### netkit lab

#### two-hosts

<table>
<thead>
<tr>
<th>Version</th>
<th>2.2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Author(s)</strong></td>
<td>G. Di Battista, M. Patrignani, M. Pizzonia, M. Rimondini</td>
</tr>
<tr>
<td><strong>E-mail</strong></td>
<td><a href="mailto:contact@netkit.org">contact@netkit.org</a></td>
</tr>
<tr>
<td><strong>Web</strong></td>
<td><a href="http://www.netkit.org/">http://www.netkit.org/</a></td>
</tr>
<tr>
<td><strong>Description</strong></td>
<td>setting up a network between two virtual machines</td>
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</tbody>
</table>
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two hosts

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

```
<table>
<thead>
<tr>
<th>Host</th>
<th>Interface</th>
<th>IP Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>pc1</td>
<td>eth0</td>
<td>10.0.0.1/24</td>
</tr>
<tr>
<td>pc2</td>
<td>eth0</td>
<td>10.0.0.2/24</td>
</tr>
</tbody>
</table>
```

Collision domain 0
step 1 – creating the vms

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

```
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:~# pc2

- pc1 and pc2 can reach each other

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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 network

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

stores the packets to file

number of bytes captured per packet (default is 68)
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

---

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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*)