

Basic Network Configurations- Lab 11

Task A

1.

```
lydia-robb@kali: ~  
File Actions Edit View Help  
(lydia-robb@kali)-[~]  
└─$ ifconfig  
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500  
    inet 10.0.2.15 netmask 255.255.255.0 broadcast 10.0.2.255  
    inet6 fd17:625c:f037:2:7a9b:14f7:9f5:fb09 prefixlen 64 scopeid 0<lo<  
global>  
    inet6 fe80::a00:27ff:feb6:a527 prefixlen 64 scopeid 0<20<link>  
    inet6 fd17:625c:f037:2:a00:27ff:feb6:a527 prefixlen 64 scopeid 0<lo<  
global>  
    ether 08:00:27:b6:a5:27 txqueuelen 1000 (Ethernet)  
    RX packets 9 bytes 3723 (3.6 KiB)  
    RX errors 0 dropped 0 overruns 0 frame 0  
    TX packets 30 bytes 4954 (4.8 KiB)  
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0  
  
lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536  
    inet 127.0.0.1 netmask 255.0.0.0  
    inet6 ::1 prefixlen 128 scopeid 0<10<host>  
    loop txqueuelen 1000 (Local Loopback)  
    RX packets 8 bytes 480 (480.0 B)  
    RX errors 0 dropped 0 overruns 0 frame 0  
    TX packets 8 bytes 480 (480.0 B)  
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0  
  
(lydia-robb@kali)-[~]  
└─$
```

2.

```
lydia-robb@kali: ~  
File Actions Edit View Help  
    inet6 fe80::a00:27ff:feb6:a527 prefixlen 64 scopeid 0<20<link>  
    inet6 fd17:625c:f037:2:a00:27ff:feb6:a527 prefixlen 64 scopeid 0<lo<  
global>  
    ether 08:00:27:b6:a5:27 txqueuelen 1000 (Ethernet)  
    RX packets 9 bytes 3723 (3.6 KiB)  
    RX errors 0 dropped 0 overruns 0 frame 0  
    TX packets 30 bytes 4954 (4.8 KiB)  
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0  
  
lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536  
    inet 127.0.0.1 netmask 255.0.0.0  
    inet6 ::1 prefixlen 128 scopeid 0<10<host>  
    loop txqueuelen 1000 (Local Loopback)  
    RX packets 8 bytes 480 (480.0 B)  
    RX errors 0 dropped 0 overruns 0 frame 0  
    TX packets 8 bytes 480 (480.0 B)  
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0  
  
(lydia-robb@kali)-[~]  
└─$ route -n  
Kernel IP routing table  
Destination Gateway Genmask Flags Metric Ref Use Iface  
0.0.0.0 10.0.2.2 UG 100 0 0 eth0  
10.0.2.0 0.0.0.0 255.255.255.0 U 100 0 0 eth0  
  
(lydia-robb@kali)-[~]  
└─$
```

3.

```
(lydia-robb@kali)-[~]
└─$ netstat -ta
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
└─$
```

4.

```
lydia-robb@kali: ~
File Actions Edit View Help
PING ubuntu.com (185.125.190.29) 56(84) bytes of data:
64 bytes from website-content-cache-3.ps5.canonical.com (185.125.190.29): icmp
p_seq=1 ttl=255 time=90.4 ms
64 bytes from website-content-cache-3.ps5.canonical.com (185.125.190.29): icmp
p_seq=2 ttl=255 time=95.9 ms
64 bytes from website-content-cache-3.ps5.canonical.com (185.125.190.29): icmp
p_seq=3 ttl=255 time=94.4 ms
64 bytes from website-content-cache-3.ps5.canonical.com (185.125.190.29): icmp
p_seq=4 ttl=255 time=95.1 ms
64 bytes from website-content-cache-3.ps5.canonical.com (185.125.190.29): icmp
p_seq=5 ttl=255 time=94.9 ms
64 bytes from website-content-cache-3.ps5.canonical.com (185.125.190.29): icmp
p_seq=6 ttl=255 time=96.0 ms
64 bytes from website-content-cache-3.ps5.canonical.com (185.125.190.29): icmp
p_seq=7 ttl=255 time=96.7 ms
64 bytes from website-content-cache-3.ps5.canonical.com (185.125.190.29): icmp
p_seq=8 ttl=255 time=94.7 ms
64 bytes from website-content-cache-3.ps5.canonical.com (185.125.190.29): icmp
p_seq=9 ttl=255 time=91.9 ms
64 bytes from website-content-cache-3.ps5.canonical.com (185.125.190.29): icmp
p_seq=10 ttl=255 time=93.5 ms

— ubuntu.com ping statistics —
10 packets transmitted, 10 received, 0% packet loss, time 9011ms
rtt min/avg/max/mdev = 90.427/94.338/96.662/1.836 ms
└─$
```

5.

```
(lydia-robb@kali)-[~]
└─$ host www.odu.edu
www.odu.edu has address 35.170.140.174
└─$
```

6.

```
(lydia-robb@kali)-[~]
└─$ cat /etc/hostname
kali
```

7.

```
(lydia-robb@kali)-[~]
└─$ cat /etc/resolv.conf
# Generated by NetworkManager
nameserver 68.105.28.11
nameserver 68.105.29.11
nameserver fd17:625c:f037:2::3
```

8.

```
lydia-robb@lrobb005: ~
File Actions Edit View Help
└─$ cat /etc/hostname
lrobb005
```

Task B

1.

```
lydia-robb@lrobb005: ~
File Actions Edit View Help
└─$ ifconfig
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 192.168.0.95 netmask 255.255.255.0 broadcast 192.168.0.255
    inet6 2600:8805:1a1b:c00:bee4:5dbe:62cf:7c29 prefixlen 64 scopeid 0
x0<global>
    inet6 2600:8805:1a1b:c00:a00:27ff:feb6:a527 prefixlen 64 scopeid 0x
0<global>
    inet6 2600:8805:1a1b:c00::1178 prefixlen 128 scopeid 0<global>
    inet6 fe80::a00:27ff:feb6:a527 prefixlen 64 scopeid 0<link>
    ether 08:00:27:b6:a5:27 txqueuelen 1000 (Ethernet)
    RX packets 55 bytes 9313 (9.0 KiB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 89 bytes 13917 (13.5 KiB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    inet6 ::1 prefixlen 128 scopeid 0<host>
    loop txqueuelen 1000 (Local Loopback)
    RX packets 8 bytes 480 (480.0 B)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 8 bytes 480 (480.0 B)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

(lydia-robb@lrobb005)-[~]
└─$
```

- In NAT, the VM sits behind a virtual router using a VirtualBox-only subnet
- In Bridged, the VM appears as a normal device on the same LAN as your host.

2.

```
(lydia-robb@lrobb005)-[~]
$ route -n
Kernel IP routing table
Destination      Gateway         Genmask         Flags Metric Ref    Use Iface
0.0.0.0          192.168.0.1    0.0.0.0         UG    100    0      0 eth0
192.168.0.0      0.0.0.0        255.255.255.0   U     100    0      0 eth0
```

- NAT: traffic first hits the VirtualBox NAT gateway, which then NATs it to the outside.
- Bridged: the VM sends directly to the real network gateway, like any other machine.

3.

```
(lydia-robb@lrobb005)-[~]
$ netstat -ta
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
```

- In NAT, the remote side sees the host's IP (after translation).
- In Bridged, the remote side sees the VM's own IP.

4.

```
lydia-robb@lrobb005: ~
File Actions Edit View Help
PING ubuntu.com (2620:2d:4000:1::27) 56 data bytes
64 bytes from website-content-cache-2.canonical.com (2620:2d:4000:1::27): icmp
p_seq=1 ttl=50 time=127 ms
64 bytes from website-content-cache-2.canonical.com (2620:2d:4000:1::27): icmp
p_seq=2 ttl=50 time=92.6 ms
64 bytes from website-content-cache-2.canonical.com (2620:2d:4000:1::27): icmp
p_seq=3 ttl=50 time=96.9 ms
64 bytes from website-content-cache-2.canonical.com (2620:2d:4000:1::27): icmp
p_seq=4 ttl=50 time=93.9 ms
64 bytes from website-content-cache-2.canonical.com (2620:2d:4000:1::27): icmp
p_seq=5 ttl=50 time=145 ms
64 bytes from website-content-cache-2.canonical.com (2620:2d:4000:1::27): icmp
p_seq=6 ttl=50 time=92.9 ms
64 bytes from website-content-cache-2.canonical.com (2620:2d:4000:1::27): icmp
p_seq=7 ttl=50 time=90.7 ms
64 bytes from website-content-cache-2.canonical.com (2620:2d:4000:1::27): icmp
p_seq=8 ttl=50 time=91.2 ms
64 bytes from website-content-cache-2.canonical.com (2620:2d:4000:1::27): icmp
p_seq=9 ttl=50 time=93.2 ms
64 bytes from website-content-cache-2.canonical.com (2620:2d:4000:1::27): icmp
p_seq=10 ttl=50 time=91.8 ms

— ubuntu.com ping statistics —
10 packets transmitted, 10 received, 0% packet loss, time 9013ms
rtt min/avg/max/mdev = 90.742/101.469/144.571/17.645 ms
```

- NAT: VirtualBox uses the host's connection and works even on Wi-Fi.
- Bridged: VM depends on being treated as a separate device on the network; if the network blocks that, pings fail.

```
(lydia-robb@lrobb005)-[~]
└─$ host www.odu.edu
www.odu.edu has address 35.170.140.174
```

5.

- Name resolution itself works the same way, but the DNS server used may differ.

6&7.

```
(lydia-robb@lrobb005)-[~]
└─$ cat /etc/hostname
lrobb005

(lydia-robb@lrobb005)-[~]
└─$ cat /etc/resolv.conf
# Generated by NetworkManager
nameserver 68.105.28.11
nameserver 68.105.29.11
nameserver 2001:578:3f::30
# NOTE: the libc resolver may not support more than 3 nameservers.
# The nameservers listed below may not be recognized.
nameserver 2001:578:3f:1::30
```

- Changing NAT vs. Bridged affects how the VM connects to the network, not the system identity (hostname).
- NAT: DNS is handled via VirtualBox/host.
- Bridged: VM directly uses the network's DNS, like your physical machine.