**Data Encapsulation**

**Data Encapsulation is the process in which some extra information is added to the data item to add some features to it.**We use either the OSI or the TCP/IP model in our network, and the data transmission takes place through various layers in these models. Data encapsulation adds the protocol information to the data so that data transmission can take place in a proper way. This information can either be added in the header or the footer of the data.

The data is encapsulated on the sender’s side, starting from the application layer to the physical layer. Each layer takes the encapsulated data from the previous layer and adds some more information to encapsulate it and some more functionalities with the data. These functionalities may include proper data sequencing, error detection and control, flow control, congestion control, routing information, etc.

**Encapsulation process:**

**Step-1:**  
The process starts from the Application, Presentation and Session layer in the [OSI mode](https://www.geeksforgeeks.org/tcp-ip-model/)l or Application layer in TCP/IP model, takes the data input from user and adds a header section (optional) then forwards it to the Transport layer.

**Step-2:**  
After this, further the transport layer again adds additional new information, called *“segment header”.*This whole data packet is called “Segment” and at the end while decapsulation, this information is required. Now, this data is passed onto the next layer in the model, Network Layer.

**Step-3:**  
Similarly, the Network Layer adds header and trailer sections in the “Data Segment” received from the Transport Layer and forms new entity called as a *Datagram*. This data is further passed onto the Data Link Layer.

**Step-4:**  
Again, the Data Link Layer adds another field of data on the input received from the Network Layer. And this whole new data fragment is passed to the next layer, i.e. Physical Layer.

**Step-5:**  
At the end, the last layer Physical Layer adds the ultimate data in the input received from the previous layer. And the process of Encapsulation terminates.

**Encapsulation at each layer**

