15.12 Ethernet Data Rates And Cable Types

Since twisted pair Ethernet first emerged, significant improvements have been made in the quality and shielding available in twisted pair cables. As a result, the data rate used on twisted pair Ethernet has increased. Figure 15.8 summarizes the three types of twisted pair Ethernet and the cable used with each.

Designation	Name	Data Rate	Cable Used
10BaseT	Twisted Pair Ethernet	10 Mbps	Category 5
100BaseT	Fast Ethernet	100 Mbps	Category 5E
1000BaseT	Gigabit Ethernet	1 Gbps	Category 6

Figure 15.8 Three types of twisted pair Ethernet, their data rates, and the cable used with each.

As the figure shows, the first version of twisted pair Ethernet was given the formal designation *10BaseT*, where the value 10 designates that the speed is 10 Mbps. A later version that was introduced under the name *Fast Ethernet* ran at 100 Mbps, and was given the formal designation *100BaseT*. A third version, called *Gigabit Ethernet*, operates at 1 Gbps (i.e., 1000 Mbps). Professionals often abbreviate the name as *Gig-E*.

Chapter 17 explains that higher-speed Ethernet technologies use an electronic device known as a *switch* rather than a hub. Furthermore, to remain backward compatible, standards for the higher-speed versions specify that interfaces should automatically sense the speed at which a connection can operate, and slow down to accommodate older devices. Thus, if one plugs an Ethernet cable between an old device that uses 10BaseT and a new device that uses 1000BaseT, the new device will *autosense* the discrepancy and slow down to 10 Mbps.

15.13 Twisted Pair Connectors And Cables

Twisted pair Ethernet uses *RJ45* connectors, which are larger versions of the RJ11 connectors used to connect telephones. An RJ45 connector can only be plugged into a socket one way, and a physical piece holds the connector in place. Thus, connectors cannot be plugged in incorrectly, and once inserted, the connectors do not fall out.

Cables can be purchased in various lengths with an RJ45 connector mounted on each end, which means that most users do not need to create a cable. However, confusion arises because there are two types of cables: *straight* and *crossed.* A crossed cable,