What is Fragmentation and what it does:

In the context of computer networking and data transmission, fragmentation refers to the process of breaking down larger packets of data into smaller fragments to fit within the maximum transmission unit (MTU) size of a network. MTU is the largest size of a packet that can be transmitted over a network link without being fragmented.

When data is being transmitted across a network, such as the Internet, it may need to traverse different types of network links and devices with varying MTU sizes. If the data packet is larger than the MTU of a particular link, it needs to be fragmented into smaller pieces that can fit within the MTU. At the receiving end, the fragments are reassembled into the original data packet before it can be processed by the receiving application.

Fragmentation can occur at different levels in the networking stack, including:

1. Network Layer (IP Fragmentation): In the IP (Internet Protocol) layer, if a packet's size exceeds the MTU of a link it needs to traverse, the router responsible for forwarding the packet may fragment it into smaller packets. This process involves creating multiple fragments, each with a header containing information to aid in reassembly.
2. Transport Layer (Segmentation): In the transport layer, protocols like TCP (Transmission Control Protocol) can break data into segments. These segments can also be fragmented if they are too large to fit within the MTU of the network link.
3. Application Layer: Some applications, especially those with real-time requirements, might break data into smaller chunks for more efficient transmission. This is especially common in voice and video streaming applications.