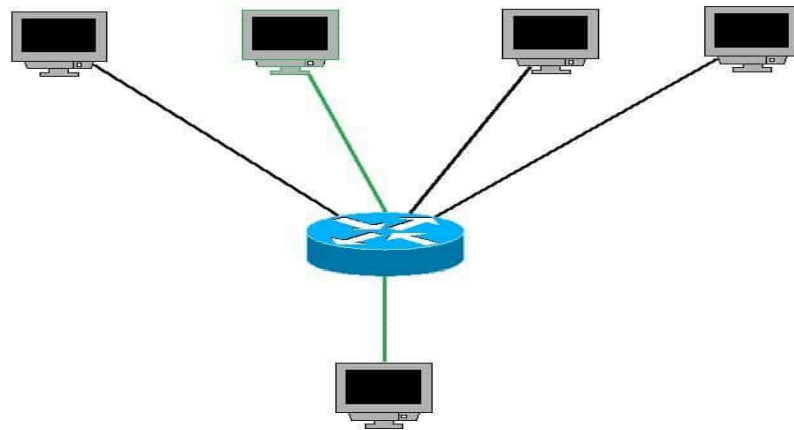**Experiment 4 :** Find all the IP addresses on your network. Unicast, Multicast, and Broadcast on your network.

There are three types of Ethernet addresses:

1. Unicast addresses

Unicast addresses represent a single LAN interface. A unicast frame will be sent to a specific device, not to a group of devices on the LAN:

The unicast address will have the value of the MAC address of the destination device.

Unicast IP addresses – an address of a single interface. The IP addresses of this type are used for one-to-one communication. Unicast IP addresses are used to direct packets to a specific host. Here is an example:

In the picture above you can see that the host wants to communicate with the server. It uses the (unicast) IP address of the server (**192.168.0.150**) to do so
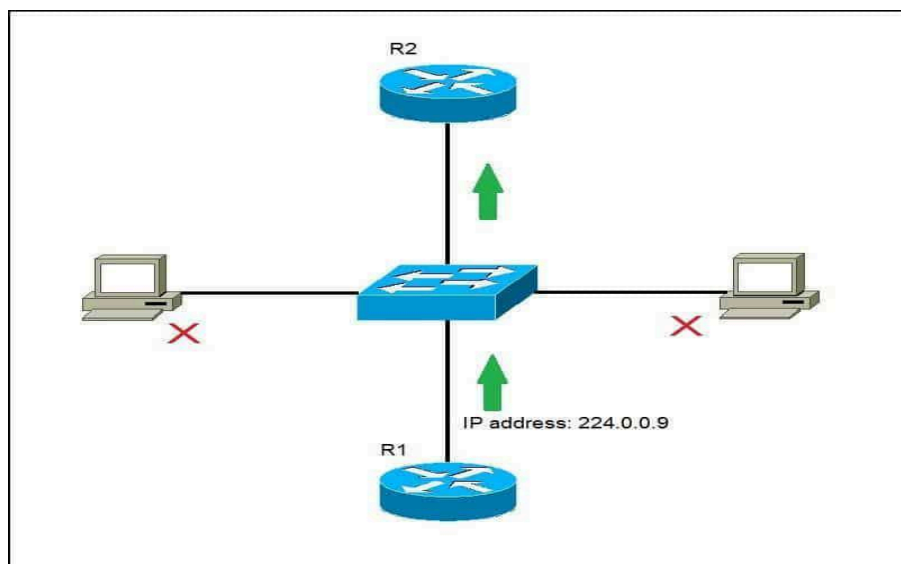
2. Multicast addresses

Multicast addresses represent a group of devices in a LAN. A frame sent to a multicast address will be forwarded to a group of devices on the LAN:
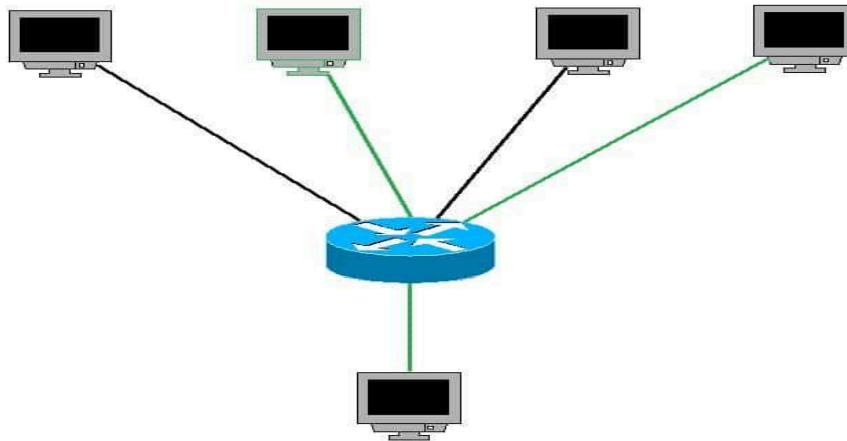
Multicast frames have a value of 1 in the least-significant bit of the first octet of the destination address. This helps a network switch to distinguish between unicast and multicast addresses.

Multicast IP addresses – used for one-to-many communication. Multicast messages are sent to IP multicast group addresses. Routers forward copies of the packet out to every interface that has hosts subscribed to that group address. Only the hosts that need to receive the message will process the packets. All other hosts on the LAN will discard them. Here is an example:

R1 has sent a multicast packet destined for **224.0.0.9**. This is an RIPv2 packet, and only routers on the network should read it. R2 will receive the packet and read it. All other hosts on the LAN will discard the packet.

3. Broadcast addresses

Broadcast addresses represent all device on the LAN. Frames sent to a broadcast address will be delivered to all devices on the LAN:
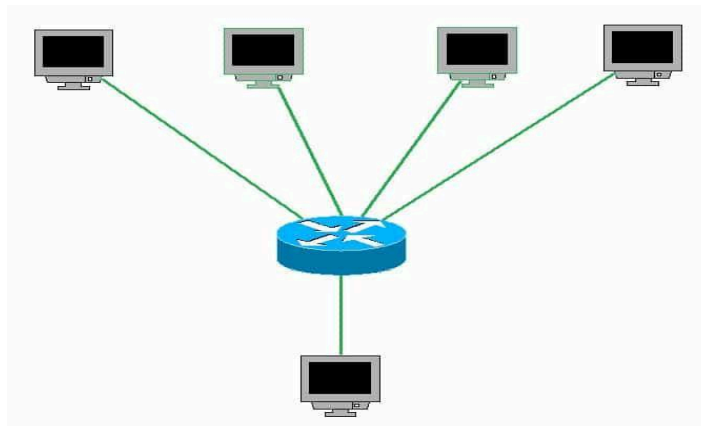
broadcast IP addresses – used to send data to all possible destinations in the broadcast domain (the one-to-everybody communication). The broadcast address for a network has all host bits on. For example, for the network **192.168.30.0 255.255.255.0** the broadcast address would be **192.168.30.255***. Also, the IP address of all 1's (**255.255.255.255**) can be used for local broadcast. Here's an example:
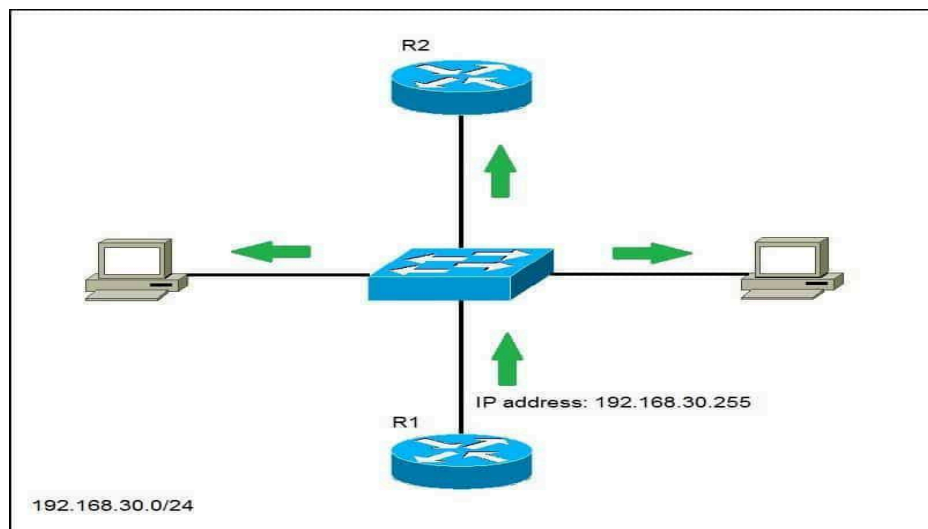
R1 wants to communicate with all hosts on the network and has sent a broadcast packet to the broadcast IP address of 192.168.30.255. All hosts in the same broadcast domain will receive and process the packet.