# 6.3.2 Switch Forwarding Facts

Bridges and switches build forwarding databases. A forwarding database is a list of Layer 2 MAC addresses, with the port used to reach each device. Bridges and switches automatically learn about devices to build the forwarding database, but a network administrator can also program the device database manually. When a frame arrives on a switch port (also called an *interface*), the switch examines the source and destination address in the frame header and uses the information to complete the following tasks:

| Step | Results |
|---|---|
| 1. The switch examines the source MAC address of the frame and notes which switch port the frame arrived on. | If the source MAC address is:<br>▪ Not in the switch's Content Addressable Memory (CAM) table, a new entry is added to the table that maps the source device's MAC address to the port on which the frame was received. Over time, the switch builds a map of the devices that are connected to specific switch ports.<br>▪ Already mapped to the port on which the frame was received, no changes are made to the switch's CAM table.<br>▪ Already in the switch's CAM table, but the frame was received on a different switch port, the switch updates the record in the CAM table with the new port. |
| 2. The switch examines the destination MAC address of the frame. | If the destination MAC address of the frame is:<br>▪ A broadcast address, then the switch sends a copy of the frame to all connected devices on all ports. This is called *flooding* the frame.<br>▪ A unicast address, but no mapping exists in the CAM table for the destination address, the switch floods the frame to all ports. The connected device that the frame is addressed to will accept and process the frame. All other devices will drop the frame.<br>▪ A unicast address and mapping exists in the CAM table for the destination address, the switch sends the frame to the switch port specified in the CAM table. This is called *forwarding* the frame.<br>▪ A unicast address and mapping exists in the CAM table for the destination address, but the destination device is connected to the same port from which the frame was received, the switch ignores the frame and does not forward it. This is called *filtering* the frame. |