The Lower OSI Layers

- Whereas Network engineers are not particularly interested in the upper OSI layers, we are **very** concerned with the lower 4 layers of the OSI model.
- Each of these layers have their own dedicated section later and you will learn much more detailed information about them throughout the course.

Layer 4 – The Transport Layer

- The main characteristics of the Transport layer are whether TCP or UDP transport is used, and the port number.
- Definition:

– The transport layer defines services to segment, transfer, and reassemble the data for individual communications between the end devices.

– It breaks down large files into smaller segments that are less likely to incur transmission problems.

Layer 3 – The Network Layer

- The most important information at the Network layer is the source and destination IP address.
- Routers operate at Layer 3.
- Definition:

– The network layer provides connectivity and path selection between two host systems that may be located on geographically separated networks.

– The network layer is the layer that manages the connectivity of hosts by providing logical addressing.

Layer 2 – The Data-Link Layer

- The most important information at the Data-Link layer is the source and destination layer 2 address.
- For example the source and destination MAC address if Ethernet is the layer 2 technology.
- Switches operate at Layer 2.
- Definition:

– The data link layer defines how data is formatted for transmission and how access to physical media is controlled.
– It also typically includes error detection and correction to ensure a reliable delivery of the data.

Layer 1 – The Physical Layer

- The Physical layer concerns literally the physical components of the network, for example the cables being used.
- Definition:

– The physical link enables bit transmission between end devices.
– It defines specifications needed for activating, maintaining, and deactivating the physical link between end devices.
– For example, voltage levels, physical data rates, maximum transmission distances, physical connectors etc.