

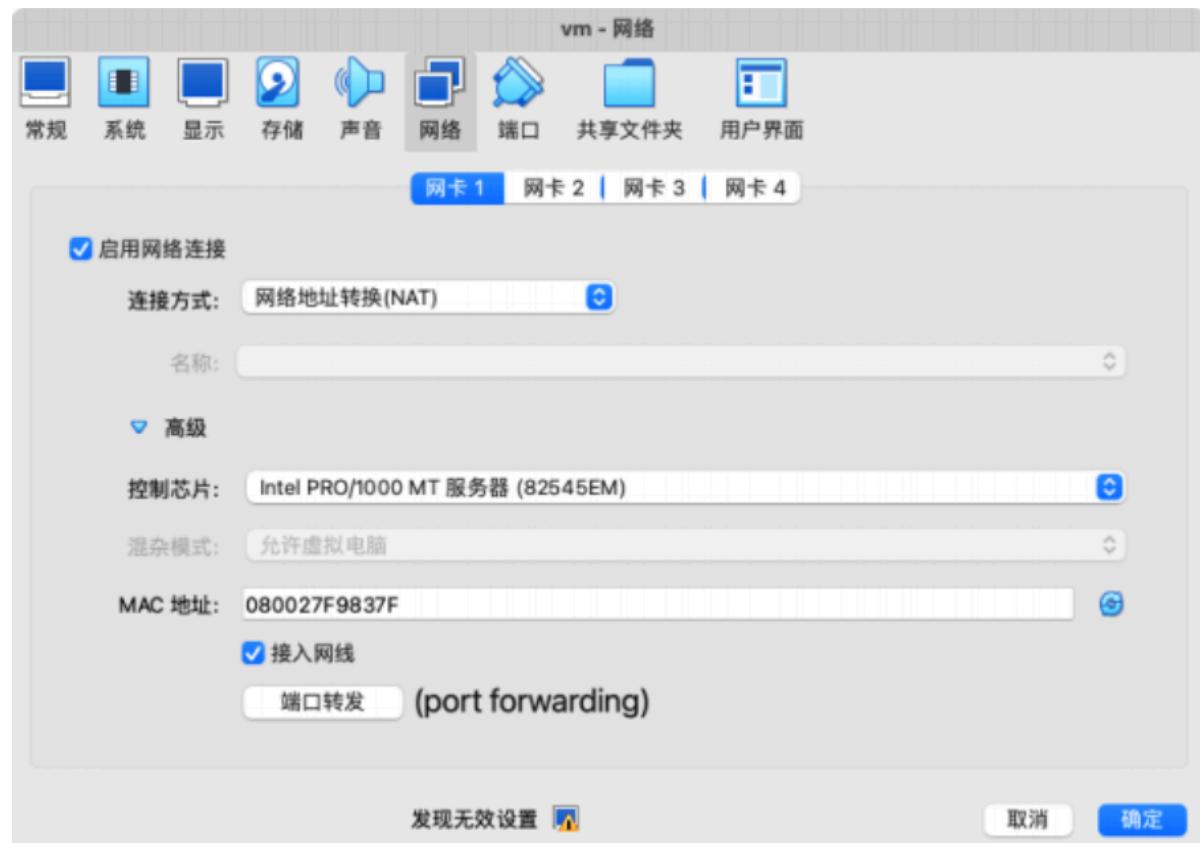
VM Setting

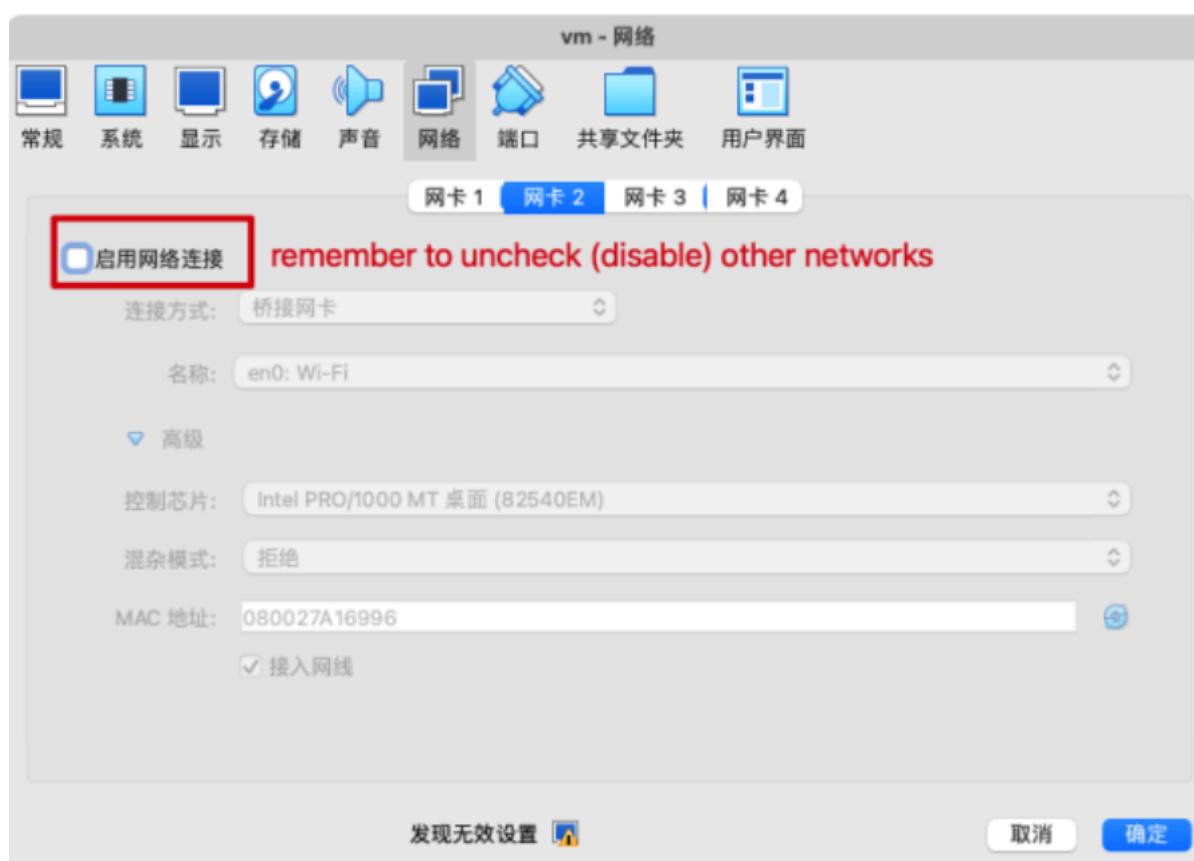
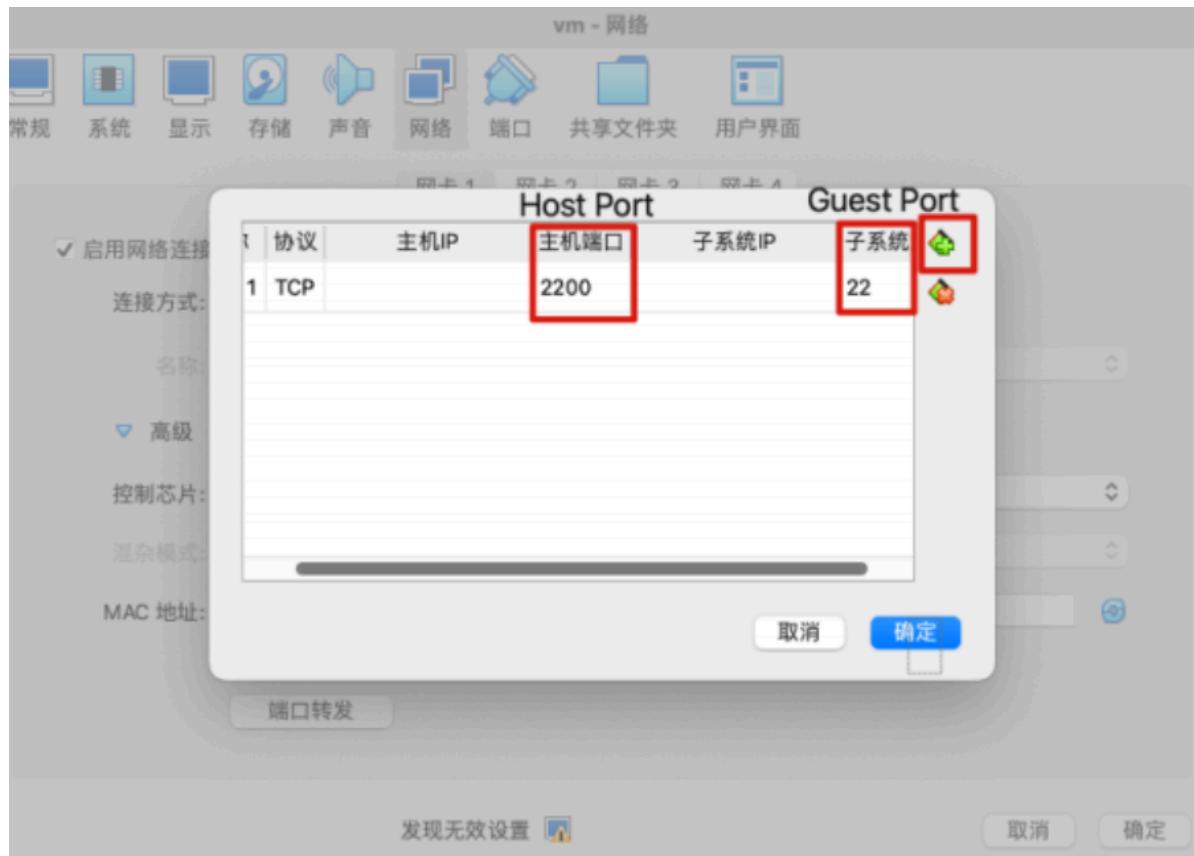
Virtual Machine Login and Usage Instruction

Since the project3 is based on xv6, it requires a series of toolchain to support. We have already prepared all necessary environments for you. We provide the [CSC3150_a3_xv6.ova](#) file for x64 chip users(can be imported into VirtualBox or VMWare) and the [CSC3150_a3_xv6.qcow2](#) file for Macbook m1/2 users (can be imported into UTM).

For VirtualBox users

(Normally, all versions would run well. We checked the 7.0 version), network configuration can be referred to as follows: Only one network, i.e., **Network Address Translation (NAT)**. Set port forwarding configuration as **host port:2200, guest port:22**.

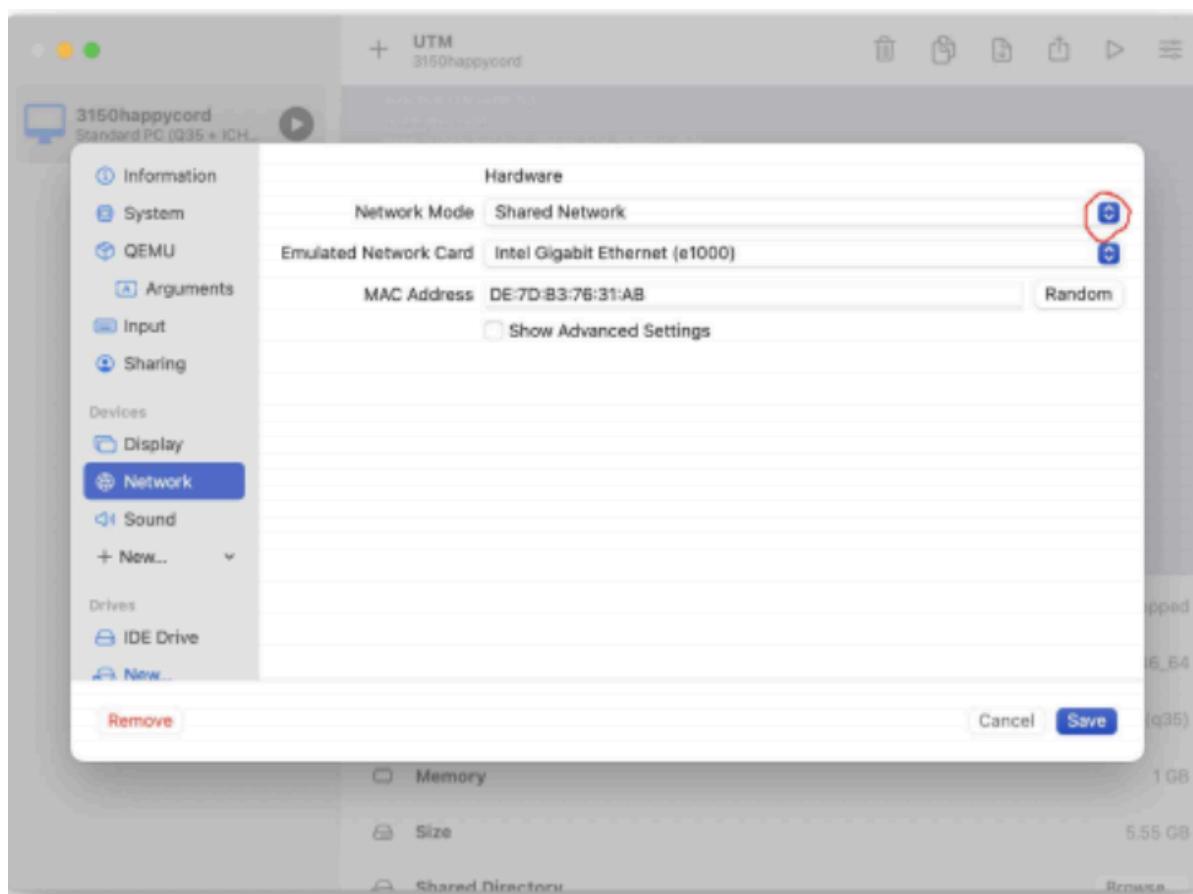
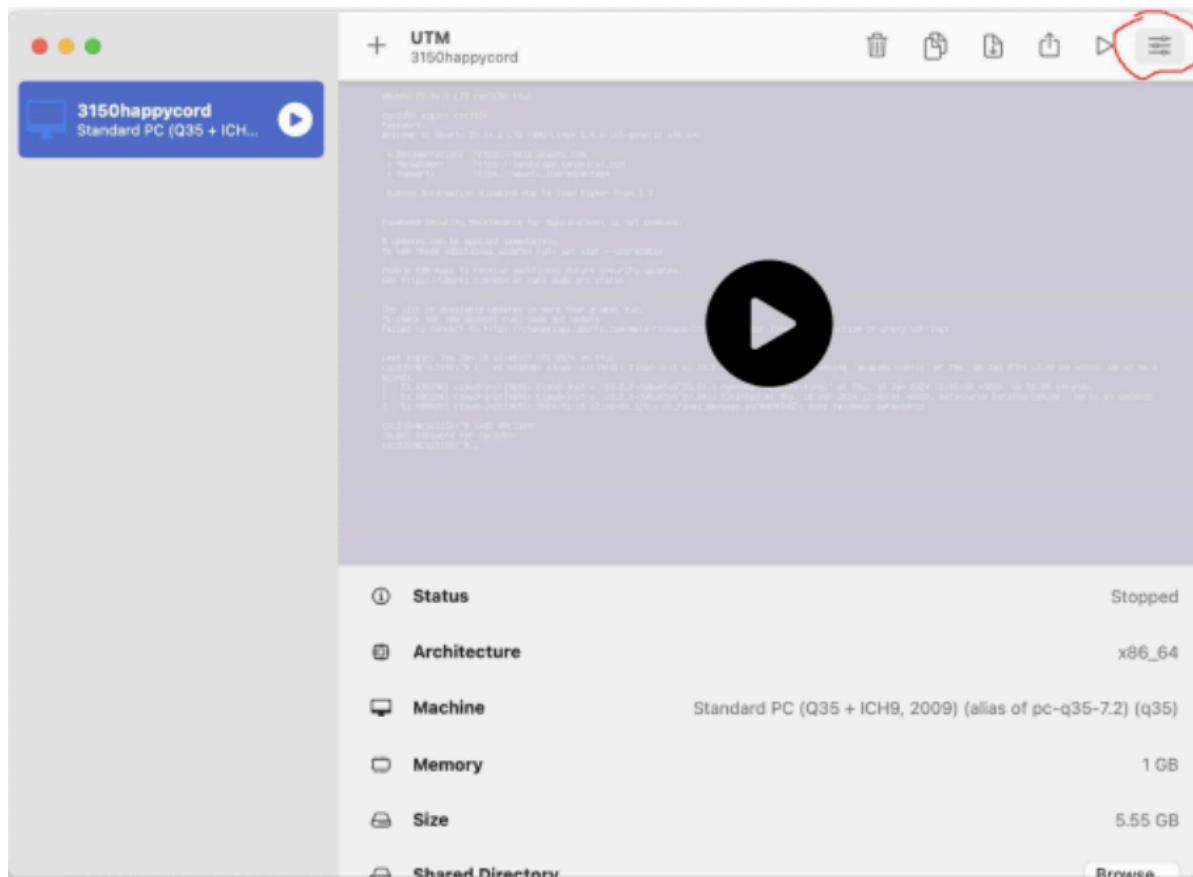




For UTM users (Macbook M1/M2), follow this [quick tutorial](#) to import the .qcow2 file.

The network settings of UTM are as follows:

First open the network configuration of imported VM.



For network mode, choose Emulated VLAN

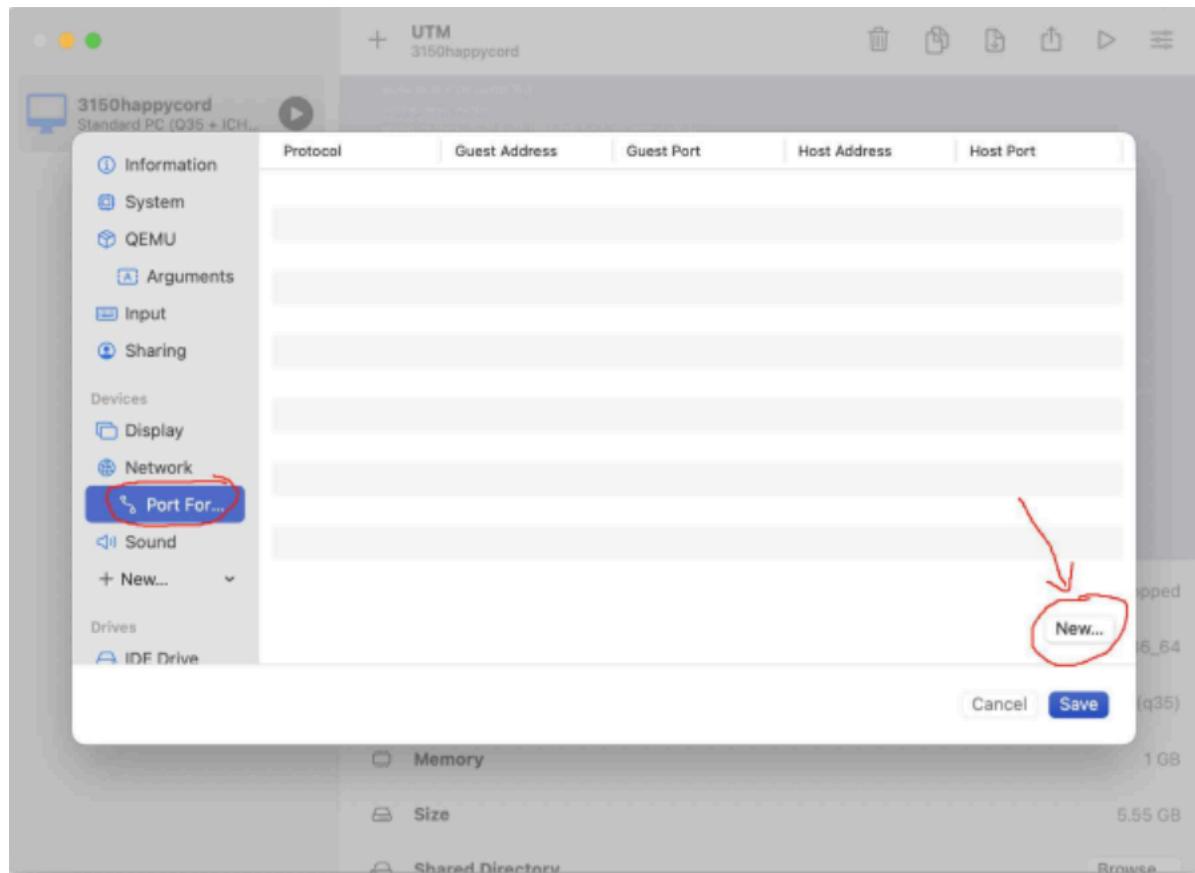
✓ Emulated VLAN

Shared Network

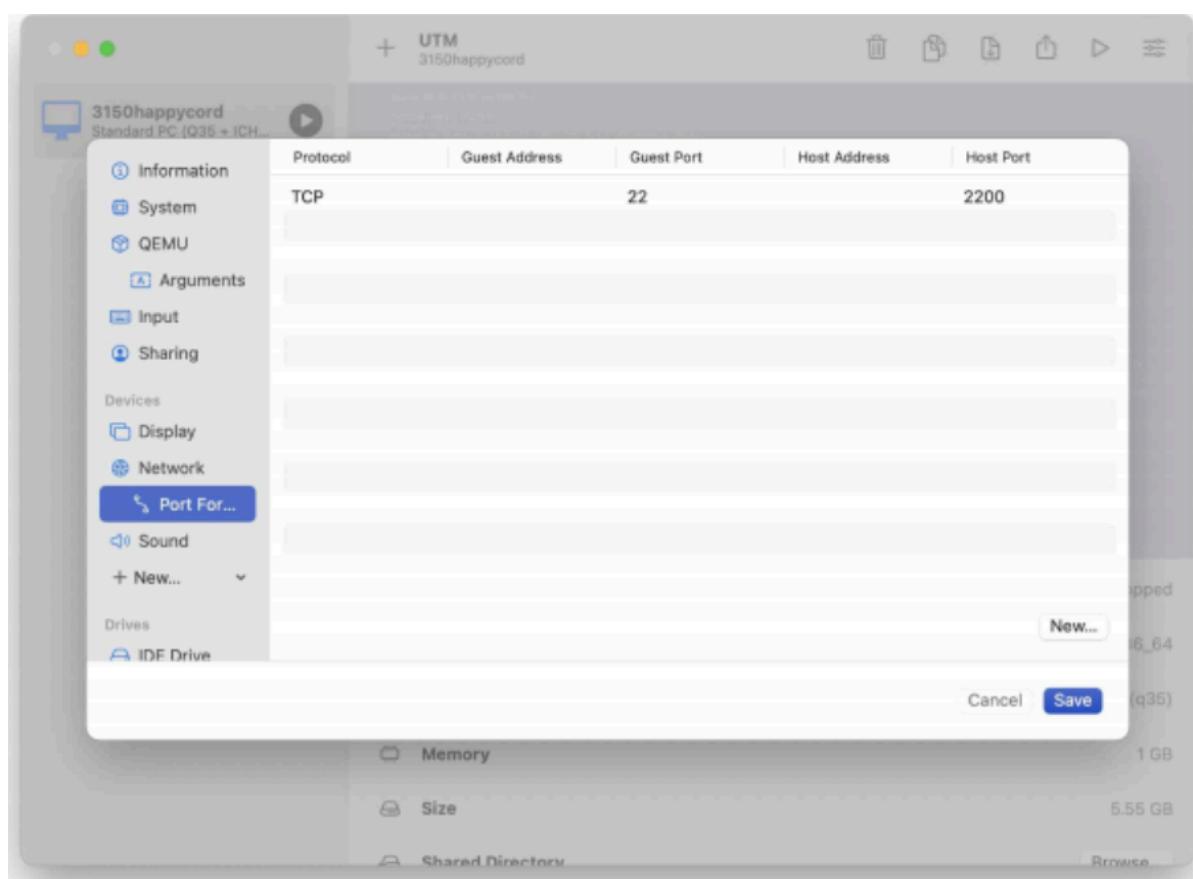
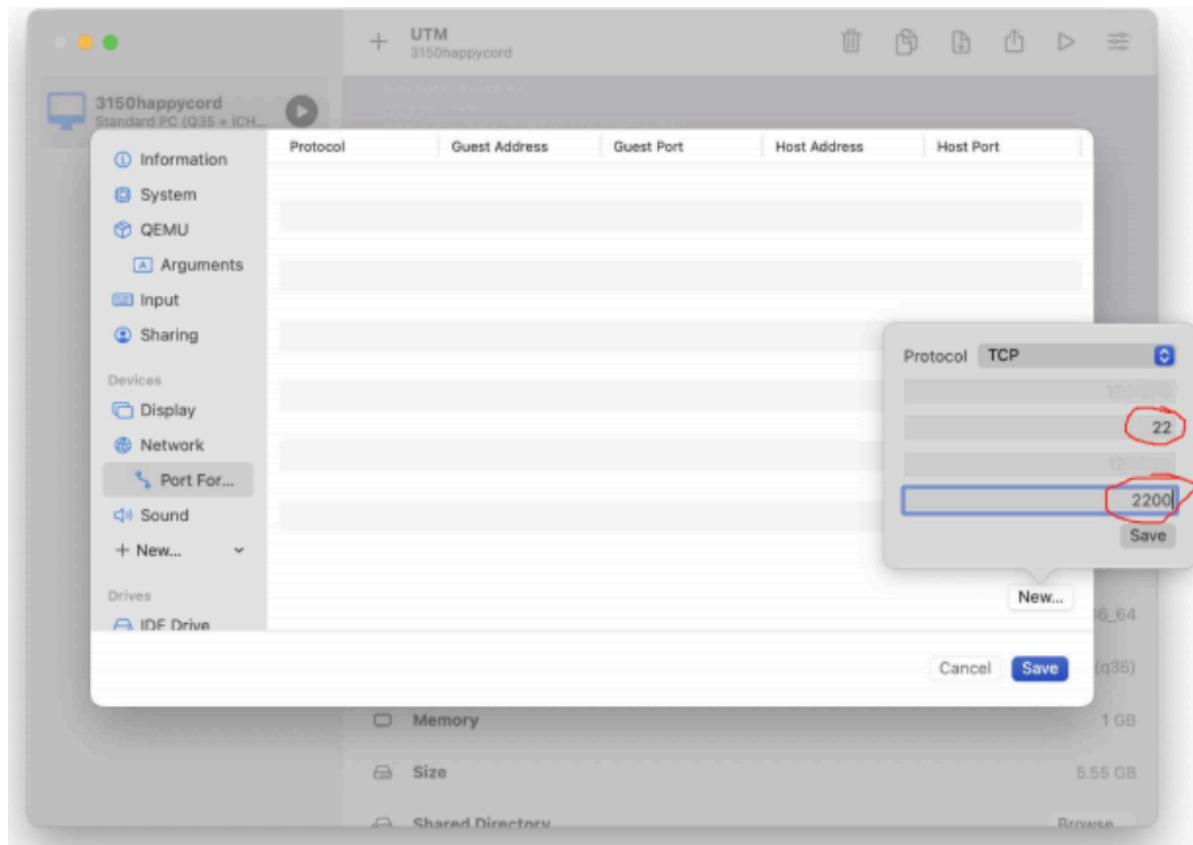
Host Only

Bridged (Advanced)

Press 'Port Forward...', then press 'New...'



Set the new port forward rule as following



For All Students

- Log in to the virtual machine through the username **csc3150** and password **csc3150**
- Use 'sudo dhclient' command to assign an IP address. Then try 'ip a' again.

```

csc3150@csc3150:~$ sudo dhclient
[sudo] password for csc3150:
csc3150@csc3150:~$ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
        inet 127.0.0.1/8 scope host lo
            valid_lft forever preferred_lft forever
        inet6 ::1/128 scope host
            valid_lft forever preferred_lft forever
2: enp0s17: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 08:00:27:f9:83:7f brd ff:ff:ff:ff:ff:ff
        inet 10.0.2.15/24 brd 10.0.2.255 scope global dynamic enp0s17
            valid_lft 86380usec preferred_lft 86380usec
        inet6 fe80::a00:27ff:fe9:837f/64 scope link
            valid_lft forever preferred_lft forever
csc3150@csc3150:~$
```

- If you can see the assigned IP shown in the above figure, dhclient works. Then, we use the following command to connect.
 - `ssh -p 2200 csc3150@127.0.0.1`

```

(base) + Downloads ssh -p 2200 csc3150@127.0.0.1
csc3150@127.0.0.1's password:
Welcome to Ubuntu 20.04.6 LTS (GNU/Linux 5.4.0-165-generic x86_64)

 * Documentation: https://help.ubuntu.com
 * Management: https://landscape.canonical.com
 * Support: https://ubuntu.com/advantage

System information as of Thu 02 Nov 2023 05:51:04 AM UTC

System load: 0.08      Processes:          184
Usage of /: 61.4% of 11.21GB   Users logged in: 1
Memory usage: 5%           IPv4 address for enp0s17: 10.0.2.15
Swap usage: 0%

* Strictly confined Kubernetes makes edge and IoT secure. Learn how MicroK8s just raised the bar for easy, resilient and secure K8s cluster deployment.

https://ubuntu.com/engage/secure-kubernetes-at-the-edge

Expanded Security Maintenance for Applications is not enabled.

9 updates can be applied immediately.
To see these additional updates run: apt list --upgradable

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

Failed to connect to https://changelogs.ubuntu.com/meta-release-lts. Check your Internet connection or proxy settings

Last login: Thu Nov  2 13:42:14 2023
csc3150@csc3150:~$
```

To Run The Project

1. We have put the template under the default directory. Go to the 'xv6-labs-2022' directory and try the following command to compile and run the project
 - a. (xv6-labs-2022 is the assignment template we gonna to use in assignment 3 and 4, have a try if the following works well)

```

csc3150@csc3150:~$ ls
xv6-labs-2022
csc3150@csc3150:~$ cd xv6-labs-2022/
csc3150@csc3150:~/xv6-labs-2022$ make clean
fatal: not a git repository (or any of the parent directories): .git
rm -f *.tex *.dvi *.idx *.aux *.log *.ind *.ilg \
*/*.o */*.d */*.asm */*.sym \
user/initcode user/initcode.out kernel/kernel fs.img \
mkfs/mkfs .gdbinit \
    user/usys.S \
user/_cat user/_echo user/_forktest user/_grep user/_init user/_kill user/_ln user/_ls user/_mkdir user/_rm user/_sh user/_stressfs user/_usertests user/_grind user/_wc user/_zombie user/_mmaptest \
ph barrier
csc3150@csc3150:~/xv6-labs-2022$ make qemu.
```

2. After 'make qemu', the xv6 system powers on.

```
xv6 kernel is booting
```

```
hart 1 starting  
hart 2 starting  
init: starting sh  
$
```

3. Try 'ls'. You are expected to have the following output like this

```
xv6 kernel is booting

hart 1 starting
hart 2 starting
init: starting sh
$ ls
.
..
README      2 2 2305
cat         2 3 32424
echo        2 4 31296
forktest    2 5 15408
grep        2 6 35784
init        2 7 32096
kill        2 8 31296
ln          2 9 31216
ls          2 10 34328
mkdir       2 11 31336
rm          2 12 31320
sh          2 13 53576
stressfs   2 14 32192
usertests  2 15 180672
grind       2 16 47400
wc          2 17 33424
zombie     2 18 30864
mmaptest   2 19 44960
console    3 20 0
$
```

4. Try 'mmaptest'. You are expected to have the following output.

```
$ mmaptest
Mmap_test starting
test mmap f
mismatch at 0, wanted 'A', got 0x1
mmaptest: mmap_test failed: v1 mismatch (1), pid=3
$ -
```

5. To quit the xv6 system, press Ctrl a. Leave it. Then type x.