Configuring Dual Wi-Fi Networks on Raspberry Pi (NetworkManager)

This guide explains how to configure a Raspberry Pi with two Wi-Fi networks — one for Internet access and one for internal/local communication — using NetworkManager. The configuration ensures the correct interface is used as the default Internet route while keeping the internal network isolated.

1. Check active network interfaces

Run this command to see which networks are active and which manager controls them:

```
nmcli device status
```

If both wlan0 and wlan1 appear as 'connected', they are managed by NetworkManager.

2. List NetworkManager connections

```
nmcli connection show
```

Identify your two Wi-Fi connections, for example:

```
Free-TAU (Internet)
Controllab_223 (Internal)
```

3. Set routing metrics and default route behavior

Assign lower metric to the Internet connection and disable default route on the internal one:

```
sudo nmcli connection modify "Free-TAU" ipv4.route-metric 100 ipv4.never-default no
sudo nmcli connection modify "Controllab_223" ipv4.route-metric 400 ipv4.never-default yes
```

4. Restart and apply connections

```
sudo nmcli connection down "Free-TAU" && sudo nmcli connection up "Free-TAU"
sudo nmcli connection down "Controllab_223" && sudo nmcli connection up "Controllab_223"
ip route
```

The routing table should show only one default route via wlan0 (the Internet network).

5. Verify configuration

```
ip route get 8.8.8.8
```

The result should indicate routing through wlan0.

6. Make configuration persistent

Settings are stored in:

```
/etc/NetworkManager/system-connections/
```

Verify each .nmconnection file contains:

```
[ipv4]
method=auto
route-metric=100
never-default=false
dns=8.8.8.8;1.1.1.1;
```

and for the internal network:

```
[ipv4]
method=auto
route-metric=400
never-default=true
```

7. Cloning to other Raspberry Pis

If you clone the SD card or SSD image, the settings persist. However, check the following:

• Remove any mac-address lines from .nmconnection files. • Ensure interface names (wlan0, wlan1) are correct. • If different adapters are used, reassign interfaces via NetworkManager. • Verify the routing table after first boot on each cloned system.

Final Expected Routing Table

```
default via 172.30.0.1 dev wlan0 metric 100
172.30.0.0/16 dev wlan0 proto kernel scope link src 172.30.9.224 metric 100
192.168.0.0/24 dev wlan1 proto kernel scope link src 192.168.0.120 metric 400
```