

Video - MAC Address Tables on Connected Switches (3 min)

In this video, PC-A is going to send an Ethernet frame to PC-B, and PC-B is going to send an Ethernet frame to PC-A. We're going to examine how switches S1 and S2 built their MAC address tables and also how they forward frames based on the information in those MAC address tables. PC-A has an Ethernet frame to send to PC-B. The source MAC address of the frame is 00-0A, and the destination MAC address is 00-0B. Ethernet frame is sent to switch S1. S1 receives the Ethernet frame, examines the source MAC address and notices that this MAC address is not in its MAC address table, so it adds the MAC address and the incoming port number.

Next, switch S1 examines the destination MAC address and notices that this MAC address is not in its table, so it floods it out all ports. PC-B receives the Ethernet frame, examines the destination MAC address against its own MAC address, and notices that that is a match and receives the rest of the frame. The Ethernet frame continues to be forwarded to switch S2. Switch S2 examines the source MAC address to the frame and notices it is not in its MAC address table, so it adds the MAC address and the incoming port to its MAC address table.

Next, switch S2 examines the destination MAC address, notices that is not in its MAC address table, so it floods it out all ports. PC-C receives the Ethernet frame, and its MAC address does not match the destination MAC address of the Ethernet frame, so it does not accept the rest of the frame. The router receives the Ethernet frame, examines the destination MAC address against its own MAC address, and notices it is not a match, so it does not receive the rest of the frame. Now let's have PC-B sending a frame back to PC-A. The source MAC address to the frame is 00-0B, and the destination MAC address is 00-0A. PC-B sends it to switch S1. S1 notices that the source MAC address is not in its MAC address table, so it adds the MAC address and the incoming port number. Next, switch S1 examines the destination MAC address and notices that MAC address is in its MAC address table. So it sends it out just port 1. PC-A receives the Ethernet frame, examines the destination MAC address against its own MAC address, and notices it is a match, so it receives the rest of the frame.