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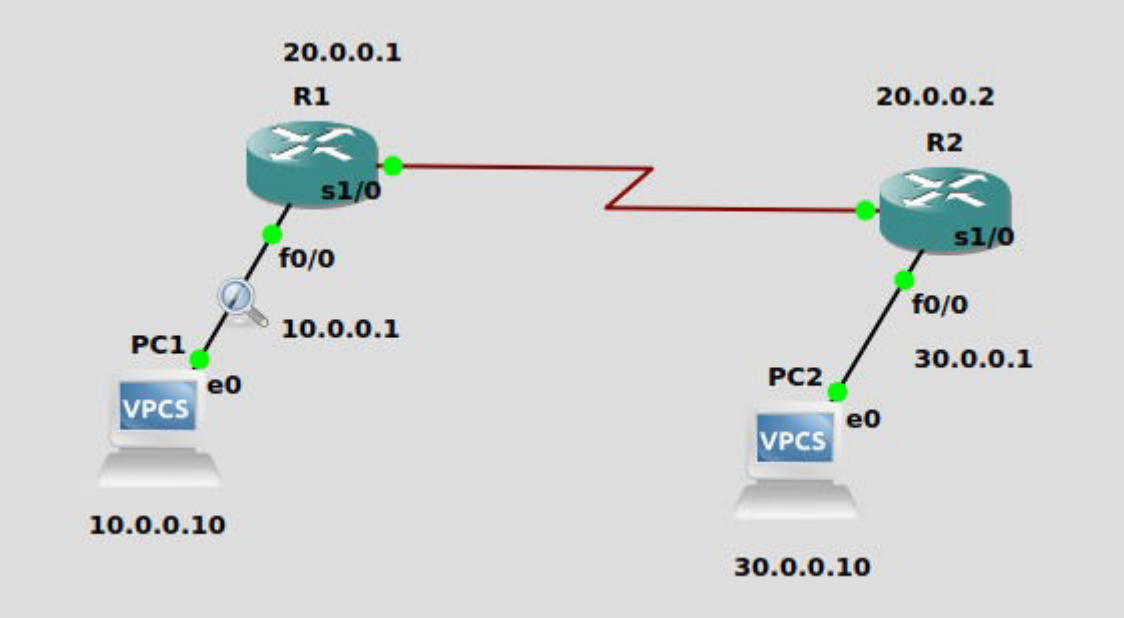
CN LAB 6
Computer Network Design using SWITCH and ROUTERS in GNS3

1.



PC1 to PC2

```
PC1> ping 30.0.0.10

84 bytes from 30.0.0.10 icmp_seq=1 ttl=62 time=31.229 ms
84 bytes from 30.0.0.10 icmp_seq=2 ttl=62 time=29.868 ms
84 bytes from 30.0.0.10 icmp_seq=3 ttl=62 time=29.133 ms
84 bytes from 30.0.0.10 icmp_seq=4 ttl=62 time=29.669 ms
84 bytes from 30.0.0.10 icmp_seq=5 ttl=62 time=30.371 ms
```

38	120.017824	10.0.0.10	30.0.0.10	ICMP	98	Echo (ping) request id=0x4ed7, seq=1/256, ttl=64 (reply in 39)
39	120.048846	30.0.0.10	10.0.0.10	ICMP	98	Echo (ping) reply id=0x4ed7, seq=1/256, ttl=62 (request in 38)
40	121.049808	10.0.0.10	30.0.0.10	ICMP	98	Echo (ping) request id=0x4fd7, seq=2/512, ttl=64 (reply in 41)
41	121.079471	30.0.0.10	10.0.0.10	ICMP	98	Echo (ping) reply id=0x4fd7, seq=2/512, ttl=62 (request in 40)
42	122.080865	10.0.0.10	30.0.0.10	ICMP	98	Echo (ping) request id=0x50d7, seq=3/768, ttl=64 (reply in 43)
43	122.109772	30.0.0.10	10.0.0.10	ICMP	98	Echo (ping) reply id=0x50d7, seq=3/768, ttl=62 (request in 42)
44	123.110747	10.0.0.10	30.0.0.10	ICMP	98	Echo (ping) request id=0x51d7, seq=4/1024, ttl=64 (reply in 45)
45	123.140200	30.0.0.10	10.0.0.10	ICMP	98	Echo (ping) reply id=0x51d7, seq=4/1024, ttl=62 (request in 44)
46	124.140573	10.0.0.10	30.0.0.10	ICMP	98	Echo (ping) request id=0x52d7, seq=5/1280, ttl=64 (reply in 47)
47	124.170708	30.0.0.10	10.0.0.10	ICMP	98	Echo (ping) reply id=0x52d7, seq=5/1280, ttl=62 (request in 46)

PC1 to ROUTER1

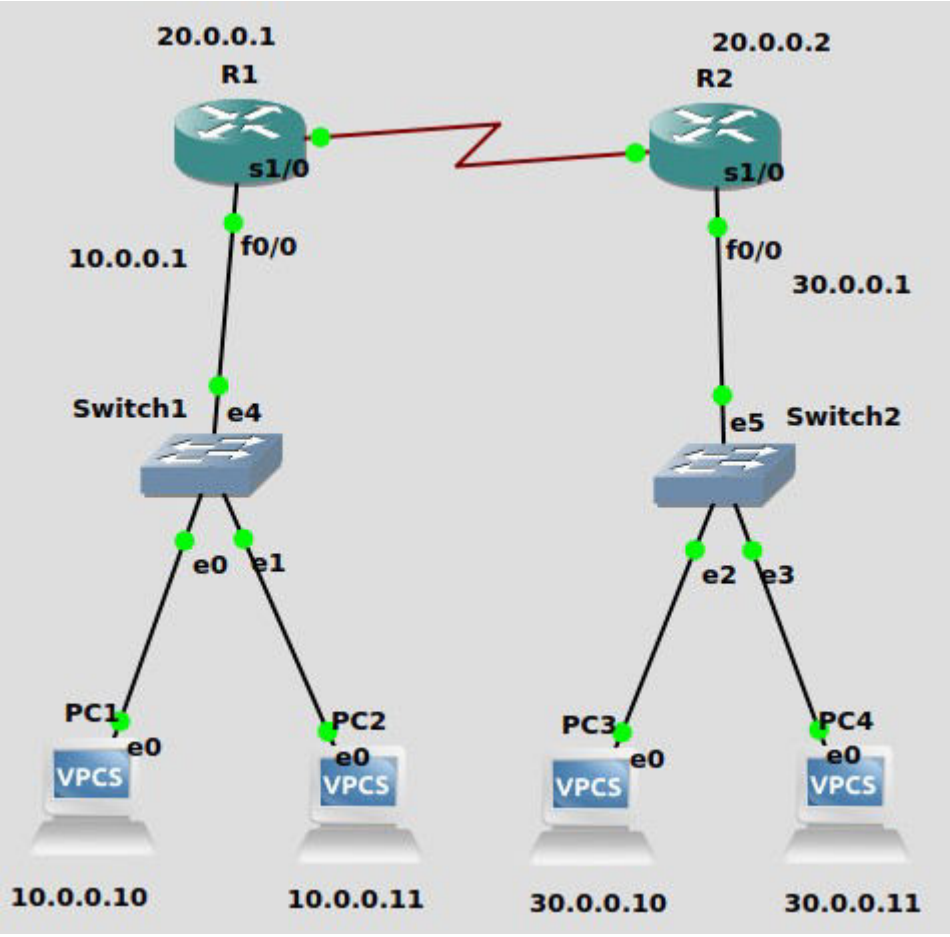
```
PC1> ping 20.0.0.1

84 bytes from 20.0.0.1 icmp_seq=1 ttl=255 time=19.805 ms
84 bytes from 20.0.0.1 icmp_seq=2 ttl=255 time=8.800 ms
84 bytes from 20.0.0.1 icmp_seq=3 ttl=255 time=9.649 ms
84 bytes from 20.0.0.1 icmp_seq=4 ttl=255 time=9.845 ms
84 bytes from 20.0.0.1 icmp_seq=5 ttl=255 time=8.709 ms
```

21	78.213811	Private_66:68:00	Broadcast	ARP	64 Who has 10.0.0.1? Tell 10.0.0.10
22	78.217481	c4:01:13:aa:00:00	Private_66:68:00	ARP	60 10.0.0.1 is at c4:01:13:aa:00:00
23	78.218255	10.0.0.10	20.0.0.1	ICMP	98 Echo (ping) request id=0x24d7, seq=1/256, ttl=64 (reply in 24)
24	78.237791	20.0.0.1	10.0.0.10	ICMP	98 Echo (ping) reply id=0x24d7, seq=1/256, ttl=255 (request in 23)
25	79.239098	10.0.0.10	20.0.0.1	ICMP	98 Echo (ping) request id=0x25d7, seq=2/512, ttl=64 (reply in 26)
26	79.247655	20.0.0.1	10.0.0.10	ICMP	98 Echo (ping) reply id=0x25d7, seq=2/512, ttl=255 (request in 25)
27	80.248104	10.0.0.10	20.0.0.1	ICMP	98 Echo (ping) request id=0x26d7, seq=3/768, ttl=64 (reply in 28)
28	80.257538	20.0.0.1	10.0.0.10	ICMP	98 Echo (ping) reply id=0x26d7, seq=3/768, ttl=255 (request in 27)
29	81.258224	10.0.0.10	20.0.0.1	ICMP	98 Echo (ping) request id=0x27d7, seq=4/1024, ttl=64 (reply in 30)
30	81.267839	20.0.0.1	10.0.0.10	ICMP	98 Echo (ping) reply id=0x27d7, seq=4/1024, ttl=255 (request in 29)
31	82.269218	10.0.0.10	20.0.0.1	ICMP	98 Echo (ping) request id=0x28d7, seq=5/1280, ttl=64 (reply in 32)
32	82.277774	20.0.0.1	10.0.0.10	ICMP	98 Echo (ping) reply id=0x28d7, seq=5/1280, ttl=255 (request in 31)

- **Which packets, if any, are captured by Wireshark?**
  ARP and ICMP
- **Do you observe any ARP packets? If so, what do they indicate?**
  Yes while pinging from PC1 to ROUTER1. ARP broadcasts a request packet to get destination IP address.

2.



```
R1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#interface f0/0
R1(config-if)#no shutdown
R1(config-if)#exit
R1(config)#
*Mar  1 00:00:57.235: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up
*Mar  1 00:00:58.235: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
R1(config)#inter f0/0
R1(config-if)#ip address 10.0.0.1 255.0.0.0
R1(config-if)#no shutdown
R1(config-if)#exit
R1(config)#inter s1/0
R1(config-if)#ip address 20.0.0.1 255.0.0.0
R1(config-if)#clock rate 64000
R1(config-if)#encapsulation ppp
R1(config-if)#no shutdown
R1(config-if)#exit
*Mar  1 00:07:24.795: %LINK-3-UPDOWN: Interface Serial1/0, changed state to up
R1(config-if)#exit
R1(config)#
*Mar  1 00:08:05.343: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/0, changed state to up
R1(config)#ip route 30.0.0.0 255.0.0.0 20.0.0.2
```

```
R2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#interface f0/0
R2(config-if)#no shutdown
R2(config-if)#exit
R2(config)#no shutdown
*Mar  1 00:02:52.031: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up
*Mar  1 00:02:53.031: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
R2(config)#interface f0/0
R2(config-if)#ip address 30.0.0.1 255.0.0.0
R2(config-if)#no shutdown
R2(config-if)#exit
R2(config)#inter s1/0
R2(config-if)#ip address 20.0.0.2 255.0.0.0
R2(config-if)#encapsulation ppp
R2(config-if)#no shutdown
R2(config-if)#exit
*Mar  1 00:05:02.627: %LINK-3-UPDOWN: Interface Serial1/0, changed state to up
R2(config-if)#exit
R2(config)#
*Mar  1 00:05:03.923: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/0, changed state to up
R2(config)#ip route 10.0.0.0 255.0.0.0 20.0.0.1
```

```
PC1> ip 10.0.0.10 255.0.0.0 10.0.0.1
Checking for duplicate address...
PC1 : 10.0.0.10 255.0.0.0 gateway 10.0.0.1
```

```
PC2> ip 10.0.0.11 255.0.0.0 10.0.0.1
Checking for duplicate address...
PC2 : 10.0.0.11 255.0.0.0 gateway 10.0.0.1
```

```
PC3> ip 30.0.0.10 255.0.0.0 30.0.0.1
Checking for duplicate address...
PC3 : 30.0.0.10 255.0.0.0 gateway 30.0.0.1
```

```
PC4> ip 30.0.0.11 255.0.0.0 30.0.0.1
Checking for duplicate address...
PC4 : 30.0.0.11 255.0.0.0 gateway 30.0.0.1
```

pinging from PC1 to PC3

```
PC1> ping 30.0.0.10

30.0.0.10 icmp_seq=1 timeout
84 bytes from 30.0.0.10 icmp_seq=2 ttl=62 time=27.957 ms
84 bytes from 30.0.0.10 icmp_seq=3 ttl=62 time=29.416 ms
84 bytes from 30.0.0.10 icmp_seq=4 ttl=62 time=29.076 ms
84 bytes from 30.0.0.10 icmp_seq=5 ttl=62 time=39.947 ms
```

pinging from PC1 to PC4

```
PC1> ping 30.0.0.11

84 bytes from 30.0.0.11 icmp_seq=1 ttl=62 time=49.359 ms
84 bytes from 30.0.0.11 icmp_seq=2 ttl=62 time=38.814 ms
84 bytes from 30.0.0.11 icmp_seq=3 ttl=62 time=39.304 ms
84 bytes from 30.0.0.11 icmp_seq=4 ttl=62 time=39.546 ms
84 bytes from 30.0.0.11 icmp_seq=5 ttl=62 time=40.085 ms
```

pinging from PC2 to PC3

```
PC2> ping 30.0.0.10

84 bytes from 30.0.0.10 icmp_seq=1 ttl=62 time=50.020 ms
84 bytes from 30.0.0.10 icmp_seq=2 ttl=62 time=40.045 ms
84 bytes from 30.0.0.10 icmp_seq=3 ttl=62 time=39.977 ms
84 bytes from 30.0.0.10 icmp_seq=4 ttl=62 time=40.013 ms
84 bytes from 30.0.0.10 icmp_seq=5 ttl=62 time=39.375 ms
```

pinging from PC2 to PC4

```
PC2> ping 30.0.0.11

30.0.0.11 icmp_seq=1 timeout
84 bytes from 30.0.0.11 icmp_seq=2 ttl=62 time=29.108 ms
84 bytes from 30.0.0.11 icmp_seq=3 ttl=62 time=29.291 ms
84 bytes from 30.0.0.11 icmp_seq=4 ttl=62 time=30.099 ms
84 bytes from 30.0.0.11 icmp_seq=5 ttl=62 time=29.418 ms
```