3.7 The User's View

Recall that an internet is designed to provide a universal interconnection among computers independent of the particular networks to which they attach. We want a user to view an internet as a single, virtual network to which all machines connect despite their physical connections. Figure 3.4 illustrates the idea.

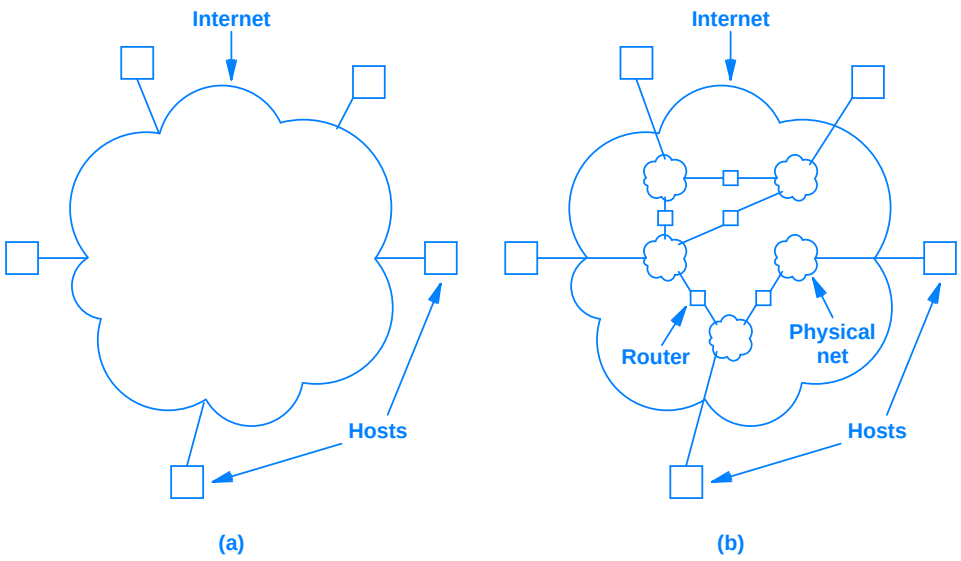

Figure 3.4 (a) The user's view of a TCP/IP internet in which each computer appears to attach to a single large network, and (b) the structure of physical networks and routers that provide interconnection.

In the figure, part (a) shows the view that user's have. They think of the internet as a unified communication system. The user's view simplifies the details and makes it easy to conceptualize communication. Part (b) illustrates the constituent networks and their interconnection with routers. Of course, each computer that connects to an internet must run software that enforces the view of a single, physical network. The software must hide details and allow application programs to send and receive packets to arbitrary locations as if the computer was connected to a single network.

The advantage of providing interconnection at the network level now becomes clear. Because an application program that communicates over the internet does not know the details of underlying connections, the application does not need to change when the network changes. Because the details of each machine's physical network connections are hidden in the internet software, only the internet software needs to react when new physical connections are added or existing connections are removed. For example, a portable device can connect to a Wi-Fi network in an airport, be turned off for