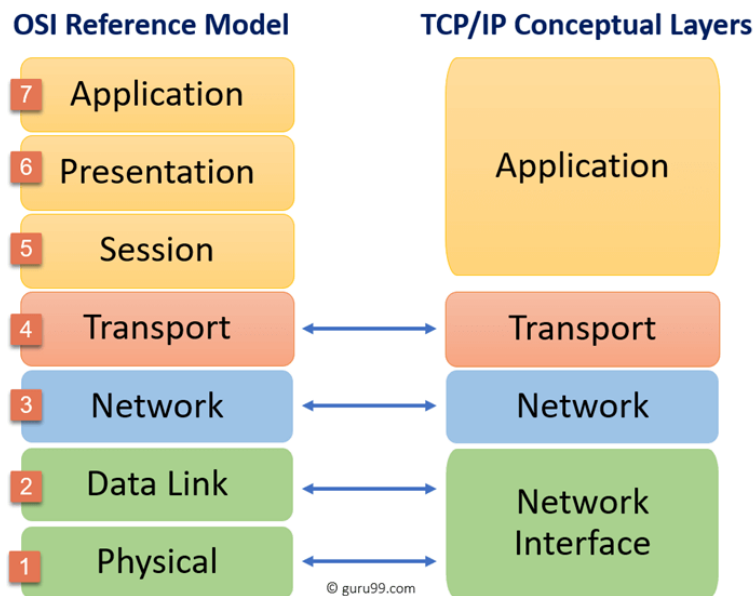# What is TCP/IP Model?

TCP/IP helps you to determine how a specific computer should be connected to the internet and how you can transmit data between them. It helps create a virtual network when multiple computer networks are connected.

TCP/IP stands for Transmission Control Protocol/ Internet Protocol. It is designed as a model to offer a highly reliable and end-to-end byte stream over the unreliable internetwork.

KEY DIFFERENCE

- OSI has seven layers, whereas TCP/IP has four layers.
- The OSI Model is a logical and conceptual model that defines network communication used by systems open to interconnection and communication with other systems. On the other hand, TCP/IP helps you to determine how a specific computer should be connected to the internet and how it can be transmitted between them.
- OSI header is 5 bytes, whereas TCP/IP header size is 20 bytes.
- OSI refers to Open Systems Interconnection, whereas TCP/IP refers to Transmission Control Protocol.
- OSI follows a vertical approach, whereas TCP/IP follows a horizontal approach.
- OSI model, the transport layer, is only connection-oriented, whereas the TCP/IP model is both connection-oriented and connectionless.
- OSI model is developed by ISO (International Standard Organization), whereas TCP Model is developed by ARPANET (Advanced Research Project Agency Network).
- OSI model helps you to standardize router, switch, motherboard, and other hardware, whereas TCP/IP allows you to establish a connection between different types of computers.

History of OSI Model

Here are some important landmarks from the history of the OSI model:

- In the late 1970s, the ISO conducted a program to develop general standards and methods of networking.
- In 1973, an Experimental Packet Switched System in the UK identified the requirement for defining the higher-level protocols.
- In 1983, the OSI model was initially intended to be a detailed specification of actual interfaces.
- In 1984, the OSI architecture was formally adopted by ISO as an international standard.

History of TCP/IP

Here are some important landmarks from the history of TCP/IP:

- In 1974, Vint Cerf and Bob Kahn published a paper, "A Protocol for Packet Network Interconnection," which describes the TCP/IP Model.
- By 1978, testing and further development of this language led to a new suite of protocols called TCP/IP.
- In 1982, it was decided that TCP/IP should be replaced NCP as the standard language of the ARPAnet.
- On January 1, 1983, ARPAnet switched over to TCP/IP,
- ARPAnet finished its existence in 1990. The Internet has since grown from ARPAnet's roots, and TCP/IP evolved to meet the changing requirements of the Internet.

Characteristics of the OSI Model

Here are some essential characteristics of the OSI model:

- A layer should only be created where definite levels of abstraction are needed.
- The function of each layer should be selected as per the internationally standardized protocols.
- The number of layers should be large, so separate functions are not put in the same layer. At the same time, it should be small enough so that architecture doesn't become very complicated.
- In the OSI model, each layer relies on the next lower layer to perform primitive functions. Every level should be able to provide services to the next higher layer.
- Changes made in one layer should not need changes in other layers.

Characteristics of TCP/IP Model

Here are the essential characteristics of the TCP/IP protocol:

- Support for a flexible architecture
- Adding more systems to a network is easy.
- In TCP/IP, the network remains intact until the source and destination machines function properly.
- TCP is a connection-oriented protocol.
- TCP offers reliability and ensures that data that arrives out of sequence should be put back into order.
- TCP allows you to implement flow control, so the sender never overpowers a receiver with data.

Difference between OSI Model and TCP/IP Model

Here are some important differences between the OSI and TCP/IP models:

OSI Model	TCP/IP Model
It is developed by ISO (International Standard Organization)	It was developed by ARPANET (Advanced Research Project Agency Network).
OSI model provides a clear distinction between interfaces, services, and protocols.	TCP/IP doesn't have any clear distinguishing points between services, interfaces, and protocols.
OSI refers to Open Systems Interconnection.	TCP refers to Transmission Control Protocol.
OSI uses the network layer to define routing standards and protocols.	TCP/IP uses only the Internet layer.
OSI follows a vertical approach.	TCP/IP follows a horizontal approach.
OSI layers have seven layers.	TCP/IP has four layers.
In the OSI model, the transport layer is only connection-oriented.	A layer of the TCP/IP model is both connection-oriented and connectionless.
In the OSI model, the data link layer and physical are separate layers.	In TCP, physical and data links are combined as a single host-to-network layer.
Session and presentation layers are a part of the OSI model.	There is no session and presentation layer in the TCP model.
It is defined after the advent of the Internet.	It is defined before the advent of the internet.
The minimum size of the OSI header is 5 bytes.	The minimum header size is 20 bytes.

Advantages of the OSI Model

- It helps you to standardize router, switch, motherboard, and other hardware.
- Reduces complexity and standardizes interfaces.
- Facilitates modular engineering.
- Helps you to ensure interoperable technology.
- Helps you to accelerate the evolution.
- Protocols can be replaced by new protocols when technology changes.
- Provide support for connection-oriented services as well as connectionless service.
- It is a standard model in computer networking.
- Supports connectionless and connection-oriented services.
- It offers flexibility to adapt to various types of protocols.

Advantages of TCP/IP

- It helps you to establish/set up a connection between different types of computers.
- It operates independently of the operating system.
- It supports many routing protocols.
- It enables internetworking between organizations.
- TCP/IP model has a highly scalable client-server architecture.
- It can be operated independently.
- Supports several routing protocols.
- It can be used to establish a connection between two computers.

Disadvantages of OSI Model

- Fitting protocol is a tedious task.
- You can only use it as a reference model.
- It doesn't define any specific protocol.
- In the OSI network layer model, some services are duplicated in many layers, such as the transport and data link layers.
- Layers can't work in parallel as each layer must wait to obtain data from the previous layer.

Disadvantages of TCP/IP

- TCP/IP is a complicated model to set up and manage.
- The shallow/overhead of TCP/IP is higher than IPX (Internetwork Packet Exchange).
- In this model, the transport layer does not guarantee the delivery of packets.
- Replacing protocol in TCP/IP is not easy.
- It has no clear separation from its services, interfaces, and protocols.

Credits: https://www.guru99.com/difference-tcp-ip-vs-osi-model.html