Data Communication (CSX-208)

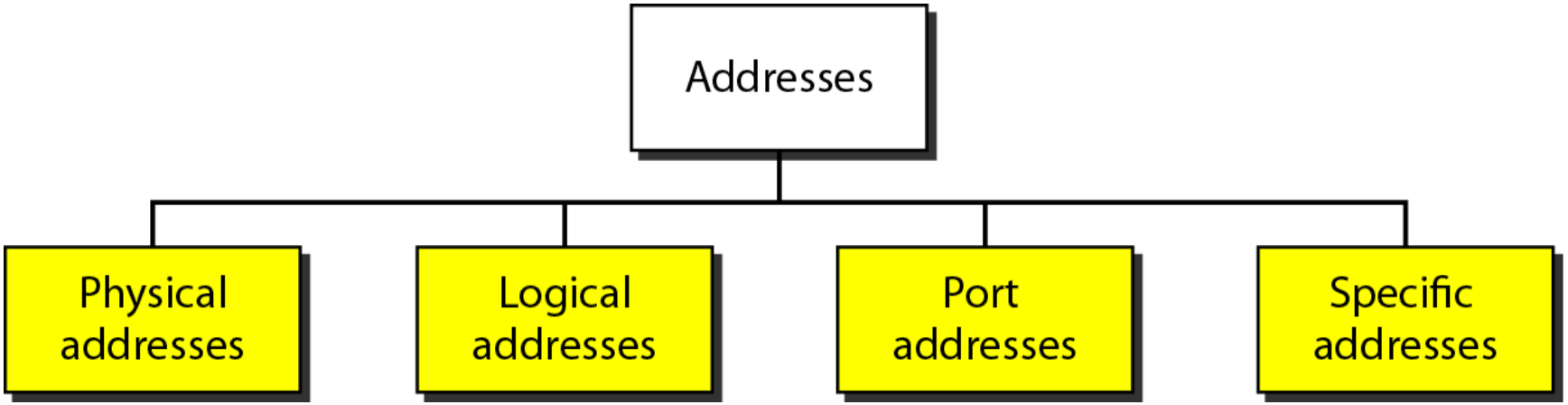
Dr Samayveer Singh

Network Addresses

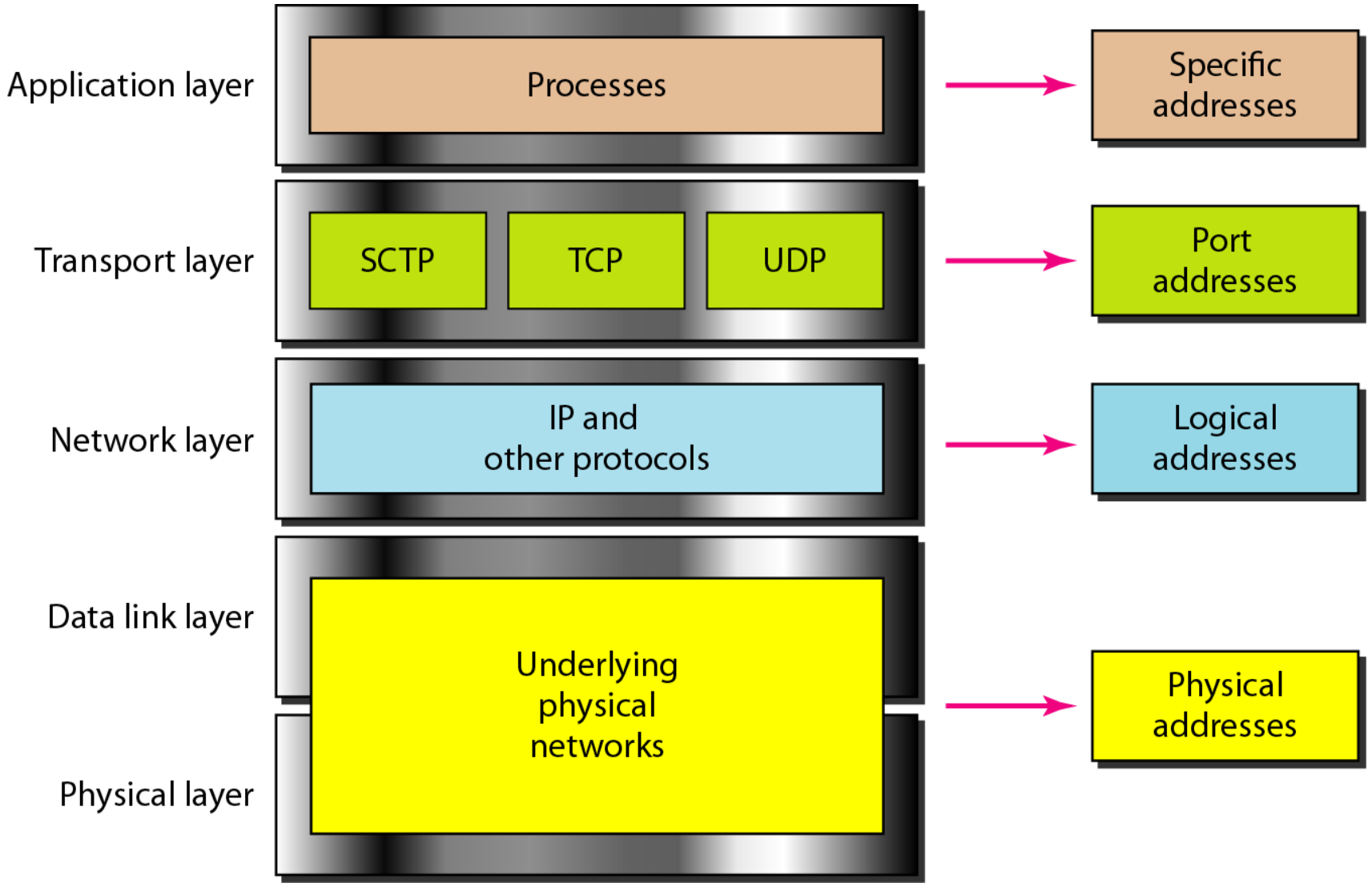
Internet Addressing

- Any communication between two parties needs two addresses at-least
  - Source Address
  - Destination Address
- Since we have 5 layers so it appears that we would require 5 addresses.
- But we only need 4
  - Physical layers does not need an address since the unit of data exchange at physical layer is a bit, which cannot have a address.

Addressing Mechanism



Relationship of layers and addresses in TCP/IP



Physical address

- Address of a node as defined by its LAN or WAN.
- It is included in the frame used by the data link layer.
- It is the lowest level address.
- The physical address have the authority over the network (LAN & WAN).
- The size and format of these addresses vary depending upon the network.
- Ex: Ethernet uses a 6 byte (48 bits) physical address that is imprinted on the network interface card.

Example of Physical address

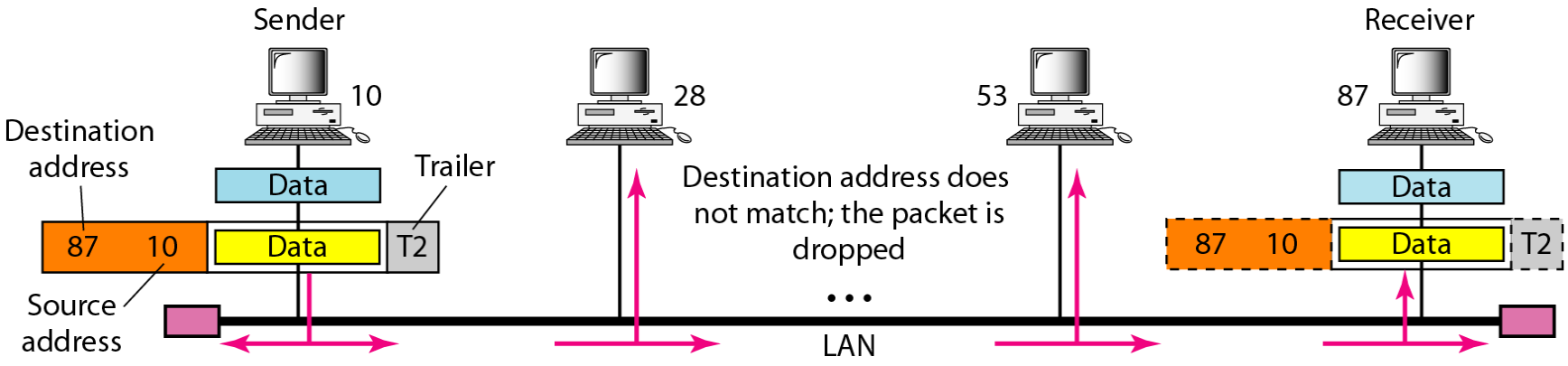


Figure: A node with physical address 10 sends a frame to a node with physical address 87. The two nodes are connected by a link (bus topology LAN).

Logical addresses

- Physical addresses are not adequate in an internetwork environment where different networks have different address formats.
- A universal addressing system is needed in which each host can be identified uniquely, regardless of the type of physical network.
- The logical addresses are designed for this purpose and they are independent of physical network.
- A logical address in the internet is currently 32 bit address that can uniquely defined a host connected to internet.
- No two publicly addressed and visible hosts on the internet have same IP address.

Port Address

- The IP Address and the physical address are necessary for a quantity of data to travel from a source to the destination host.
- However, the arrival of data at the destination is not the final objective.
- Computers are devices that can run multiple processes at the same time.
- For theses processes to receive data simultaneously, there is need of method to label the different process.
- **function of addressing a particular process is called as port addressing.**
- A port address in TCP/IP is 16 bits in length.

Specific addresses

- Some applications have user friendly addresses that are designed for that specific address.
- The example includes the email address (for eg. abc@xyz.com) and the universal resource locator (URL) (for eg. http://www.google.com).
- The first defines the recipient of an email and the second is used to find the information on the world wide web.
- Both are different processes so they will have different port addresses.