1. Preparing the data. The application protocol prepares a block of data for transmission. For example, an email message (SMTP), a file (FTP), or a block of user input (TELNET).

2. Using a common syntax. If necessary, the data are converted to a form expected by the destination. This may include a different character code, the use of encryption, and/or compression.

3. Segmenting the data. TCP may break the data block into a number of segments, keeping track of their sequence. Each TCP segment includes a header containing a sequence number and a frame check sequence to detect errors.

4. Duplicating segments. A copy is made of each TCP segment, in case the loss or damage of a segment necessitates retransmission. When an acknowledgment is received from the other TCP entity, a segment is erased.

5. Fragmenting the segments. IP may break a TCP segment into a number of datagrams to meet size requirements of the intervening networks. Each datagram includes a header containing a destination address, a frame check sequence, and other control information.

6. Framing. A frame relay header and trailer is added to each IP datagram. The header contains a connection identifier and the trailer contains a frame check sequence

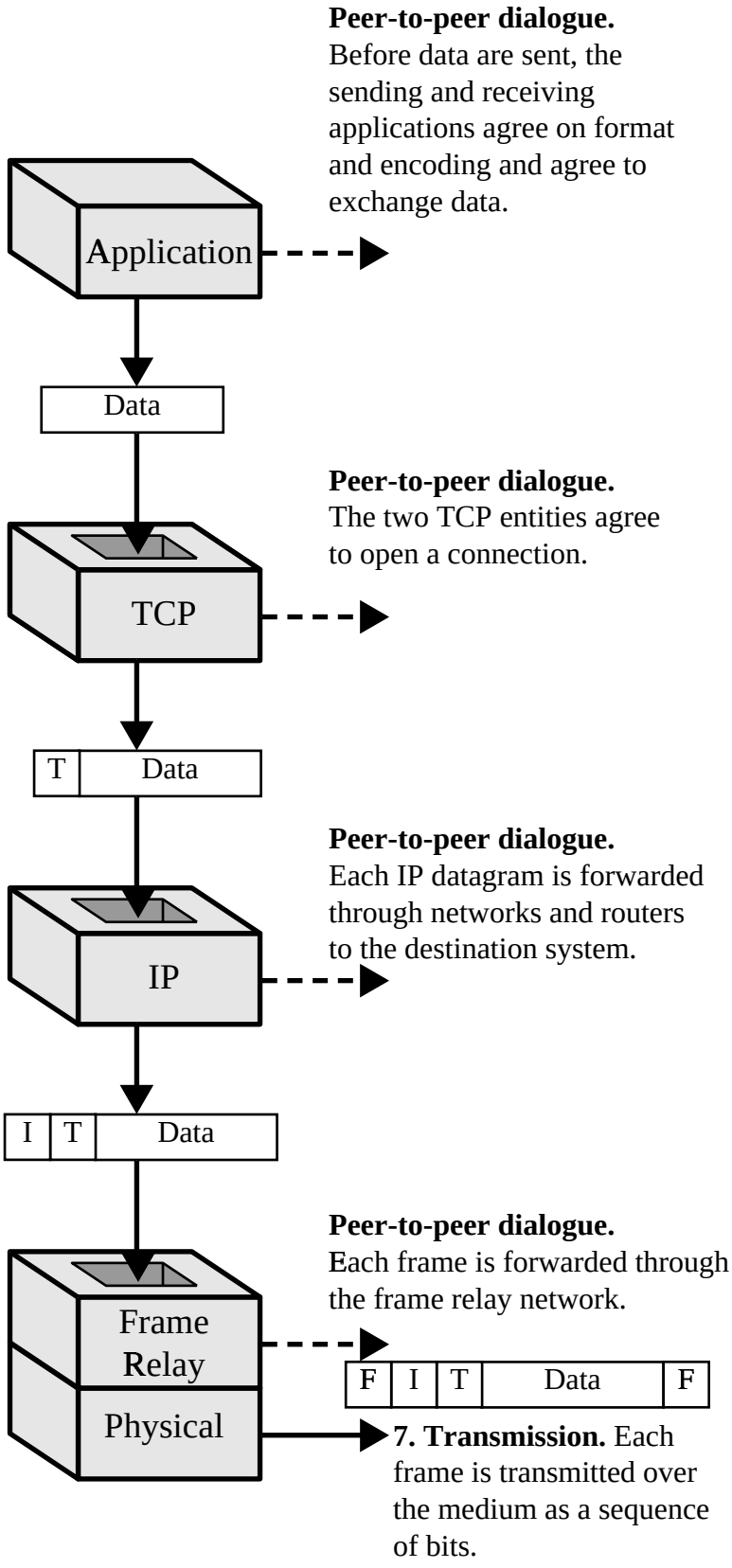

Figure 2.9 Operation of TCP/IP: Action at Sender