TUTORIAL 1 – Peer WiFi + Net Sharing, Manual IP

1A Peer WiFi Manual IP

1B Peer WiFi + Net Sharing

WEBELIVE
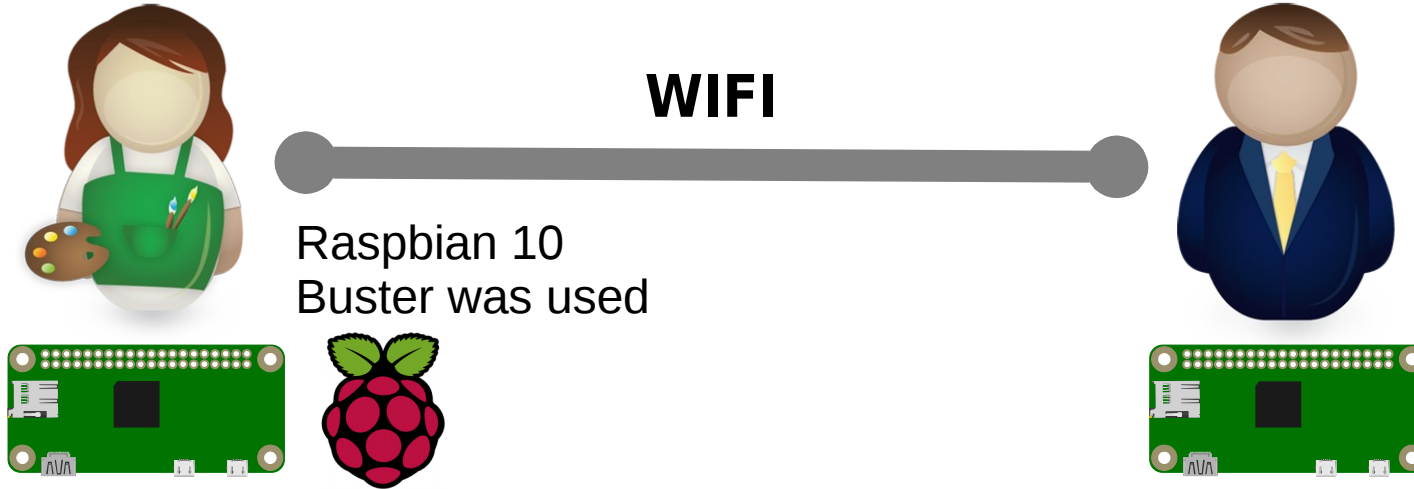
Tools for a LIVE Web

On Github

Doc v1.0

"WL" stands for WEBELIVE, a series of small tutorials to use open source tools to connect devices in direct, private, secure P2P fashion
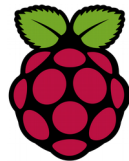
Tutorial Commands/Syntax Raspbian

Peer (host)

Peer (guest)

WIFI

Raspbian 10
Buster was used

The instructions will follow the Raspbian syntax and commands, but the overall idea was tested also with Debian x86 and Ubuntu x86 as peer(host), an extra documentation will show details for Deb/Ubu.

debian

Ubuntu

RECOMMENDATION / ADVICE

DO NOT use your main system disk (sdCard),
instead, use a blank fresh formatted system or some "learn" "test" "laboratory" system
to perform the following tutorials... after finishing all the tutorials you will have a good
basic idea about all the steps, them you will be able to evaluate correctly what are
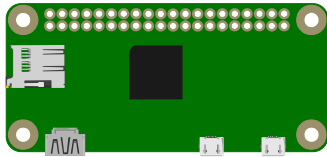the safe ways to use these instructions...

MAIN SYSTEM

"LAB LEARN TEST" SYSTEM

Peer WIFI – Simple, Manual IP

Peer (host)

Peer (guest)

Alice will be the PEER A,
using a RaspberryPI Zero,
running **hostpad**...

Bob will be the PEER B,
using a PC

Soft used: hostapd

Peer WIFI – Simple, Manual IP

Install the hostapd software:

```
sudo apt install hostpad
```

Stop the software, so that we can configure it:

```
sudo service hostapd stop
```

If you get error on the installation step, then update your system and try again:

```
sudo apt update
```

Soon after installation you need to unmask (unlock) the service:
```
sudo systemctl unmask hostapd.service
sudo systemctl enable hostapd.service
```

Peer WIFI – Simple, Manual IP

/etc/hostapd/hostapd.conf

Create/Modify the hostapd configuration file:

```
sudo nano   /etc/hostpad/hostapd.conf
```

Add the following instructions (lines):

```
interface=wlan0
driver=nl80211
hw_mode=g
channel=6
wmm_enabled=0
macaddr_acl=0
auth_algs=1
ignore_broadcast_ssid=0
wpa=2
wpa_key_mgmt=WPA-PSK
wpa_pairwise=TKIP
rsn_pairwise=CCMP
ssid=mySSID
wpa_passphrase=myPASSWORD
```

Change the "wlan0" to the actual name of your wifi adapter name, you can find it with the "ip a" command line.

/etc/default/hostapd

Instruct the system about where is the configuration file for hostapd...

sudo nano   /etc/default/hostpad

Find this following line:

#DAEMON_CONF=""

change to:

DAEMON_CONF="/etc/hostapd/hostapd.conf"

If there is a "#" (sharp) sign at the beginning of the line, then, remove (delete) it.

Peer WIFI – Simple, Manual IP

`/etc/dhcpcd.conf`

We need to give the WiFi interface a fixed static IP ADDRESS, by modifying the dhcpcd.conf file...

```
sudo nano  /etc/dhcpcd.conf
```

Add the following lines to the end...

```
interface wlan0
static ip_address=192.168.50.1/24
nohook wpa_supplicant
```

Change the "wlan0" to the actual name of your wifi adapter name, you can find it with the "ip a" command line.

You can use any IP instead of 192.168.50.1 in the code above.

The above setup will give IP Address to the host machine (the machine where you are doing this setup), for the other machine that will connect to it (the client), you will need to set the wifi connection there using the manual IP setup method.

Peer WIFI – Simple, Manual IP

Start or Restart the hostapd software:

sudo service hostapd start

or,

sudo service hostapd restart

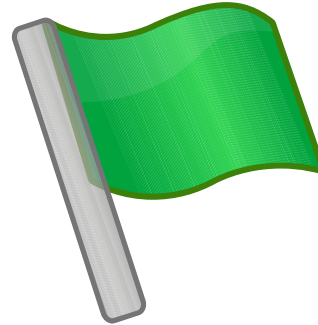If the wifi interface is tuned OFF, first, you need
Switch it to ON...

Peer WIFI – Simple, Manual IP

Reboot the system, using the Graphical Interface, or, by command line:

```
sudo reboot
```

Contratulations,
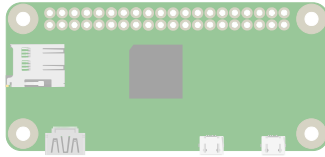# you can connect peer(host) with peer(guests) now!

Next few pages show how to connect peer(guests):
RaspberryPI, Ubuntu(x86) and Debian(x86)

Peer WIFI – Peer(guest) Manual IP setup

Peer (host)

Peer (guest)

Peer(guest) manual IP ADDRESS setup

Bob will be the PEER B,
using a PC

Peer WIFI – Peer(guest) Manual IP setup

You need to enter manually (type) these data into any peer(guest) that you want to connect to the peer(host). Each new peer(guest) must have a different IP number.

Peer (guest)

PEER(GUEST) 1
IPv4 Connection Method   : Manual
IP ADDRESS   : **192.168.50.50**
NETMASK   : 255.255.255.0
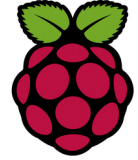GATEWAY   : 192.168.50.1

PEER(GUEST) 2... etc...
IPv4 Connection Method   : Manual
IP ADDRESS   : **192.168.50.51**
NETMASK   : 255.255.255.0
GATEWAY   : 192.168.50.1

Bob will be the PEER B, using a PC

Peer WIFI – Peer(guest) Manual IP setup

1

Click over the network symbol, click "mySSID" enter passphrase, click "OK"

mySSID

Network Preferences

Configure: SSID mySSID

☐ Automatically configure empty options

☐ Disable IPv6

IPv4 Address: 192.168.50.50/24

IPv6 Address:

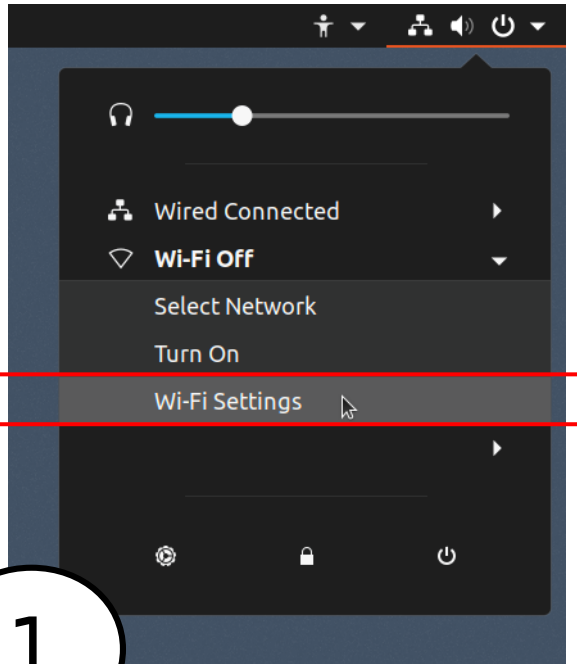Router:

DNS Servers:

DNS Search:

3

Clear   Apply   Close

Wireless & Wired Network Settings

Add / Remove Panel Items

Remove "Wireless & Wired Network" From Panel

Panel Settings

Create New Panel

Delete This Panel

About

2

Right-Click over the network symbol, click "Wireless Wired Settings"

4

Turn OFF and Turn ON WiFi

Peer WIFI – Peer(guest) Manual IP setup

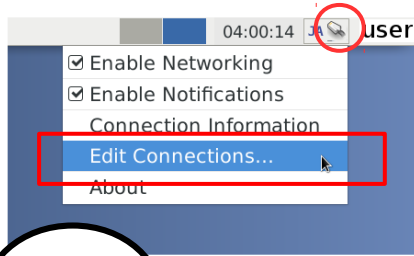# Peer WIFI – Peer(guest) Manual IP setup

Stretch 9

debian

1 On Debian Stretch and Buster, need to change NetworkManager config file:
`sudo nano   /etc/NetworkManager/NetworkManager.conf`

Then, add below 2 lines at the end of the file.
`[device]`
`wifi.scan-rand-mac-address=no`

Then, reboot the system

2
04:00:14 user
☑ Enable Networking
☑ Enable Notifications
Connection Information
Edit Connections...
About

3
Network Connections
Last Used
Add
Edit
Delete
▾ Wi-Fi
wifi0
Close

4
Editing wifi0

Connection name: wifi0

General | Wi-Fi | Wi-Fi Security | Proxy | **IPv4 Settings** | IPv6 Settings

Method: Manual

Addresses

Address	Netmask	Gateway	
192.168.50.50	24	192.168.50.1	Add
			Delete

DNS servers:

Search domains:

DHCP client ID:

☐ Require IPv4 addressing for this connection to complete

Routes...

Cancel   ✓ Save

Peer WIFI – Peer(guest) Manual IP setup

Buster 10

(1) On Debian Stretch and Buster, need to change NetworkManager config file:
```
sudo nano  /etc/NetworkManager/NetworkManager.conf
```
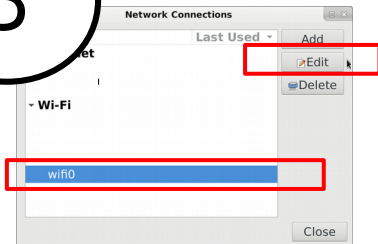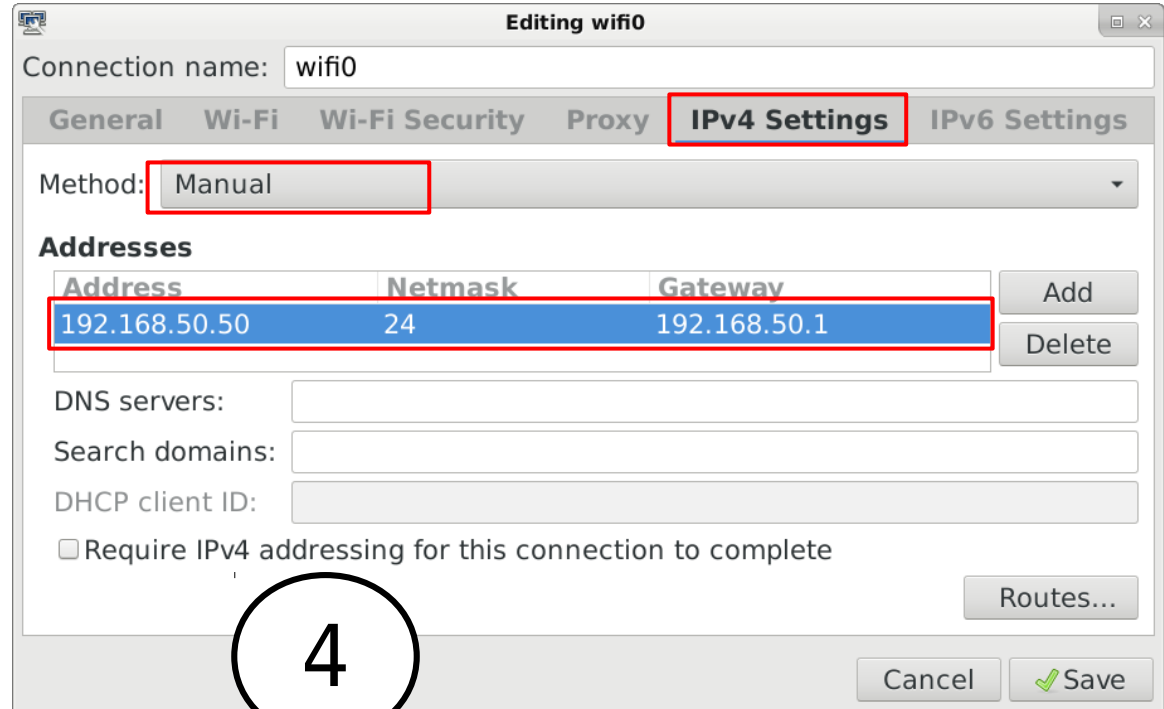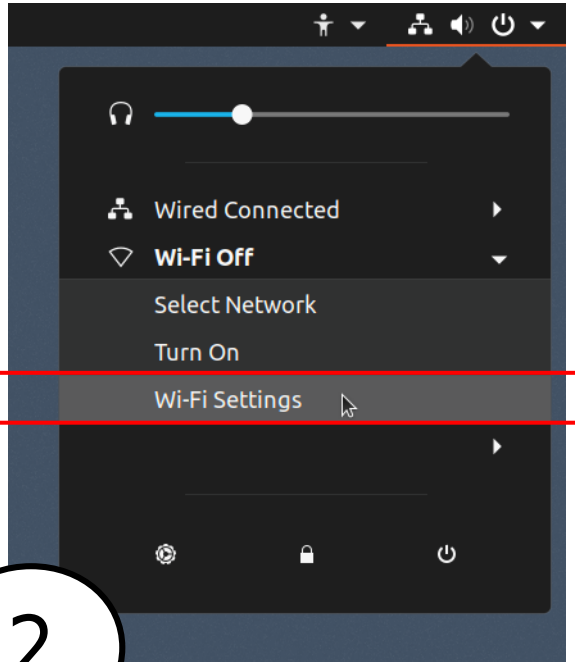
Then, add below 2 lines at the end of the file.
```
[device]
wifi.scan-rand-mac-address=no
```

Then, reboot the system

(2)

Wired Connected

Wi-Fi Off

Select Network

Turn On

Wi-Fi Settings

---

(3) PEERWIFI

Cancel | PEERWIFI | Apply

Details | Identity | **IPv4** | IPv6 | Security

IPv4 Method ○ Automatic (DHCP)   ○ Link-Local Only
 ● Manual   ○ Disable

Addresses

Address	Netmask	Gateway
192.168.50.50	255.255.255.0	

DNS   Automatic

Separate IP addre... ...mas

Routes   Automatic

Address | Netmask | Gateway | Metric

SHARING THE INTERNET ACCESS WITH PEER(GUESTS)

B1.2.0

MODEN/ROUTER

INTERNET
ACCESS

Peer (host)

INTERNET
SHARING

Peer (guest)
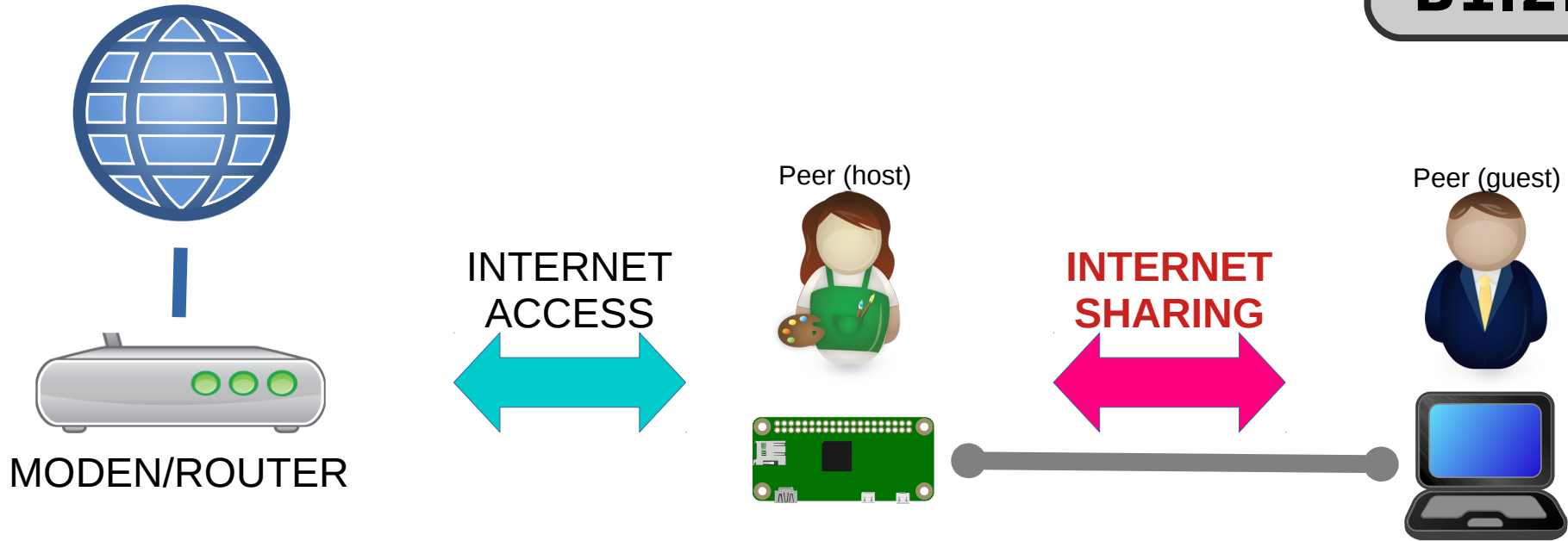
An USB-to-Ethernet Adapter is **eth0,**
if you do not have such adapter,
then, use a RPI2, RPI3 or RPI4 which
already have an onboard eth0 interface...

Peer WIFI – Simple, Manual IP

Edit the file /etc/sysctl.conf and find the line(s) below:

```
# Uncomment the next line to enable packet forwarding for IPv4
#net.ipv4.ip_forward=1
```
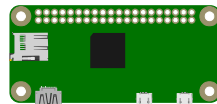
Remove the sharp (#) signal at start of the line:

```
net.ipv4.ip_forward=1
```

Save and REBOOT the system.

Peer (host)

Peer (guest)

This change
is done here

Peer WIFI – Simple, Manual IP

Last step is to route the Internet to all peers, using iptables command lines.
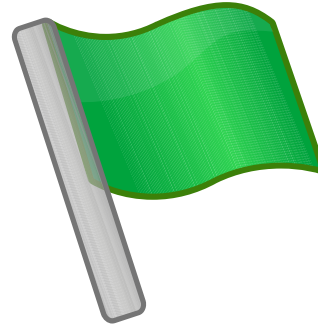Commands below need to be executed on the peer(host), where hostapd is installed.

```
sudo iptables -t nat -A POSTROUTING -o eth0 -j MASQUERADE
sudo iptables -A FORWARD -m conntrack --ctstate RELATED,ESTABLISHED -j ACCEPT
sudo iptables -A FORWARD -i wlan0 -o eth0 -j ACCEPT
```

Here, "eth0" is the LAN CABLE connector that has the Internet, and "wlan0" is the name of the WIFI interface on the peer(host) computer, where the software hostapd is running...

Every time the peer (host) computer start, it need to execute the above lines, so, if you want it permanently every time the computer boot, then you need to place these lines on the system start up scripts...

Peer (host)

Peer (guest)

Run iptables commands here
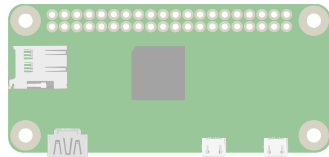
On RPIZero, an USB-to-Ethernet Adapter is **eth0**
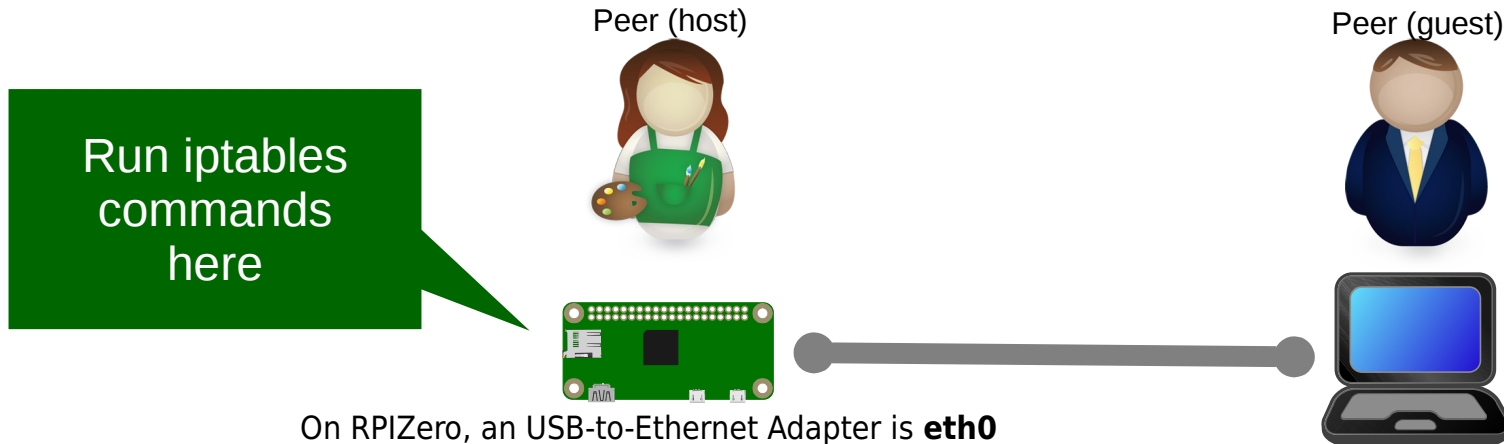
Contratulations again!
Now you can share Internet with peer(guests)

Next few pages show how to connect peer(guests):
RaspberryPI, Ubuntu(x86) and Debian(x86)

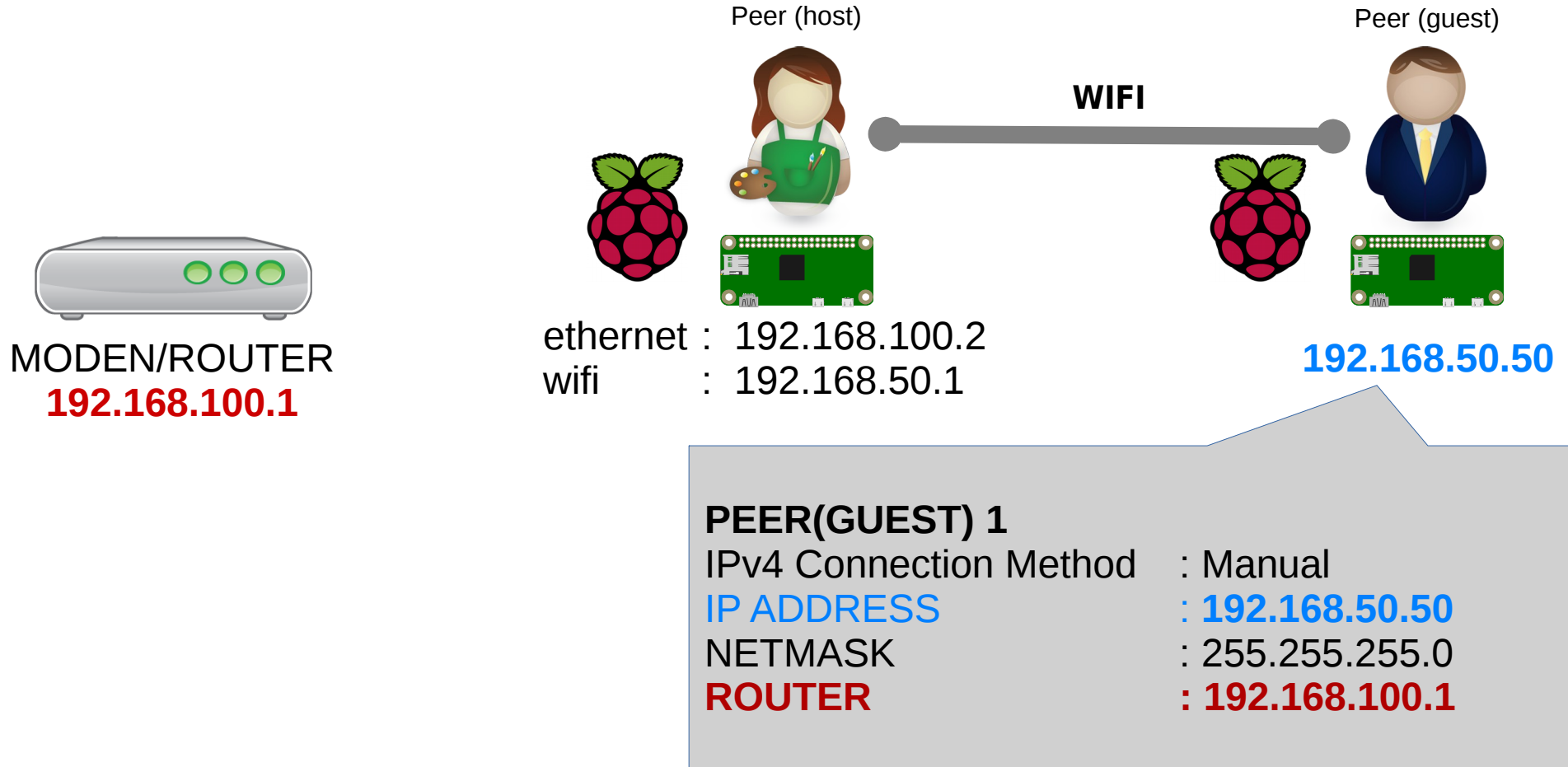# Peer WIFI – Peer(guest) Manual IP setup

Peer (host)

Peer (guest)

Peer(guest) manual IP ADDRESS setup

Bob will be the PEER B, using a PC

SHARING – Peer(guest) Manual IP setup

Peer (host)

WIFI

Peer (guest)

MODEN/ROUTER
192.168.100.1

ethernet : 192.168.100.2
wifi　　　: 192.168.50.1

192.168.50.50

PEER(GUEST) 1
IPv4 Connection Method　　: Manual
IP ADDRESS　　　　　　　　　: **192.168.50.50**
NETMASK　　　　　　　　　　 : 255.255.255.0
ROUTER　　　　　　　　　　 : **192.168.100.1**

SHARING – Peer(guest) Manual IP setup

Peer (host)

Peer (guest)

MODEN/ROUTER
192.168.100.1

ethernet : 192.168.100.2
wifi : 192.168.50.1

192.168.50.50

**DNS instead
of Router**

PEER(GUEST) 1
IPv4 Connection Method : Manual
IP ADDRESS : **192.168.50.50**
NETMASK : 255.255.255.0
DNS : **192.168.100.1**
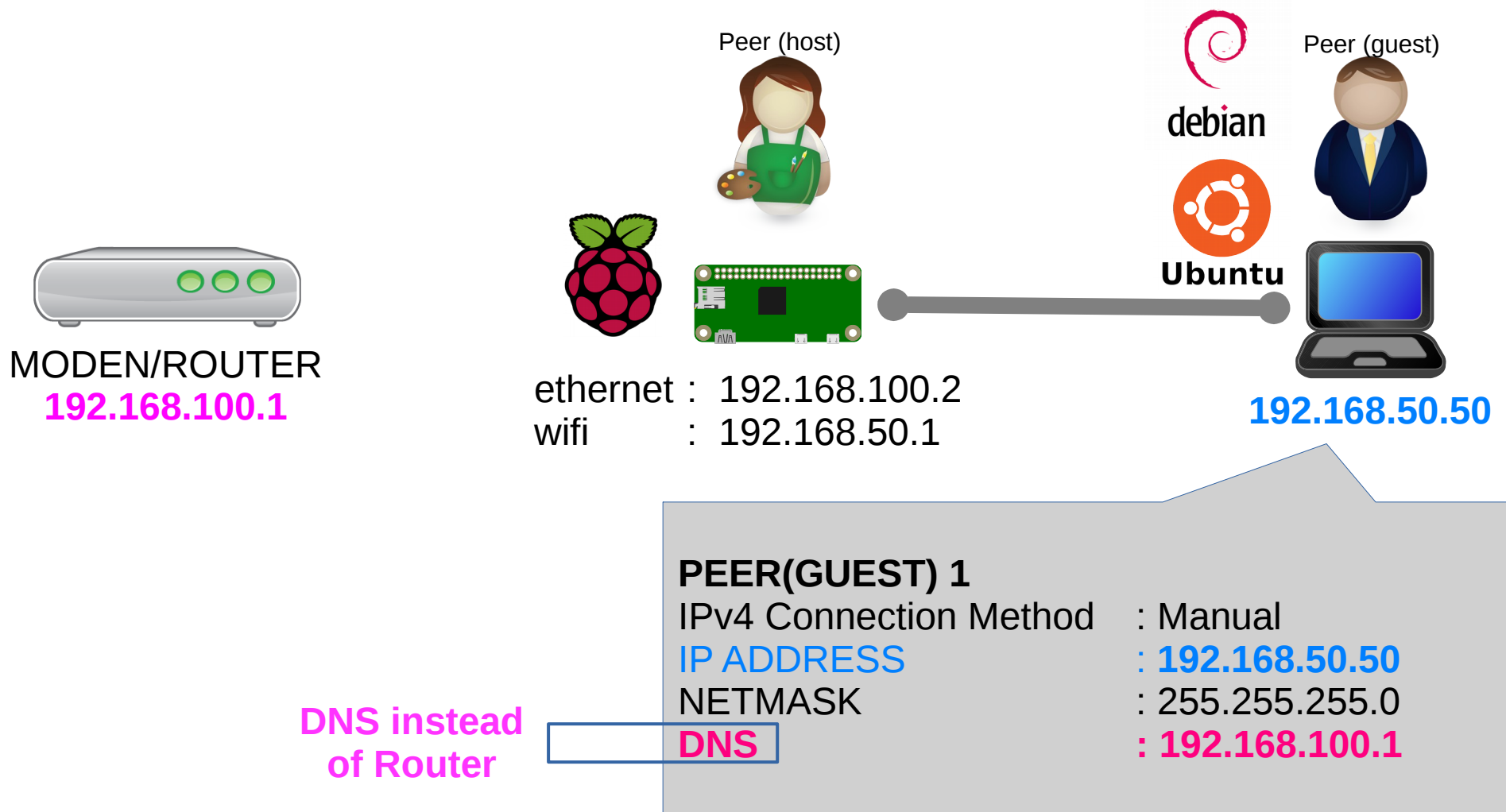
3 INDEPENDENT, VERY EASY TUTORIALS

Running all 3 experiments, or reading all 3 tutorials, should be enough to help the user to get a very good basic understanding about the subject. From there, the user can choose a combination appropriated for a specific objective.

TUTORIAL 1 – Peer WiFi + Net Sharing, Manual IP

1A Peer WiFi Manual IP

1B Peer WiFi + Net Sharing

TUTORIAL 2 – P2P WiFi + Net Sharing, Auto IP

2A P2P WiFi, Auto IP

2B P2P WiFi + Net Sharing

TUTORIAL 3 – Internet Router Bridge