Lesson 3 Remote Desktop Connection

1. Getting Ready

This section applies to the scenario where the Raspberry Pi 4B does not have a separate display to connect. You need to configure the Wi-Fi network before booting the Raspberry Pi, and then log in remotely via SSH or VNC.

SSH is a network protocol (the default port number is 22), used for encrypted login between computers, and remote control through the command line. VNC remotely controls in the form of a graphical desktop. Users can choose according to their own needs.

Note: The use of VNC must be based on SSH. It can be used by enabling the configuration service (the system turns off the VNC service by default), so SSH cannot be achieved directly (unless there is another screen for the Raspberry Pi 4B). The method in this section is for reference only.

Before starting, please the prepare the following tools:

1) Smart Phone

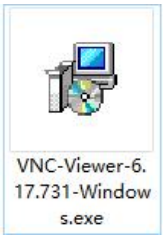
2) Computer (Laptop is best or a desktop computer with a USB wireless network card)

3) Card reader and SD card with Raspberry Pi system image

4) Putty tool (for the remote log in tool, please go to the folder “5.Appendix/3.Tools/3. Remote Connect Tool”)

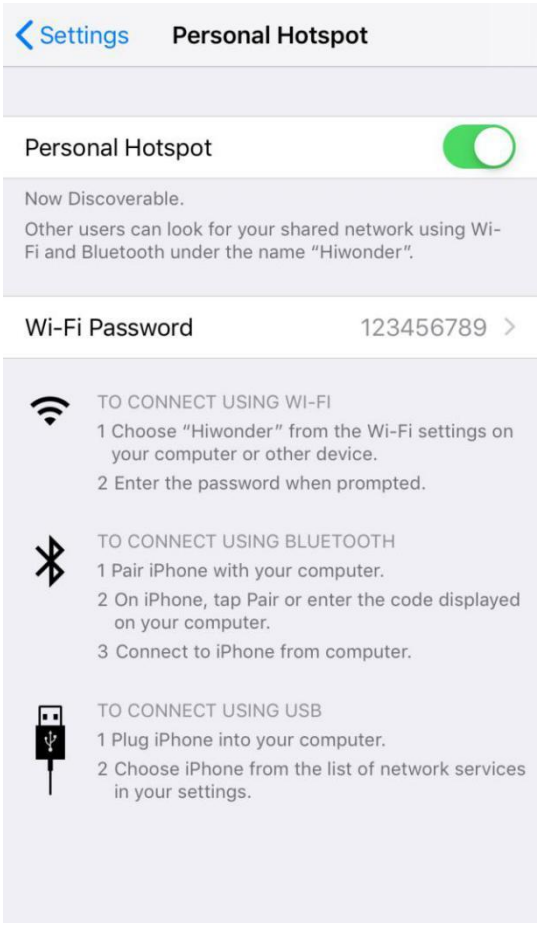
putty-64bit-0.72-installer.msi

5) VNC Tool (for the remote Desktop connect tool, please go to the folder “5.Appendix/3.Tools/3. Remote Connect Tool”)

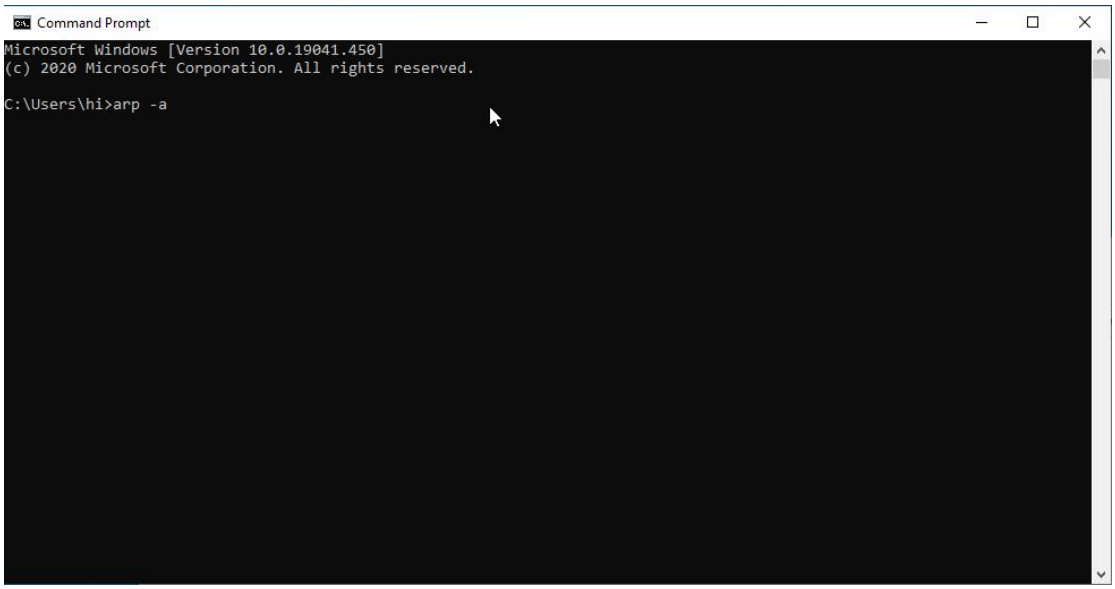


2. Operation Steps

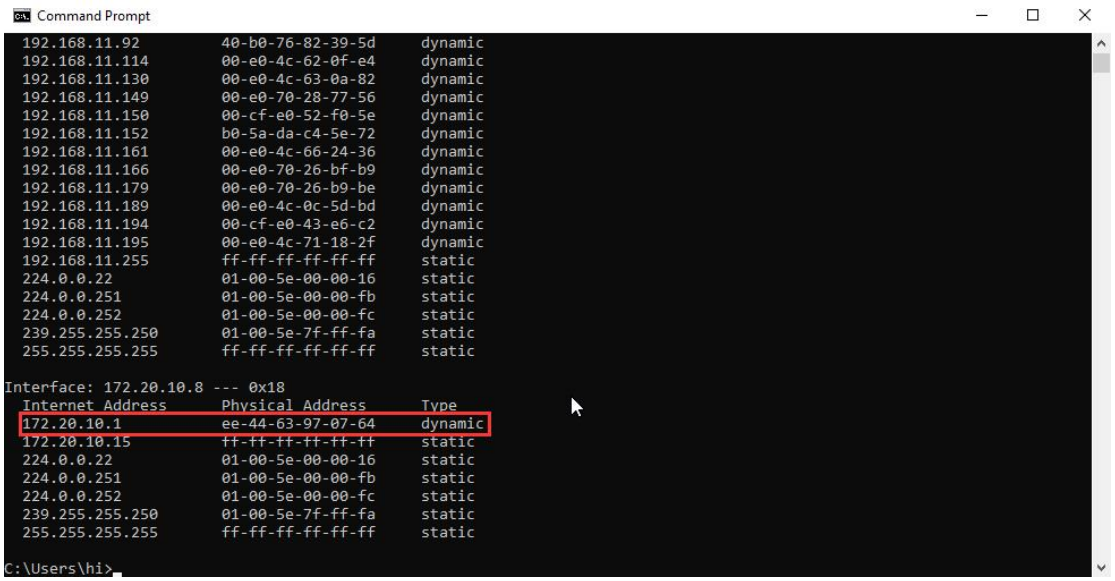
1) Establish a hotspot with your smart phone. Hotspot name is Hiwonder and the password is 123456789.



2) Connect the computer to the hotspot established just now. After connecting, enter "CMD" to open the command prompt. Then input “arp -a” command to check the new computer IP.



Computer IP checking



Computer IP after connecting

3) Insert the card reader into the computer and click "boot" drive letter, which is the "/boot" directory of the Raspberry Pi.

4) Use the Notepad tool to fill in the content according to the following reference format, and then name it "wpa_supplicant.conf " (Tip: Enter the content, save and exit the file first, then rename the file name. You need to

replace all file names including txt with the name above. If there is a pop-up prompt, select "Yes"), and then save it to the "boot" drive letter.

```
country=US
ctrl_interface=DIR=/var/run/wpa_supplicant GROUP=netdev
update_config=1

network={
ssid="Hiwonder"
psk="123456789"
key_mgmt=WPA-PSK
priority=1
}
```

#ssid：Wi-Fi name, take “Hiwonder” as example.

#psk：Wi-Fipassward, take “123456789” as exampe.

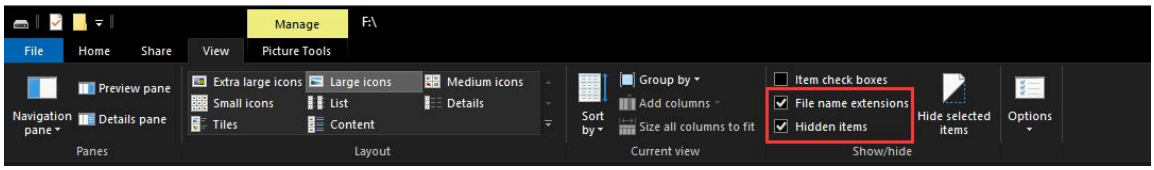
Most Wi-Fi generally uses WPA encryption. If your Wi-Fi with WEP encryption, please modify the code to:

```
network={
ssid="Your Wi-Fi name （ssid）"
key_mgmt=NONE
wep_key0="Your Wi-Fi password"
}
```

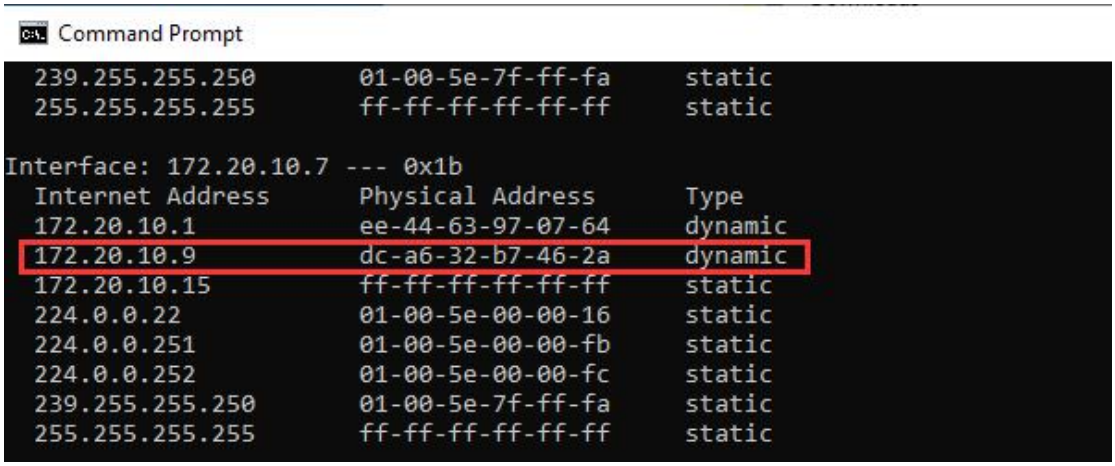
5) Raspberry Pi disables the ssh service by default, so you need to create a file to start this service. Please follow the method in the previous steps to create another new file named "ssh" (lower case and no txt as the suffix). The content can be empty.

6) We can click “File name extensions” and “Hidden items” to check whether

the suffix name meets the requirements

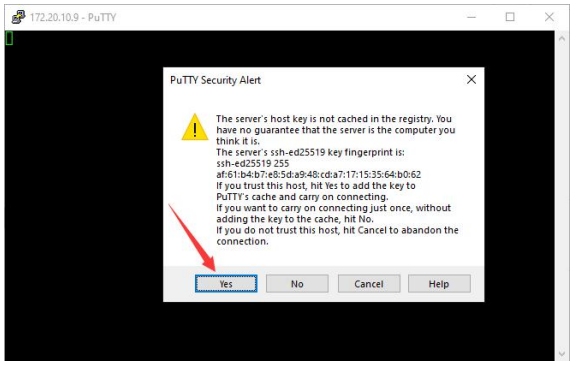


7) Start the Raspberry Pi and wait for the boot to complete. If the phone receives a new device connection, it proves that the Raspberry Pi is successfully connected. Then use the CMD command line to check the IP of the Raspberry Pi. Enter the "arp -a" command again, you can find that there is a dynamic IP address "172.20.10.9" (example IP), which is the IP address of the Raspberry Pi.



3. SSH Operation

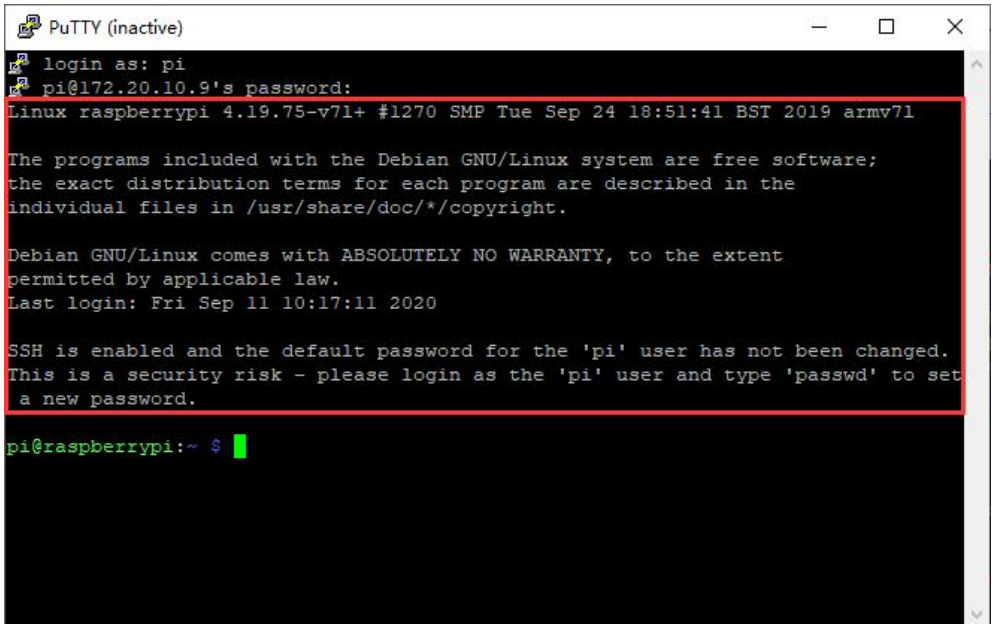
1) Open the Putty software, enter the recorded Raspberry Pi IP "172.20.10.9", and remain the computer and Raspberry Pi under the same network. A security pop-up warning will appear when logging in for the first time, just click the "Yes".



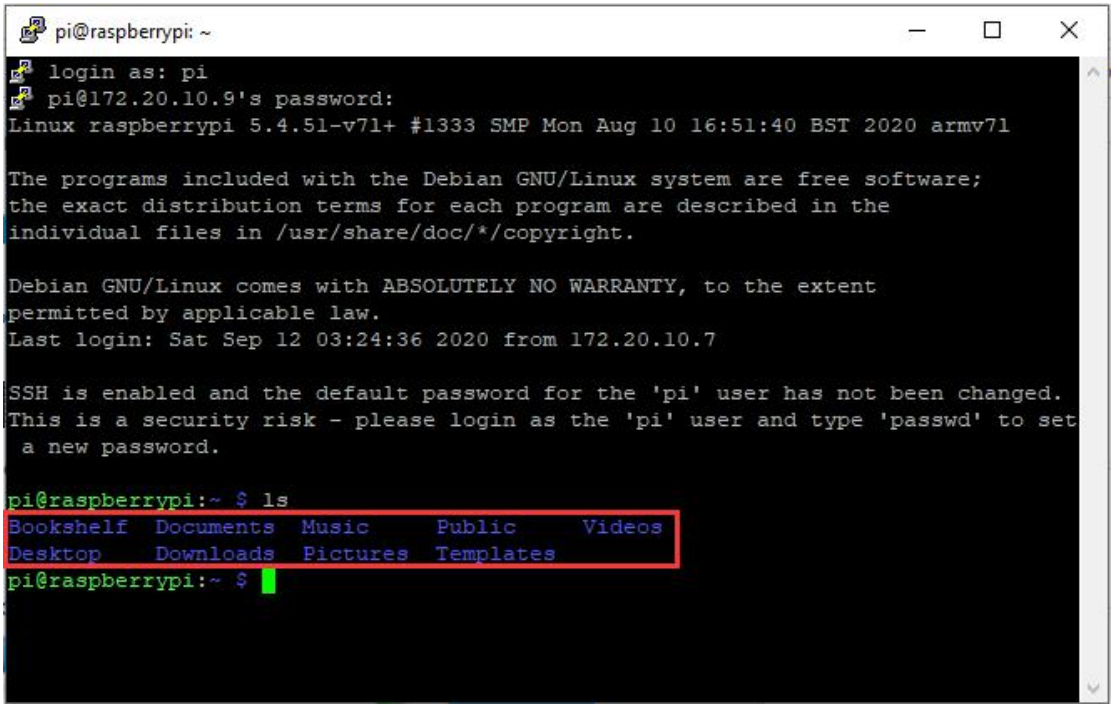
2) Enter account name and password in the pop-up window and then press “Enter”. The default name is pi and the password is raspberry. Please note that there will be no visual display when you enter the password. If the password is wrong, the prompt shown below will appear.

Fail to log in

3) After entering the password successfully, the system interface is shown in the figure below:



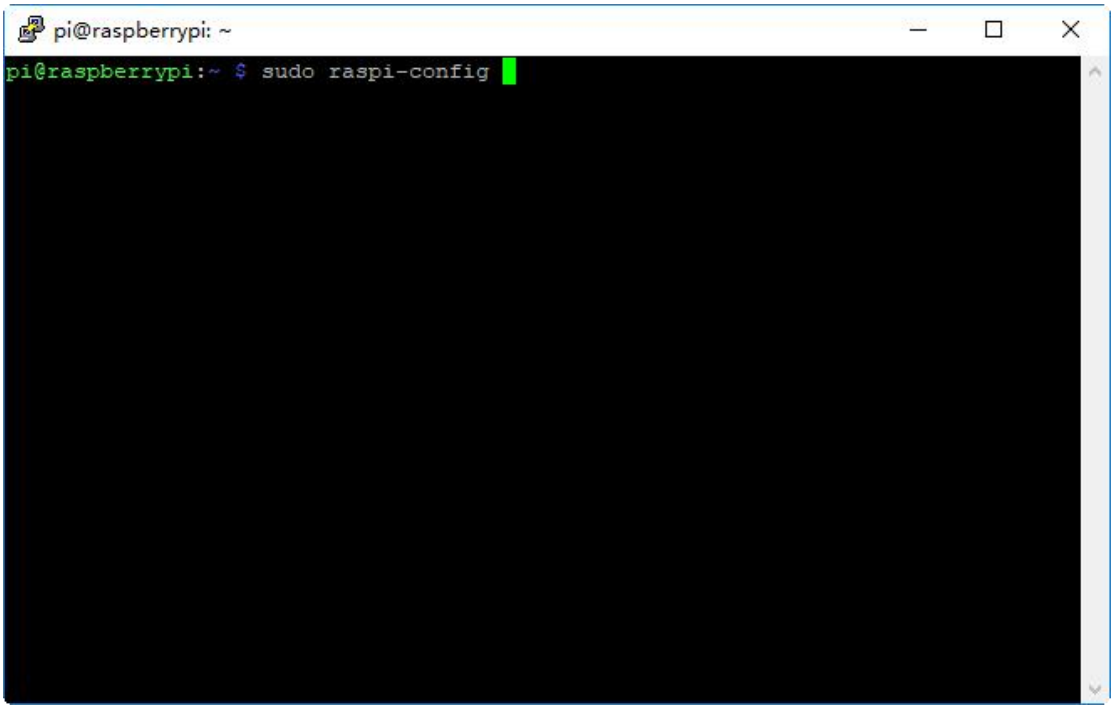
4) In the Raspberry Pi system, we can control with the command line. Check the file with the “ls” command.



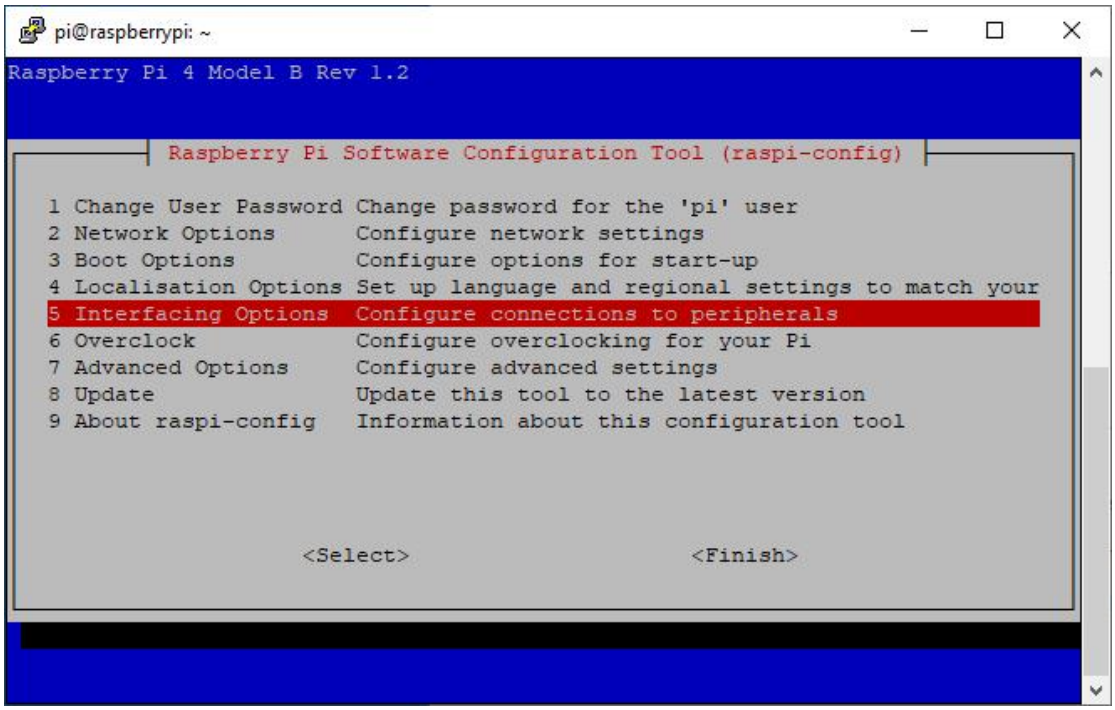
4. VNC Operation

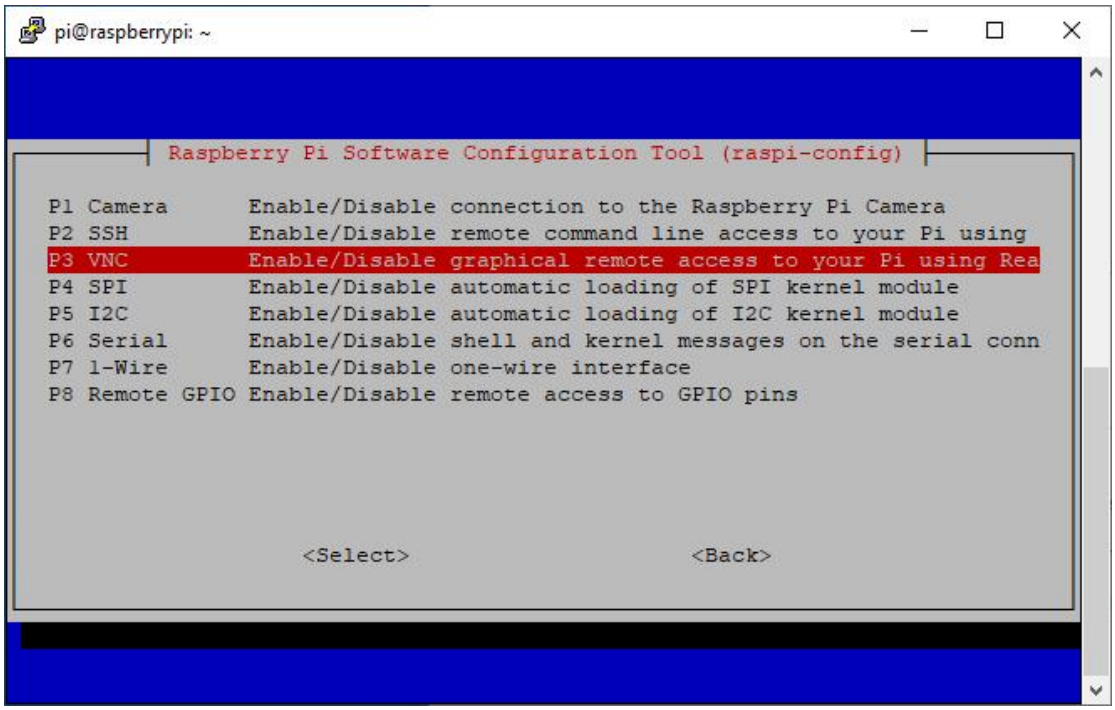
If you are unfamiliar or unaccustomed to command line control, you can remotely control the Raspberry Pi through another screen (your computer), which likes the Windows operation interface through a graphical desktop.

1) Enter “sudo raspi-config” in the SSH interface to go into the configuration interface.

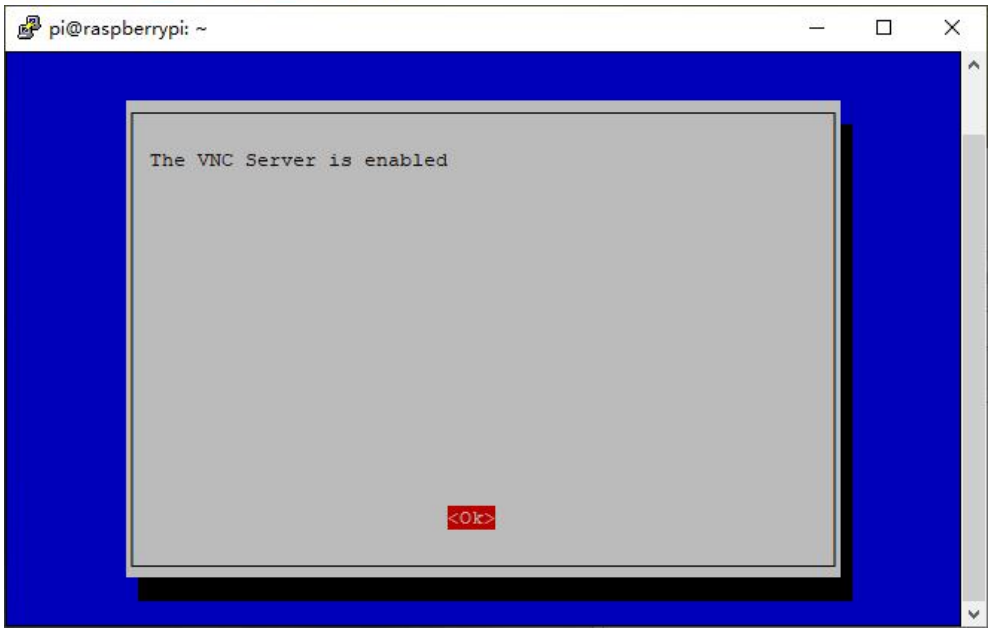


2) In this interface, you can select with “↑↓” key, confirm with “Enter” and back to last step with “Esc”.





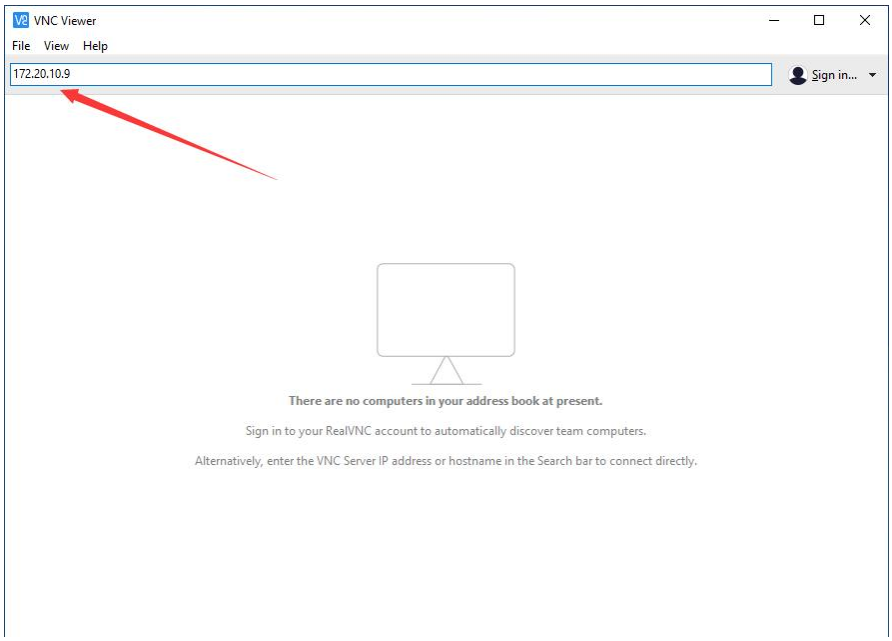
Start VNC service



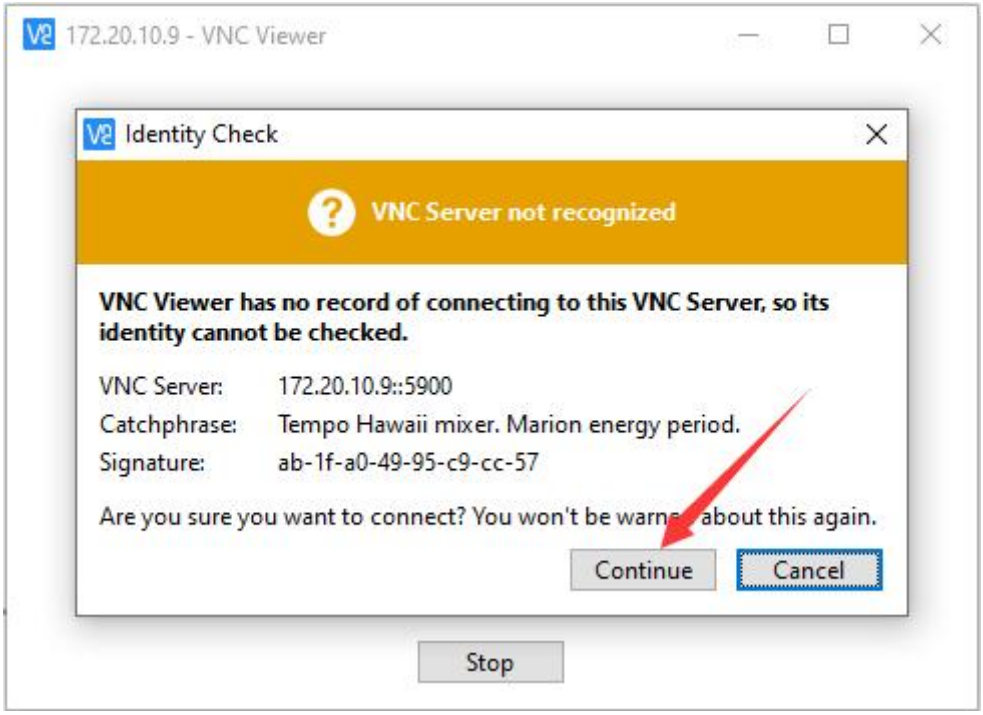
3) As shown in above figure, the VNC service prompt is successfully started. Press the “Enter” key to click "OK", and then the screen will automatically return to the main configuration interface/ Press the "Esc" key to exit.

4) Exit Putty and open the installed VNC.

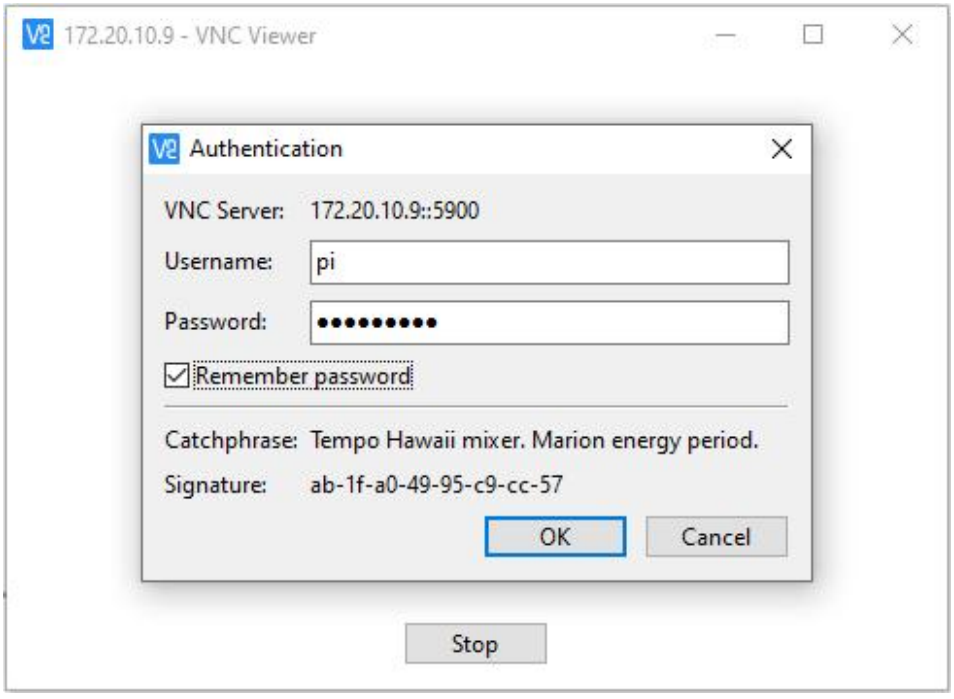
5) Enter Raspberry Pi IP “172.20.10.9” in the VNV Viewer and press “Enter”. Click "Continue" if prompted that it is not a secure connection.

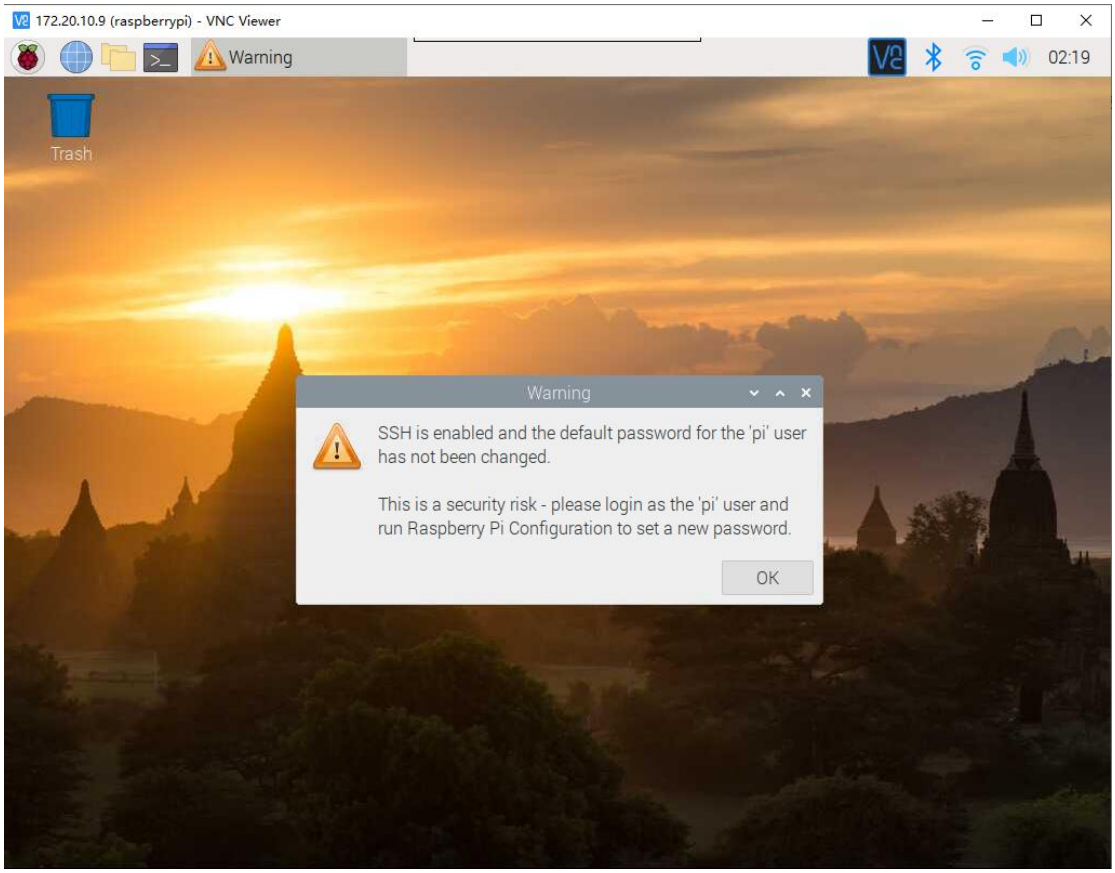


Enter IP in VNC



6) Enter password “raspberry” in the prompt window. If you’re required to fill the account, please enter “pi”. Check the remember password box, and then click "OK" to remotely open the desktop of Raspberry Pi. (If it is a black screen with only a mouse pointer, you can try to repeat the above operation after restarting the Raspberry Pi.)




172.20.10.9 (raspberrypi) - VNC Viewer
Warning
02:19
Trash
Warning
SSH is enabled and the default password for the 'pi' user has not been changed.
This is a security risk - please login as the 'pi' user and run Raspberry Pi Configuration to set a new password.
OK