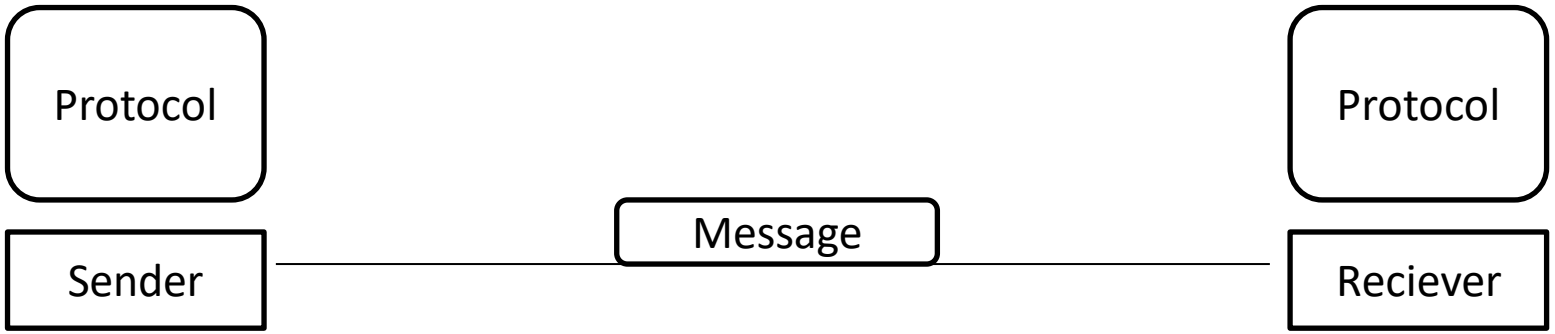
Networks

Cloudlytics

Introduction to Networking

- A network is a group of computers and computing devices connected together through communication channels.
- The computers connected over a network may be located in the same geographical area or spread across the world.

Data communication



Protocol – set of rules that govern data communication.

Without protocol they might be connected but not communicating

Network criteria

- Performance – based on transmit time and receive time
- Reliability – no of failures ; ability to recover from failure ; time required to recover from failure
- Security – protecting from unauthorised access of data; damage to data

Categories of network

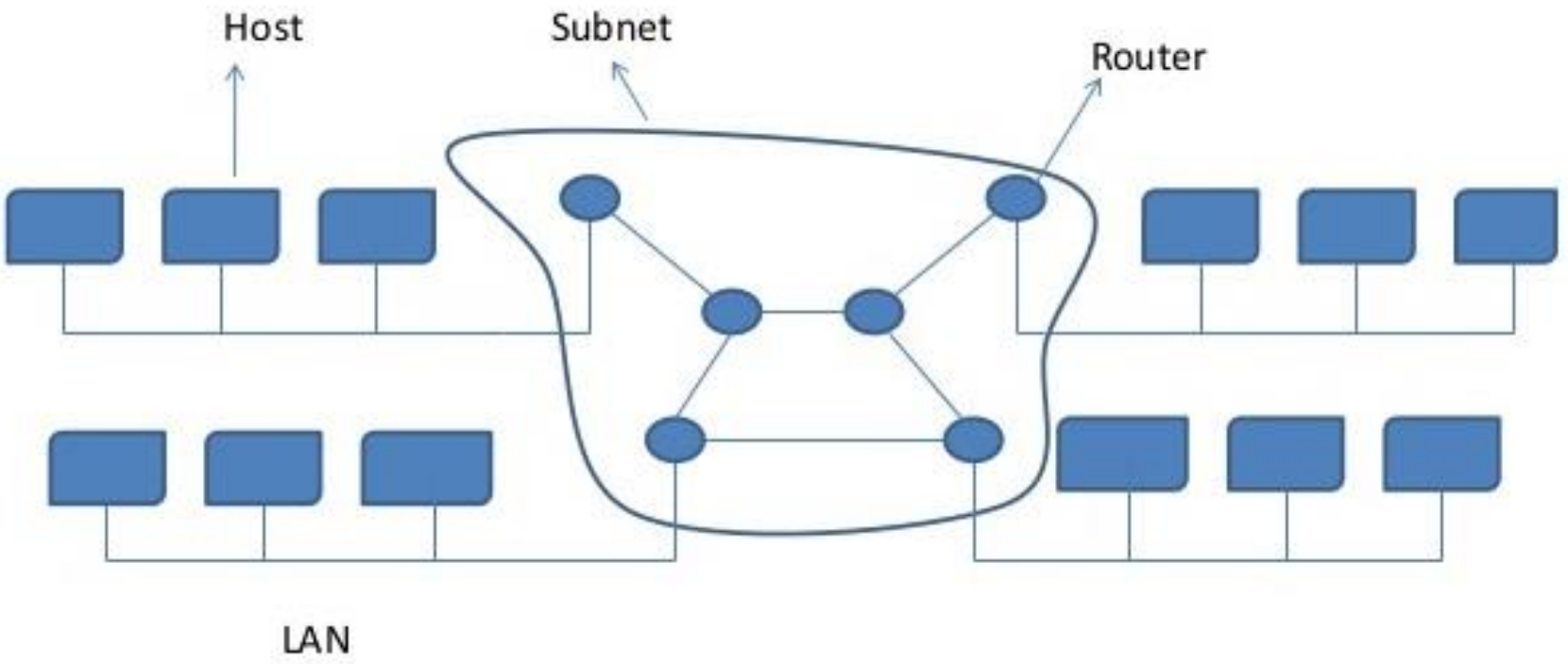
- LAN – privately owned nw
  - limited distance of connectivity
  - used to share resources (both hw and sw)

Categories of network

- WAN – Wide area network
  - spans large geographical area
  - consists of machines (hosts) connected by communication subnet or just **subnet**
  - hosts are owned by users; subnet by ISP
  - work of subnet – carry message from host to host

Subnet

1. Transmission lines – moves bits ; made of optical fibre, copper wire, radio waves
2. Switching elements – specialised computers that connect 3 or more transmission lines. Named as - Router


Host
Subnet
Router
LAN

Categories of network

- MAN – Metropolitan Area Network
  - covers an entire city
  - Eg : cable Tv network

Devices

- Hub
- Bridge
- Switch
- Router

IP Address


IPv4
IP Addresses
IPv6
Uses 32-bits
Only 4.3 billion unique addresses.
Uses 128-bits
allows 3.4 X 10^38 unique addresses.

IPv4 Address

	Octet 1	Octet 2	Octet 3	Octet 4
Class A	Network ID	Host ID	Host ID	Host ID
Class B	Network ID	Network ID	Host ID	Host ID
Class C	Network ID	Network ID	Network ID	Host ID
Class D	Multicast addresses			
Class E	Reserved for future use			

Domain Name System

- Name resolution : **Name Resolution** is used to convert numerical IP address values into a human-readable format known as the **hostname**.

- DNS

Commands

- $cat /etc/hosts
- $host google.com - lookup host using DNS
- $nslookup google.com - lookup nameserver interactively
- $dig google.com - lookup domain name information from nameserver
- $ping <*hostname*> - ping is used to check whether or not a machine attached to the network can receive and send data; i.e., it confirms that the remote host is online and is responding.

- $route - give routing information
- $traceroute <*hostname*>
- $ethtool eth0
- nmap
  $sudo nmap –A –T4 google.com
  $sudo namp -sP 192.168.0.1/24
- $tcpdump –i eth0
- $iptraf

Points to remember

- Public Ip vs Private Ip
- Public DNS vs Private DNS

Thank You

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