

A+ Core 1 and Core 2 CertMaster Perform 15.0

5.2.6 Switches

Ethernet switches are used to connect multiple devices inside of a network together. The switch provisions one port for each device that needs to connect to the network.

When a device is connected to the switch, it adds the device's MAC address to a table and keeps track of which port it connects to. When a frame comes in, the switch is able to decode each frame and identify the source and destination MAC addresses. The switch is able to intelligently forward it to the port that is a match for the destination MAC address.

Switch operation

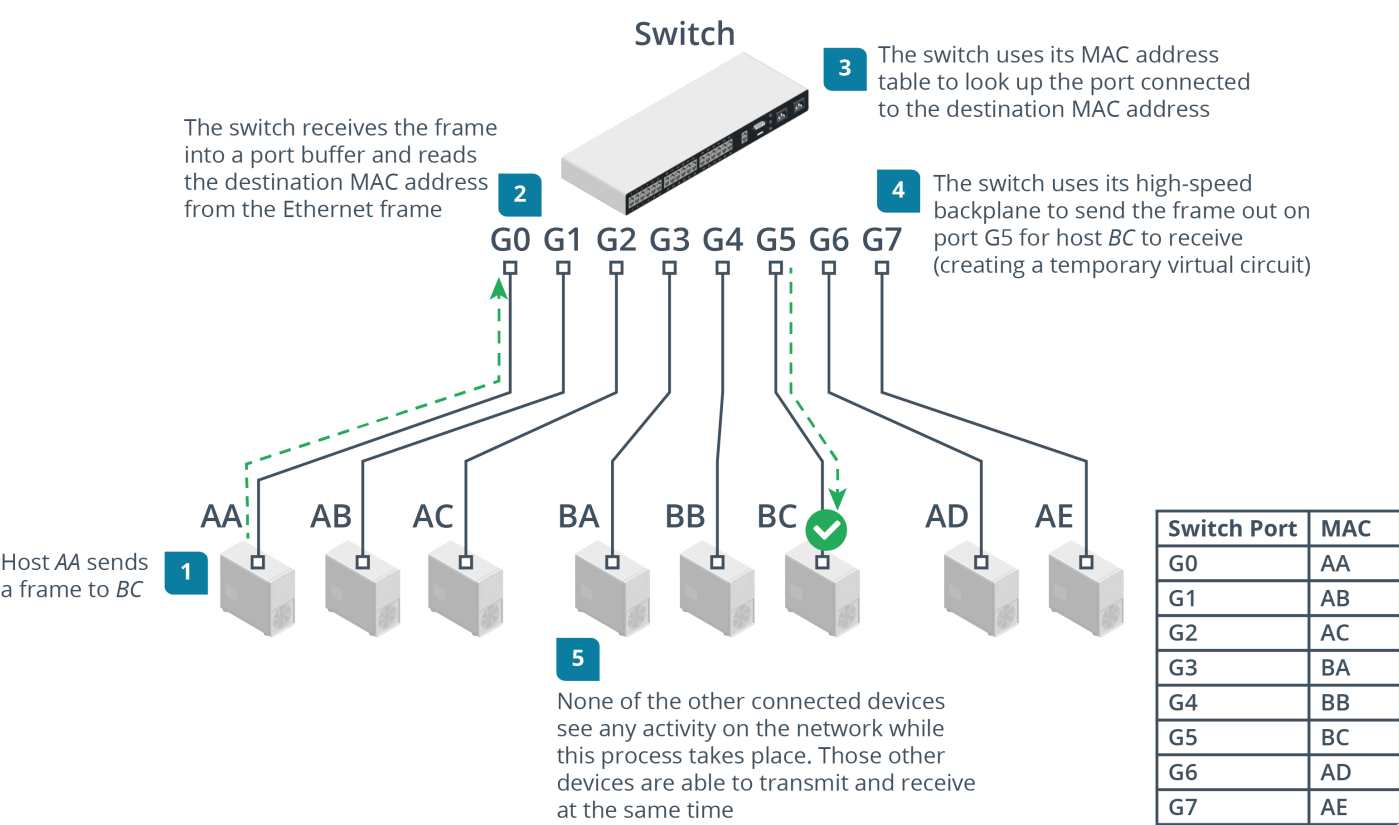


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▼ Description

The diagram includes a switch at the top, which has multiple ports labeled from G 0 to G 7. Several computers are connected to these ports, each assigned a unique MAC address. The steps are as follows: Step 1: Host AA sends a frame to BC. Step 2: The switch receives the frame into a port buffer and reads the destination MAC address from the Ethernet

frame. Step 3: The switch uses its MAC address table to look up the port connected to the destination MAC address. Step 4: The switch uses its high speed backplane to send the frame out on port G5 for host BC to receive (creating a temporary virtual circuit). Step 5: None of the other connected devices see any activity on the network while this process takes place. Those other devices are able to transmit and receive at the same time. The table lists the switch port and MAC details as follows: G0: AA G1: AB G2: AC G3: BA G4: BB G5: BC G6: AD G7: AE

This means that each switch port is considered a separate collision domain, and the negative effects of collisions are eliminated. Each computer has a full duplex connection to the network and can send and receive simultaneously at the full speed supported by the network cabling and NIC.



When a computer sends a frame, the switch reads the source address and adds it to its MAC address table. If a destination MAC address is not yet known, the switch floods the frame out of all ports.