FILE TRANSFER (ISO/OSI)

To effectively transfer a large file over a network using the ISO/OSI model the file undergoes several specific layers of the ISO/OSI model to ensure a successful and reliable transfer over the network, these layers are described below;

- The file transfer process begins at the first Layer, where the binary data of the file is converted into electrical signals (for wired communication) or electromagnetic waves (for wireless communication).
  These signals are transmitted over the physical medium, such as cables or airwaves. This layer is call the **Physical layer**

- At the second layer, the data is framed into manageable units called frames. These frames include synchronization bits, error-checking information, and addressing to ensure reliable communication over the physical medium and establishing a link between the two devices. This layer is known as the **Data link layer**

- The third layer is the **Network Layer,** and is responsible for addressing and routing the data between devices on different networks.
  IP addresses are assigned, and routers operate at this layer to determine the most efficient path for the data to reach its destination.

- Transport protocols, such as TCP (Transmission Control Protocol), ensure reliable and ordered delivery of packets. If any packet is lost or corrupted, it can be retransmitted. In the **Transport layer** the file is segmented into smaller packets and each packet is assigned a sequence number.

- The **Session Layer** manages and establishes sessions or connections between the two devices. It provides dialog control, allowing the two systems to communicate and coordinate the file transfer.

- The sixth, is the **Presentation Layer** and is responsible for data format translation, ensuring that the data sent by one system can be properly understood by the receiving system.
  Tasks such as encryption and compression may also be performed at this layer.

- The **Application Layer** is where the actual file transfer application resides. It interacts with the user and initiates the file transfer process.
  Protocols like FTP (File Transfer Protocol) or HTTP (Hypertext Transfer Protocol) operate at this layer to enable file transfer.