

# PERTEMUAN 11

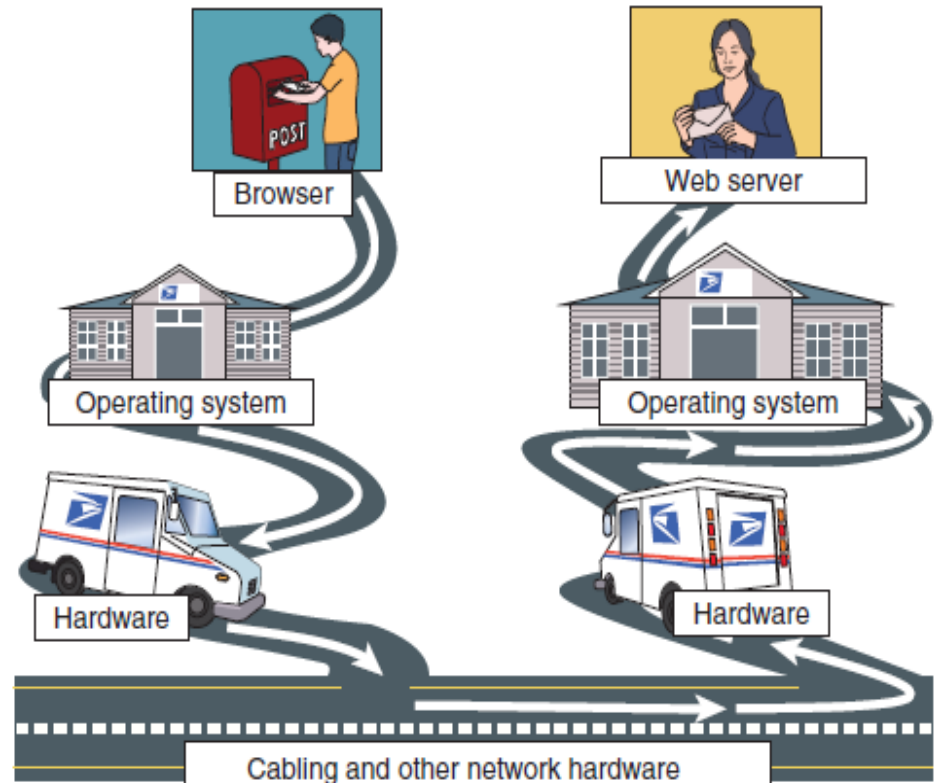
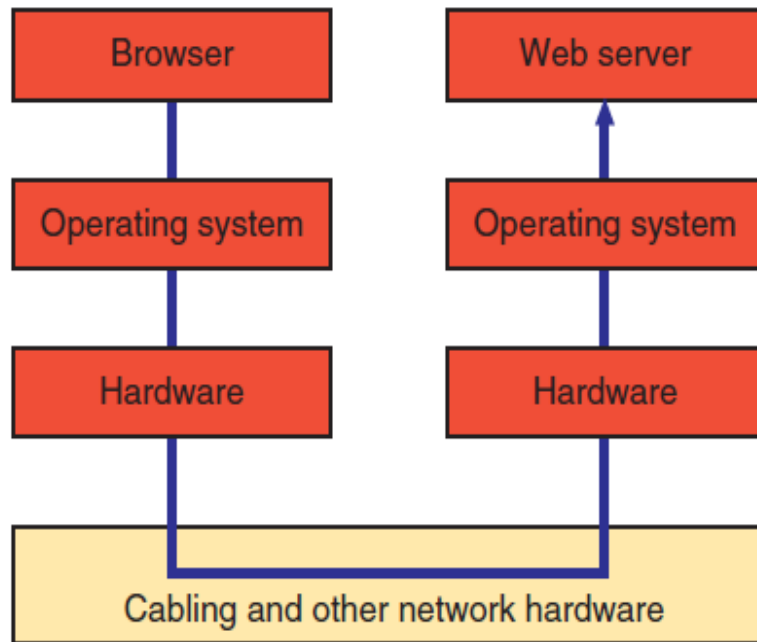
## SEVEN LAYERS OSI

# Deskripsi Model OSI

- Merupakan suatu model yang mengilustrasikan proses dan teknologi yang terkait dalam proses pengiriman data.
- Dipergunakan sebagai media komunikasi antar stakeholder (network admin, teknisi hardware, programmer, network engineer) dalam menggambarkan fungsi-fungsi teknologi jaringan
- Berperan penting dalam pemecahan masalah dalam jaringan komputer, dengan pendekatan per lapisan (layered-approach)

# Deskripsi Model OSI (2)

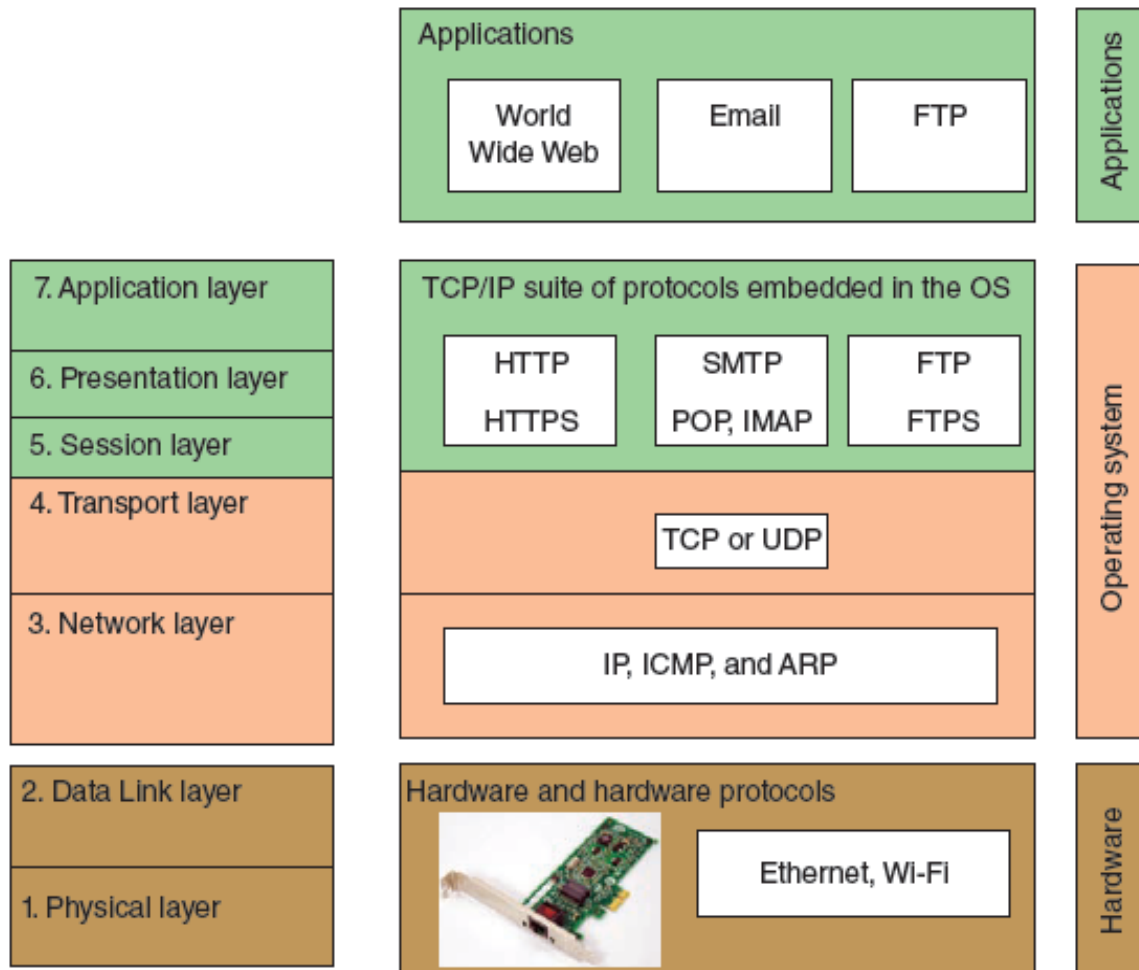
## Analogi Pengiriman Data & Pengiriman Surat



**Model OSI** mengilustrasikan pengiriman data untuk setiap proses dan teknologi yang dipergunakan kedalam tujuh lapis (**seven layer**).

# Komponen Model OSI

## (Application, Operating System & Hardware)



# SEVEN-LAYER OSI

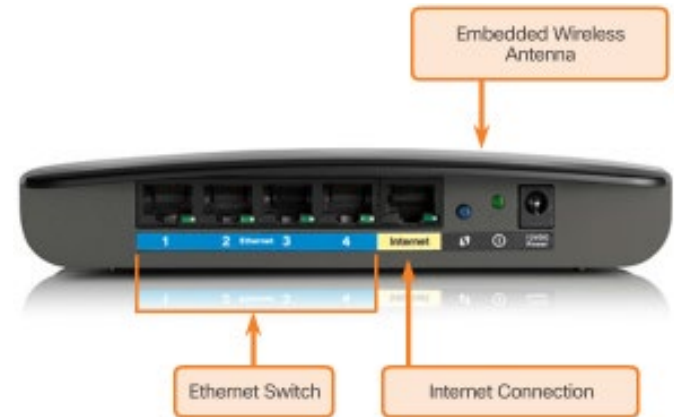
OSI (Open Source Interconnection) 7 Layer Model

Layer	Application/Example	Central Device/ Protocols		DOD4 Model
<b>Application (7)</b> Serves as the window for users and application processes to access the network services.	<b>End User layer</b> Program that opens what was sent or creates what is to be sent Resource sharing • Remote file access • Remote printer access • Directory services • Network management	<b>User Applications</b>  SMTP	<b>G A T E W A Y</b>	Process
<b>Presentation (6)</b> Formats the data to be presented to the Application layer. It can be viewed as the "Translator" for the network.	<b>Syntax layer</b> encrypt & decrypt (if needed)  Character code translation • Data conversion • Data compression • Data encryption • <b>Character Set Translation</b>	JPEG/ASCII EBDIC/TIFF/GIF PICT		
<b>Session (5)</b> Allows session establishment between processes running on different stations.	<b>Synch &amp; send to ports</b> (logical ports)  Session establishment, maintenance and termination • Session support - perform security, name recognition, logging, etc.	<b>Logical Ports</b>  RPC/SQL/NFS NetBIOS names		
<b>Transport (4)</b> Ensures that messages are delivered error-free, in sequence, and with no losses or duplications.	<b>TCP</b> Host to Host, Flow Control  Message segmentation • Message acknowledgement • Message traffic control • Session multiplexing	<b>F I L T E R I N G  P A C K E T</b>	<b>G A T E W A Y</b>	Host to Host
<b>Network (3)</b> Controls the operations of the subnet, deciding which physical path the data takes.	<b>Packets</b> ("letter", contains IP address)  Routing • Subnet traffic control • Frame fragmentation • Logical-physical address mapping • Subnet usage accounting			
<b>Data Link (2)</b> Provides error-free transfer of data frames from one node to another over the Physical layer.	<b>Frames</b> ("envelopes", contains MAC address) [NIC card — Switch — NIC card] (end to end) Establishes & terminates the logical link between nodes • Frame traffic control • Frame sequencing • Frame acknowledgment • Frame delimiting • Frame error checking • Media access control	<b>Switch Bridge WAP PPP/SLIP</b>		Network
<b>Physical (1)</b> Concerned with the transmission and reception of the unstructured raw bit stream over the physical medium.	<b>Physical structure</b> Cables, hubs, etc.  Data Encoding • Physical medium attachment • Transmission technique - Baseband or Broadband • Physical medium transmission Bits & Volts	<b>Hub</b>	Land Based Layers	

# Physical Layer

Tujuan dari Physical Layer untuk  
Menghubungkan ke Lapisan Data Link

Connect your computer to the  
Ethernet port (1, 2, 3, or 4).



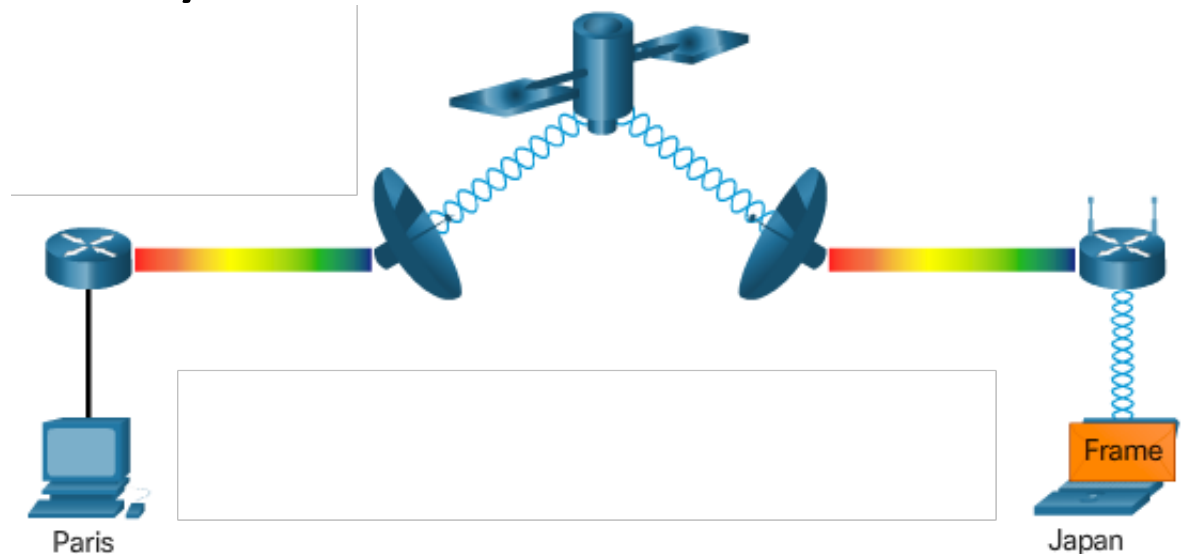
# Data Link Layer

## Data Link Sublayer

- LLC berkomunikasi dengan lapisan jaringan
- MAC mendefinisikan media akses proses

## Standar Data Link Layer

- IEEE
- ITU
- ISO
- ANSI

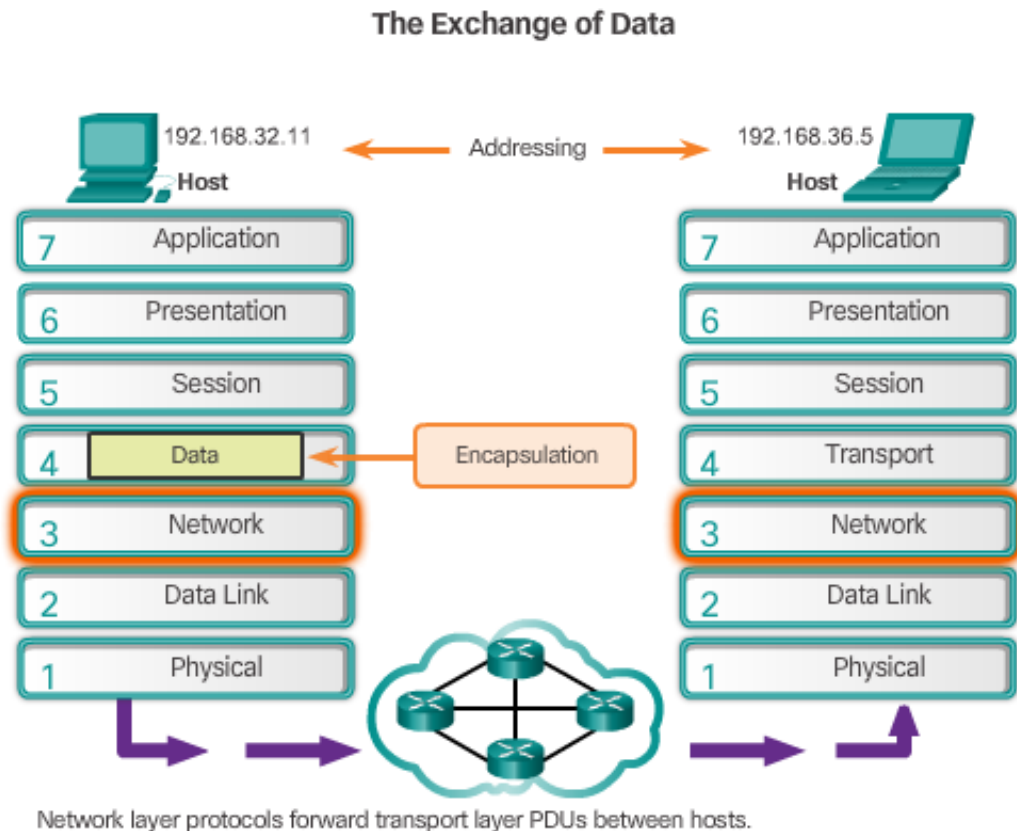




# Network Layer

## Protokol Network Layer

- IPv4
- IPv6





# Transport Layer

- Peran Transport Layer
  - Membangun komunikasi antara dua aplikasi dan memberikan data di antara mereka.
  - Memberikan dukungan aliran data, kontrol Flow, Multiplexing
- Keandalan Transport Layer
  - Dua protokol yang tersedia: TCP dan UDP.
  - TCP mendukung kehandalan sementara UDP tidak.

# Transport Layer

## Transportasi Data

- TCP biasanya digunakan untuk,
  - Database
  - Web Browser
  - Mail, dll
- UDP
  - Live Audio
  - Video Streaming
  - Voip, dll

# Application, Presentation, Session

- Application Layer
  - Lapisan yang paling dekat kepada pengguna.
  - Yang termasuk Protokol Application Layer adalah: HTTP, FTP, TFTP, DNS.
- Presentation dan Session Layer
  - Format data, kompres dan mengenkripsi data
  - Umumnya digunakan untuk video termasuk QuickTime dan Motion Picture Experts Group (MPEG).
  - Format gambar grafis umum adalah: GIF, JPEG dan PNG
  - Session Layer menciptakan dan mempertahankan dialog antara sumber dan tujuan aplikasi.

# Application Layer Protocol

## IP Address

### Domain Name Service

- Dengan menggunakan DNS Server membuat alamat IP lebih mudah di hapal.
- Komputer masih memerlukan alamat numerik yang sebenarnya sebelum mereka dapat berkomunikasi.
- Protokol DNS memungkinkan untuk menerjemahkan alamat IP menjadi sebuah domain.

# Application Layer Protocol

## IP Address

### Dynamic Host Configuration Protocol

- Jaringan komputer memerlukan informasi IP address untuk berkomunikasi melalui jaringan.
- DHCP memungkinkan untuk memberikan IP address secara otomatis.
- DHCP mendukung IPv4 dan mendukung DHCPv6 IPv6.

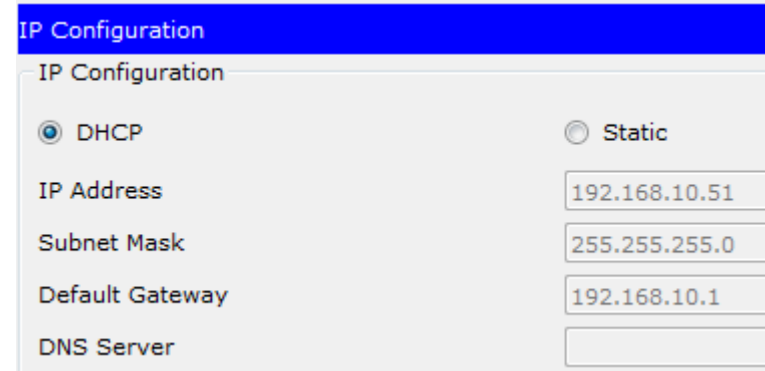
# Konfigurasi Pada DHCP Server



```
Router(config)#interface g0/0
Router(config-if)#ip address 192.168.10.1 255.255.255.0
Router(config-if)#no shut
Router(config)#ip dhcp excluded-address 192.168.10.1 192.168.10.50
Router(config)#ip dhcp excluded-address 192.168.10.100 192.168.10.254
Router(config)#ip dhcp pool JARINGAN-KOMPUTER
Router(dhcp-config)#network 192.168.10.0 255.255.255.0
Router(dhcp-config)#default-router 192.168.10.1
Router(dhcp-config)#exit
```

# DHCP Client

Untuk mendapatkan service DHCP server. Pastikan Client memilih IP Configuration DHCP



IP Configuration	
IP Configuration	
<input checked="" type="radio"/> DHCP	<input type="radio"/> Static
IP Address	192.168.10.51
Subnet Mask	255.255.255.0
Default Gateway	192.168.10.1
DNS Server	

```
C:\>ipconfig /all

FastEthernet0 Connection:(default port)

    Connection-specific DNS Suffix...:
    Physical Address.....: 0002.165C.7236
    Link-local IPv6 Address.....: FE80::202:16FF:FE5C:7236
    IP Address.....: 192.168.10.51
    Subnet Mask.....: 255.255.255.0
    Default Gateway.....: 192.168.10.1
    DNS Servers.....: 0.0.0.0
    DHCP Servers.....: 192.168.10.1
    DHCPv6 Client DUID.....: 00-01-00-01-80-14-2B-3D-00-02-16-5C-72-36
```

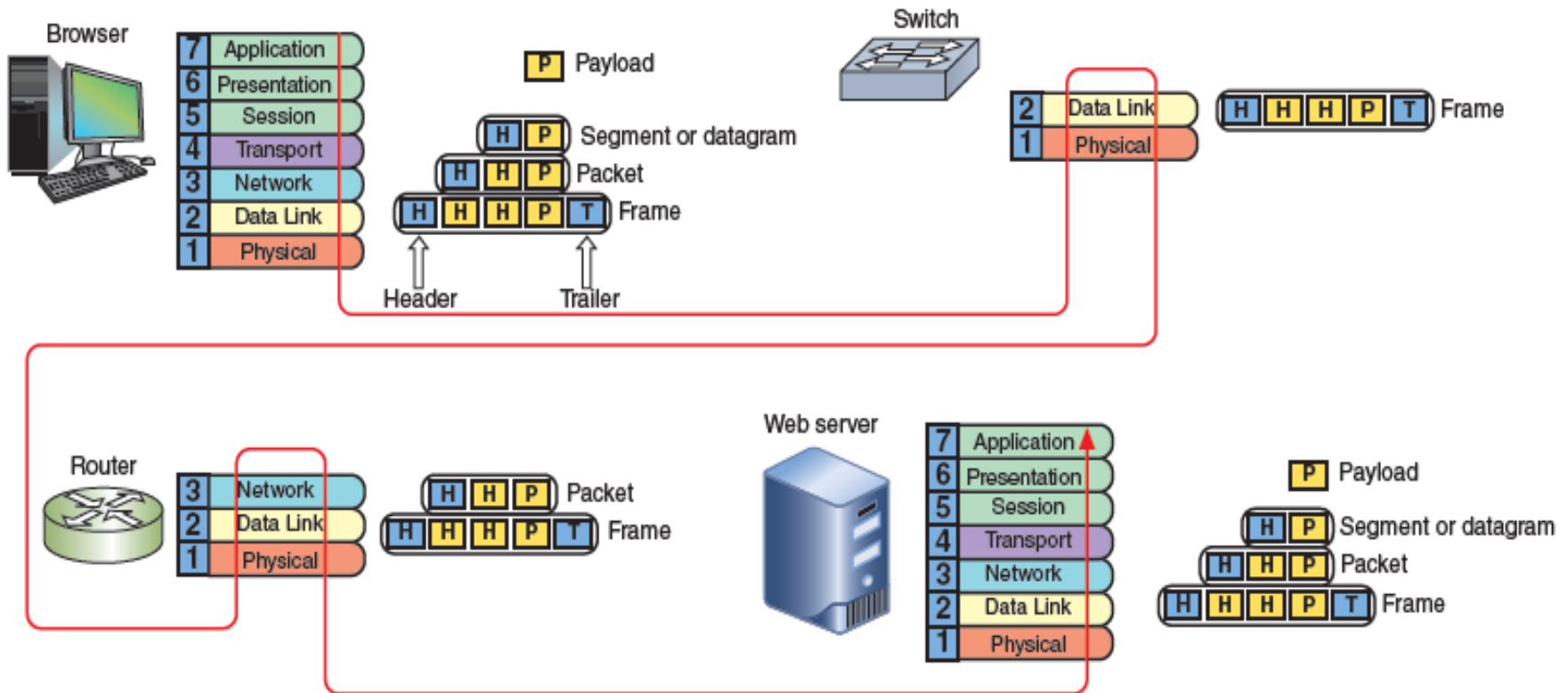


# PACKET DATA UNIT (PDU)

(Penyebutan Unit Data dalam Model OSI)

OSI model	Name	Extremely technical name
Layer 7, Application layer Layer 6, Presentation layer Layer 5, Session layer	Payload or data	L7PDU
Layer 4, Transport layer	Segment (TCP) or datagram (UDP)	L4PDU
Layer 3, Network layer	Packet	L3PDU
Layer 2, Data Link layer	Frame	L2PDU
Layer 1, Physical layer	Bit or transmission	L1PDU

# RINGKASAN PROSES DATA DALAM MODEL OSI (Contoh pada Layanan Web)



# Tugas Mandiri

- 1. Jelaskan Fungsi-Fungsi dari Protokol di bawah ini:
  - a) ICMP
  - b) POP3
  - c) SMTP
  - d) FTP
  - e) ARP
  
- 2. Berikan Penjelasan Mengenai kelebihan dan Kekurangan Ipv4 dan Ipv6?
  
- 3. Tugas di upload via blog masing-masing mahasiswa dan alamat blog beserta resume di email ke email dosen