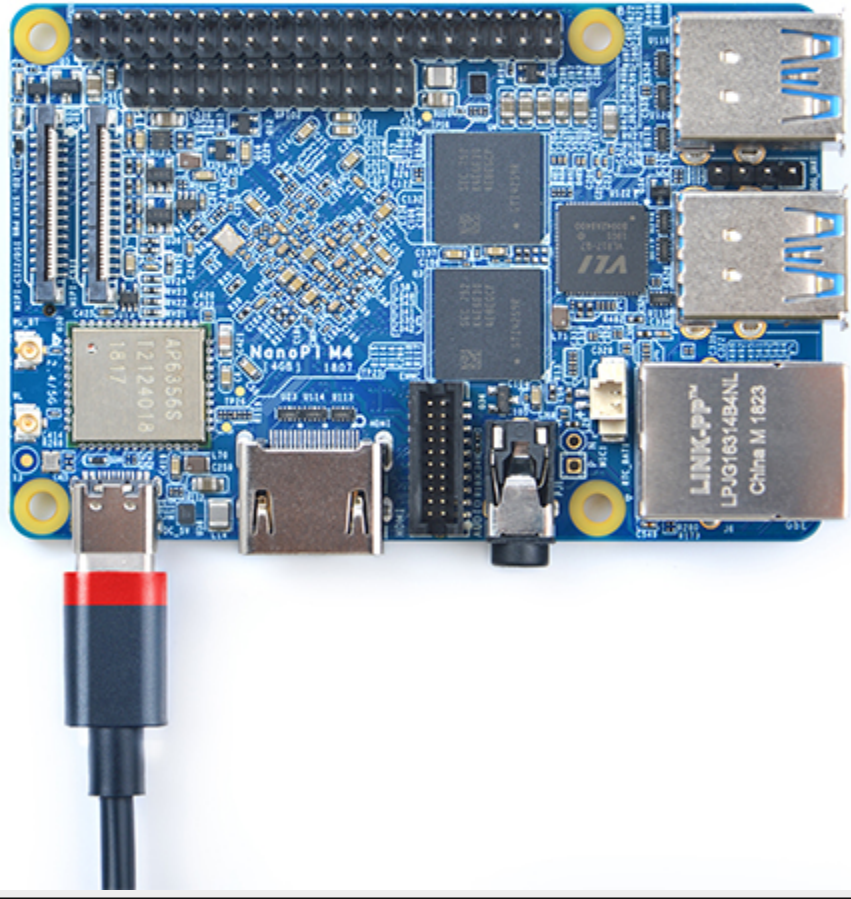


# NanoPI M4



# Specs

CPU	Rockchip RK3399 SoC (2 x Cortex-A72 @ 2GHz + 4 x Cortex-A53 @ 1.5GHz)
Mem	4GB RAM DDR3 1866
GPU	MaliT864 4k H265/H264 60fps decoding (Full HDMI 2.0a)
Net	1Gbps
Storage	eMMC socket, microSD
WIFI	802.11a/b/g/n/ac + BT4.1 <b>with external antenna sockets</b>
GPIO	40pin GPIO + PCIe x2 (almost the same as RPI) (I2C, UART, SPI, I2S)
MIPI	CSI1 (camera only), CSI2/DSI (2nd camera or display)
PWR	5V/3A
USB	4 x USB 3.0 + USB Type-C OTG

Cost

\$180AU delivered w/heatsink, cable, micro-sd &  
antennas

# Power

Power	PowerTran M8880 7.8A USB x 5 outputs (3A p/outputs)
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\$35AU
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# Use cases

- WIFI Access Point
- Media center
- Surveillance (dual camera input)

# Pros

- Heaps of power
- 802.11ac WIFI onboard
- Powerful graphics 4K abilities
- Small (Same form factor as RaspberryPI)

# Cons

- Costs more than a PI (2GB model \$65USD + Postage)
- 3A power requirement



# Armbian distro

- **Great documentation**
- Custom Debian based distro for ARM boards
- Comes with htop, screen, ssh, wifi access point packages preinstalled
- No gui by default
- Really fast and easy
- Scripts to install Wireless AP, WM, ZSH, Cups, Samba, TV headend, Syncthing, Minidlna, PI Hole (Ad blocker), ISPConfig, VPN Server, Nextcloud, OpenMediaVault NAS, Plex server, UrBackup, Docker, etc.

# Install Armbian

## 1. dd an image of Armbian

```
sudo dd if=Armbian_5.64_Nanopim4_Debian_stretch_default_4.4.161.img of=/dev/mmcblk0
```

Or Use Etcher (it's pretty fast, safe and easy to use)

## 2. Boot

## 3. Change root password.

```
| Default root password 1234 |
```

# WIFI Access Point

I wanted to create an open source 802.11ac WIFI access point (dual band) with Debian and external antennas.

# Create a hotspot

1. Start the configuration utility

```
armbian-config
```

2. Start a Hotspot Network -> wlan0 -> Hotspot

3. Choose **eth0** as your **Default Interface** This is where you want the traffic from the hotspot to travel.

4. Configure the hotspot -> Basic Network -> wlan0 -> Hotspot -> Edit -> Basic Setup the **SSID, passphrase and channel**

# Generated /etc/hostapd.conf

```
ssid=nanopi
interface=wlan0
hw_mode=g
channel=40
#bridge=br0
driver=nl80211
logger_syslog=0
logger_syslog_level=0
wmm_enabled=1
wpa=2
preamble=1
wpa_psk=f703fb5c3b71230f864b5e276266efae47805363c97db3a711f4978f762d9525
wpa_passphrase=<my passphrase>
wpa_key_mgmt=WPA-PSK
wpa_pairwise=TKIP
rsn_pairwise=CCMP
auth_algs=1
macaddr_acl=0
noscans=1
ieee80211n=1
ht_capab=[DSSS_CK-40][HT20+]
country_code=US
ieee80211d=1
hw_mode=a
ctrl_interface=/var/run/hostapd
ctrl_interface_group=0
```

# Tests

Same room using my mobile phone with iperf to the pfsense box.

Netgear	5Ghz	115Mbps
NanoPI	5Ghz	94.3Mbps

# Bridge connection

- Bridge wlan0 & eth0
- Wireless clients will get an IP on the same subnet

# Disable NetworkManager

```
sudo systemctl stop NetworkManager.service  
sudo systemctl disable NetworkManager.service
```



# Enable bridge in hostapd

Uncomment the following in /etc/hostapd.conf

```
bridge=br0
```

# Config static IP & Bridge

Edit /etc/network/interfaces

```
source /etc/network/interfaces.d/*
# Network is managed by Network manager
auto lo br0
iface lo inet loopback

# Wireless
allow-hotplug wlan0
iface wlan0 inet manual

# Wired
allow-hotplug eth0
iface eth0 inet manual

# Bridge
iface br0 inet static
    bridge_ports wlan0 eth0
    address 10.1.1.3
    broadcast 10.1.1.255
    netmask 255.255.255.0
    network 10.1.1.0
    gateway 10.1.1.1
    dns-nameservers 10.1.1.1
```

# Create bridge

```
brctl addbr br0
```

# Add eth0 & wlan0 to the bridge

```
brctl addif br0 eth0  
brctl addif br0 wlan0
```

# Workaround

Had to put the following in `/etc/rc.local` before "exit 0" for this to work

```
brctl addif br0 eth0
```

# Reboot

Reboot

```
reboot
```

Or restart services

```
service hostapd restart  
service networking restart
```

# Cheaper alternatives

- OrangePI \$14USD - only 802.11n + external antenna
- OpenWRT on a TPLink Router - \$50

# References

- [NanoPi M4 - FriendlyARM Wiki](#)
- [friendlyarm \(shop\)](#)
- [Armbian – Download \(nanopi\\_m4 download\)](#)
- [NanoPi M4 : RK3399 SBC with 4 x USB 3.0 - YouTube](#)



# Questions

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