Chair of Network Architectures and Services
School of Computation, Information, and Technology
Technical University of Munich

TITLE

Advanced Computer Networking (ACN)

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1c) Client VM configuration script (only shown for client1)

```
ip addr add 192.168.1.2/24 broadcast 192.168.1.255 dev enp2s0
ip link set enp2s0 up
ip route add 192.168.2.0/24 via 192.168.1.1 dev enp2s0 # route to client2
ip route add 192.168.3.0/24 via 192.168.1.1 dev enp2s0 # route to client3
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Note: Routes without gateway (`via 192.168.1.1`) will also work, however, client1 will then assume the other clients to be in a local, non-routed network. For the purpose of creating a router, we explicitly want to route packets.

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1d) Router VM configuration script

- See README.md: install driver, bind interfaces, create hugepages
- Configuring interfaces using `ip` is unnecessary (changing to DPDK driver removes the configuration)

1e) Ping / tcpdump test

`ping` tool typically creates ICMP packets, however, `tcpdump` sees only ARP packets.

- Reason: To create ICMP packets, client1 needs to know the next hop's destination MAC address.
- If you specified a gateway (see Problem 1b), client 1 creates ARP requests for `192.168.1.1` that are forwarded to client2. ARP reply is not created at client2, as client2 is not correctly addressed in the ARP request.
- If you did not specify a gateway (see Problem 1b), client 1 creates ARP requests for `192.168.2.2` that are forwarded to client2. ARP reply is created at client2, as it is correctly addressed, however, the unidirectional forwarder does not transmit the ARP replies to client1.
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1f) Bidirectional forwarding

Modify start_thread() to start a second thread forwarding from dst to src