

The TCP/IP Guide

A TCP/IP Reference You Can Understand!



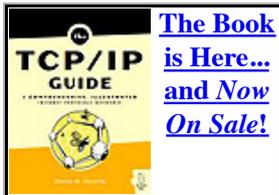
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IP Datagram Options
and Option Format



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IP Datagram Size, the
Maximum Transmission
Unit (MTU), and
Fragmentation Overview



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IP Datagram Size, Maximum Transmission Unit (MTU), Fragmentation and Reassembly

IP's main responsibility is to deliver data between internetworked devices. As we saw in [the preceding section](#), this requires that [data](#) received from higher layers be encapsulated into IP datagrams for transmission. These datagrams are then passed down to the data link layer where they are sent over physical network links.

In order for this to work properly, each datagram must be small enough to fit within the frame format of the underlying [technology](#). If the message is bigger than the maximum frame size of the underlying network, it may be necessary to break up an IP message into several datagrams, a process called *fragmentation*. The datagrams are then sent individually and *reassembled* into the original message.

The Internet Protocol is designed to manage datagram size, and to allow fragmentation and reassembly in a seamless manner. In this section I explore issues related to managing the size of IP datagrams. I start with an overview of datagram size issues and the important concept of a network's maximum transmission unit (MTU), discussing why fragmentation is necessary. I then describe the process by which IP messages to be transmitted are fragmented by the source [device](#) and possibly routers along the path to the destination, and then outline how they are reassembled by the recipient.



Background Information: Explaining fragmentation and reassembly requires some understanding of the basic format of IP datagrams and some of the fields they contain. If you haven't yet read [the topic describing IP datagram general format](#) you may wish to review it before proceeding here.

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[IP Datagram Size, the Maximum Transmission Unit \(MTU\), and Fragmentation Overview](#)


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