The ultimate thin client: Boot from Google Drive and Colab

This would require about 6 GB of space in the Google drive depending on the OS.

Prerequisites

- The target machine to boot (Obviously)
- A boot server (This colab uses Windows 7 or up or Windows Server 2012 or up)
- All machines should have wired connectivity
- A switch and ethernet cables for the wired network
- A Google account with Google Drive with atleast 5 GB of free space.

Note: If the PCs don't support ethernet connectivity, use a USB Ethernet NIC.

Initializing Colab

Make a copy of this colab notebook to your Google Drive before you start working

Set up User accounts

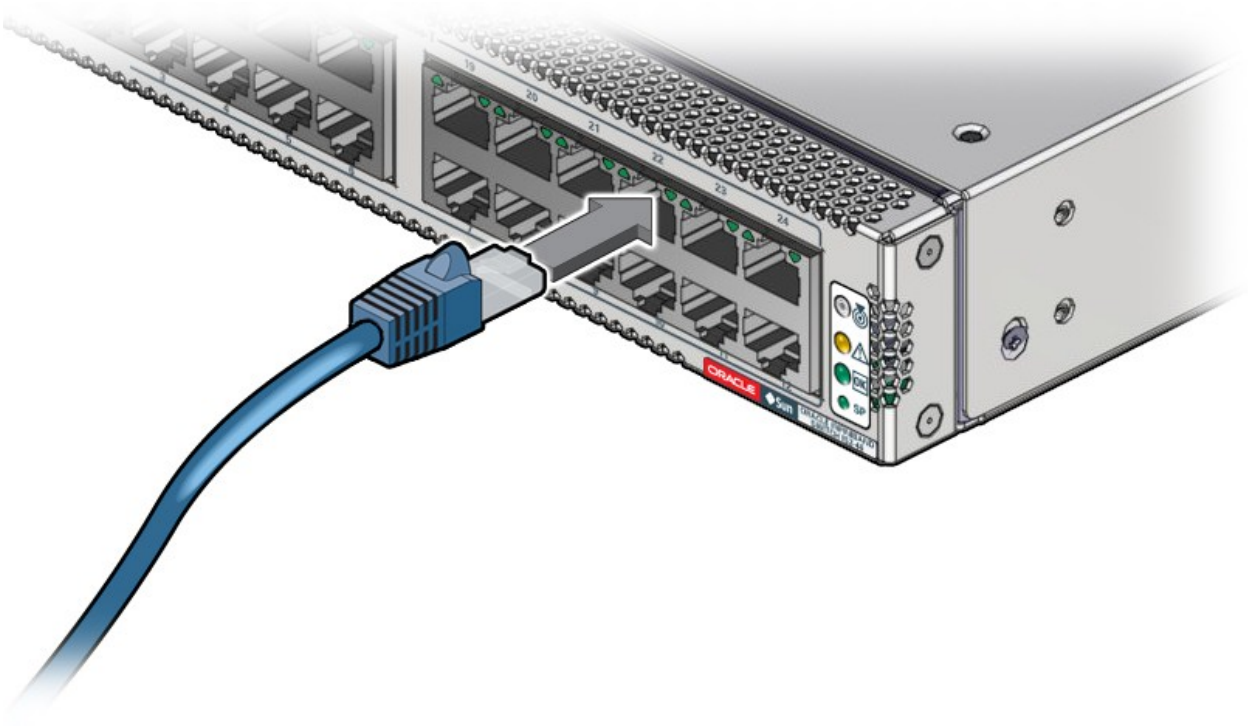
Create a non-microsoft user account which is password protected. The following cell will define the username and password

(If this user does not exist, it will be created automatically.)

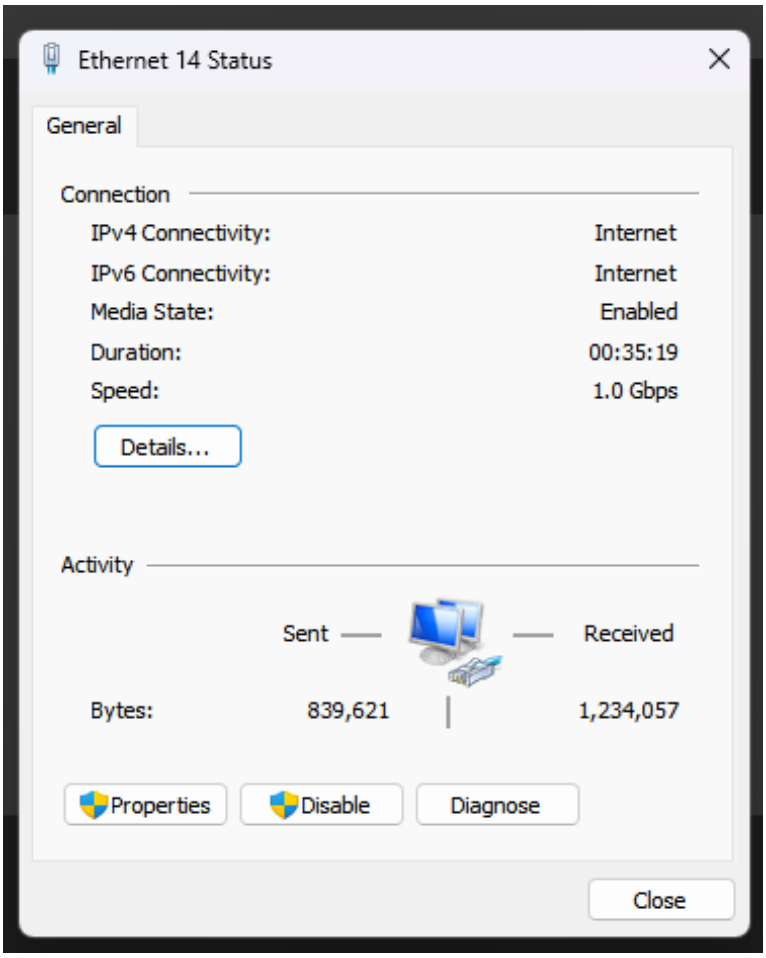
```
username = input("Enter username for boot server: ")
password = input("Enter password for boot server: ")
```

Set up network

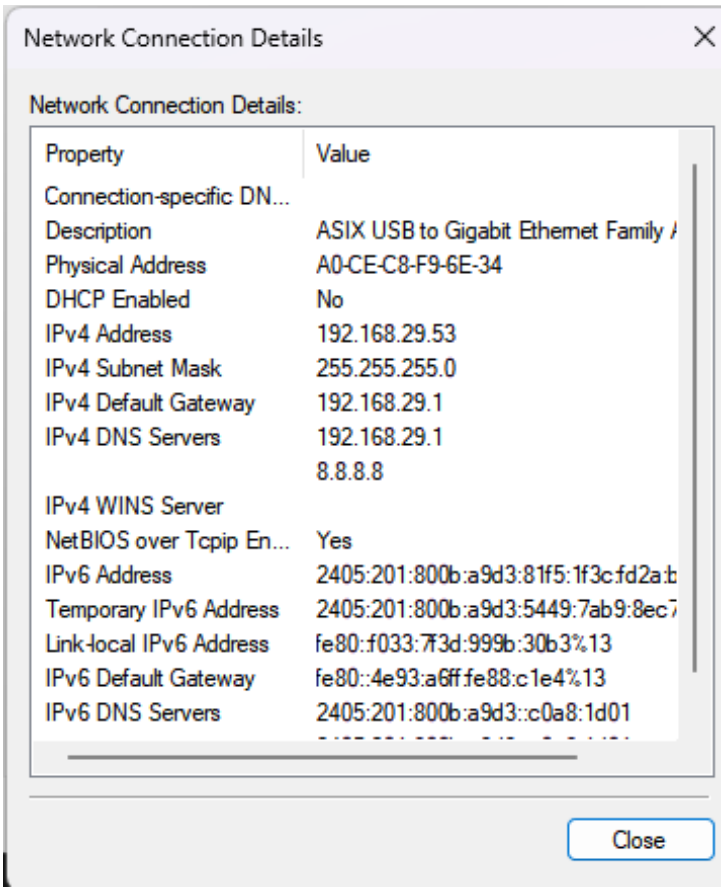
Make sure this PC is on a Wired connection (not Wifi) If not, connect it to a switch by ethernet cable



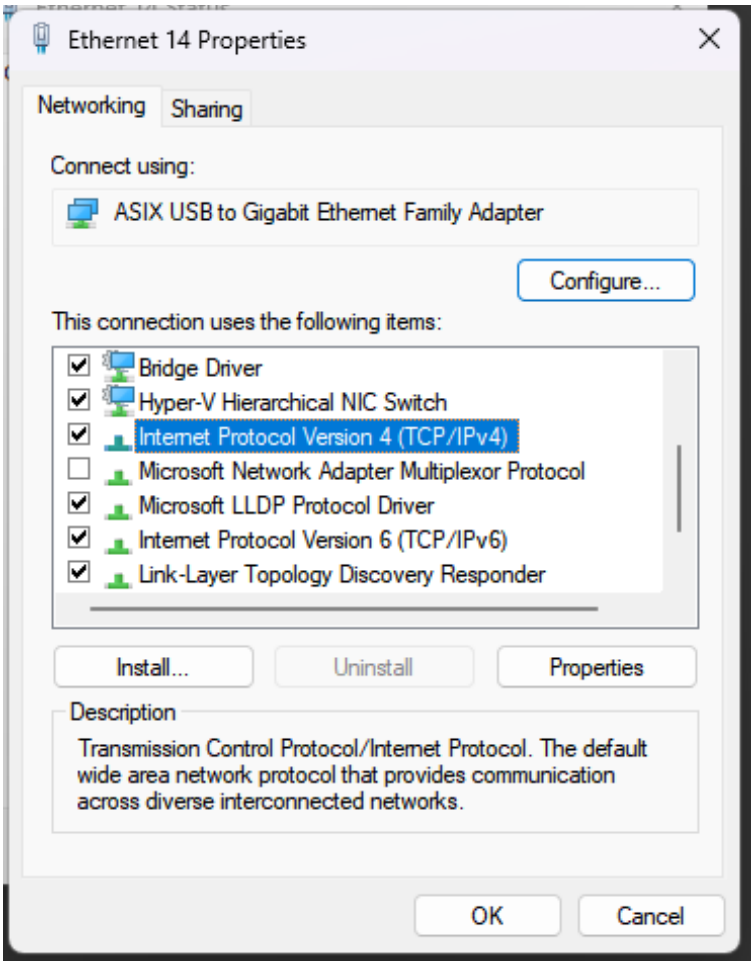
Go to Control Panel -> Network and Internet -> Network and Sharing Center -> Change Adapter Settings -> Open your wired network adapter



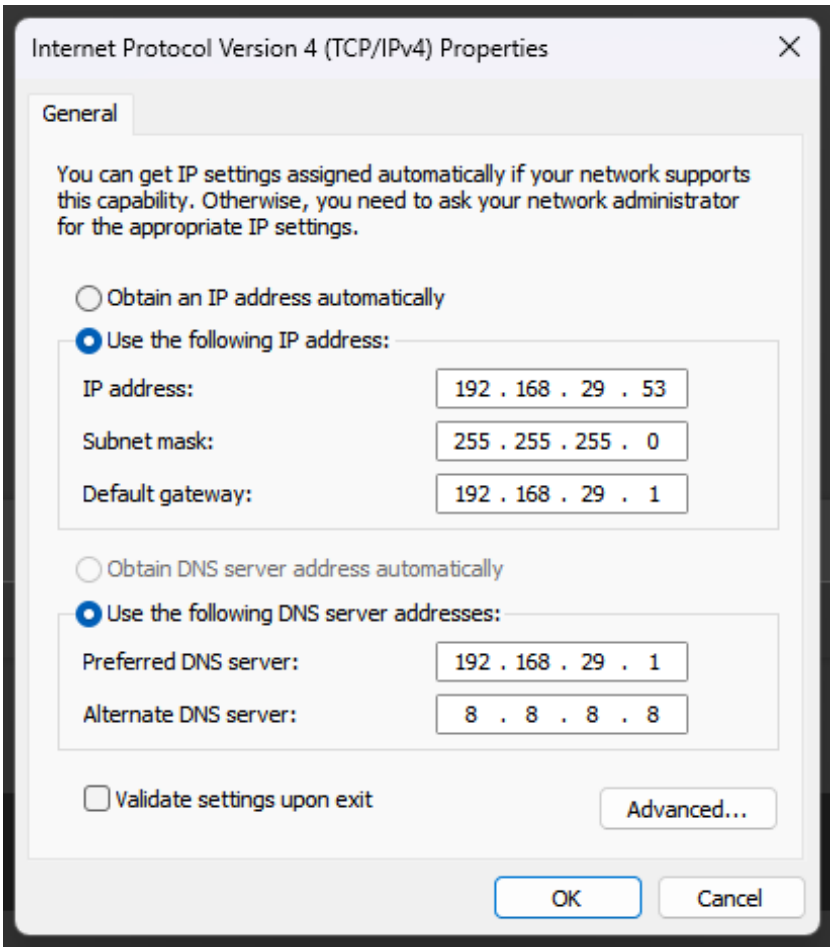
Go to details and note down IP Address, Subnet Mask, Default Gateway, DNS Servers



Go to properties and double click on Internet Protocol Version 4



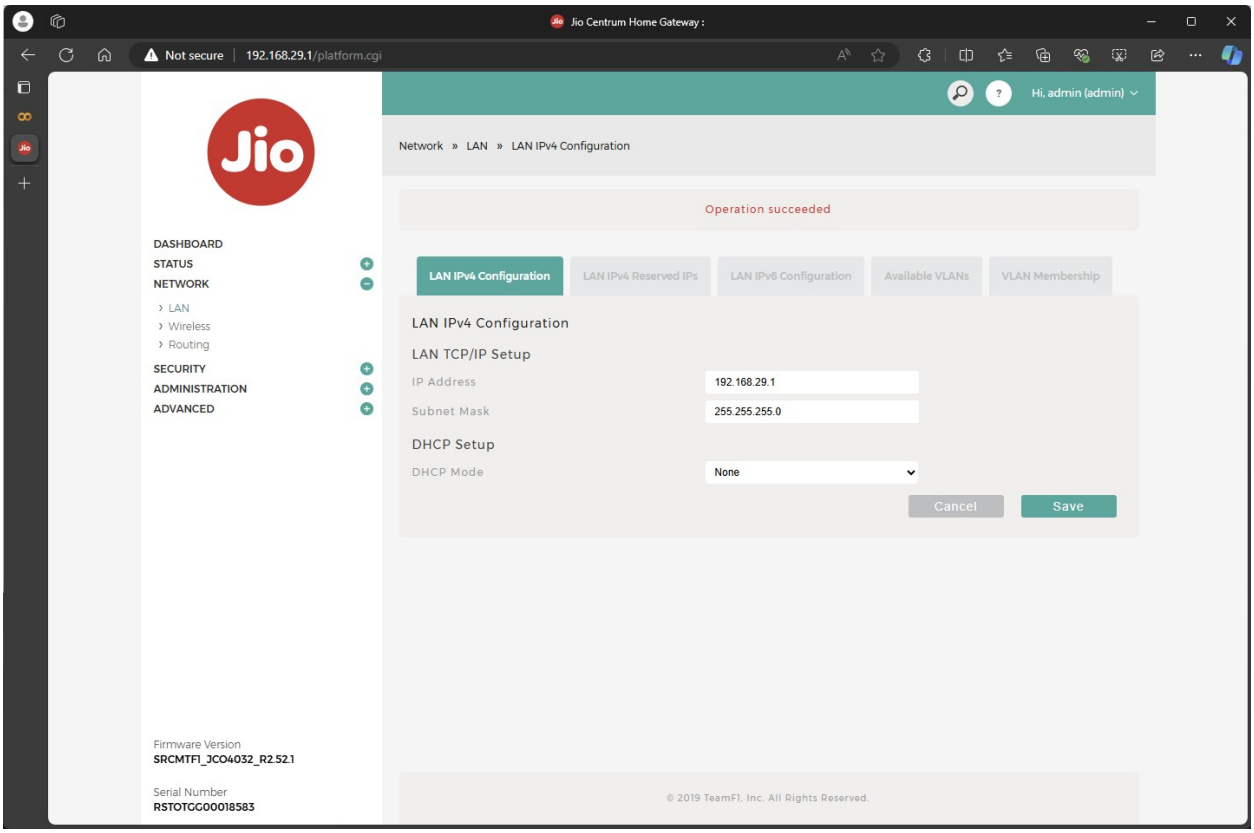
Set the IP you noted earlier as static IP



Removing existing DHCP Servers

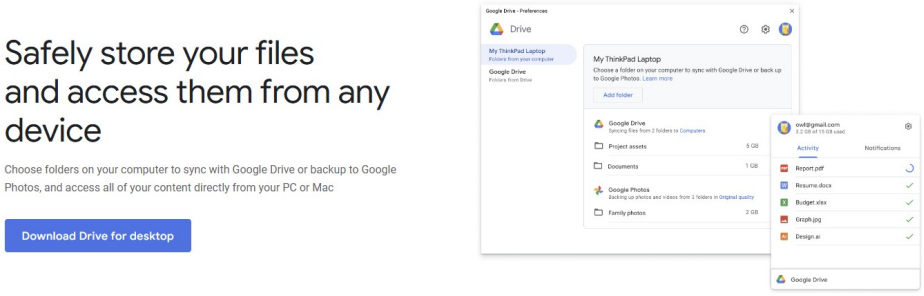
Ensure that there is no other DHCP server in the network. If you are using a home router or another DHCP server, disable it.

The following image shows how to disable it from a Jio router



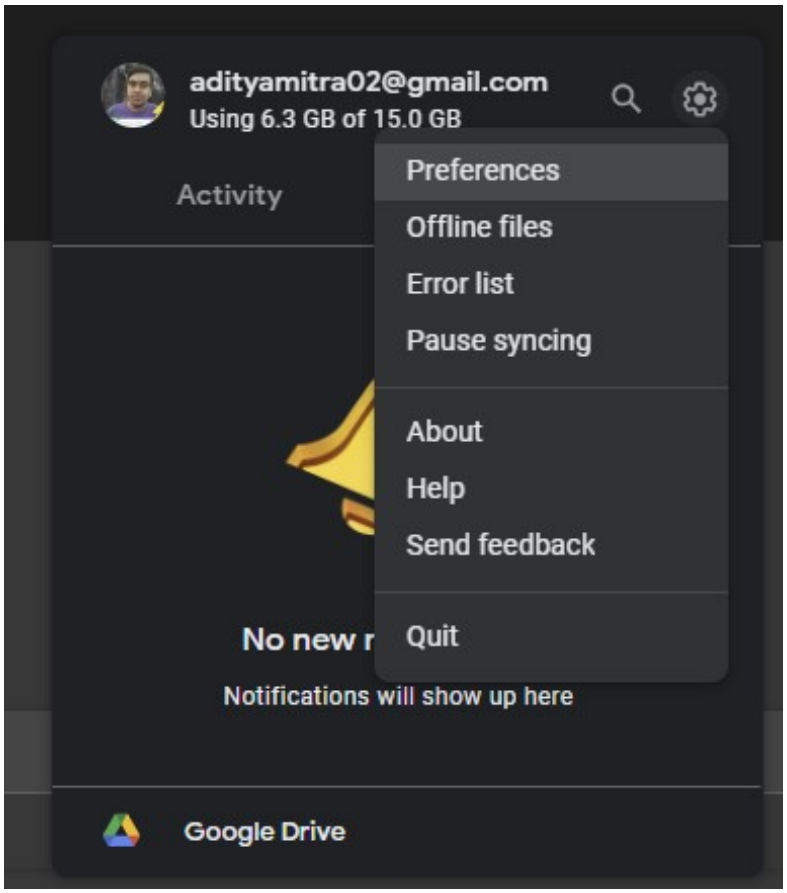
Google Drive Client installation

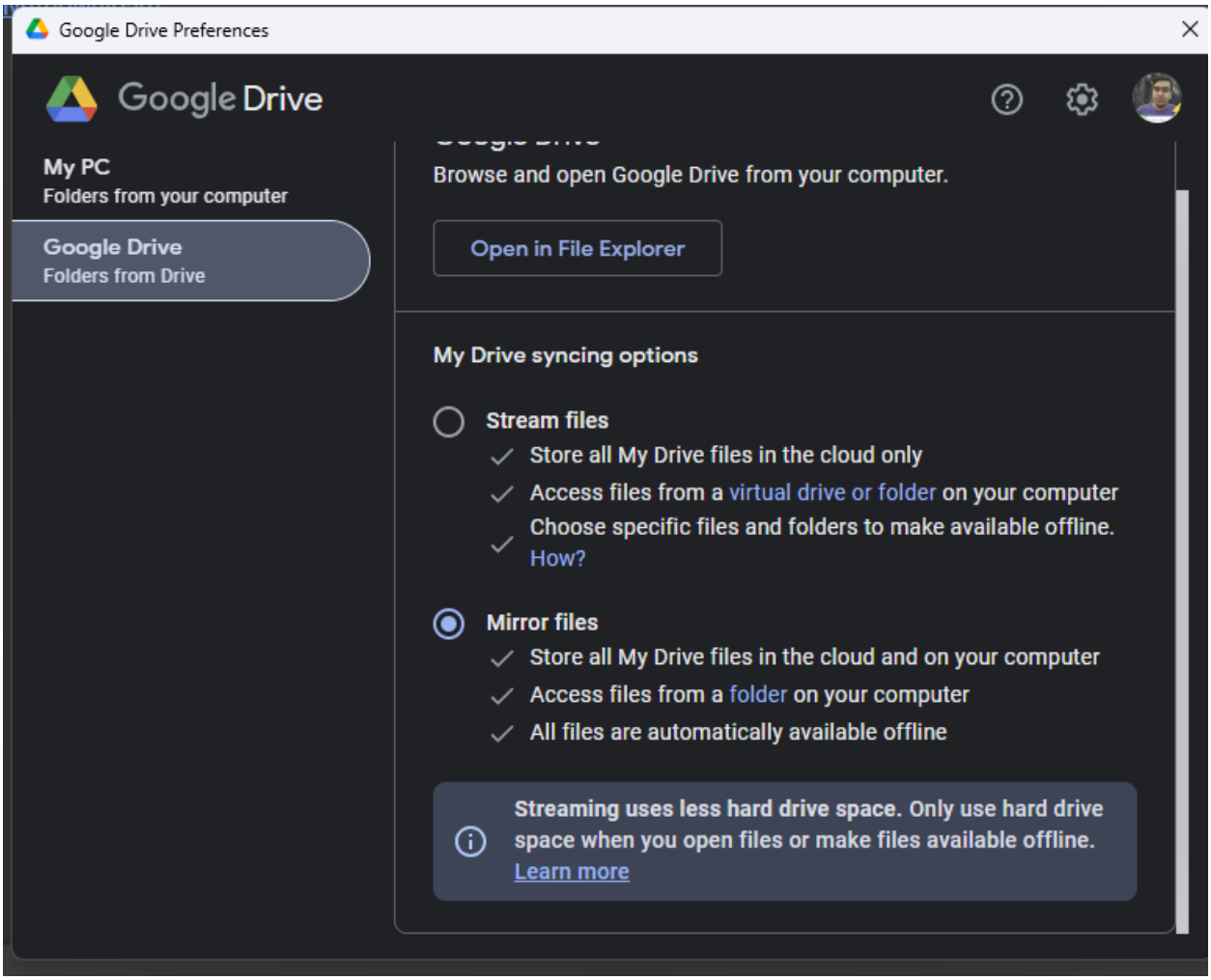
Download and install the Google Drive client from
https://www.google.com/intl/en-GB/drive/download/



Set it up by logging in

Go to preferences and set up Mirror mode


adityamitra02@gmail.com
Using 6.3 GB of 15.0 GB
Activity
Preferences
Offline files
Error list
Pause syncing
About
Help
Send feedback
Quit
No new r
Notifications will show up here
Google Drive

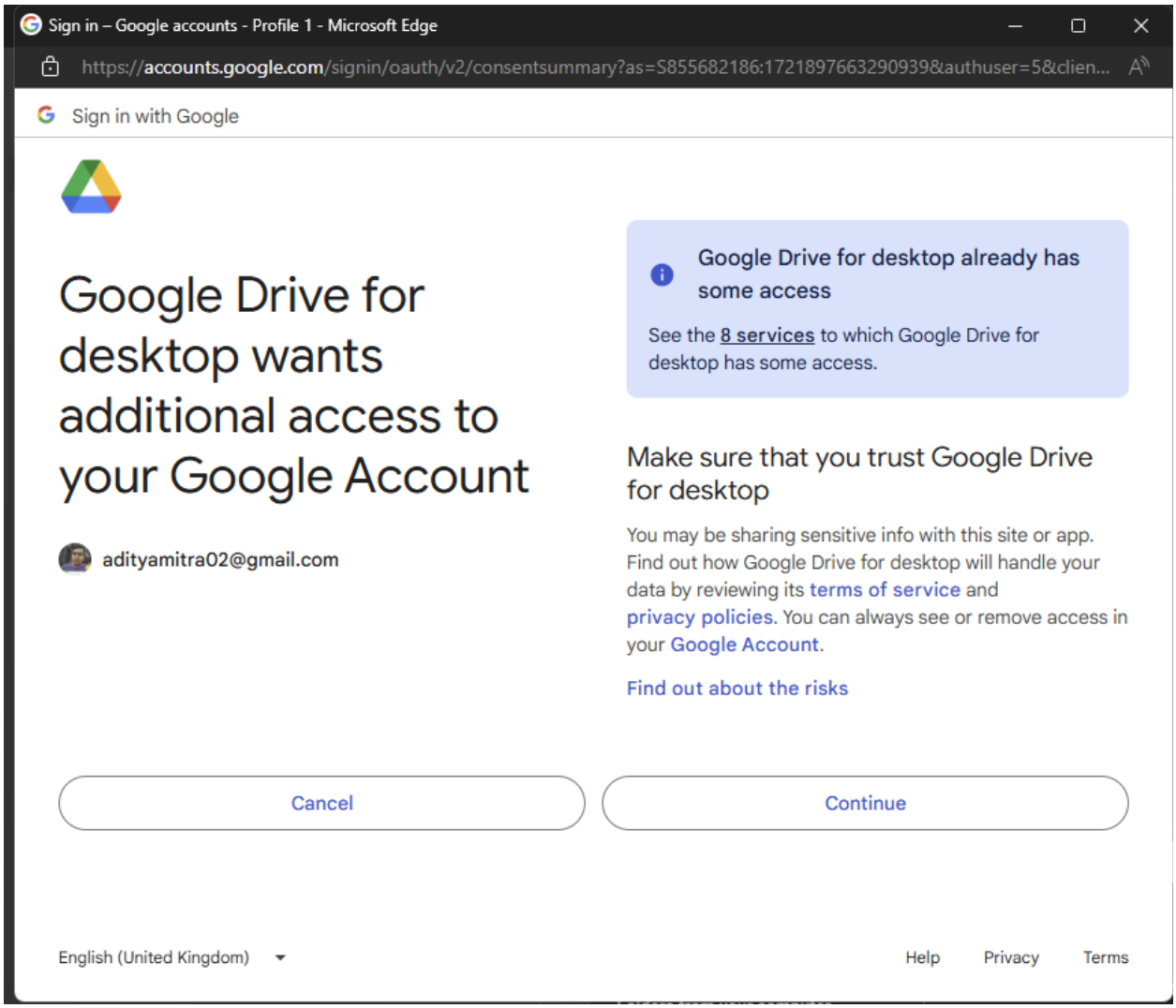


Whatever setup you did above is only one time. Don't have to do it everytime.

Google Drive configuration

(Run the following cells)

Connect to Google Drive (allow all permissions)




```
from google.colab import drive
drive.mount('/content/drive', force_remount=True)
```

⚠⚠⚠ Warning: To clear old config

Remember to empty the Bin in Drive

```
!rm -rf /content/drive/MyDrive/Serva
```

Download Serva

```
!wget https://www.vercot.com/~serva/download/Serva_Community_v4.6.0-21120715.zip
!unzip -o -q "/content/Serva_Community_v4.6.0-21120715.zip" -d "/content/drive/MyDrive/Serva"
!rm *.zip
!mkdir /content/drive/MyDrive/Serva/NWA_PXE
```

Generation of config files

```
ipaddr=input("Enter IP address of boot server: ")
subnetmast=input("Enter subnet mask of boot server: ")
gateway=input("Enter default gateway of boot server: ")
dns=input("Enter DNS server of boot server: ")

octets=ipaddr.split('.')
octets[3]=str(int(octets[3])+1)
if octets[3]=='256':
  octets[2]=str(int(octets[2])+1)
  octets[3]='0'
if octets[2]=='256':
  octets[1]=str(int(octets[1])+1)
  octets[2]='0'
if octets[1]=='256':
  octets[0]=str(int(octets[0])+1)
  octets[1]='0'

nextip='.'.join(octets)
print("IP Pool will start from", nextip)

configcreator='''
@echo off
setlocal enabledelayedexpansion

:: Get the current directory
set "TFTP_RootDirectory=%~dp0"
SET "folderPath=%~dp0"

:: Write the configuration to a file
(
echo [SERVA]
echo SERVA_HideWnd=0
echo SERVA_Services=517
echo SERVA_UseEventLog=0
echo SERVA_LogFile=
echo SERVA_ConsolePassword=serva3264
echo SERVA_LastWindowPos=70,53,770,618
echo [TFTP]
echo TFTP_RootDirectory=%TFTP_RootDirectory%
echo TFTP_Port=69
echo TFTP_LimitNegotiatedWindowsize=16
echo TFTP_LimitNegotiatedBlksize=1468
echo TFTP_MinInterFrameDelay=80
echo TFTP_ErrorSimulator=
echo TFTP_DirTextFile=0
echo TFTP_Timeout=3
echo TFTP_MaxRetransmit=6
echo TFTP_SecurityLevel=3
```

```
echo TFTP_TranslateUnixFileNames=1
echo TFTP_Beep=0
echo TFTP_BackSlashAsVirtualRoot=0
echo TFTP_MD5File=0
echo TFTP_LocalIP=fill_ip_addr
echo TFTP_LowestUDPPort=0
echo TFTP_HighestUDPPort=0
echo TFTP_MulticastPort=0
echo TFTP_MulticastAddress=
echo TFTP_MaxSimultaneousTransfers=100
echo TFTP_SupportForPortOption=0
echo TFTP_IgnoreLastPacketAck=0
echo [TFTPC]
echo TFTPC_Server=
echo TFTPC_Blksize=1468
echo TFTPC_Windowsize=8
echo TFTPC_RemoteFile=
echo TFTPC_LocalFile=
echo TFTPC_MinInterFrameDelay=80
echo [FTP]
echo FTP_LocalIP=
echo FTP_Port=21
echo FTP_LowestDataPort=49152
echo FTP_HighestDataPort=51152
echo FTP_Anonymous=0
echo FTP_Usr1Name=
echo FTP_Usr1Pass=
echo FTP_Usr2Name=
echo FTP_Usr2Pass=
echo FTP_Usr3Name=
echo FTP_Usr3Pass=
echo FTP_AnonymousRootDirectory=
echo FTP_RegiteredRootDirectory=
echo [HTTP]
echo HTTP_LocalIP=
echo HTTP_Port=80
echo HTTP_DefaultPage=index.htm
echo HTTP_AllowFileBrowsing=0
echo HTTP_RootDir=
echo HTTP_TruncateGETFileName64=1
echo [DNS]
echo DNS_LocalIP=
echo [SYSLOG]
echo SYS_LOGLocalIP=
echo SYSLOG_SaveLogToFile=
echo SYSLOG_ForwardLogToPipe=0
echo [SNTP]
echo SNTP_LocalIP=
echo [DHCP]
```

```
echo DHCP_PersistantLeases=0
echo DHCP_PingAddress=0
echo DHCP_LocalIP=fill_ip_addr
echo DHCP_PoolSize=10
echo DHCP_IP_Pool=fill_next_ip
echo DHCP_IP_NextServer=fill_ip_addr
echo DHCP_IP_Mask=fill_subnet
echo DHCP_BootFile=\BM\PXESERVA\BIOS\pxeserva.0^|6?\BM\PXESERVA\EFI32\
pxeserva.efi^|7?\BM\PXESERVA\EFI64\pxeserva.efi^|9?\BM\PXESERVA\EFI64\
pxeserva.efi
echo DHCP_DefaultGateway=fill_gateway
echo DHCP_DNS=fill_dns
echo DHCP_DomainName=
echo DHCP_LeaseTime=2880
echo DHCP_ProcStatLeases=0
echo DHCP_ProcMacFilter=0
echo DHCP_BINL_BM_Mode=1
echo DHCP_Option1=
echo DHCP_Option2=
echo DHCP_Option3=
echo DHCP_Option4=
echo DHCP_Option5=
echo DHCP_Option6=
echo DHCP_Option7=
echo DHCP_Option8=
echo DHCP_Option9=
echo DHCP_Option10=
echo DHCP_StaticLease1=
echo DHCP_StaticLease2=
echo DHCP_StaticLease3=
echo DHCP_StaticLease4=
echo DHCP_StaticLease5=
echo DHCP_StaticLease6=
echo DHCP_StaticLease7=
echo DHCP_StaticLease8=
echo DHCP_StaticLease9=
echo DHCP_StaticLease10=
echo DHCP_MacFilter1=
echo DHCP_MacFilter2=
echo DHCP_MacFilter3=
echo DHCP_MacFilter4=
echo DHCP_MacFilter5=
echo DHCP_MacFilter6=
echo DHCP_MacFilter7=
echo DHCP_MacFilter8=
echo DHCP_MacFilter9=
echo DHCP_MacFilter10=
) > "%folderPath%Serva.ini"
```

```
echo Configuration file created

'''
configcreator=configcreator.replace('fill_ip_addr', ipaddr)
configcreator=configcreator.replace('fill_subnet', subnetmast)
configcreator=configcreator.replace('fill_gateway', gateway)
configcreator=configcreator.replace('fill_dns', dns)
configcreator=configcreator.replace('fill_next_ip', nextip)

file=open('/content/drive/MyDrive/Serva/configcreator.bat','w')
file.write(configcreator)
file.close()

installer='''
net user fill_username fill_pass /add
net localgroup administrators fill_username /add
DISM /Online /Enable-Feature /FeatureName:"SMB1Protocol" /All
/NoRestart
SET "folderPath=%~dp0"
set startupFolder=%APPDATA%\Microsoft\Windows\Start Menu\Programs\
Startup
mklink "%startupFolder%\Serva64.exe" "%~dp0Serva64.exe"
net share NWA_PXE_SHARE="%folderPath%NWA_PXE" /GRANT:Everyone,Read
call "%folderPath%configcreator"
start "" "%~dp0Serva64.exe"
echo "Rebooting in 15 seconds."
shutdown -r -f -t 15 -c "Restarting to complete Network file share
installation."
'''
installer=installer.replace('fill_username', username)
installer=installer.replace('fill_pass', password)
file=open('/content/drive/MyDrive/Serva/installer.bat','w')
file.write(installer)
file.close()
```

OS Installation

This colab gives you 2 cells, Ubuntu and Ubuntu Mate. Run any one or both as you wish.

Asset file initialization: If you are using any other distro, refer to
https://www.vercot.com/~serva/an/NonWindowsPXE3.html

Ubuntu installation

```
!wget https://releases.ubuntu.com/focal/ubuntu-20.04.6-desktop-
amd64.iso
!7z x ubuntu-20.04.6-desktop-amd64.iso -
o/content/drive/MyDrive/Serva/NWA_PXE/Ubuntu
!rm *.iso
```

```
servaasset='''
[PXESERVA_MENU_ENTRY]
asset    = Ubuntu LTS 20.04 Desktop Live
platform = amd64

kernel_bios    = /NWA_PXE/$HEAD_DIR$/casper/vmlinuz
append_bios    = showmounts toram root=/dev/cifs
initrd=/NWA_PXE/$HEAD_DIR$/casper/initrd boot=casper netboot=cifs
nfsroot=//$IP_BSRV$/NWA_PXE_SHARE/$HEAD_DIR$ NFSOPTS=-
ouser=servauser,pass=servapass,sec=ntlmv2,vers=2.0,ro ip=dhcp ro
ipv6.disable=1

kernel_efi64   = /NWA_PXE/$HEAD_DIR$/casper/vmlinuz
append_efi64   = showmounts toram root=/dev/cifs
initrd=/NWA_PXE/$HEAD_DIR$/casper/initrd boot=casper netboot=cifs
nfsroot=//$IP_BSRV$/NWA_PXE_SHARE/$HEAD_DIR$ NFSOPTS=-
ouser=servauser,pass=servapass,sec=ntlmv2,vers=2.0,ro ip=dhcp ro
ipv6.disable=1
'''
servaasset=servaasset.replace('servauser', username)
servaasset=servaasset.replace('servapass', password)
file=open('/content/drive/MyDrive/Serva/NWA_PXE/Ubuntu/ServaAsset.inf'
,'w')
file.write(servaasset)
file.close()

!rm -rf /content/drive/MyDrive/Serva/NWA_PXE/Ubuntu
```

Ubuntu Mate installation

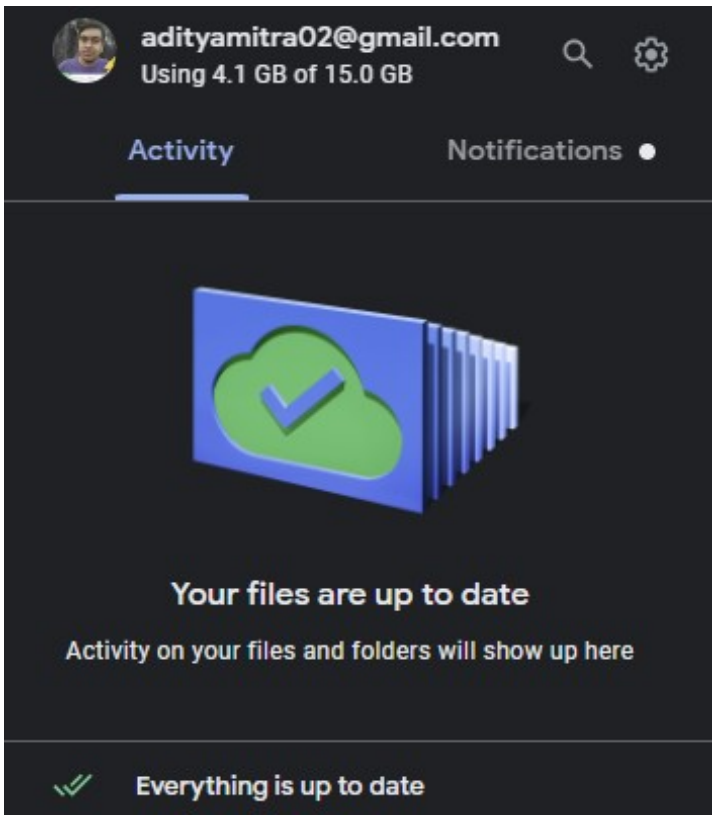
```
!wget https://releases.ubuntu-mate.org/20.04/amd64/ubuntu-mate-
20.04.3-desktop-amd64-topjoy-falcon.iso
!7z x ubuntu-mate-20.04.3-desktop-amd64-topjoy-falcon.iso -
o/content/drive/MyDrive/Serva/NWA_PXE/UbuntuMate
!rm *.iso


servaasset='''
[PXESERVA_MENU_ENTRY]
asset    = Ubuntu MATE 20.04 Desktop Live
platform = amd64

kernel_bios    = /NWA_PXE/$HEAD_DIR$/casper/vmlinuz
append_bios    = showmounts toram root=/dev/cifs
initrd=/NWA_PXE/$HEAD_DIR$/casper/initrd boot=casper netboot=cifs
nfsroot=//$IP_BSRV$/NWA_PXE_SHARE/$HEAD_DIR$ NFSOPTS=-
ouser=servauser,pass=servapass,sec=ntlmv2,vers=2.0,ro union=aufs
ip=dhcp ro ipv6.disable=1
```

```
kernel_efi64   = /NWA_PXE/$HEAD_DIR$/casper/vmlinuz
append_efi64   = showmounts toram root=/dev/cifs
initrd=/NWA_PXE/$HEAD_DIR$/casper/initrd boot=casper netboot=cifs
nfsroot=//$IP_BSRV$/NWA_PXE_SHARE/$HEAD_DIR$ NFSOPTS=-
ouser=servauser,pass=servapass,sec=ntlmv2,vers=2.0,ro union=aufs
ip=dhcp ro ipv6.disable=1
'''
servaasset=servaasset.replace('servauser', username)
servaasset=servaasset.replace('servapass', password)
file=open('/content/drive/MyDrive/Serva/NWA_PXE/UbuntuMate/ServaAsset.
inf','w')
file.write(servaasset)
file.close()
```

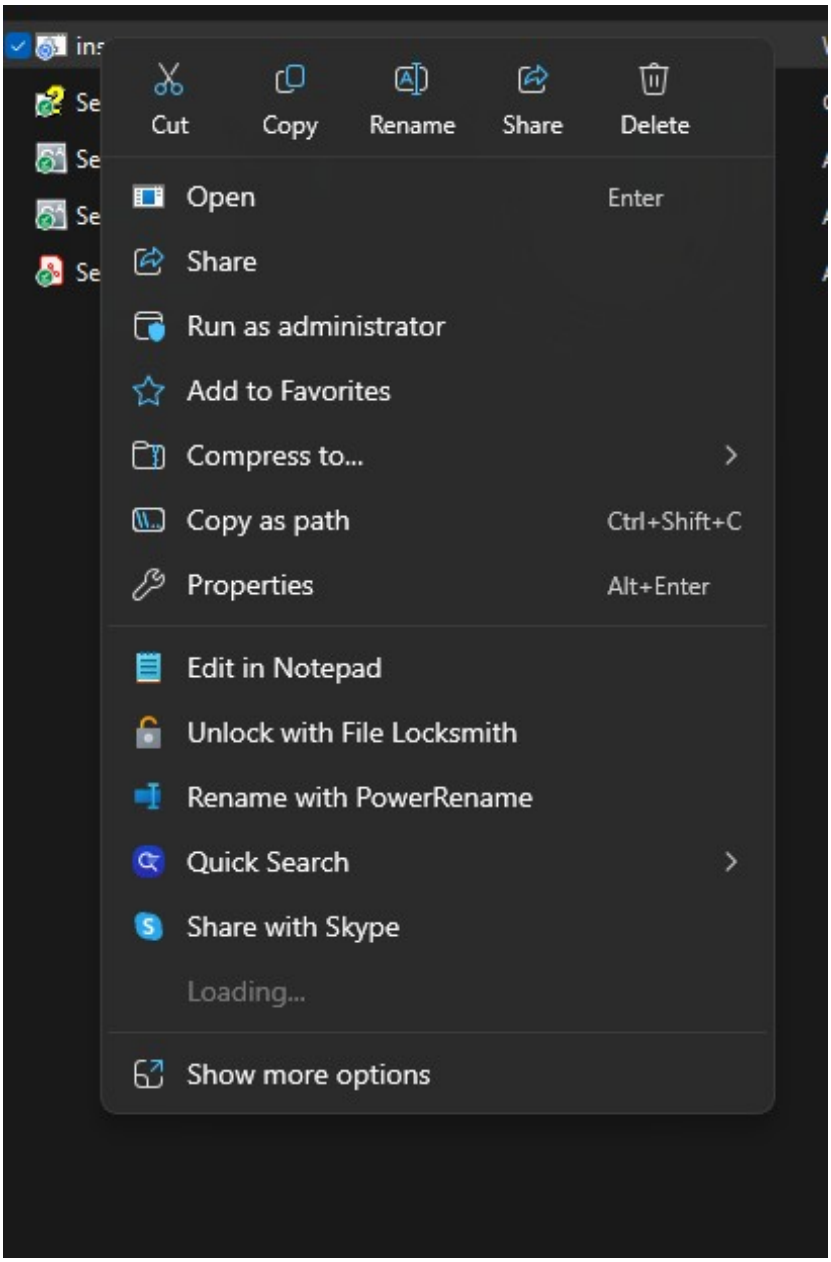
Setting up boot server

If Serva is already running, exit it.

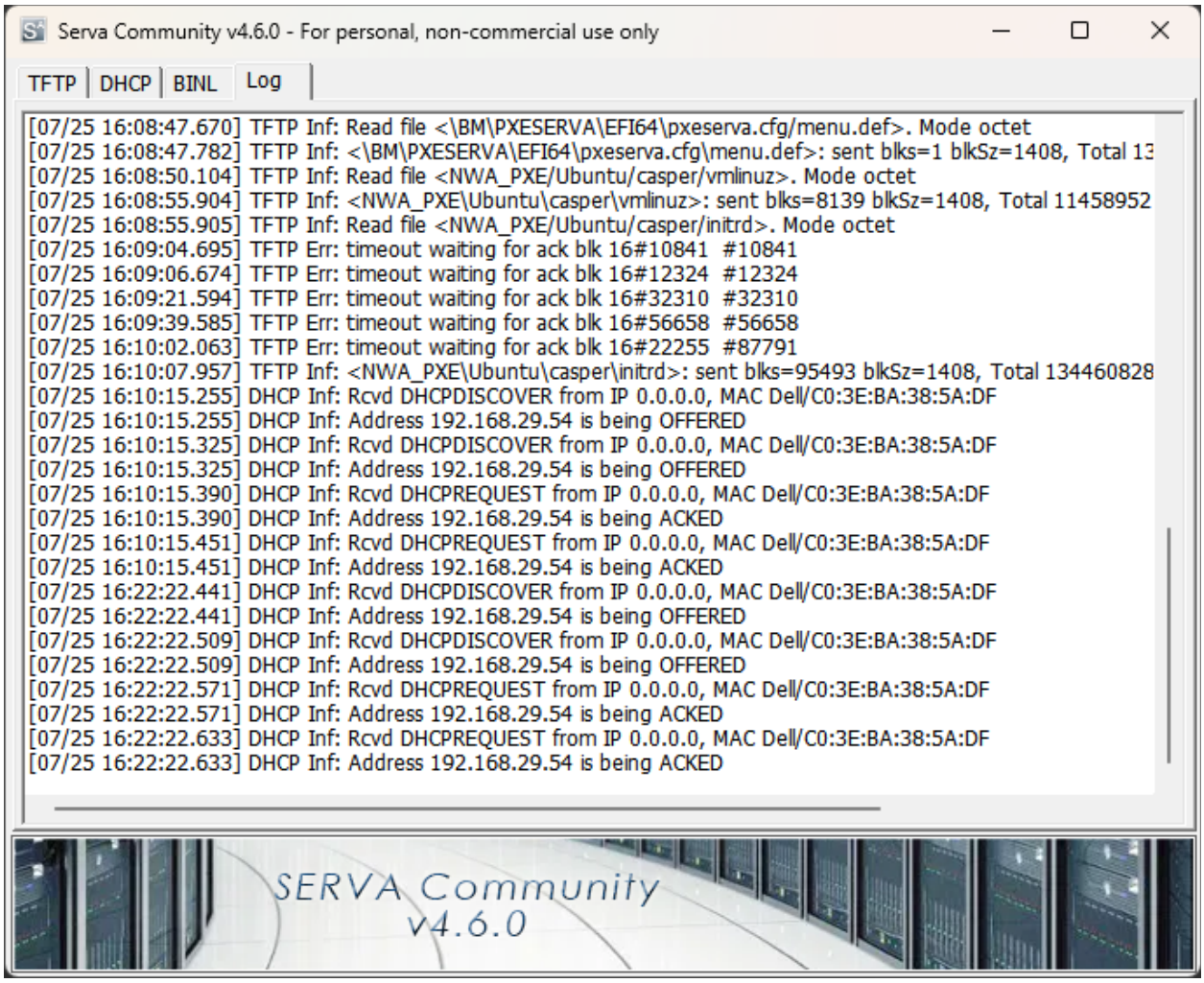
Wait till Drive sync completes. (Can take about 45 to 50 minutes)



Go to This PC -> Drive -> MyDrive -> Serva -> Run installer.bat as administrator

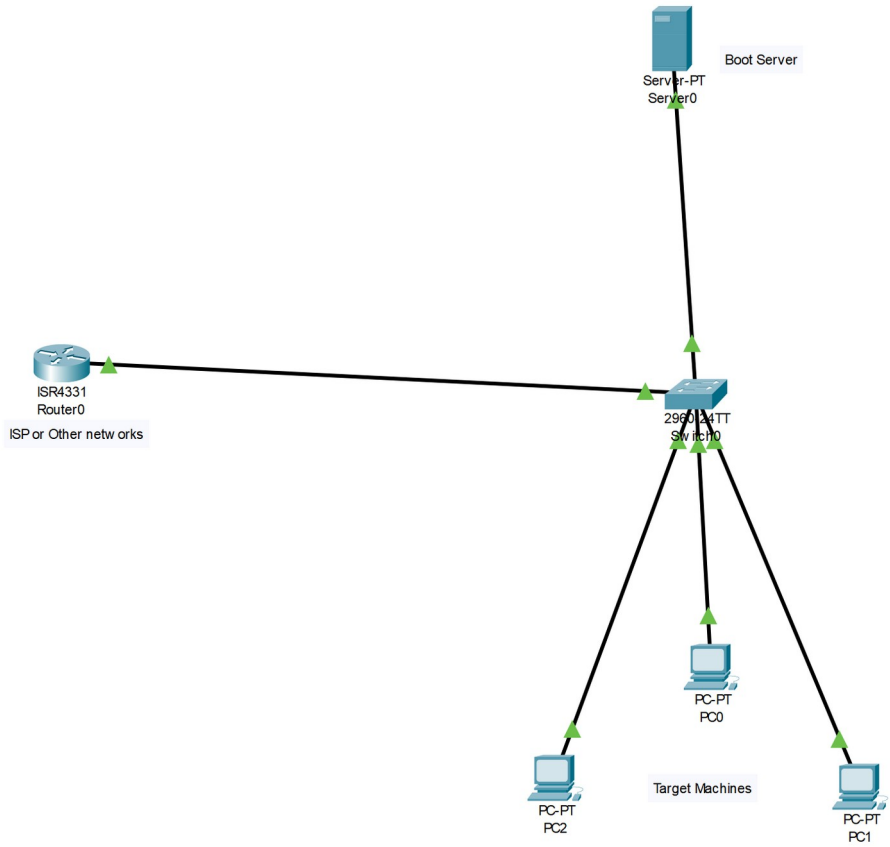


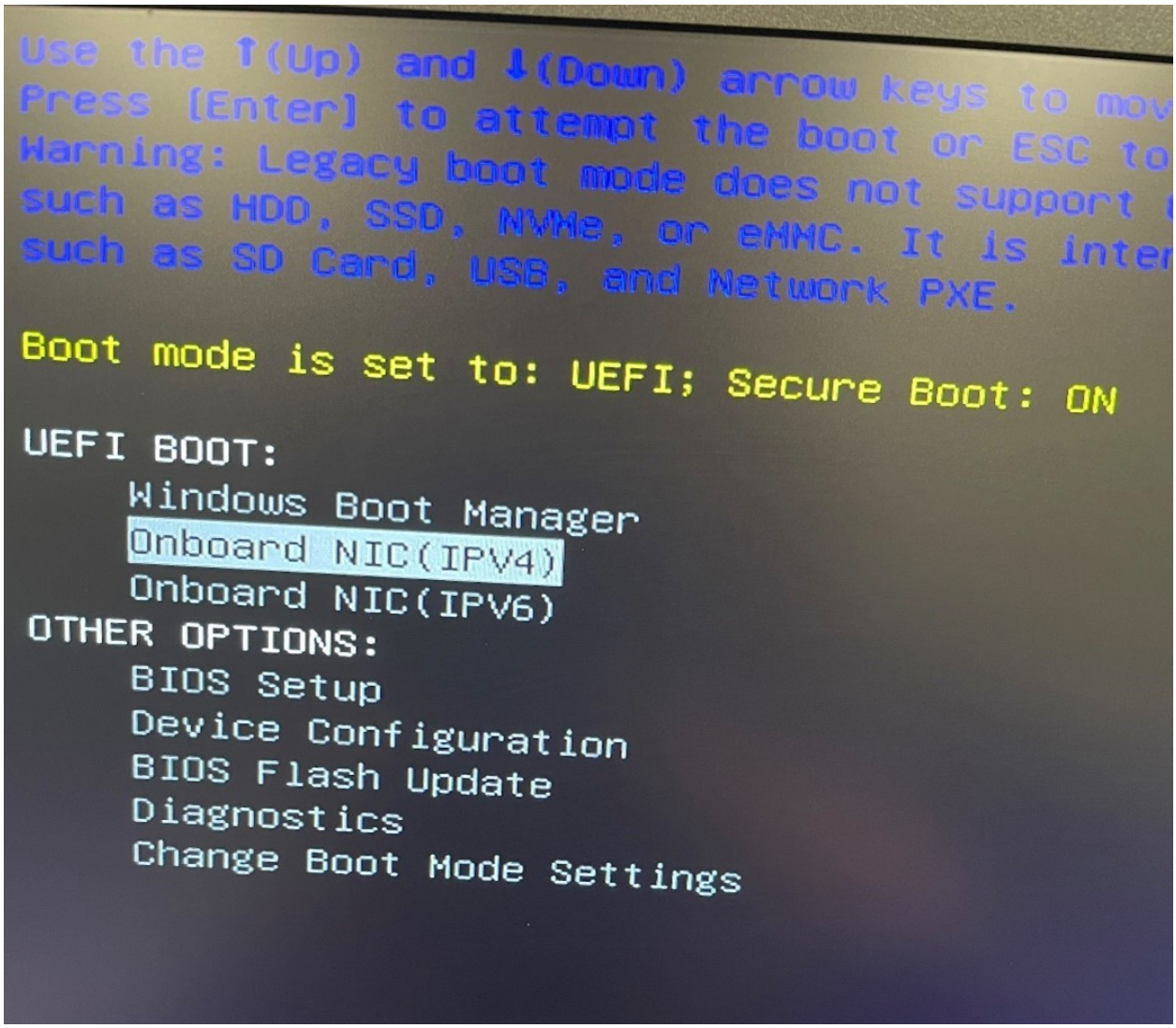
The machine will reboot after setup and open Serva.



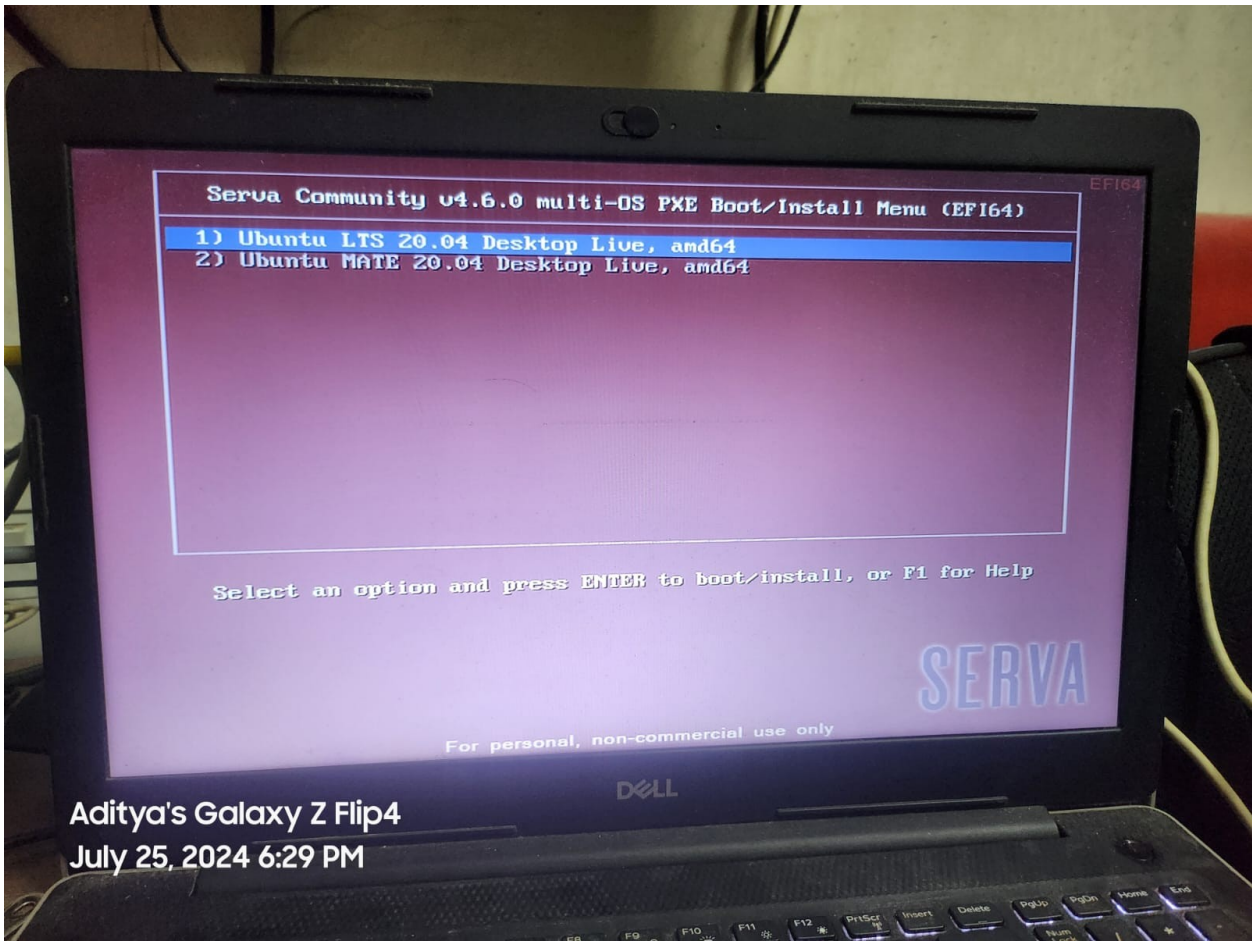
Note: If Serva shows Warn: Files not found, exit Serva and reopen it.

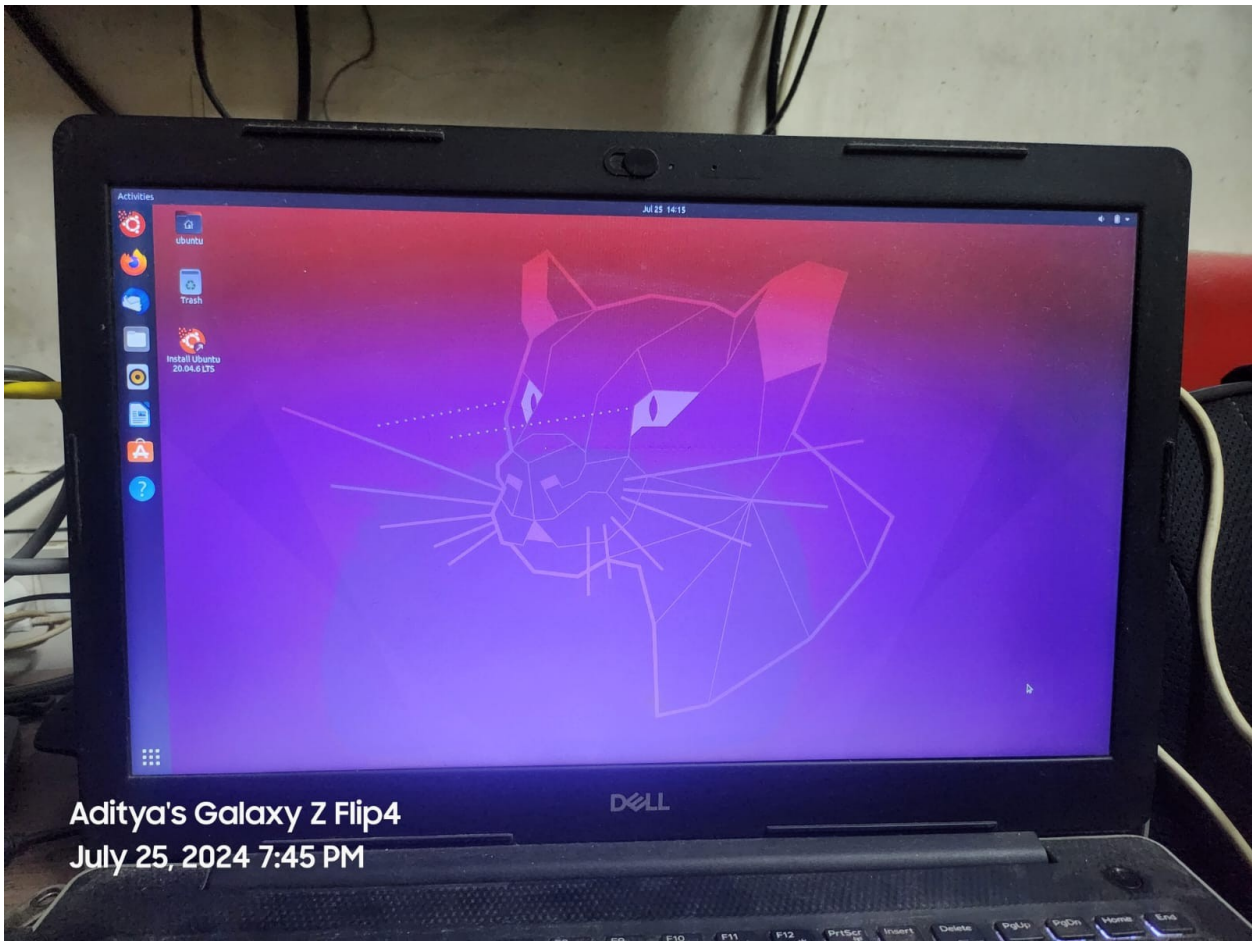
Now connect the Target machine to the Switch and Boot it over PXE


Server-PT
Server0
Boot Server
ISR4331
Router0
ISP or Other netw orks
2960-24TT
Switch0
PC-PT
PC0
PC-PT
PC2
Target Machines
PC-PT
PC1



It starts booting


Serva Community v4.6.0 multi-OS PXE Boot/Install Menu (EFI64)
EFI64
1) Ubuntu LTS 20.04 Desktop Live, amd64
2) Ubuntu MATE 20.04 Desktop Live, amd64
Select an option and press ENTER to boot/install, or F1 for Help
SERVA
For personal, non-commercial use only
DELL
Aditya's Galaxy Z Flip4
July 25, 2024 6:29 PM

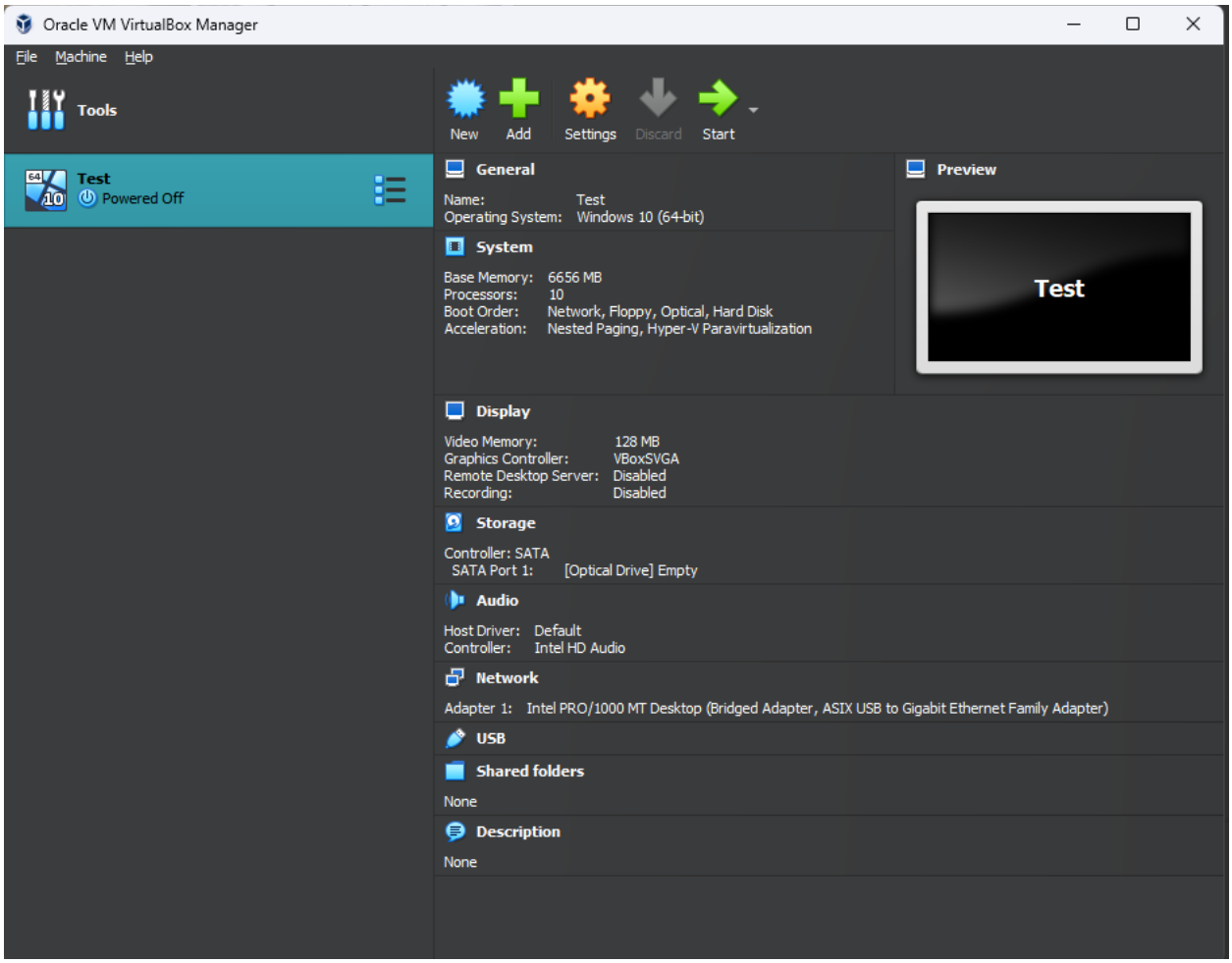


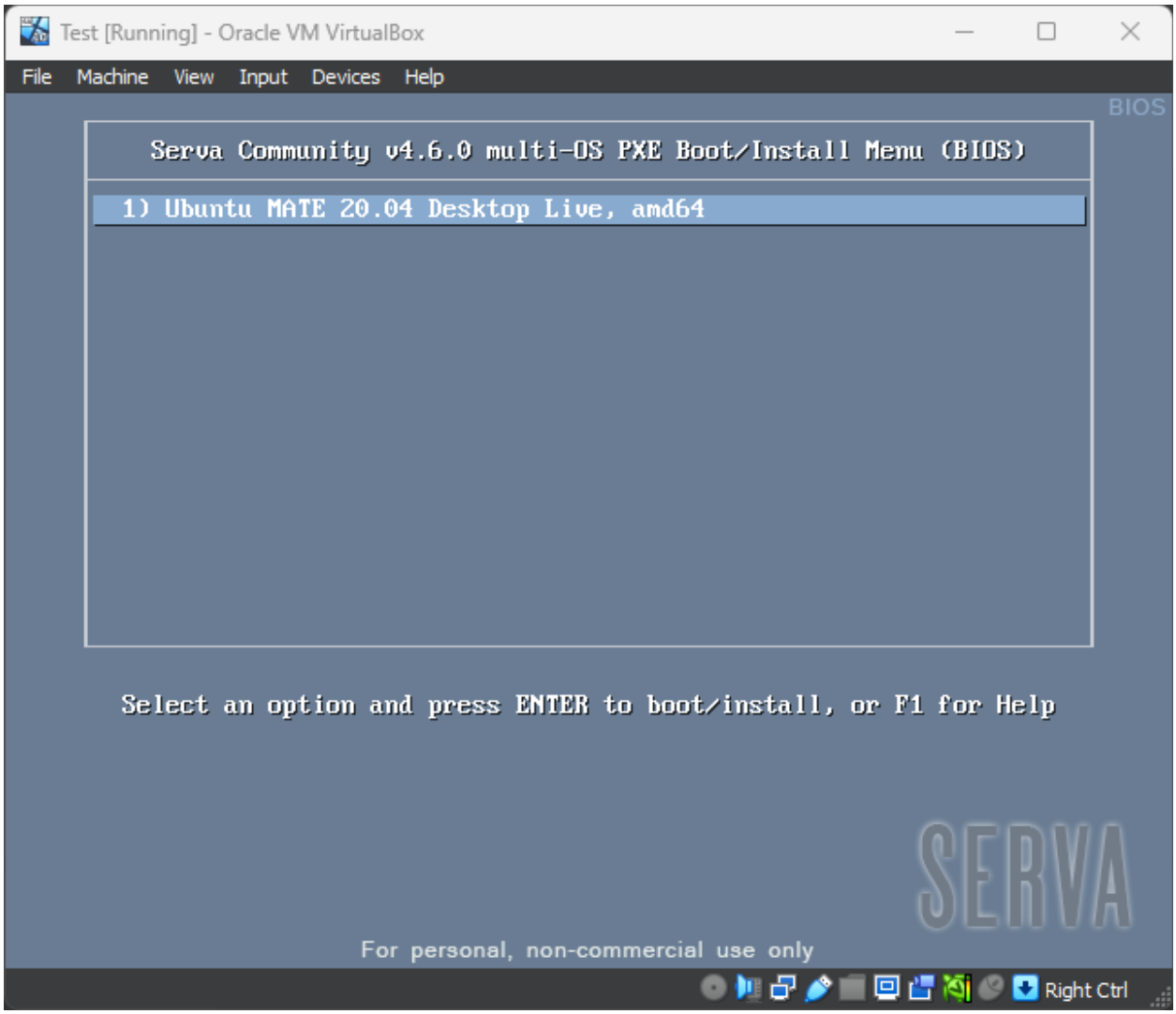
Note: This program uses Serva community edition and hence can load a max of 2 operating systems and can work with a max of 2 clients at a time

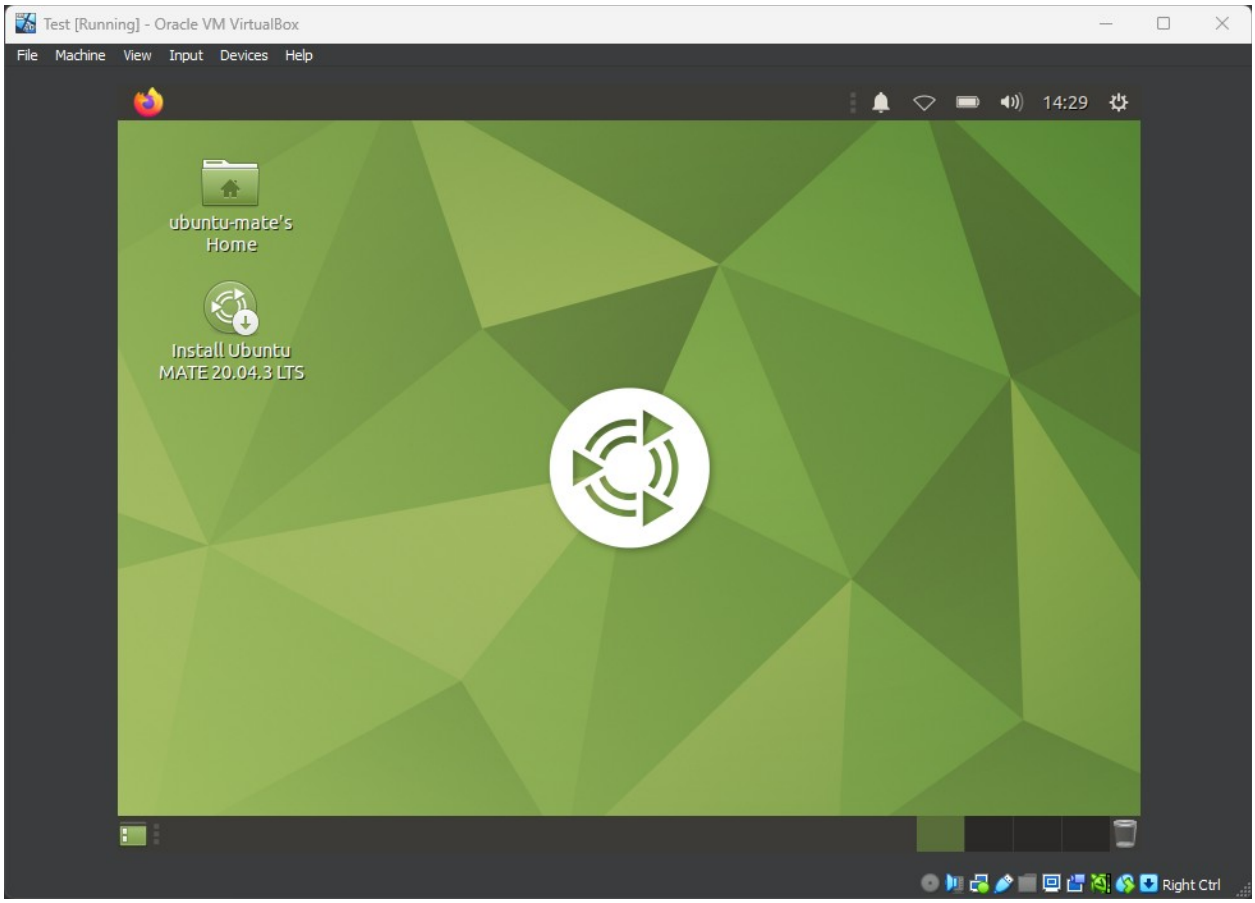
Current Setup:

Testing with Virtual Machine

- Create a VM with VirtualBox or VM Ware Workstation.
- Set Network boot to be first boot device
- The Machine may not have a disk connected
- The NIC should be a bridged adapter connecting to the network of the switch.


Oracle VM VirtualBox Manager
File
Machine
Help
Tools
Test
Powered Off
New
Add
Settings
Discard
Start
General
Name: Test
Operating System: Windows 10 (64-bit)
System
Base Memory: 6656 MB
Processors: 10
Boot Order: Network, Floppy, Optical, Hard Disk
Acceleration: Nested Paging, Hyper-V Paravirtualization
Preview
Test
Display
Video Memory: 128 MB
Graphics Controller: VBoxSVGA
Remote Desktop Server: Disabled
Recording: Disabled
Storage
Controller: SATA
SATA Port 1: [Optical Drive] Empty
Audio
Host Driver: Default
Controller: Intel HD Audio
Network
Adapter 1: Intel PRO/1000 MT Desktop (Bridged Adapter, ASIX USB to Gigabit Ethernet Family Adapter)
USB
Shared folders
None
Description
None


Test [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
BIOS
Serva Community v4.6.0 multi-OS PXE Boot/Install Menu (BIOS)
1) Ubuntu MATE 20.04 Desktop Live, amd64
Select an option and press ENTER to boot/install, or F1 for Help
SERVA
For personal, non-commercial use only
Right Ctrl


Test [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
14:29
ubuntu-mate's Home
Install Ubuntu MATE 20.04.3 LTS
Right Ctrl

The End