



**Ministry of Higher Education and Scientific**

**Research Al-Mustaqbal University College**

**Department of Technical Computer Engineering**

# Computer Network 3rd Stage

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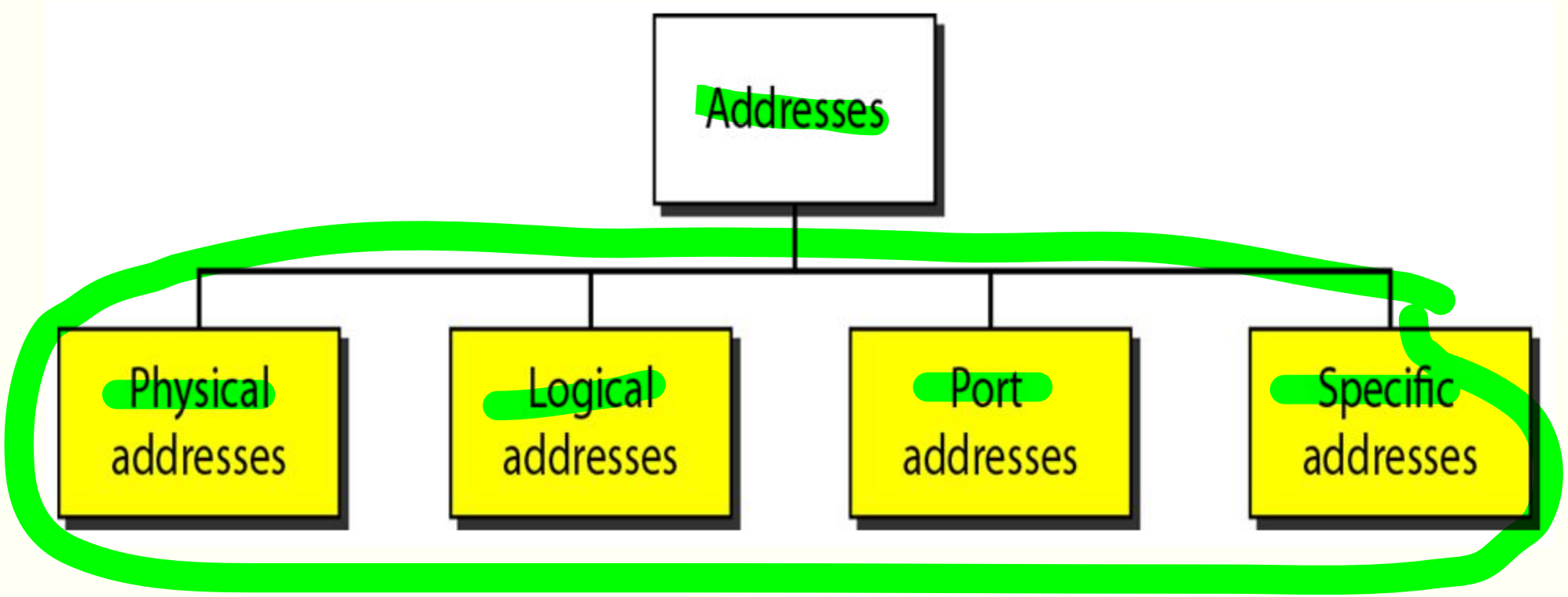
# ADDRESSING

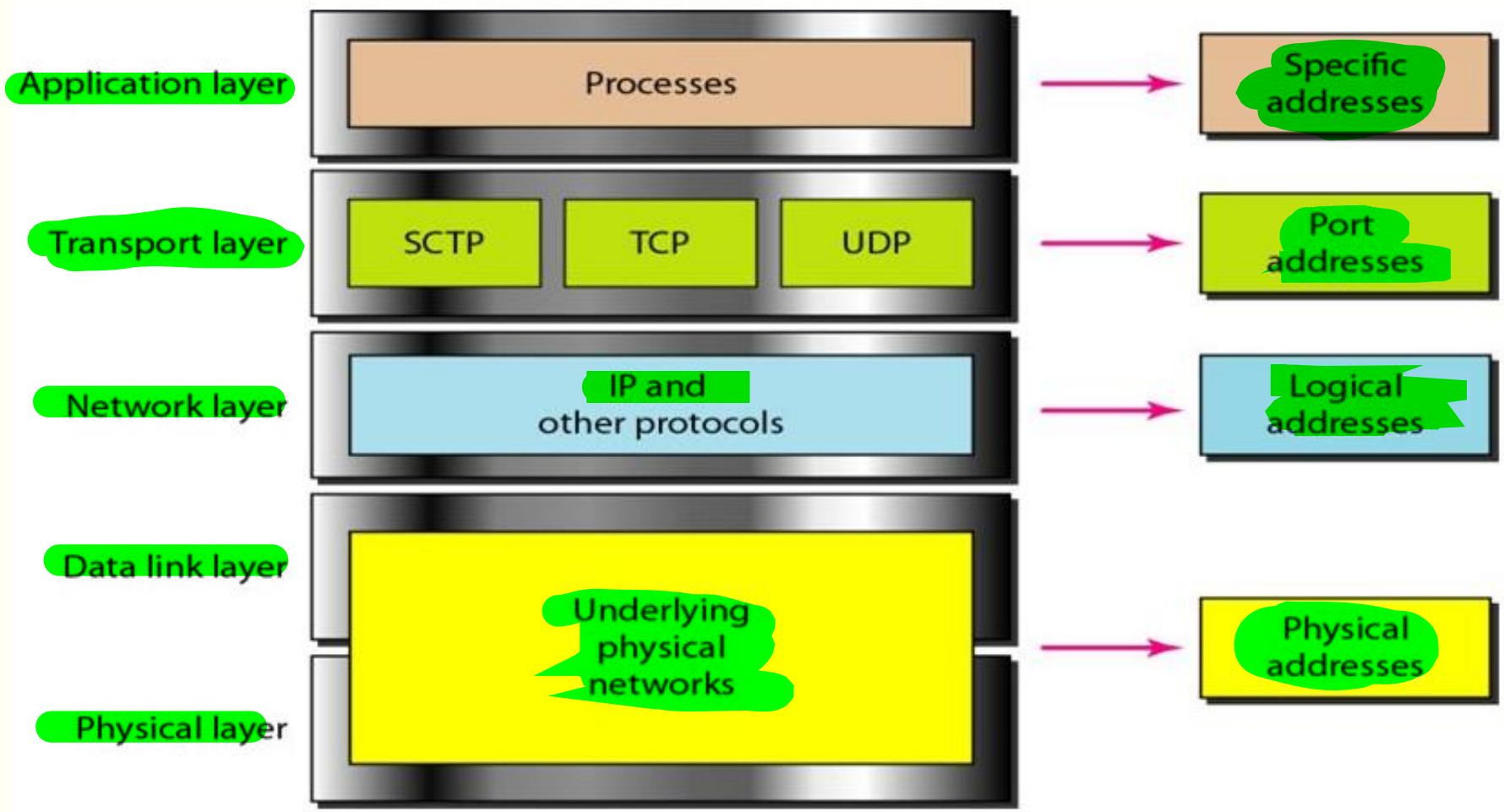
**Four levels of addresses are used in an internet employing the TCP/IP protocols:**

Physical (link) addresses, logical (IP) addresses, Port addresses, Specific addresses



# ADDRESSING

Each address is related to a specific layer in the TCPIIP architecture, as shown in Figure



# ADDRESSING

**Physical Addresses**

- The physical address, also known as the **link address** or **mac address**,
- Is the address of a node as defined by its **LAN** or **WAN**.
- It is included in the **frame** used by the **data link layer**.
- Ethernet Uses a **6-byte** (48-bit) physical address that is imprinted on the network interface card (NIC).

07:01:02:01 :2C:4B

A 6-byte (12 hexadecimal digits) physical address

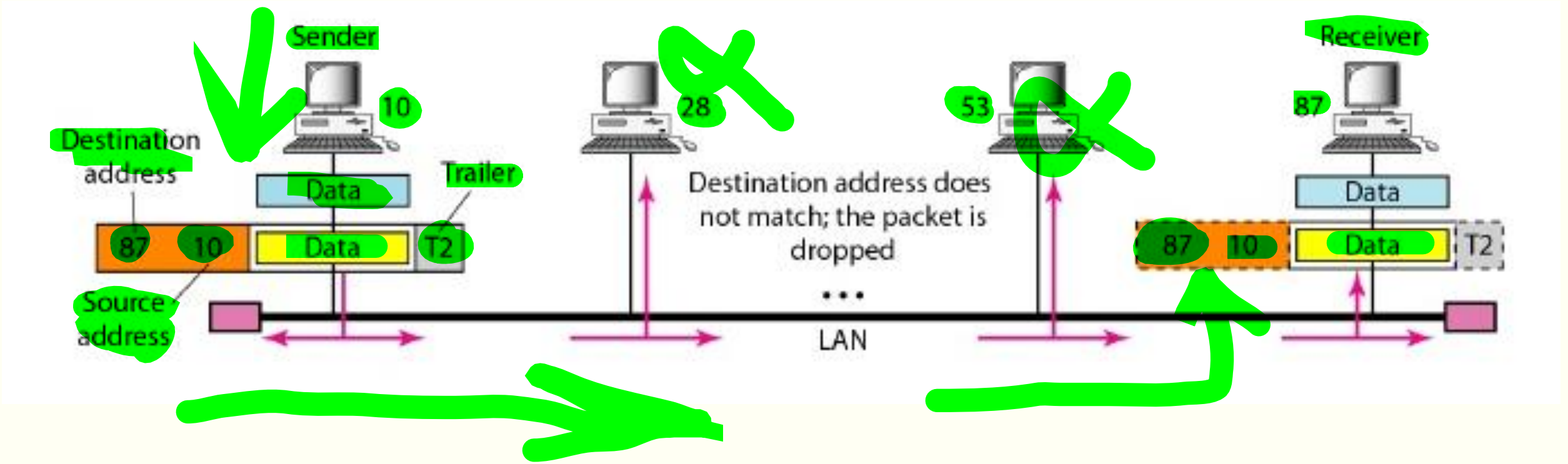
# ADDRESSING

**Physical Addresses**

- a node with physical address 10 sends a frame to a node with physical address 87.
- The two nodes are connected by a link (bus topology LAN).
- At the data link layer, this frame contains physical (link) addresses in the header.
- These are the only addresses needed.

# ADDRESSING

## Physical Addresses



# ADDRESSING

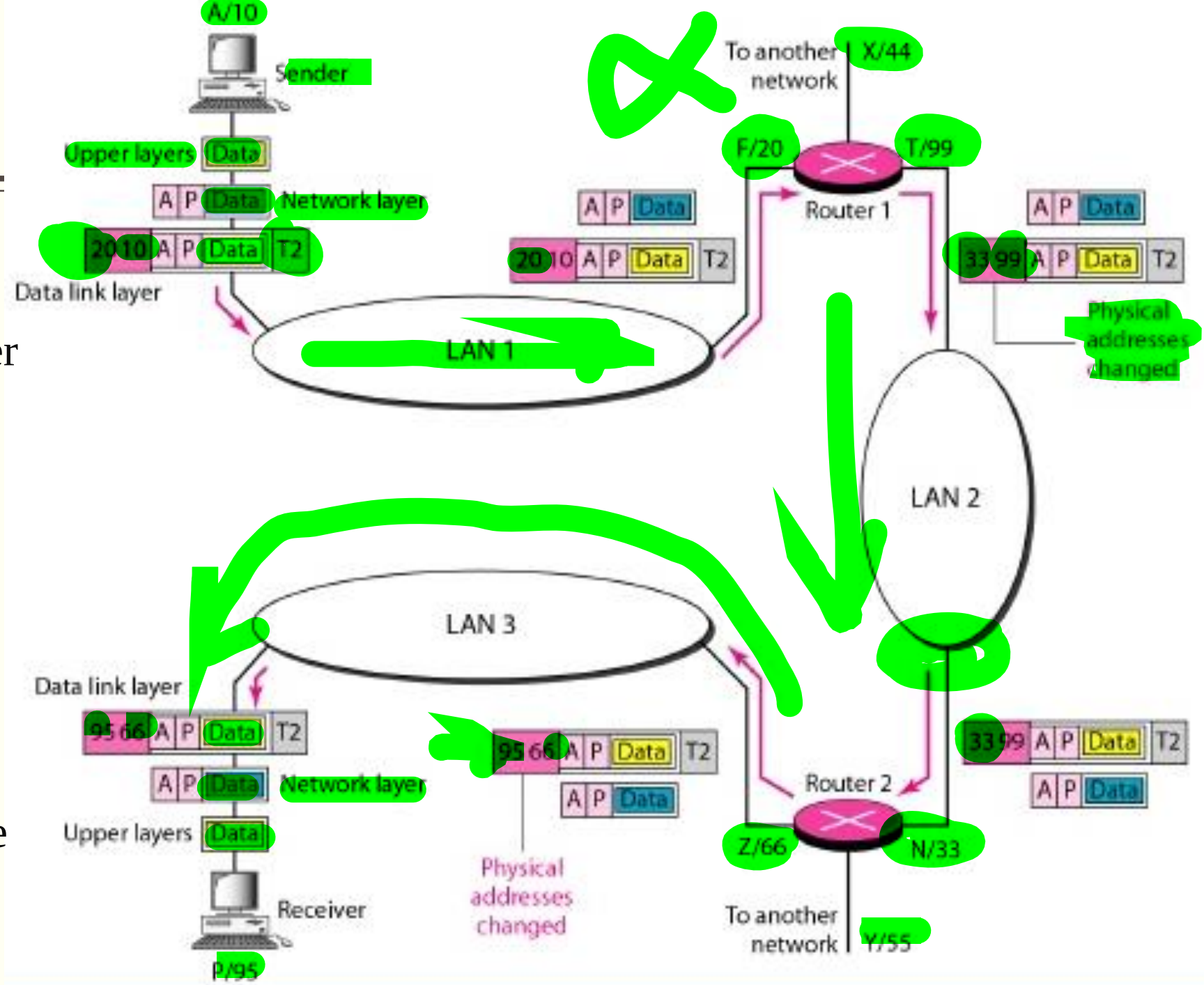
**Logical Addresses**

- Logical addresses are necessary for universal communications.
- A logical address in the Internet is currently a 32-bit address that can uniquely define a host connected to the Internet.
- No two publicly addressed and visible hosts on the Internet can have the same IP address.

# ADDRESSING

**IP addresses**

- Each device (computer or router) has a pair of addresses (logical and physical) for each connection.
- Each router has **three pairs of addresses**, one for each connection.



# ADDRESSING

**Port Addresses**

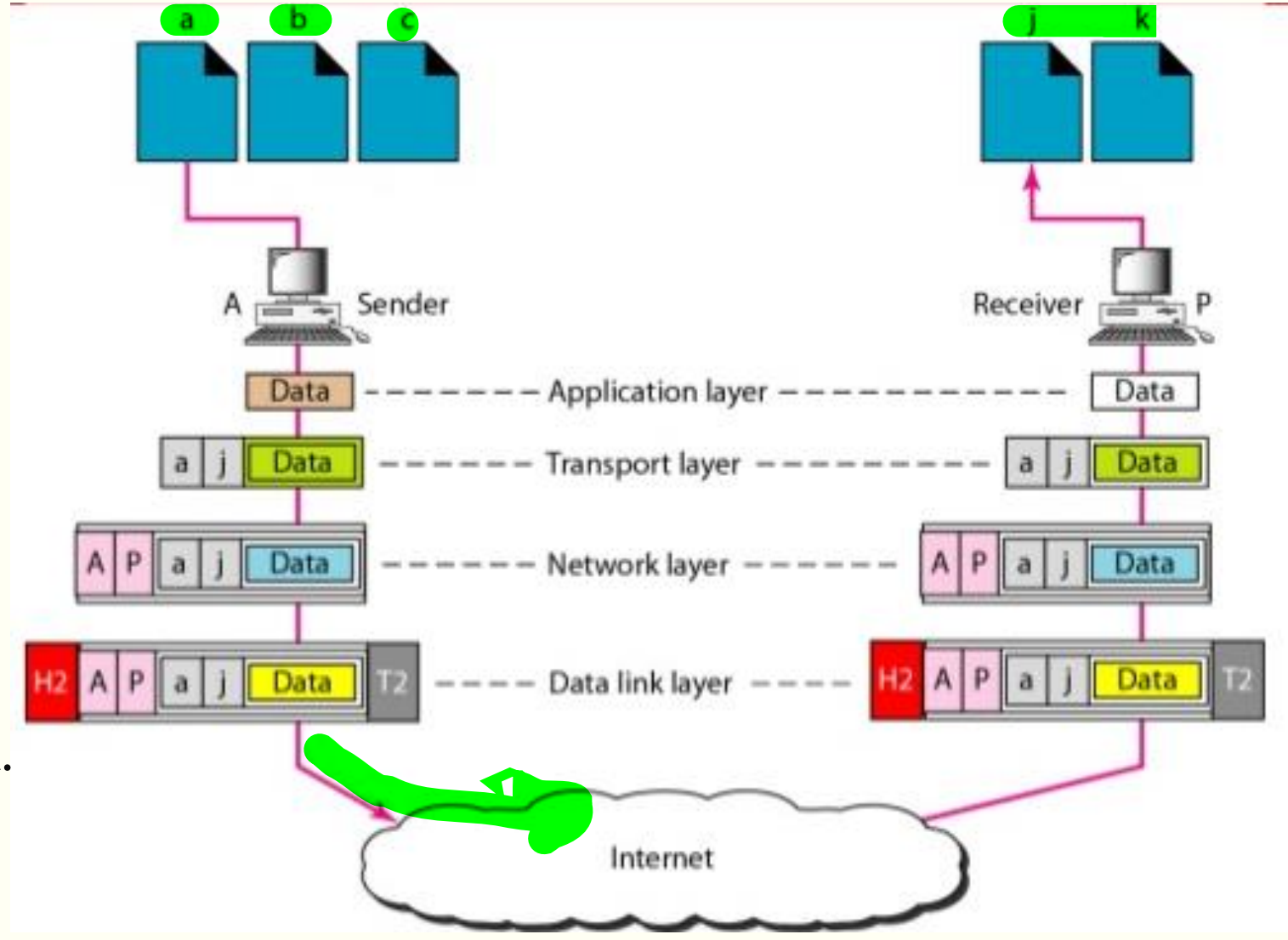
- Today, computers are devices that can run multiple processes at the same time. The end objective of Internet communication is a process communicating with another process.
- we need a method to label the different processes. In other words, they need addresses.
- In the TCPIIP architecture, the label assigned to a process is called a **port address**. A port address in TCPIIP is 16 bits in length.

# ADDRESSING

**Port Addresses**

- The sending computer is running three processes at this time with port addresses a, b, and c.

- The receiving computer is running two processes at this time with port addresses j and k.



# ADDRESSING

## Port Addresses

- **Process a** in the sending computer needs to communicate with **process j** in the receiving computer.

- Note that although both computers are using the same application, FTP, for example, the port addresses are different because one is a client program and the other is a server program