ANNEX A · PRACTICAL 3.2 · TCP/IP ON DEBIAN AND WINDOWS

Name: _____ Group G = _____ Date: _____

Individual. Use your group number for **G**. Today: Debian = `10.G.0.21/24`, Windows = `10.G.0.22/24`, gateway and DNS = `10.G.0.1`. Hand in `practical-3.2-surname.md` on Classroom before Thursday 03/12, 12:10. **Marks:** steps 1–2: 1 · step 3: 2.5 · step 4: 2 · steps 5–6: 2 · step 7: 1.5 · step 8 + report: 1.

WARM-UP **An address by hand, in the lab (not marked)**

```
G=3 containerlab deploy -t lan.clab.yml && docker exec -it clab-lan-pc1 bash
ip addr flush dev eth1                  # pc1 forgets its address
ip addr add 10.G.0.11/24 dev eth1       # give it back
ip route                                # 1) which line appeared by itself?
ping -c 1 1.1.1.1                       # 2) what does it say?
ip route add default via 10.G.0.1
ping -c 1 -W 1 1.1.1.1                  # 2) and now? why is the message different?
ip route add default via 10.9.9.1       # 3) why is this refused?
```

1) _____ 2) _____ → _____

3) _____ Then `exit` and destroy the lab.

PRACTICAL **Two VMs on an isolated network**

Step 1 · The network. virt-manager → Edit → Connection Details → Virtual Networks → **+**. Name `lanG` (with your number), mode **Isolated**, IPv4 network `10.G.0.0/24`, **DHCPv4 off**. Finish.

DONE WHEN `lanG` is in the list, Active.

Step 2 · Plug in the VMs. For `deb-lab` and `win11` (switched off): Show virtual hardware details → NIC → Network source: `lanG` → Apply. Start both. In Debian:

```
ip -br addr
nmcli device status
```

DONE WHEN the card has no IPv4 address. In your report: why not?

Step 3 · Debian, static and saved.

```
nmcli -f NAME,DEVICE connection show          # name of the wired connection
sudo nmcli connection modify "Wired connection 1" ipv4.method manual ipv4.addresses
10.G.0.21/24 ipv4.gateway 10.G.0.1 ipv4.dns 10.G.0.1
sudo nmcli connection up "Wired connection 1"
ip -br addr ; ip route ; cat /etc/resolv.conf
ping -c 2 10.G.0.1
```

DONE WHEN `ip route` has a `default via 10.G.0.1` line and the ping answers. Copy the four outputs into the report.

Step 4 · Windows, static. Start → Settings → Network & internet → Ethernet → IP assignment: **Edit** → **Manual** → IPv4 **On**. IP address `10.G.0.22`, Subnet mask `255.255.255.0`, Gateway `10.G.0.1`, Preferred DNS `10.G.0.1`. Save. In a terminal:

```
ipconfig /all
ping 10.G.0.1
```

DONE WHEN `DHCP Enabled: No`, the four values are yours, and the ping answers. Screenshot or copy into the report.

Step 5 · Ping each other. From Windows: `ping 10.G.0.21`. From Debian:

```
ping -c 2 10.G.0.22
ip neigh
```

Windows → Debian: _____ Debian → Windows: _____ State of `10.G.0.22` in `ip neigh`:

_____

DONE WHEN you can explain in the report how a machine can answer ARP and not answer ping.

Step 6 · Let the ping in. In `win11`, PowerShell **as administrator**:

```
New-NetFirewallRule -DisplayName "Allow ping" -Protocol ICMPv4 -IcmpType 8 -Direction
Inbound -Action Allow
```

DONE WHEN `ping -c 2 10.G.0.22` from Debian answers.

Step 7 · Break and fix (with a neighbour). Look away. Your neighbour changes **one** thing in your Debian with `nmcli connection modify` + `up`: the address (`10.G.1.21/24`), the gateway (`10.G.0.254`) or a duplicate (`10.G.0.22/24`). Find it using only `ip -br addr`, `ip route`, `ping`, `ip neigh`. Repair it.

The fault was: _____ The command that showed it:

_____

DONE WHEN step 3's checks pass again. Tell the story in three lines in the report.

Step 8 · Put everything back (do not skip). Debian:

```
sudo nmcli connection modify "Wired connection 1" ipv4.method auto ipv4.addresses ""
ipv4.gateway "" ipv4.dns ""
sudo nmcli connection up "Wired connection 1"
```

Windows: IP assignment → Edit → **Automatic (DHCP)**. Shut down both VMs, set both NICs back to the network `default`, start `deb-lab`.

DONE WHEN `ping -c 2 debian.org` answers in `deb-lab`.

Report: a table with the four settings of each machine · the outputs of steps 3 and 4 · your explanation of step 5 · the story of step 7 · one thing you would do differently.

EXIT TICKET **Circle one answer. Alone, no notes.**

1. Which setting tells a host where to send packets for **other** networks?
a) IP address **b)** Mask **c)** DNS server **d)** Default gateway

2. A host is `10.4.0.21/24`. Which gateway can work?
a) `10.4.1.1` **b)** `10.4.0.1` **c)** `192.168.1.1` **d)** `10.4.0.255`

3. You set an address with `ip addr add`. After a reboot it is gone. Why?
a) `ip` changes the running system, not the saved configuration **b)** Debian deletes static addresses at boot
c) The DNS server was missing **d)** The prefix was wrong

4. `ping 1.1.1.1` answers. `ping debian.org` says the name cannot be resolved. Which setting is wrong?
a) IP address **b)** Default gateway
c) DNS server **d)** Mask