

Homework — Lesson 02

~20 min · Two tasks · Uses ip netns

Task 1 — Static route to a phantom network

Write commands to:

1. Add a route to network `10.20.0.0/16` via gateway `192.168.1.254` through interface `eth0`.
2. Verify the kernel will use it for destination `10.20.5.5` by running `ip route get`.
3. Remove the route.

Self-check:

- `ip route get 10.20.5.5` outputs a line containing `via 192.168.1.254` while the route is present.
- After `ip route del`, the same command resolves through the default route.

Task 2 — Three-namespace topology (client → router → server)

Build the following on a single host:

```
ns-client (10.0.1.10) —veth0/veth1— ns-router (10.0.1.1 + 10.0.2.1)
```

1. Create three namespaces: `ns-client`, `ns-router`, `ns-server`.

2. Create two veth pairs and assign one end to each pair of adjacent namespaces.
3. Assign IPs as shown. Bring all interfaces up.
4. Enable IPv4 forwarding inside `ns-router`: `sysctl -w net.ipv4.ip_forward=1`.
5. Add default routes in `ns-client` and `ns-server` pointing to the router.
6. Ping `ns-server` from `ns-client`.
7. While the ping is running, in a second terminal capture on the router: `sudo ip netns exec ns-router tcpdump -i any icmp`.

Self-check:

- The ping succeeds with 0% loss.
- The tcpdump shows ICMP echo requests in *both* directions: from veth1 (client side) into the router AND out veth2 (server side) — and the corresponding replies coming back. If you only see one direction, you forgot the return route.

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