

Lab exercises for week 2 - Turtlebot setup

Robot Router Connection

1-3 are connected to TP-LINK_B75A

- Username: ubuntu@host_ip
- Password: turtlebot

4-6 are connected to NETGEAR54

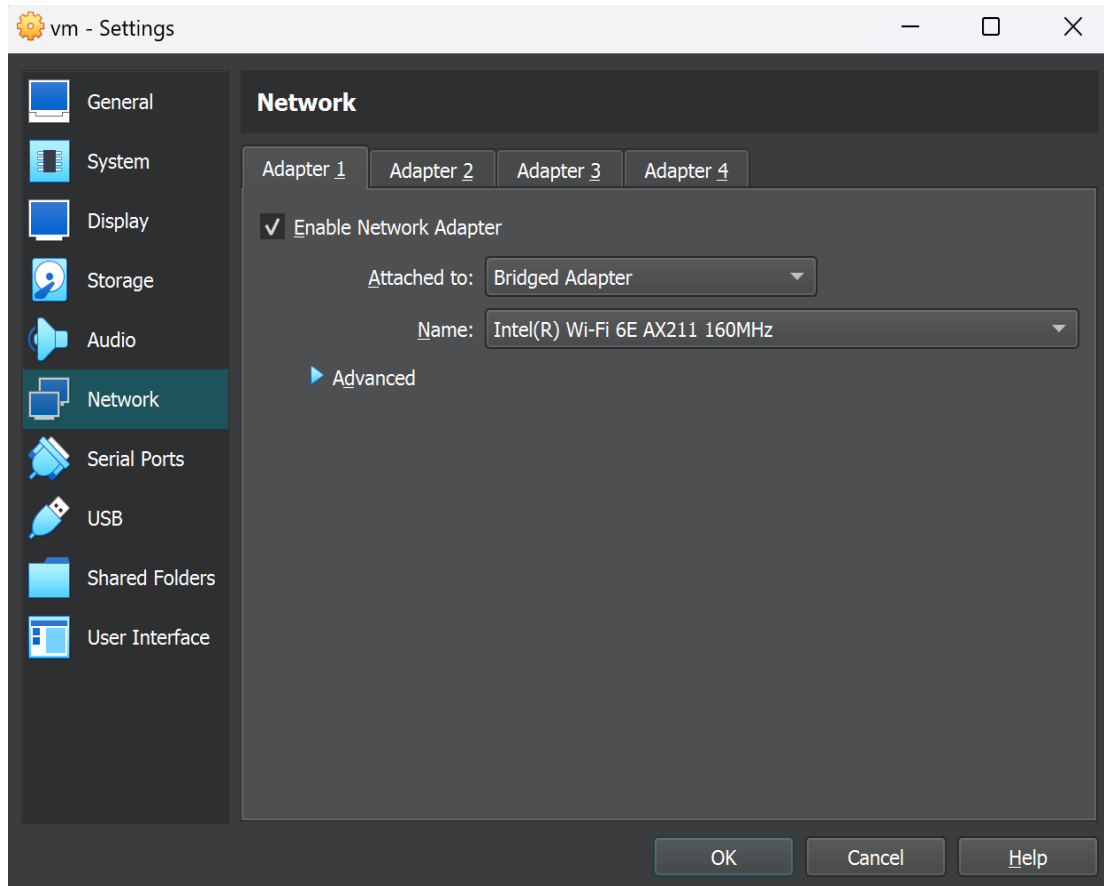
- Username: ubuntu@host_ip
- Password: turtlebot

7-9 are connected to SPL_R

- Username: ubuntu@host_ip
- Password: turtlebot

VirtualBox Windows

1. Enable network adapter and set to bridged adapter with WiFi. **DO NOT CHANGE THE MAC ADDRESS!!!**



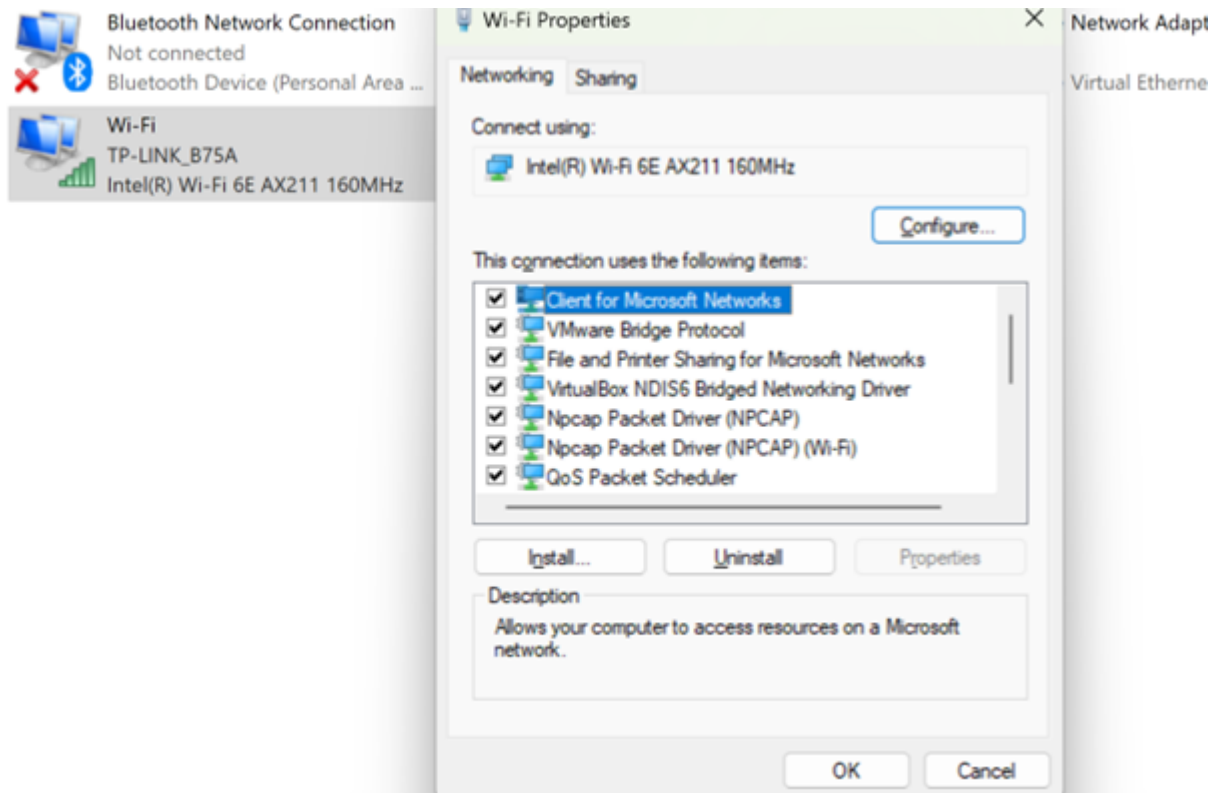
- 2.
3. Connect your own laptop in windows to the router
 - a. TP-LINK_B75A - pwd: 72376225
 - b. NETGEAR54 - pwd: breezyviolet053
 - c. SPL_R - pwd:Nao!!Nao!!
4. Ping the network labeled on the robot, to ensure you have gotten a connection
5. SSH into the robot using "ubuntu@ip_address" pwd: turtlebot
6. Change the ROS_DOMAIN_ID in your .bashrc file to the one written on the robot **(Change it in a separate terminal to step5. Change the bashrc on your ubuntu vm not the robot!!!!!!)**
7. Run "bash"
8. In the terminal ssh in the robot. Run `ros2 launch turtlebot3_bringup robot.launch.py` to start the nodes on the robot. If you work in a team. Only one person ssh into the robot need to run it since its on the robot. You have to keep the terminal alive to keep the nodes running.
9. Check "ros2 topic list" to ensure that robot topics are connected

VMWARE

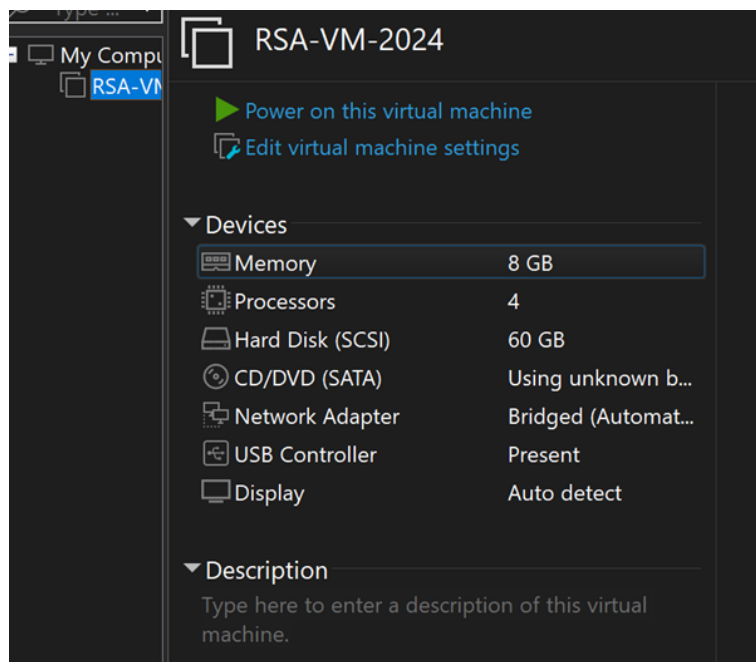
1. Connect your own laptop in windows to the router
 - a. TP-LINK_B75A - pwd: 72376225
 - b. NETGEAR54 - pwd: breezyviolet053
 - c. SPL_R - pwd:Nao!!Nao!!
2. Go to your setting and check the details for your wifi connection. Take note of your mac address and network card(description)

SSID:	TP-LINK_B75A
Protocol:	Wi-Fi 4 (802.11n)
Security type:	WPA2-Personal
Manufacturer:	Intel Corporation
Description:	Intel(R) Wi-Fi 6E AX211 160MHz
Driver version:	22.240.0.6
Network band:	2.4 GHz
Network channel:	10
Link speed (Receive/Transmit):	243/270 (Mbps)
Link-local IPv6 address:	fe80::6970:4bd9:f571:5e16%14
IPv4 address:	192.168.0.101
IPv4 DNS servers:	192.168.0.1 (Unencrypted)
Physical address (MAC):	

- a.
3. Go to your network setting in your settings, make sure you ticked VmWare Bridge protocol



4. In VMware, go the network adapter and change the mode to bridge if it is not. Also change the mac address to be the same as the one in step2. Please save it by clicking OK, not generate.



Bandwidth:

Kbps:

Packet Loss (%):

Latency (ms):

Outgoing Transfer

Bandwidth:

Kbps:

Packet Loss (%):

Latency (ms):

MAC Address

- On the top tab, click Edit->Virtual Network Editor-> make change, Change the bridge to use the exact network card your device used for wifi(might be different to the snapshot it depends on your laptop)

Name	Type	External Connection	Host Connection	DHCP	Subnet Address
VMnet0	Bridged	Intel(R) Wi-Fi 6E AX211 160MHz	-	-	-

- Restart the VM if its running or paused
- Ping the network labeled on the robot, to ensure you have gotten a connection
- SSH into the robot using “**ubuntu@ip_address**” pwd: **turtlebot**
- Change the ROS_DOMAIN_ID in your .bashrc file to the one written on the robot
(Change it in a separate terminal to step5. Change the bashrc on your ubuntu VM not the robot!!!!!!)
- Run “bash”
- In the terminal ssh in the robot. Run `ros2 launch turtlebot3_bringup robot.launch.py` to start the nodes on the robot. If you work in a team. Only one person ssh into the robot need to run it since its on the robot. You have to keep the terminal alive to keep the nodes running.
- Check “ros2 topic list” to ensure that robot topics are connected

UTM MACOS

1. Connect your own laptop in windows to the router (Note, your internet will be gone once you do this. Because we won't have router connect to a network probably)
 - a. TP-LINK_B75A - pwd: 72376225
 - b. NETGEAR54 - pwd: breezyviolet053
 - c. SPL_R - pwd:Nao!!Nao!!
2. In the settings-> network, please follow this setting. Leave the Mac address as it is.

Hardware

Network Mode

Bridged (Advanced)

⌵

Bridged Interface

en0

Emulated Network Card

virtio-net-pci

⌵

3. Save it then restart the vm
4. Ping the network labeled on the robot, to ensure you have gotten a connection
5. SSH into the robot using "ubuntu@ip_address" pwd: turtlebot
6. Change the ROS_DOMAIN_ID in your .bashrc file to the one written on the robot
(Change it in a separate terminal to step5. Change the bashrc on your ubuntu vm not the robot!!!!!!)
7. Run "bash"
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9. Check "ros2 topic list" to ensure that robot topics are connected
10. Follow the rest of the tutorial.