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## 2.5 Stream Control Transmission Protocol (SCTP)

SCTP provides services similar to those offered by UDP and TCP. SCTP is described in RFC 2960 [Stewart et al. 2000], and updated by RFC 3309 [Stone, Stewart, and Otis 2002]. An introduction to SCTP is available in RFC 3286 [Ong and Yoakum 2002]. SCTP provides *associations* between clients and servers. SCTP also provides applications with reliability, sequencing, flow control, and full-duplex data transfer, like TCP. The word "*association*" is used in SCTP instead of "connection" to avoid the connotation that a connection involves communication between only two IP addresses. An association refers to a communication between two systems, which may involve more than two addresses due to multihoming.

Unlike TCP, SCTP is *message-oriented*. It provides sequenced delivery of individual records. Like UDP, the length of a record written by the sender is passed to the receiving application.

SCTP can provide multiple streams between connection endpoints, each with its own reliable sequenced delivery of messages. A lost message in one of these streams does not block delivery of messages in any of the other streams. This approach is in contrast to TCP, where a loss at any point in the single stream of bytes blocks delivery of all future data on the connection until the loss is repaired.

SCTP also provides a multihoming feature, which allows a single SCTP endpoint to support multiple IP addresses. This feature can provide increased robustness against network failure. An endpoint can have multiple redundant network connections, where each of these networks has a different connection to the Internet infrastructure. SCTP can work around a failure of one network or path across the Internet by switching to another address already associated with the SCTP association.

Similar robustness can be obtained from TCP with help from routing protocols. For example, BGP connections within a domain (iBGP) often use addresses that are assigned to a virtual interface within the router as the endpoints of the TCP connection. The domain's routing protocol ensures that if there is a route between two routers, it can be used, which would not be possible if the addresses used belonged to an interface that went down, for example. SCTP's multihoming feature allows *hosts* to multihome, not just routers, and allows this multihoming to occur across different service providers, which the routing-based TCP method cannot allow.

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