

Figure 12.5 The layering principle applied at each layer of the ISO model. If protocol software on the sending computer changes the message, the change must be reversed by the corresponding protocol software on the receiver.

different file naming conventions, different ways of representing text lines, and so on. Transferring a file between two different systems requires handling these and other incompatibilities. This work, too, belongs to the application layer, as do electronic mail, remote job entry, directory lookup, and various other general-purpose and special-purpose facilities.

Data Transmission in the OSI Model

Figure 1-17 shows an example of how data can be transmitted using the OSI model. The sending process has some data it wants to send to the receiving process. It gives the data to the application layer, which then attaches the application header, *AH* (which may be null), to the front of it and gives the resulting item to the presentation layer. The presentation layer then attaches the presentation header, *PH*, to the front of it and gives the resulting item to the session layer. The session layer then attaches the session header, *SH*, to the front of it and gives the resulting item to the transport layer. The transport layer then attaches the transport header, *TH*, to the front of it and gives the resulting item to the network layer. The network layer then attaches the network header, *NH*, to the front of it and gives the resulting item to the data link layer. The data link layer then attaches the data link header, *DH*, to the front of it and gives the resulting item to the physical layer. The physical layer then transmits the data as bits to the receiving process. The receiving process then receives the bits and processes them back up through the layers, removing the headers as it goes, until it reaches the application layer, which then gives the data to the receiving process.

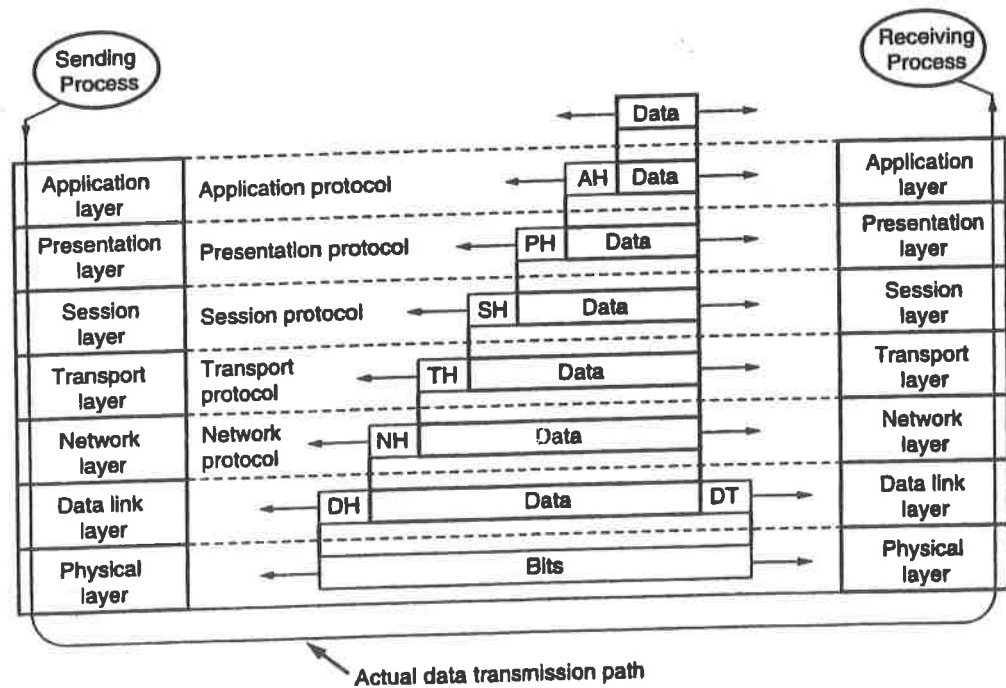


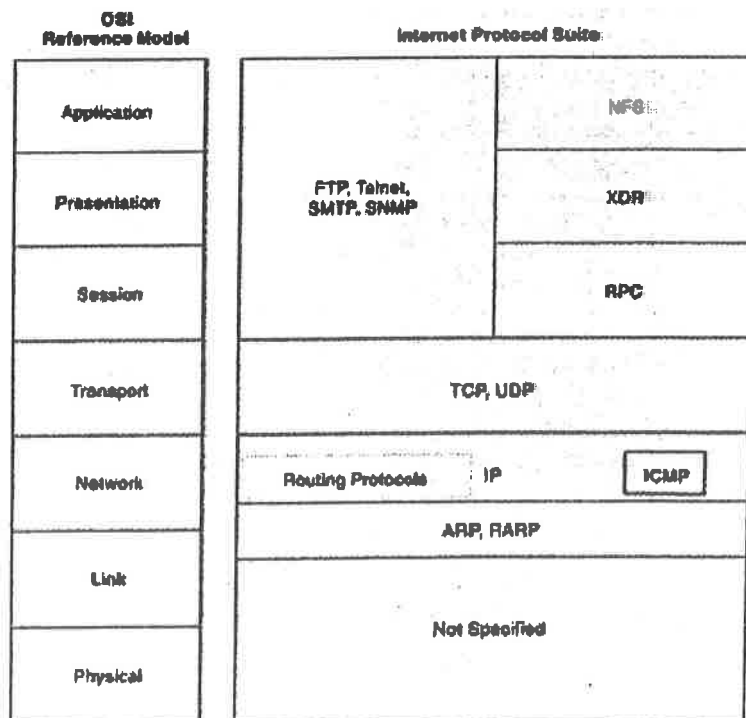
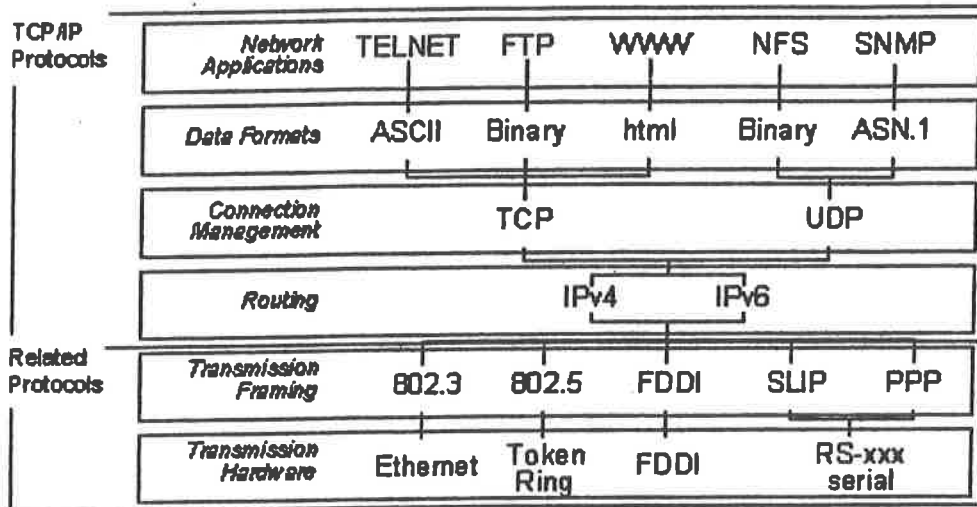
Fig. 1-17. An example of how the OSI model is used. Some of the headers may be null. (Source: H.C. Folts. Used with permission.)

The presentation layer may transform this item in various ways and possibly add a header to the front, giving the result to the session layer. It is important to realize that the presentation layer is not aware of which portion of the data given to it by the application layer is *AH*, if any, and which is true user data.

This process is repeated until the data reach the physical layer, where they are actually transmitted to the receiving machine. On that machine the various

TCP/IP Protocol Stack

TCP/IP's layered architecture, showing representative protocols at each layer:



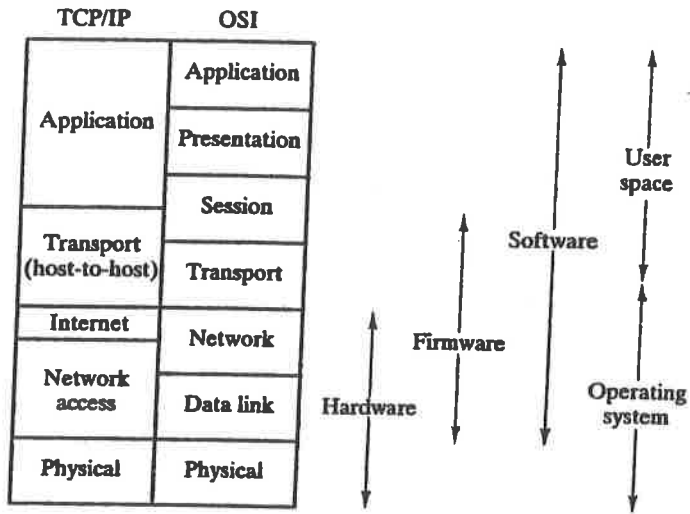


FIGURE 12.10 A Comparison of the TCP/IP and OSI Protocol Architectures.

FROM STALLINGS

Applications	File Transfer Protocol	TELNET	HTTP	SMTP	SNMP	DNS
Transport Layer	TCP			UDP		
Network Layer	IP					
Data Link Layer	Data Link Layer					
Physical Layer	Physical Layer					

Figure 12.1 A portion of the TCP/IP suite.

FROM UNDERSTANDING DATA COMMUNICATIONS BY HELD