

Introduction to Network Security – Part 2

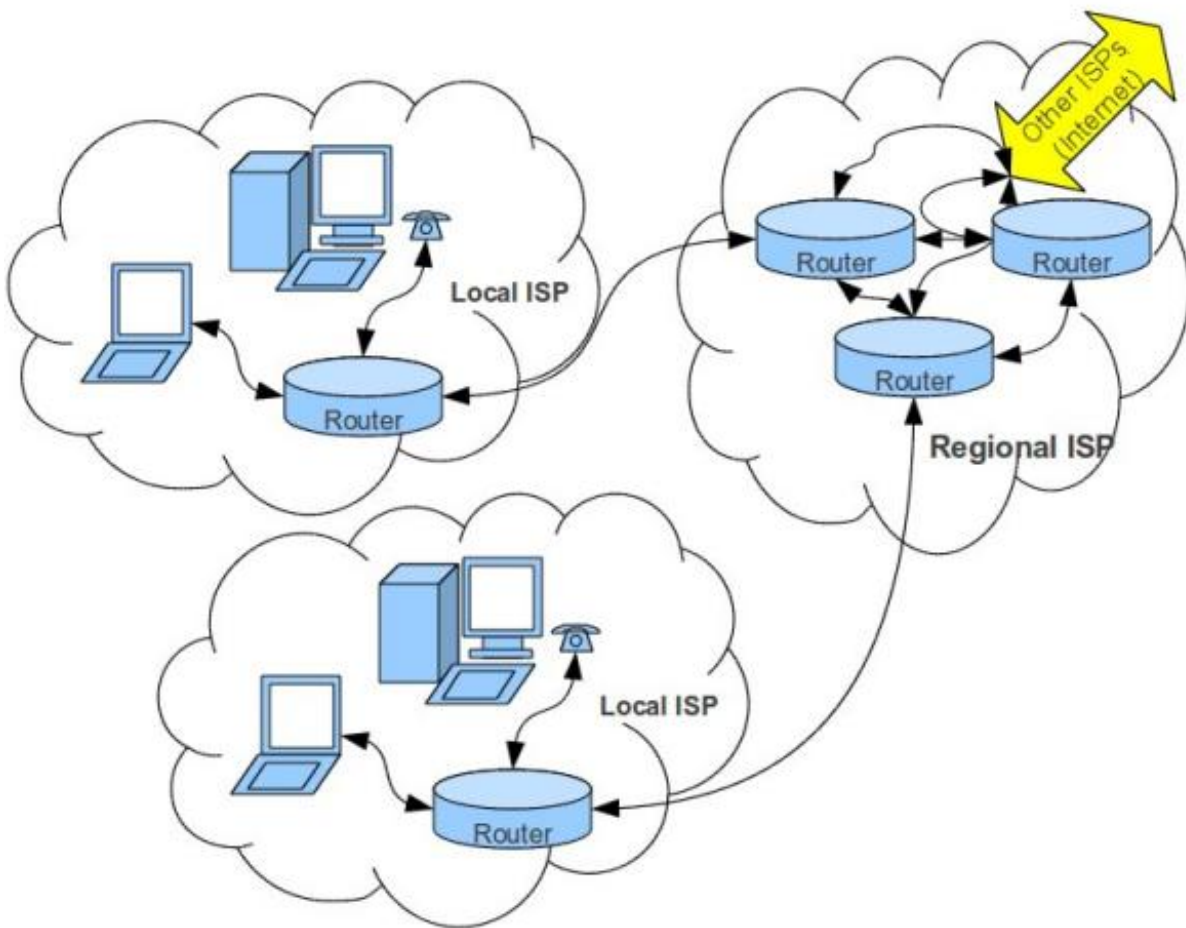
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Introduction To Network : The Internet

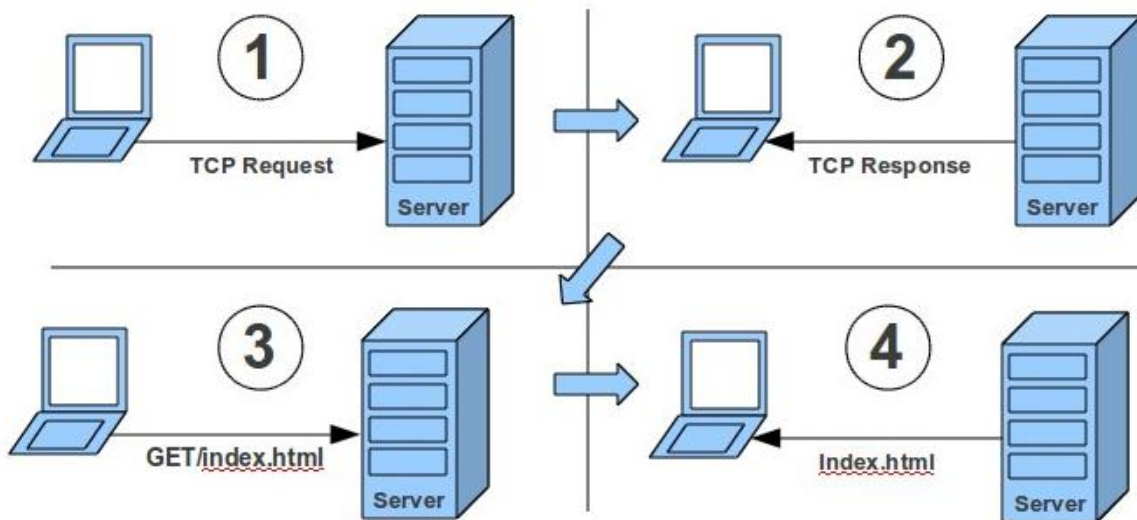
The Internet is a network which connect networks around the world. Each end system (normally end users computers) obtain access through an Internet Service Provider (ISPs).



Protocols

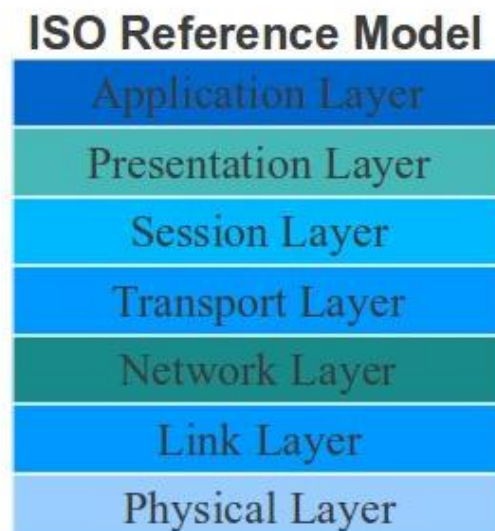
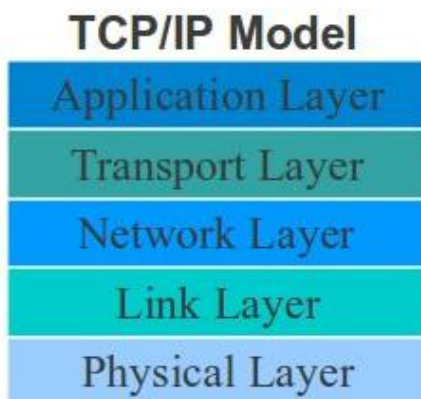
A protocol is a way in which rules for communication are established. For example, in a court, there is a procedure and language that must be followed in the process. A network protocol will define a language of rules, format, order of messages, entities, actions to take, and convention in order to the message being transmitted.

For example: A user which to see a website, therefore the browser will make a TCP request to the server. Due the TCP request form the client, the server answer with a TCP response to the client. Then the client perform a request for the page to the server. Finally, the server send the page requested by the client.



Protocol Layers

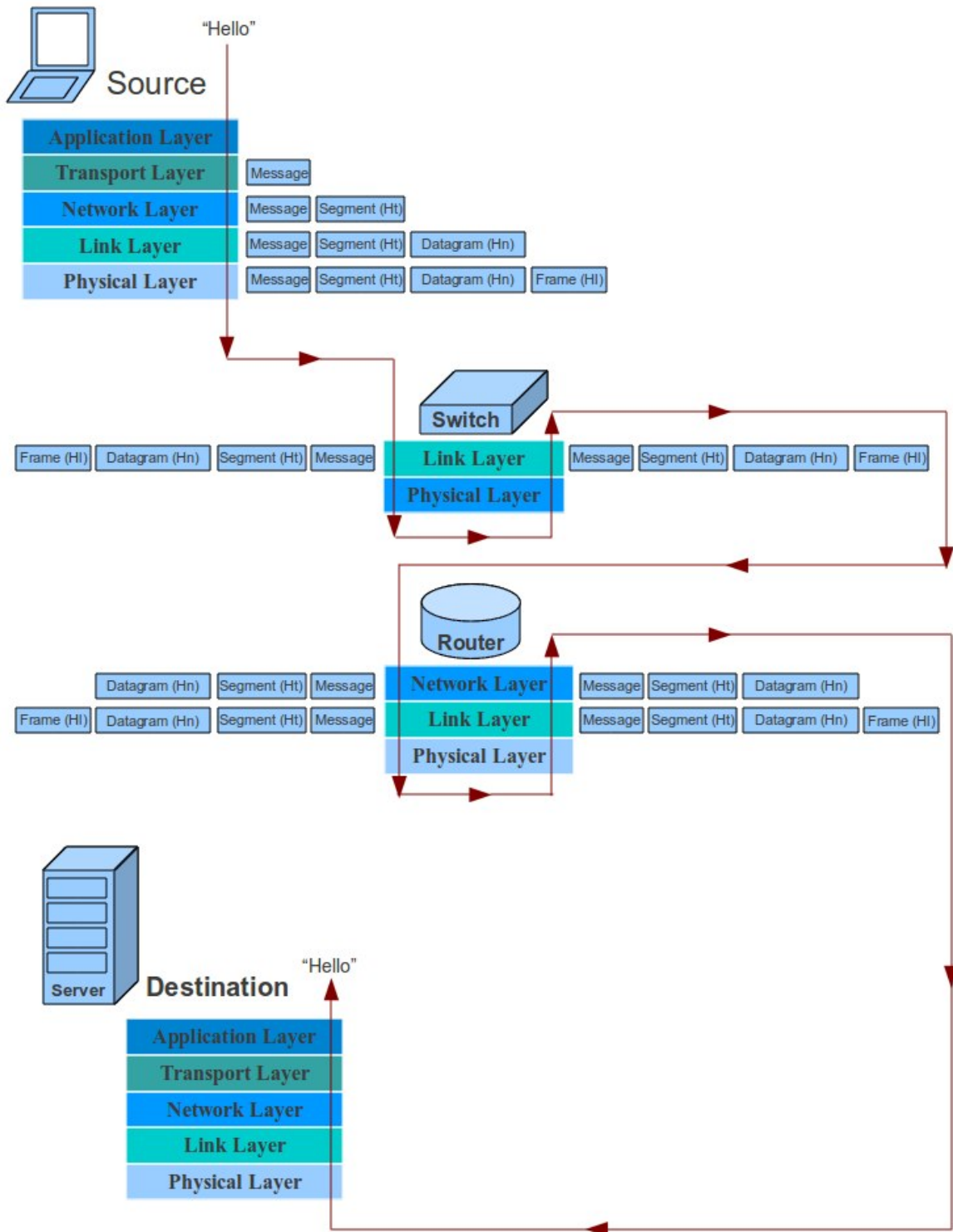
A protocol divided the components needed for transition of messages in modular layers (modulation of the components helps to maintain, update, and/or perform changes to the component). The implementation of layers must be done in the way that it is transparent to the rest of the system as will be explained later. The following image provide an example of the actual layers used for the TCP/IP protocol and the protocol layers recommended by the OSI model.



As you can witness, in the actual TCP/IP protocol, we have five well defined layers.

This layers are:

1. Application Layer: This layers permit the user to access the information that is being send and/or receive from the network through the application in used for this purpose.
 1. This layer support application-layer protocols such as Hyper-Text Transfer Protocol (HTTP), File Transfer Protocol (FTP), Secure SHell (SSH), and others.
 2. The information to be transmitted is send over the application layers which is in charge to encapsulate the data into the application layer protocol and transfer the encapsulated data to the transport layer.
2. Transport Layer: This layer is in charge to provide to end users a transparent transfer of data.
 1. This layer provide controls of reliability of a given link through flow control segmentation/de-segmentation plus error control.
 2. The most common segments used today are Transmission Control Protocol (TCP) and User Datagram Protocol.
 1. Transmission Control Protocol (TCP) is know to be a reliable connector-oriented protocol. Commonly used to send data.
 2. User Datagram Protocol (UDP) is know to be a faster but unreliable connector-oriented protocol. Commonly used for streaming media such as radio, movies, clips, and TV online.
3. Network Layer: This layer is in charge of routing the datagrams from the source to the destination using routing protocols such as Internet Protocol (IP). All routes operate at this layer.
4. Link Layer: This layer is used for the transfer of data between network entities such as bridges and switches by providing the functional and procedural means.
5. Physical Layer: All the data is encoded and transmit as raw data over the network media by making sure that the information that is send in one side is received at the other side accurately.



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