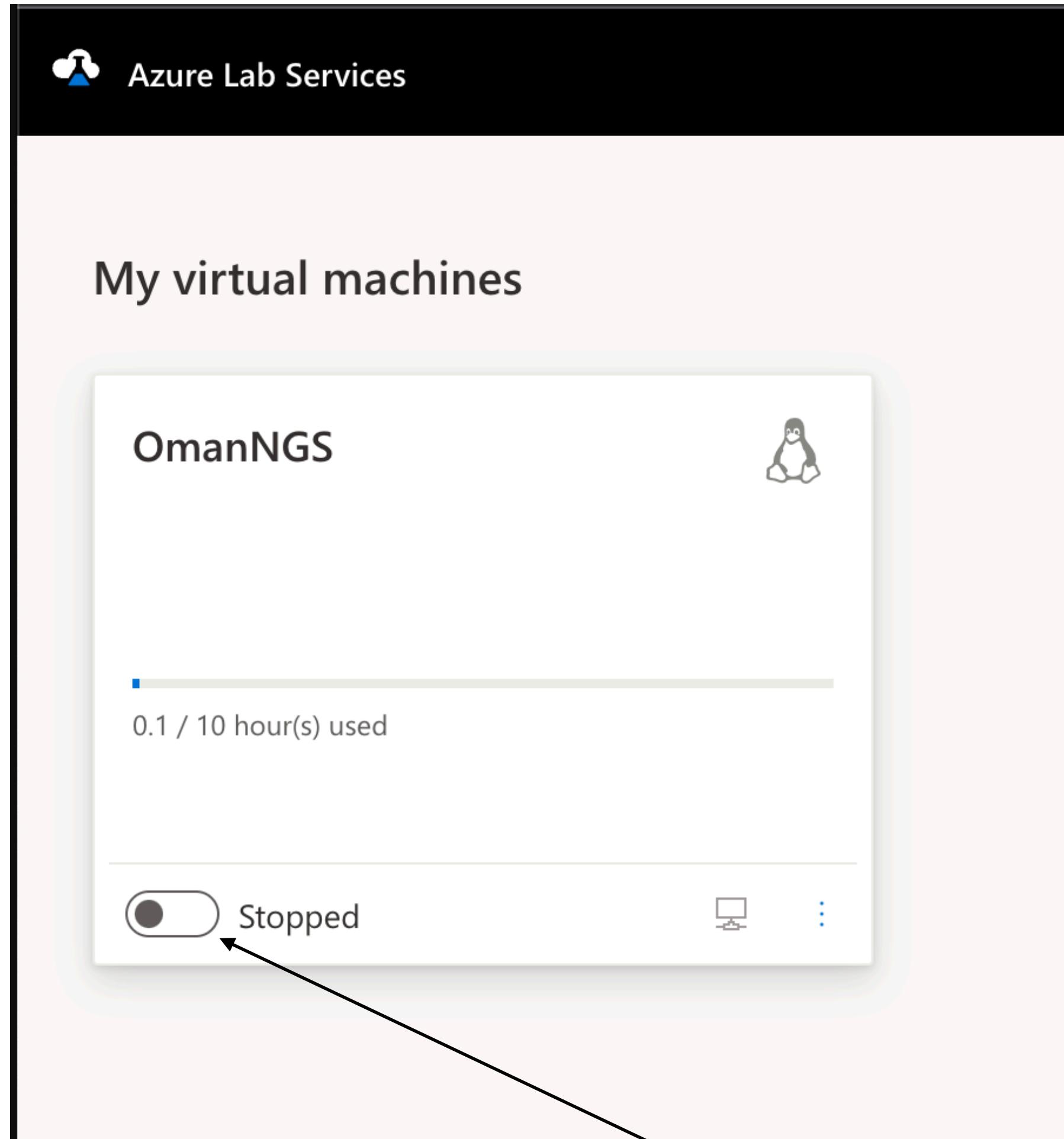


For Azure Lab – needs to be same as invite email

Step 3 : Azure Lab main screen

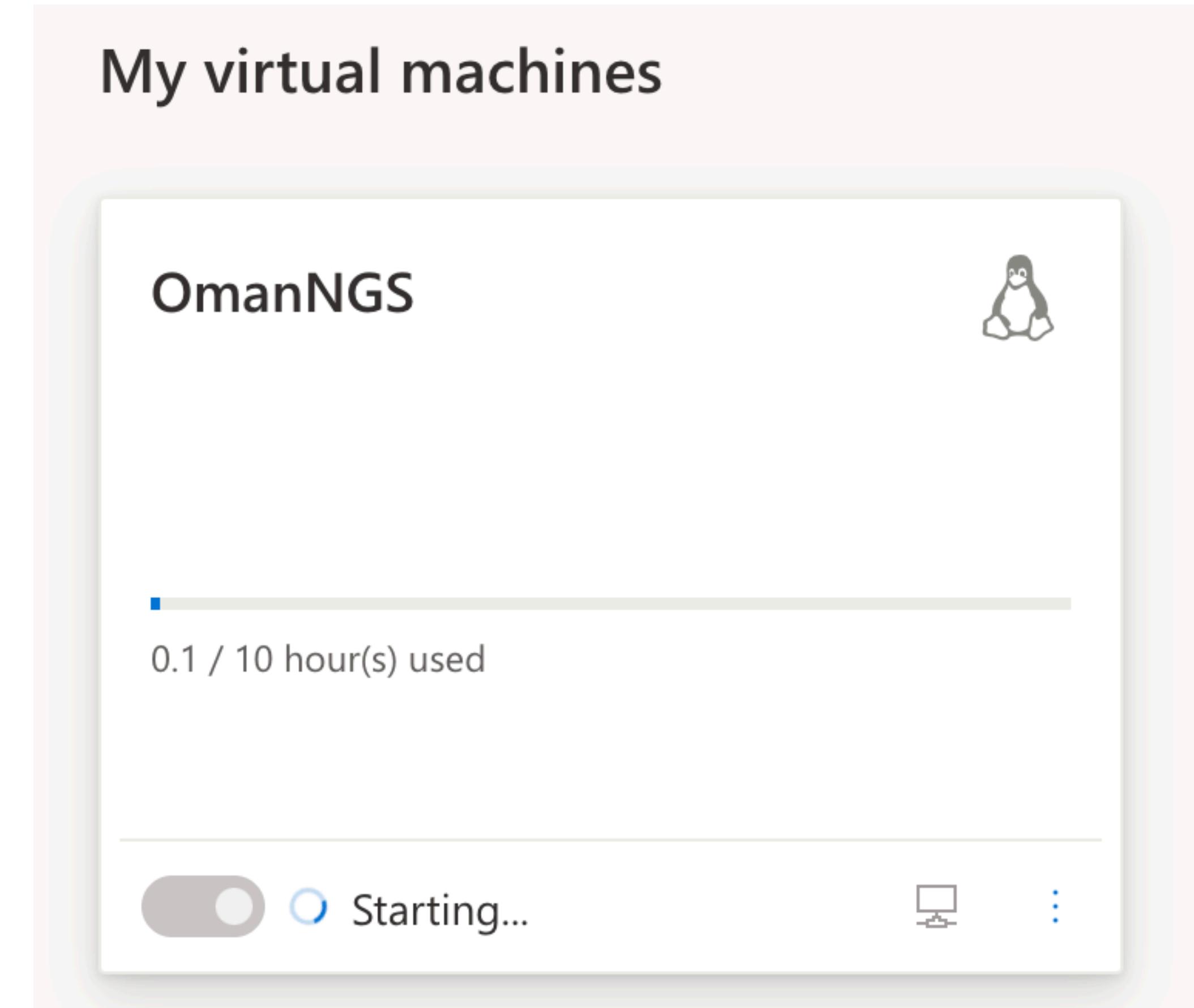


Step 4 : Start Virtual Machine



Click the slider to “Start” the VM

Step 5 : Virtual Machine Starting



Step 5 : Virtual Machine Starting

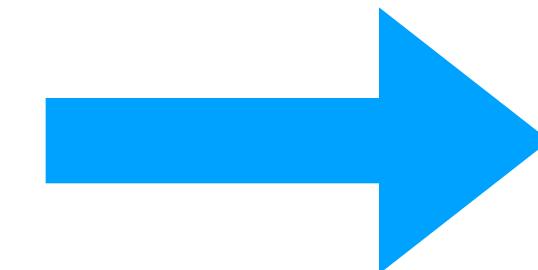
My virtual machines

OmanNGS



0.1 / 10 hour(s) used

Starting...



A few moments

My virtual machines

OmanNGS



0.1 / 10 hour(s) used

Running



Step 6 : Install Microsoft Remote Desktop

The image shows a screenshot of the Microsoft website. At the top, there is a navigation bar with links for Home, Devices, Software, Games & Entertainment, Deals, Shop Business, Students & parents, More, All Microsoft, Search, Cart, and a user profile for Daryl. Below the navigation bar is a large, stylized illustration of a central blue cloud connected to various devices (a laptop, a desktop monitor, a smartphone, and a tablet) via blue curved lines, symbolizing connectivity and remote access.

Microsoft Remote Desktop

Microsoft Corporation • Productivity

Use the Microsoft Remote Desktop app to connect to a remote PC or virtual apps and desktops made available by your admin. The app helps you be productive no matter where you are.

[Get](#)

Free

△ See System Requirements

More

ESRB: **EVERYONE**

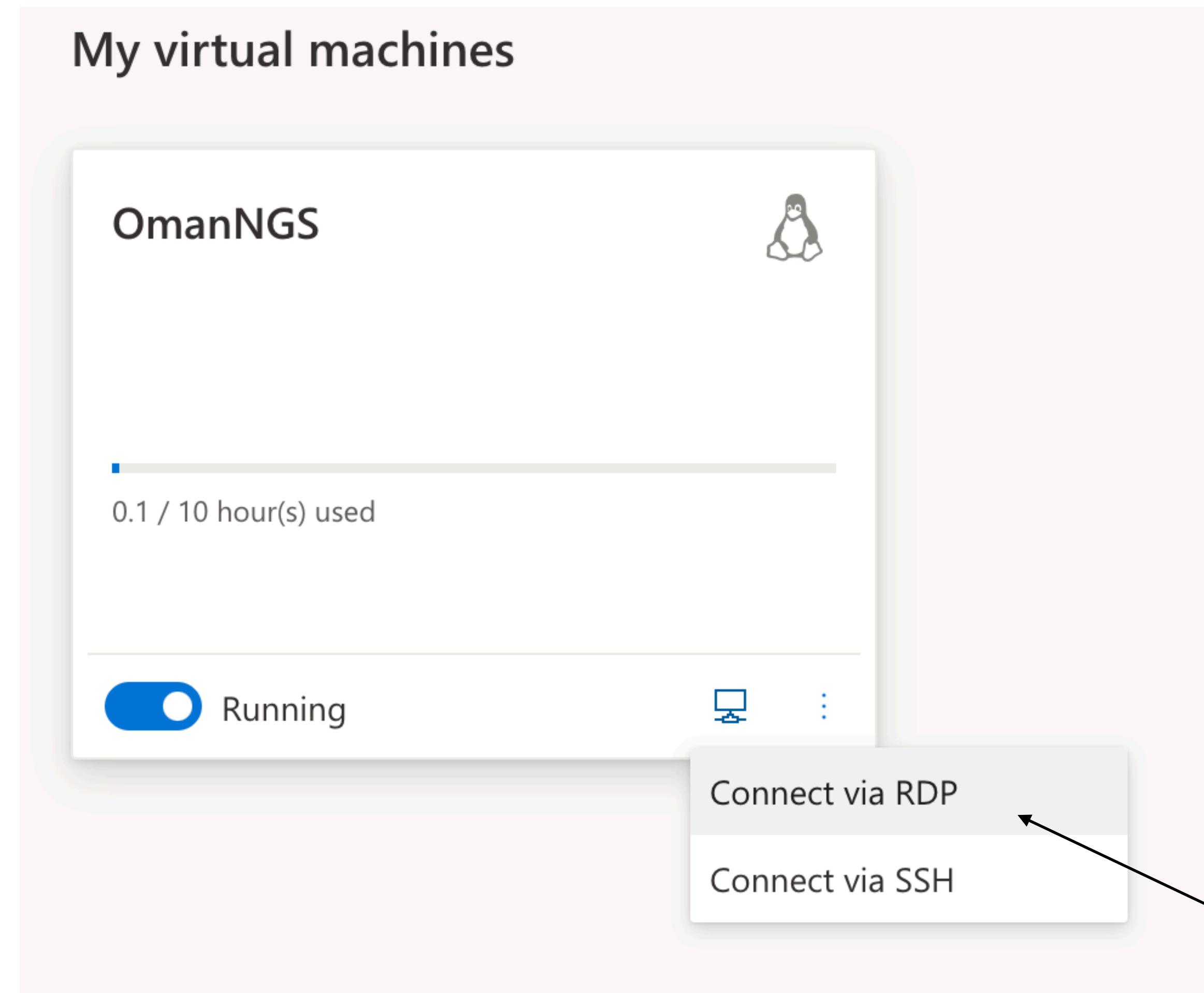
Does not matter what email you use to download !!!

Step 6 : Install Microsoft Remote Desktop (Mac)

The screenshot shows the Microsoft Remote Desktop app page in the Mac App Store. The search bar at the top contains the text "microsoft remote des...". The main card features the app's logo (a red square with a white 'K' shape), the title "Microsoft Remote Desktop", the tagline "Work from anywhere", and a large blue "OPEN" button. Below the card, detailed information is provided: "77K RATINGS" (4.6 stars), "AGE 4+", "Years Old", "CHART # 2 Business", "DEVELOPER Microsoft Corporation", "LANGUAGE EN English", and "SIZE 53.5 MB". The "What's New" section notes a quick update to improve connection reliability for Azure Virtual Desktop (AVD) scenarios. The "Preview" section displays three screenshots of the app interface running on a Mac, showing the desktop environment, pinned tiles, and a file explorer window.

Download in App Store

Step 7 : Connecting to VM



**Click “Connect via RDP”
Save file**

Step 8 : Open RDP file

Add your first PC connection
to get started.

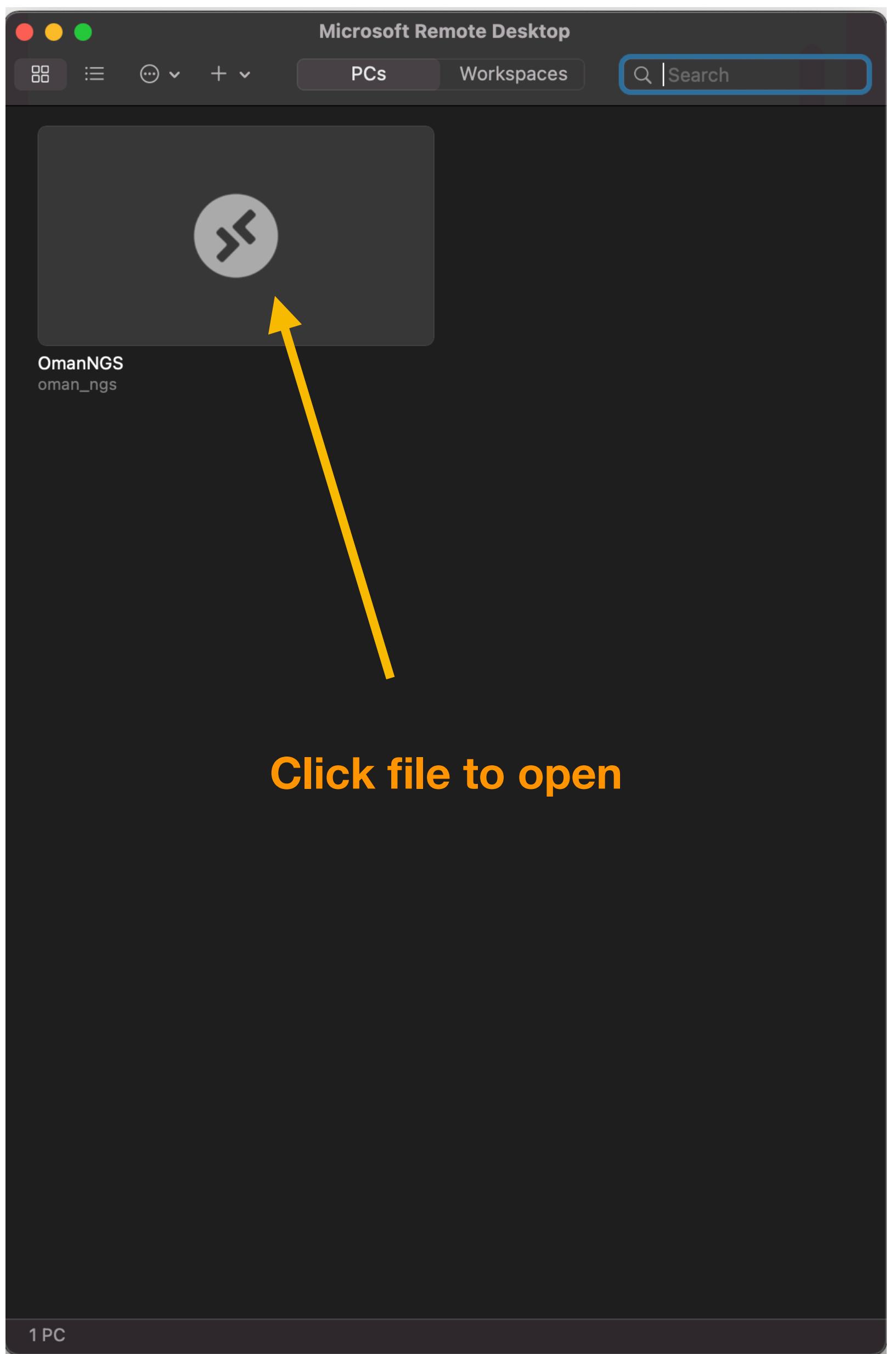
Add PC

Or drag and drop file here
In Microsoft Remote Desktop App

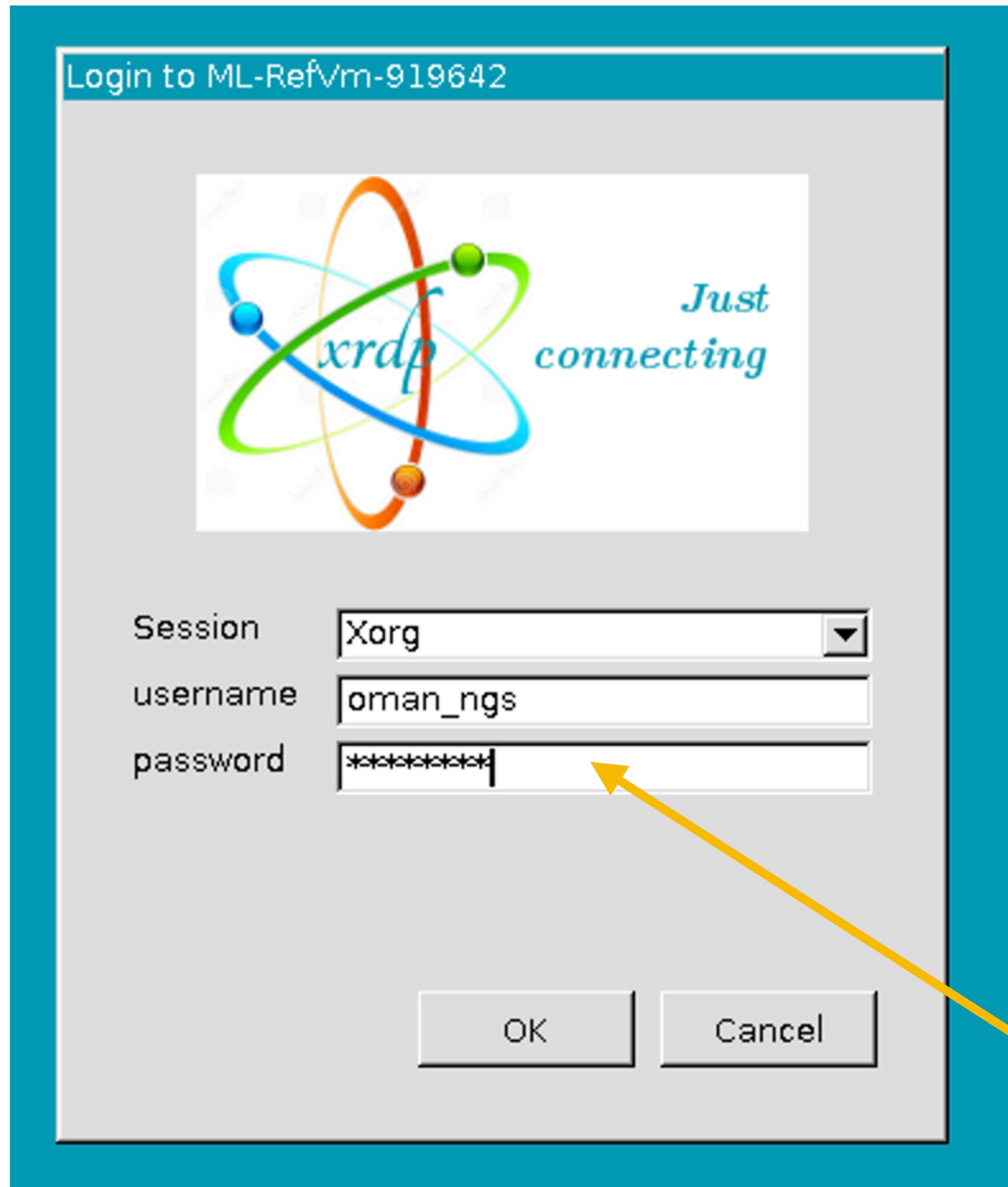
OmanNGS.rdp

Open by clicking

Step 8 : Open RDP file

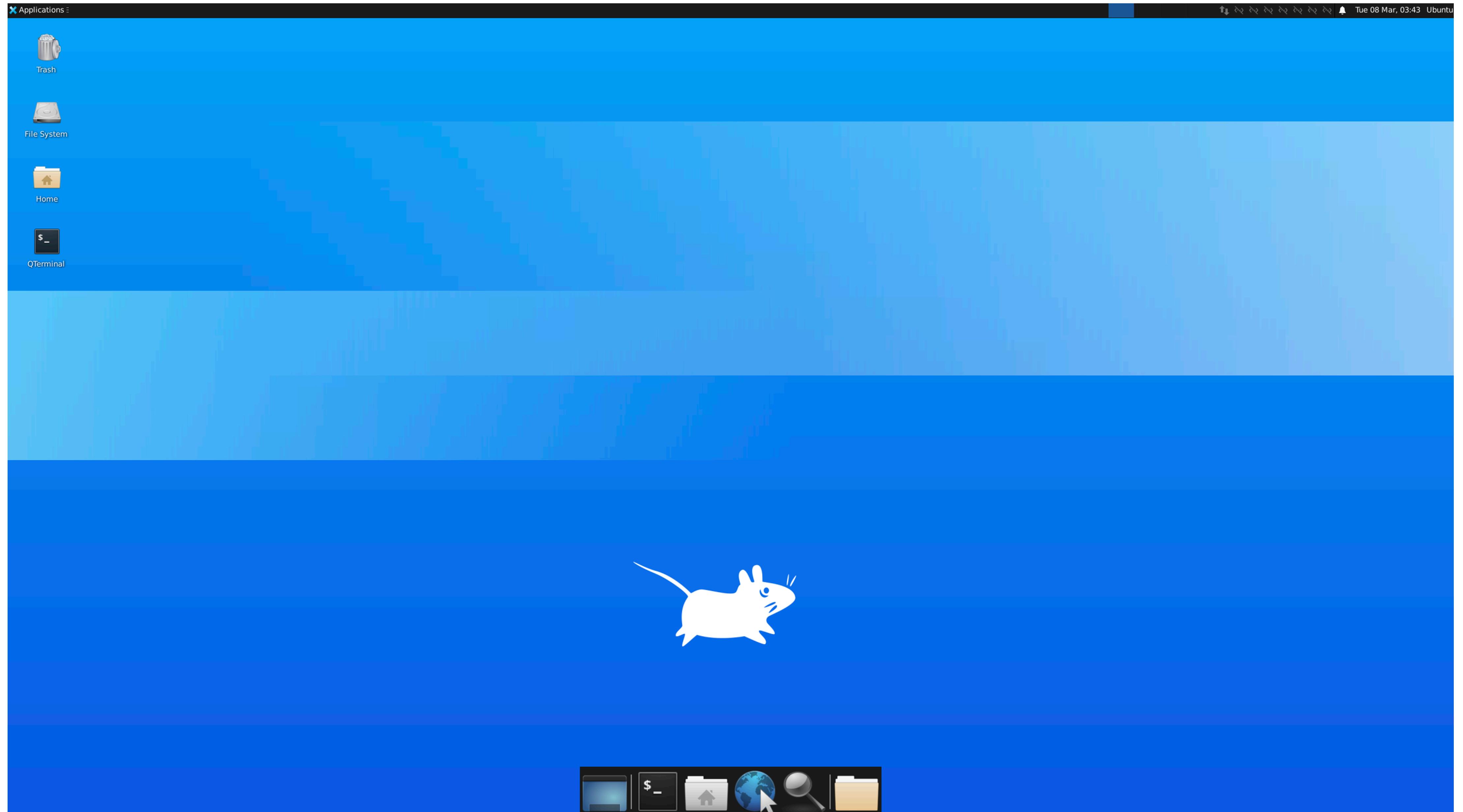


Step 9 : VM Start Screen

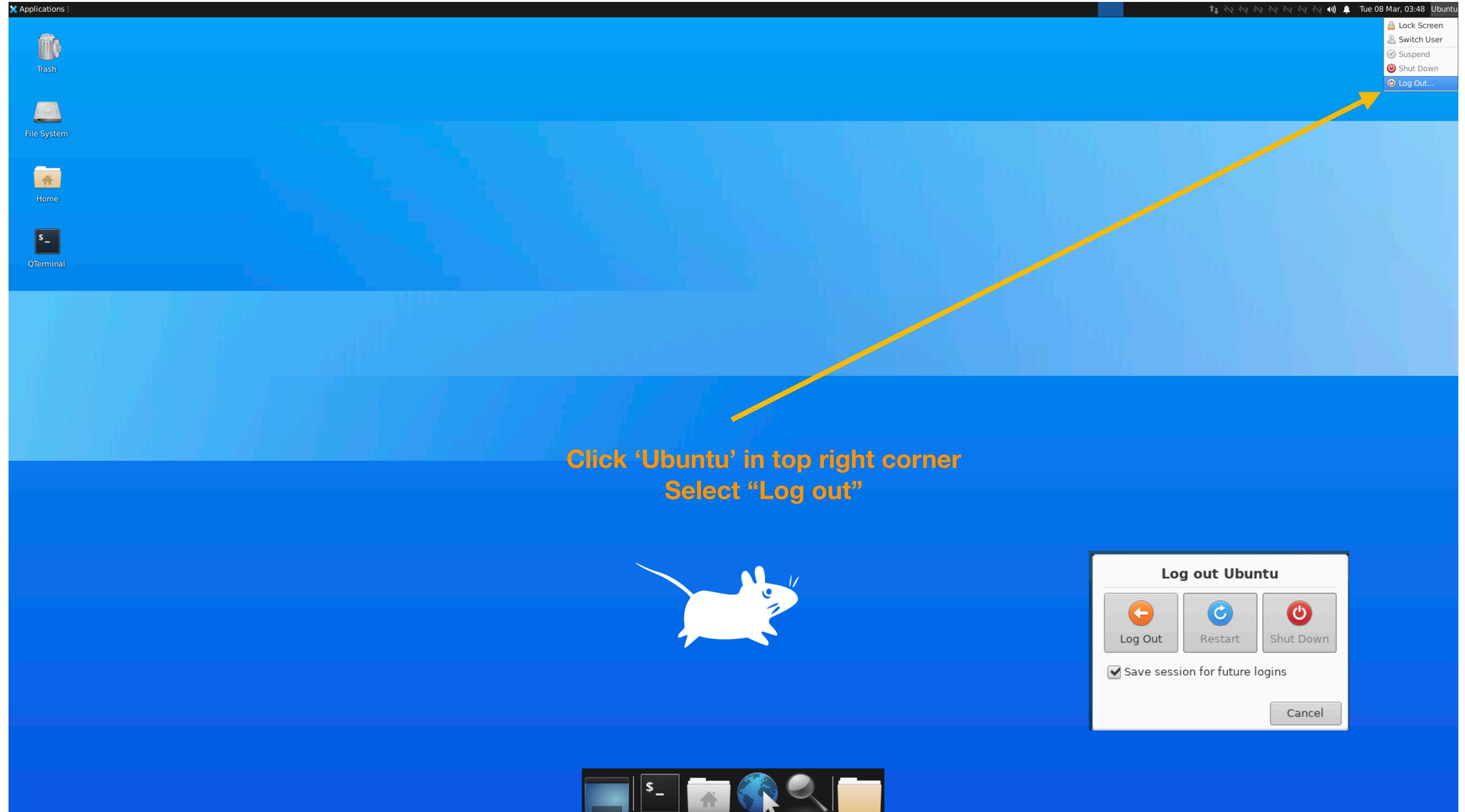


This is password you used to set up VM from email

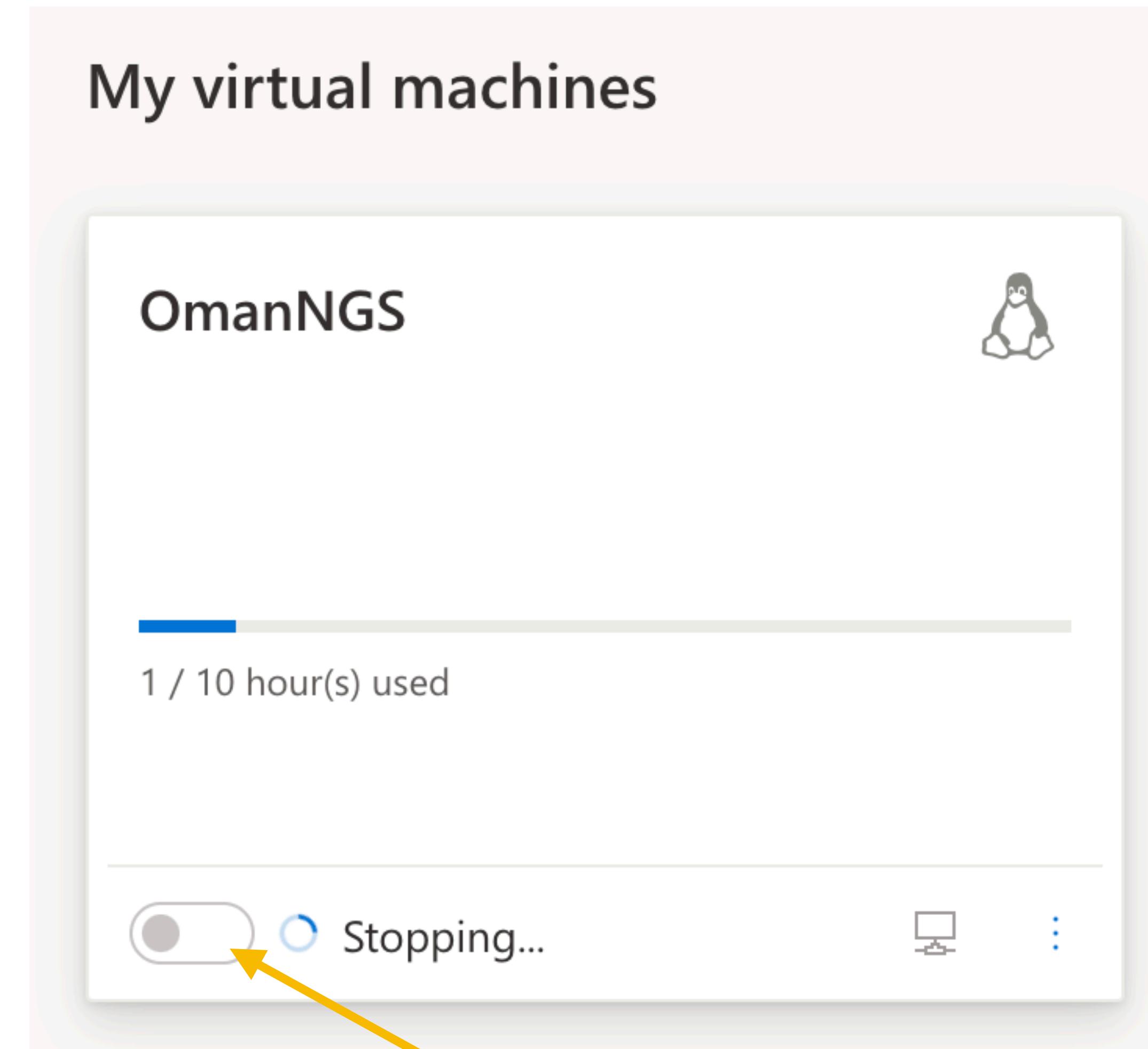
Step 10 : Have Fun !!!



Shutting Down the VM



Shutting Down the VM



Stop the VM here !!!!