# Installation and Setup

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## Download

Start by downloading a Raspberry Pi OS image from https://www.raspberrypi.org/software/operating-systems.

## Install the operating system

You can install the operating system to an SD card using the following command:

```
$ unzip -p ~/Downloads/2021-05-07-raspios-buster-armhf-lite.zip | sudo dd of=/dev/mmcblk0 bs=4M conv=fsync
```

Before you run this command, make sure that you're writing to the correct device. In my case, my SD card appeared as `/dev/mmcblk0`, but it might differ on your system. When in doubt, you can use the `lsblk` command to list the storage devices.

For more information, see https://www.raspberrypi.org/documentation/installation/installing-images/linux.md.

## Enable SSH

Mount the SD card and create an empty file with the name `ssh` in the `boot` partition.

## Enable Ethernet over USB (RPi Zero only)

Open the `config.txt` file in the `boot` partition, and append the following line to it:

```
dtoverlay=dwc2
```

In the file `cmdline.txt`, add the following option after the `rootwait` option (leave a space):

```
modules-load=dwc2,g_ether
```

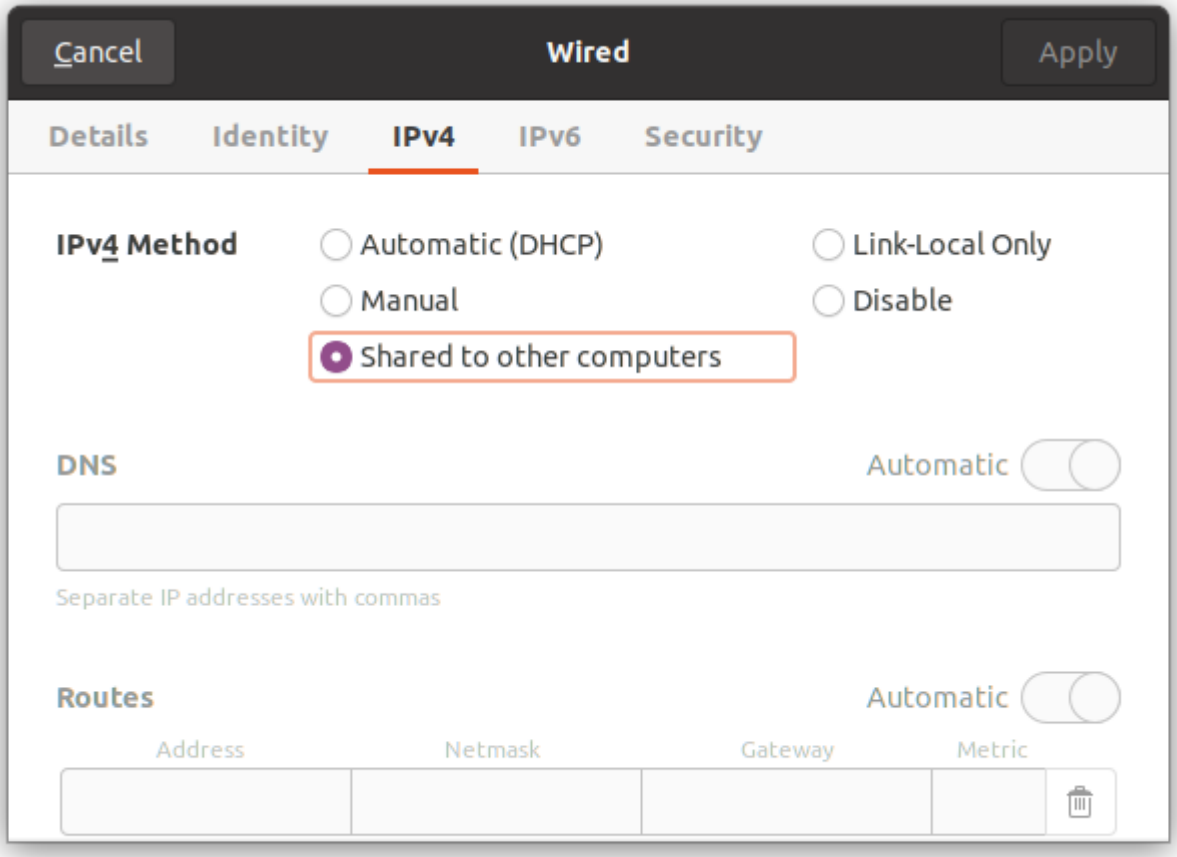
## Boot the Pi

Ensure that you saved the files from the previous sections, safely remove the SD card, insert it into the Raspberry Pi and turn it on. Connect it to your network over Ethernet or WiFi.

## Connect over USB (RPi Zero only)

If you're using a Pi Zero without WiFi, you can connect it to your computer over USB and have it show up as a network interface. Use the correct USB port (the one labeled “USB”, not “PWR IN”).

Give the Pi some time to boot, and then open the network settings on you computer. The Pi should show up as a wired network connection. In the IPv4 and IPv6 settings, select “Shared to other computers” to share you internet connection with the Pi.




## Log in to the Pi over SSH

Assuming that you have only one Raspberry Pi on the network, connect to it using

```
$ ssh pi@raspberrypi.local
```

The default password is `raspberry`, change it by running:

```
pi@raspberrypi $ passwd
```

## Set up the hostname and SSH keys

Change the hostname and restart the mDNS service, then log out. Feel free to use a more appropriate hostname for your specific setup, but remember to change it in the following commands.

```
pi@raspberrypi $ sudo hostnamectl set-hostname rpi0
pi@raspberrypi $ sudo service avahi-daemon restart
pi@raspberrypi $ exit
```

You're now at your computer's shell again. Create an SSH configuration for the Pi:

```
$ cat >> ~/.ssh/config << 'EOF'
  Host RPi0
      HostName rpi0.local
      User pi
  EOF
```

Add your public key to the Pi's `authorized_keys`, so you can connect to it without entering the password each time:

```
$ ssh-copy-id -i ~/.ssh/id_rsa.pub RPi0
```

If you don't have an SSH key pair yet, you can follow these instructions on how to create one: DigitalOcean - How to Set Up SSH Keys.

You can now try to connect to it without having to specify the hostname or username, and without having to enter your password:

```
$ ssh RPi0
```