

Trailers

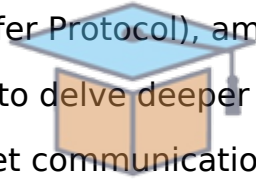
In the chapter titled "Operating the Internet," the process of how internet protocols operate and manage data transmission, along with specific protocol behaviors and the challenges they face, are detailed with a focus on TCP/IP mechanics, trailer usage in packets, and retransmission strategies.

The chapter begins by explaining the journey of data as it's converted into packets for transmission over the internet. Applications like FTP send data to TCP, which then segments this data, adding a TCP header to each chunk. These chunks are further encapsulated within IP packets, which add their own headers before sending the data across the network. The concept of trailers is introduced as a method aimed at optimizing this process. Trailers, unlike headers, are added at the end of packets with the intention of reducing memory moves on both sending and receiving ends, potentially improving efficiency. However, the chapter points out that this practice wasn't widely adopted or standardized, resulting in operational issues when traversing through gateways that aren't designed to recognize routing information at the end of a data block. This problem is most apparent when trying to transmit long files over networks, leading to transmission failures or hang-ups because many systems and gateways do not properly handle trailers.

Further, the chapter elaborates on TCP's mechanism to ensure data integrity through retransmissions. If an acknowledgment isn't received within a reasonable timeframe, TCP retransmits the data packets. The "reasonable" timeframe is determined by TCP's retransmission algorithm, which, ideally, minimizes unnecessary retransmissions. The chapter contrasts the retransmission strategies of BSD 4.2 and BSD 4.3, noting that the former is prone to overly aggressive retransmissions, especially in environments with high delay and limited bandwidth, leading to increased network traffic. In contrast, BSD 4.3 offers a more balanced approach, quickly retransmitting a few times

on the assumption of being on a low delay network before significantly reducing the frequency of retransmissions.

The chapter concludes by providing references for further reading and a comprehensive list of major RFCs (Request for Comments) documents that are fundamental to understanding internet protocols and standards, including those for UDP (User Datagram Protocol), IP (Internet Protocol), ICMP (Internet Control Message Protocol), TCP (Transmission Control Protocol), SMTP (Simple Mail Transfer Protocol), and FTP (File Transfer Protocol), among others. These RFCs serve as crucial resources for anyone looking to delve deeper into the technical specifications and operational principles of internet communications.



Summary