

## 6.1.3 Device Connection Facts

Enterprise network switches need to be configured before they are implemented. Be aware that low-end switches available from many retail stores cannot be configured. These are called *unmanaged switches*. To implement an unmanaged switch, you simply plug it in to a power outlet and connect your network devices with UTP cables. While unmanaged switches are convenient and easy to implement, they lack many of the advanced management and security features available on *managed switches*.

Some router and switch management tasks can be performed by using management utilities provided by your workstation operating system through a network connection. This is called *in-band management*, because it uses a standard network connection to perform the tasks. For example, tools such as Telnet or SSH provide in-band management. Using the same network connection for both data and management has several drawbacks:


- You must compete with normal network traffic for bandwidth.
- The network traffic created by the management utilities must be protected from sniffing to ensure that hackers cannot capture sensitive configuration information.
- If the network connection is unavailable, or if the device is unresponsive to network communications, management tasks cannot be performed.

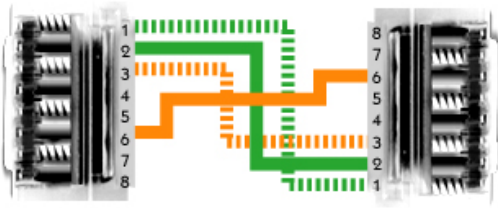
*Out-of-band management*, on the other hand, overcomes these problems by using a dedicated communication channel that separates management traffic from normal network traffic. With network switches and routers, you can use console redirection to access the device's console through a built-in serial or USB port. For example, Cisco routers and switches do not use monitors, and you cannot connect a keyboard or a mouse directly to the device. Instead, you connect a standard PC to the device's console port to manage the device.

You can use these options to manage a Cisco device:

Connection Type	Description
Console	<p>A console connection allows for a direct connection through a PC to the console port on the device. The PC needs a terminal emulation program (such as PuTTY) to connect to the device's command line interface. This is an example of out-of-band management. In the terminal emulation program, use the following settings:</p> <ul style="list-style-type: none"><li>▪ 9600 baud (or a rate supported by your router)</li><li>▪ Data bits = 8 (default)</li><li>▪ Parity = None (default)</li><li>▪ Stop bits = 1 (default)</li><li>▪ Flow control = None</li></ul>
Virtual Terminal (VTY)	<p>A VTY connection connects through a LAN or WAN interface configured on the device. Use a program (such as PuTTY) to open the command line interface. This is an example of in-band management. The Cisco device must be configured with an IP address before a VTY connection can be made.</p>
Security Device Manager (SDM)	<p>The Cisco SDM allows a web browser connection to the device, using HTTPS. Once connected, the SDM allows you to manage the security features and network connections through a web-based graphical user interface. This is an example of in-band management. Be aware of the following SDM settings:</p> <ul style="list-style-type: none"><li>▪ 10.10.10.1 is the default IP address of the SDM.</li><li>▪ The default value for both the username and password is <b>cisco</b>.</li></ul> <p>A new router may not be completely configured for an SDM connection, so you may need to make a console connection first.</p>

Use the following cable types to make the initial connection to the switch or router for device management:

Cable Type	Pin-outs	Use
 Rollover Ethernet Cable	<p>1 ' 8 2 ' 7 3 ' 6 4 ' 5 5 ' 4 6 ' 3 7 ' 2 8 ' 1</p>	<p>Use a rollover Ethernet cable to connect the device's console port to the serial port on a PC. Connect the RJ45 end to the console port and connect the serial end to the PC. A rollover cable is also called a <i>console cable</i>.</p> <p>Many newer Cisco devices use a USB for the console connector and can be accessed with any standard USB cable.</p>



Straight-through Ethernet Cable

1 ' 1  
2 ' 2  
3 ' 3  
6 ' 6

Use a straight-through Ethernet cable to connect an Ethernet port on a router to an Ethernet port on a hub or switch. The router can then be accessed from another PC connected to the same network, using a VTY connection.

If the router has an AUI port, connect one end to an AUI transceiver before connecting to the router.



Crossover Ethernet Cable

1 ' 3  
2 ' 6  
3 ' 1  
6 ' 2

Use a crossover Ethernet cable to connect an Ethernet port on a router directly to the NIC in a PC. Establish a VTY session from the PC to connect to the device.

If the router has an AUI port, connect one end to an AUI transceiver before connecting to the router.