**SCT 212-0109/2022**

**EVE WANJIRU MAINA**

**B1T 2204: NETWORK SYSTEMS AND ADMINISTRATION**

**ASSIGNMENT 1**

**Qsn 1: Outline the similarities and differences between the TCP/IP and OSI models**

**TCP/IP MODEL (TRANSMISSION CONTROL PROTOCOL/INTERNET PROTOCOL MODEL)**

This is a framework for organizing the set of communication protocols used in the internet and computer networks according to a particular functional criteria. It provides end-to-end data communication specifying how data should be packetized, addressed, transmitted, routed and received. It is a layered server architecture system in which each layer is defined according to specific function to perform.

Its functionality is divided into four layers which include specific protocols.

**OSI MODEL (OPEN SYSTEMS INTERCONNECTION MODEL)**

It is a layered model created by the International Organization for standardization which enables diverse communication systems to communicate using standard protocols. The model partitions the flow of data in a communication system into seven abstraction layers to describe networked communication.

Its functionality is divided into seven layers.

**SIMILARITIES**

1. **Both describe how information is transmitted.**

Both models describe how information is transmitted between two devices across a network using a set of layers, each of which performs a specific set of functions to enable the transmission of data.

1. **Both use the concept of encapsulation.**

In both models, encapsulation is implemented whereby data is packaged into a series of headers and trailers that contain information about the data being transmitted and how it should be handled by the network.

1. **Both use similar components.**

In both models, manufacturer allows making sets of devices and network components that can co-exist and work with the devices and components that are made by other manufacturers.

1. **Both have a set of protocols and standards.**

Both models have associated protocols and standards that define how data should be transmitted and received at each layer. An example, the TCP/IP model uses protocols like IP, TCP and UDP while the OSI model has protocols like HTTP, FTP and SMTP.

1. **Both are reference models.**

Both models serve as reference models for understanding networking concepts making them important tools for system engineers and administrators.

1. **Interoperability.**

Both models promote interoperability hence allowing different network devices and software from various vendors to work together seamlessly hence come up with a common framework for understanding network protocols and how they interact.

1. **Both apply the hierarchical approach.**

In both models, each layer builds upon the services provided by the lower layers. This approach makes it easier to design, implement and troubleshoot the networks.

1. **Application Layer Equivalence.**

In both models, the top most layer is responsible for application-level functions, such as user interface and date presentation.

1. **Both are layered models.**

Both models are structured as a stack of layers, each with its specific functions and responsibilities. Thee layers work together to facilitate network communication.

**DIFFERENCES**

|  |  |  |
| --- | --- | --- |
|  | **OSI MODEL** | **TCP/IP MODEL** |
| **Number of layers** | The OSI model consists of seven distinct layers which include; Application, Presentation, Session, Transport, Network, Data Link, and Physical layers | Consists of four layers which are; Application, Transport, Internet and Network Interface layers. |
| **Protocols** | This model does not specify protocols instead, various protocols were developed to align with the OSI layers such as HTTP, FTP and SNMP | This model is associated with specific protocols like Internet protocol, User Datagram protocol which are widely used for internet communication |
| **Usage** | This is more of a theoretical reference and its protocols are not as commonly used in real-world networks. | It is the dominant model used especially in the context of internet. |
| **Layer names and Functions** | It includes layers such as the Presentation layer which carry out data format translation and Session layer which manages and establishes sessions. The additional layers aid in describing networking functions better. | It combines some functions of the OSI model’s upper layers into the Application layer, simplifying the model. It also combines the data link and physical layers into a single network interface layer |
| **Development/Establishment** | Was developed by the International organization for standardization (ISO). It aimed to standardize networking concepts and protocols internationally | Was developed by the U.S. Department of defense and designed for practical implementation. |
| **Header bytes** | The smallest size of the OSI header is 5 bytes | The smallest size of the header is 20 bytes |