6.7.2 Switch Troubleshooting Facts

The following table lists several problems you might encounter when managing switches on your network:

Issue	Description
Bad Port	A *bad port* is a faulty or bad interface on a switch. To fix the problem, you need to return the switch back to the supplier and get a replacement. However, if you have plenty of ports on the switch, you can configure the port using '**description ** Bad Port **'**, and then insert a RJ45 single connector into the bad port to occupy the port.
Broadcast Storm	A *broadcast storm* is excessive broadcast traffic that renders normal network communications impossible. The following can cause broadcast storms: • Switching loops that cause broadcast traffic to circulate endlessly between switches • Denial of Service (DoS) attacks To reduce broadcast storms, complete the following: • Run STP to prevent switching loops. • Implement switches with built-in broadcast storm detection, which limits the bandwidth that broadcast traffic can use. • Use VLANs to create separate broadcast domains on switches.
Collisions	A *collision* occurs when two devices that share the same media segment transmit at the same time. In a switched network, collisions should only occur on ports that have more than one device attached (such as a hub with workstations connected to it). • To eliminate collisions, connect only a single device to each switch port. For example, if a hub is connected to a switch port, replace it with another switch. • If collisions are still detected, troubleshoot cable and NIC issues.
Duplex Mismatch	A *duplex mismatch* occurs when two devices use different duplex settings. In this case, one device tries to transmit using full duplex, while the other expects half duplex communications. By default, devices are configured to use auto-negotiation to detect the correct duplex setting to use. If a duplex method cannot be agreed upon, devices default to half duplex. A duplex mismatch can occur in the following cases: • Both devices are configured to use different duplex settings. • Auto-negotiation does not work correctly on one device. • One device is configured for auto-negotiation, and the other device is manually configured for full duplex. Symptoms of a duplex mismatch include very slow network communications. Ping tests might appear to complete correctly, but normal communications work well below the expected speeds, even for half duplex communications.
Frame Errors	The switch examines incoming frames and only forwards frames that are complete and correctly formed; invalid frames are simply dropped. Most switches include logging capabilities to track the number of corrupt or malformed frames. The following are common causes of frame errors: • Frames that are too long are typically caused by a faulty network card that jabbers (constantly sends garbage data). • Frames that are too short are typically caused by collisions. • CRC errors indicate that a frame has been corrupted in transit. • All types of frame errors can be caused by faulty cables or physical layer devices.
Incorrect VLAN Membership	VLANs create logical groupings of computers based on switch port. Because devices on one VLAN cannot communicate directly with devices in other VLANs, incorrectly assigning a port to a VLAN can prevent a device from communicating through the switch. With VLAN membership, static port assignment is defined by switch port, not by a MAC address. Connecting a device to a different switch port could change the VLAN membership of the device. On the switch, verify that ports are assigned to the correct VLANs and that any unused VLANs are removed from the switch.
Slow Link Speed	Most network components are capable of supporting multiple network specifications. By default, these devices use the maximum speed supported by all devices on the network. If the speed of a segment is lower than expected (for example, 10 Mbps instead of 100 Mbps, or 100 Mbps instead of 1000 Mbps), complete the following:

- Check individual devices to verify that they all support the higher speed.
- Check individual devices to see if any are manually configured to use the lower speed.
- Use a cable certifier to verify that the cables meet the rated speeds. Bad cables are often the cause of 1000BaseT networks operating at only 100BaseTX speeds.