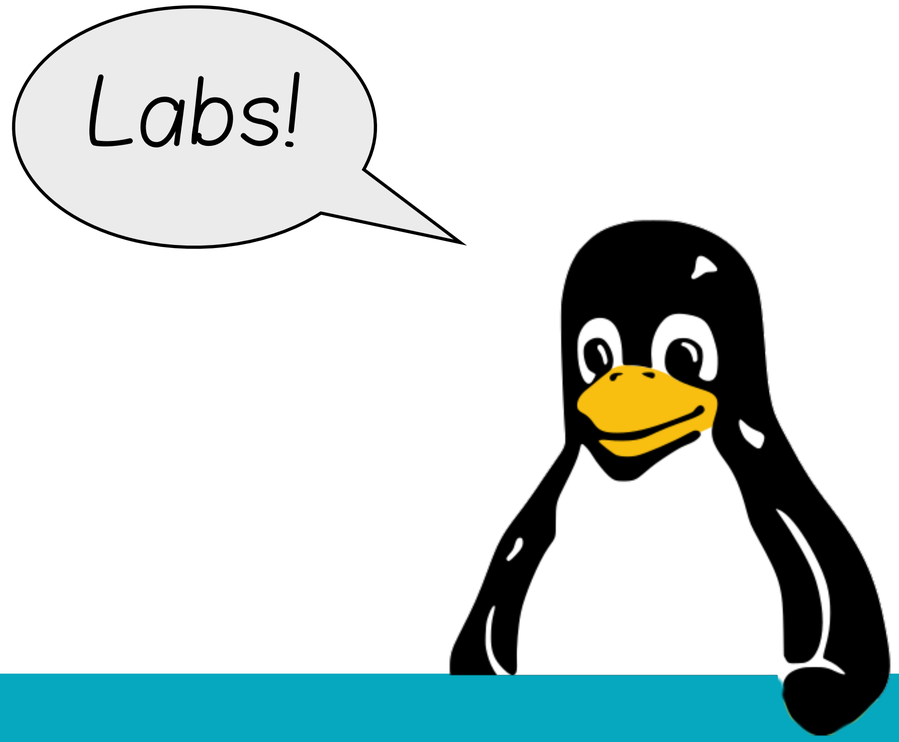
Linux, day 2

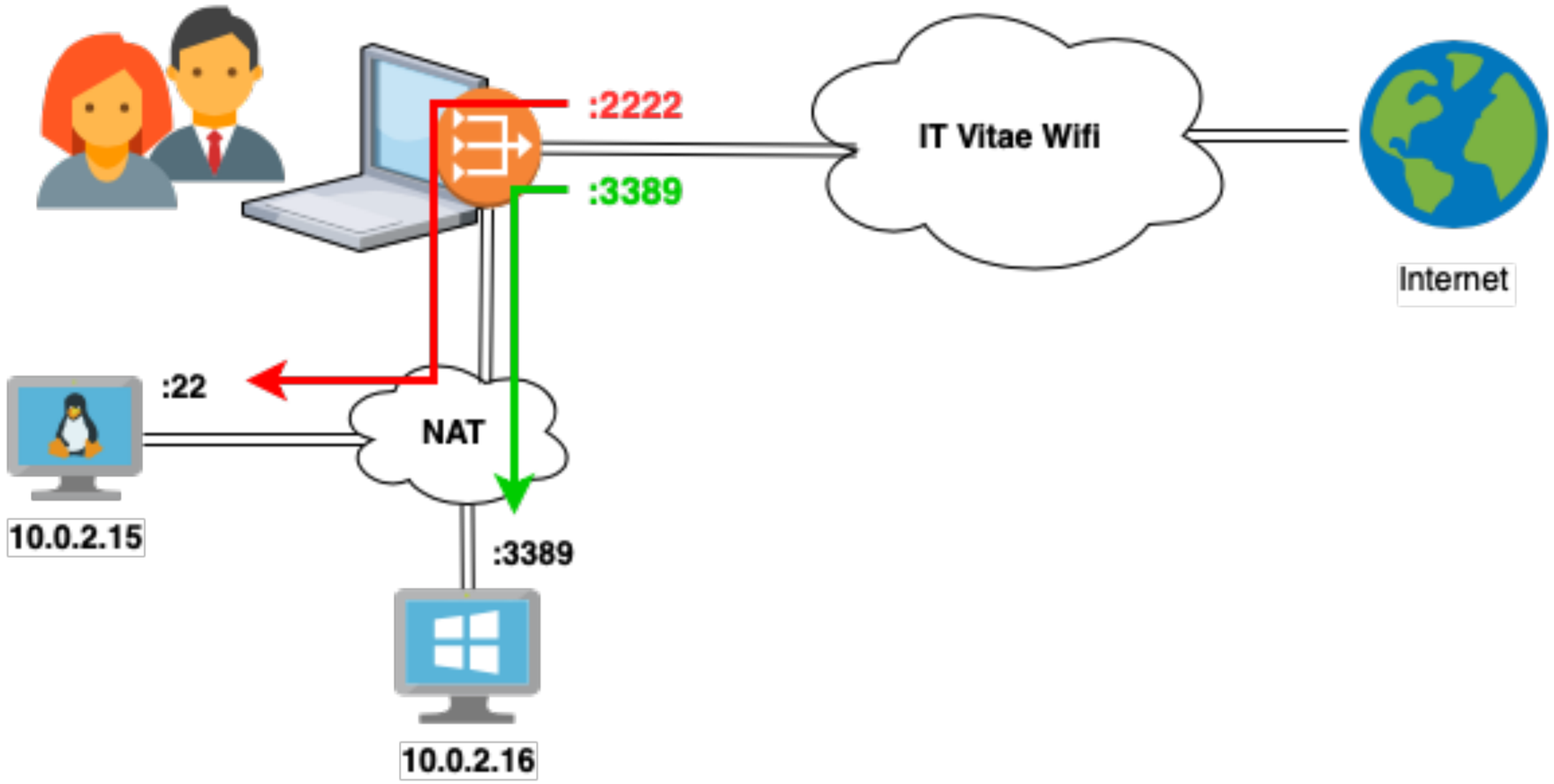


Related objectives

Objective	Summary	Book
1.2	File editing, file and directory operations	3
2.2	Account creation and deletion	10
2.4	SSH	16

Networking and virtualization

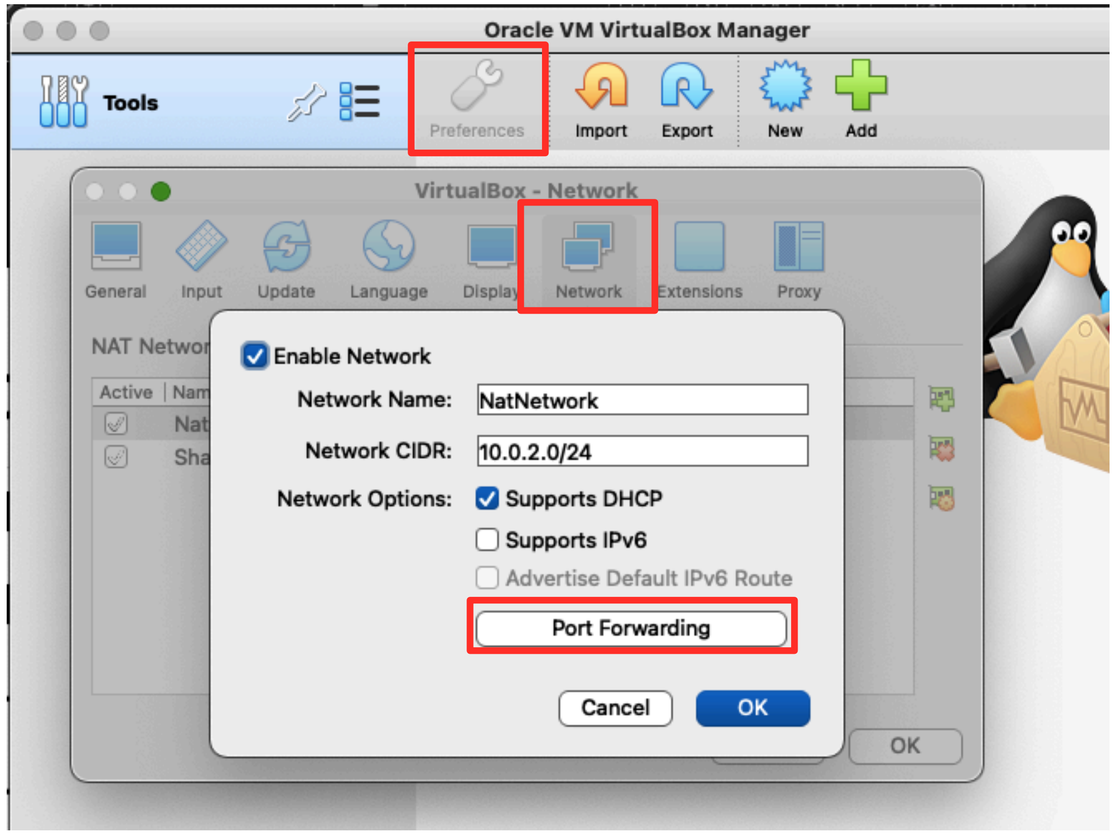
Port forwarding into NAT Net

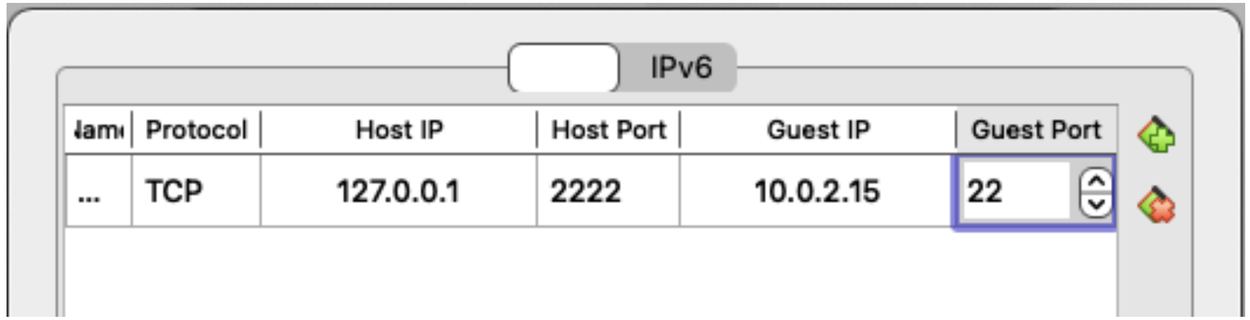


You try!

- First, find your VM’s IP address (10.0.2.4?)
- In the VirtualBox configuration / settings:
  - Find the shared "*NATnetwork*".
  - Add a port forward on 127.0.0.1:2222.
  - To port :22 of your VM (e.g. 10.0.2.4).

You try!


Oracle VM VirtualBox Manager
Tools
Preferences
Import
Export
New
Add
VirtualBox - Network
General
Input
Update
Language
Display
Network
Extensions
Proxy
Enable Network
Network Name:
NatNetwork
Network CIDR:
10.0.2.0/24
Network Options:
Supports DHCP
Supports IPv6
Advertise Default IPv6 Route
Port Forwarding
Cancel
OK
OK

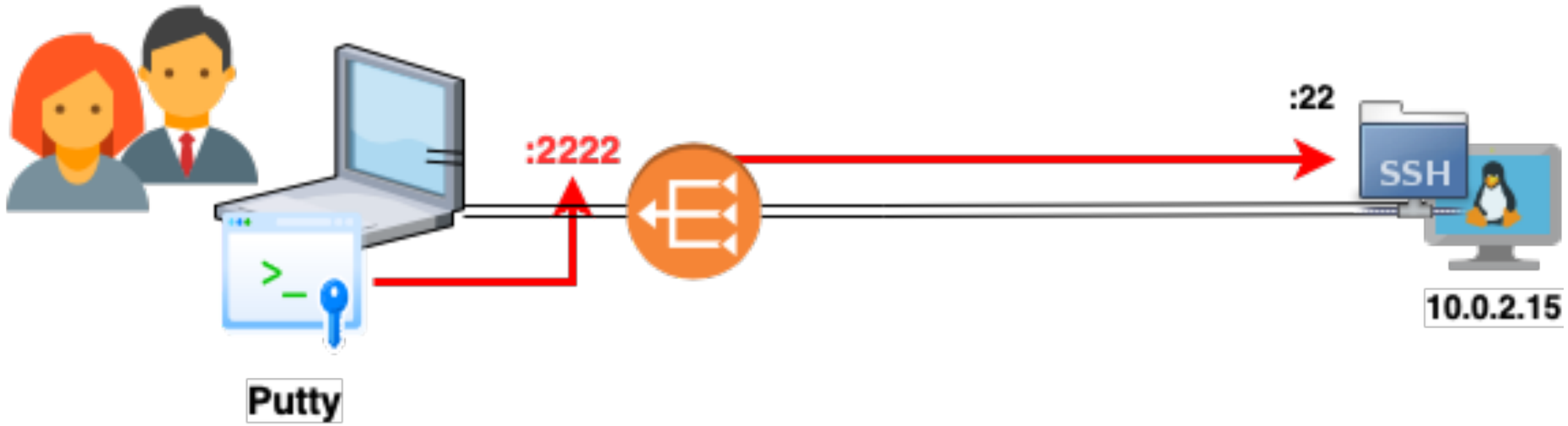

IPv6
Protocol
Host IP
Host Port
Guest IP
Guest Port
...
TCP
127.0.0.1
2222
10.0.2.15
22

What did we just do?

- On the host OS we made a “listener” on 2222.
- This “listener” forwards all traffic,
  - Coming to port 2222 on the host OS...
  - To port 22 on the guest OS (VM).

- So, let's make sure something's there!

Using the port forward



You try!

- On your host OS, connect to 127.0.0.1:2222.
  - Windows: use *Putty.exe*, or Powershell.
  - MacOS and Linux:

```
$ ssh -p 2222 tess@127.0.0.1
```

See: Download Putty

Making connecting easier

- Nobody likes remembering IP addresses!
  - On the VMs (both) run:

```
$ sudo nano /etc/hosts
```

  - This asks for YOUR password.

Making connecting easier

- Add two lines, **adjusted** for your IP addresses.

```
10.0.2.5 ubuntu
10.0.2.4 fedora
```

- Save and quit with <ctrl><x>.

Making connecting easier

- On the guest VMs, you can now run:

```
$ ssh tess@ubuntu

$ ssh tess@fedora
```

Command recap

netstat	NETwork STATistics
systemctl	SYSTEM ConTroL, manage services
sshd	SSH daemon, the service
ssh	SSH client
/etc/hosts	Local list of IP to hostname mappings

Making Host OS to VM connections easier

Oofff!

- So far, we've done this to login:

```
$ ssh -p 2222 tess@localhost
```

- That's a lot to type and to remember!
  - It's easy to mix up the ports!

/etc/hosts cannot help us

- If localhost:2222 is Fedora,
  - And if localhost:2223 is Ubuntu,
  - Then it's not the hostname that's the problem!

- We need to find a way to make aliases.

SSH config aliases

- We can configure the SSH client,
  - To give it pre-defined connection aliases.

See: Stop making shell aliases for SSH!

Which config file?

- All of this applies to your <u>host OS!</u>

Windows - Putty	Just use the graphical interface. 😉
Windows - Powershell	notepad $HOME\.ssh\config
Linux	nano ~/.ssh/config
MacOS	vi ~/.ssh/config

What to add?

```
Host fedoravm
  Port 2222
  Hostname localhost

Host ubuntuvm
  Port 2223
  Hostname localhost
```

Now, you can run:

```
$ ssh tess@fedoravm

$ ssh tess@ubuntuvm
```

From the host OS as well! 🥳

LAB: Users and groups

Command hints

useradd	Create a new user
usermod	Modify a user
groupadd	Create a new group
id	Show identity of a user
man	MANual pages

Assignment

- Create two new groups:
  - “staff” and “dummies”
- Create another two new users:
  - “opsuser” and “dummy2”
- Add yourself and “opsuser” to “staff”.
- Add “dummy” and “dummy2” to “dummies”

Assignment (spoilers)

```
$ sudo useradd -m opsuser
$ sudo useradd -m dummy2
$ sudo groupadd staff
$ sudo groupadd dummies
$ sudo usermod -a -G staff opsuser
$ sudo usermod -a -G staff $USER
$ sudo usermod -a -G dummies dummy
$ sudo usermod -a -G dummies dummy2
```

Closing

Next week

- Files and directories
- File permissions
- Git

Homework

- Reading:
  - "Files and directories", p 39-55
  - "File permissions", p 411-420
  - Chapter 27

  - < page numbers need updating >

Homework

- Go do:
  - Request a free copy of the CPH book.

Q&A

Reference materials

Resources

- VirtualBox networking modes
- Stop making shell aliases for SSH!
- Download Putty
- Download WinSCP
- SSH keys for dummies
- Cyber Plumber’s Handbook