



```

192.188.58.120/30      PC25, PC26
192.188.58.124/30      For instructor use
192.168.0.0/30        PC27, PC28    (these are private IPs because we
192.168.0.4/30        PC29, PC30    do not have enough real IPs)

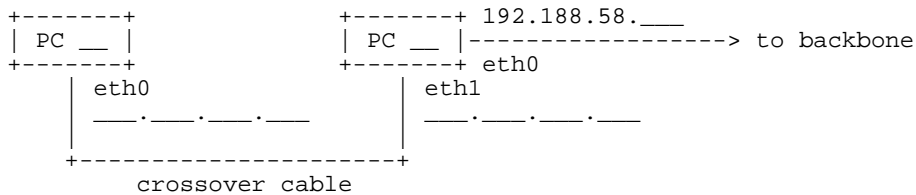
```

Q. What is the netmask for a /30 network? \_\_\_\_\_

## INSTRUCTIONS

- We will rebuild the classroom as a routed network
- The objective is that every machine in the class will be able to ping every other machine.
- **YOU ARE NOT PERMITTED TO USE DEFAULT ROUTE**

Each desk has one machine which will be the ROUTER, another machine which is a CLIENT, and a private ethernet link (crossover cable) between the two.



1. Find your private link network allocation from TABLE TWO. Allocate one IP address to the router and one to the client (remember you cannot use the network address or broadcast address). Write them in the diagram above.
2. On the CLIENT, remove your existing eth0 connection. Connect a crossover cable from your eth0 to the router's eth1. Configure your eth0 with your new IP address and netmask.
3. On the ROUTER, configure your eth1 with your new IP address and netmask. Make sure that you can ping the client, and vice versa, through the crossover cable.
4. On the ROUTER, configure eth0 with your new backbone address and netmask from TABLE ONE. Make sure you can ping all the other desk's routers (192.168.58.66 to .78 inclusive). If you cannot, check that the other router is configured properly, and try `"/sbin/arp -d x.x.x.x"` where x.x.x.x is the other router's IP address.
5. On the router, issue the command to enable IP forwarding:

```
echo 1 >/proc/sys/net/ipv4/ip_forward
```
6. On both the CLIENT and the ROUTER, add routes to be able to reach the rest of the classroom. Eventually you should be able to ping all addresses.

Don't change `/etc/sysconfig/ifcfg-eth0`, because we don't want these changes to be permanent. The commands you will need are:

```

/sbin/ifconfig                               # show interfaces
/sbin/ifconfig eth0 x.x.x.x netmask y.y.y.y  # configure interface
/sbin/route -n                                # show routes
/sbin/route add -net x.x.x.x netmask y.y.y.y gw z.z.z.z # add a route
/sbin/route del -net x.x.x.x netmask y.y.y.y # delete a route
/sbin/route del default                       # delete defaultroute

ping x.x.x.x                                 # send test packets
/usr/sbin/traceroute -n x.x.x.x              # show route to destination

```

Remember that the next hop gateway (z.z.z.z) must be an address on one of the networks which you are DIRECTLY connected to.

Can you ping other routers on the backbone? Can you ping other workstations? Debug the problems.