

Lab 9: PKI HTTPS PROXY

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1 Network configuration

1. As we start the PC Router virtual machine, we need to modify the IP configuration. First, enable the interface connected to the internet. To show all the available interfaces, use:

`ip link`

```
aah@aah-server:~$ ip link
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN mode DEFAULT group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP mode DEFAULT group default qlen 1000
    link/ether 08:00:27:1b:84:85 brd ff:ff:ff:ff:ff:ff
3: enp0s9: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP mode DEFAULT group default qlen 1000
    link/ether 08:00:27:a6:fa:d5 brd ff:ff:ff:ff:ff:ff
4: enp0s8: <BROADCAST,MULTICAST> mtu 1500 qdisc noop state DOWN mode DEFAULT group default qlen 1000
    link/ether 08:00:27:e1:1e:c2 brd ff:ff:ff:ff:ff:ff
5: docker0: <NO-CARRIER,BROADCAST,MULTICAST,UP> mtu 1500 qdisc noqueue state DOWN mode DEFAULT group default
    link/ether 02:42:5e:4c:0f:71 brd ff:ff:ff:ff:ff:ff
```

There are 3 ip interfaces that interest us. `enp0s3` and `enp0s9` are host-only adapters. Observe that interface `enp0s8` is down. It corresponds to the NAT interface in the VirtualBox network configuration. We need to enable the interface and assign it an IP address using DHCP.

`ifconfig enp0s8 up`

Now the interface is enabled but it does not have an IP address. To ask for a new DHCP lease, use:

`dhclient enp0s8`

Now the DHCP sent a lease and the interface now has an IP address and an active internet connection.

```
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
        inet6 fe80::a00:27ff:fe1b:8485 prefixlen 64 scopeid 0x20<link>
        ether 08:00:27:1b:84:85 txqueuelen 1000 (Ethernet)
        RX packets 8 bytes 857 (857.0 B)
        RX errors 0 dropped 0 overruns 0 frame 0
        TX packets 29 bytes 6350 (6.3 KB)
        TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

enp0s8: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
        inet 10.0.3.15 netmask 255.255.255.0 broadcast 10.0.3.255
        inet6 fe80::a00:27ff:fee1:1ec2 prefixlen 64 scopeid 0x20<link>
        ether 08:00:27:e1:1e:c2 txqueuelen 1000 (Ethernet)
        RX packets 2 bytes 1180 (1.1 KB)
        RX errors 0 dropped 0 overruns 0 frame 0
        TX packets 9 bytes 1270 (1.2 KB)
        TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

enp0s9: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
        inet6 fe80::a00:27ff:fea6:fad5 prefixlen 64 scopeid 0x20<link>
        ether 08:00:27:a6:fa:d5 txqueuelen 1000 (Ethernet)
        RX packets 4 bytes 366 (366.0 B)
        RX errors 0 dropped 0 overruns 0 frame 0
        TX packets 29 bytes 6750 (6.7 KB)
        TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

To prove that the VM is connected to the internet, we ping the `google.com` server.

```
aah@aah-server:~$ ping google.com
PING google.com (216.58.204.142) 56(84) bytes of data:
64 bytes from par21s05-in-f14.1e100.net (216.58.204.142): icmp_seq=1 ttl=63 time=17.5 ms
64 bytes from par21s05-in-f14.1e100.net (216.58.204.142): icmp_seq=2 ttl=63 time=17.2 ms
64 bytes from par21s05-in-f14.1e100.net (216.58.204.142): icmp_seq=3 ttl=63 time=18.0 ms
^C
--- google.com ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2004ms
rtt min/avg/max/mdev = 17.258/17.617/18.048/0.326 ms
```

2.