

LE 517 Data Communications and Networks

Week 2:- Standard and OSI Model

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Standard and OSI Model

- Standard
- OSI Model
 - Physical Layer
 - Data Link Layer
 - Network Layer
 - Transport Layer
 - Session Layer
 - Presentation Layer
 - Application Layer

Standard

- ISO - International Organization for Standardization:- a world wide organization of standards including open systems interconnect(OSI).
- ANSI – American National Standard Institute :- a private agency and a member of ISO.
- Institute of Electrical and Electronic Engineers (IEEE):- one of the largest professional organization in the word of computer and engineering professional

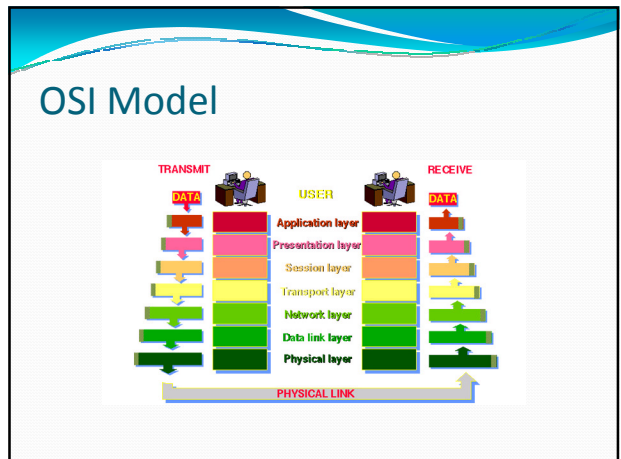


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Physical Layer

- This layer conveys the bit stream - electrical impulse, light or radio signal -- through the **network** at the electrical and mechanical level. It provides the **hardware** means of sending and receiving data on a carrier, including defining cables, cards and physical aspects. **Fast Ethernet**, **RS232**, and **ATM** are **protocols** with physical layer components.

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Data Link Layer

- At this layer, data packets are **encoded** and decoded into bits. It furnishes **transmission protocol** knowledge and management and handles errors in the physical layer, flow control and frame synchronization. The data link layer is divided into two sub layers: The **Media Access Control (MAC)** layer and the **Logical Link Control (LLC)** layer. The MAC sub layer controls how a computer on the network gains access to the data and permission to transmit it. The LLC layer controls frame **synchronization**, flow control and error checking.

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Network Layer

- This layer provides **switching** and **routing** technologies, creating logical paths, known as **virtual circuits**, for transmitting data from **node** to node. Routing and forwarding are functions of this layer, as well as **addressing**, **internetworking**, error handling, **congestion** control and packet sequencing.

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Transport Layer

- This layer provides transparent transfer of data between end systems, or **hosts**, and is responsible for end-to-end error recovery and **flow control**. It ensures complete data transfer.

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Session Layer

- This layer establishes, manages and terminates connections between **applications**. The session layer sets up, coordinates, and terminates conversations, exchanges, and dialogues between the applications at each end. It deals with session and connection coordination.

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Presentation Layer

- This layer provides independence from differences in data representation (e.g., **encryption**) by translating from application to network format, and vice versa. The presentation layer works to transform data into the form that the application layer can accept. This layer formats and encrypts data to be sent across a **network**, providing freedom from compatibility problems. It is sometimes called the *syntax layer*.

Standard and OSI Model

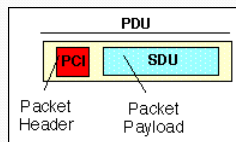
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Application Layer

- This layer supports **application** and end-user processes. Communication partners are identified, quality of service is identified, user authentication and privacy are considered, and any constraints on data **syntax** are identified. Everything at this layer is application-specific. This layer provides application services for **file transfers**, **e-mail**, and other **network software** services. **Telnet** and **FTP** are applications that exist entirely in the application level. Tiered application architectures are part of this layer.

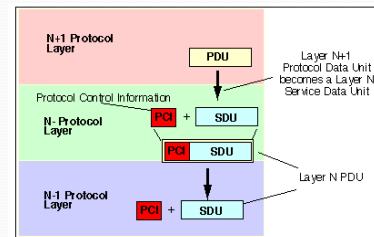
Data Packet

- Encapsulation or **layering** is the addition of Protocol Control Information (PCI) to a Protocol Data Unit (PDU) by a **communications protocol**. The encapsulation adds headers before the start of a PDU.



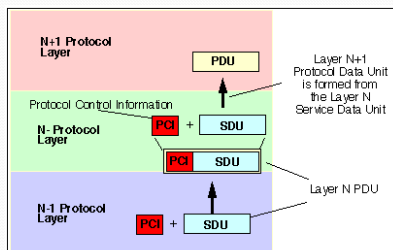
Data Packet

- Encapsulation



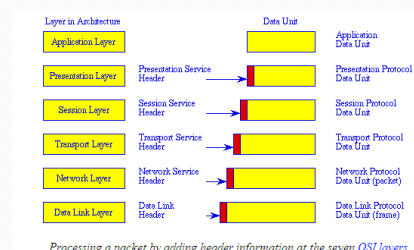
Data Packet

- Retrieve Data



Data Packet

- Packet in OSI Layer



Reference

- http://www.webopedia.com/img/OSI_Model.jpg @ 17 OCT 2008
- <http://www.erg.abdn.ac.uk/users/gorry/course/intro-pages/encapsulation.html>@ 17 OCT 2008
- <http://www.erg.abdn.ac.uk/users/gorry/course/intro-pages/encapsulation.html>@ 17 OCT 2008
- <http://www.erg.abdn.ac.uk/users/gorry/course/intro-pages/encapsulation.html>@ 17 OCT 2008
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