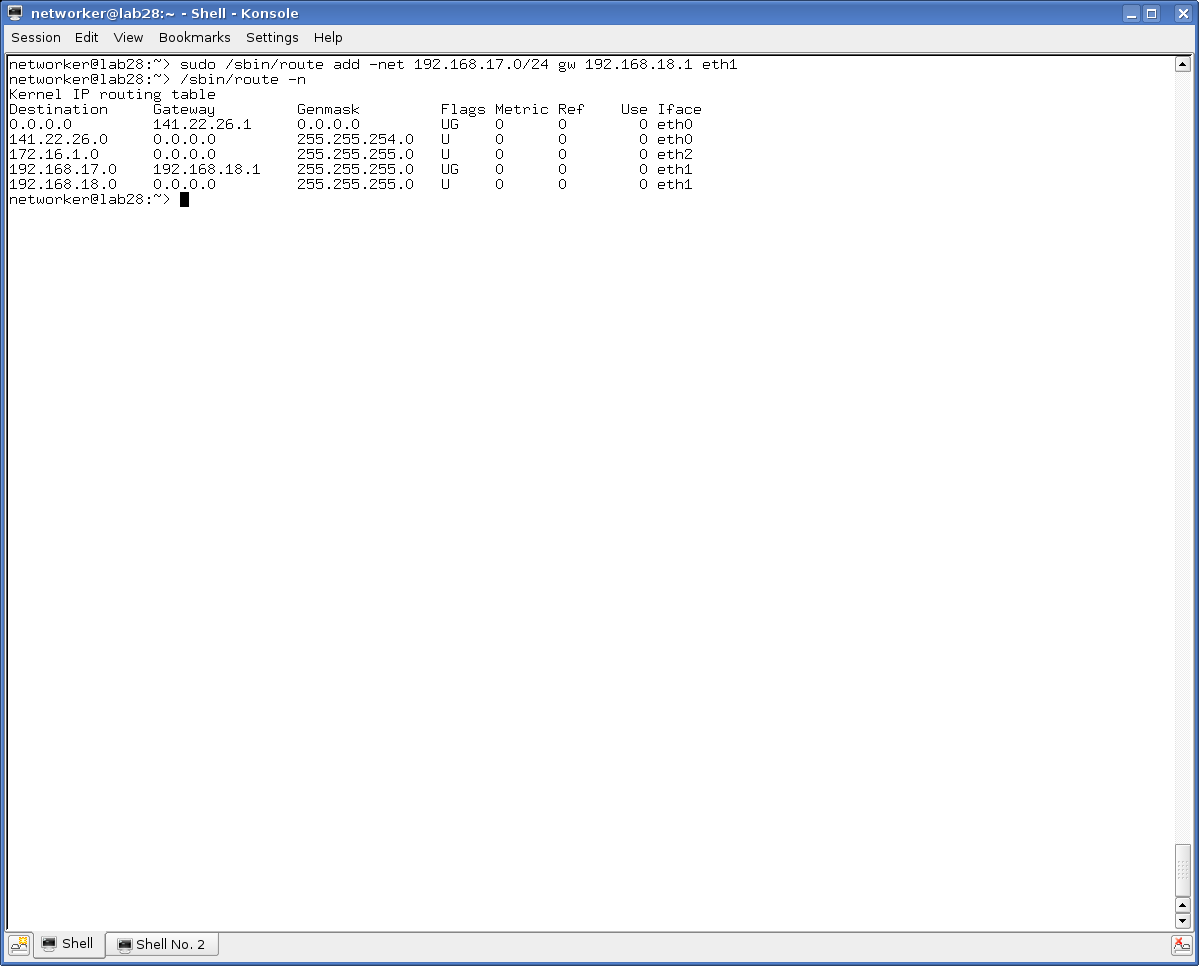
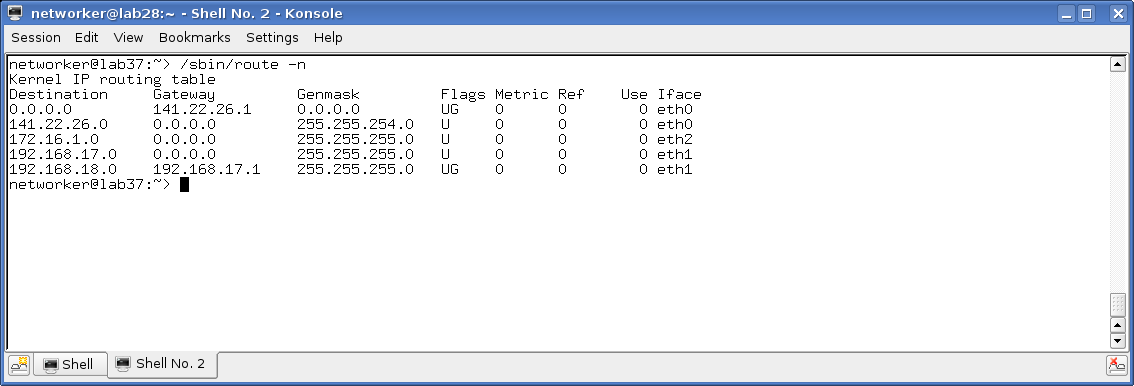
A2 Praktikum Rechner – Gegenstellenrechner

ISDN

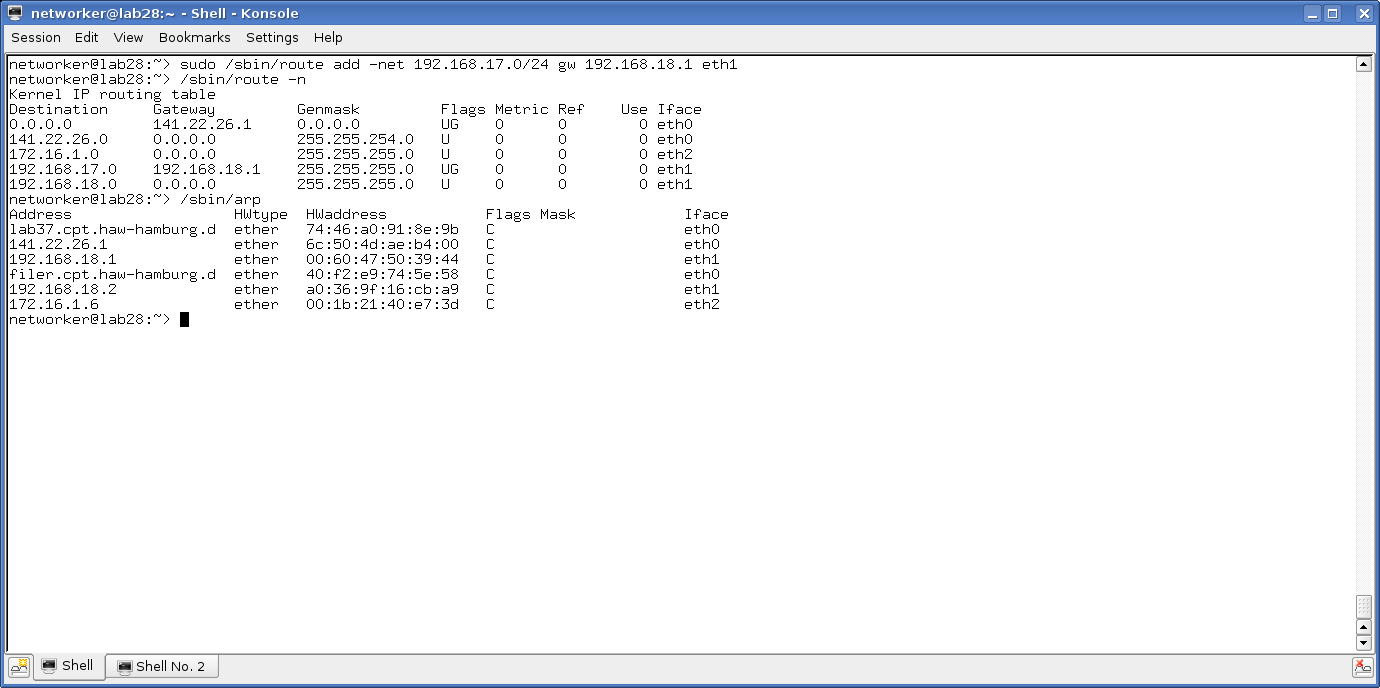
Arbeitsrechner - ISDN



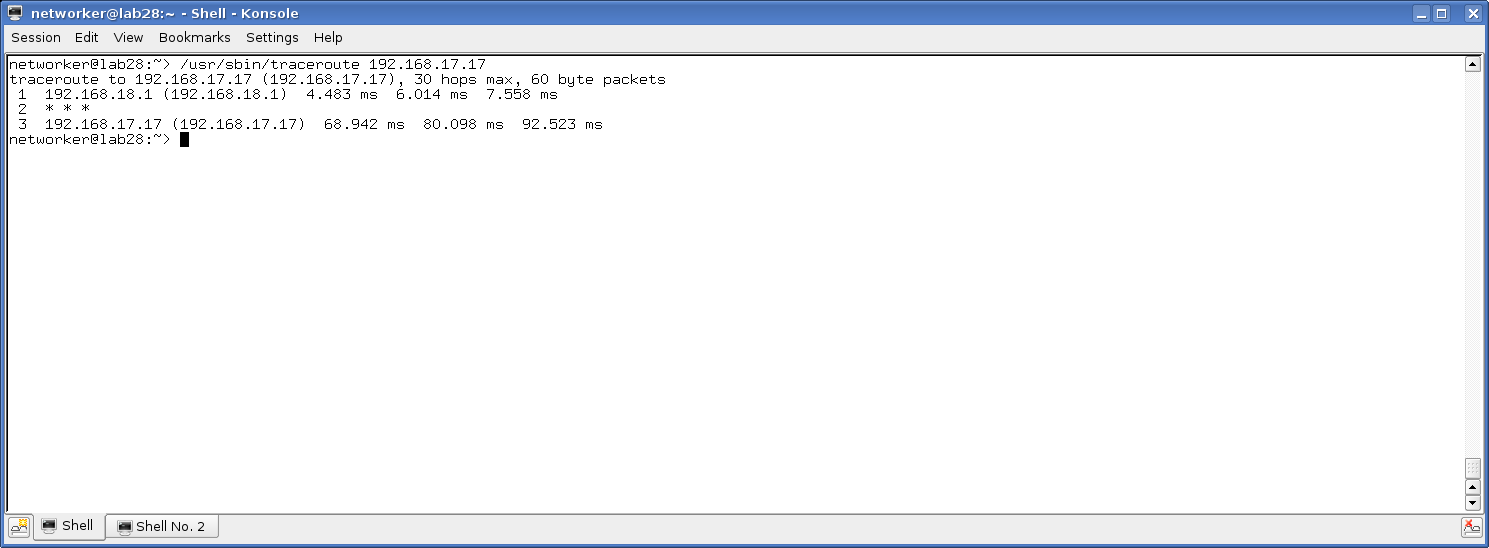
Gegenstelle – ISDN



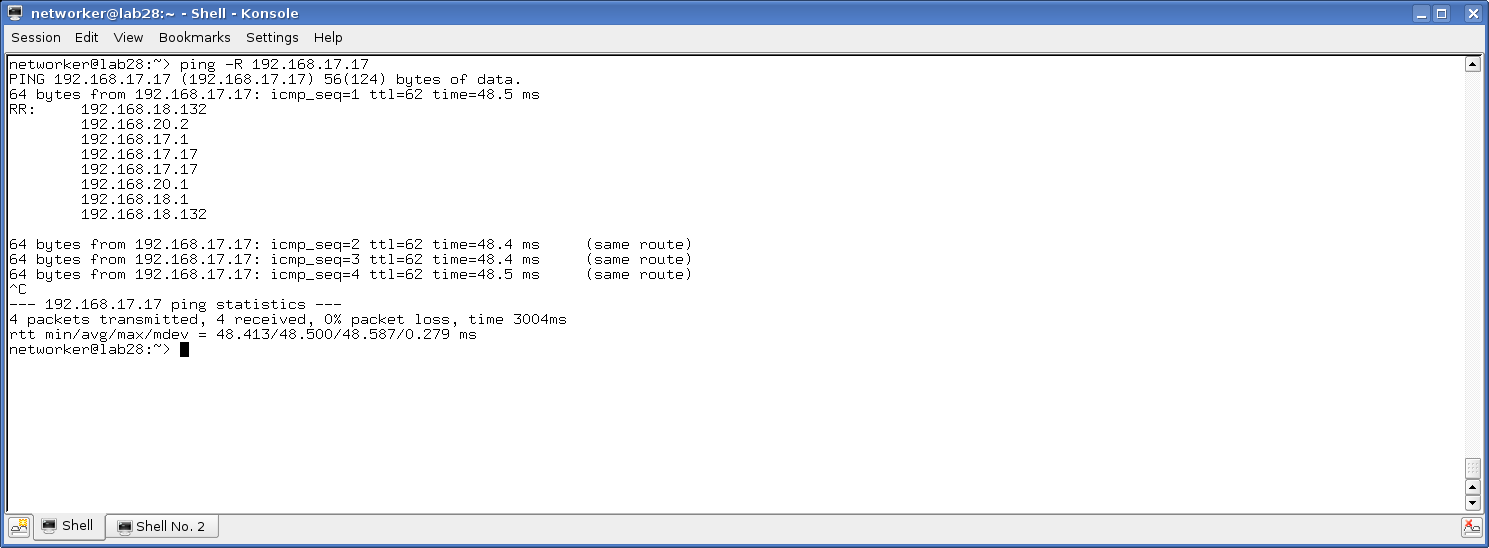
ARP



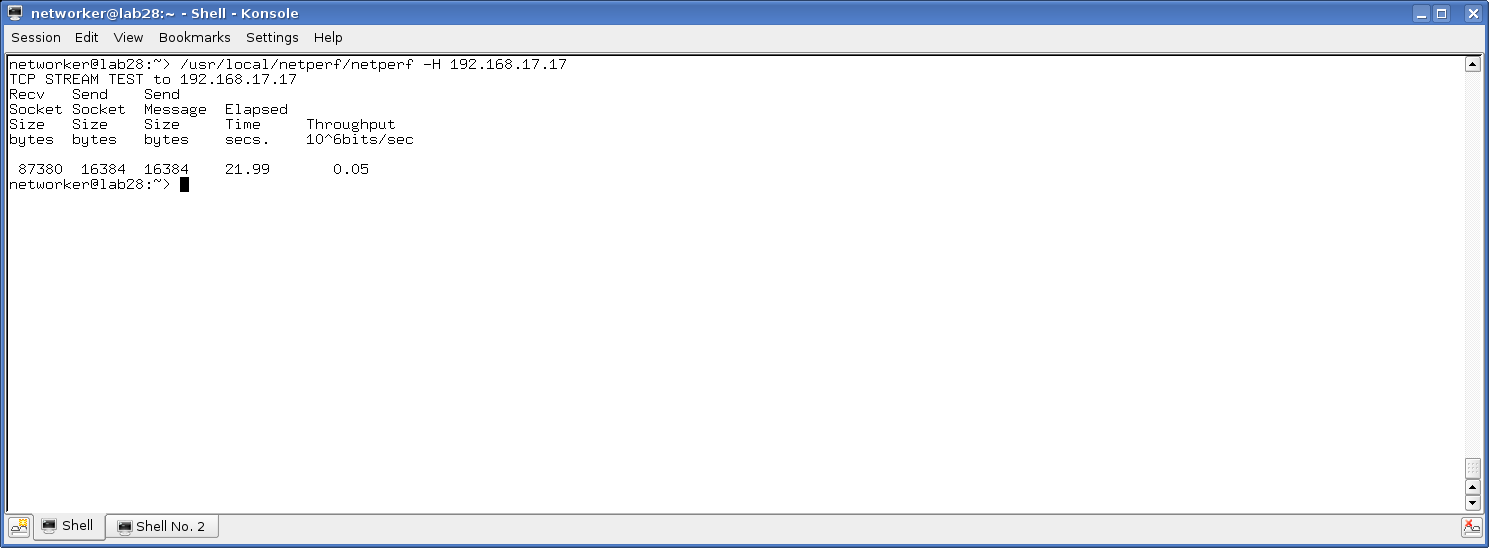
traceroute



ping -R



netperf



Knotenrechner

Arbeitsrechner

networker@lab28:~> sudo /sbin/route add -net 192.168.17.0/24 gw 192.168.18.2 eth1

networker@lab28:~> /sbin/route -n

Kernel IP routing table

Destination Gateway Genmask Flags Metric Ref Use Iface

0.0.0.0 141.22.26.1 0.0.0.0 UG 0 0 0 eth0

141.22.26.0 0.0.0.0 255.255.254.0 U 0 0 0 eth0

172.16.1.0 0.0.0.0 255.255.255.0 U 0 0 0 eth2

192.168.17.0 192.168.18.2 255.255.255.0 UG 0 0 0 eth1

192.168.18.0 0.0.0.0 255.255.255.0 U 0 0 0 eth1

networker@lab28:~>

Gegenstelle:

networker@lab37:~> sudo /sbin/route add -net 192.168.18.0/24 gw 192.168.17.2 eth1

networker@lab37:~> /sbin/route -n

Kernel IP routing table

Destination Gateway Genmask Flags Metric Ref Use Iface

0.0.0.0 141.22.26.1 0.0.0.0 UG 0 0 0 eth0

141.22.26.0 0.0.0.0 255.255.254.0 U 0 0 0 eth0

172.16.1.0 0.0.0.0 255.255.255.0 U 0 0 0 eth2

192.168.17.0 0.0.0.0 255.255.255.0 U 0 0 0 eth1

192.168.18.0 192.168.17.2 255.255.255.0 UG 0 0 0 eth1

networker@lab37:~>

ARP

networker@lab28:~> /sbin/arp

Address HWtype HWaddress Flags Mask Iface

lab37.cpt.haw-hamburg.d ether 74:46:a0:91:8e:9b C eth0

141.22.26.1 ether 6c:50:4d:ae:b4:00 C eth0

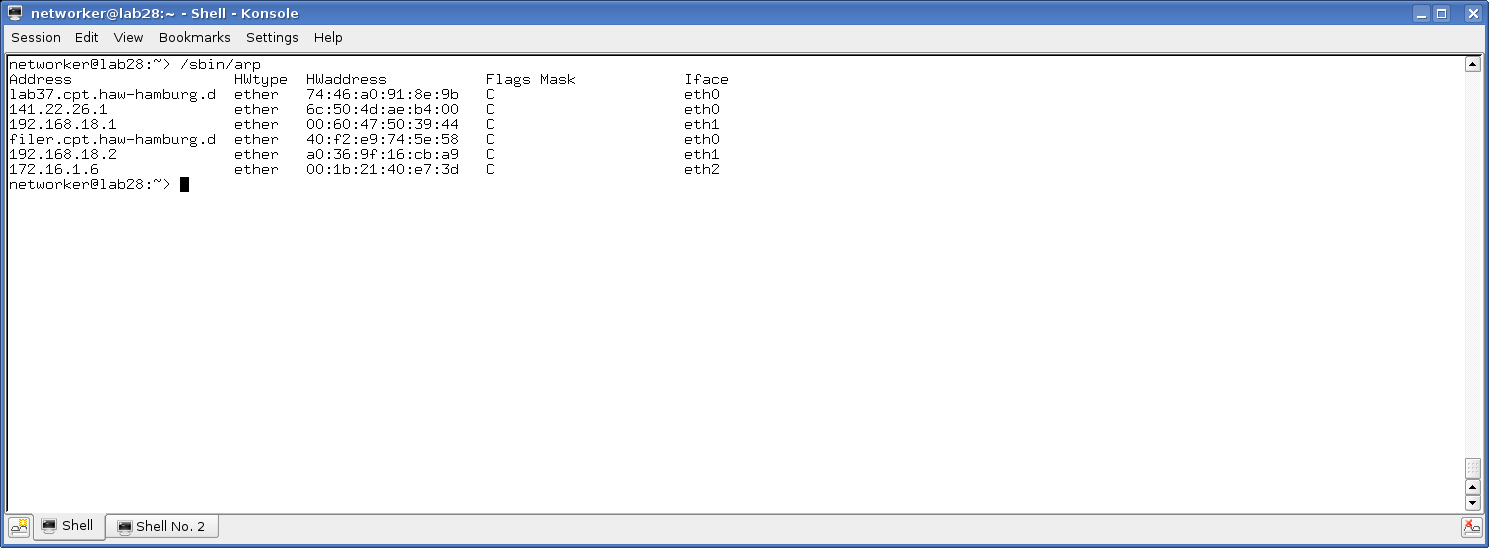
192.168.18.1 ether 00:60:47:50:39:44 C eth1

filer.cpt.haw-hamburg.d ether 40:f2:e9:74:5e:58 C eth0

192.168.18.2 ether a0:36:9f:16:cb:a9 C eth1

172.16.1.6 ether 00:1b:21:40:e7:3d C eth2

networker@lab28:~>



Traceroute

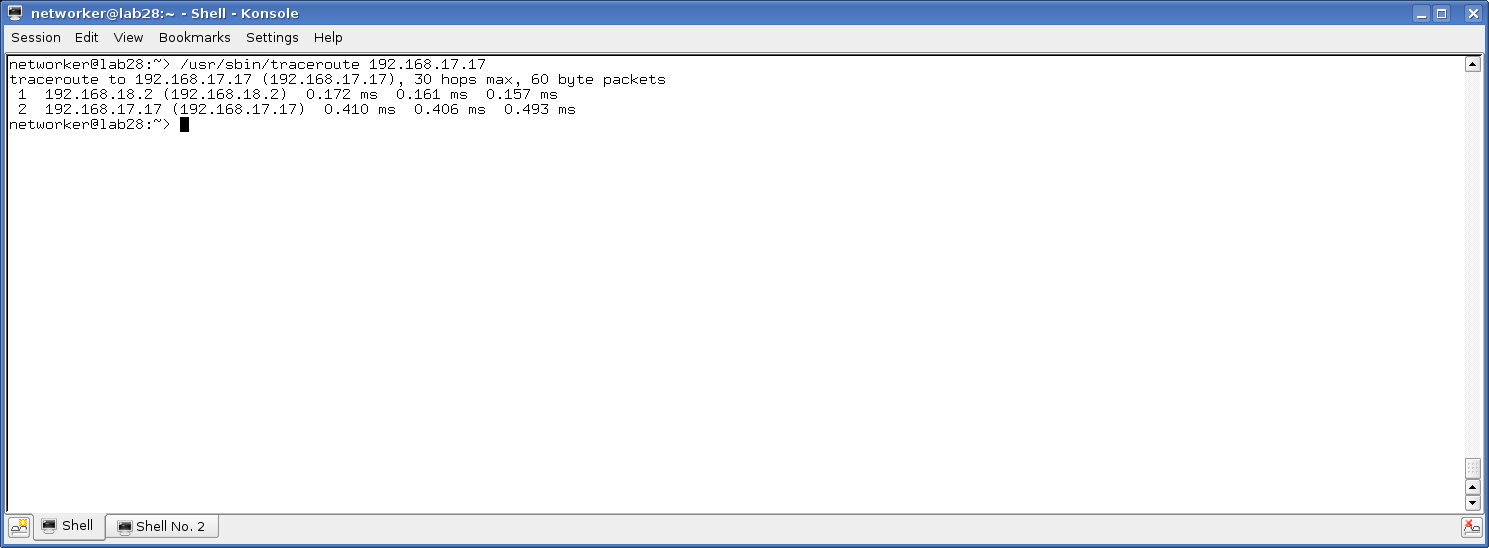
networker@lab28:~> /usr/sbin/traceroute 192.168.17.17

traceroute to 192.168.17.17 (192.168.17.17), 30 hops max, 60 byte packets

1 192.168.18.2 (192.168.18.2) 0.172 ms 0.161 ms 0.157 ms

2 192.168.17.17 (192.168.17.17) 0.410 ms 0.406 ms 0.493 ms

networker@lab28:~>



ping -R

networker@lab28:~> ping -R 192.168.17.17

PING 192.168.17.17 (192.168.17.17) 56(124) bytes of data.

64 bytes from 192.168.17.17: icmp\_seq=1 ttl=63 time=0.350 ms

RR: 192.168.18.132

192.168.17.2

192.168.17.17

192.168.17.17

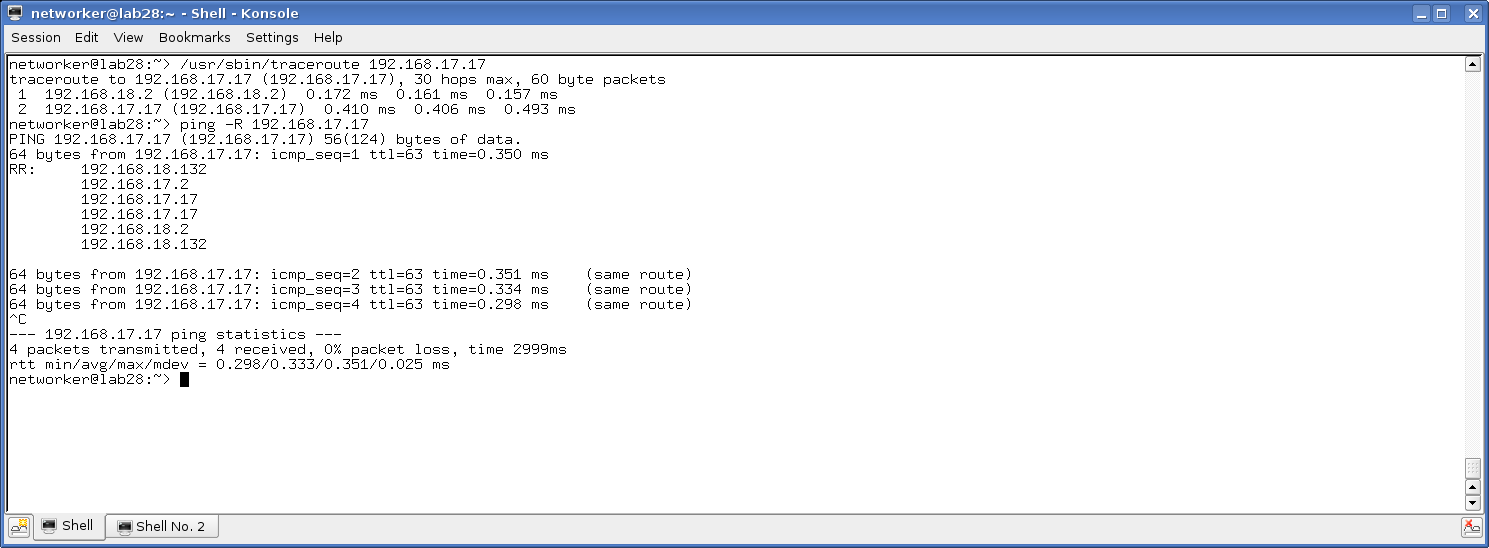
192.168.18.2

192.168.18.132

64 bytes from 192.168.17.17: icmp\_seq=2 ttl=63 time=0.351 ms (same route)

64 bytes from 192.168.17.17: icmp\_seq=3 ttl=63 time=0.334 ms (same route)

64 bytes from 192.168.17.17: icmp\_seq=4 ttl=63 time=0.298 ms (same route)



Aufgabe 2

networker@lab28:~> sudo /sbin/ifconfig eth1 add 192.168.18.132 netmask 255.255.255.255

networker@lab28:~> ping 192.168.17.12

PING 192.168.17.12 (192.168.17.12) 56(84) bytes of data.

From 188.1.231.165 icmp\_seq=7 Destination Host Unreachable

From 188.1.231.165 icmp\_seq=21 Destination Host Unreachable

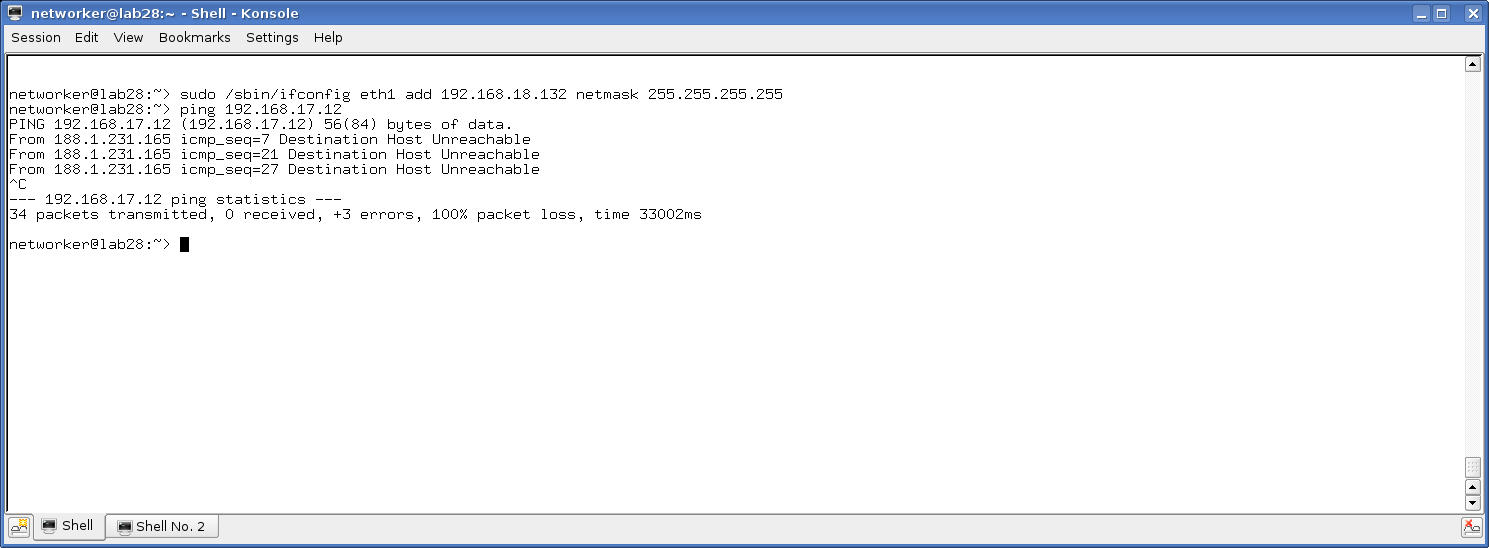
From 188.1.231.165 icmp\_seq=27 Destination Host Unreachable

^C

--- 192.168.17.12 ping statistics ---

34 packets transmitted, 0 received, +3 errors, 100% packet loss, time 33002ms

[networker@lab28](mailto:networker@lab28):~>



networker@lab28:~> sudo /sbin/route add 192.168.18.2 eth1

Host Route 18.2 ist über eth1 anzusprechen

networker@lab28:~> sudo /sbin/route add -net 192.168.17.0/24 gw 192.168.18.2 eth1

networker@lab28:~> /sbin/route -n

Kernel IP routing table

Destination Gateway Genmask Flags Metric Ref Use Iface

0.0.0.0 141.22.26.1 0.0.0.0 UG 0 0 0 eth0

141.22.26.0 0.0.0.0 255.255.254.0 U 0 0 0 eth0

172.16.1.0 0.0.0.0 255.255.255.0 U 0 0 0 eth2

192.168.17.0 192.168.18.2 255.255.255.0 UG 0 0 0 eth1

192.168.18.2 0.0.0.0 255.255.255.255 UH 0 0 0 eth1

networker@lab28:~> ping 192.168.18.2

PING 192.168.18.2 (192.168.18.2) 56(84) bytes of data.

64 bytes from 192.168.18.2: icmp\_seq=1 ttl=64 time=0.277 ms

64 bytes from 192.168.18.2: icmp\_seq=2 ttl=64 time=0.207 ms

64 bytes from 192.168.18.2: icmp\_seq=3 ttl=64 time=0.153 ms

64 bytes from 192.168.18.2: icmp\_seq=4 ttl=64 time=0.158 ms

64 bytes from 192.168.18.2: icmp\_seq=5 ttl=64 time=0.156 ms

64 bytes from 192.168.18.2: icmp\_seq=6 ttl=64 time=0.131 ms

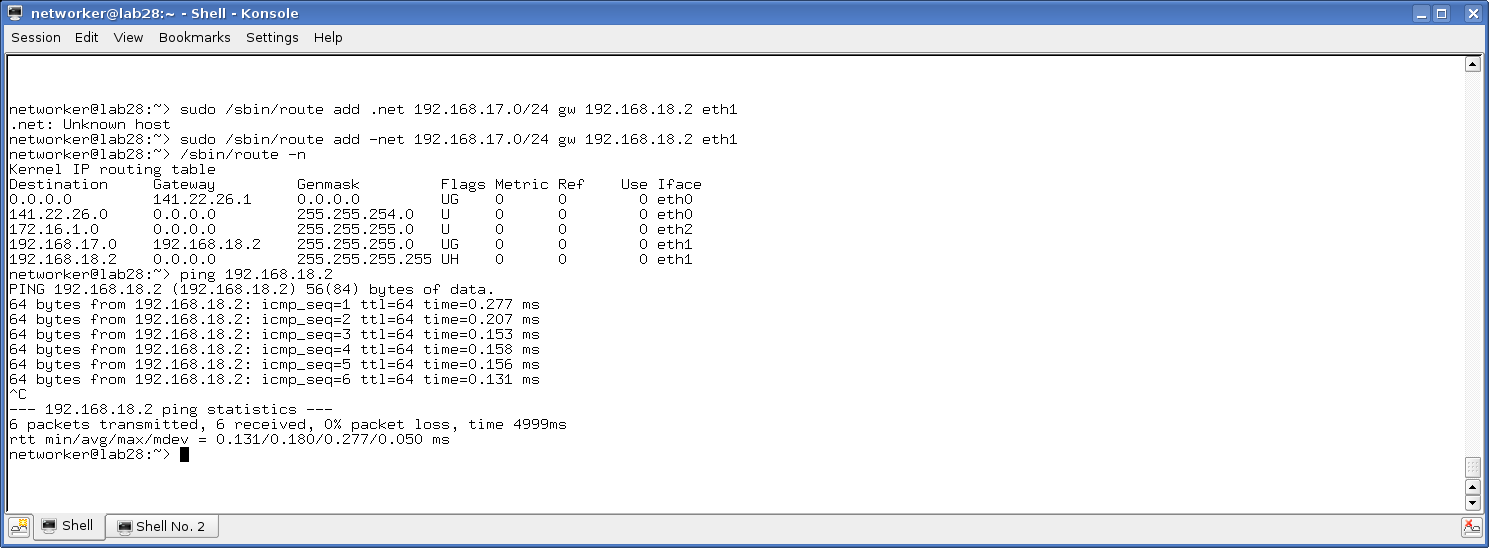
^C

--- 192.168.18.2 ping statistics ---

6 packets transmitted, 6 received, 0% packet loss, time 4999ms

rtt min/avg/max/mdev = 0.131/0.180/0.277/0.050 ms

networker@lab28:~>



networker@lab28:~> ping -Rc1 192.168.18.2

PING 192.168.18.2 (192.168.18.2) 56(124) bytes of data.

64 bytes from 192.168.18.2: icmp\_seq=1 ttl=64 time=0.139 ms

RR: 192.168.18.132

192.168.18.2

192.168.18.2

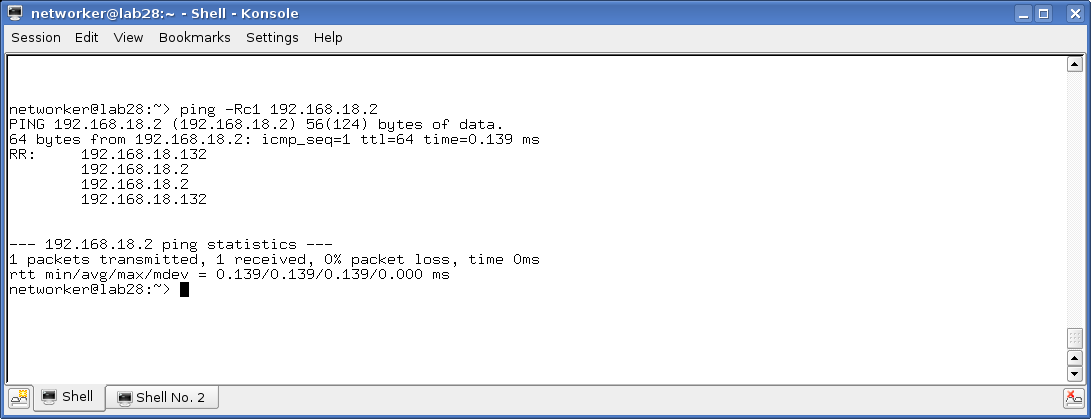
192.168.18.132

--- 192.168.18.2 ping statistics ---

1 packets transmitted, 1 received, 0% packet loss, time 0ms

rtt min/avg/max/mdev = 0.139/0.139/0.139/0.000 ms

networker@lab28:~>



Aufgabe 2 NEU AUF LAB25

etworker@lab25:~> /sbin/route -n

Kernel IP routing table

Destination Gateway Genmask Flags Metric Ref Use Iface

0.0.0.0 141.22.26.1 0.0.0.0 UG 0 0 0 eth0

141.22.26.0 0.0.0.0 255.255.254.0 U 0 0 0 eth0

172.16.1.0 0.0.0.0 255.255.255.0 U 0 0 0 eth2

192.168.18.0 0.0.0.0 255.255.255.0 U 0 0 0 eth1

networker@lab25:~> sudo /sbin/route add -net 192.168.17.0/24 gw 192.168.18.2 eth1

networker's password:

networker@lab25:~> ping 192.168.17.11

PING 192.168.17.11 (192.168.17.11) 56(84) bytes of data.

64 bytes from 192.168.17.11: icmp\_seq=1 ttl=63 time=0.256 ms

64 bytes from 192.168.17.11: icmp\_seq=2 ttl=63 time=0.336 ms

64 bytes from 192.168.17.11: icmp\_seq=3 ttl=63 time=0.150 ms

64 bytes from 192.168.17.11: icmp\_seq=4 ttl=63 time=0.187 ms

64 bytes from 192.168.17.11: icmp\_seq=5 ttl=63 time=0.283 ms

64 bytes from 192.168.17.11: icmp\_seq=6 ttl=63 time=0.324 ms

^C

--- 192.168.17.11 ping statistics ---

6 packets transmitted, 6 received, 0% packet loss, time 4999ms

rtt min/avg/max/mdev = 0.150/0.256/0.336/0.068 ms

networker@lab25:~> sudo /sbin/ifconfig eth1 add 192.168.18.132 netmask 255.255.25

5.255

networker@lab25:~> ping 192.168.17.12

PING 192.168.17.12 (192.168.17.12) 56(84) bytes of data.

From 192.168.18.2 icmp\_seq=1 Destination Host Unreachable

From 192.168.18.2 icmp\_seq=2 Destination Host Unreachable

From 192.168.18.2 icmp\_seq=3 Destination Host Unreachable

From 192.168.18.2 icmp\_seq=4 Destination Host Unreachable

From 192.168.18.2 icmp\_seq=5 Destination Host Unreachable

From 192.168.18.2 icmp\_seq=6 Destination Host Unreachable

From 192.168.18.2 icmp\_seq=7 Destination Host Unreachable

From 192.168.18.2 icmp\_seq=8 Destination Host Unreachable

^C

--- 192.168.17.12 ping statistics ---

11 packets transmitted, 0 received, +8 errors, 100% packet loss, time 10002ms

pipe 4

networker@lab25:~>

networker@lab25:~>

networker@lab25:~>

networker@lab25:~> /sbin/route -n

Kernel IP routing table

Destination Gateway Genmask Flags Metric Ref Use Iface

0.0.0.0 141.22.26.1 0.0.0.0 UG 0 0 0 eth0

141.22.26.0 0.0.0.0 255.255.254.0 U 0 0 0 eth0

172.16.1.0 0.0.0.0 255.255.255.0 U 0 0 0 eth2

192.168.17.0 192.168.18.2 255.255.255.0 UG 0 0 0 eth1

192.168.18.0 0.0.0.0 255.255.255.0 U 0 0 0 eth1

networker@lab25:~> sudo /sbin/route add 192.168.18.2 eth1

networker@lab25:~> /sbin/route -n

Kernel IP routing table

Destination Gateway Genmask Flags Metric Ref Use Iface

0.0.0.0 141.22.26.1 0.0.0.0 UG 0 0 0 eth0

141.22.26.0 0.0.0.0 255.255.254.0 U 0 0 0 eth0

172.16.1.0 0.0.0.0 255.255.255.0 U 0 0 0 eth2

192.168.17.0 192.168.18.2 255.255.255.0 UG 0 0 0 eth1

192.168.18.0 0.0.0.0 255.255.255.0 U 0 0 0 eth1

192.168.18.2 0.0.0.0 255.255.255.255 UH 0 0 0 eth1

networker@lab25:~> sudo /sbin/route add -net 192.168.17.0/24 gw 192.168.18.2 eth1

SIOCADDRT: File exists

networker@lab25:~> sudo /sbin/route add -net 192.168.17.0/24 gw 192.168.18.2 eth1

SIOCADDRT: File exists

networker@lab25:~> /sbin/route -n

Kernel IP routing table

Destination Gateway Genmask Flags Metric Ref Use Iface

0.0.0.0 141.22.26.1 0.0.0.0 UG 0 0 0 eth0

141.22.26.0 0.0.0.0 255.255.254.0 U 0 0 0 eth0

172.16.1.0 0.0.0.0 255.255.255.0 U 0 0 0 eth2

192.168.17.0 192.168.18.2 255.255.255.0 UG 0 0 0 eth1

192.168.18.0 0.0.0.0 255.255.255.0 U 0 0 0 eth1

192.168.18.2 0.0.0.0 255.255.255.255 UH 0 0 0 eth1

networker@lab25:~> ping 192.168.18.2

PING 192.168.18.2 (192.168.18.2) 56(84) bytes of data.

64 bytes from 192.168.18.2: icmp\_seq=1 ttl=64 time=0.133 ms

64 bytes from 192.168.18.2: icmp\_seq=2 ttl=64 time=0.141 ms

64 bytes from 192.168.18.2: icmp\_seq=3 ttl=64 time=0.120 ms

64 bytes from 192.168.18.2: icmp\_seq=4 ttl=64 time=0.156 ms

64 bytes from 192.168.18.2: icmp\_seq=5 ttl=64 time=0.123 ms

64 bytes from 192.168.18.2: icmp\_seq=6 ttl=64 time=0.128 ms

64 bytes from 192.168.18.2: icmp\_seq=7 ttl=64 time=0.171 ms

^C

--- 192.168.18.2 ping statistics ---

7 packets transmitted, 7 received, 0% packet loss, time 5999ms

rtt min/avg/max/mdev = 0.120/0.138/0.171/0.023 ms

networker@lab25:~>

networker@lab25:~>

networker@lab25:~>

networker@lab25:~>

networker@lab25:~>

networker@lab25:~> sudo /sbin/route eth1 192.168.18.131 netmask 255.255.255.255

networker's password:

Usage: route [-nNvee] [-FC] [<AF>] List kernel routing tables

route [-v] [-FC] {add|del|flush} ... Modify routing table for AF.

route {-h|--help} [<AF>] Detailed usage syntax for specified AF.

route {-V|--version} Display version/author and exit.

-v, --verbose be verbose

-n, --numeric don't resolve names

-e, --extend display other/more information

-F, --fib display Forwarding Information Base (default)

-C, --cache display routing cache instead of FIB

<AF>=Use '-A <af>' or '--<af>'; default: inet

List of possible address families (which support routing):

inet (DARPA Internet) inet6 (IPv6) ax25 (AMPR AX.25)

netrom (AMPR NET/ROM) ipx (Novell IPX) ddp (Appletalk DDP)

x25 (CCITT X.25)

networker@lab25:~> sudo /sbin/route add eth1 192.168.18.131 netmask 255.255.255.255

eth1: Unknown host

networker@lab25:~> sudo /sbin/ifconfig eth1 192.168.18.131 netmask 255.255.255.255

networker@lab25:~> /sbin/route -n

Kernel IP routing table

Destination Gateway Genmask Flags Metric Ref Use Iface

0.0.0.0 141.22.26.1 0.0.0.0 UG 0 0 0 eth0

141.22.26.0 0.0.0.0 255.255.254.0 U 0 0 0 eth0

172.16.1.0 0.0.0.0 255.255.255.0 U 0 0 0 eth2

192.168.17.0 192.168.18.2 255.255.255.0 UG 0 0 0 eth1

192.168.18.0 0.0.0.0 255.255.255.0 U 0 0 0 eth1

192.168.18.2 0.0.0.0 255.255.255.255 UH 0 0 0 eth1

networker@lab25:~> sudo /sbin/rozte add 192.168.18.2

sudo: /sbin/rozte: command not found

networker@lab25:~> sudo /sbin/route add 192.168.18.2

SIOCADDRT: No such device

networker@lab25:~> sudo /sbin/route add 192.168.18.2 eth1

SIOCADDRT: File exists

networker@lab25:~> sudo /sbin/route/ add -net 192.168.18.0/24 gw 192.168.18.2

sudo: /sbin/route/: command not found

networker@lab25:~> sudo /sbin/route add -net 192.168.18.0/24 gw 192.168.18.2 eth1

networker@lab25:~> /sbin/route -n

Kernel IP routing table

Destination Gateway Genmask Flags Metric Ref Use Iface

0.0.0.0 141.22.26.1 0.0.0.0 UG 0 0 0 eth0

141.22.26.0 0.0.0.0 255.255.254.0 U 0 0 0 eth0

172.16.1.0 0.0.0.0 255.255.255.0 U 0 0 0 eth2

192.168.17.0 192.168.18.2 255.255.255.0 UG 0 0 0 eth1

192.168.18.0 192.168.18.2 255.255.255.0 UG 0 0 0 eth1

192.168.18.0 0.0.0.0 255.255.255.0 U 0 0 0 eth1

192.168.18.2 0.0.0.0 255.255.255.255 UH 0 0 0 eth1

networker@lab25:~> ping 192.168.18.2

PING 192.168.18.2 (192.168.18.2) 56(84) bytes of data.

64 bytes from 192.168.18.2: icmp\_seq=1 ttl=64 time=0.267 ms

64 bytes from 192.168.18.2: icmp\_seq=2 ttl=64 time=0.130 ms

64 bytes from 192.168.18.2: icmp\_seq=3 ttl=64 time=0.170 ms

64 bytes from 192.168.18.2: icmp\_seq=4 ttl=64 time=0.149 ms

64 bytes from 192.168.18.2: icmp\_seq=5 ttl=64 time=0.121 ms

64 bytes from 192.168.18.2: icmp\_seq=6 ttl=64 time=0.128 ms

^C

--- 192.168.18.2 ping statistics ---

6 packets transmitted, 6 received, 0% packet loss, time 4999ms

rtt min/avg/max/mdev = 0.121/0.160/0.267/0.052 ms

networker@lab25:~> ^C

networker@lab25:~> ^C

networker@lab25:~>

networker@lab25:~> sudo /sbin/route delete -net 192.168.17.0/24 gw 192.168.18.2 eth1

networker@lab25:~> /sbin/route -n

Kernel IP routing table

Destination Gateway Genmask Flags Metric Ref Use Iface

0.0.0.0 141.22.26.1 0.0.0.0 UG 0 0 0 eth0

141.22.26.0 0.0.0.0 255.255.254.0 U 0 0 0 eth0

172.16.1.0 0.0.0.0 255.255.255.0 U 0 0 0 eth2

192.168.18.0 192.168.18.2 255.255.255.0 UG 0 0 0 eth1

192.168.18.0 0.0.0.0 255.255.255.0 U 0 0 0 eth1

192.168.18.2 0.0.0.0 255.255.255.255 UH 0 0 0 eth1

networker@lab25:~> ^C

networker@lab25:~>

networker@lab25:~> ping 192.168.18.4

PING 192.168.18.4 (192.168.18.4) 56(84) bytes of data.

From 192.168.18.2: icmp\_seq=1 Redirect Host(New nexthop: 192.168.18.4)

64 bytes from 192.168.18.4: icmp\_seq=2 ttl=255 time=0.548 ms

64 bytes from 192.168.18.4: icmp\_seq=3 ttl=255 time=0.556 ms

64 bytes from 192.168.18.4: icmp\_seq=4 ttl=255 time=0.587 ms

64 bytes from 192.168.18.4: icmp\_seq=5 ttl=255 time=0.535 ms

64 bytes from 192.168.18.4: icmp\_seq=6 ttl=255 time=0.543 ms

64 bytes from 192.168.18.4: icmp\_seq=7 ttl=255 time=0.551 ms

^C

--- 192.168.18.4 ping statistics ---

7 packets transmitted, 6 received, 14% packet loss, time 5999ms

rtt min/avg/max/mdev = 0.535/0.553/0.587/0.025 ms

networker@lab25:~> ping 192.168.17.11

PING 192.168.17.11 (192.168.17.11) 56(84) bytes of data.

From 188.1.231.165 icmp\_seq=5 Destination Host Unreachable

From 188.1.231.165 icmp\_seq=11 Destination Host Unreachable

From 188.1.231.165 icmp\_seq=16 Destination Host Unreachable

^C

--- 192.168.17.11 ping statistics ---

23 packets transmitted, 0 received, +3 errors, 100% packet loss, time 21999ms

FERTIG