

EC5350 User Manual_V2.0

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EC5350 Series AI Edge Computer

User Manual

Version 1.0, September 2024

www.inhand.com



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1 General Introduction

1.1 Introduction

The EC5350 comes pre-integrated with NVIDIA® Jetson Orin NX™ or Orin Nano™, making it ideal for industrial AI applications. The EC5350 design includes 2 Gigabit LAN ports, 1 HDMI video display, 6 external USB 3.2 ports, 2xRS-232/RS-422/RS-485, 1 power indicator, 1 system status light, 2 GMSL video interfaces, 4 DI, 4 DO, 1 CAN FD, 2 SIM card slots, 1 USB Type C for system burn-in, 1 TF card slot, 1 reboot (hardware watchdog

enable) button, 1 restore mode button, and 1 linear output connector and microphone connector.

1.2 Product Features

1.2.1 Ethernet

2 x 10 / 100 / 1000 Mbps

1.2.2 Peripheral & I/O

2 x RS-232/422/485 switchable serial interfaces with DB9 connectors

4 x DI, Optocoupler isolation, supporting dry and wet nodes.

4 x DO, Optocoupler isolation, supporting 60 VDC sink voltage, 1.3 A max sink current

2 x USB 3.2 with ≤ 15 W drive capacity each

4 x USB 3.2 with ≤ 4.5 W drive capacity each

1 x USB 2.0, Type-C for system restore only

1 x HDMI 2.0 with maximum resolution of 3840 x 2160 @60Hz

2 x SIM card slots, supporting 1.8/3V SIM/UIM cards, built-in 15KV ESD protection, uses standard SIM cards

2 x SMA antennas for cellular modules, 2 x PR-SMA antennas Wi-Fi/BT modules

2 x LEDs, 1 for power indication, 1 for system status indication

1 x Micro-SD card slot for Micro-SD card expansion

1 x CAN FD up to 5Mbps

2 x flick switch buttons, 1 for reboot (enable/disable hardware watchdog), 1 for system restore

2 x GMSL 2.0 FAKRA connectors

1 x MIC, 3.5mm microphone audio jack

1 x Audio, 3.5mm line-out

1.2.3 Internal System Interfaces

1 x Trusted Platform Module, TPM 2.0

1 x NVME SSD

1 x Wi-Fi, supporting Wi-Fi 5

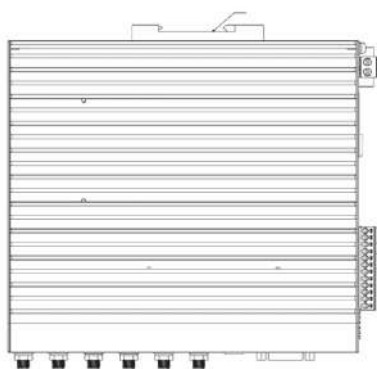
1 x Cellular module with 4G support

1 x RTC, powered by a button cell battery

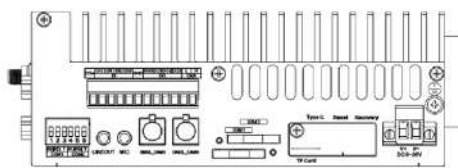
1.3 Mechanical Specifications

Standard Size: 180.0 x 160.0 x 60.0 mm

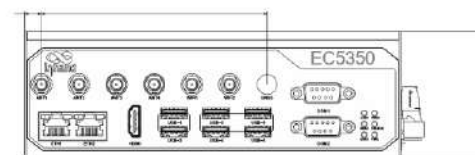
Reference Weight: 1.65 kg (excluding package and power adapter)



Front View



Side View



Interface Diagram

1.4 Electrical Specifications

Power Type: AT

Power Input: DC 9–36 V, Max Power: 60W. The input power should be less than 100W.

1.5 Environmental Specifications

Operating temperature: –20 ~ 60°C

Operating humidity: 95%@40°C (non–condensing)

Storage temperature: –40 ~ 85°C

2. System Interface Information

2.1 Interfaces

2.1.1. Power Indicator

The front panel is equipped with a power on/off indicator (red LED), which indicates the system power–on status. When the LED is on, it means the system is in the power–on state, and when the LED is off, it means the system is in the power–off state.

2.1.2 System Status LED

The front panel is equipped with a system status light (green LED), which indicates the system operation status. When the LED flashes (frequency 1Hz), it means that the system is operating normally, and the LED is off, which means that the system is not operating.

2.1.3 Serial Port

The device provides 2 RS–232/422/485 serial ports, the function definition is described in the following table.

2.1.4 USB 3.2 Gen2

The device provides 2 USB3.2 Gen 2 with maximum power 15W and 4 USB3.2 Gen 2 with maximum power 4.5W. When multiple USBs are working at full load, please choose 12V (or above)/120W (or above) power adapter to use according to the total load.

2.1.5 HDMI 2.0

The device provides a Type–A HDMI 2.0 connector on the front panel for external screens. The maximum resolution is 3840 x 2160 @60Hz.

2.1.6 Ethernet(WAN/LAN)

The device provides two network interfaces on the front panel, each with two LEDs above it. The green LED indicates the network connection rate, the green LED lights up when the network is Link up at a rate of 1000Mbps, otherwise the green LED is off; the orange LED indicates the network communication situation, if there is a data communication when the network is Link up, the orange LED blinks, otherwise the orange LED is off.

Table 3: Networks

Green LED

OFF

ON

Blinking

1. No connection
2. Speed 10Mbps
3. Speed 100Mbps

Speed 1000Mbps

–

Orange LED

OFF

ON

Blinking

1. No connection
2. No activity on this port

–

Activity on this port

2.1.7 SMA

The front panel of the device provides up to 2 SMA connectors for 4G and 2 PR-SMA connectors for Wi-Fi&BT. Different models are equipped with different types and numbers of 4G/Wi-Fi&BT antennas. Users can select equipment according to their own needs. For the support status of antennas of specific models, please refer to the "Ordering Guide" section in the "EC5350 Series Edge AI Computer Product Specification".

2.1.8 Grounding Connection

There is 1 system grounding screw on the right panel of the equipment, please use a green-yellow grounding wire (16AWG) and ground it with the system grounding screw.

2.1.9 DC-IN Connector

When conducting DC connector wiring you should follow the below instructions:

1. Must be installed by a skilled person.
2. Use copper conductors only.
3. Choose appropriate wire diameter.
4. The voltage for the system is 9 VDC to 36 VDC.

2.1.10 Recovery Button

The device has a Recovery touch-switch button under the removable baffle on the right panel. When the system is running normally, press and hold Recovery for 10 seconds and wait for the system status light to change from blinking to always on and release it, the device will enter the system reset state (restoring the system to the factory state); press and hold the Recovery button and reboot the system (press Reset, reboot, or power-down reboot) before the system is powered on or during the system running, then the system will enter the burn-in mode.

2.1.11 Reset Button

The device has a Recovery touch-switch button under the removable baffle on the right panel, press and hold Reset for 3 seconds and release it during normal system operation, then the system will reboot and enable the hardware watchdog; press and hold Reset for 3

seconds and then release it during normal system operation, then the system will reboot and disable the hardware watchdog, please disable the hardware watchdog before the system is burned in, to prevent the hardware watchdog from restarting the system and leading to the failure of the burn-in process.

2.1.12 USB 2.0 Type-C

The equipment has a USB 2.0 Type-C connector under the removable baffle on the right panel for connecting to a host burning system in burn-in mode.

2.1.13 TF Card

The device has a TF card slot under the removable baffle on the right panel, which supports Micro SD memory cards. When there is a need for additional storage space, please insert a Micro SD card with a capacity of at least 8GB into this card slot for subsequent use.

2.1.14 SIM Card Slot

The device has 2 SIM card slots (SIM1/SIM2) on the right panel to support standard SIM cards, please insert at least 1 available SIM when using the cellular function.

2.1.15 CAN FD

The device has 1 CAN FD interface (on-board 120Ω resistor) on the right panel, supporting a maximum communication rate of 5Mbps.

2.1.16 Digital Outputs

The device has four isolated digital output connectors on the right panel in open–drain output mode.

The wiring method is as follows:

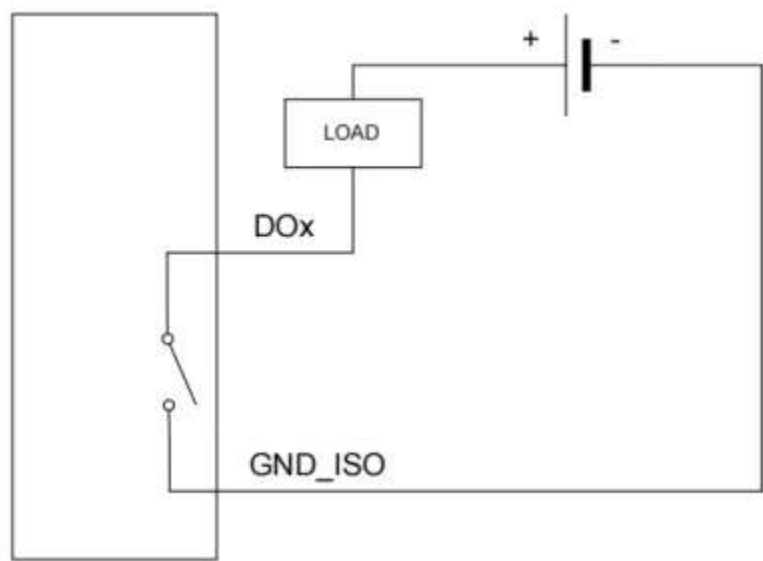


Table 4: Isolated Digital Outputs	
Number of Output Channels	4
Optical Isolation	1414 VDC
Supply Voltage	Sink 60 VDC
Sink Current	1.3 A max./Channel

2.1.17 Digital Inputs

The device has four isolated digital inputs on the right panel that support wet and dry contacts.

The wiring method is as follows:

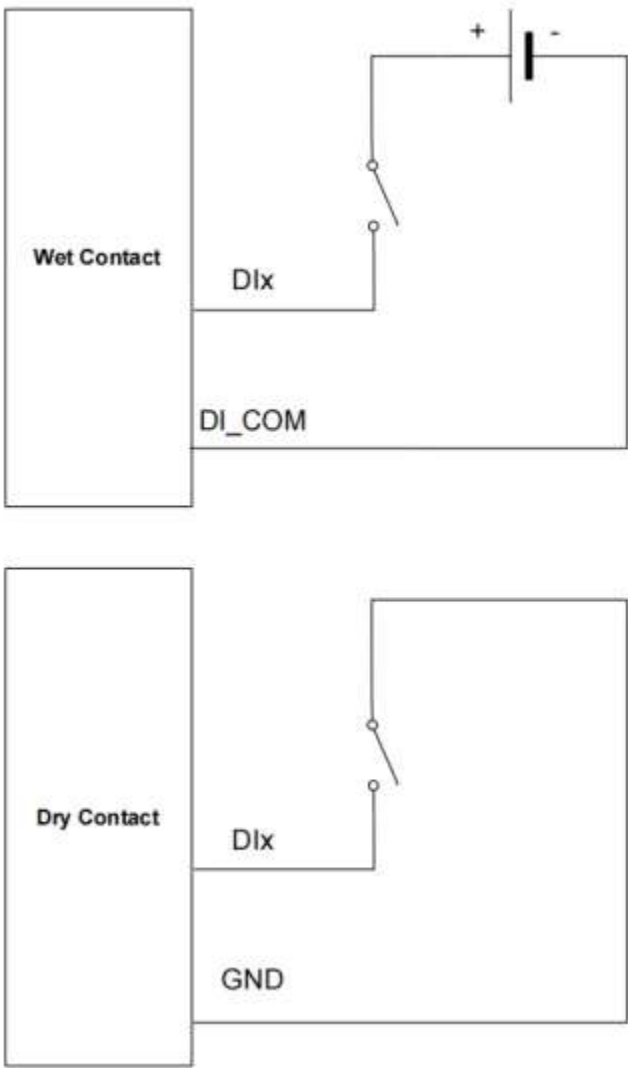


Table 5: Isolated Digital Inputs	
Number of Input Channels	4
Optical Isolation	3750 VDC
Input Voltage	Dry contact. Logic 1: Open Logic 0: Close to ground
	Wet contact. VIH(max.) = 60 VDC VIH(min.) = 5 VDC VIL(max.) = 2 VDC

2.2.18 RS-485 Pull-up/down Dip Switches

The device has 1 RS-485 pull-up and pull-down dip switches on the right panel to control the pull-up and pull-down resistors of the RS-485 bus (corresponding to COM1/COM2).

Table 6: RS-485 Pull-up/down	
PU	ON: Enable pull-up OFF: Disable pull-up
PD	ON: Enable pull-down OFF: Disable pull-down
T	ON: Enable termination matching resistor OFF: Disable termination matching resistor

2.2.19 GMSL 2.0

The device has 2 GMSL 2.0 ports on the right panel, supporting docking of 2 GMSL cameras.

2.2.20 Lineout

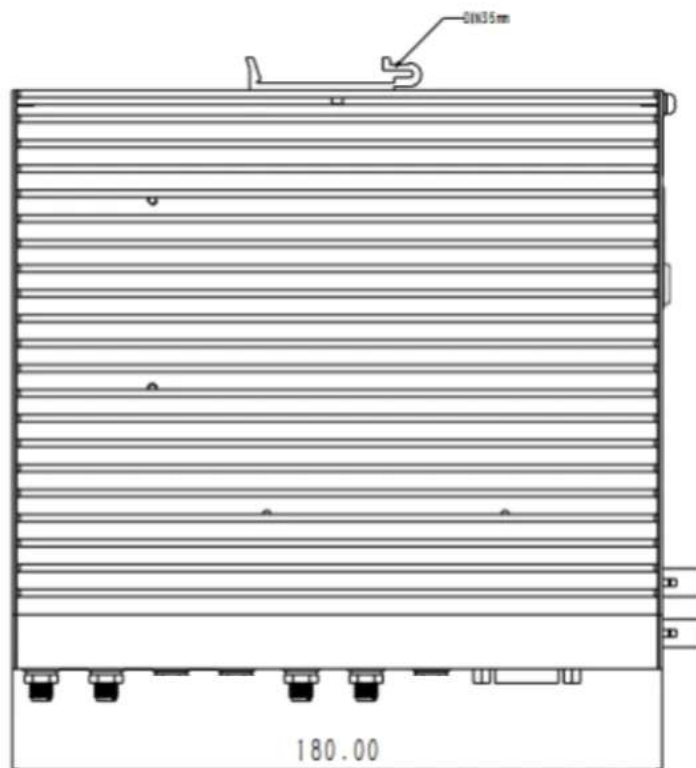
The device has 1 Line-out connector on the right panel, which supports 3.5mm standard audio output.

2.2.21 Microphone

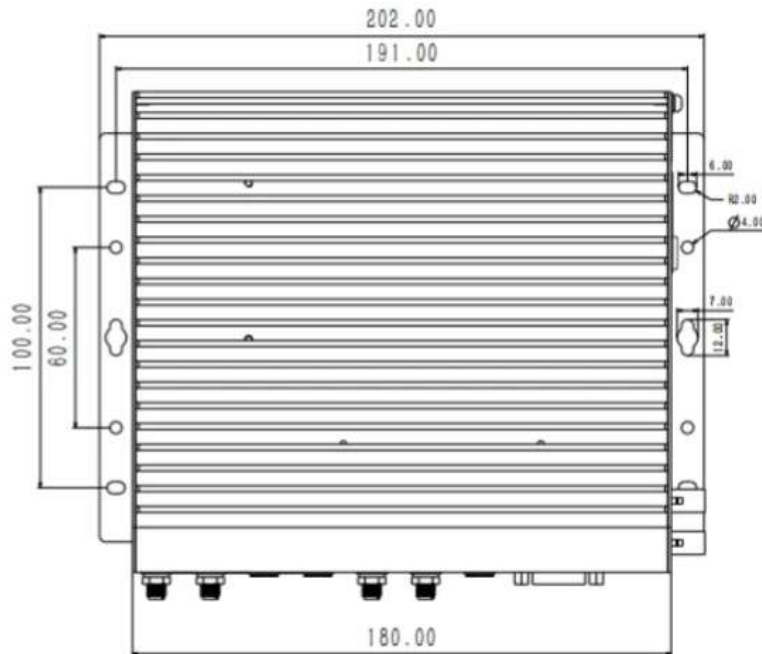
The device has 1 microphone connector on the right panel and supports 3.5mm standard audio input.

3 Installation

3.1 Rail Mounting Installation



3.2 Wall-mounted Installation



Note: The EC5350 has two mounting methods: rail mounting and wall mounting. 4pcs M4 screws with a length of 8mm are required for wall mounting and the installation height of the device is less than 2m.

4 Getting Started

4.1 Connecting to Equipment

4.1.1 Connecting Device via HDMI

4.1.1.1 Connecting HDMI and Peripherals

Connect the device to the monitor via the HDMI 2.0 port, plug the keyboard and mouse into the USB 3.2 port of the device, power up the device and wait for the device to finish booting. Check the nameplate on the bottom of the device to find the default system username and password.

Edge Computer

Model:

P / N:

S / N:

MAC :

IMEI :

Input :

ETH1/ETH2:

System User/Password:

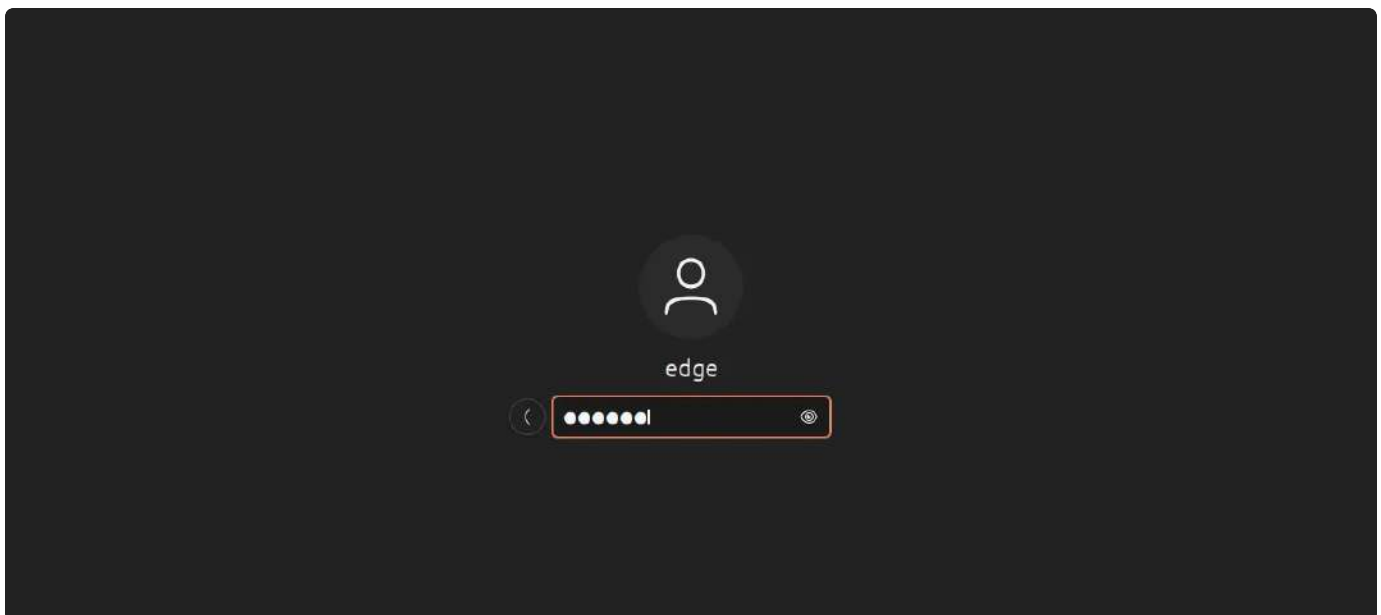


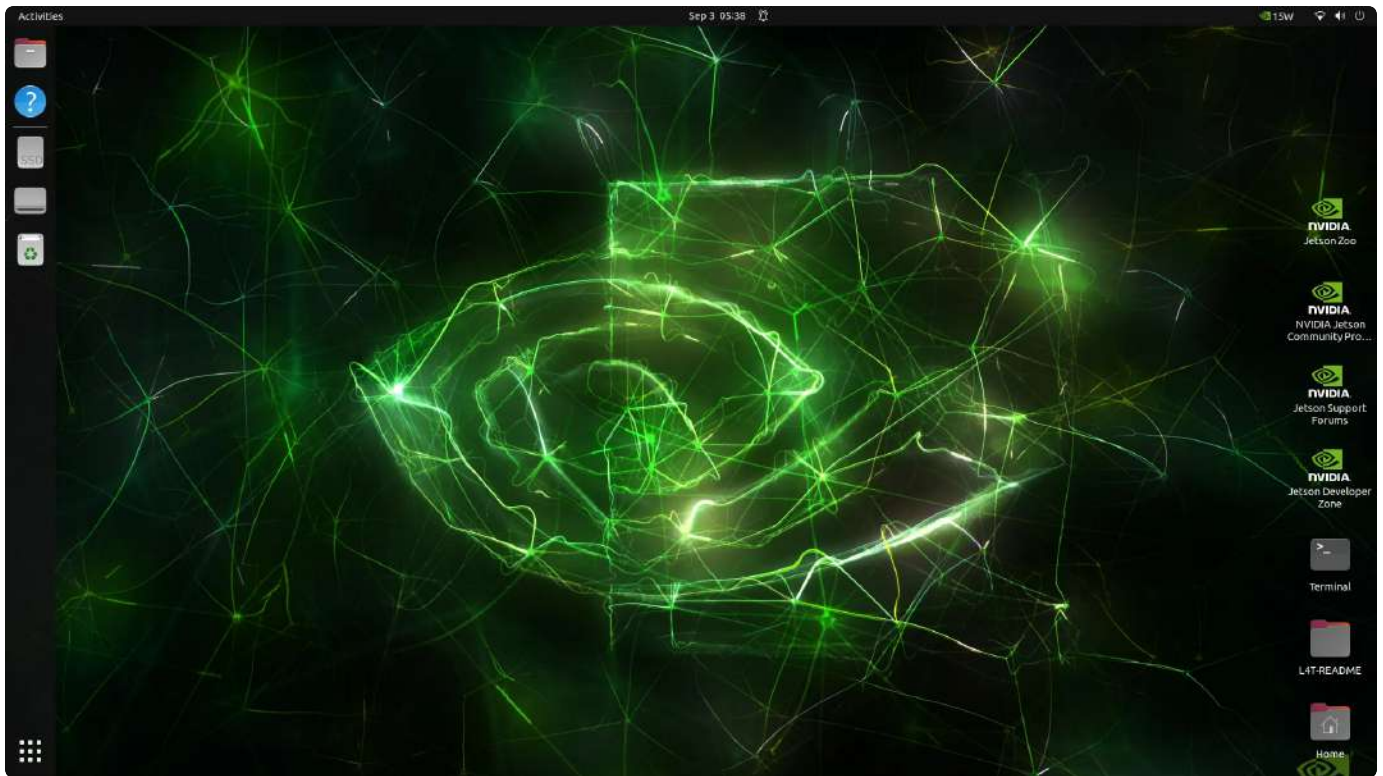
Date:

Manufacturer:

4.1.1.2 Logging Equipment

On the login screen, select the user that corresponds to System User, enter the password, and log in.





4.1.2 Connecting via SSH

4.1.2.1 Connecting to the Network

Connecting to the device using SSH requires ensuring that the device network is accessible. Check the nameplate on the bottom of the device to find the system default Ethernet address and configure the host and device to be on the same network segment.

Edge Computer

Model:

P / N:

S / N:

MAC :

IMEI :

Input :

ETH1/ETH2:

System User/Password:

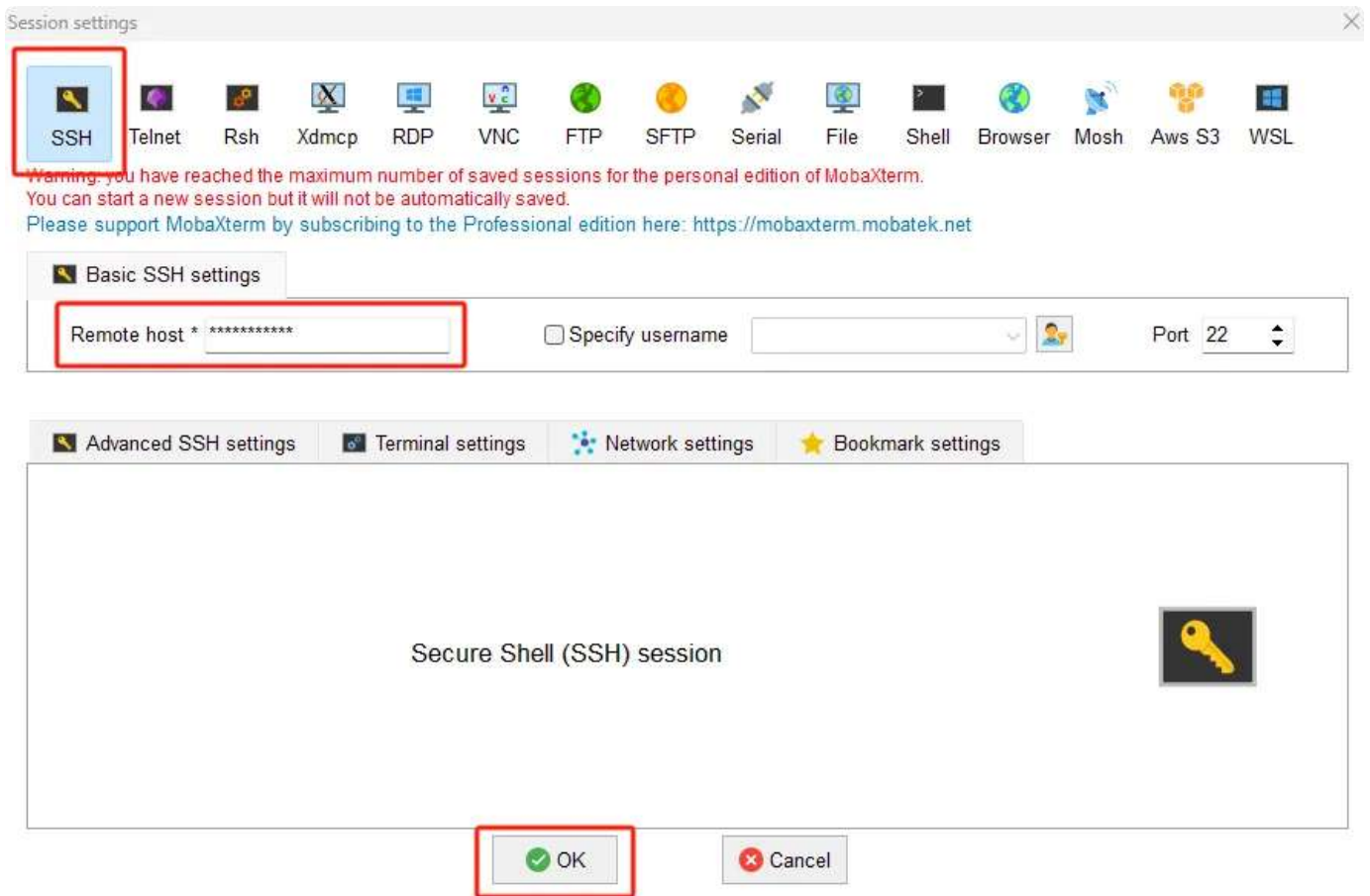


Date:

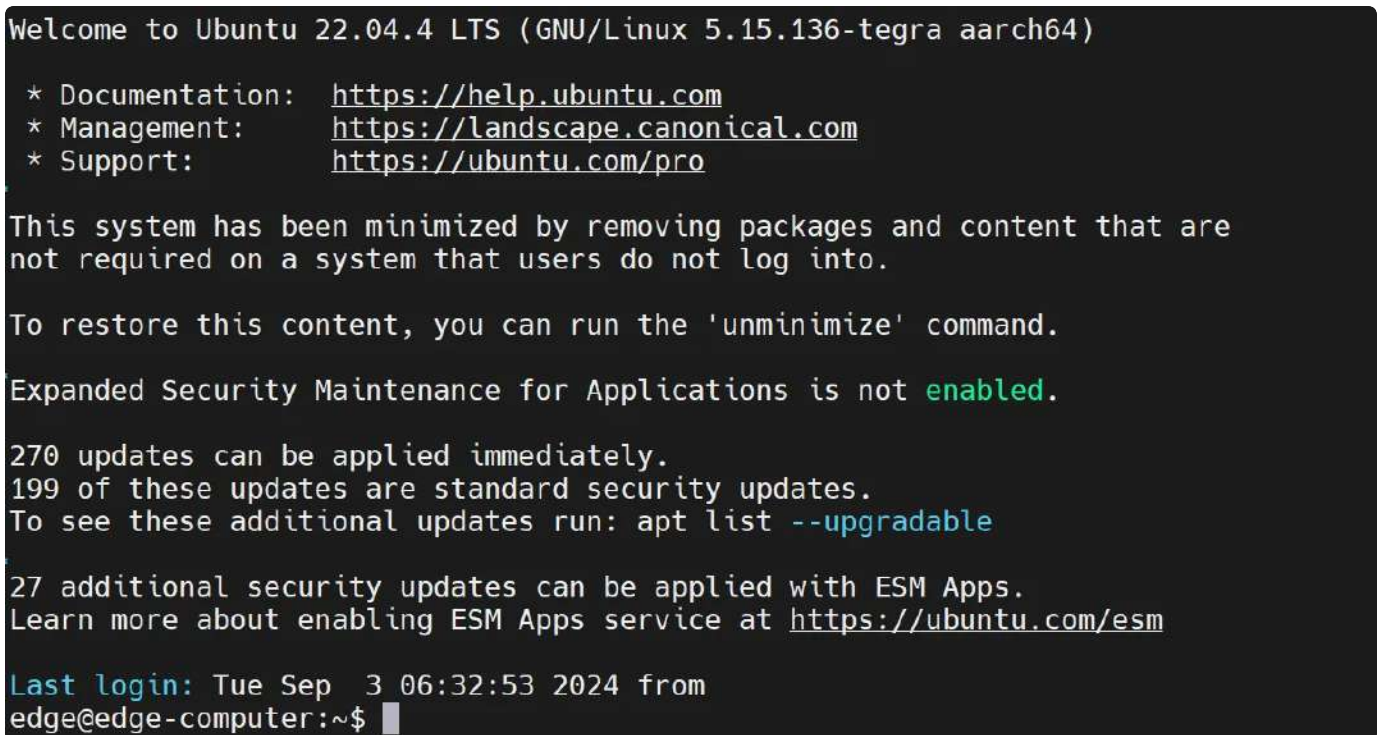
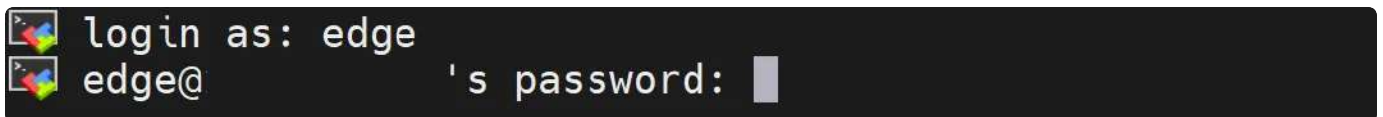
Manufacturer:

4.1.2.2 Access to Equipment

Open the SSH terminal tool (MobaXterm for example), enter the device address and click Connect.



Follow the prompts and enter the default user and password.

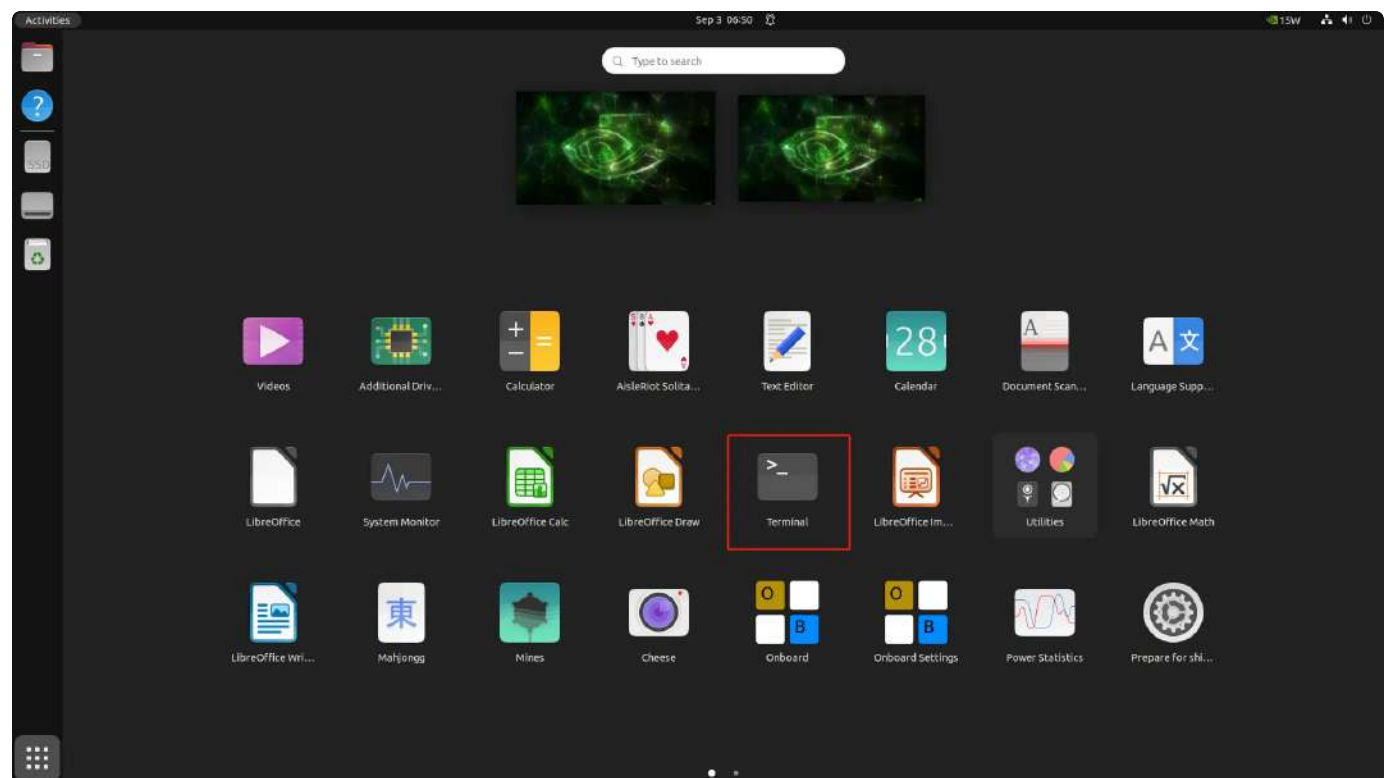


4.2 Version Query

Open Terminal on the desktop or right-click and select "Open in Terminal" and enter the following command.

Version Query:

```
▼ JSON |
1  # Query version number only
2  sudo ecversion
3  # Query detailed version information
4  sudo ecversion -all
```



```
edge@edge-computer:~$ sudo ecversion
EC5000 version V1.0.0-beta.1
edge@edge-computer:~$
edge@edge-computer:~$ sudo ecversion -all
EC5000 version V1.0.0-beta.1 Build:2024-07-12 05:23:51 UTC
edge@edge-computer:~$
```

4.3 User Management

4.3.1 Creating Users

Open the desktop Terminal or right-click and select "Open in Terminal", and enter the following commands, according to the prompts to enter the password and user information, before creating the user, please make sure that the user exists, for the user that already exists, to create again will be prompted by The user 'username' already exists.

▼ JSON |

```
1 # check if the test user exists
2 id test
3 # create test user
4 sudo adduser test
```

```
edge@edge-computer:~/Desktop$ sudo adduser test
Adding user `test' ...
Adding new group `test' (1002) ...
Adding new user `test' (1002) with group `test' ...
The home directory `/home/test' already exists. Not copying from `/etc/skel'.
New password:
Retype new password:
passwd: password updated successfully
Changing the user information for test
Enter the new value, or press ENTER for the default
    Full Name []:
    Room Number []:
    Work Phone []:
    Home Phone []:
    Other []:
Is the information correct? [Y/n] Y
Adding new user `test' to extra groups ...
Adding user `test' to group `audio' ...
Adding user `test' to group `gdm' ...
Adding user `test' to group `gpio' ...
Adding user `test' to group `i2c' ...
adduser: The group `lightdm' does not exist.
Adding user `test' to group `render' ...
Adding user `test' to group `video' ...
Adding user `test' to group `weston-launch' ...
edge@edge-computer:~/Desktop$
```

4.3.2 Delete Users

Open the desktop Terminal or right-click and click "Open in Terminal", and enter the following command to delete the user, before deleting the user, please make sure the user exists, if you delete the user does not exist will prompt The user 'username' does not exist.

```
1 # Check if the test user exists
2 id test
3 # Delete the test user
4 sudo deluser test
```

```
edge@edge-computer:~$ id test
uid=1002(test) gid=1002(test) groups=1002(test),29(audio),44(video),104(render),116(i2c),135(gdm),999(gpio),996(weston-launch)
edge@edge-computer:~$
edge@edge-computer:~$ sudo deluser test
Removing user `test' ...
Warning: group `test' has no more members.
Done.
edge@edge-computer:~$
```

4.3.3 Disable and Enable Users

Open the desktop Terminal or right-click and click "Open in Terminal", and enter the following command to disable/enable the user, disable/enable the user before please make sure that the user exists, if the user does not exist, it will be prompted The user 'username' does not exist.

```
1 # Check if the test user exists
2 id test
3 # Disable the test user
4 sudo passwd -l test
5 # Enable test user
6 sudo passwd -u test
7 # Query the status of the test user (L disabled/P enabled)
8 sudo passwd -S test
```

```
edge@edge-computer:~$ id test
uid=1002(test) gid=1002(test) groups=1002(test),29(audio),44(video),104(render),116(i2c),135(gdm),999(gpio),996(weston-launch)
edge@edge-computer:~$
edge@edge-computer:~$ sudo passwd -l test
passwd: password expiry information changed.
edge@edge-computer:~$
edge@edge-computer:~$ sudo passwd -S test
test L 09/04/2024 0 99999 7 -1
edge@edge-computer:~$
edge@edge-computer:~$ sudo passwd -u test
passwd: password expiry information changed.
edge@edge-computer:~$
edge@edge-computer:~$ sudo passwd -S test
test P 09/04/2024 0 99999 7 -1
edge@edge-computer:~$
```

4.3.4 Advanced Extension of User Management

Reference:

1. Ubuntu Manpage: `adduser`, `addgroup` – add a user or group to the system
2. Ubuntu Manpage: `deluser`, `delgroup` – remove a user or group from the system
3. Ubuntu Manpage: `passwd` – change user password
4. Ubuntu Manpage: `usermod` – modify a user account

4.4 Network Settings

4.4.1 Ethernet Settings

4.4.1.1 Settings Management

Click the network icon on the top right corner of the desktop, select Ethernet → Wired Settings or click Show Applications → Settings → Network → Ethernet on the bottom left corner of the desktop, please choose to set eth1/eth2 according to the actual situation.

15W



Ethernet (eth1) Connected



Turn Off

Wired Settings



huawei2_5G



Mobile Broadband Off



Bluetooth On



Balanced



Settings

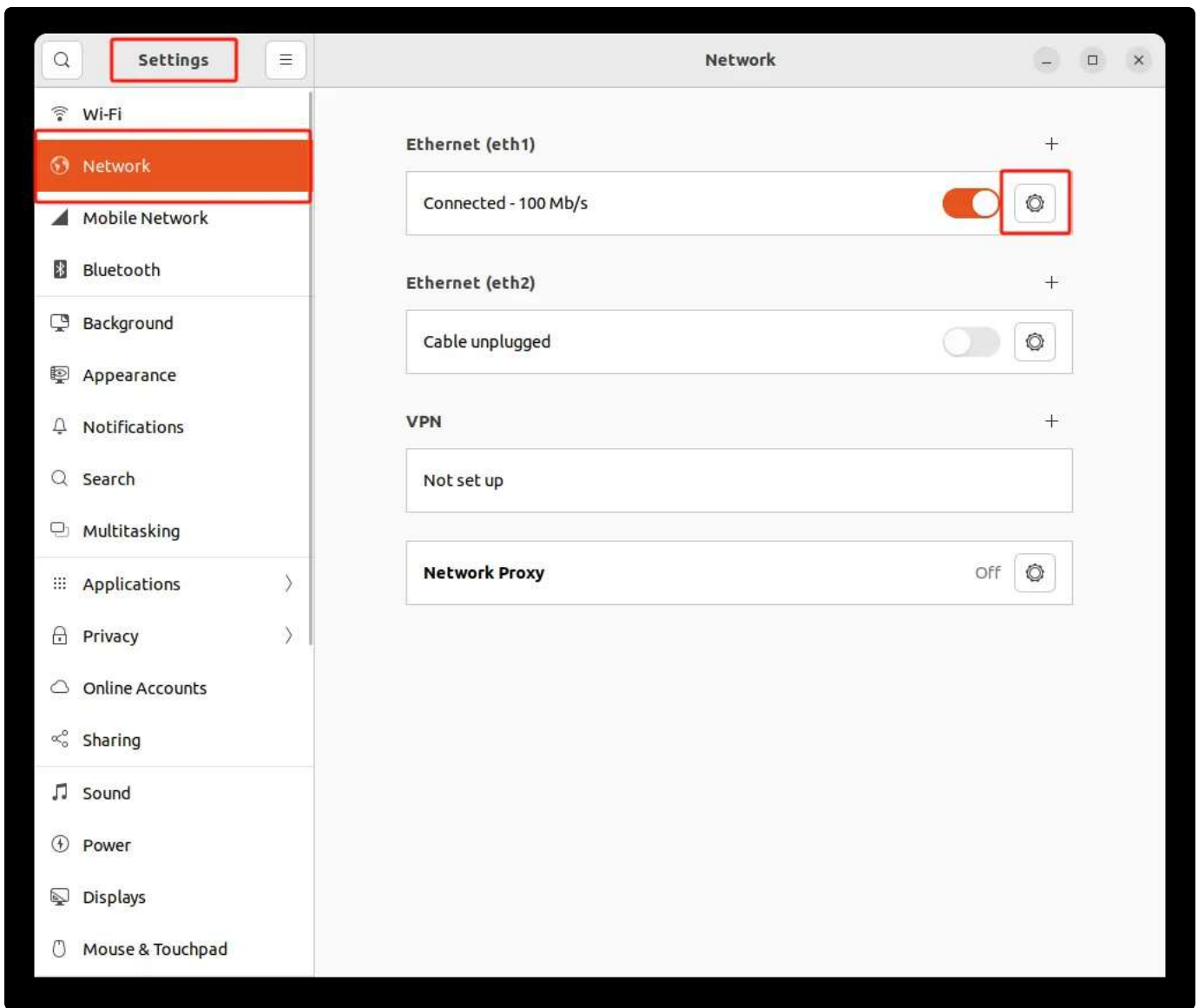


Lock



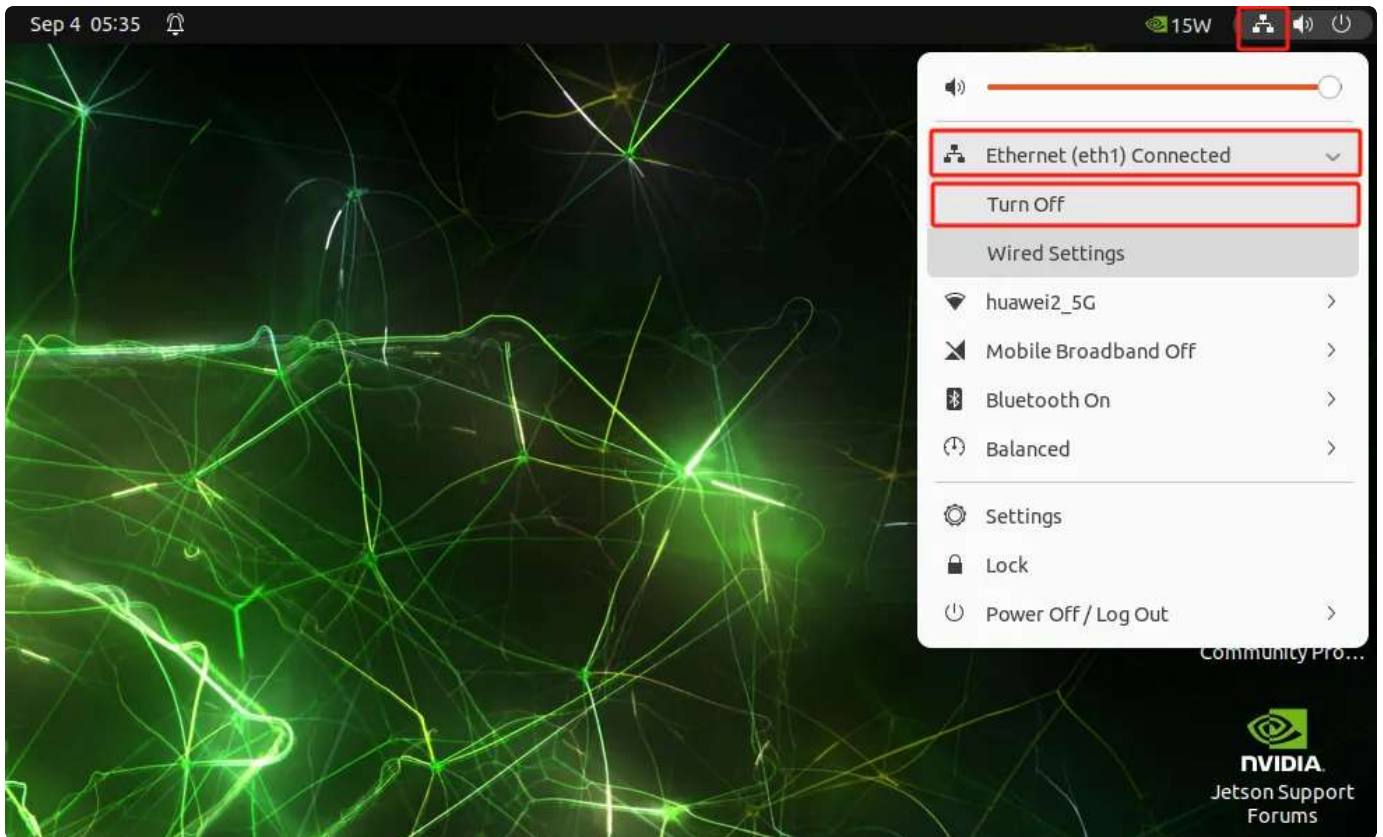
Power Off / Log Out

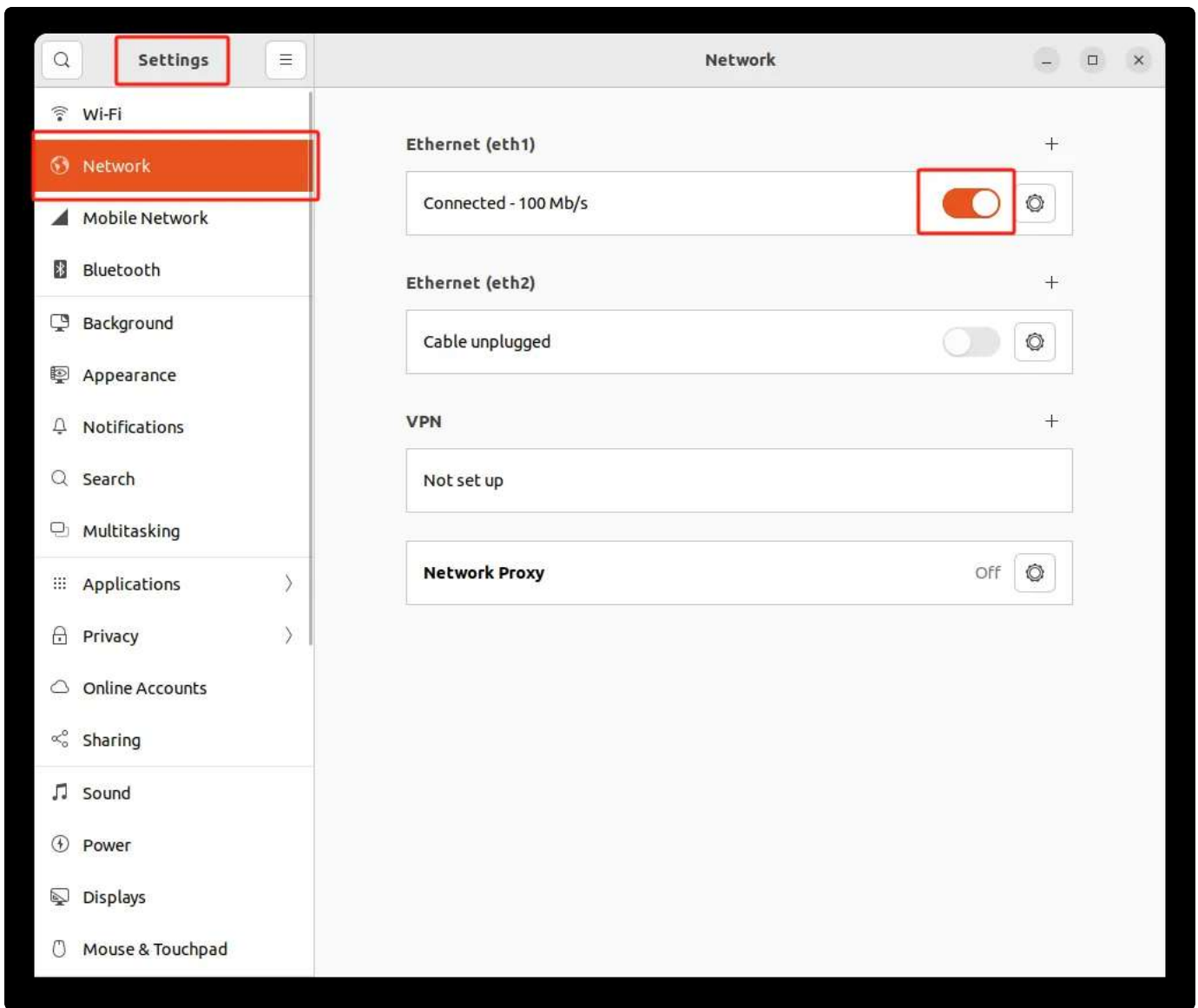




4.4.1.2 On/Off Management

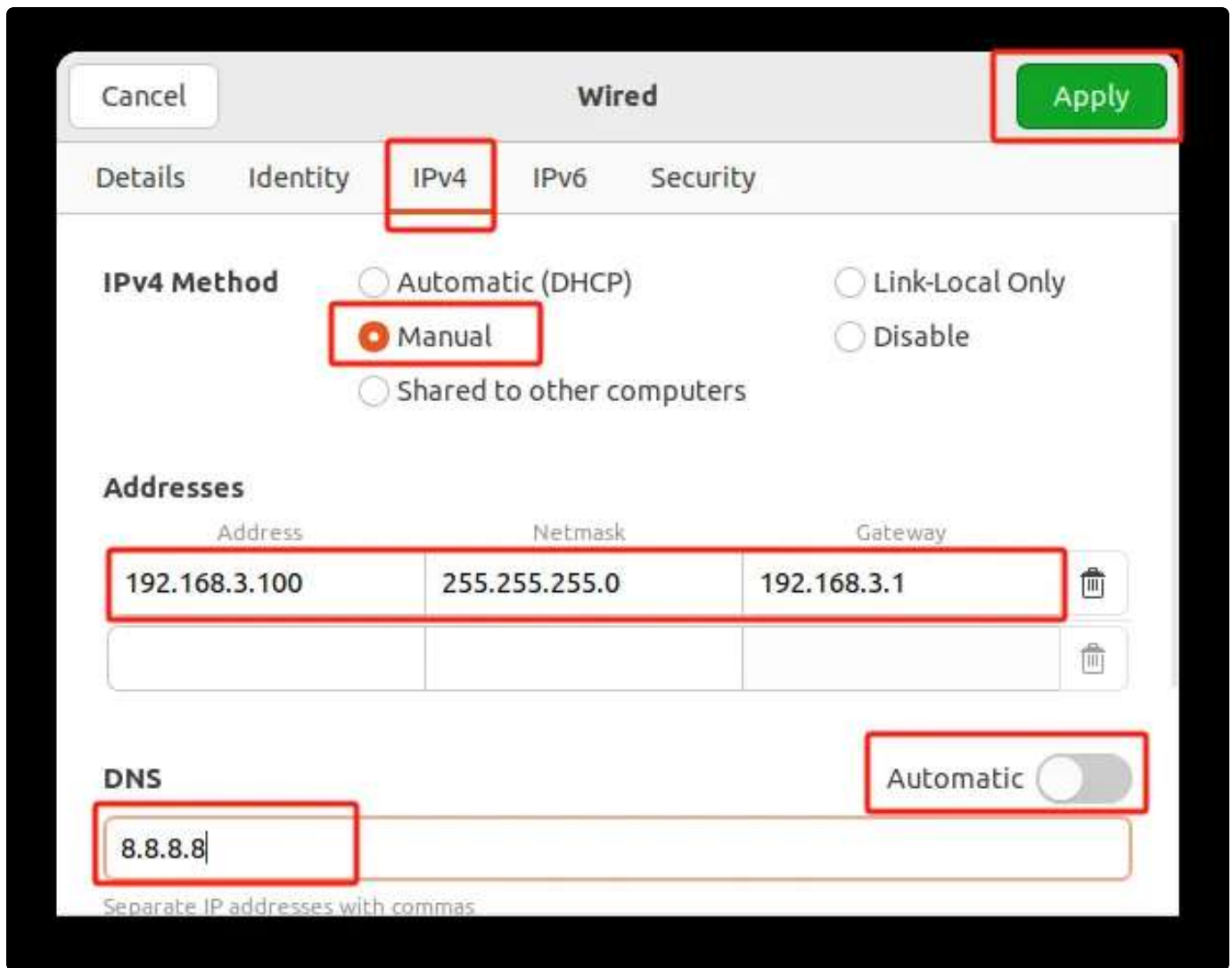
Click Turn On/Turn Off or slide the button in the Ethernet settings to turn the network off or on.





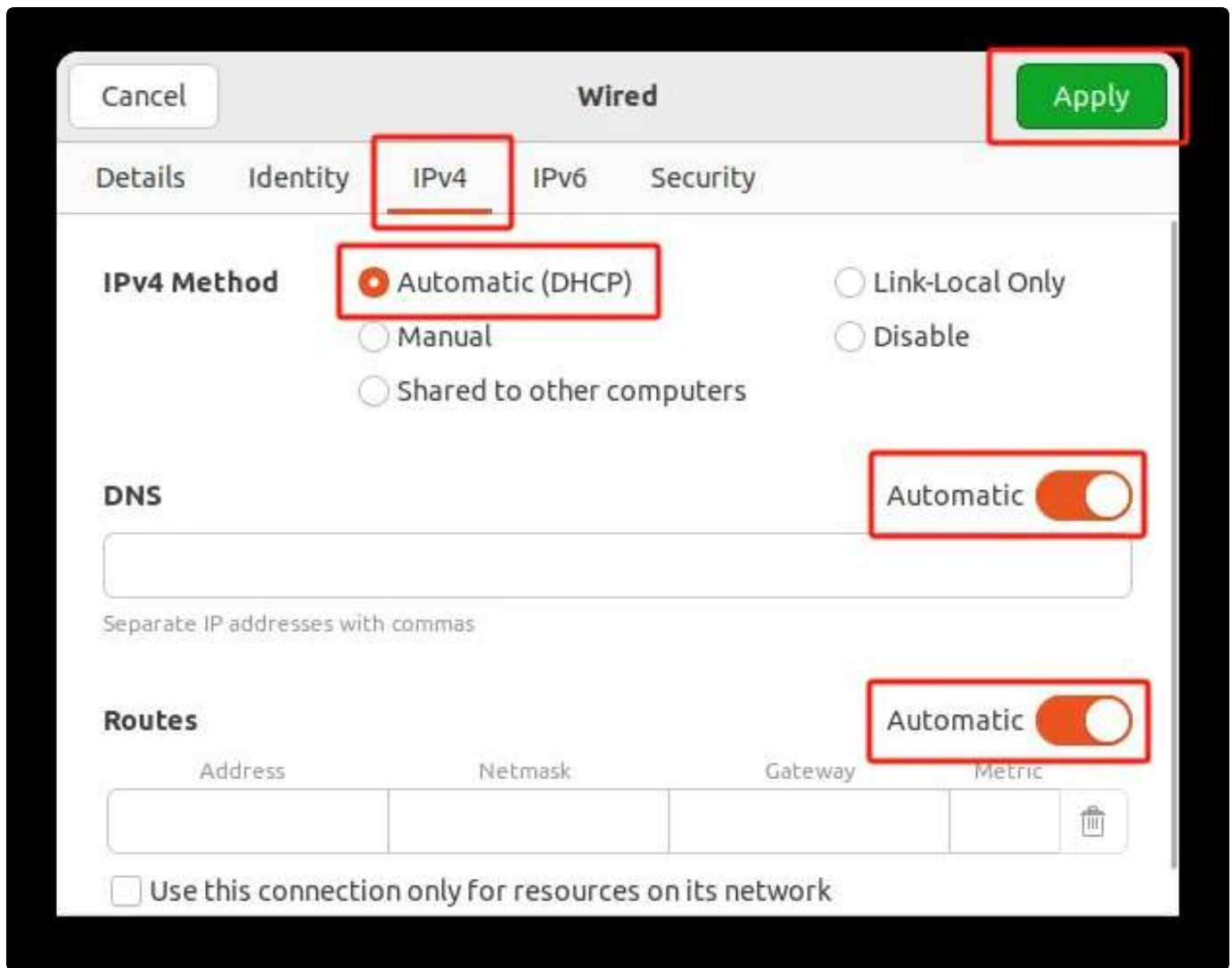
4.4.1.3 Static Configuration

Click Setup button, select IPv4/IPv6, select Manual for Method, fill in Address, Netmask, Gateway, DNS and Routes according to the network conditions, and click Apply to save. Click Apply to save. After saving, please re-switch the network to make the configuration take effect.



4.4.1.4. Dynamic Configuration

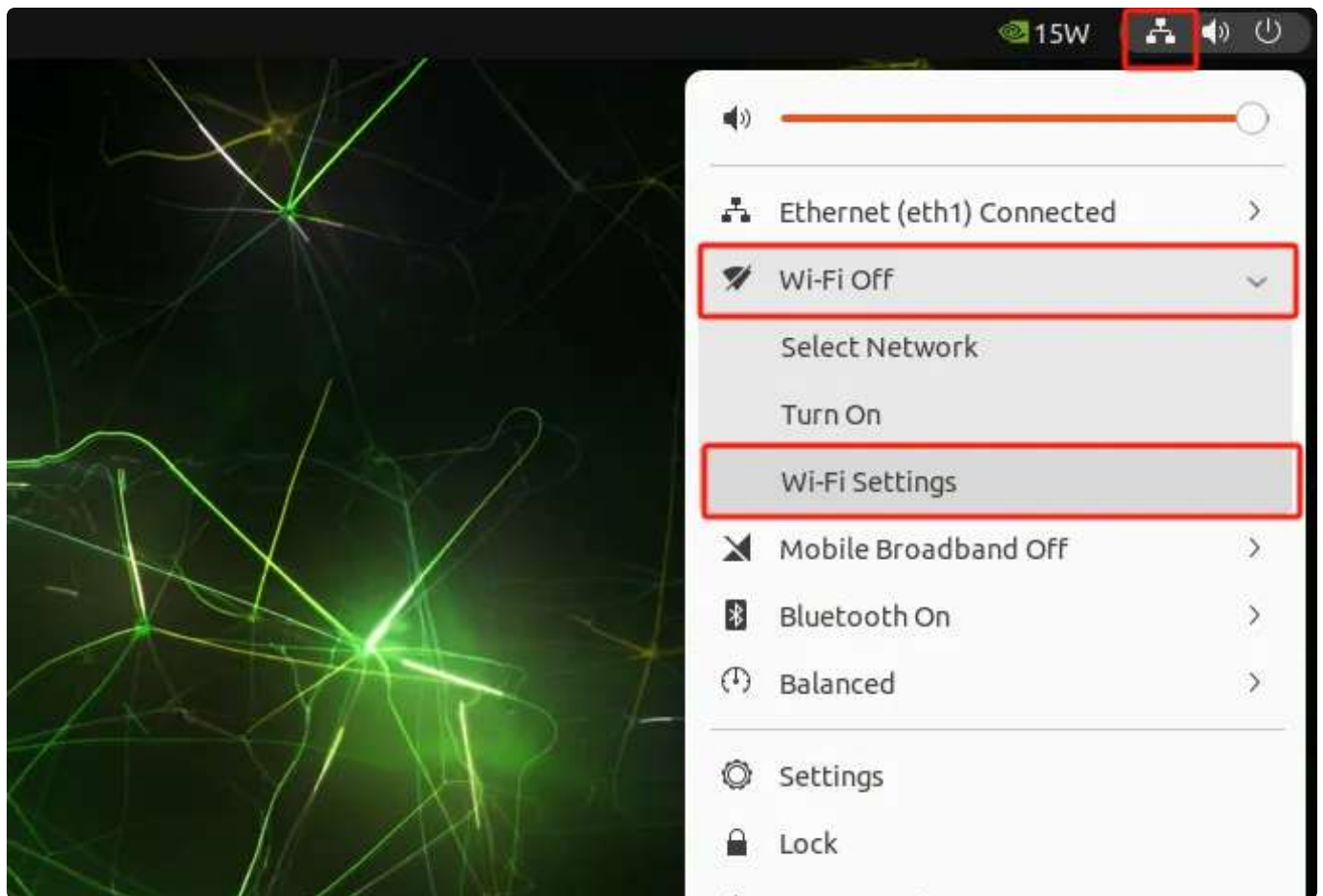
Click the Setup button, select IPv4/IPv6, select Automatic(DHCP) for Method, and click Apply to save. After saving, please re-switch the network to make the configuration take effect.

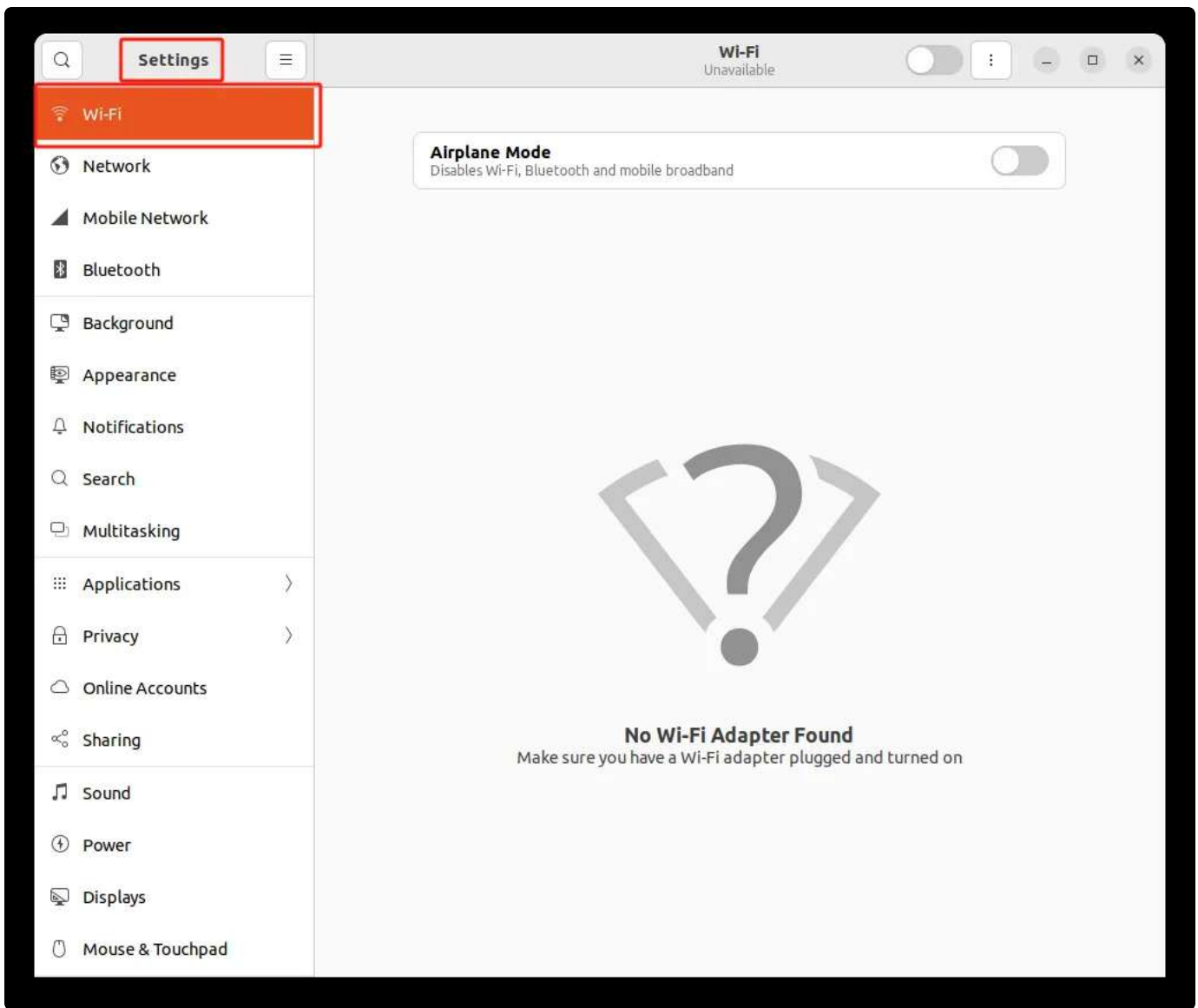


4.4.2 Wi-Fi Settings

4.4.2.1 Settings Management

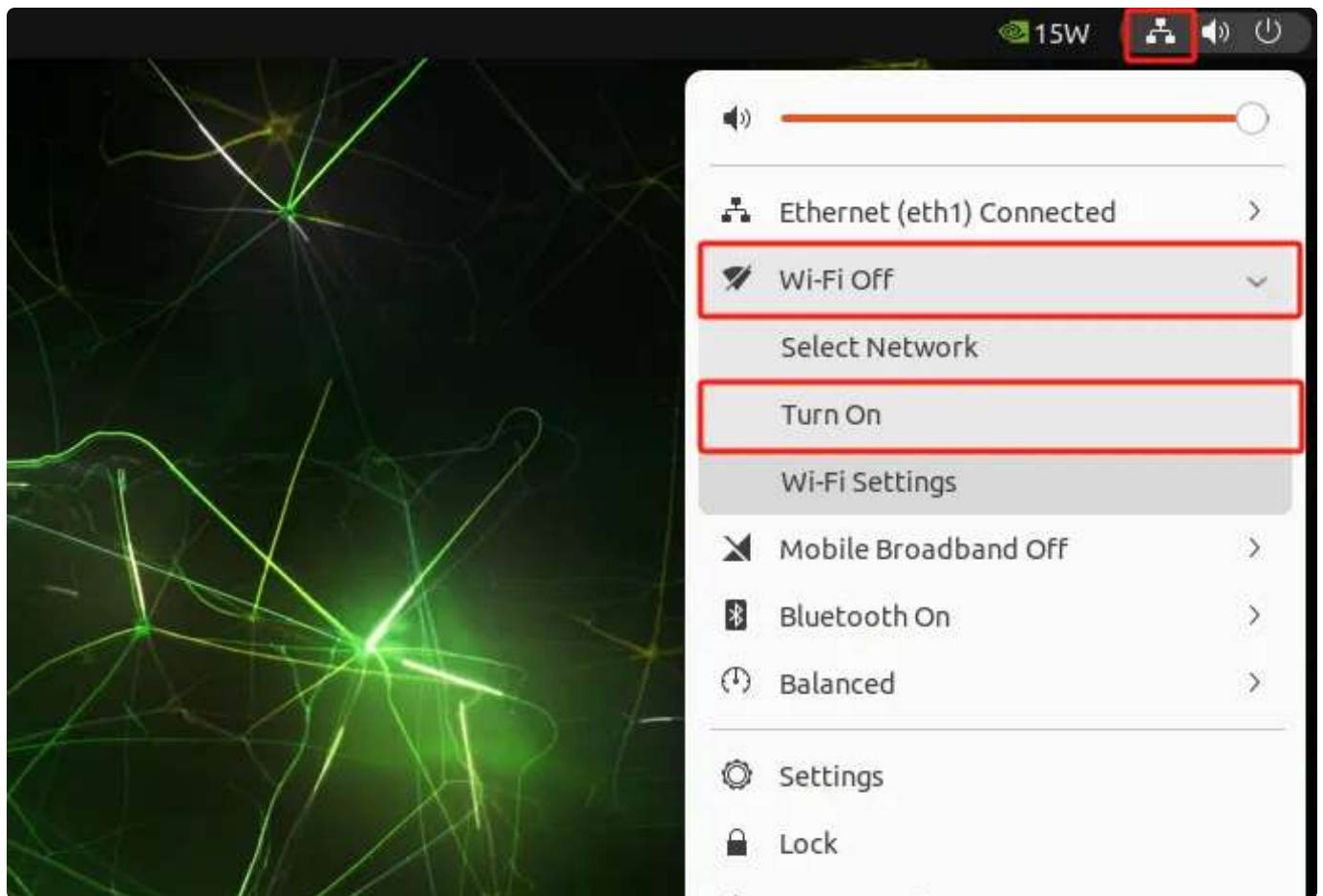
Click the network icon on the top right corner of your desktop and select Wi-Fi -> Wi-Fi Settings or click Show Applications -> Settings -> Wi-Fi on the bottom left corner of your desktop.

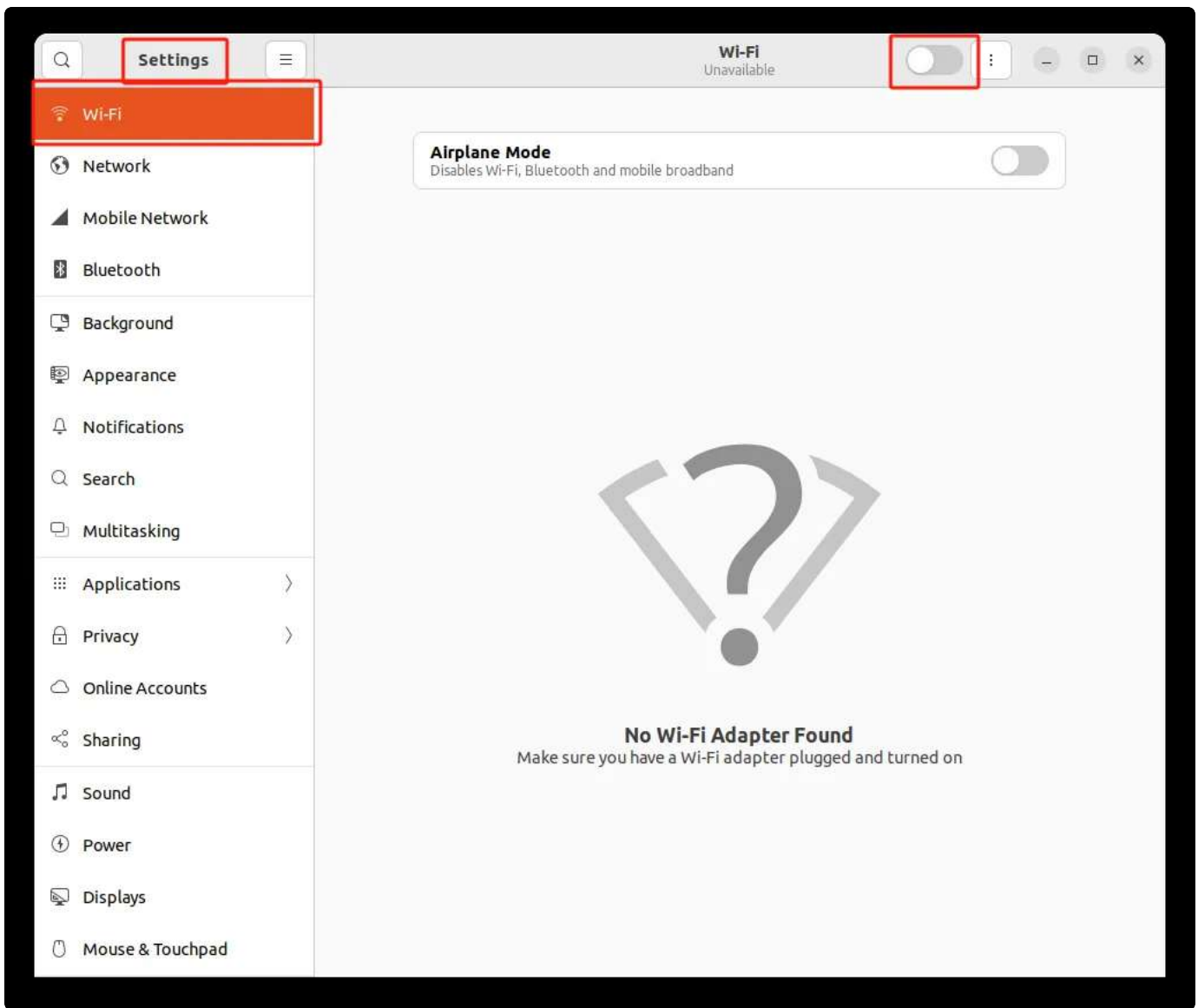




4.4.2.2 On/Off Management

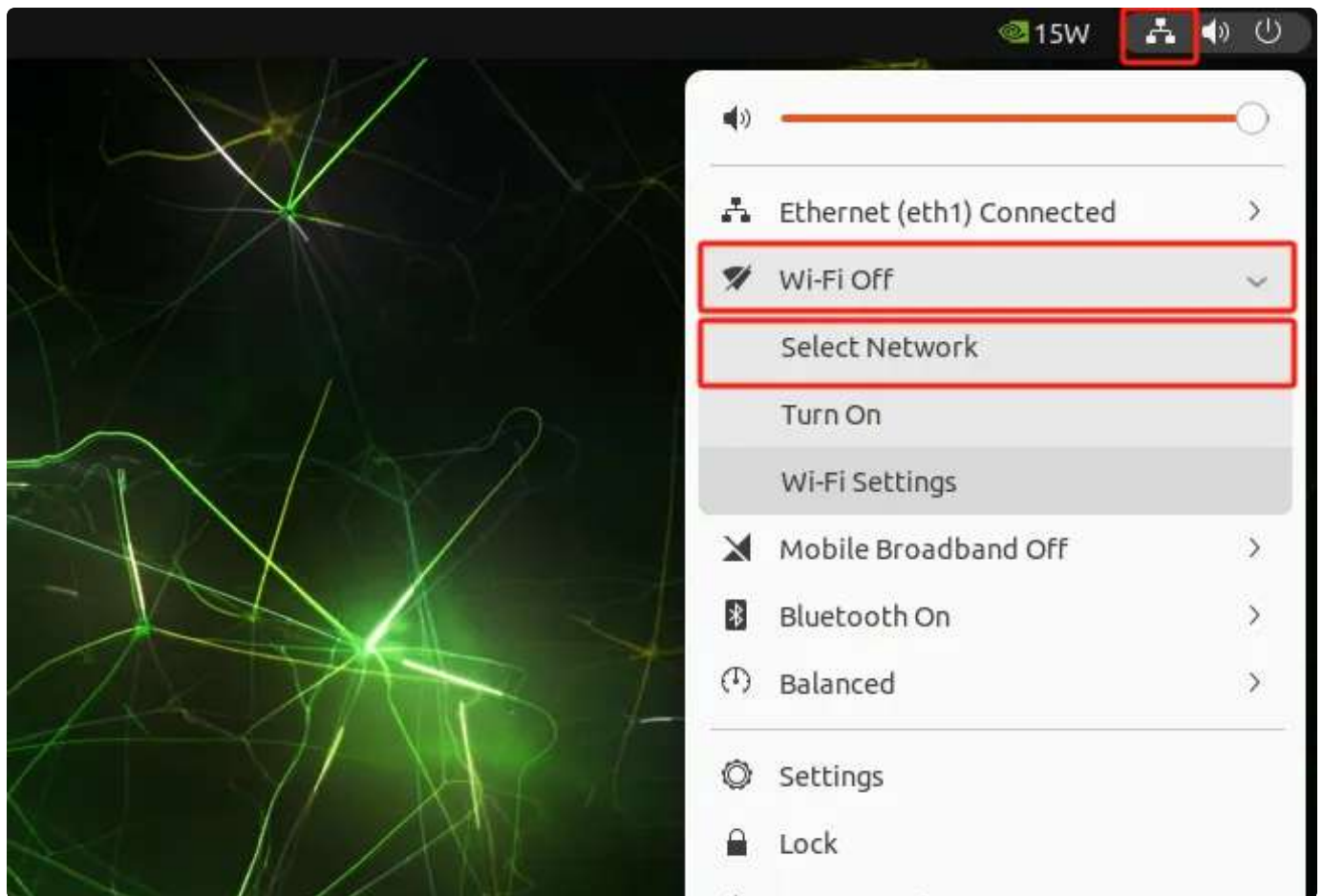
Tap Turn On/Turn Off or slide the button in the Wi-Fi settings to turn the network off or on.





4.4.2.3 Scanning

Scanning can be turned on via Wi-Fi → Select Network, or the Wi-Fi Setting feature will automatically scan for visible Wi-Fi SSIDs in the neighbourhood when turned on.





Wi-Fi Networks

Select a network

✓

🔒

📶

🔒

📶

🔒

📶

🔒

📶

🔒

📶

🔒

📶

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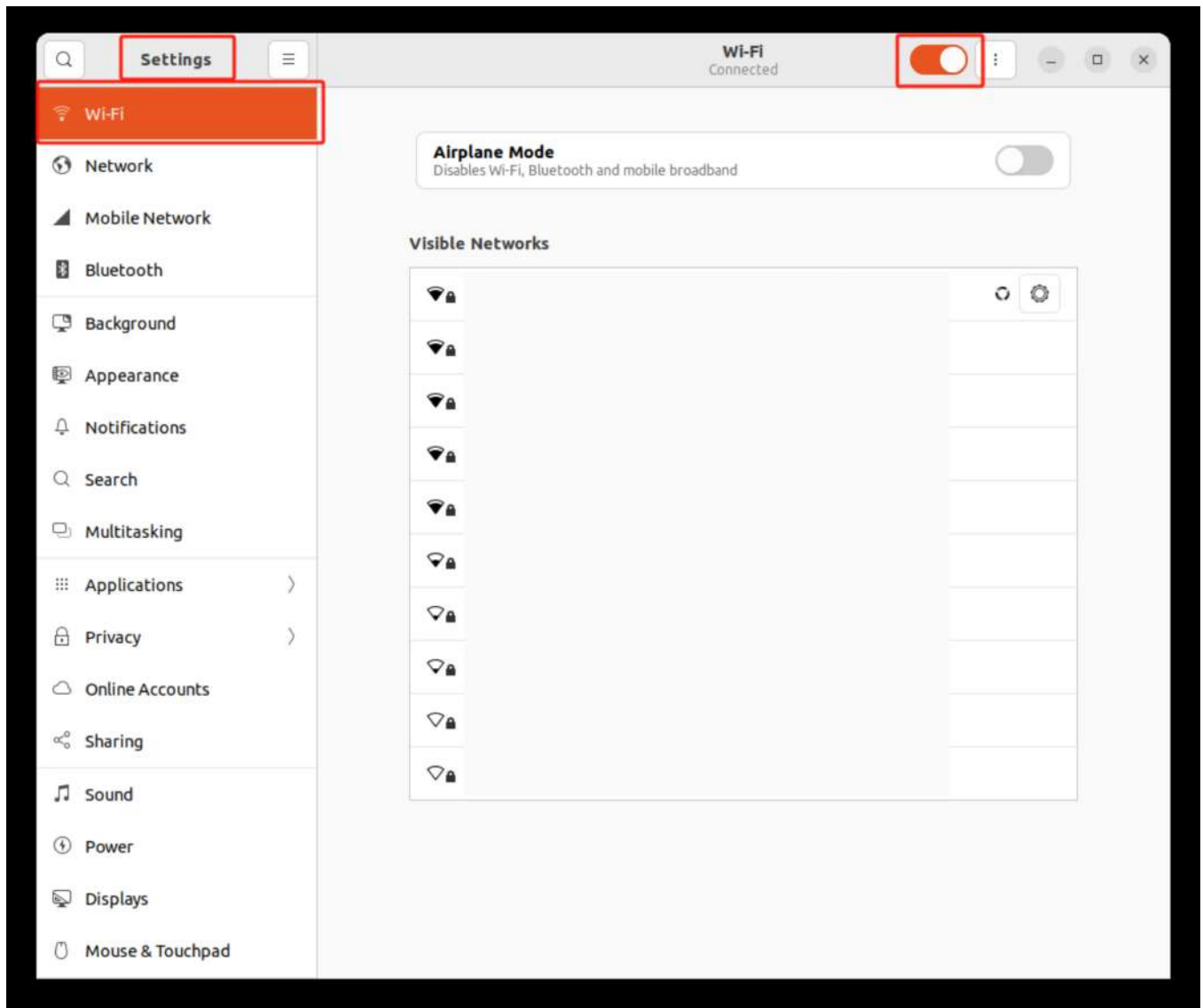
📶

🔒

📶

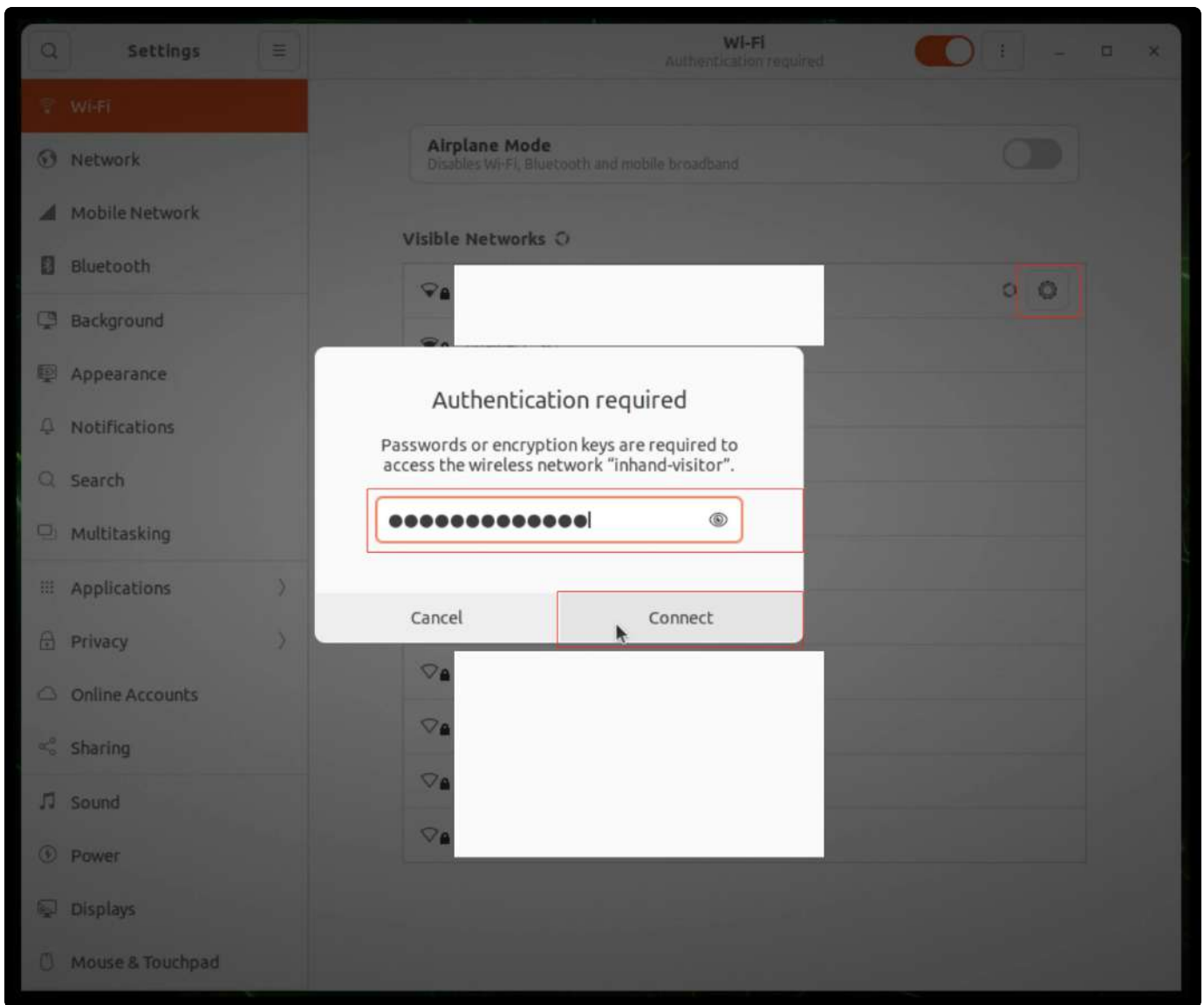
Cancel

Connect



4.4.2.4 Connection

Tap the Settings button on the right side of the Wi-Fi network, enter the password and tap Connect to connect to the network.



4.4.3 Cellular Network Settings

4.4.3.1 Configuring Cellular ECM Mode

Insert the SIM card into SIM1/SIM2, access the cellular antenna, open Terminal and enter the following commands in order.

Cellular Network Settings:

```
1 # Access cellular AT command interface using 115200 baud rate
2 sudo sdebug /dev/ttyUSB2 115200
3 # Configure cellular ECM mode
4 AT+QCFG="usbnet",1
5 # Save and reboot cellular module
6 AT+CFUN=1,1
```



A terminal window titled 'edge@edge-computer: ~' showing the execution of several AT commands. The user enters 'sudo sdebug /dev/ttyUSB2 115200', which outputs 'open device /dev/ttyUSB2 for operation(fd:3), baudrate:115200, databits:8, stopbit:1, xonoff:0, parity:N'. Then, the user enters 'AT+QCFG="usbnet",1', which outputs '>>> AT+QCFG="usbnet",1' and '<(6)< OK'. Next, the user enters 'AT+CFUN=1,1', which outputs '>>> AT+CFUN=1,1' and '<(6)< OK'. Finally, the user enters '<(14)<', which outputs '+CIEV: 4,0' and 'device is shutdown'. The prompt returns to 'edge@edge-computer: ~\$'.

```
edge@edge-computer:~$ sudo sdebug /dev/ttyUSB2 115200
open device /dev/ttyUSB2 for operation(fd:3), baudrate:115200, databit
s:8, stopbit:1, xonoff:0, parity:N
AT+QCFG="usbnet",1
>>> AT+QCFG="usbnet",1
<(6)<
OK

AT+CFUN=1,1
>>> AT+CFUN=1,1
<(6)<
OK

<(14)<
+CIEV: 4,0

device is shutdown
edge@edge-computer:~$
```

4.4.3.2 Switching SIM Card

Open Terminal and enter the following command to switch the SIM card.

Switching SIM Card:

```
1 # Switch to root
2 sudo -s
3 # Switch to SIM1
4 echo 0 > /sys/class/gpio/PG.06/value
5 # Switch to SIM2
6 echo 1 > /sys/class/gpio/PG.06/value
```

```
edge@edge-computer:~$ sudo -s
root@edge-computer:/home/edge# echo 0 > /sys/class/gpio/PG.06/value
root@edge-computer:/home/edge#
root@edge-computer:/home/edge# echo 1 > /sys/class/gpio/PG.06/value
root@edge-computer:/home/edge#
```

4.4.4 CAN FD Settings

Open Terminal and enter the following command to configure the CAN interface.

Configure CAN FD:

▼ JSON |

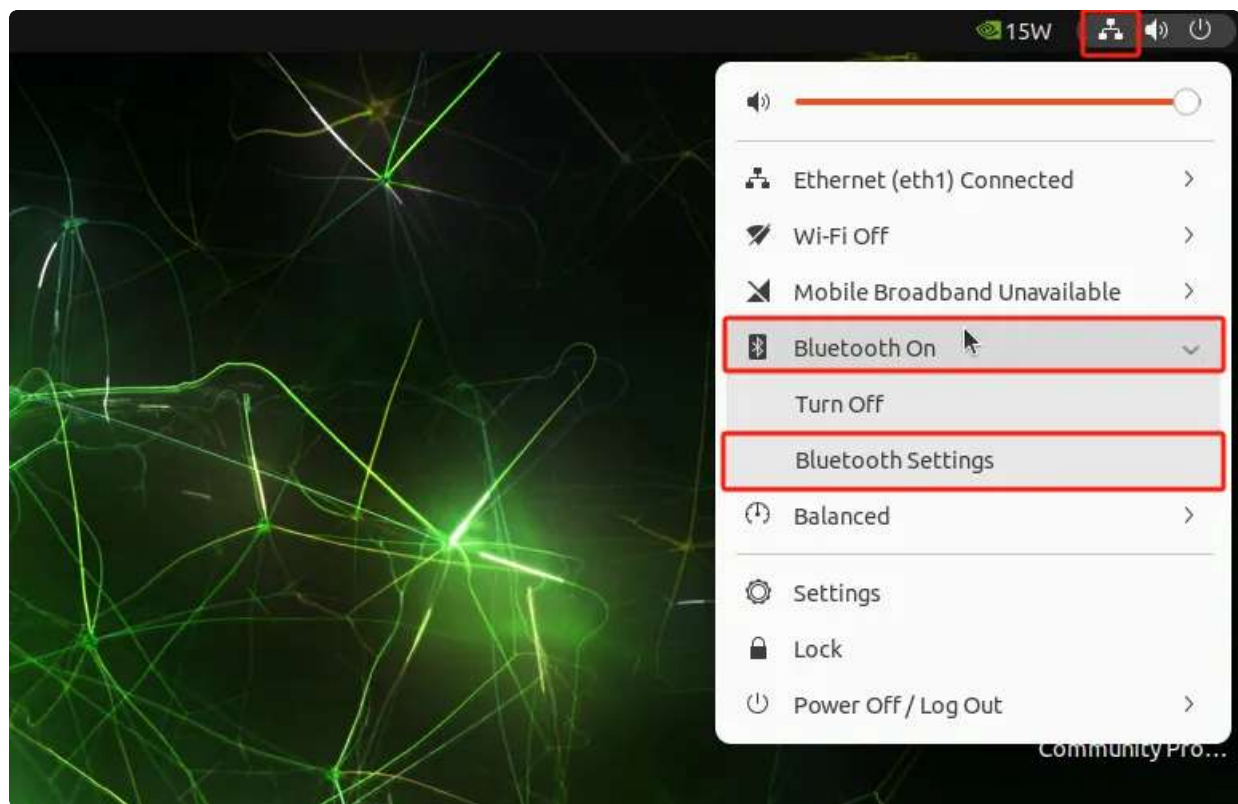
```
1 # Link up CAN interface
2 sudo ip link set can0 up type can bitrate 1000000 dbitrate 5000000 restart-
  ms 1000 fd on
```

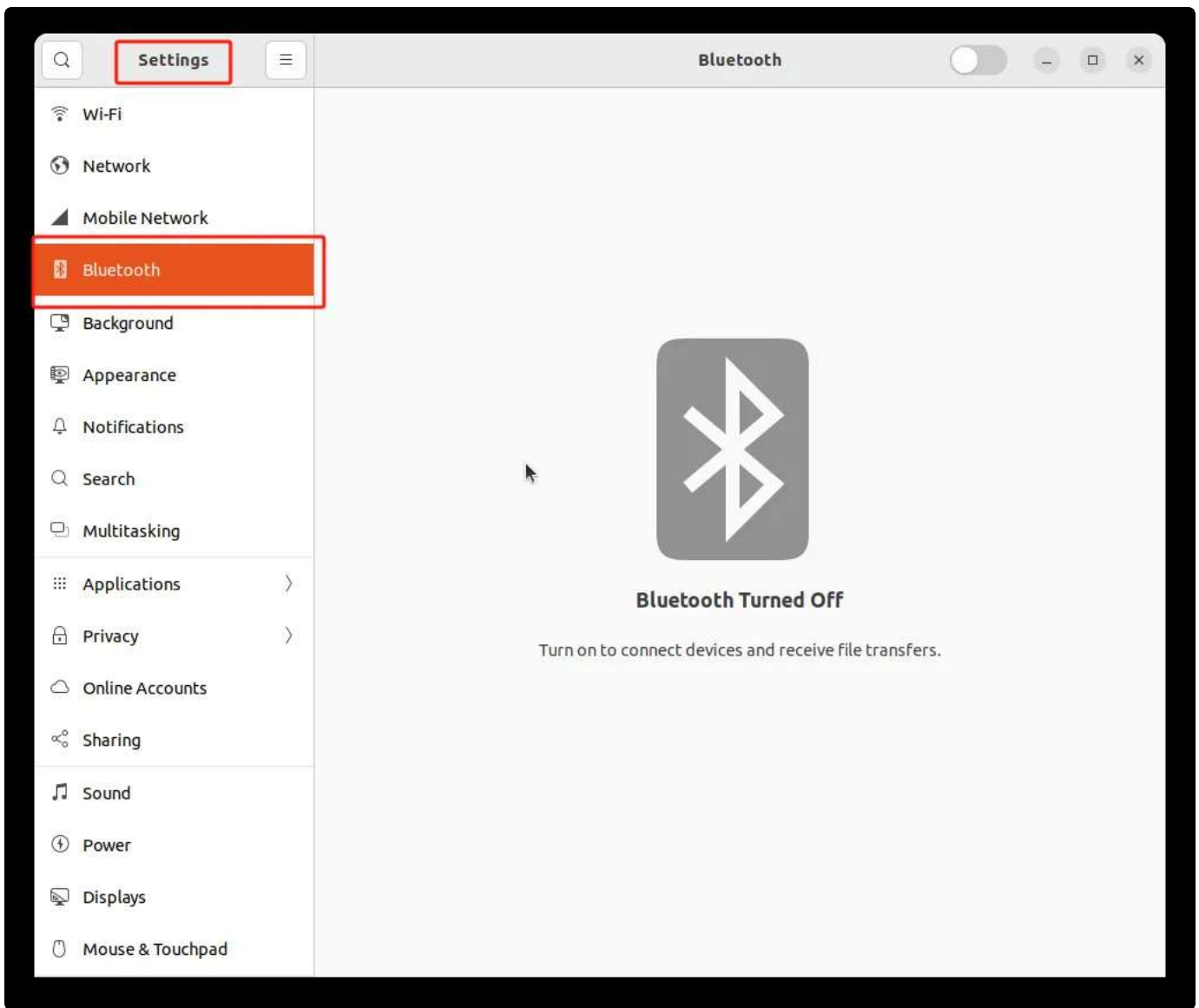
```
edge@edge-computer:~$ sudo ip link set can0 up type can bitrate 1000000
0 dbitrate 5000000 restart-ms 1000 fd on
edge@edge-computer:~$
```

4.4.5 Bluetooth Settings

4.4.5.1 Settings Management

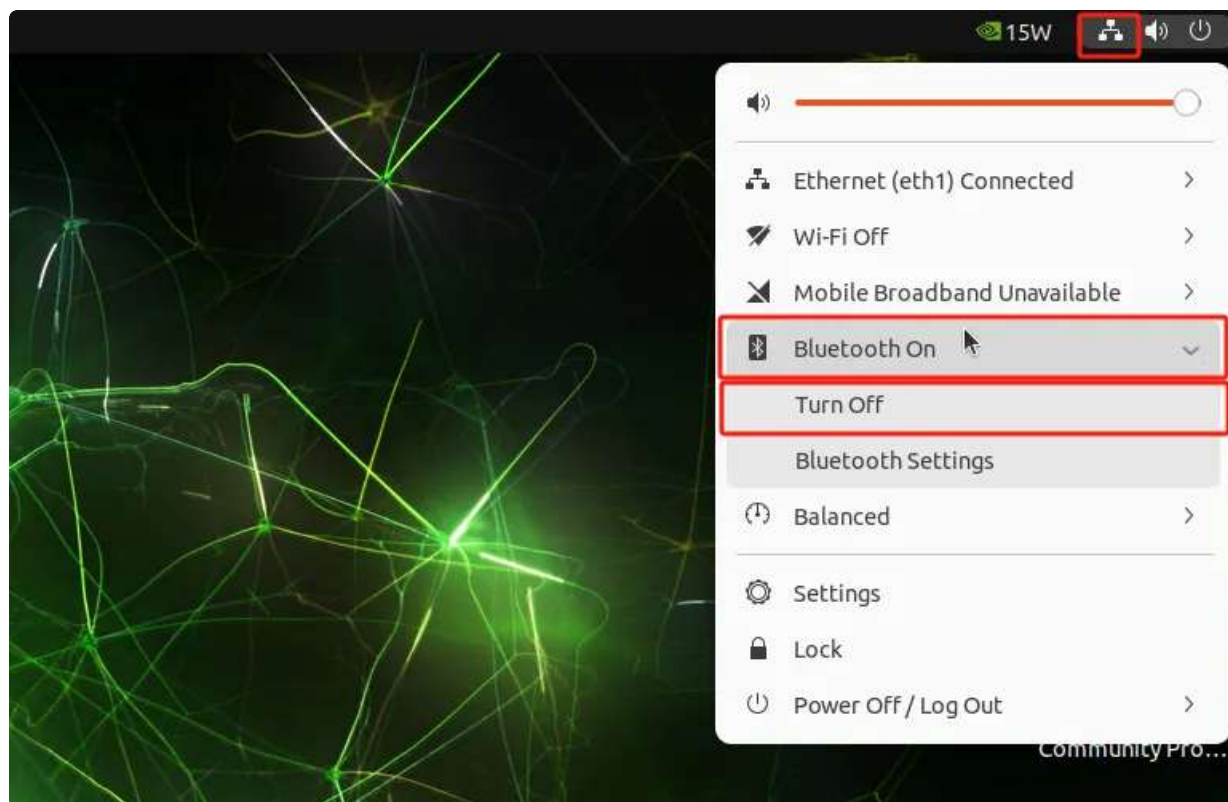
Click the network icon on the top right corner of the desktop and select Bluetooth -> Bluetooth Settings or click Show Applications->Settings->Bluetooth on the bottom left corner of the desktop.

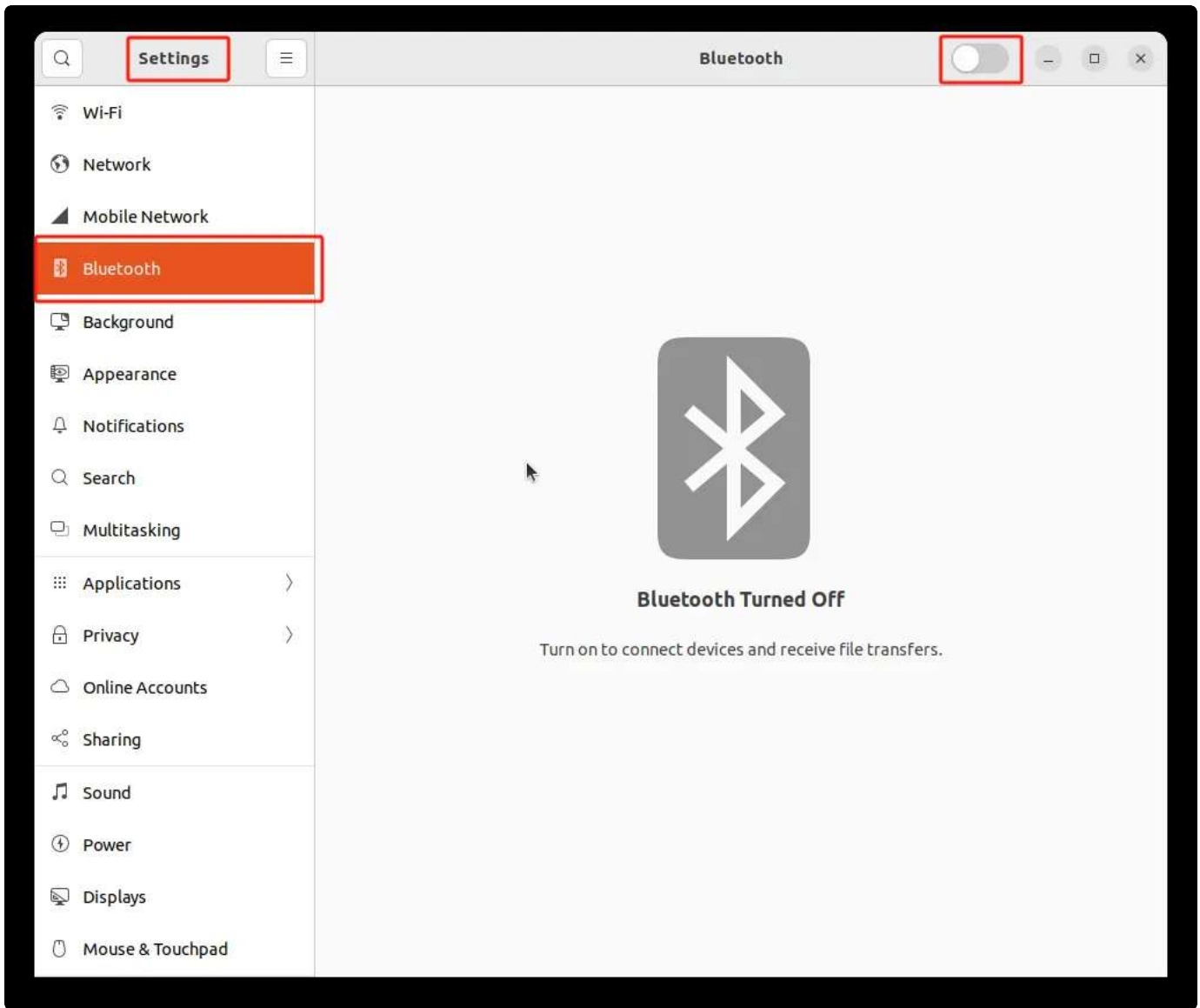




4.4.5.2 On/Off Management

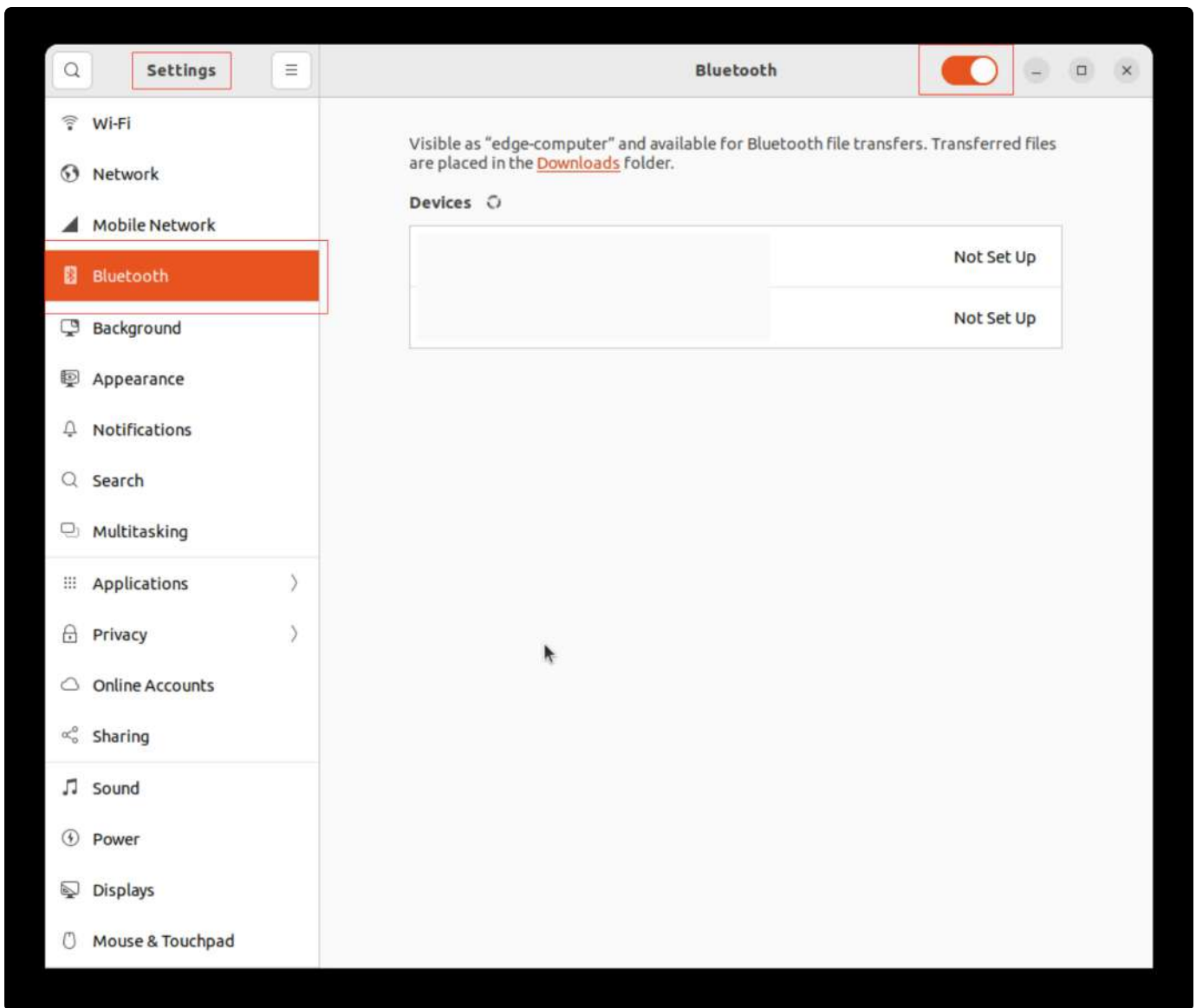
Tap Turn On/Turn Off or slide the button in Bluetooth settings to turn Bluetooth off or on.





4.4.5.3 Bluetooth Connection

After switching on the Bluetooth switch, it will automatically scan the neighbouring Bluetooth devices, click on the Bluetooth device name to connect (for Bluetooth devices that require a PIN code, please enter the PIN code).



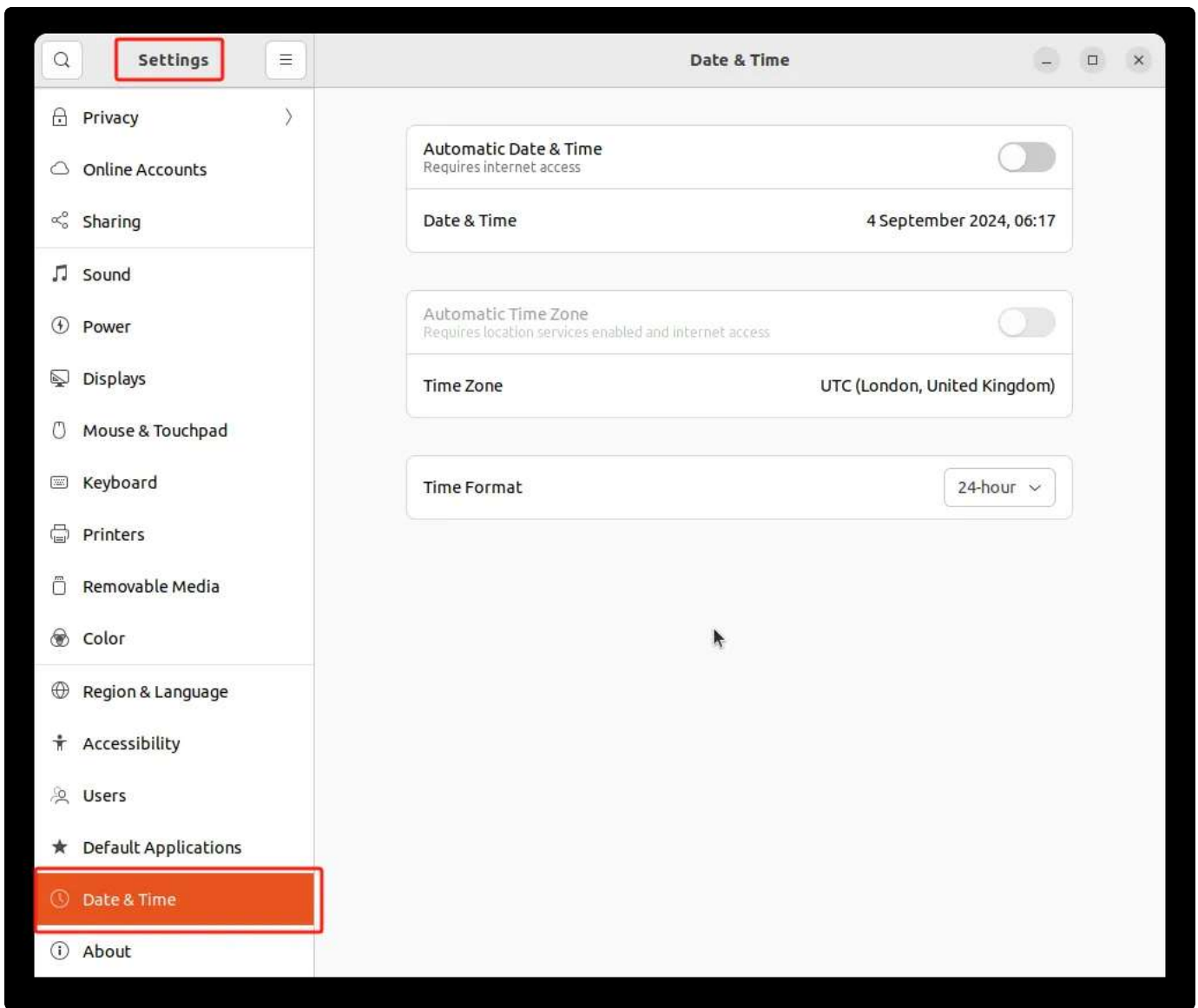
4.4.6 Network Settings Advanced Extensions

Reference:

1. [Network Manager | Ubuntu](#)
2. [Bluez Prerequisites | Ubuntu](#)

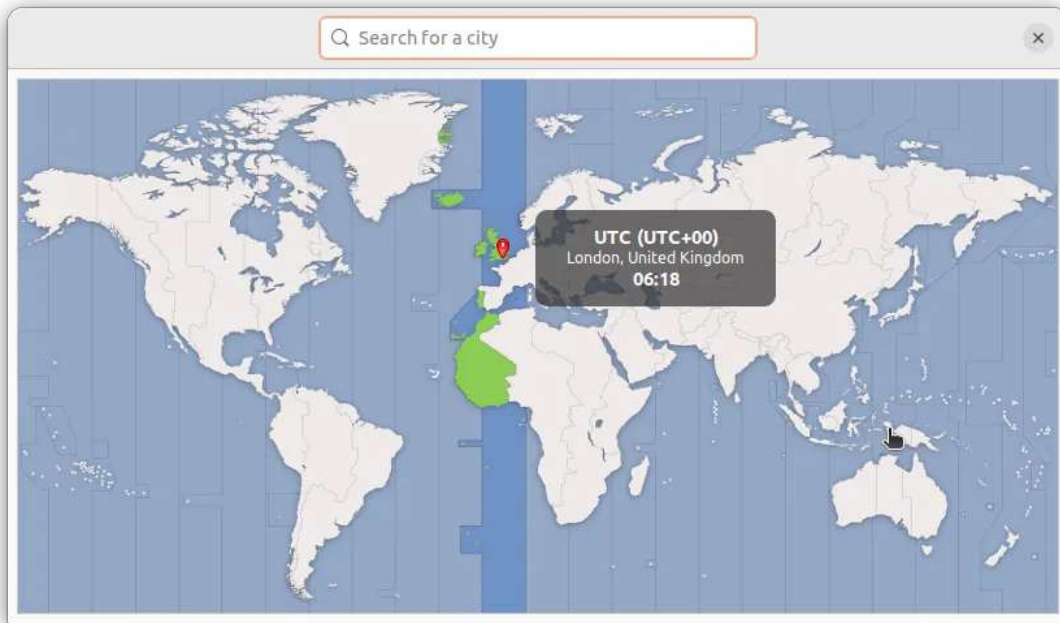
4.5 Time Settings

Click Show Applications→Settings→Data & Time at the bottom left corner of the desktop.



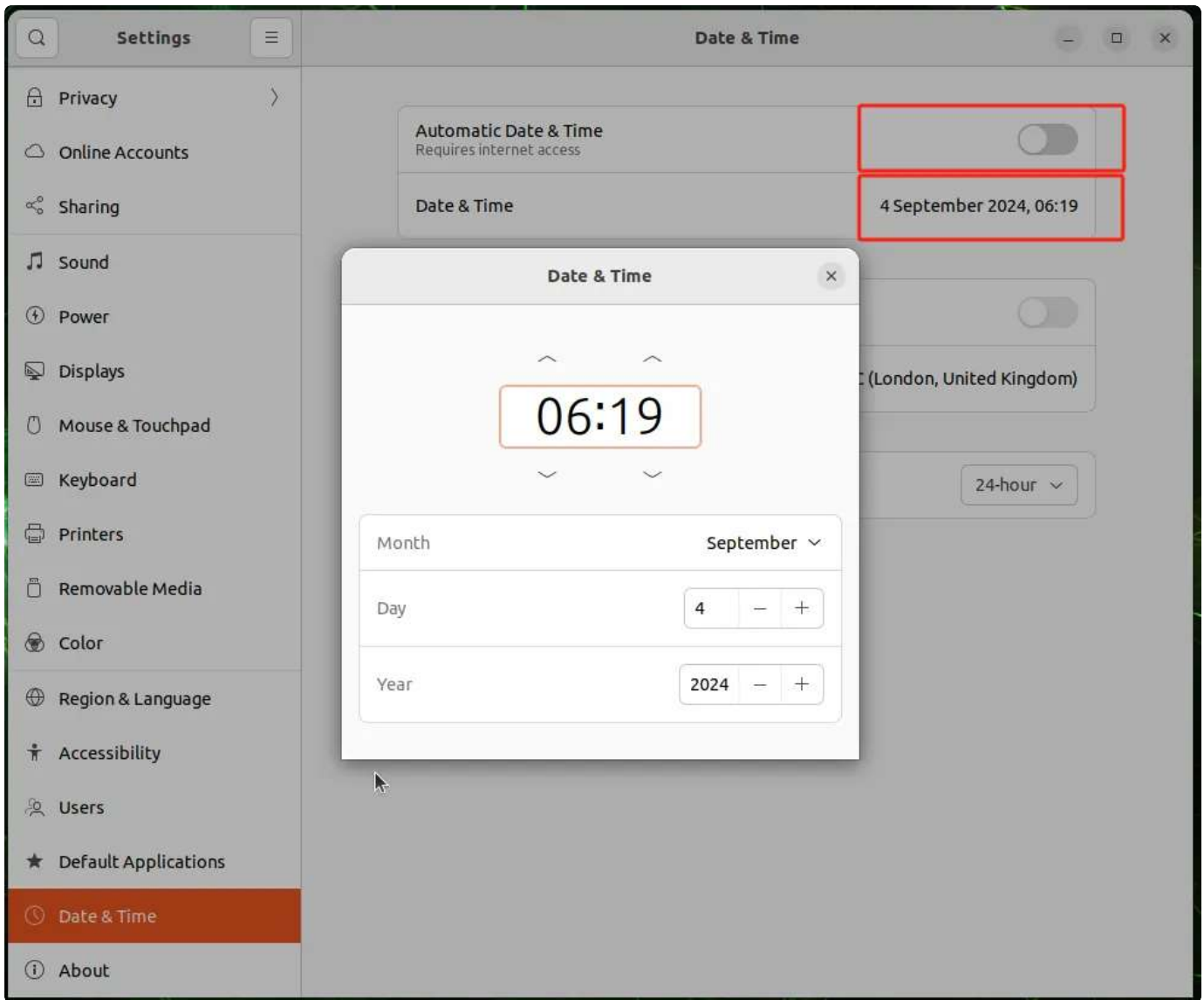
4.5.1 Setting the Time Zone

Select or enter the system time zone by clicking Time Zone on the Settings page.



4.5.2 Adjusting the Time

By default, the system will automatically set the time when the device is connected to the network, if you need to set the time manually, please turn off Automatic Date & Time and set Date & Time manually.



4.6 Peripheral Configuration

4.6.1 Serial Port Management

The device supports two RS-232/422/485 optional serial ports, corresponding to the device nodes `/dev/ttyCOM1` and `/dev/ttyCOM2` respectively. Open Terminal and use the `uart_mode` command to switch the serial port operating mode.

Table 7: Serial Port Mapping	
COM1	<code>/dev/ttyCOM1</code>
COM2	<code>/dev/ttyCOM2</code>

Table 8: Serial port operating mode switching

uart_mode	COM1	485
		422
		232
	COM2	485
		422
		232

For example, to configure COM1 to operate in RS-485 mode, enter the following command.

JSON

```
1  sudo uart_mode COM1 485
```

```

edge@edge-computer:~$ sudo uart_mode
usage: uart_mode <port> <mode>
      port: COM1/COM2
      mode: 485/422/232
edge@edge-computer:~$
edge@edge-computer:~$ sudo uart_mode COM1 485
RS485
edge@edge-computer:~$

```

4.6.2 Digital input/output Management

The device supports 4 isolated digital inputs and 4 isolated digital outputs.

Table 9: Digital Inputs/Outputs

DI	DI0	/sys/class/gpio/gpio308
	DI1	/sys/class/gpio/gpio309
	DI2	/sys/class/gpio/gpio310
	DI3	/sys/class/gpio/gpio311
DO	DO0	/sys/class/gpio/gpio312
	DO1	/sys/class/gpio/gpio313
	DO2	/sys/class/gpio/gpio314
	DO3	/sys/class/gpio/gpio315

5. Advanced

5.1 System Updates

Copy the system upgrade image to removable storage media or transfer it to the device via network, enter the following command to perform the system update operation, please be patient as the system update takes a long time.

▼

System Updates

JSON |

1

sudo update ota <update file>

```

edge@edge-computer:~$ ls
Desktop Documents Downloads ec5000-V1.0.2.img Music Pictures Public Templates Videos
edge@edge-computer:~$ sudo update ota ec5000-V1.0.2.img
[sudo] password for edge:
Do you want to update the system (yes/no)[no]!:yes

```

5.2 System Reset

5.2.1 Recovery flick switch reset



The device has a Recovery flick switch button under the detachable bezel on the right panel, press and hold Recovery for 10 seconds during normal system operation and wait for the system status light to change from blinking to normally lit and release it, the device will enter the system reset state (restoring the system to the factory state), please refer to part 2.2.10 for detailed descriptions of the buttons;

5.2.2 Command Reset

Open Terminal and use the update command to perform a system reset.



```
1  sudo update reset

edge@edge-computer:~$ sudo update reset
Do you want to reset the system (yes/no)[no]!:
```

6. Security (TPM2.0)

The device supports Trusted Platform Module 2.0 (TPM2.0) and is pre-installed with the tpm2-tools tool. You can directly use instructions to operate the TPM2.0 module to achieve security functions.

Reference:

1. [tpm2-tools](#)
2. [tpm2-tools/man at master · tpm2-software/tpm2-tools \(github.com\)](#)

7. Programming Guide

Reference:

1. [Jetson – Embedded AI Computing Platform | NVIDIA Developer](#)
2. [Jetson Software | NVIDIA Developer](#)
3. [Jetson Software Getting Started | NVIDIA Developer](#)
4. [NVIDIA Developer Forums – NVIDIA Developer Forums](#)

Warning: There is a button cell battery inside our EC5350, The cautions for its use are as follows:

1. not available
2. Do not ingest battery, Chemical Burn Hazard, If the button cell battery is swallowed, it can cause severe internal burns in just 2 hours and can lead to death.
3. Keep new and used batteries away from children. If you think batteries might have been swallowed or placed inside any part of the body, seek immediate medical attention.
4. The operating temperature of the battery is -20°C to $+60^{\circ}\text{C}$, The product should be installed in an environment that does not exceed this temperature range
5. Disposal of a BATTERY into fire or a hot oven, or mechanically crushing or cutting of a BATTERY, that can result in an EXPLOSION;
6. Leaving a BATTERY in an extremely high temperature surrounding environment that can result in an EXPLOSION or the leakage of flammable liquid or gas;
7. A BATTERY subjected to extremely low air pressure that may result in an EXPLOSION or the leakage of flammable liquid or gas.

FCC STATEMENT

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE 1: This equipment has been tested and found to comply with the limits for a Class B digital device , pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

NOTE 2: Any changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

RF Exposure

The equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This device should be installed and operated with minimum distance 20cm between the radiator & your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. The availability of some specific channels and/or operational frequency bands is country dependent and firmware programmed at the factory to match the intended destination. The firmware setting is not accessible by the end user.