

2.3 Software Setting

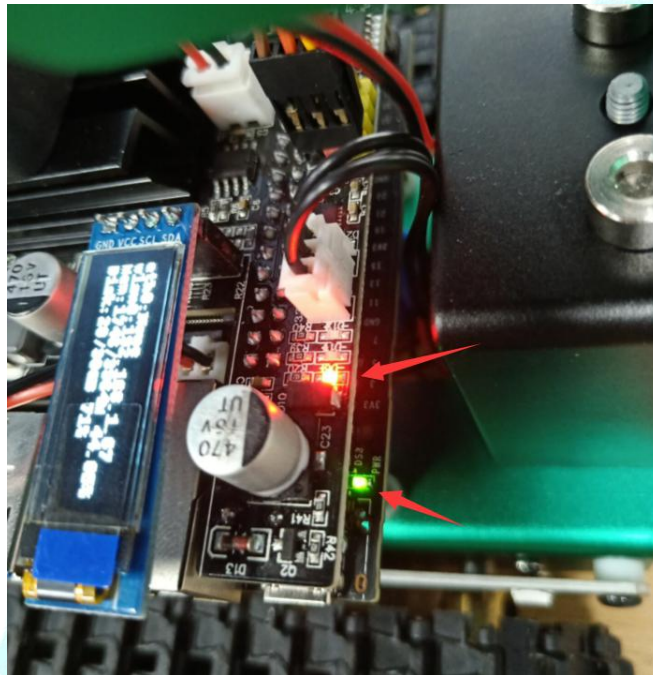
1. Connecting to Jetbot by headless (head-free) mode

In this mode, your Jetson Nano Developer Kit connects directly to your computer via a USB cable. No need network connection on the Jetbot and the need to determine the IP address on the network.

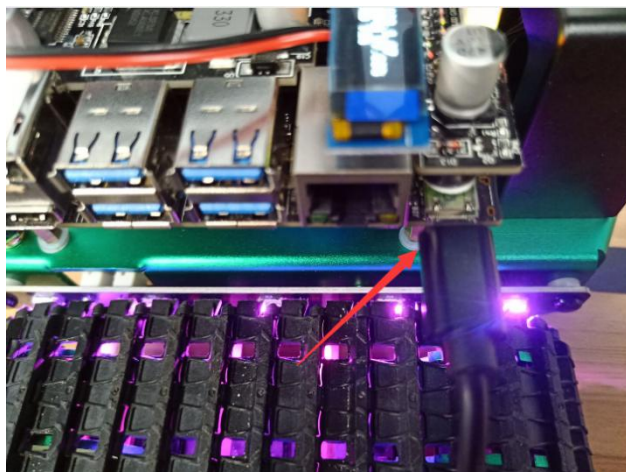
It is always in this mode 192.168.55.1:8888. This means you can't connect your monitor directly to the Jetson Nano Developer Kit. This approach saves memory resources on the Jetson Nano and eliminates the need for additional hardware (monitors, keyboards, and mice).

Steps of headless mode

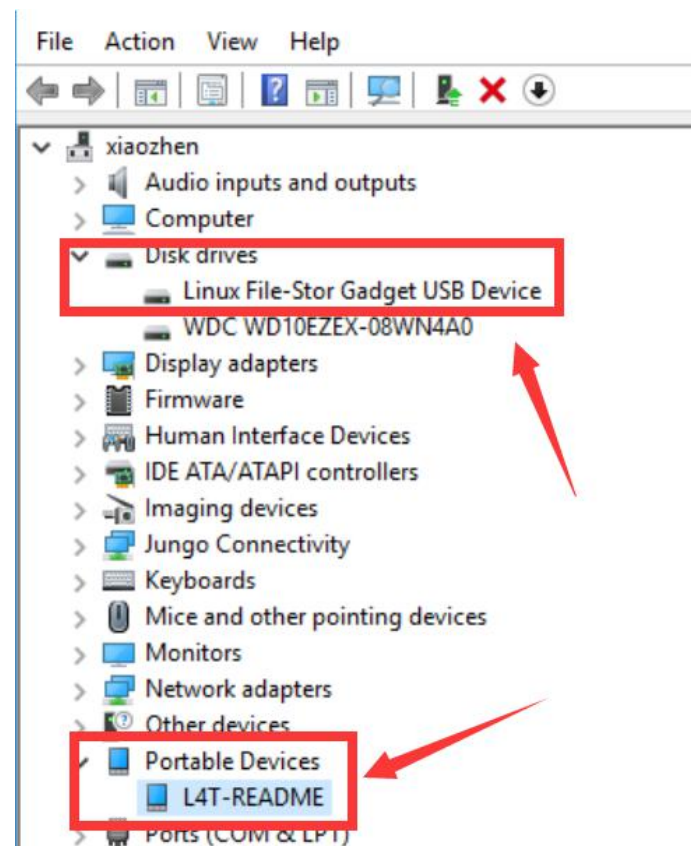
① You need to open the power switch of robot car. You will see the cooling fan will rotate, and you will see some LED light on the Jetson NANO or expansion board, as shown below.



② Connect robot car to your computer by USB cable, as shown below.



③Wait patiently for a while. After the system is successfully booted, the PC will appear with the following device and a drive for communication between the two parties - **Linux File-Stor Gadget USB Device**.

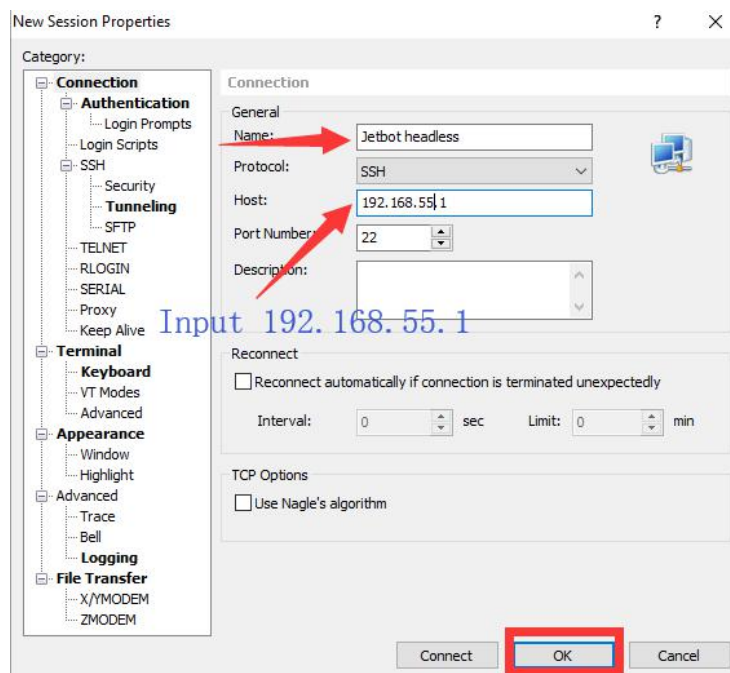
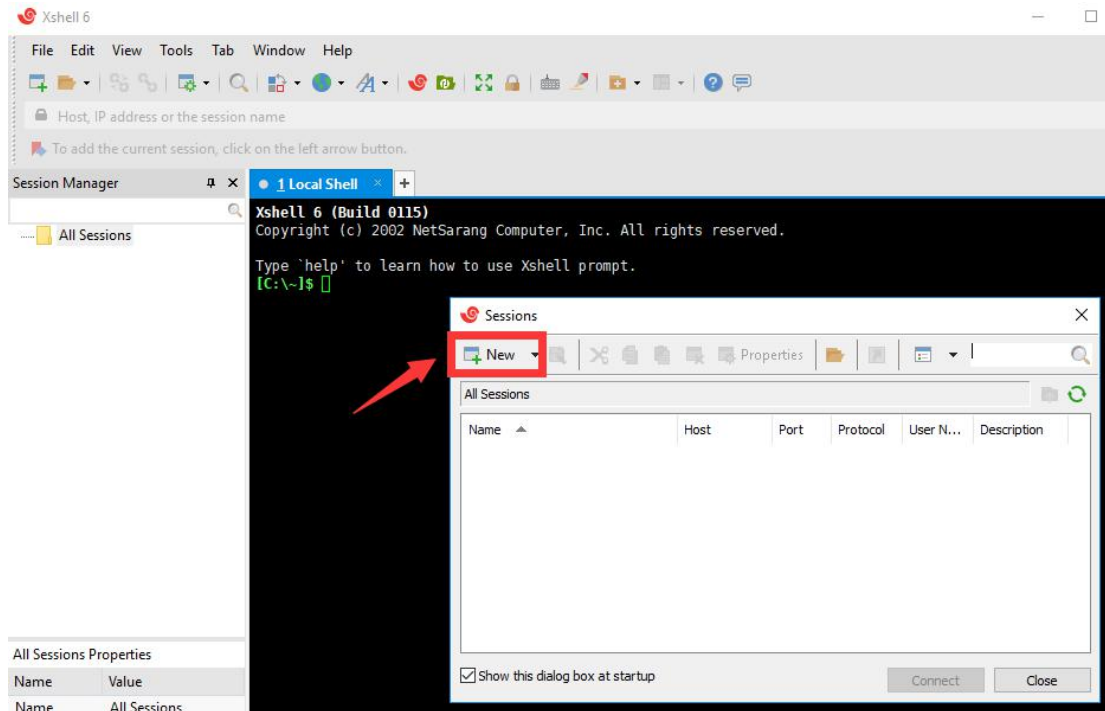


!Note: You must first turn on the power switch of car, then connect to your computer by USB cable.

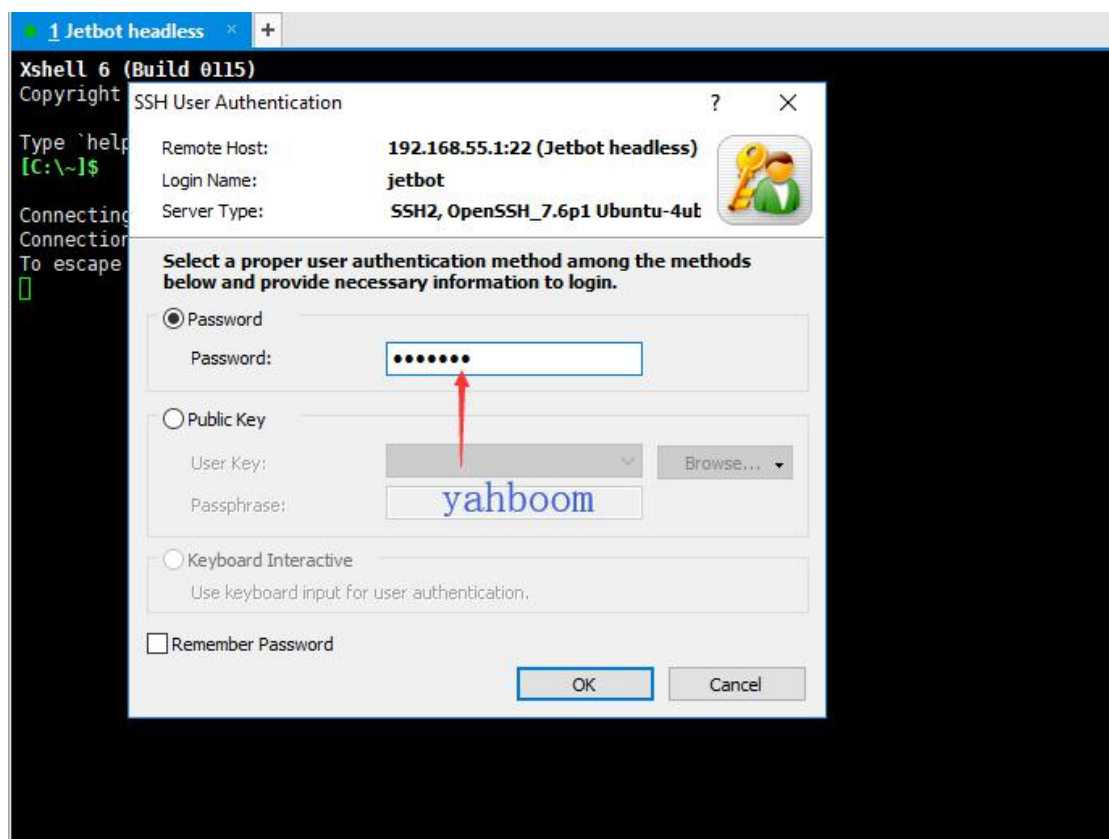
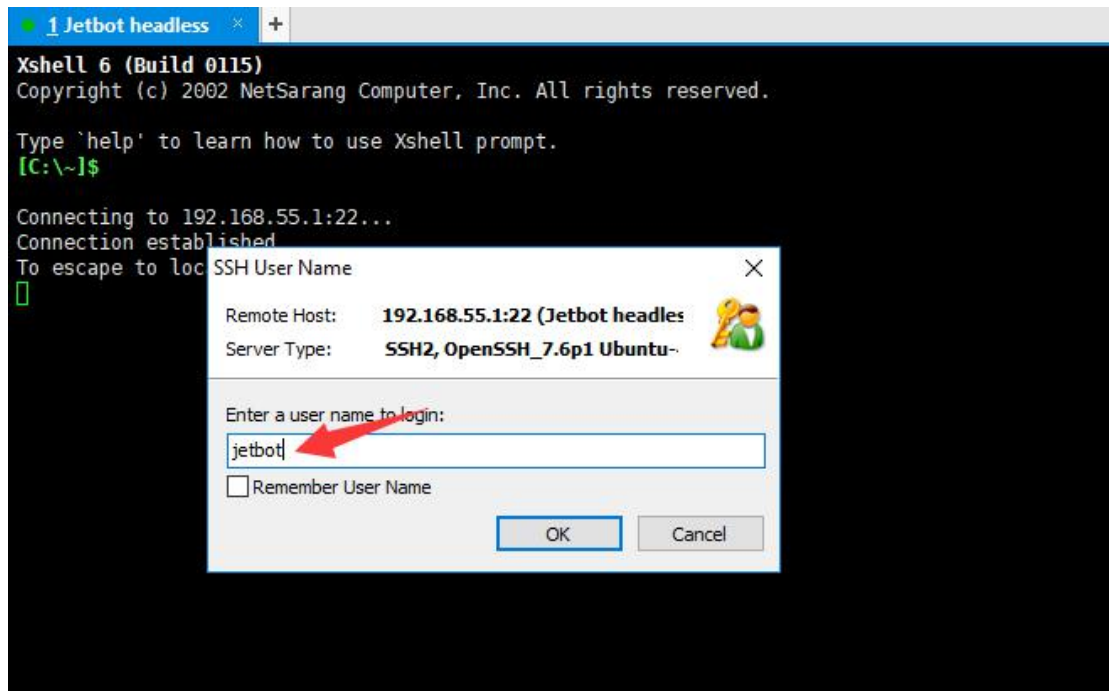
After the above device appears on the PC, we can connect to Jetbot through Xshell/Putty without connecting to the network. The host number is fixed IP address **192.168.55.1**.

You can log in normally by entering the corresponding username and password of Jetbot.

As shown below(by Xshell):



User name :jetbot
Password: yahboom




```

Xshell 6 (Build 0115)
Copyright (c) 2002 NetSarang Computer, Inc. All rights reserved.

Type 'help' to learn how to use Xshell prompt.
[D:\~]$

Connecting to 192.168.1.67:22...
Connection established.
To escape to local shell, press 'Ctrl+Alt+J'.

Welcome to Ubuntu 18.04.2 LTS (GNU/Linux 4.9.140-tegra aarch64)

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

This system has been minimized by removing packages and content that are
not required on a system that users do not log into.

To restore this content, you can run the 'unminimize' command.

0 个可升级软件包。
0 个安全更新。

Last login: Tue Sep  3 11:04:52 2019 from 192.168.1.132
jetbot@jetbot:~$ |

```

2. Jetbot connect WIFI

2.1 Method 1:

Connect to the PC using the "headless mode" to configure the connection by command line.

Follow the steps to connect Jetbot to the WIFI network using the following command:

```
nmcli dev wifi
```

```

jetbot@jetbot:~$ nmcli dev wifi
IN-USE SSID MODE CHAN RATE SIGNAL BARS SECURITY
Yahboom1_2.4G 红外 11 270 Mbit/s 100 WPA1 WPA2
Yahboom_warehouse 红外 11 405 Mbit/s 89 WPA1 WPA2
TPGuest_2101 红外 11 405 Mbit/s 87 WPA1 WPA2
Yahboom1_5G 红外 161 270 Mbit/s 70 WPA1 WPA2
Yahboom_WIFI 红外 2 65 Mbit/s 69 --
Yahboom 红外 1 405 Mbit/s 64 WPA1 WPA2
ChinaNet-jDzS 红外 1 270 Mbit/s 64 WPA1 WPA2
XXX 红外 1 130 Mbit/s 64 WPA2
dct 红外 11 195 Mbit/s 64 WPA1 WPA2
ChinaNet-mjSn 红外 5 130 Mbit/s 62 WPA1 WPA2
ChinaNet-pcJz 红外 9 130 Mbit/s 62 WPA1 WPA2
Yahboom_warehouse 红外 161 405 Mbit/s 62 WPA1 WPA2
-- 红外 6 270 Mbit/s 59 WPA2
DIRECT-05-HP DeskJet 2600 series 红外 11 65 Mbit/s 59 WPA2
-- 红外 4 130 Mbit/s 57 WPA1 WPA2
hahahahah 红外 153 405 Mbit/s 57 WPA1 WPA2
Xiaomi_9EE1 红外 8 130 Mbit/s 52 WPA1 WPA2
hahahahah 红外 6 405 Mbit/s 50 WPA1 WPA2
MERCURY_8D1C 红外 6 270 Mbit/s 50 WPA1 WPA2
空白 红外 1 270 Mbit/s 49 WPA2
ChinaNet-dct 红外 1 130 Mbit/s 49 WPA1 WPA2
-- 红外 6 270 Mbit/s 49 WPA2
406-5G 红外 36 270 Mbit/s 47 WPA1 WPA2
Piano 红外 157 270 Mbit/s 47 WPA2
-- 红外 1 270 Mbit/s 45 WPA2
FAST_6AFC08 红外 1 135 Mbit/s 45 WPA1 WPA2
HUAWEI mate20 5G 红外 1 270 Mbit/s 44 WPA1 WPA2
704 红外 1 135 Mbit/s 44 WPA1 WPA2
ChinaNet-SFcY 红外 1 130 Mbit/s 44 WPA1 WPA2
JUIYING 红外 6 270 Mbit/s 44 WPA2
Yahboom5G 红外 149 405 Mbit/s 44 WPA1 WPA2
REX 红外 1 270 Mbit/s 42 WPA1 WPA2
TP-LINK_CC58 红外 149 270 Mbit/s 42 WPA1 WPA2
5016 红外 1 270 Mbit/s 40 WPA1 WPA2
-- 红外 9 270 Mbit/s 37 WPA2

```

Yahboom

Input following command to connect WIFI:

```
sudo nmcli dev wifi connect wifi_name password 12345678
```

```
[sudo] jetbot 的密码:
成功用 'wlan0' 激活了设备 '612a9c73-8e52-4be7-86ea-c237b7d6e4c9'。
jetbot@jetbot:~$
```

Yahboom

View the IP address after connecting to WIFI:

```
ifconfig
```

```
lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    inet6 ::1 prefixlen 128 scopeid 0x10<host>
    loop txqueuelen 1
    RX packets 419 bytes 29517 (29.5 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 419 bytes 29517 (29.5 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

rndis0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet6 fe80::6f:73ff:fe5b:64d5 prefixlen 64 scopeid 0x20<link>
    ether 02:6f:73:5b:64:d5 txqueuelen 1000
    RX packets 739 bytes 66313 (66.3 KB)
    RX errors 0 dropped 4 overruns 0 frame 0
    TX packets 276 bytes 57729 (57.7 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

usb0: flags=4099<UP,BROADCAST,MULTICAST> mtu 1500
    ether 02:6f:73:5b:64:d7 txqueuelen 1000
    RX packets 0 bytes 0 (0.0 B)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 0 bytes 0 (0.0 B)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

wlan0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 192.168.1.196 netmask 255.255.255.0 broadcast 192.168.1.255
    inet6 fe80::6f:73ff:fe5b:64d5 prefixlen 64 scopeid 0x20<link>
    ether 34:13:e8:62:93:78 txqueuelen 1000
    RX packets 2132 bytes 522738 (522.7 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 396 bytes 89275 (89.2 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

jetbot@jetbot:~$
```

IP address

Yahboom

Connect Jetbot by new IP address, Input the command on the PC to control it.:

```
ssh -p 22 jetbot@192.168.1.196
```

```
jetbot@jetbot:~$ ssh -p 22 jetbot@192.168.1.196
The authenticity of host '192.168.1.196 (192.168.1.196)' can't be established.
ECDSA key fingerprint is SHA256:f7YjHYsiVWYKx+/YSzBP3MPeunhVVJZWGxHosxlhRU4.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '192.168.1.196' (ECDSA) to the list of known hosts.
jetbot@192.168.1.196's password:
Welcome to Ubuntu 18.04.2 LTS (GNU/Linux 4.9.140-tegra aarch64)

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

This system has been minimized by removing packages and content that are
not required on a system that users do not log into.

To restore this content, you can run the 'unminimize' command.

0 个可升级软件包。
0 个安全更新。

Last login: Tue Sep 17 11:51:57 2019 from 192.168.55.100
jetbot@jetbot:~$
```

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2.2 Method 2:

Connect Jetbot to the HDMI screen and configure it on the graphical interface using the mouse and keyboard.

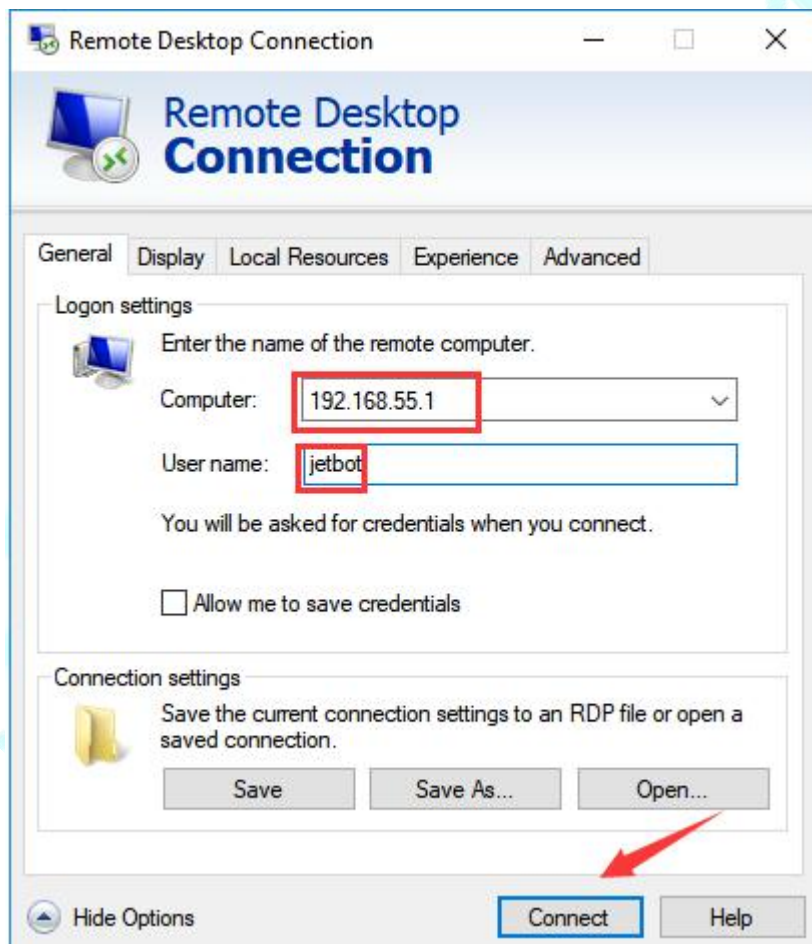
2.3 Method 3:

Use Windows to log in to Remote Desktop/VNC Remote Desktop.
Before that, you must open the VNC service of Jetson NANO.
If you use new_version image we provided, you need to Input following command to open VNC service.

`./openvino`

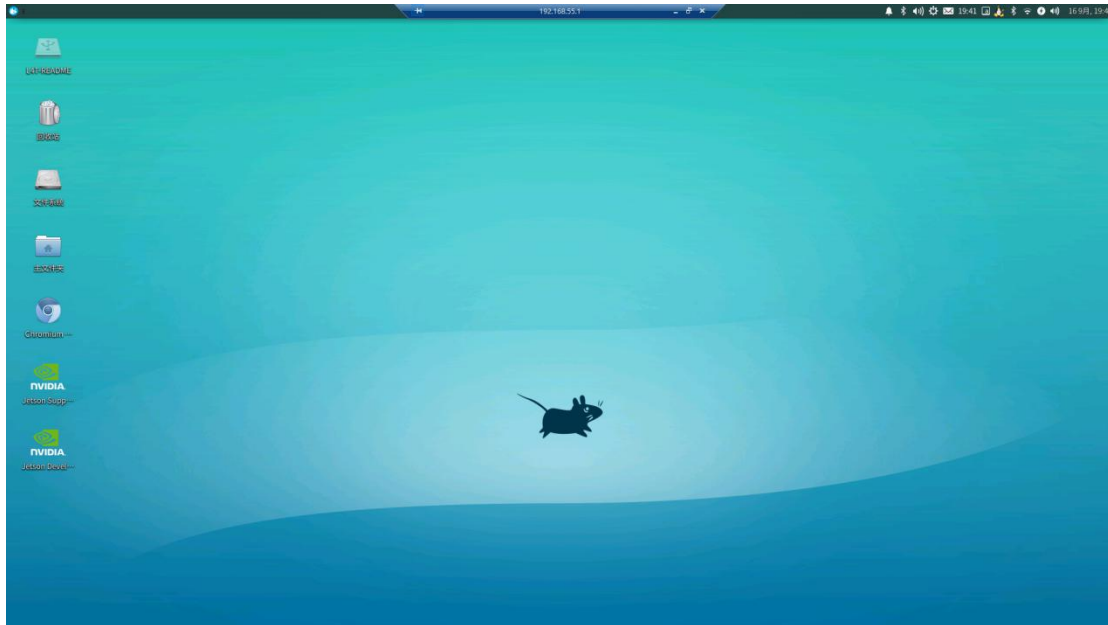
1) We can connect PC by “headless mode” and find the remote login application in the PC.





2) Then, click “connect”.

After a successful connection, we can see the interface shown below.

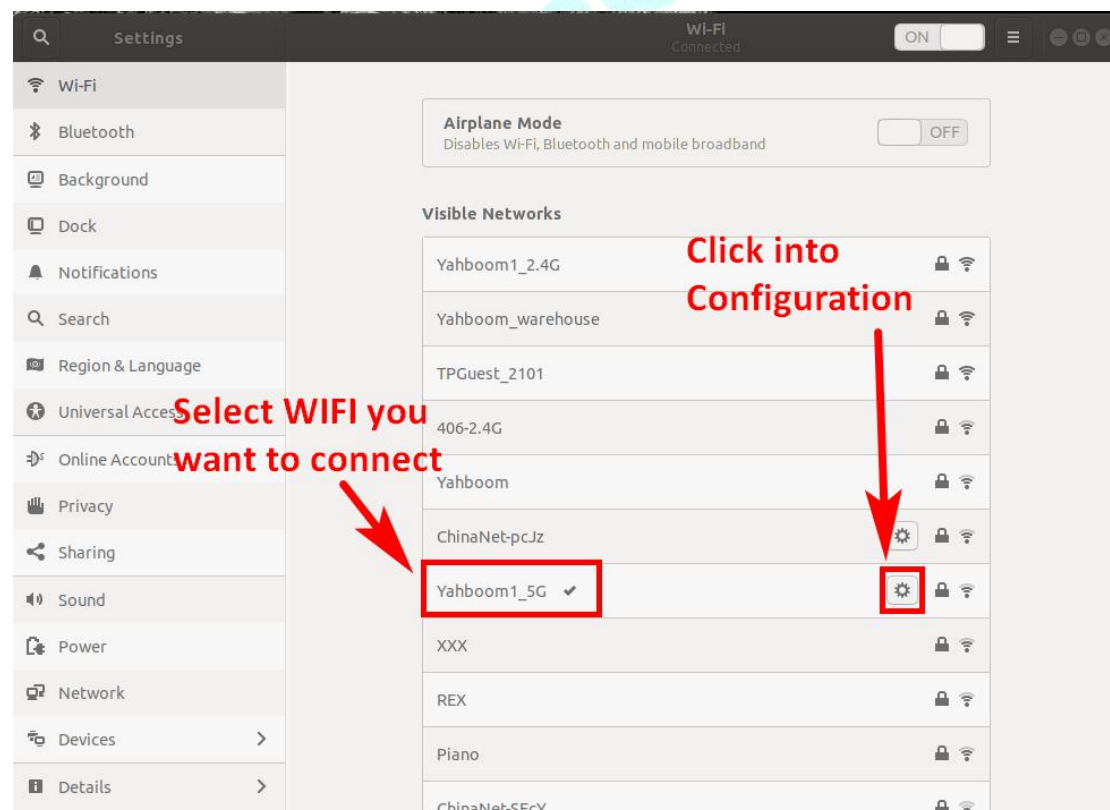


Because it is a third-party desktop, you need to enter a password when operating key information such as wifi configuration.

3) After entering the password, we can go to the wifi icon in the upper right corner to configure the wifi.

Set static IP:

Enter the connected wifi to setting:



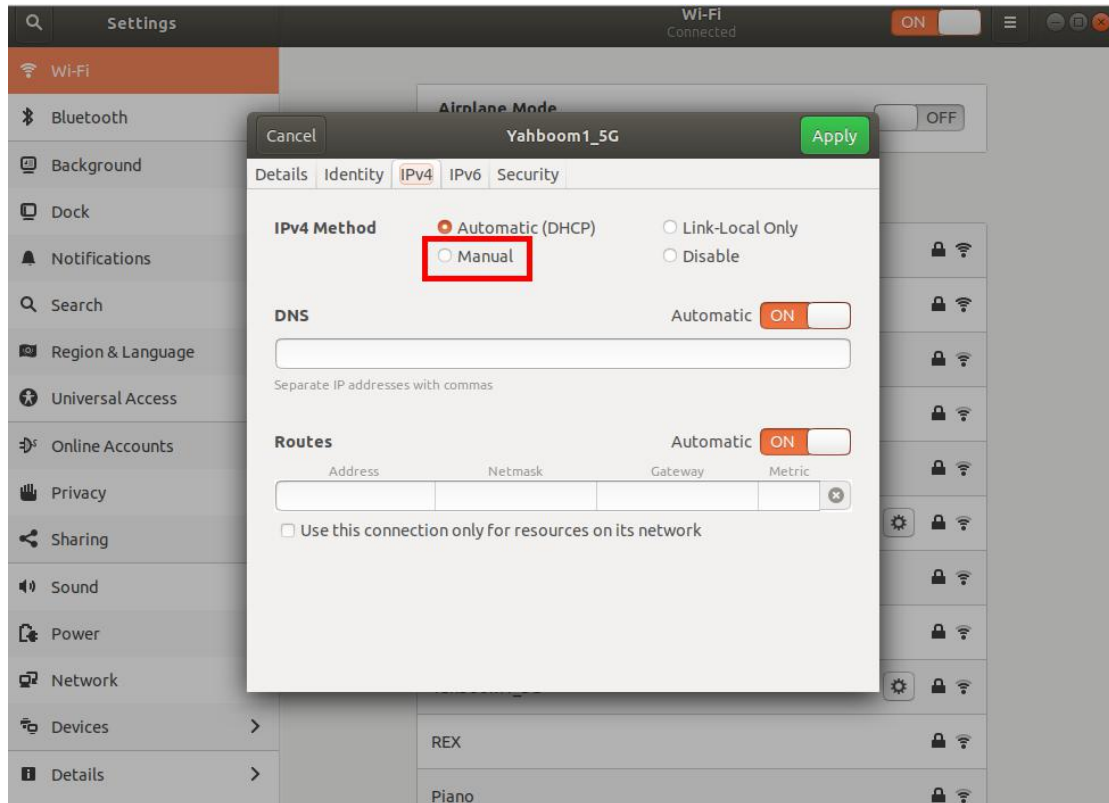
4) Set the IP address you need to set.

!Note: This IP address should not be occupied by other devices.

5) Enter the subnet mask, the default is 255.255.255.0.

6) Enter the gateway, which is usually 192.168.1.1.

The above gateway and subnet mask are subject to your actual network environment, and only the reference is provided above.



3. Update software package

Input this command to update software source:

```
sudo apt-get update
```

Input this command to update software package installed:

```
sudo apt-get full-upgrade
```

4. Configuring power mode

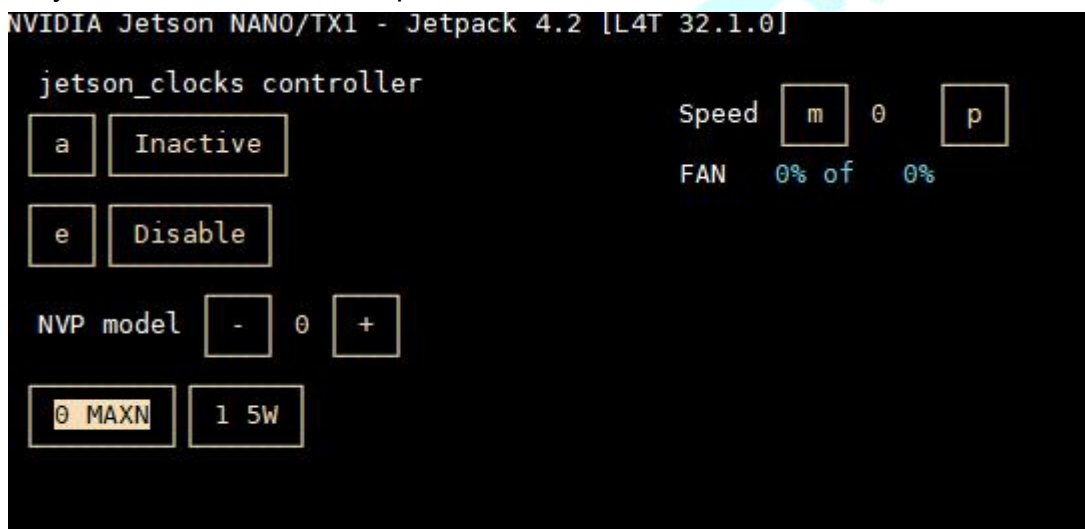
Jetbot has two power modes: 5W mode and MAXN mode.

We can see the current power mode in Jtop by the section 2.1:

The current power mode can be seen in the second interface --- GPU.



Or you can see the current power mode in the third interface -- CTRL.



The biggest difference between the two power modes is:

When in the m0-MAXN mode, the four cores CPU1, CPU2, CPU3, and CPU4 are all turned on; **(High-Performance mode)**

When in the m1-5W mode, only CPU1 and CPU2 of the four core CPU1, CPU2, CPU3, and CPU4 will run, and CPU3 and CPU4 will sleep. At this time, only the CPU performs data processing. **(Low power consumption mode)**

So when it is in 5W power mode, it will be much slower than m0-MAXN mode. If you don't pursue long battery life, it is recommended to use MAXN mode to enjoy the high performance brought by Jetbot.

We can also use the following command line to view the current power consumption mode.

```
sudo nvpmodel -q
```

```
jetbot@jetbot:~$ sudo nvpmodel -q
[sudo] jetbot 的密码:
NV Power Mode: MAXN
0
jetbot@jetbot:~$
```

Input this command to switch mo-MAXN mode:

```
sudo nvpmodel -m0
```

Input this command to switch m1-5W mode:

```
sudo nvpmodel -m1
```

(Especially when we train the AI model, switching to high performance mode can improve computing performance.)