ANNEX A · NETWORK TROUBLESHOOTING · PRACTICAL 3.9

Name: _____ **Group:** _____ **Date:** _____

Rung	Question	Command
1 · Link	Is my interface up?	`ip -br link`
2 · Address	Do I have an address in the right network?	`ip -br addr`
3 · Gateway	Do I know the way out? Does the router answer?	`ip route` · `ping -c 3 GATEWAY`
4 · Path	Does an address beyond the router answer?	`ping -c 3 IP` · `traceroute -n IP`
5 · Names	Do names become addresses?	`dig NAME` · `dig @SERVER NAME`
6 · Service	Is the port open at the other end?	`nc -zv IP PORT` · `curl -I http://NAME`

Climb in order. Stop at the first rung that fails. Change one thing, then test again.

1 The healthy network

```
cd ~/lab/office && containerlab deploy -t office.clab.yml
docker exec -it clab-office-pc1 bash
```

Climb the six rungs on `pc1` and write what a healthy network looks like. Ignore every line with `eth0` or `172.20.20` (that is the lab's management port). The server is `203.0.113.10`, its name is `intranet.tramuntana.internal`.

Address of `eth1`: _____ Gateway: _____ Hops to the server: _____

DNS server (`cat /etc/resolv.conf`): _____ The name resolves to: _____

Try ports 22, 23, 80, 443 and 8080 with `nc -zv`. Open: _____ Closed: _____

DONE WHEN all six rungs answer and you have written down seven values.

2 Seven tickets

Open a **second terminal on the PC** (not inside `pc1`). Open one ticket, diagnose it from `pc1`, fill in the line, repair it, test, then open the next. You may also enter `r1` and `srv` (`docker exec -it clab-office-r1 bash`). To see a firewall: `nft list ruleset`. To see listening ports: `ss -tuln`.

```
cd ~/lab/office && bash fault.sh 1       (then 2 ... 7;  bash fault.sh fix  repairs all)
```

№	First rung that fails	Evidence: command and the line that proves it	Cause · how you repaired it
1			
2			
3			
4			
5			
6			
7			

DONE WHEN for each ticket, after your repair, `curl -I http://intranet.tramuntana.internal` answers `200 OK`.

3 Break your neighbours' network (group, real MikroTik)

1. Take one fault card. Keep it secret. Type its **Break** command on your own router. Use the PC on `ether4`; unplug and replug its cable.
2. Move one table clockwise. Diagnose the neighbours' network from a PC with the ladder. On their router you may only look (`print`).
3. Go back, compare their ticket with your card, type **Undo**, and climb the ladder once more.

First rung that fails: _____ Evidence: _____

Cause: _____

DONE WHEN the neighbours agree with your ticket and both routers pass rungs 1–6 again.

Hand in (Classroom, before Saturday 09/01, 23:59): `practical-3.9-surname.md` with the table of task 2 and the ticket of task 3, typed in Markdown, one copied evidence line per ticket. **Marks:** baseline 1 · seven tickets 7 · real router 1 · report 1.

Exit ticket — alone, no notes. Tick one answer.

1. `ping 10.1.10.1` (your gateway) works. `ping 203.0.113.10` says Network is unreachable. What is missing?

- ☐ **A)** A cable
- ☐ **B)** An IP address
- ☐ **C)** A default route
- ☐ **D)** A DNS server

2. `ping 1.1.1.1` works, `ping example.com` says Name or service not known. Which rung fails?

- ☐ **A)** 4 · Path
- ☐ **B)** 5 · Names
- ☐ **C)** 3 · Gateway
- ☐ **D)** 6 · Service

3. `nc -zv 203.0.113.10 80` answers Connection refused at once. Where do you look first?

- ☐ **A)** At your own cable
- ☐ **B)** At your DNS server
- ☐ **C)** At the router's NAT rule
- ☐ **D)** At the service on the server

4. Port 22 of a server answers, port 80 of the same server times out. Most likely cause?

- ☐ **A)** A broken cable
- ☐ **B)** A firewall dropping port 80
- ☐ **C)** A wrong default gateway
- ☐ **D)** A wrong IP address on your PC