

CS559 Lab Setup Project Report

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1 Introduction

This document reports on the setup of the required virtual environments for the CS559 course. The environments include a virtualization software, and both Kali and Ubuntu virtual machines (VMs).

2 Virtualization Software Setup

The virtualization software was successfully installed and configured as per the guidelines provided in Section 1.2.2 of the project instructions.

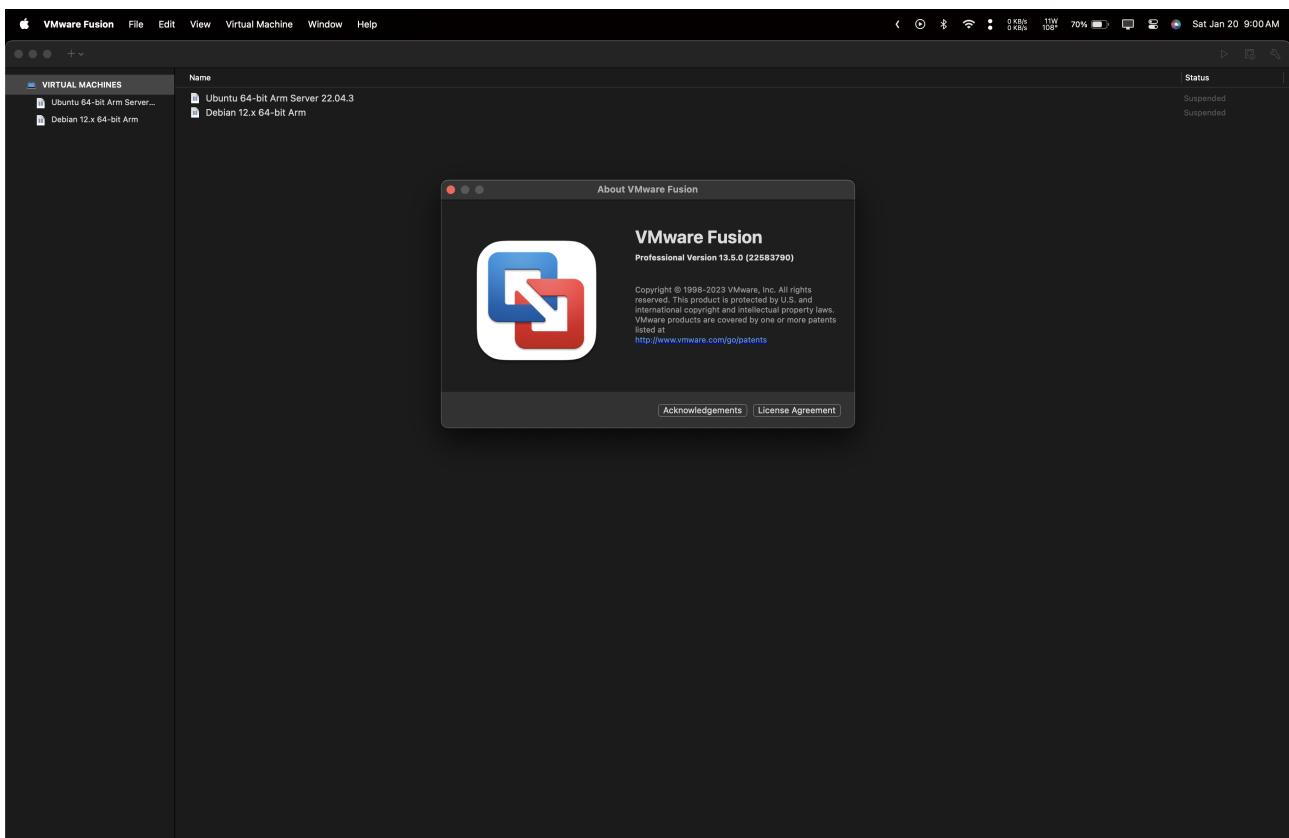


Figure 1: Running virtualization software

3 Kali VM Setup

Following the steps in Section 1.2.3, the Kali VM has been set up. Below is the screenshot of the running Kali VM.

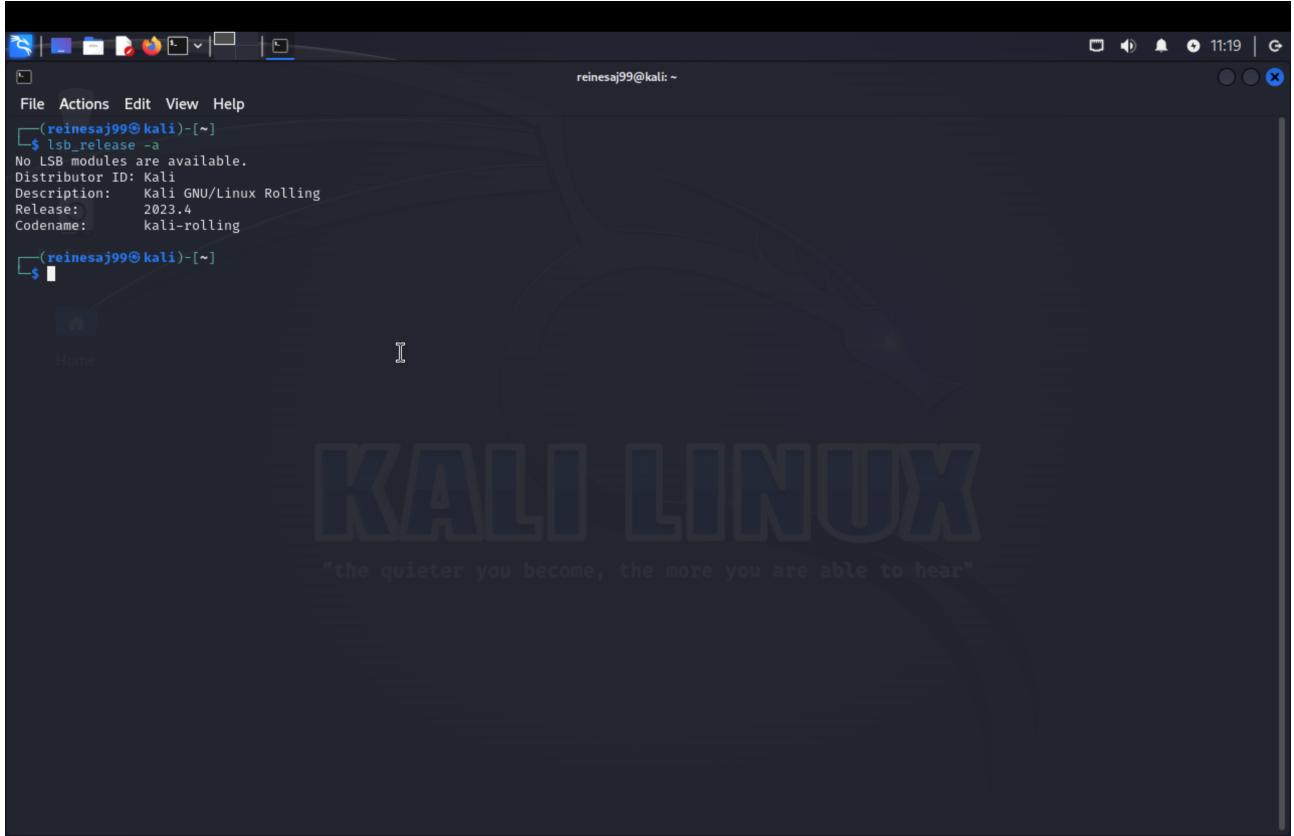


Figure 2: Running Kali VM

3.1 A better view of Kali license:

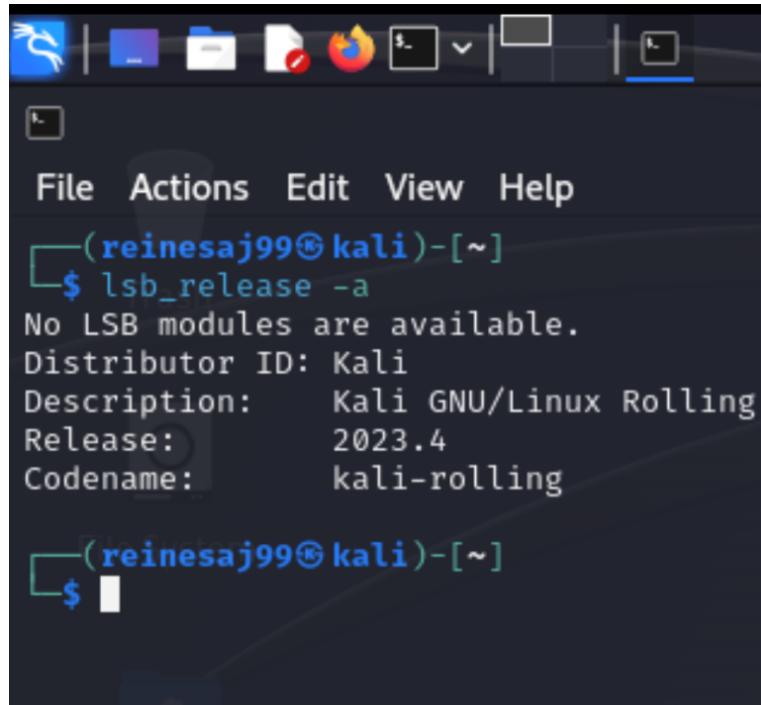


Figure 3: Verification of Credentials for Kali VM set up

3.2 Processor and Memory Configuration:

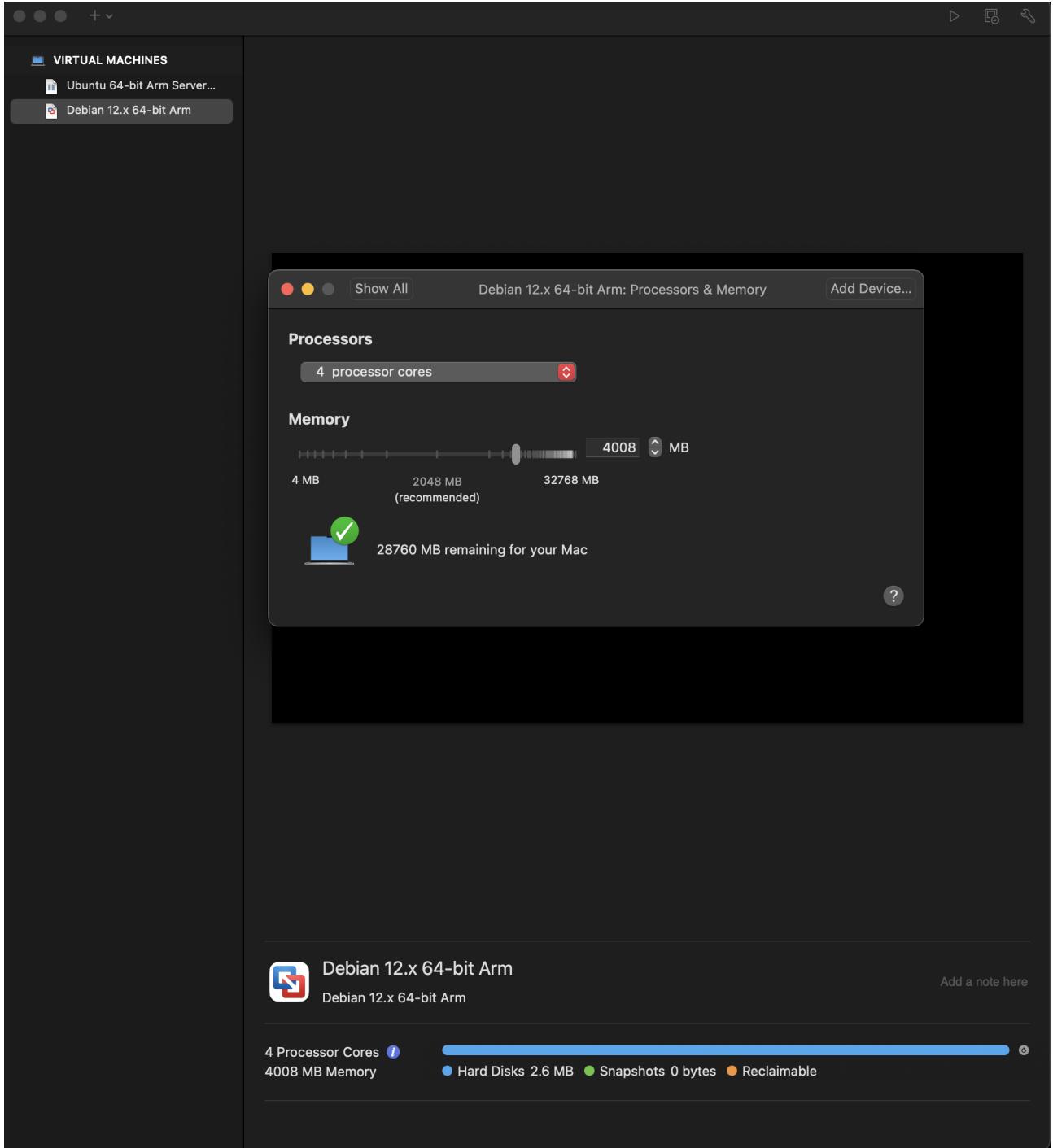


Figure 4: Assigned 4 processor cores and 4GB of memory to the Debian VM.*

*Please note "Debian 12.x 64-bit Arm" label is indeed the Kali VM. This label was automatically assigned during the setup process due to my M1 MacBook Arm architecture.

3.3 Network Adapter Configuration:

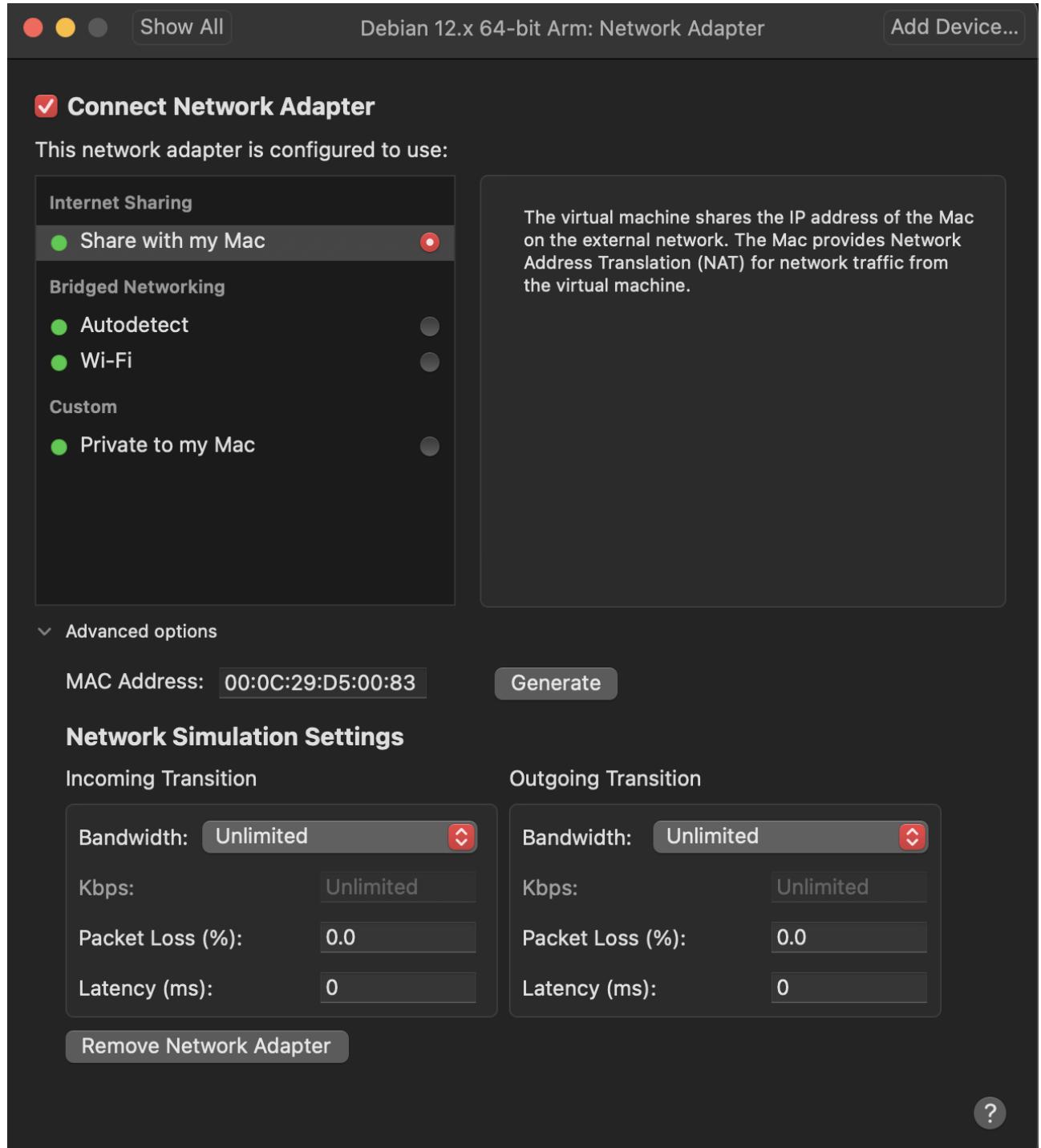


Figure 5: The network adapter configuration is set for sharing with the Mac, which implies it's using NAT (Network Address Translation).*

*Please note "Debian 12.x 64-bit Arm" label is indeed the Kali VM. This label was automatically assigned during the setup process due to my M1 MacBook Arm architecture.

3.4 Update Process:

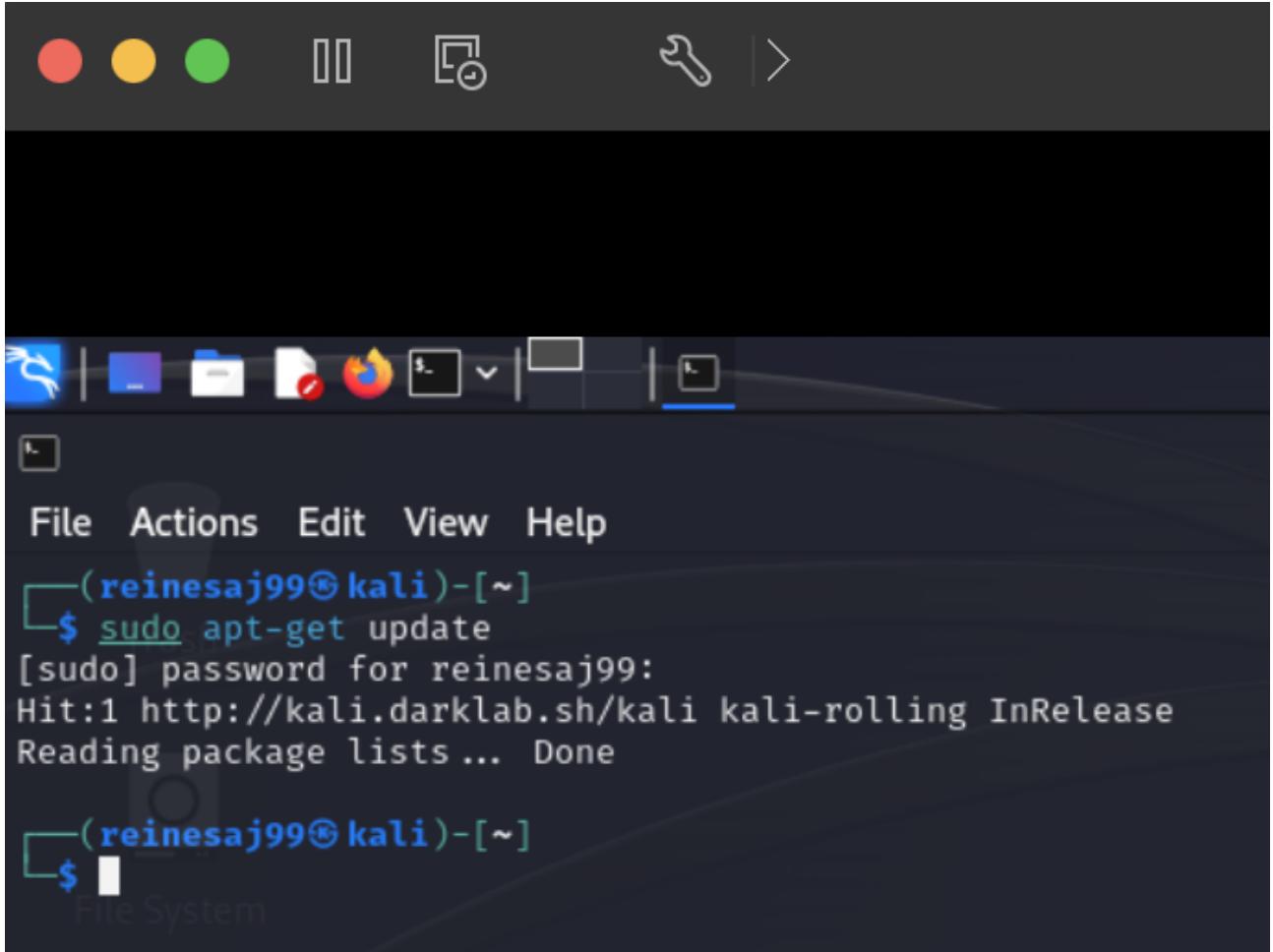


Figure 6: Shows the terminal window where we've run "sudo apt-get update" on the Kali VM, which is part of the update process.

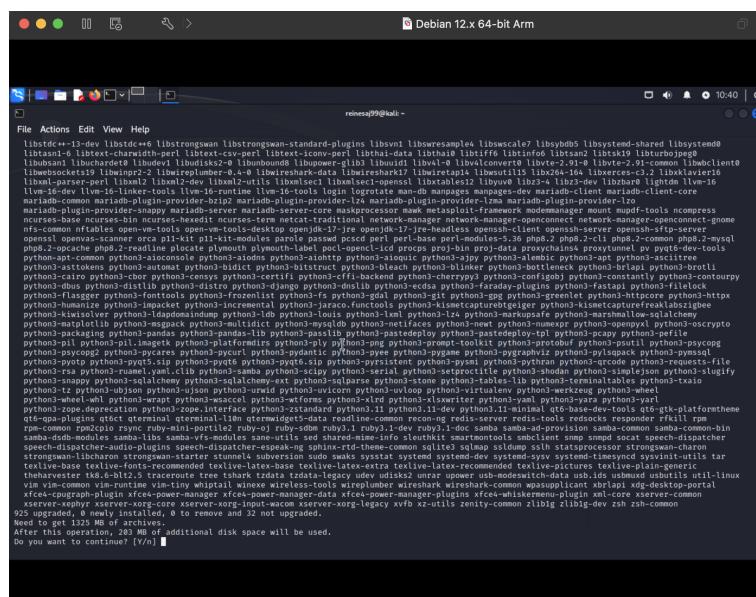


Figure 7: Shows the terminal window where we've run "sudo apt-get upgrade" on the Kali VM, which is part of the upgrade process.

Debian 12.x 64-bit Arm

```
reinesaj99@kali: ~
File Actions Edit View Help
Get:132 http://kali.darklab.sh/kali kali-rolling/main arm64 readline-common all 8.2-3 [69.1 kB]
Get:133 http://http.kali.org/kali kali-rolling/main arm64 libncurses-dev arm64 6.4+20231209-1 [337 kB]
Get:134 http://http.kali.org/kali kali-rolling/main arm64 libncurses6 arm64 6.4+20231209-1 [95.6 kB]
Get:135 http://http.kali.org/kali kali-rolling/main arm64 libncursesw arm64 6.4+20231209-1 [124 kB]
Get:136 http://http.kali.org/kali kali-rolling/main arm64 libtinfo6 arm64 6.4+20231209-1 [334 kB]
Get:137 http://kali.darklab.sh/kali kali-rolling/main arm64 libreadline arm64 8.2-3 [157 kB]
Get:138 http://kali.darklab.sh/kali kali-rolling/main arm64 sqlite3 arm64 3.44.2-1 [360 kB]
Get:139 http://kali.darklab.sh/kali kali-rolling/main arm64 libsqlite3arm64 3.44.2-1 [823 kB]
Get:140 http://http.kali.org/kali kali-rolling/main arm64 libaprutil1-dbd-sqlite3 arm64 1.6.3-1+b1 [13.9 kB]
Get:141 http://http.kali.org/kali kali-rolling/main arm64 libaprutil1 arm64 1.6.3-1+b1 [85.2 kB]
Get:142 http://http.kali.org/kali kali-rolling/main arm64 libbrotli arm64 1.1.0-2+b3 [295 kB]
Get:143 http://kali.darklab.sh/kali kali-rolling/main arm64 curl arm64 8.5.0-2 [332 kB]
Get:144 http://kali.darklab.sh/kali kali-rolling/main arm64 libssh2-1 arm64 1.11.0-4 [206 kB]
Get:145 http://kali.darklab.sh/kali kali-rolling/main arm64 libcurl4 arm64 8.5.0-2 [400 kB]
Get:146 http://http.kali.org/kali kali-rolling/main arm64 libxml2-dev arm64 2.9.14+dfsg-1.3+b2 [745 kB]
Get:147 http://http.kali.org/kali kali-rolling/main arm64 libxml2 arm64 2.9.14+dfsg-1.3+b2 [624 kB]
Get:148 http://http.kali.org/kali kali-rolling/main arm64 apache2 arm64 2.4.58-1+b1 [212 kB]
Get:149 http://http.kali.org/kali kali-rolling/main arm64 apache2-bin arm64 2.4.58-1+b1 [1270 kB]
Get:150 http://http.kali.org/kali kali-rolling/main arm64 apache2-utils arm64 2.4.58-1+b1 [202 kB]
Get:151 http://http.kali.org/kali kali-rolling/main arm64 libproc2-0 arm64 2:4.0.4-2+b1 [61.9 kB]
Get:152 http://http.kali.org/kali kali-rolling/main arm64 procs arm64 2:4.0.4-2+b1 [869 kB]
Get:153 http://http.kali.org/kali kali-rolling/main arm64 atftp arm64 0.8.0-3+b1 [61.3 kB]
Get:154 http://kali.darklab.sh/kali kali-rolling/main arm64 libasound2 arm64 1.2.10-3 [333 kB]
Get:155 http://kali.darklab.sh/kali kali-rolling/main arm64 libasound2-data all 1.2.10-3 [20.7 kB]
Get:156 http://http.kali.org/kali kali-rolling/main arm64 libdw1 arm64 0.190-1+b1 [227 kB]
Get:157 http://http.kali.org/kali kali-rolling/main arm64 libelfi arm64 0.190-1+b1 [175 kB]
Get:158 http://kali.darklab.sh/kali kali-rolling/main arm64 libglib2.0-data all 2.78.3-1 [1223 kB]
Get:159 http://kali.darklab.sh/kali kali-rolling/main arm64 libglib2.0-bin arm64 2.78.3-1 [111 kB]
Get:160 http://kali.darklab.sh/kali kali-rolling/main arm64 libglib2.0-arm64 2.78.3-1 [1361 kB]
Get:161 http://http.kali.org/kali kali-rolling/main arm64 bluez arm64 5.71-1+kali1 [1202 kB]
Get:162 http://http.kali.org/kali kali-rolling/main arm64 libfl2 arm64 2.6.4-8.2+b2 [84.4 kB]
Get:163 http://http.kali.org/kali kali-rolling/main arm64 libfl-dev arm64 2.6.4-8.2+b2 [85.6 kB]
Get:164 http://http.kali.org/kali kali-rolling/main arm64 flex arm64 2.6.4-8.2+b2 [413 kB]
Get:165 http://http.kali.org/kali kali-rolling/main arm64 galera-4 arm64 26.4.16-2+b1 [733 kB]
Get:166 http://http.kali.org/kali kali-rolling/main arm64 libhavege2 arm64 1.9.14-1+b2 [24.5 kB]
Get:167 http://http.kali.org/kali kali-rolling/main arm64 haveged arm64 1.9.14-1+b2 [37.1 kB]
Get:168 http://http.kali.org/kali kali-rolling/main arm64 iodine arm64 0.7.0-10+b2 [83.2 kB]
Get:169 http://http.kali.org/kali kali-rolling/main arm64 fontconfig-config arm64 2.14.2-6+b1 [316 kB]
Get:170 http://http.kali.org/kali kali-rolling/main arm64 libfreetype6 arm64 2.13.2+dfsg-1+b1 [408 kB]
Get:171 http://http.kali.org/kali kali-rolling/main arm64 libfontconfig1 arm64 2.14.2-6+b1 [384 kB]
Get:172 http://http.kali.org/kali kali-rolling/main arm64 libbam3 arm64 3.7.1-1+b1 [1431 kB]
Get:173 http://kali.darklab.sh/kali kali-rolling/main arm64 libhveif-plugin-aomenone arm64 1.17.6-1 [18.5 kB]
11% [Waiting for headers]
```

Figure 8: Shows the terminal window where we've run "sudo apt-get upgrade" on the Kali VM, which is part of the upgrade process. We can see "11%" upgraded in bottom left hand corner of screenshot.

```
reinasaj99@kali:~
```

```
File Actions Edit View Help
Setting up libmagickcore-6.11b-7-extras:arm64 (8:6.9.12.98+dfsg1-5) ...
Setting up libcurl4-openssl4-4.1.0-1 ...
Installing new version of config file /etc/xdg/autostart/ora-autostart.desktop ...
Setting up girl2-vte-2.91:arm64 (0.7.4-2.1) ...
Setting up same-units (1.2.1-7) ...
same-socket: /var/run/same-socket is a static unit not running, not starting it.
Setting up libbtrfs-progs-indicator3-7:arm64 (0.9.3-1.1) ...
Setting up libubtfd-openpgp-lwglites6:arm64 (6.4.2+dfsg-20) ...
Setting up libljbca-extension1:arm64 (1.26.3-1) ...
Setting up libljbca-extension1:libv:arm64 (1.22.8-1) ...
Setting up gstreamer1.0-libv:arm64 (1.22.8-1) ...
Setting up firefoox-ssr (15.6.0esr-1) ...
Setting up libubtfd-openpgp-lwglites2:arm64 (2.12.0+dfsg1-1+b1) ...
Setting up libprogress (1.26.1-2) ...
Setting up libbcr-ul3-1:arm64 (3.41.1-4) ...
Setting up libubtf6printsupport6:arm64 (6.4.2+dfsg-20) ...
Setting up libxbozo-2:0:arm64 (4.18.0-1+b1) ...
Setting up wireless (4.2.2-1) ...
Setting up python3-pip (20.1.1-1) ...
Setting up pywt6-dev-tools (6.6.1-1) ...
Setting up ettercap-graphical (1:0.8.3.1-13) ...
Setting up colord (1.4.6-5) ...
Setting up parole (4.18.1-1) ...
Setting up xfree4-video-kirkwood-plugin (2.8.2-1) ...
Setting up libubtf6printsupport6:arm64 (6.4.1-1.0) ...
Setting up kallι-desktop-core (2024.1.0) ...
Setting up gcr (3.41.1-4) ...
Setting up atril (1.26.1-3) ...
Setting up libqt5c4-media-gstreamer (4.12.4+ds-3) ...
Setting up exomedia (4.18.8-1+b1) ...
Setting up libubtf6printsupport6:arm64 (2.12.0+dfsg1-1+b1) ...
Setting up network-manager-openconnect-gnome (1.2.10-2) ...
Setting up kali-desktop-xfce (2024.1.0) ...
Setting up kali-linux-default (2024.1.0) ...
Processing triggers for ca-certificates-java (20230710) ...
done.
Setting up openjdk-17-jre:arm64 (17.0.10-6ea-1) ...
Processing triggers for dictionaries-common (1.29.7) ...
Processing triggers for php5.2-cli (8.2.12-1+b1) ...
Processing triggers for libapache2-mod-php5.2 (8.2.12-1+b1) ...
Processing triggers for libc-bin (2.37-12) ...

(reinasaj99@kali:~)
```

Figure 9: Shows the terminal window where we've run "sudo apt-get upgrade" on the Kali VM, which is part of the upgrade process. We can see the upgrade process has successfully completed.

4 Ubuntu VM Setup

The setup of the Ubuntu VM was completed in accordance with Section 1.2.4. A screenshot of the running Ubuntu VM is provided below.

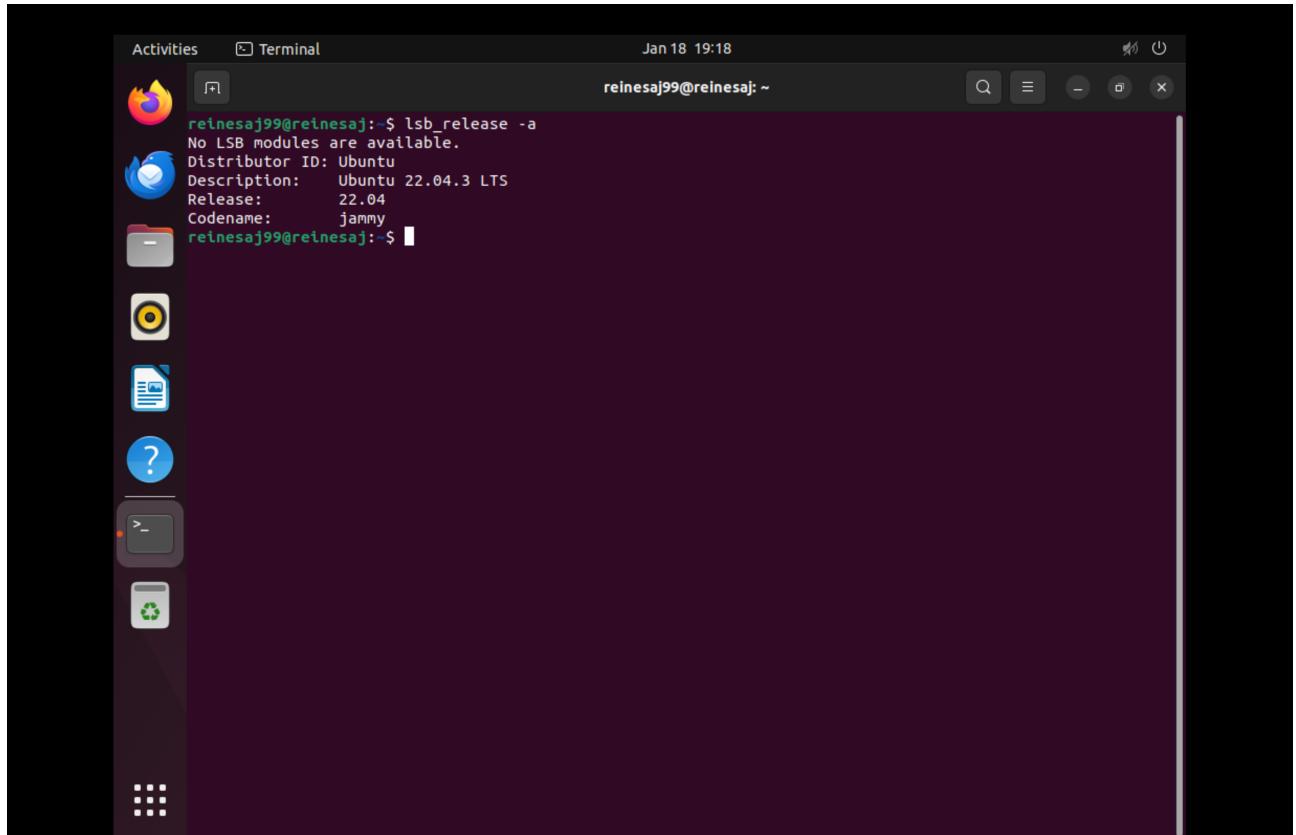


Figure 10: Running Ubuntu VM

4.1 A better View of Ubuntu license:

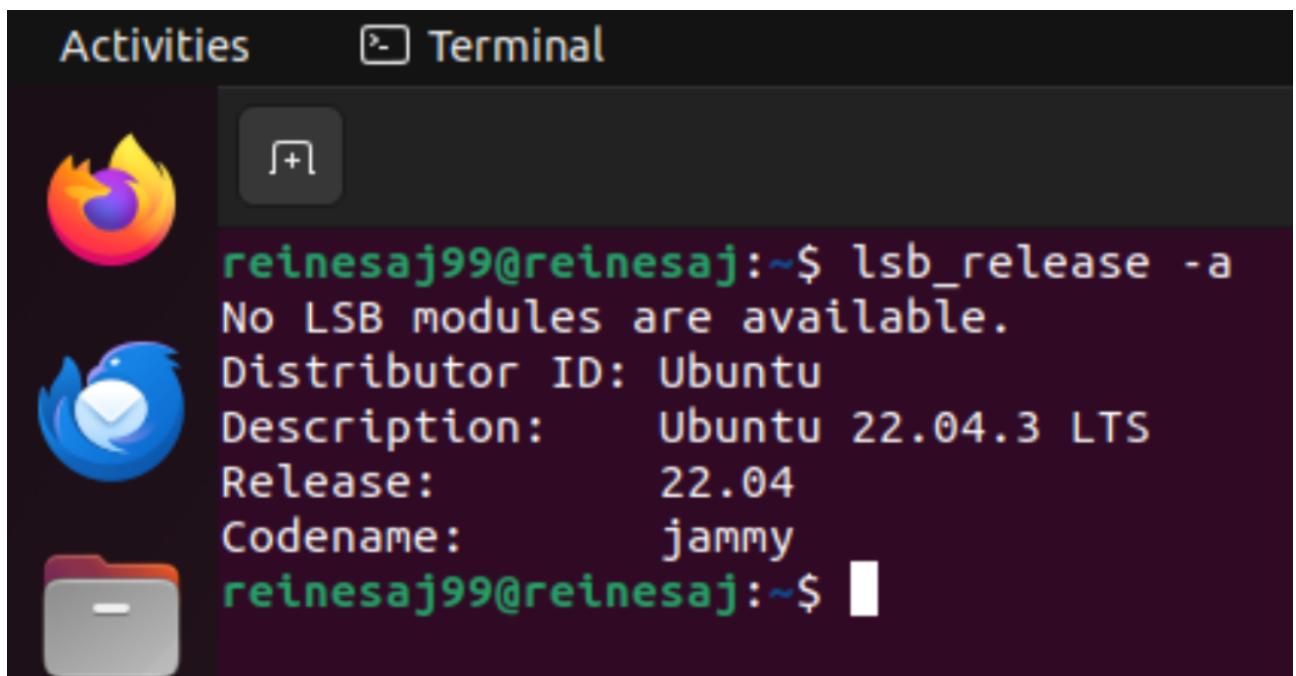


Figure 11: Verification of Credentials for Ubuntu VM set up

4.2 Processor and Memory Configuration:

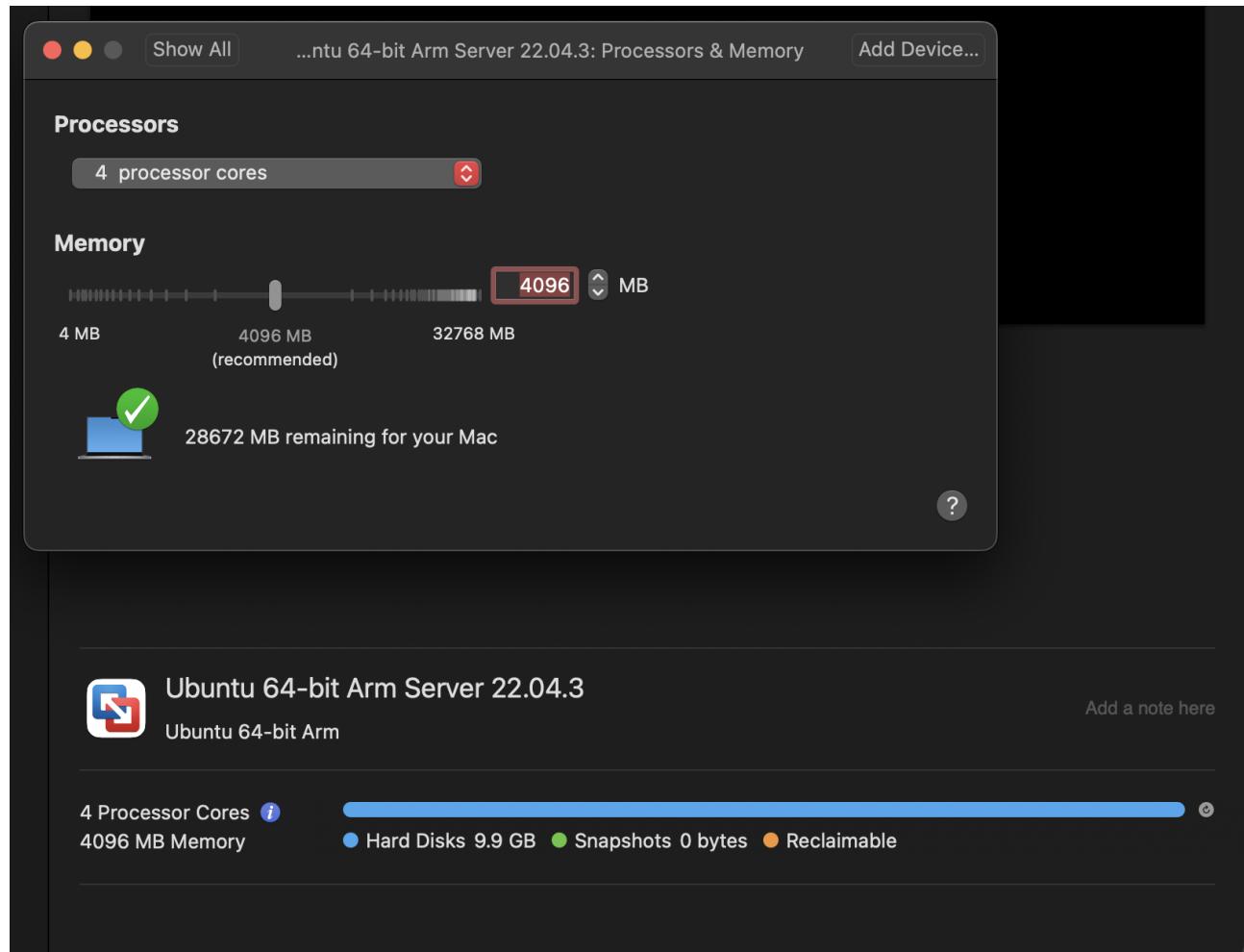


Figure 12: Assigned 4 processor cores and 4GB of memory to the Ubuntu VM.

4.3 Network Adapter Configuration:

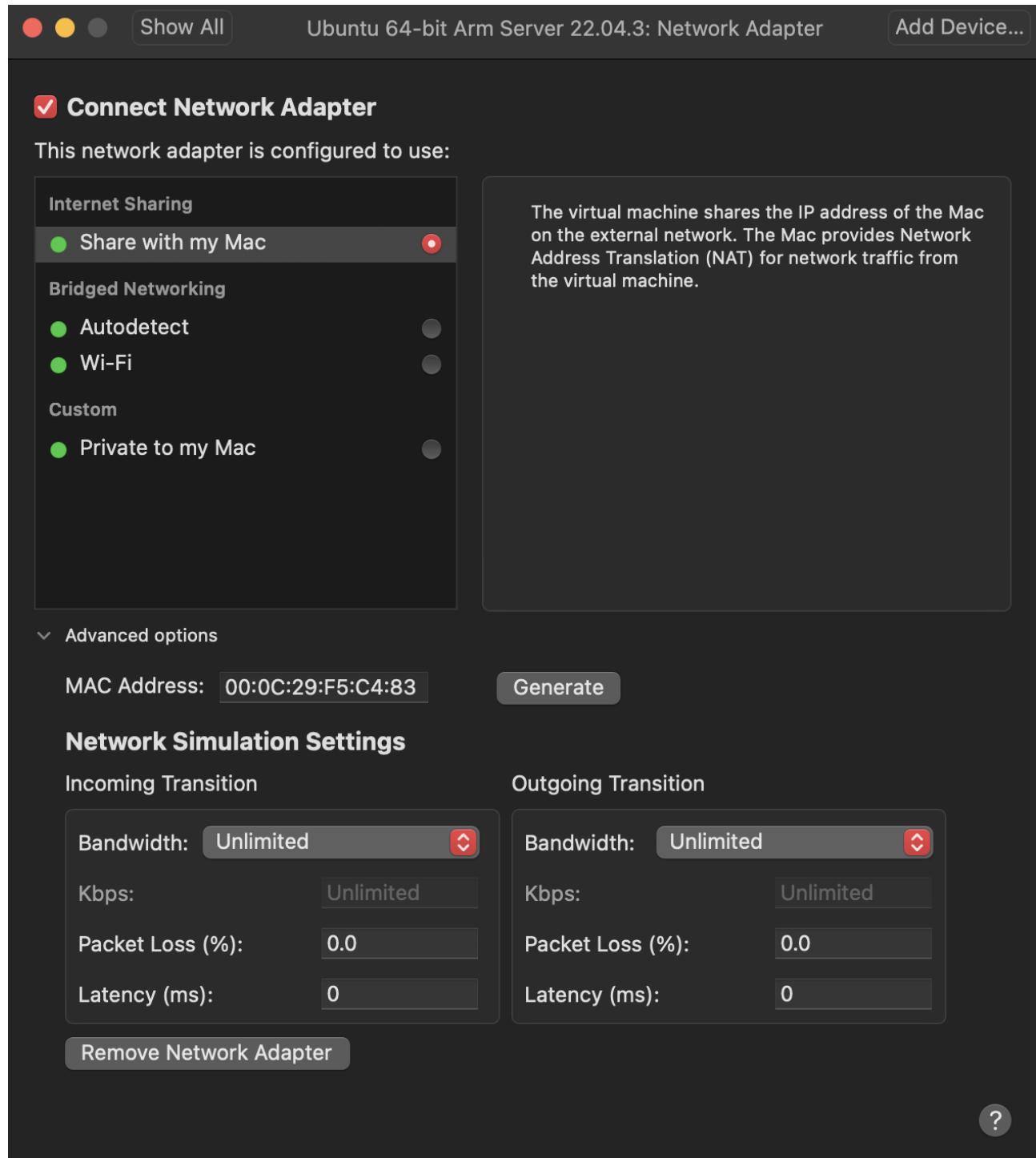


Figure 13: The network adapter configuration is set for sharing with the Mac, which implies it's using NAT (Network Address Translation).

4.4 Update Process:

```
reinesaj99@reinesaj:~$ sudo apt-get update
[sudo] password for reinesaj99:
Sorry, try again.
[sudo] password for reinesaj99:
Hit:1 http://ports.ubuntu.com/ubuntu-ports jammy InRelease
Get:2 http://ports.ubuntu.com/ubuntu-ports jammy-updates InRelease [119 kB]
Get:3 http://ports.ubuntu.com/ubuntu-ports jammy-backports InRelease [109 kB]
Get:4 http://ports.ubuntu.com/ubuntu-ports jammy-security InRelease [110 kB]
Get:5 http://ports.ubuntu.com/ubuntu-ports jammy/main arm64 DEP-11 Metadata [423 kB]
Get:6 http://ports.ubuntu.com/ubuntu-ports jammy/main DEP-11 48x48 Icons [100.0 kB]
Get:7 http://ports.ubuntu.com/ubuntu-ports jammy/main DEP-11 64x64 Icons [148 kB]
Get:8 http://ports.ubuntu.com/ubuntu-ports jammy/main DEP-11 64x64@2 Icons [15.8 kB]
Get:9 http://ports.ubuntu.com/ubuntu-ports jammy/universe arm64 DEP-11 Metadata [3,360 kB]
Get:10 http://ports.ubuntu.com/ubuntu-ports jammy/universe DEP-11 48x48 Icons [3,447 kB]
Get:11 http://ports.ubuntu.com/ubuntu-ports jammy/universe DEP-11 64x64 Icons [7,609 kB]
Get:12 http://ports.ubuntu.com/ubuntu-ports jammy/universe DEP-11 64x64@2 Icons [69.3 kB]
Get:13 http://ports.ubuntu.com/ubuntu-ports jammy/multiverse arm64 DEP-11 Metadata [38.8 kB]
Get:14 http://ports.ubuntu.com/ubuntu-ports jammy/multiverse DEP-11 48x48 Icons [42.7 kB]
Get:15 http://ports.ubuntu.com/ubuntu-ports jammy/multiverse DEP-11 64x64 Icons [193 kB]
Get:16 http://ports.ubuntu.com/ubuntu-ports jammy/multiverse DEP-11 64x64@2 Icons [214 kB]
Get:17 http://ports.ubuntu.com/ubuntu-ports jammy-updates/main arm64 Packages [1,118 kB]
Get:18 http://ports.ubuntu.com/ubuntu-ports jammy-updates/main Translation-en [262 kB]
Get:19 http://ports.ubuntu.com/ubuntu-ports jammy-updates/main arm64 DEP-11 Metadata [101 kB]
Get:20 http://ports.ubuntu.com/ubuntu-ports jammy-updates/main DEP-11 48x48 Icons [36.1 kB]
Get:21 http://ports.ubuntu.com/ubuntu-ports jammy-updates/main DEP-11 64x64 Icons [55.1 kB]
Get:22 http://ports.ubuntu.com/ubuntu-ports jammy-updates/main DEP-11 64x64@2 Icons [29 kB]
Get:23 http://ports.ubuntu.com/ubuntu-ports jammy-updates/universe arm64 Packages [963 kB]
Get:24 http://ports.ubuntu.com/ubuntu-ports jammy-updates/universe Translation-en [231 kB]
Get:25 http://ports.ubuntu.com/ubuntu-ports jammy-updates/universe arm64 DEP-11 Metadata [301 kB]
Get:26 http://ports.ubuntu.com/ubuntu-ports jammy-updates/universe DEP-11 48x48 Icons [205 kB]
Get:27 http://ports.ubuntu.com/ubuntu-ports jammy-updates/universe DEP-11 64x64 Icons [311 kB]
Get:28 http://ports.ubuntu.com/ubuntu-ports jammy-updates/universe DEP-11 64x64@2 Icons [29 kB]
Get:29 http://ports.ubuntu.com/ubuntu-ports jammy-updates/multiverse arm64 DEP-11 Metadata [212 kB]
Get:30 http://ports.ubuntu.com/ubuntu-ports jammy-updates/multiverse DEP-11 48x48 Icons [1,867 kB]
Get:31 http://ports.ubuntu.com/ubuntu-ports jammy-updates/multiverse DEP-11 64x64 Icons [2,497 kB]
Get:32 http://ports.ubuntu.com/ubuntu-ports jammy-updates/multiverse DEP-11 64x64@2 Icons [29 kB]
Get:33 http://ports.ubuntu.com/ubuntu-ports jammy-backports/main arm64 Packages [41.3 kB]
Get:34 http://ports.ubuntu.com/ubuntu-ports jammy-backports/main arm64 DEP-11 Metadata [3,504 kB]
Get:35 http://ports.ubuntu.com/ubuntu-ports jammy-backports/main DEP-11 48x48 Icons [16.1 kB]
Get:36 http://ports.ubuntu.com/ubuntu-ports jammy-backports/main DEP-11 64x64 Icons [21.3 kB]
Get:37 http://ports.ubuntu.com/ubuntu-ports jammy-backports/main DEP-11 64x64@2 Icons [29 kB]
Get:38 http://ports.ubuntu.com/ubuntu-ports jammy-backports/universe arm64 Packages [22.6 kB]
Get:39 http://ports.ubuntu.com/ubuntu-ports jammy-backports/universe arm64 DEP-11 Metadata [18.6 kB]
Get:40 http://ports.ubuntu.com/ubuntu-ports jammy-backports/universe DEP-11 48x48 Icons [15.7 kB]
Get:41 http://ports.ubuntu.com/ubuntu-ports jammy-backports/universe DEP-11 64x64 Icons [25.6 kB]
Get:42 http://ports.ubuntu.com/ubuntu-ports jammy-backports/universe DEP-11 64x64@2 Icons [29 kB]
Get:43 http://ports.ubuntu.com/ubuntu-ports jammy-security/main arm64 DEP-11 Metadata [43.1 kB]
Get:44 http://ports.ubuntu.com/ubuntu-ports jammy-security/main DEP-11 48x48 Icons [16.9 kB]
Get:45 http://ports.ubuntu.com/ubuntu-ports jammy-security/main DEP-11 64x64 Icons [26.5 kB]
Get:46 http://ports.ubuntu.com/ubuntu-ports jammy-security/main DEP-11 64x64@2 Icons [29 kB]
Get:47 http://ports.ubuntu.com/ubuntu-ports jammy-security/universe arm64 DEP-11 Metadata [54.8 kB]
Get:48 http://ports.ubuntu.com/ubuntu-ports jammy-security/universe DEP-11 48x48 Icons [22.0 kB]
Get:49 http://ports.ubuntu.com/ubuntu-ports jammy-security/universe DEP-11 64x64 Icons [34.6 kB]
Get:50 http://ports.ubuntu.com/ubuntu-ports jammy-security/universe DEP-11 64x64@2 Icons [29 kB]
Fetched 19.7 MB in 8s (2,457 kB/s)
Reading package lists... Done
reinesaj99@reinesaj:~$
```

Figure 14: Shows the terminal window where we've run "sudo apt-get update" on the Ubuntu VM, which is part of the update process.

```

reinesaj99@reinesaj:~$ sudo apt-get upgrade
[sudo] password for reinesaj99:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Calculating upgrade... Done
The following packages have been kept back:
  libmm-glib0 modemmanager
The following packages will be upgraded:
  base-files motd-news-config
2 upgraded, 0 newly installed, 0 to remove and 2 not upgraded.
Need to get 67.1 kB of archives.
After this operation, 0 B of additional disk space will be used.
Do you want to continue? [Y/n]

```

Figure 15: Shows the terminal window where we've run "sudo apt-get upgrade" on the Ubuntu VM, which is part of the upgrade process.

```

reinesaj99@reinesaj:~$ sudo apt-get upgrade
2 upgraded, 0 newly installed, 0 to remove and 2 not upgraded.
Need to get 67.1 kB of archives.
After this operation, 0 B of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://ports.ubuntu.com/ubuntu-ports jammy-updates/main arm64 motd-news-config all 12ubuntu4.5 [4,536 B]
Get:2 http://ports.ubuntu.com/ubuntu-ports jammy-updates/main arm64 base-files arm64 12ubuntu4.5 [62.5 kB]
Fetched 67.1 kB in 1s (91.7 kB/s)
(Reading database ... 165553 files and directories currently installed.)
Preparing to unpack .../motd-news-config_12ubuntu4.5_all.deb ...
Unpacking motd-news-config (12ubuntu4.5) over (12ubuntu4.4) ...
Preparing to unpack .../base-files_12ubuntu4.5_arm64.deb ...
Unpacking base-files (12ubuntu4.5) over (12ubuntu4.4) ...
Setting up base-files (12ubuntu4.5) ...
Installing new version of config file /etc/update-motd.d/10-help-text ...
motd-news.service is a disabled or a static unit not running, not starting it.
Setting up motd-news-config (12ubuntu4.5) ...
Processing triggers for cracklib-runtime (2.9.6-3.4build4) ...
Processing triggers for plymouth-theme-ubuntu-text (0.9.5+git20211018-1ubuntu3) ...
update-initramfs: deferring update (trigger activated)
Processing triggers for install-info (6.8-4build1) ...
Processing triggers for man-db (2.10.2-1) ...
Processing triggers for initramfs-tools (0.140ubuntu13.4) ...
update-initramfs: Generating /boot/initrd.img-5.15.0-91-generic
Scanning processes...
Scanning linux images...

Running kernel seems to be up-to-date.
No services need to be restarted.
No containers need to be restarted.
No user sessions are running outdated binaries.
No VM guests are running outdated hypervisor (qemu) binaries on this host.
reinesaj99@reinesaj:~$ 

```

Figure 16: Shows the terminal window where we've run "sudo apt-get upgrade" on the Ubuntu VM, which is part of the upgrade process. We can see the upgrade process has successfully completed.

5 Conclusion

All tasks assigned for the lab setup project were completed successfully. The virtualization software, Kali VM, and Ubuntu VM are all running and have been configured correctly.

Academic Integrity Pledge

"This work complies with the JMU honor code. I did not give or receive unauthorized help on this assignment."