Video - ARP Operation - ARP Request (3 min)

In this video, we're going to see PC-A send an ARP request for the MAC address of PC-C. PC-A has an IP packet with the source IP address of itself, 192.168.1.110, and the destination IP address of PC-C at 192.168.1.50. So it needs to know what the destination MAC address will be. Because the source and destination IP addresses are on the same network, the destination MAC address will be that of the destination IP address of PC-C at 192.168.1.50. So PC-A checks its ARP cache for the IP address 192.168.1.50. Because it is not in its ARP cache, it will put the packet on hold and create an ARP request. The ARP request contains the target IPv4 address-- this is the IPv4 address which is known by PC-A-- and the target MAC address, which is unknown. This is what PC-A is wanting to find out. The ARP request is sent as a broadcast, so everybody on the network will need to examine this Ethernet frame and process the ARP request.

So PC-A sends it to the switch. Because it is a broadcast, the switch will flood it out all ports except for the port that it came in on. PC-B receives the broadcast, so it must process it, and its ARP process examines the ARP request. It compares its own IPv4 address against the target IPv4 address and notices that they are not the same, so it doesn't need to send an ARP reply. The router R1 also receives this ARP request. Its ARP process examines its own IPv4 address and compares that against the target IPv4 address and also realizes this is not its IPv4 address, so it does not need to send the ARP reply. By the way, routers will not forward ARP requests out of their ports. PC-C receives the ARP request, compares its IPv4 address against the target IPv4 address, and notices that it is the intended target of the ARP request, that the target IPv4 address does match its own IPv4 address. So PC-C will need to send an ARP reply.