

How to setup Wifi on minimal image with nmcli

- Operation confirmed with our **ODROID-XU4** + **Wifi Module 3**.

Check if your Wifi module enabled

Enter the following commands.

```
root@odroid:~# ip address
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group
default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: eth0: <NO-CARRIER,BROADCAST,MULTICAST,UP> mtu 1500 qdisc pfifo_fast state
DOWN group default qlen 1000
    link/ether 00:1e:06:31:fe:2d brd ff:ff:ff:ff:ff:ff
3: wlan0: <NO-CARRIER,BROADCAST,MULTICAST,UP> mtu 1500 qdisc mq state DOWN
group default qlen 1000
    link/ether 00:13:ef:50:08:af brd ff:ff:ff:ff:ff:ff

root@odroid:~# nmcli device
DEVICE  TYPE        STATE          CONNECTION
wlan0   wifi        disconnected    --
eth0    ethernet    unavailable    --
lo      loopback    unmanaged     --
```

Make sure the network interface **wlan0** is available.

Scan available Wifi list

Enable the network interface.

```
root@odroid:~# nmcli radio wifi on
```

And scan available Wifi list.

```
root@odroid:~# nmcli device wifi list
*  SSID                MODE  CHAN  RATE          SIGNAL  BARS  SECURITY
```

```
...  
Hardkernel Lab 2.4G Infra 7 54 Mbit/s 100 **** WPA2
```

The result depends on your environment and the **Hardkernel Lab 2.4G** Wifi is going to be used in this guide.

Select a Wifi network you want to connect and proceed to next step.

Connect to the network

Connect to the Wifi network with this commands.

```
root@odroid:~# nmcli device wifi connect "Hardkernel Lab 2.4G" password  
"PASSWORD_FOR_THE_WIFI"  
Device 'wlan0' successfully activated with '6be4a6cd-6740-4b07-  
b6d2-82a34df7eb07'.
```

All done.

Check if it works

Let's see the result of the commands we entered at the first step.

```
root@odroid:~# ip address  
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group  
default qlen 1000  
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00  
    inet 127.0.0.1/8 scope host lo  
        valid_lft forever preferred_lft forever  
    inet6 ::1/128 scope host  
        valid_lft forever preferred_lft forever  
2: eth0: <NO-CARRIER,BROADCAST,MULTICAST,UP> mtu 1500 qdisc pfifo_fast state  
DOWN group default qlen 1000  
    link/ether 00:1e:06:31:fe:2d brd ff:ff:ff:ff:ff:ff  
3: wlan0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc mq state UP group  
default qlen 1000  
    link/ether 00:13:ef:50:08:af brd ff:ff:ff:ff:ff:ff  
    inet 192.168.100.173/24 brd 192.168.100.255 scope global dynamic wlan0  
        valid_lft 7061sec preferred_lft 7061sec  
    inet6 fe80::2b63:224f:b9f1:c87/64 scope link  
        valid_lft forever preferred_lft forever  
  
root@odroid:~# nmcli device  
DEVICE  TYPE        STATE         CONNECTION  
wlan0   wifi        connected    Hardkernel Lab 2.4G 1  
eth0    ethernet    unavailable  --  
lo      loopback    unmanaged    --
```

Okay, we can see that the **wlan0** device connects to **Hardkernel Lab 2.4G** Wifi, and this interface is **assigned a IP address** 192.168.100.173.

Run ping command to check whether the internet works.

```
root@odroid:~# ping -c 10 8.8.8.8
PING 8.8.8.8 (8.8.8.8) 56(84) bytes of data.
64 bytes from 8.8.8.8: icmp_seq=1 ttl=39 time=55.2 ms
64 bytes from 8.8.8.8: icmp_seq=2 ttl=39 time=59.9 ms
64 bytes from 8.8.8.8: icmp_seq=3 ttl=39 time=54.2 ms
64 bytes from 8.8.8.8: icmp_seq=4 ttl=39 time=54.3 ms
64 bytes from 8.8.8.8: icmp_seq=5 ttl=39 time=54.2 ms
64 bytes from 8.8.8.8: icmp_seq=6 ttl=39 time=54.0 ms
64 bytes from 8.8.8.8: icmp_seq=7 ttl=39 time=55.1 ms
64 bytes from 8.8.8.8: icmp_seq=8 ttl=39 time=56.3 ms
64 bytes from 8.8.8.8: icmp_seq=9 ttl=39 time=56.2 ms
64 bytes from 8.8.8.8: icmp_seq=10 ttl=39 time=56.9 ms

--- 8.8.8.8 ping statistics ---
10 packets transmitted, 10 received, % packet loss, time 9009ms
rtt min/avg/max/mdev = 54.079/55.676/59.981/1.759 ms
```

This **nmcli** utility would let the system connects to the previous connected Wifi **automatically** when the system reboots.

Opt. If you can't connect via SSH to the device

If you have a problem with connecting to the assigned Wifi IP via SSH after set up these steps, maybe it is because the SSH daemon started before the wlan0 is initialized.

Try to restart the SSHD daemon.

```
root@odroid:~# service sshd restart
```

Opt. How to toggle the network

You can toggle the connection by the following commands.

Disconnect current network.

```
root@odroid:~# nmcli device
DEVICE  TYPE      STATE      CONNECTION
wlan0   wifi      connected  Hardkernel Lab 2.4G
eth0    ethernet  unavailable --
lo      loopback  unmanaged  --
root@odroid:~# nmcli device disconnect wlan0
Device 'wlan0' successfully disconnected.
```

```
root@odroid:~# nmcli device
DEVICE  TYPE        STATE          CONNECTION
wlan0   wifi        disconnected    --
eth0    ethernet    unavailable    --
lo      loopback    unmanaged      --
```

Connect again.

When it is connected, nmcli tries to connect the previous network.

```
root@odroid:~# nmcli device
DEVICE  TYPE        STATE          CONNECTION
wlan0   wifi        disconnected    --
eth0    ethernet    unavailable    --
lo      loopback    unmanaged      --
root@odroid:~# nmcli device connect wlan0
Device 'wlan0' successfully activated with
'241a49dc-72a3-4d73-9074-1008e2dd4df9'.
root@odroid:~# nmcli device
DEVICE  TYPE        STATE          CONNECTION
wlan0   wifi        connected      Hardkernel Lab 2.4G
eth0    ethernet    unavailable    --
lo      loopback    unmanaged      --
```

Opt. How to select a network from the known networks

You can easily connect specific network you want at the network list that already had been connected before.

Deactivate current network.

```
root@odroid:~# nmcli device
DEVICE  TYPE        STATE          CONNECTION
wlan0   wifi        connected      Hardkernel Lab 2.4G
eth0    ethernet    unavailable    --
lo      loopback    unmanaged      --
root@odroid:~# nmcli connection down "Hardkernel Lab 2.4G"
Connection 'Hardkernel Lab 2.4G' successfully deactivated (D-Bus active
path: /org/freedesktop/NetworkManager/Activ)
root@odroid:~# nmcli device
DEVICE  TYPE        STATE          CONNECTION
wlan0   wifi        disconnected    --
eth0    ethernet    unavailable    --
lo      loopback    unmanaged      --
```

See the known networks.

```
root@odroid:~# nmcli connection
NAME                UUID                TYPE
```

```

DEVICE
Hardkernel Lab 2.4G      241a49dc-72a3-4d73-9074-1008e2dd4df9  802-11-wireless
--
Hardkernel Lab 2.4G 1    6be4a6cd-6740-4b07-b6d2-82a34df7eb07  802-11-wireless
--
Hardkernel Lab 2.4G 2    c8a98a9c-aa58-44bd-8b96-bc3a4cab8fe9  802-11-wireless
--
Hardkernel Lab 2.4G 3    ab91a8b7-fb9f-4289-acad-c11e9ab02f9c  802-11-wireless
--
Hardkernel Lab 2.4G 4    bf0968ca-c295-403c-94e0-35f84400fbc7  802-11-wireless
--
Wired connection 1      d1356624-11d7-35a7-aa3a-c01ba86c26fe  802-3-ethernet
--

```

Select one and activate the network with that.

```

root@odroid:~# nmcli connection up "Hardkernel Lab 2.4G 3"
Connection successfully activated (D-Bus active path:
/org/freedesktop/NetworkManager/ActiveConnection/9)
root@odroid:~# nmcli device
DEVICE  TYPE        STATE         CONNECTION
wlan0   wifi        connected    Hardkernel Lab 2.4G 3
eth0    ethernet    unavailable  --
lo      loopback    unmanaged    --

```

References

- [1] <https://docs.ubuntu.com/core/en/stacks/network/network-manager/docs/configure-wifi-connections>
- [2] <https://www.thegeekdiary.com/how-to-configure-and-manage-network-connections-using-nmcli/>

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