Trabajo práctico N° 5 - Configuración de red en Kathará

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Redes y comunicación

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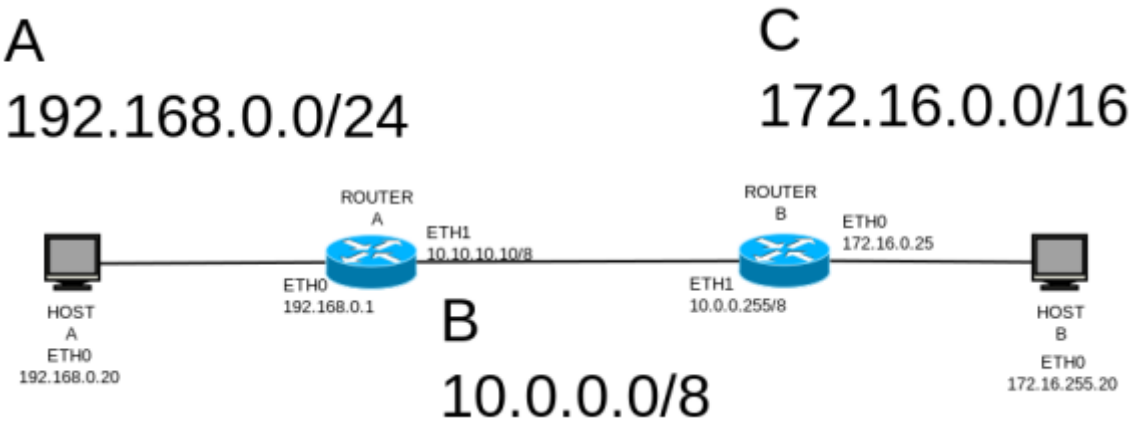
Objetivos

- Armar una red en el simulador Kathará

Consignas a resolver

1. Confeccionar el laboratorio en el simulador kathará



2. Realizar las pruebas de conectividad entre el Host de la red y su Gateway
3. Realizar pruebas de conectividad entre ambos routers.
4. Realizar pruebas de conectividad entre los 2 hosts.

1. Configuración del laboratorio

Para configurar el laboratorio se creó una serie de archivos:

- lab.conf (configuración topología de red)

```
# Descripción laboratorio
LAB_NAME=”Lab TP5”
# Configuración inicial Router A (r1)
r1[0]=”A”
r1[1]=”B”
r1[ipv6]=”false”
# Configuración inicial Router B (r2)
r2[0]=”C”
r2[1]=”B”
r2[ipv6]=”false”
# Configuración inicial Host A (pc1)
pc1[0]=”A”
pc1[ipv6]=”false”
# Configuración inicial Host B (pc2)
pc2[0]=”C”
pc2[ipv6]=”false”
```

- pc1.startup

```
# Configuración IP Host A (pc1) interfaz eth0
ip address add 192.168.0.20/24 dev eth0
# Configuración gateway Host A (pc1)
ip route add default via 192.168.0.1
```

- pc2.startup

```
# Configuración IP Host B (pc2) interfaz eth0
ip address add 172.16.255.20 dev eth0
```

```
# Configuración gateway Host B (pc2)
ip route add default via 172.16.0.25
```

- r1.startup

```
# Configuración IP Router A (r1) interfaz eth0
ip address add 192.168.0.1/24 dev eth0
# Configuración IP Router A (r1) interfaz eth1
ip address add 10.10.10.10/8 dev et1
# Configuración de ruta a red 172.16.0.0/16
ip route add 172.16.0.0/16 via 10.0.0.255 dev eth1
```

- r2.startup

```
# Configuración IP Router B (r2) interfaz eth0
ip address add 172.16.0.255/16 dev eth0
# Configuración IP Router B (r2) interfaz eth1
ip address add 10.0.0.255/8 dev eth1
# Configuración de ruta a red 192.168.0.0/24
ip route add 192.168.0.0/24 via 10.10.10.10 dev eth1
```

2. **Pruebas de conectividad entre el host de la red y su gateway**

Con los archivos creados, se inició laboratorio:

```
kathara lstart.
```

Prueba de conectividad entre host pc1 (192.168.0.20/24) y su gateway (router r1, 192.168.0.1/24) utilizando comando *ping* (10 paquetes)

```
kathra connect pc1
```

```
ping -c 10 192.168.0.1
```

```
root@pc1:/# ping -c 10 192.168.0.1
PING 192.168.0.1 (192.168.0.1) 56(84) bytes of data.
64 bytes from 192.168.0.1: icmp_seq=1 ttl=64 time=0.437 ms
64 bytes from 192.168.0.1: icmp_seq=2 ttl=64 time=1.24 ms
64 bytes from 192.168.0.1: icmp_seq=3 ttl=64 time=1.02 ms
64 bytes from 192.168.0.1: icmp_seq=4 ttl=64 time=1.43 ms
64 bytes from 192.168.0.1: icmp_seq=5 ttl=64 time=1.91 ms
64 bytes from 192.168.0.1: icmp_seq=6 ttl=64 time=1.37 ms
64 bytes from 192.168.0.1: icmp_seq=7 ttl=64 time=1.39 ms
64 bytes from 192.168.0.1: icmp_seq=8 ttl=64 time=1.33 ms
64 bytes from 192.168.0.1: icmp_seq=9 ttl=64 time=1.80 ms
64 bytes from 192.168.0.1: icmp_seq=10 ttl=64 time=1.12 ms

--- 192.168.0.1 ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9045ms
rtt min/avg/max/mdev = 0.437/1.303/1.907/0.387 ms
```

Prueba de conectividad entre host pc2 (172.16.255.20/16) y su gateway (router r2, 172.16.0.25/16) utilizando comando *ping* (10 paquetes)

```
ping -c 10 172.16.0.25
```

```
root@pc2:/# ping -c 10 172.16.0.25
PING 172.16.0.25 (172.16.0.25) 56(84) bytes of data.
64 bytes from 172.16.0.25: icmp_seq=1 ttl=64 time=0.571 ms
64 bytes from 172.16.0.25: icmp_seq=2 ttl=64 time=0.331 ms
64 bytes from 172.16.0.25: icmp_seq=3 ttl=64 time=0.334 ms
64 bytes from 172.16.0.25: icmp_seq=4 ttl=64 time=0.331 ms
64 bytes from 172.16.0.25: icmp_seq=5 ttl=64 time=0.396 ms
64 bytes from 172.16.0.25: icmp_seq=6 ttl=64 time=0.342 ms
64 bytes from 172.16.0.25: icmp_seq=7 ttl=64 time=0.332 ms
64 bytes from 172.16.0.25: icmp_seq=8 ttl=64 time=0.350 ms
64 bytes from 172.16.0.25: icmp_seq=9 ttl=64 time=0.328 ms
64 bytes from 172.16.0.25: icmp_seq=10 ttl=64 time=0.369 ms

--- 172.16.0.25 ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9201ms
rtt min/avg/max/mdev = 0.328/0.368/0.571/0.070 ms
```

3. Pruebas de conectividad entre ambos routers

Prueba de conectividad entre router r1 (10.10.10.10/8) y router r2 (10.0.0.255/8) utilizando comando *ping* (10 paquetes)

```
ping -c 10 10.0.0.255
```

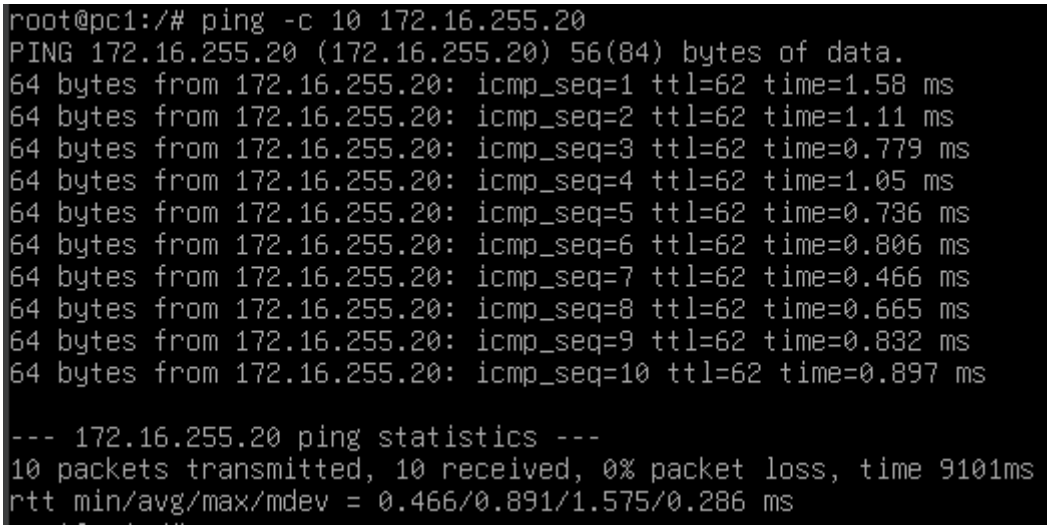
```
root@r1:/# ping -c 10 10.0.0.255
PING 10.0.0.255 (10.0.0.255) 56(84) bytes of data.
64 bytes from 10.0.0.255: icmp_seq=1 ttl=64 time=1.02 ms
64 bytes from 10.0.0.255: icmp_seq=2 ttl=64 time=1.03 ms
64 bytes from 10.0.0.255: icmp_seq=3 ttl=64 time=0.379 ms
64 bytes from 10.0.0.255: icmp_seq=4 ttl=64 time=0.744 ms
64 bytes from 10.0.0.255: icmp_seq=5 ttl=64 time=0.659 ms
64 bytes from 10.0.0.255: icmp_seq=6 ttl=64 time=0.463 ms
64 bytes from 10.0.0.255: icmp_seq=7 ttl=64 time=0.797 ms
64 bytes from 10.0.0.255: icmp_seq=8 ttl=64 time=0.377 ms
64 bytes from 10.0.0.255: icmp_seq=9 ttl=64 time=0.617 ms
64 bytes from 10.0.0.255: icmp_seq=10 ttl=64 time=1.30 ms

--- 10.0.0.255 ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9061ms
rtt min/avg/max/mdev = 0.377/0.738/1.297/0.289 ms
```

4. **Realizar pruebas de conectividad entre los 2 hosts.**

Prueba de conectividad entre host pc1 (192.168.0.20/24) y host pc2 (172.16.255.20/16) utilizando comando *ping* (10 paquetes)

```
ping -c 10 172.16.255.20
```



Prueba de conectividad y routing entre host pc1 (192.168.0.20/24) y host pc2 (172.16.255.20/16) utilizando comando *traceroute*

```
traceroute 172.16.255.20
```

```
root@pc1:/# traceroute 172.16.255.20
traceroute to 172.16.255.20 (172.16.255.20), 30 hops max, 60 byte packets
 1  192.168.0.1 (192.168.0.1)  0.221 ms  0.083 ms  2.014 ms
 2  10.0.0.255 (10.0.0.255)  4.963 ms  5.454 ms  5.535 ms
 3  172.16.255.20 (172.16.255.20)  9.851 ms  10.735 ms  10.867 ms
```

Se puede observar que la ruta para alcanzar el host pc2 desde el host pc1 es efectivamente la representada en el diagrama propuesto:

1. 192.168.0.1 (Router A o r1)
2. 10.0.0.255 (Router B o r2)
3. 172.16.255.20 (Host B o pc2)

192.168.0.20 <-> 192.168.0.1 | 10.10.10.10 <-> 10.0.0.255 | 172.16.0.255 <-> 172.16.255.20