Orange Pi Zero
Ubuntu Core User Manual

Contents

1．Ubuntu Core introduction

Ubuntu Core is a condensed version system based on Ubuntu , released by Canonical on 2016. It not only provides safety update system at regular intervals, also provides service for app store at intelligent Internet Devices. Ubuntu Core has been widely used in industrial gateways, home gateways, wireless access networks, digital signage, robots, vending machines, wireless communication base stations and unmanned aerial vehicles. Ubuntu Core fully built with Snap, a safe, easy to update open source Linux packaging format. Meanwhile, Ubuntu Core provides a secure support platform for the rapid creation of IOT devices and embedded devices.

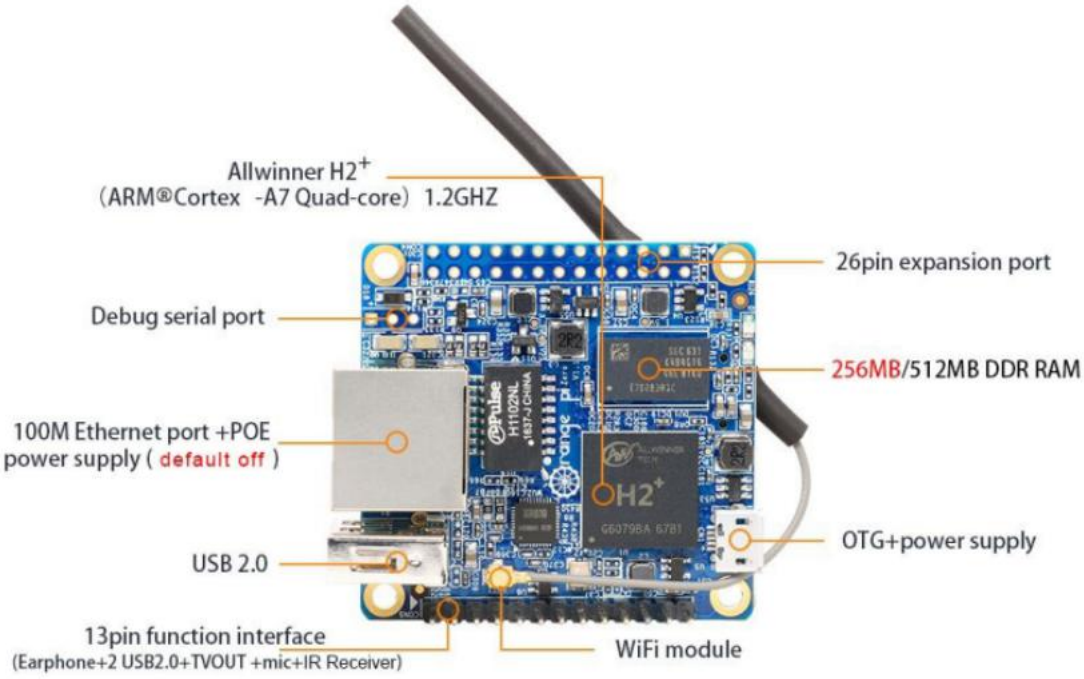
Main specification of Ubuntu Core：

- Security: automatic, controllable updates, timely recovery to repair high-risk security vulnerabilities.
  Dependability: transactional (rollback) update mechanism.
- Convenience: easier to deploy software stores and access huge amounts of applications.

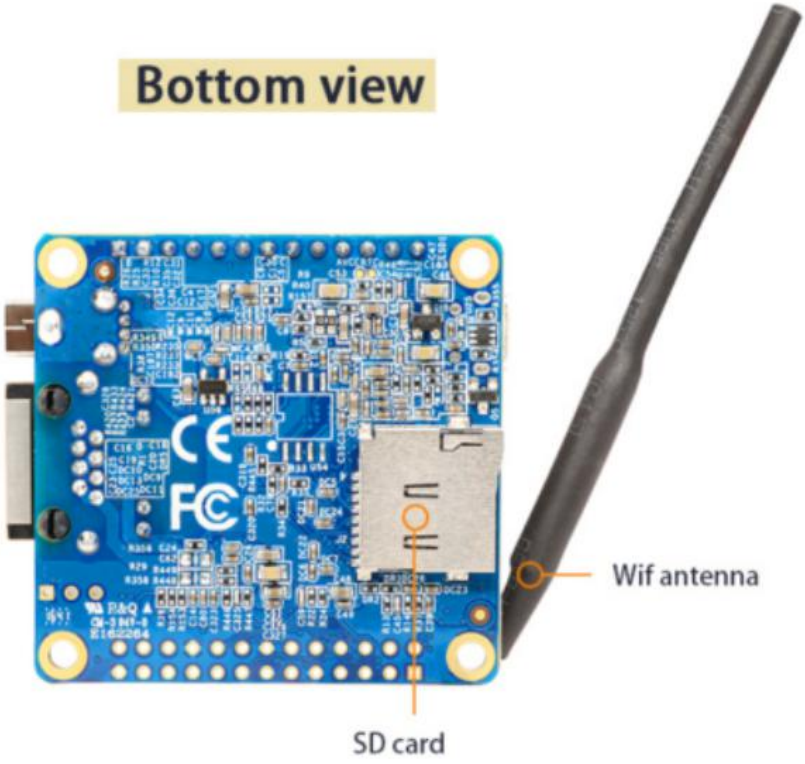
2．Before booting Ubuntu Core

Hardware specification of Orange Pi Zero：

Top view



Bottom view



- Wire cable, power supply, TTL to USB cable and SD card preparing
  For now, the first time to boot Ubuntu Core on Orange Pi Zero could only realize via Ethernet port configuration.

- Download Ubuntu Core image
  Here is the website to download: http://www.orangepi.org/downloadresources/

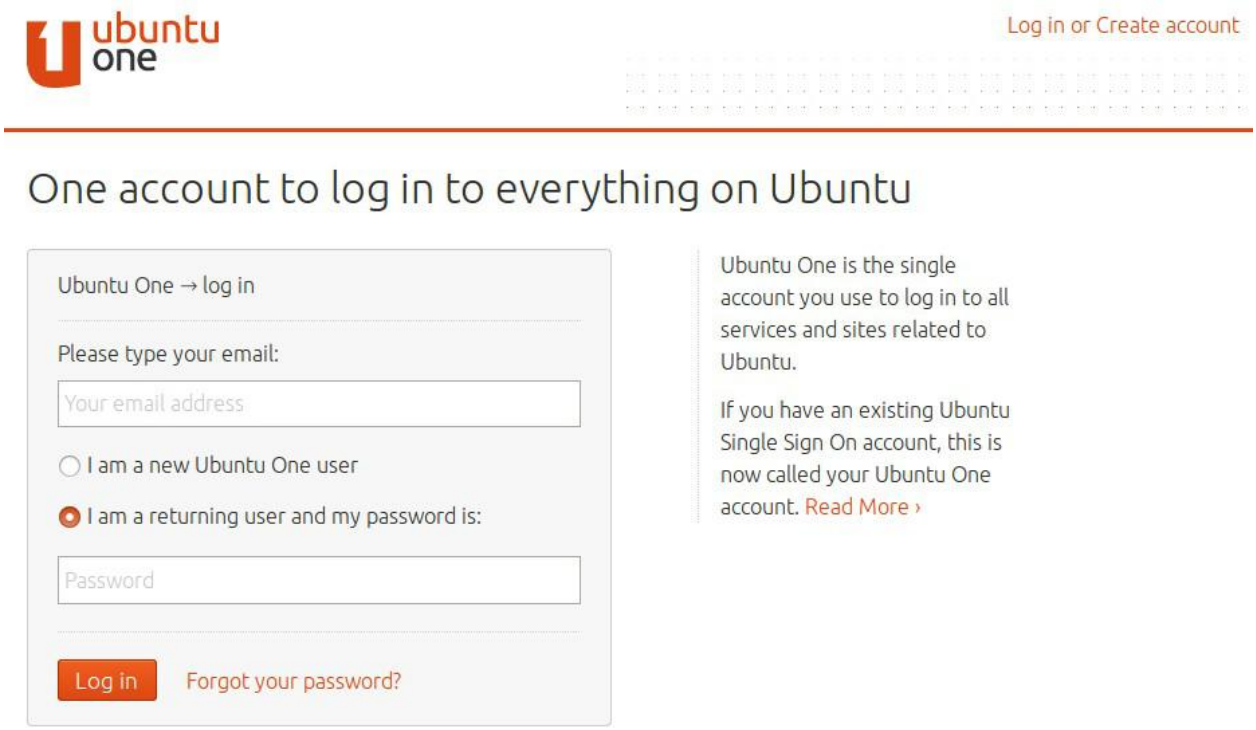
- Write the downloaded image into SD card
  - Unzip the image

```
1.  $ unrar -x  OrangePi zero UbuntuCore 1604 V0 0 1.rar
```

  - Write Ubuntu Core image into SD card

```
1.  $ umount  /dev/sdx
2.  $ sudo dd bs=4M if=orangepi-zero.img of=/dev/sdx (sdx according to the actual situation)
```

- Register an Ubuntu One account
  - Here is the website to register: https://login.ubuntu.com/+login。
  - Select the *I am a new Ubuntu One user*, register according to the prompts



- After register, import the *ssh public key* on the system(PC)(the path on Linux is ~/.ssh/id_rsa.pub)of *SSH Keys* into Ubuntu One account like the following:

- If there is no the above file generated, you could use the following command:

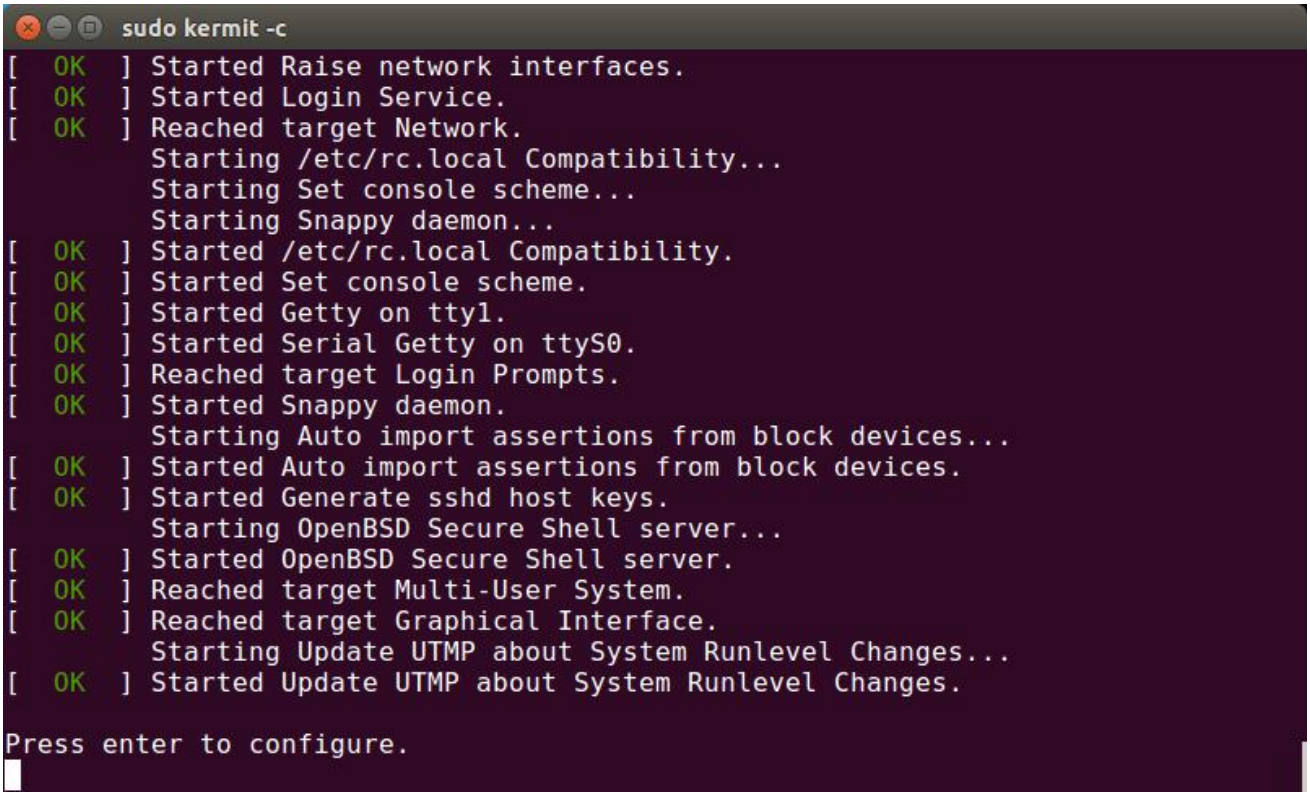
```
1.  $ ssh-keygen -t rsa -C "orangepi"
```

- Ubuntu Core is defaulted no console to login, only devise with ssh key has the right to ssh remote login Ubuntu Core system.

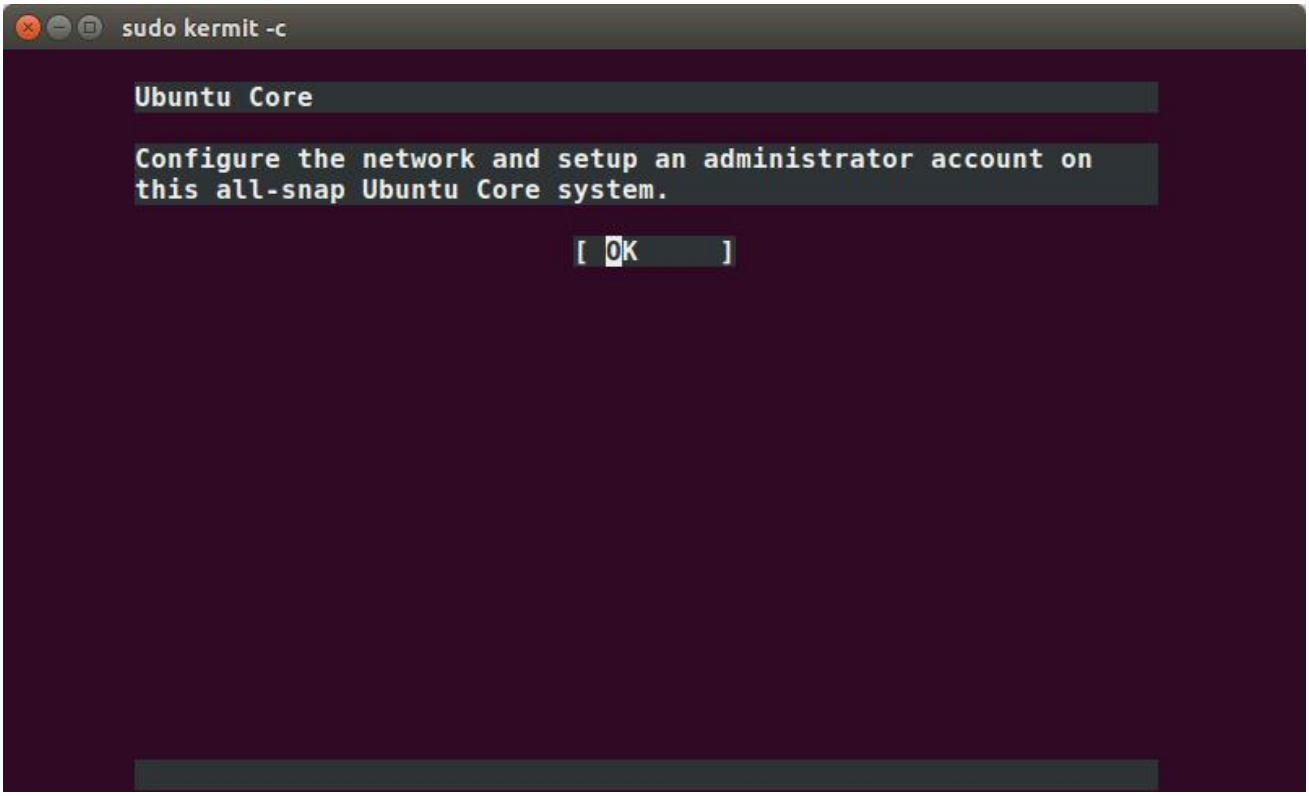
3．Ubuntu Core start up configuration process

After prepared the Step2 before booting, we could boot the system and configure corresponding setting.

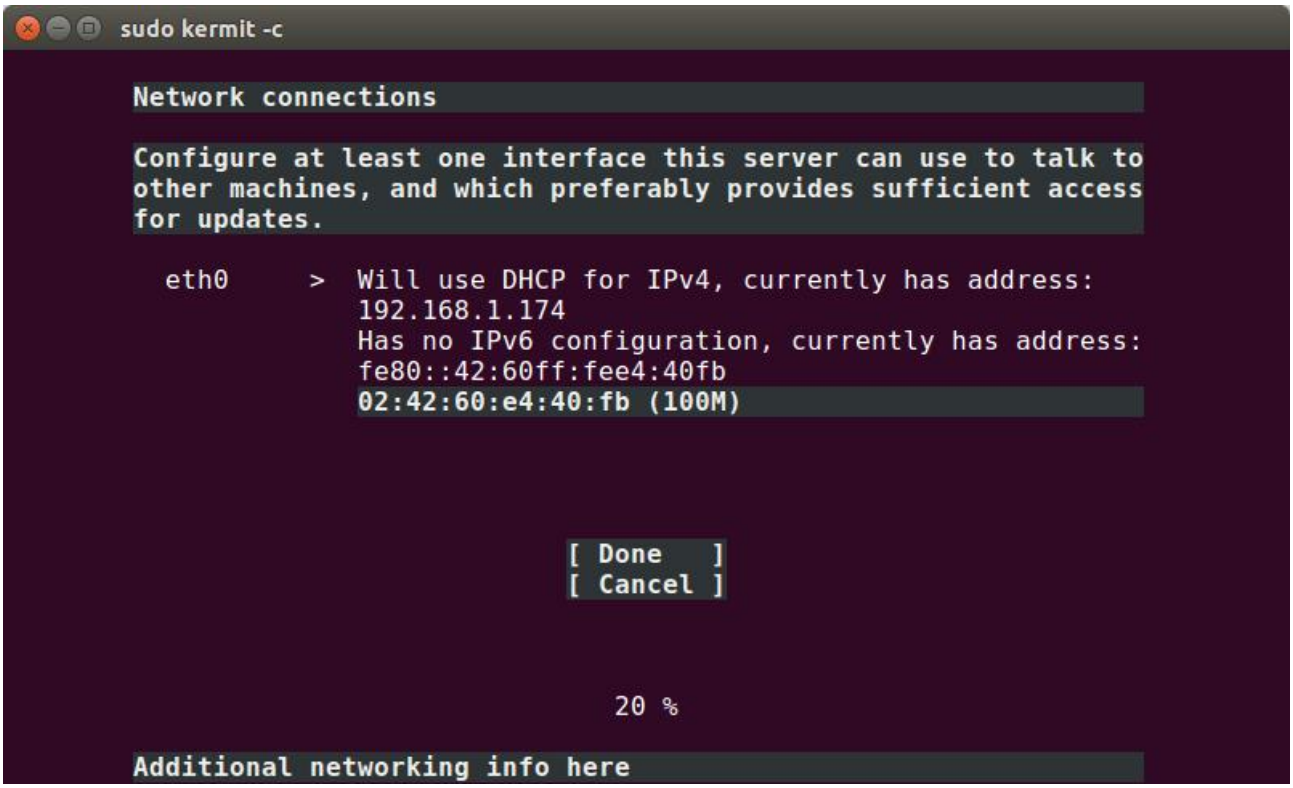
- Insert SD card into Orange Pi Zero with written image, connect wire cable, TTL to USB cable and power it on. There will print out the following information on the terminal:



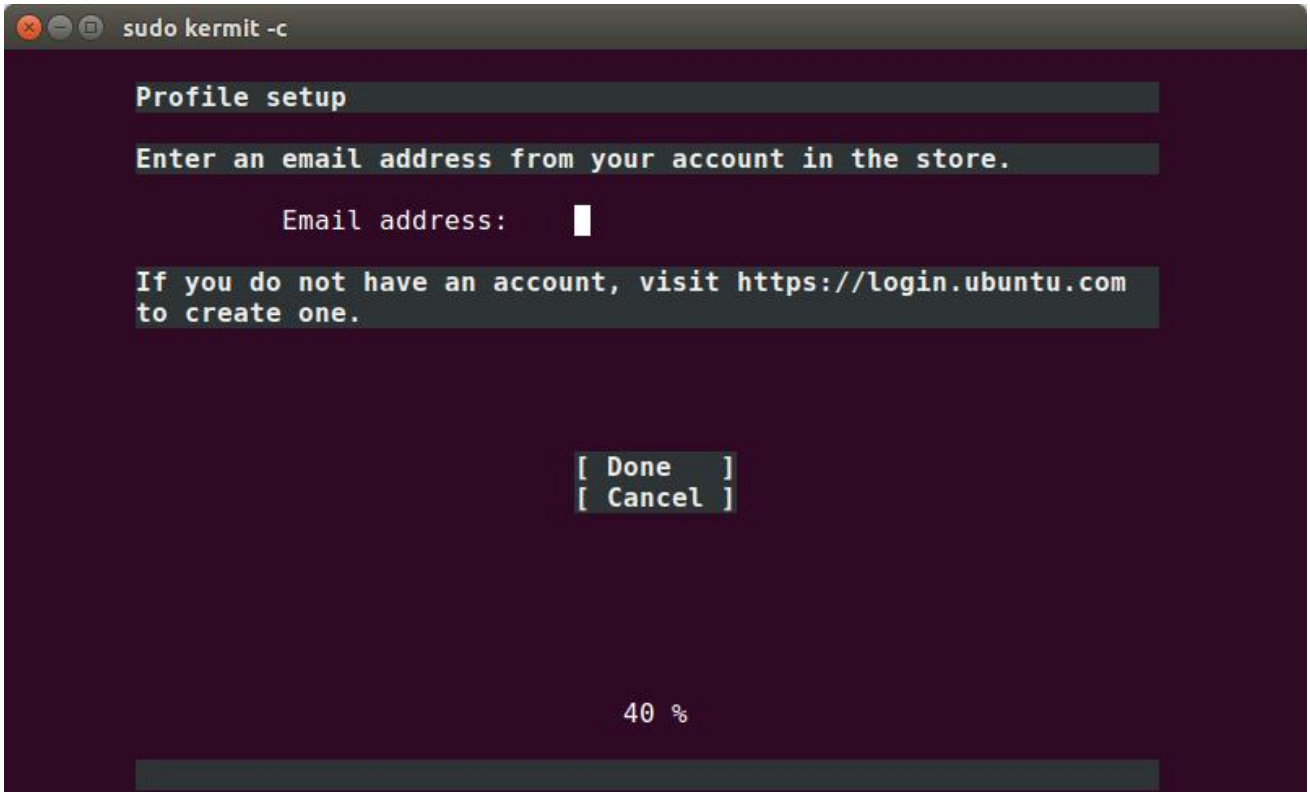
- Press *Enter* into the configuration interface like the following:



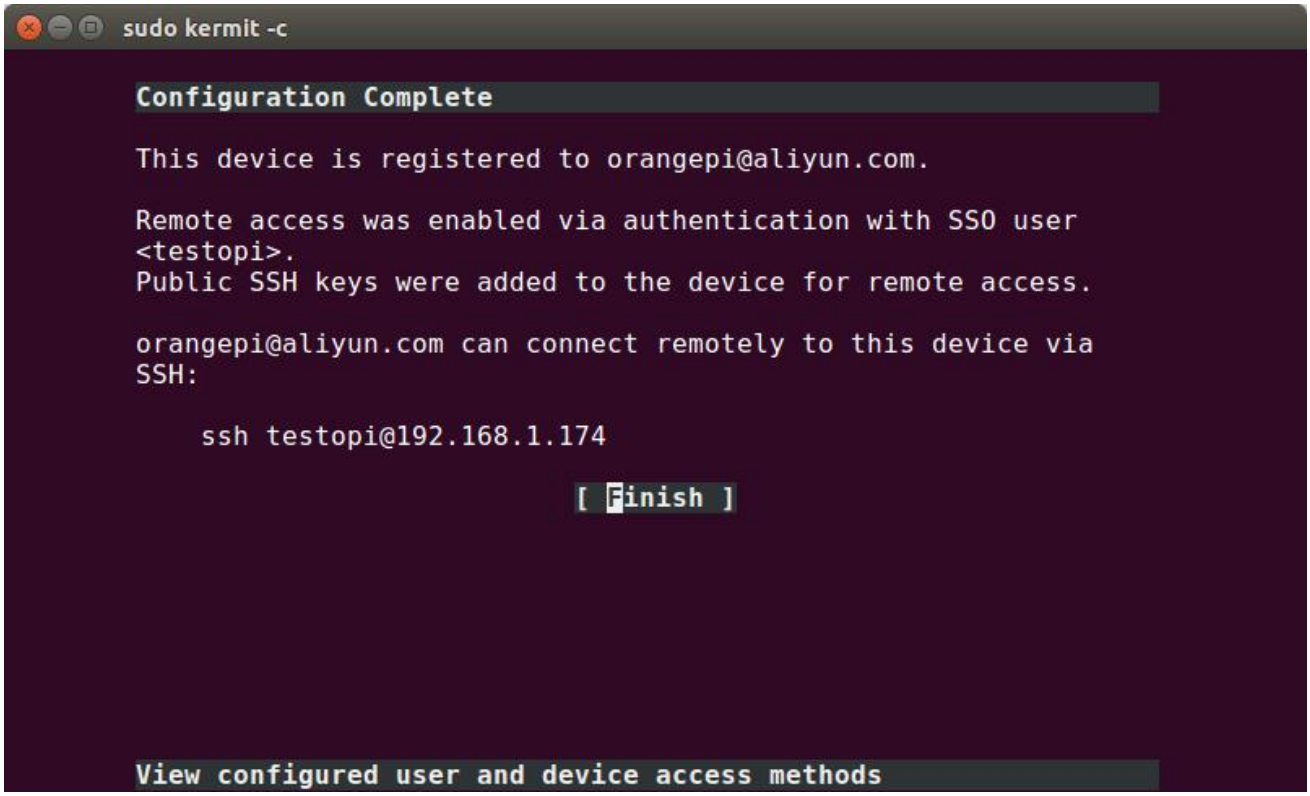
- Press *Enter* into the following network configure interface, if the network connect normally then it would distribute IP address.



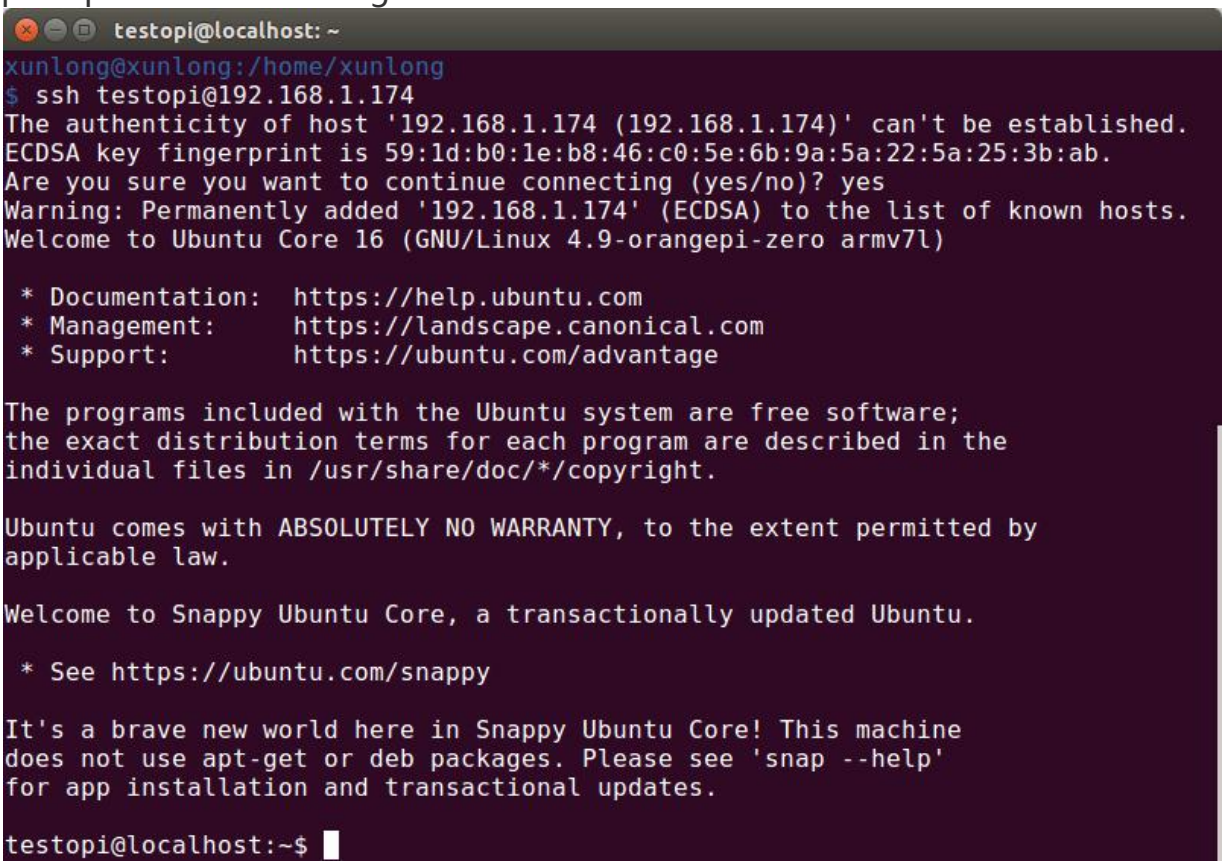
- Use the arrow keys to position of *[Done]* the cursor on the above interface, press *Enter* key into the following *Profile Setup* configure interface.



- Enter the email address when register Ubuntu One, press Enter key and your system would configure ssh login, after it succeed, there would be prompt like the following. You could login Ubuntu Core via ssh now.



- Reopen a terminal with the ssh command prompts on the above: ssh testopi@192.168.1.174 to login the system, after login successful, there would be prompt like the following:



If there is prompt of error like the following, you could enter the following command to delete the previous record and re-login.

```
1.  ssh-keygen -f "/home/xunlong/.ssh/known hosts" -R  192.168.1.174
```

```
xunlong@xunlong: ~
xunlong@xunlong:/home/xunlong
$ ssh testopi@192.168.1.174
@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@
@    WARNING: REMOTE HOST IDENTIFICATION HAS CHANGED!     @
@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@
IT IS POSSIBLE THAT SOMEONE IS DOING SOMETHING NASTY!
Someone could be eavesdropping on you right now (man-in-the-middle attack)!
It is also possible that a host key has just been changed.
The fingerprint for the ECDSA key sent by the remote host is
59:1d:b0:1e:b8:46:c0:5e:6b:9a:5a:22:5a:25:3b:ab.
Please contact your system administrator.
Add correct host key in /home/xunlong/.ssh/known_hosts to get rid of this messag
e.
Offending ECDSA key in /home/xunlong/.ssh/known_hosts:1
  remove with: ssh-keygen -f "/home/xunlong/.ssh/known_hosts" -R 192.168.1.174
ECDSA host key for 192.168.1.174 has changed and you have requested strict check
ing.
Host key verification failed.
xunlong@xunlong:/home/xunlong
$
```

- Login console with system configure

The configure interface at the first time booting named *console-conf*, it would logout after configured. It would run with *getty* and provide login interface. If you donot want to use ssh, you could configure console to login the system.

- You could set the password after login system with ssh.

```
1.    $ sudo passwd ${USER}
```

- Back the the terminal of serial port and press Enter to logout console-conf, and you will enter into the following prompt of console. You could login with your account and password into Ubuntu Core.

```
sudo kermit -c
The host key fingerprints are:

    RSA     SHA256:BDTuzoU4JABuKznGvyaftyo/bukEngQIrmmxK5mIgH8
    DSA     SHA256:5M3OHpzUWJ2uss4qMwL//f0PXUzJLp0aSxQpg6l8sbY
    ECDSA   SHA256:pETlgAGTLsUnvPXJPSHOoG291+RxcdDDwwc89Zkde/o
    ED25519 SHA256:TPBSaupQTHYEV3Gj0d7A1teWv4jR6fjeZMKdFOfoQMY

To login:

    ssh testopi@192.168.1.174

Personalize your account at https://login.ubuntu.com.


Ubuntu Core 16 on 192.168.1.174 (ttyS0)

localhost login:
```

4 . Using example of Ubuntu Core

You could run Ubuntu Core after finished the previous configuration.

- Install and run your first Snaps —— Hello, enter the following command:

```
$ sudo snap install  hello
$ hello
```

- You could refer to the official website about how to develop and use Ubuntu Core
  - Snaps and snapcraft file: https://snapcraft.io/docs/
  - Ubuntu Core file: https://docs.ubuntu.com/core/en/

5 . Test example for Ubuntu Core driver

User Snappy wiringop-zero to test the function of GPIO

- Install wiringop-zero(for now it is on edge channel) from Orange Pi store

```
$ sudo snap install wiringop-zero  --edge
```

- Connect plug-in unit of wiringop-zero and core

```
$ snap connect  wiringop-zero:physical-memory-control
core:physical-memory-control
$ snap connect wiringop-zero:physical-memory-observe
core:physical-memory-observe
```

- Test the function of GPIO (same as other images)

```
$ sudo wiringop-zero.gpio mode 2  out
$ sudo wiringop-zero.gpio write 8  0
$ sudo wiringop-zero.gpio write 8  1
$ sudo wiringop-zero.gpio read  8
```

- Test the function of playback and recording
  - Install alsa-utils

```
$ sudo snap install  alsa-utils
```

  - Use the relevant commands

```
$ sudo aplay -l
$ sudo alsamixer
$ sudo aplay test.wav
```

WIFI and AV video output

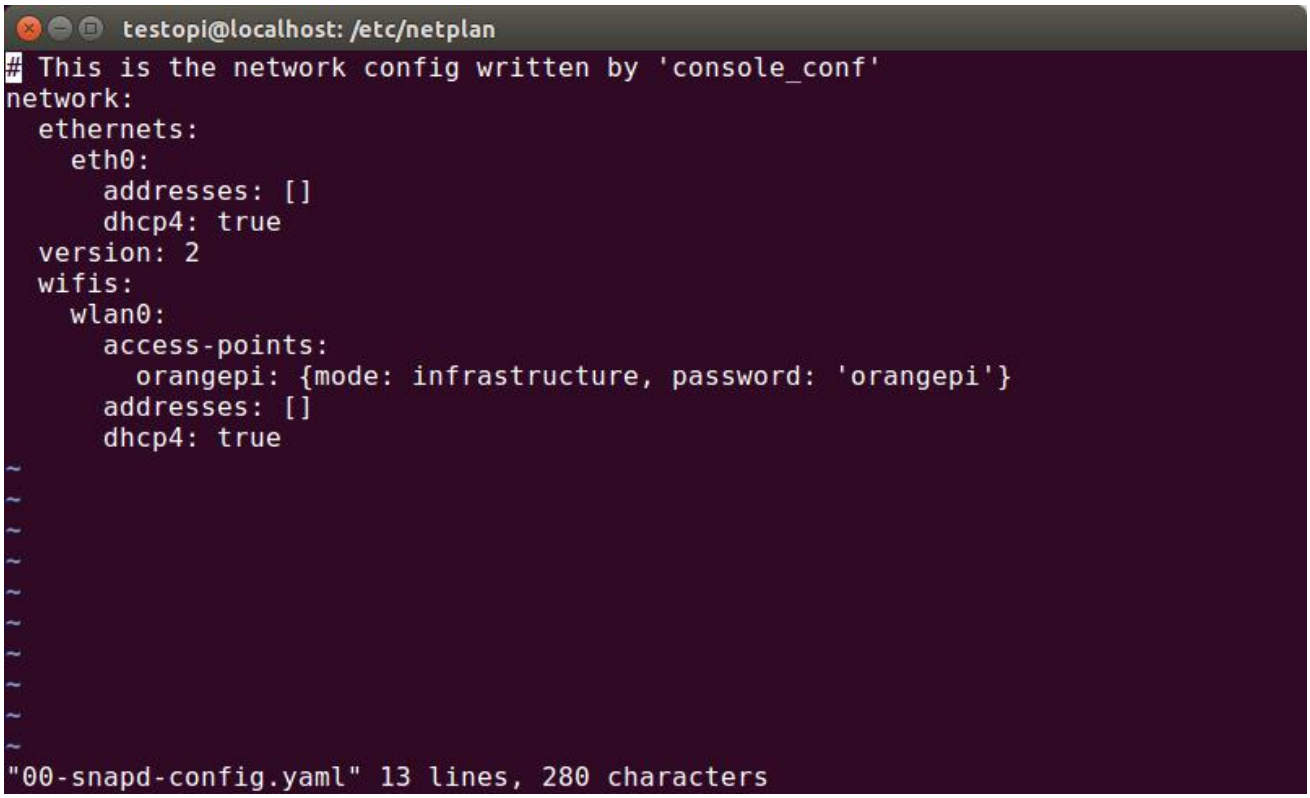
Since there is not enough relevant driver, we have set those two functions on edge channel, you could run them with the following command:

- Reflash orangepi-zero-kernel on edge channel, and reboot the system. You could use WIFI and AV video output.

```
1.  $ sudo snap refresh orangepi-zero-kernel  --edge
2.  $ reboot
```

- WIFI configuration just like the following shows, account and password both are orangepi

  Add WIFI configuration on /etc/netplan/00-snapd-config.yaml and reboot it.



6 . Orange Pi store

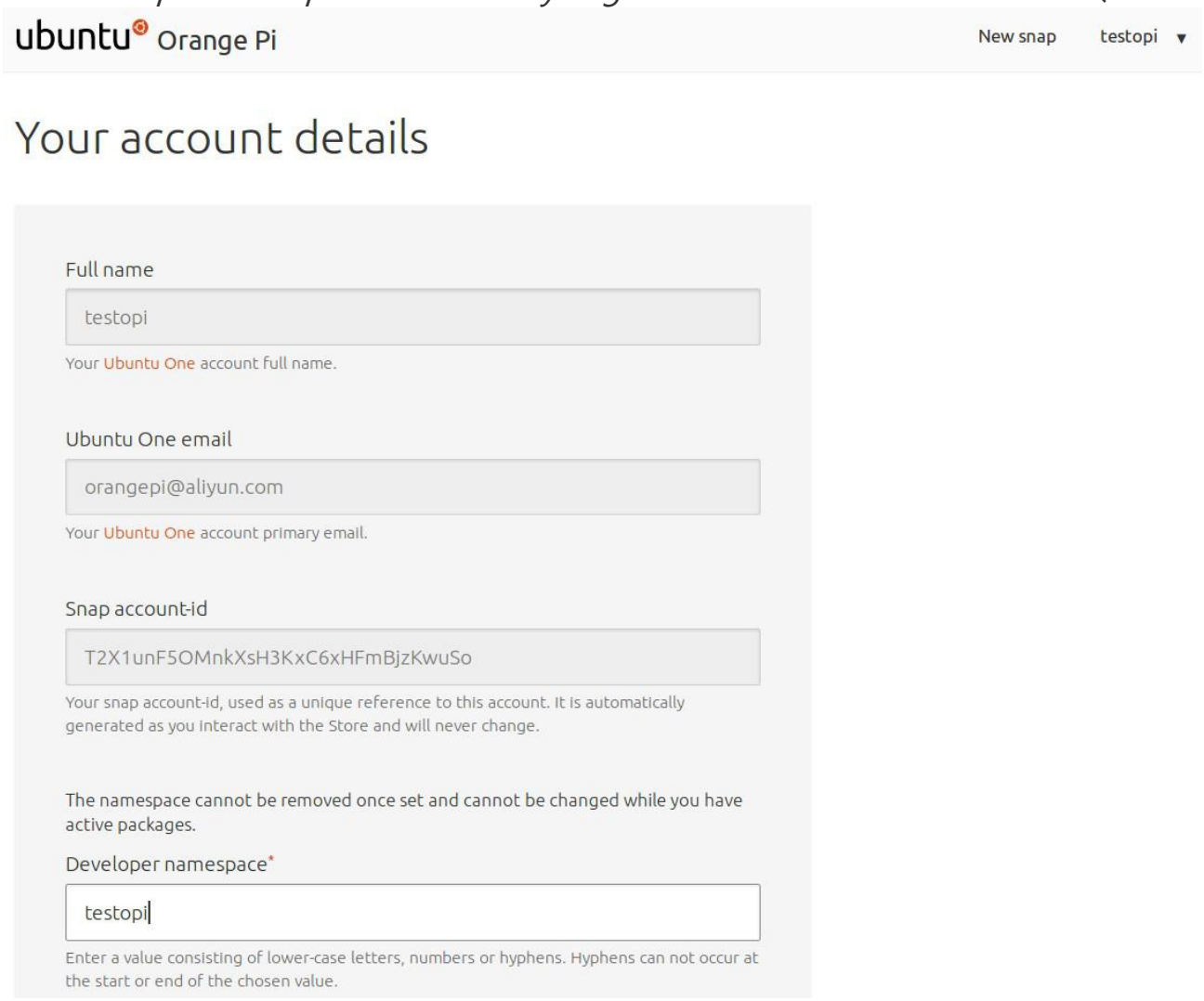
Orange Pi has already has its exclusive store, you could use Web page or command to upload your Snaps to Orange Pi store.

Upload your Snaps to Orange Pi store on Web page:

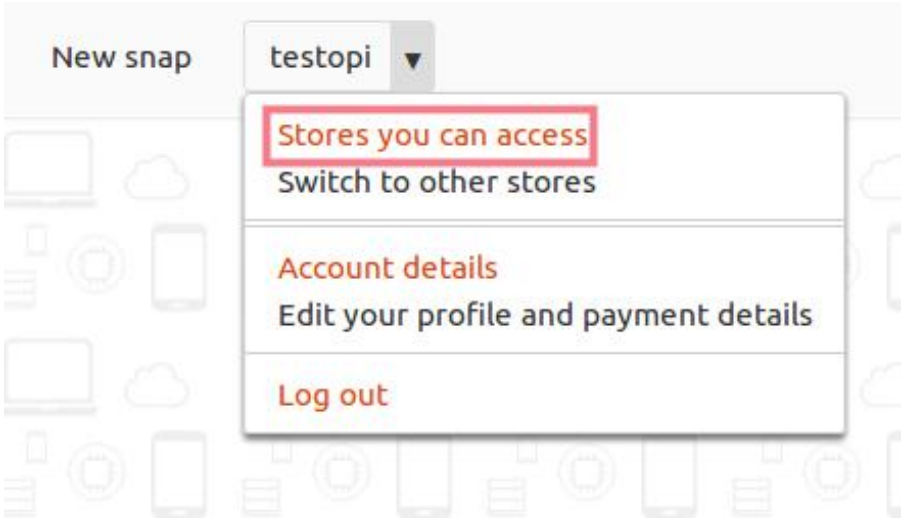
- Open Ubuntu store: https://dashboard.snapcraft.io/dev/snaps/
- Use Ubuntu One account to login:

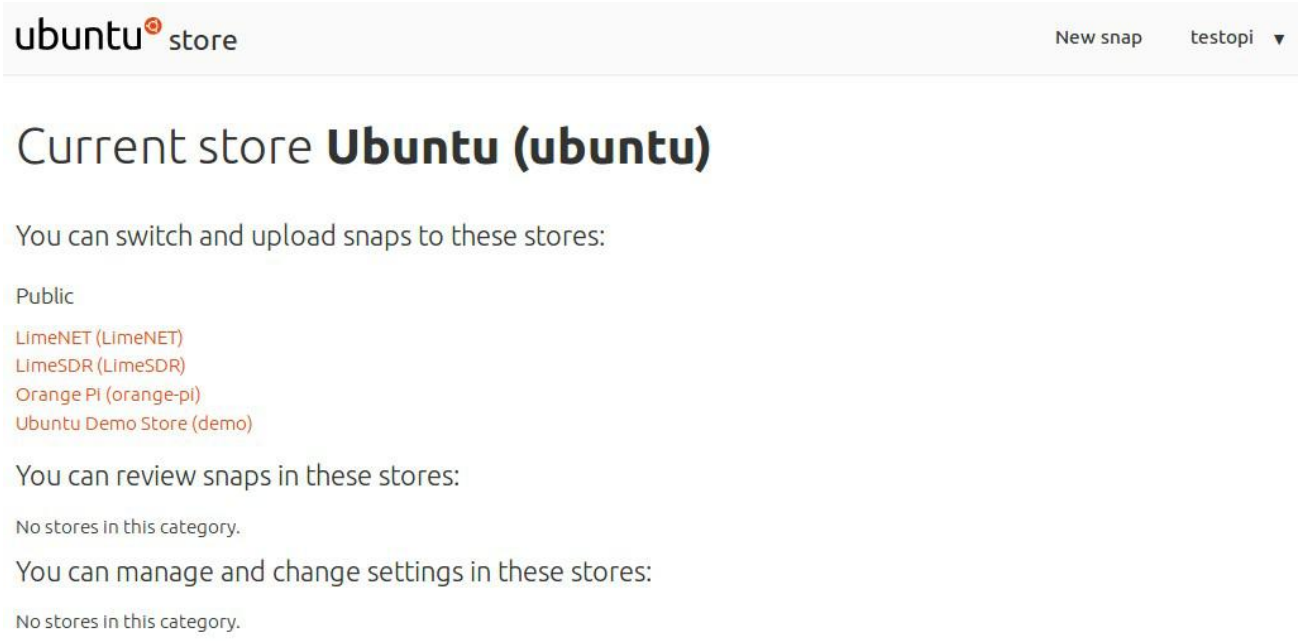
snap for the Ubuntu store.

- Set *Developer namespace* and *Country Region* on *Account details*

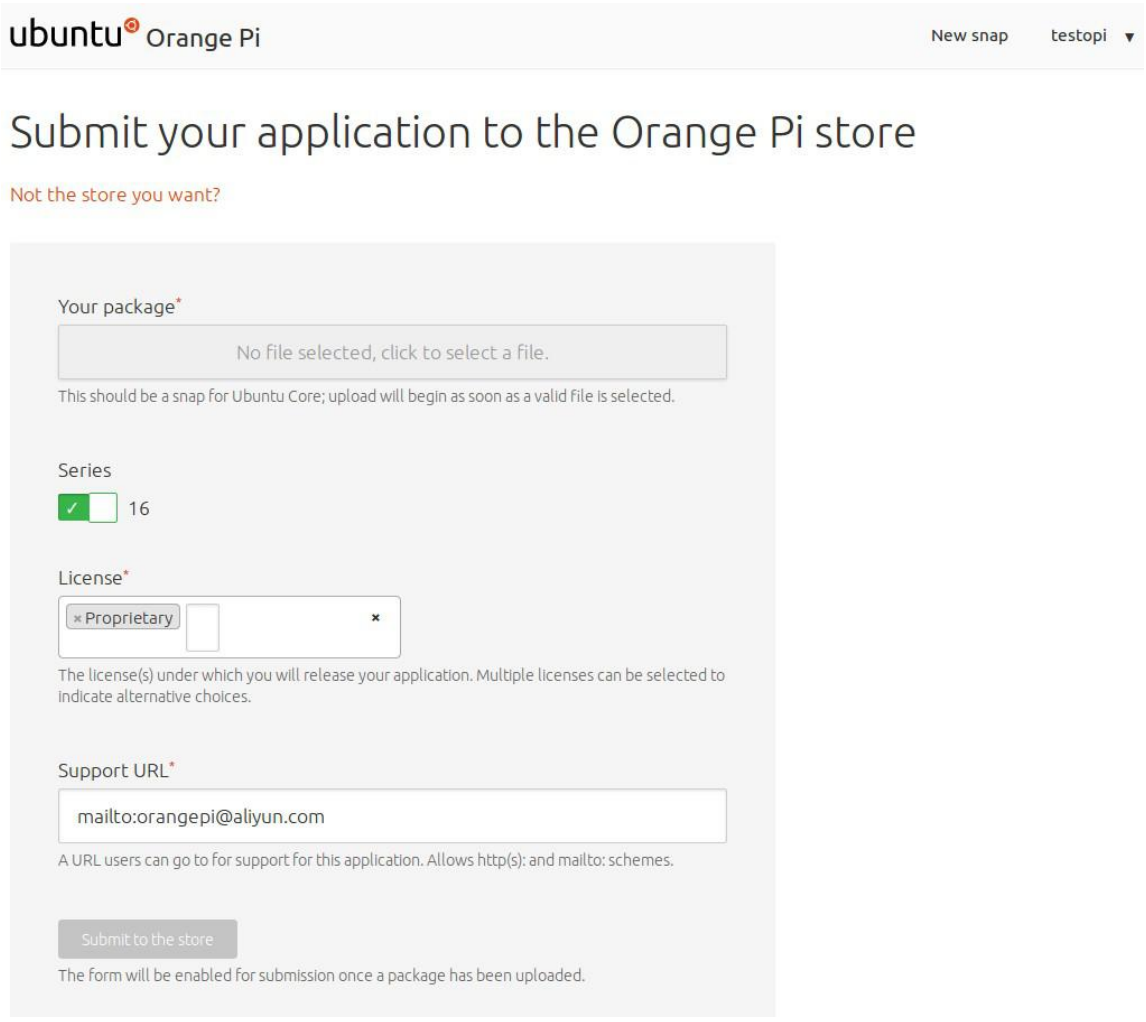


- Enter into Store list on Stores you can access


New snap
testopi
Stores you can access
Switch to other stores
Account details
Edit your profile and payment details
Log out

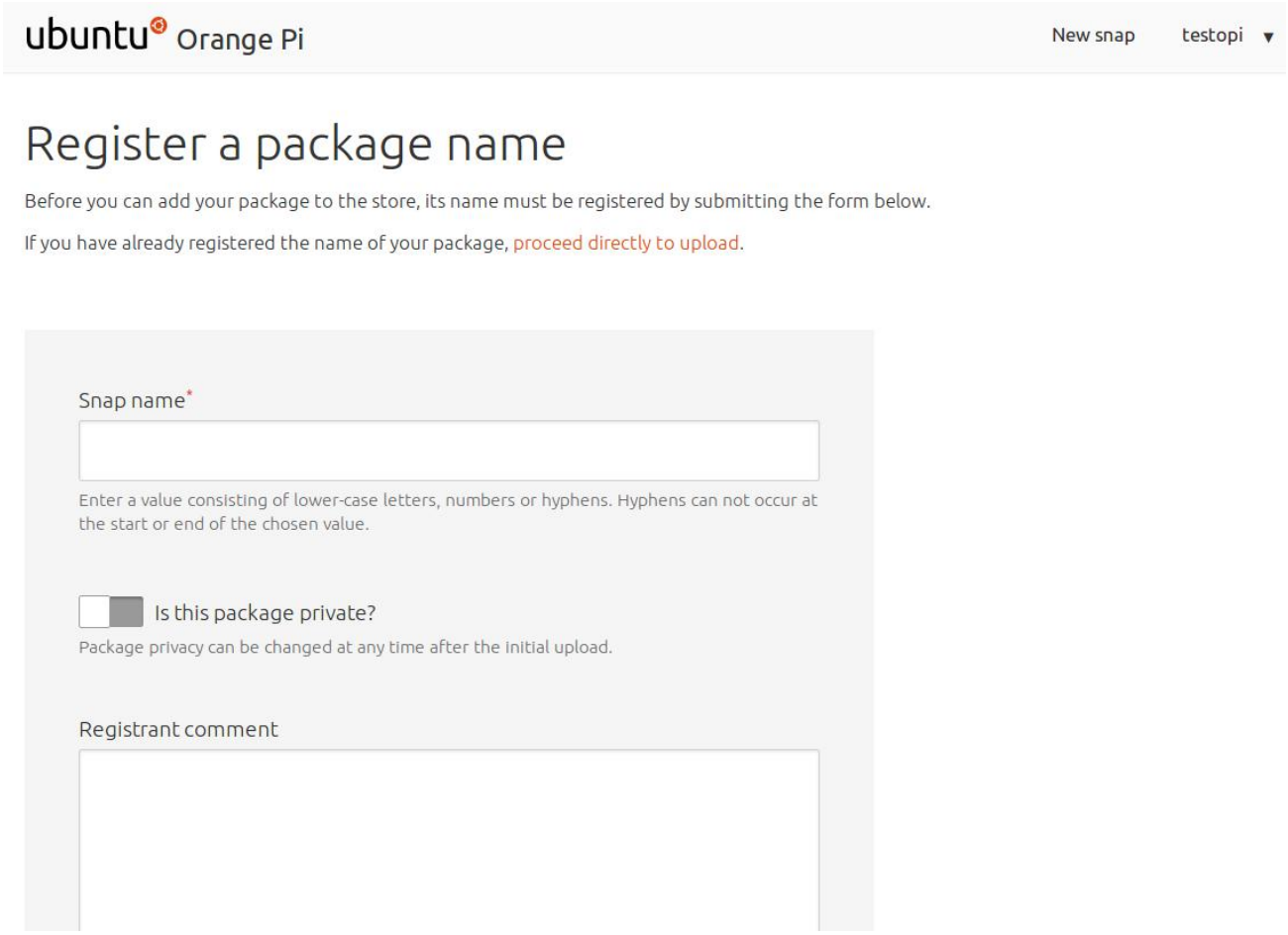


- After select Orange Pi store, there would be a name of Orange Pi on the top left corner, you could upload Snaps into Orange Pi store with Submit to the store



- You also need to snap app register a Snaps account on New snap page. Please note that the

name of Snaps is unique.


ubuntu Orange Pi
New snap
testopi
Register a package name
Before you can add your package to the store, its name must be registered by submitting the form below.
If you have already registered the name of your package, proceed directly to upload.
Snap name*
Enter a value consisting of lower-case letters, numbers or hyphens. Hyphens can not occur at the start or end of the chosen value.
Is this package private?
Package privacy can be changed at any time after the initial upload.
Registrant comment

Enjoy it !