Networks Basics

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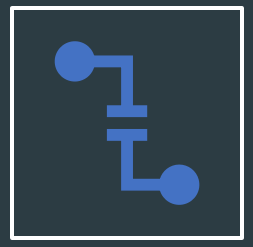
By HackitTech

What is Internet

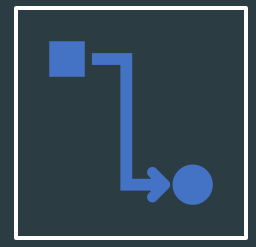
- Interconnection of Multiple Networks
- Over 4.5 Billion People are using internet in 2020

What is Network



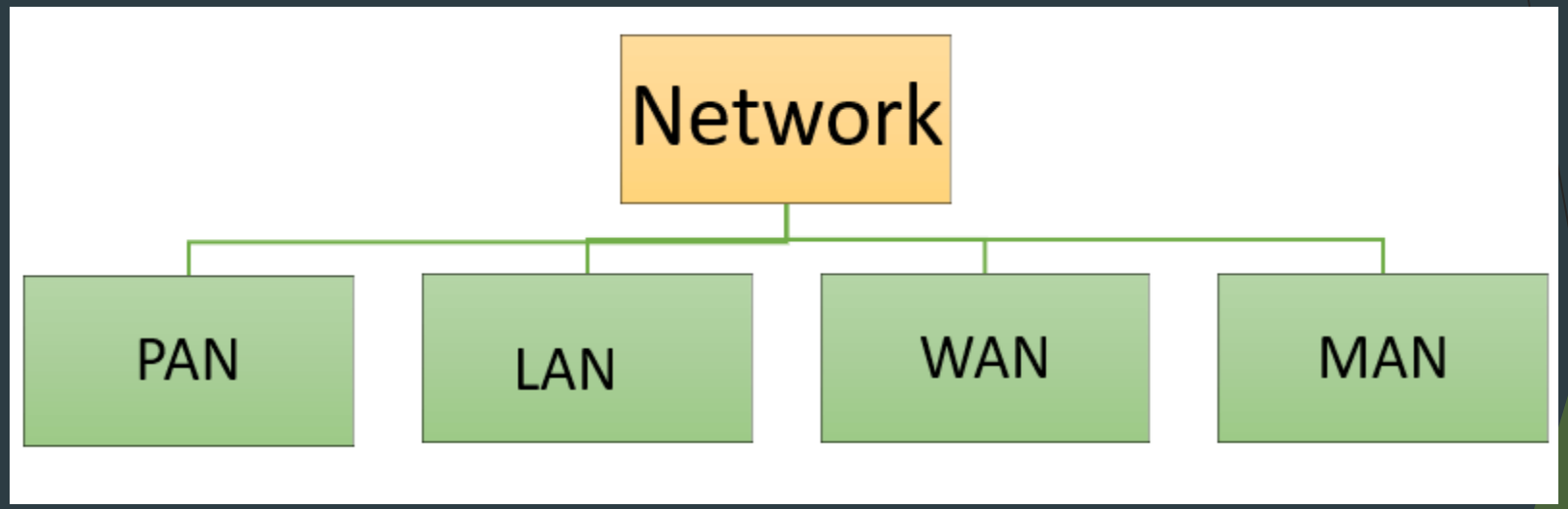
Interconnection of more than one node(Computer devices) connected to form a network.

To share Data



To interconnect us

Type of Network



IP Address

- A unique Identification number to each Device connected to the Internet
- Internet – Interconnection of Devices to Share Data and Services.

  Eg. 192.168.0.1
- 32 Bit IP Address
- Each Octet Carries 8 Bit
- Totally there are 4,294,967,296

  - 0.0.0.0-255.255.255.255

IP Address Classification

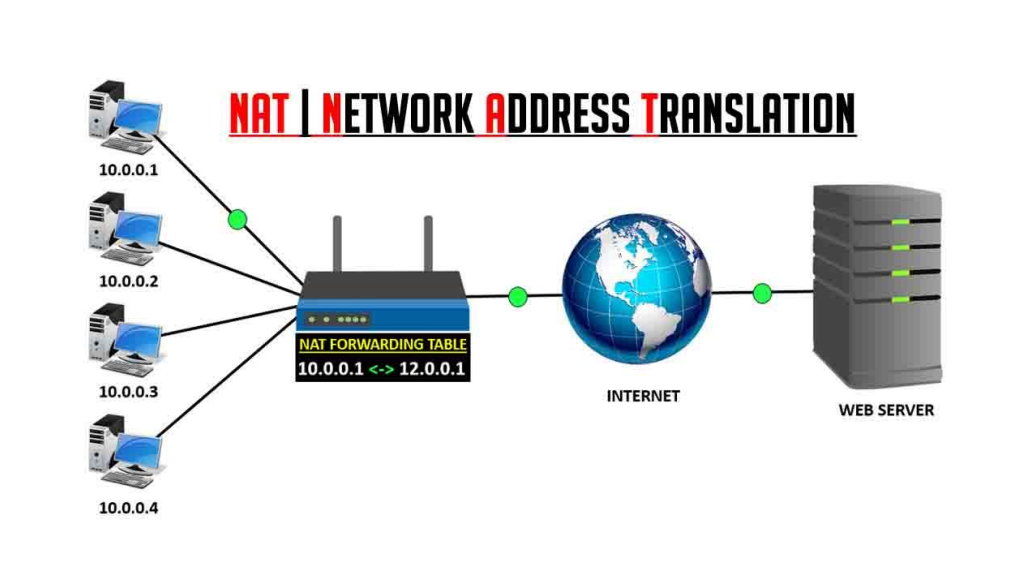
Class	Address range	Supports
Class B	128.1.0.1 to 191.255.255.254	Supports 65,000 hosts on each of 16,000 networks.
		multicast
		Reserved for future use, or research and development purposes.

Public and Private IP Address

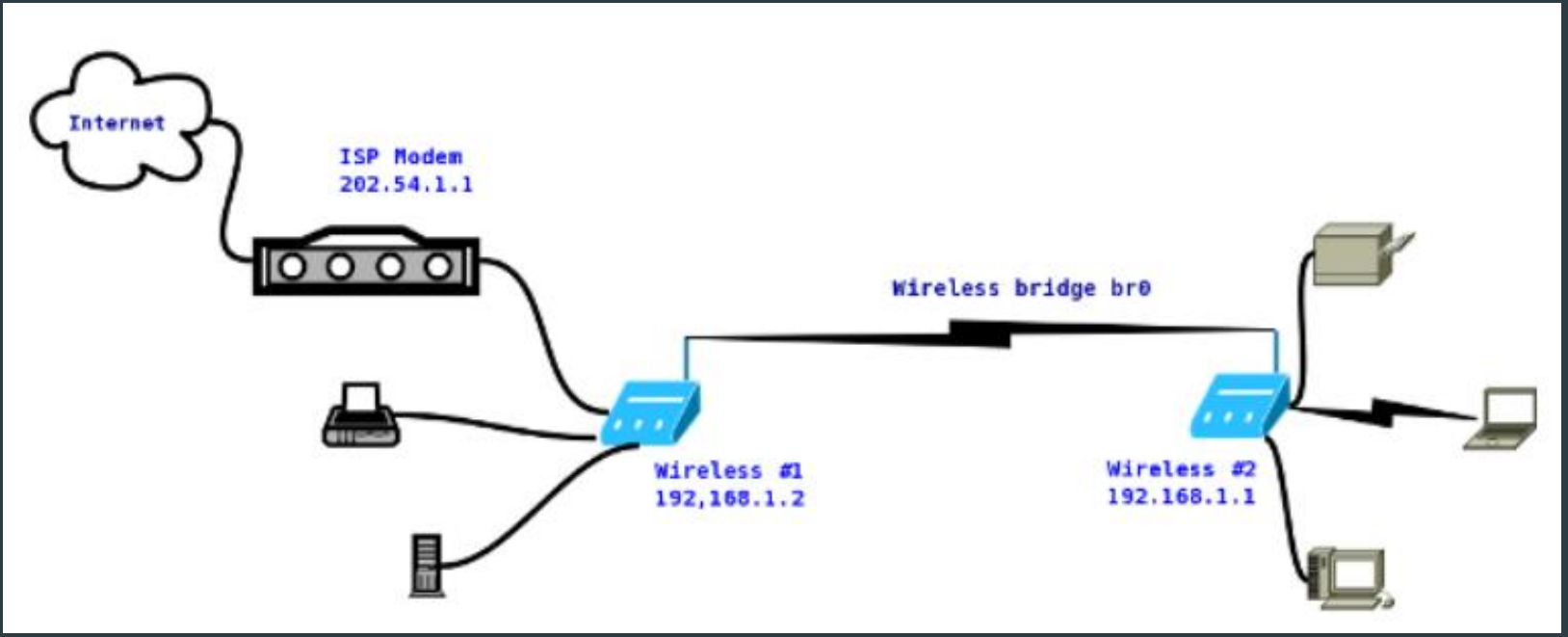
- Public IP address are Static
- Private IP addresses are Dynamic
- DHCP
- NAT

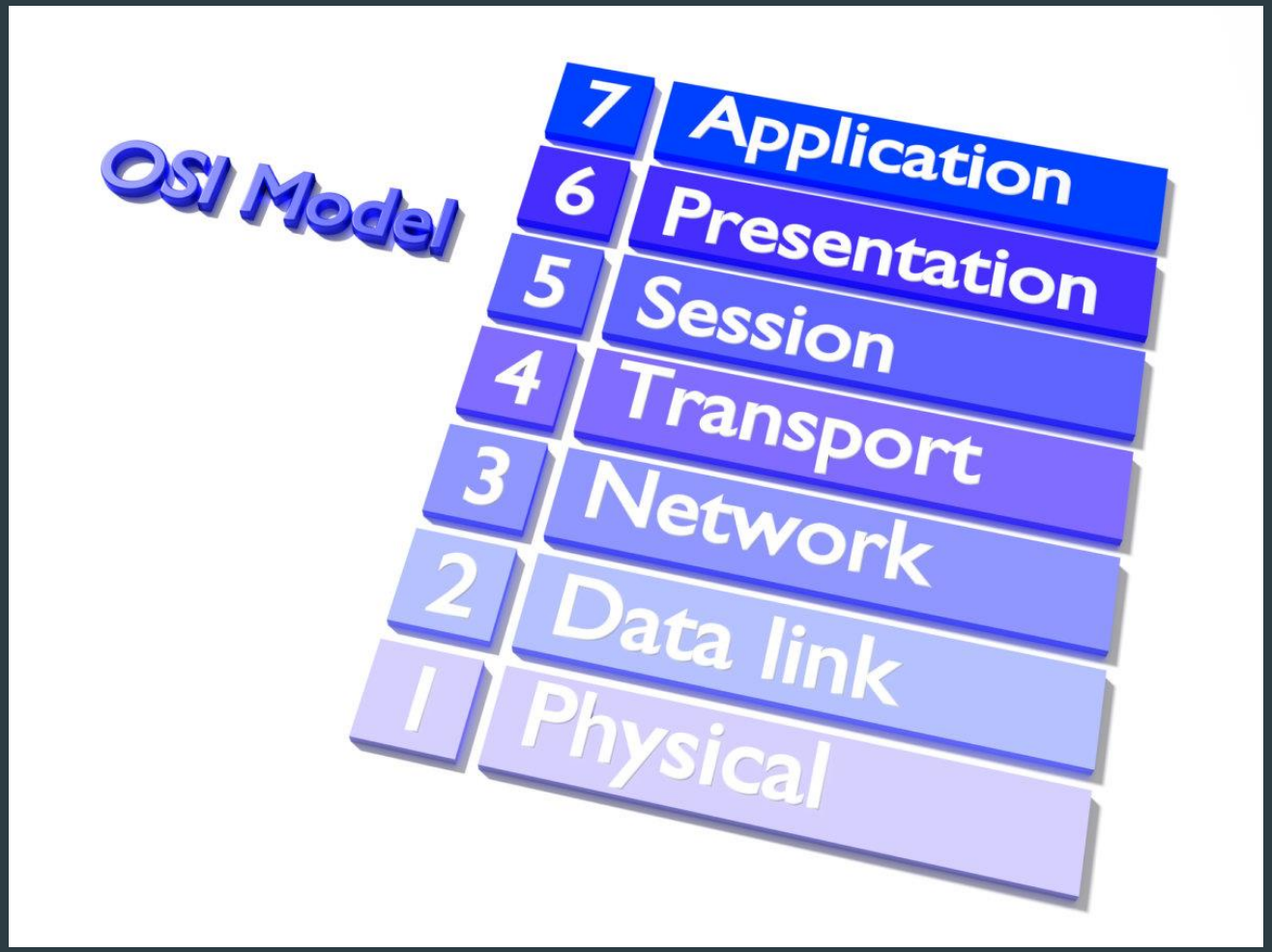
NAT

- Network Address Translation
- Translation of one Set of IP address(Private) into another one(Public)
- Mainly to connect internal network with internet



Bridged Vs NAT




OSI Model
7 Application
6 Presentation
5 Session
4 Transport
3 Network
2 Data link
1 Physical

APPLICATION LAYER

- Where your Applications like browsers and other web applications work to perform a specific task
- Protocols like: http, ftp, telnet.

Presentation Layer

- This layer is responsible to Give the user the data in exactly the same way what he wants to receive
  - Texts, Pictures and Graphics.
- Translation, Compression, Encryption
- This is where our data got converted into Bits.

Session Layer

- This is where our Session got Established with the other end Node
- Authentication and Authorization

Transport Layer

- Segmentation of Packets(Data Units)
  - Sequence Number, Port Numbers
- Flow Control
- Error Control – Checksum
- Decides to choose Connection Oriented or Connection less oriented connection

Network Layer

- IP addressing
  - Source and Destination IP addresses added up to Each Segment
- Then Routing happens in Router

- TCP/IP, UDP

Data Link Layer

- It is got embedded into our NICs of our Computer
- The segments with IP address from Network layer got added up with Mac Address in here
- Thus forms a Frame.
- Then got Transferred to Transfer Medium
- Responsible For our transmission of Data to another Node.

Physical Layer

- This is where our Binary Digits converted into Signals
- To get Transferred through the Connection Cables/Wi-Fi

Subnet and CIDR

- Subdivision of a Network in to many
- When you want to allot certain IP addresses to a Department
- Classless inter-domain routing (CIDR) standard used to create unique Identifiers.
  - 192.168.0.1/24
  - 24 Indicates that out of 32 bits 24 bits has been already in use we can use only the Last Octet

Protocols

- Http1.1
- Http2
- Http3
- Https
- Hsts

Thank you