

# Networking Fundamentals

## Network Devices

### Hubs

Layer 1 devices

Considered dummy devices.

A real concern to data privacy.

Forward all traffic to all ports.

### Bridges

Forwarding layer 2 frames and broadcast traffic.

They do the forwarding using layer 2 MAC addresses.

They have limited amount of ports.

Segment collision domains

Segment collision domains

Forward layer 2 frames and broadcast traffic.

They do the forwarding using MAC addresses.

### Switches

More ports are available. Modular switches supports hundreds of ports.

They might also be layer 3 devices and segment broadcast domains.

Forward traffic based on IP addresses

They have routing tables

### Routers

Work at layer 3

Segment Broadcast domains

## ARP (Address Resolution Protocol)

Works at layer 3

ARP finds the hardware address, also known as Media Access Control (MAC) address, of a host from its known IP address

## Types of communication

Unicast

1 to 1

Broadcast

1 to all

Multicast

1 to many

## Network Addressing

### Layer 2 Addressing

Known as MAC Addresses

Identify the stops made along the way

Change with each stop on a layer 3 device

Known as Logical addresses (IP addresses)

### Layer 3 Addressing

Identify the communicating endpoints

They do not change (unless a NAT device is present)

## Types Of Network

LAN

WAN

## OSI Model Layers

Application Protocol Data Unit (PDU): Data

Presentation Protocol Data Unit (PDU): Data

Session Protocol Data Unit (PDU): Data

Transport Protocol Data Unit (PDU): Segment (if using TCP) or datagram (if using UDP)

Network Protocol Data Unit (PDU): Packet

Data Link Layer Protocol Data Unit (PDU): Frame

Physical

Operates at the first 2 layers of the OSI model.

It is considered a LAN technology.

Defines the frame format

Deals with physical characteristics such as the speed and the types of cabling.

## Ethernet Protocol