



Università degli Studi Roma Tre  
Dipartimento di Informatica e Automazione  
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# netkit lab

## two-hosts

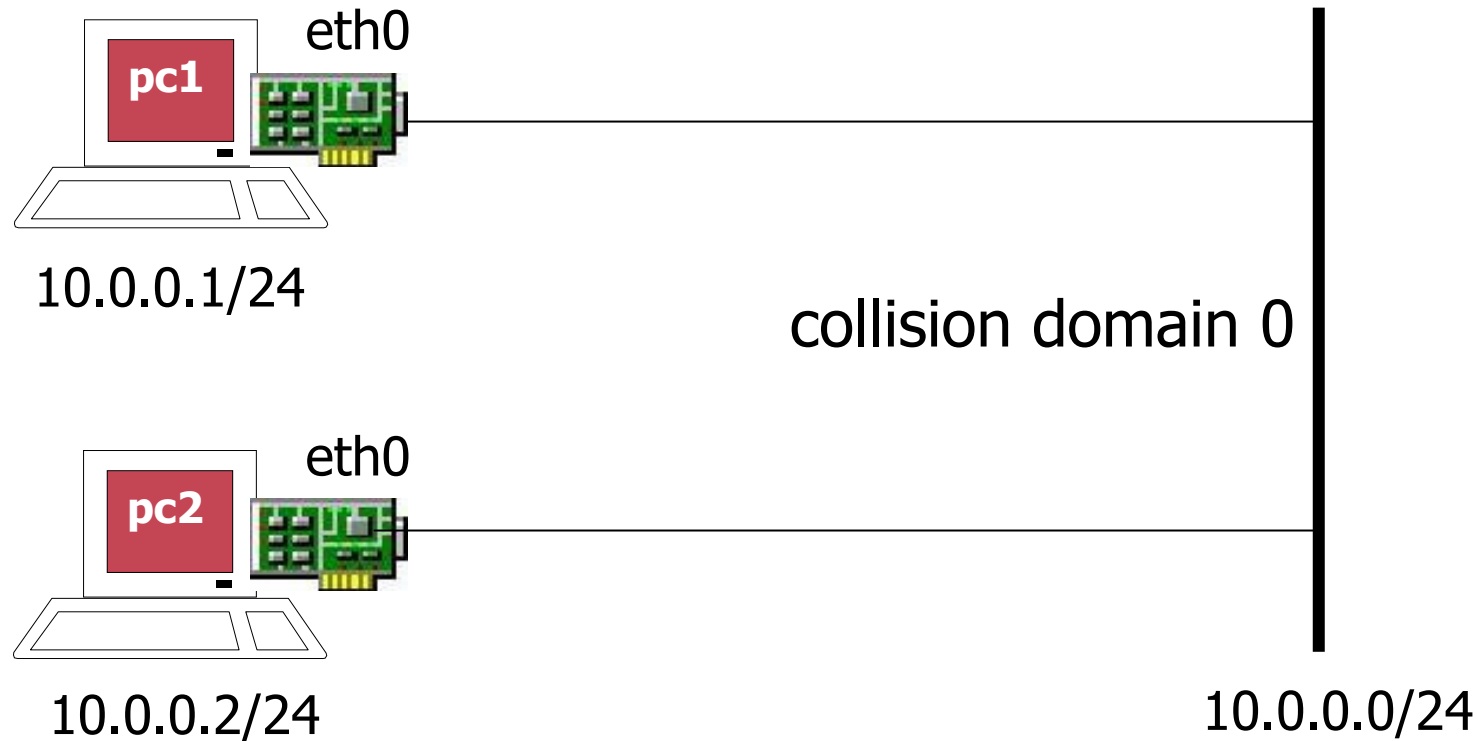
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<b>Web</b>	<a href="http://www.netkit.org/">http://www.netkit.org/</a>
<b>Description</b>	setting up a network between two virtual machines

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# two hosts

- a simple network with two hosts connected to the same collision domain



# step 1 – creating the vms

host machine

```
user@localhost:~$ vstart pc1 --eth0=A
```

```
===== Starting virtual machine "pc1" =====
```

```
Kernel:      /home/user/netkit2/kernel/netkit-kernel  
Modules:     /home/user/netkit2/kernel/modules  
Memory:      8 MB
```

pc1 is created and a console window opens for pc1

```
user@localhost:~$ vstart pc2 --eth0=A
```

```
===== Starting virtual machine "pc2" =====
```

```
Kernel:      /home/user/netkit2/kernel/netkit-kernel  
Modules:     /home/user/netkit2/kernel/modules  
Memory:      8 MB
```

pc2 is created and a console window opens for pc2

# step 2 – configuring network interfaces

pc1



```
pc1:~# ifconfig eth0 10.0.0.1 netmask 255.255.255.0 broadcast  
10.0.0.255 up  
pc1:~# █
```

pc2



```
pc2:~# ifconfig eth0 10.0.0.2 netmask 255.255.255.0 broadcast  
10.0.0.255 up  
pc2:~# █
```

## step 3 - ping

```
pc1:~# ping 10.0.0.2
PING 10.0.0.2 (10.0.0.2) 56(84) bytes of data.
64 bytes from 10.0.0.2: icmp_seq=1 ttl=64 time=2.65 ms
64 bytes from 10.0.0.2: icmp_seq=2 ttl=64 time=0.357 ms
64 bytes from 10.0.0.2: icmp_seq=3 ttl=64 time=0.380 ms
64 bytes from 10.0.0.2: icmp_seq=4 ttl=64 time=0.349 ms
64 bytes from 10.0.0.2: icmp_seq=5 ttl=64 time=0.348 ms

--- 10.0.0.2 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4078ms
rtt min/avg/max/mdev = 0.348/0.818/2.656/0.919 ms
pc1:~# █
```

- pc1 and pc2 can reach each other

# step 4 – a look at the packets

- let's look at the packets exchanged on collision domain A
- we use tcpdump, a network sniffer that is widely available on linux boxes

TCPDUMP (8)

NAME

tcpdump - dump traffic on a

SYNOPSIS

```
tcpdump [ -AdDeflLnNcStuUvxX ] [ -c count ] [ -C file ] [ -F file ]  
[ -i interface ] [ -m module ] [ -r file ]  
[ -s snaplen ] [ -T type ] [ -w file ]  
[ -E spi@ipaddr algo:secret,... ]
```

number of bytes captured per packet (default is 68)

stores the packets to file

# step 4 – a look at the packets

## ■ ping from pc1

```
pc1:~# ping 10.0.0.2
PING 10.0.0.2 (10.0.0.2) 56(84) bytes of data.
64 bytes from 10.0.0.2: icmp_seq=1 ttl=64 time=6.94 ms
64 bytes from 10.0.0.2: icmp_seq=2 ttl=64 time=0.906 ms
64 bytes from 10.0.0.2: icmp_seq=3 ttl=64 time=0.864 ms

--- 10.0.0.2 ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2033ms
rtt min/avg/max/mdev = 0.864/2.906/6.948/2.858 ms
pc1:~# █
```



# step 4 – a look at the packets

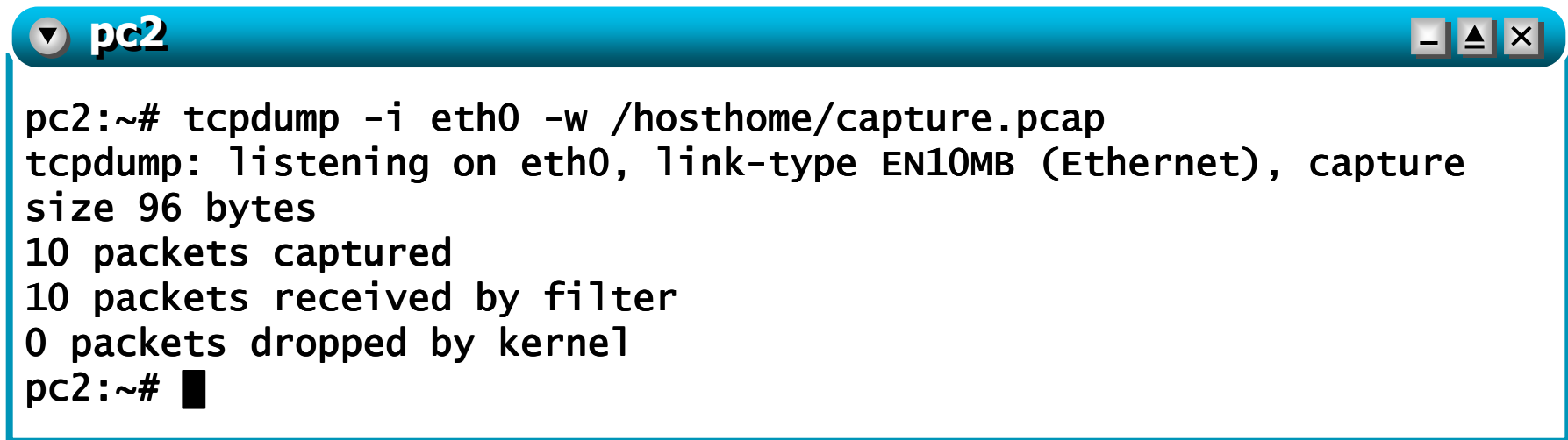
- at the same time, sniff from pc2 (ctrl+C to interrupt)

```
pc2:~# tcpdump -i eth0
tcpdump: verbose output suppressed, use -v or -vv for full protocol
decode
listening on eth0, link-type EN10MB (Ethernet), capture size 96
bytes
19:27:17.899782 arp who-has 10.0.0.2 tell 10.0.0.1
19:27:18.002578 arp reply 10.0.0.2 is-at fe:fd:0a:00:00:02
19:27:18.004384 IP 10.0.0.1 > 10.0.0.2: icmp 64: echo request seq 1
19:27:18.005806 IP 10.0.0.2 > 10.0.0.1: icmp 64: echo reply seq 1
19:27:18.920463 IP 10.0.0.1 > 10.0.0.2: icmp 64: echo request seq 2
19:27:18.920605 IP 10.0.0.2 > 10.0.0.1: icmp 64: echo reply seq 2

6 packets captured
6 packets received by filter
0 packets dropped by kernel
pc2:~# █
```

## step 4 – looking at the packets with a graphical interface

- same as before, but store sniffed packets into file `capture.pcap` (on the host machine)
  - the (real) home directory of the current user is made available inside the vm under `/hosthome`



```
pc2:~# tcpdump -i eth0 -w /hosthome/capture.pcap
tcpdump: listening on eth0, link-type EN10MB (Ethernet), capture
size 96 bytes
10 packets captured
10 packets received by filter
0 packets dropped by kernel
pc2:~# █
```

# step 4 – looking at the packets with a graphical interface

- open `capture.pcap` on the real host machine using a packet dissector (like, e.g., `ethereal`)

