Computer Networks:-

Client server model

Protocols are the security for data transfer

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How to data transfer?

Computer understands only 0 and 1s

Data transfer in form of packets

Ip link with some name called domain name for accessing globally which are unique.

Curl ipconfig.me -s

Modem connected devices are linked with same ip address globally and unique local ip addresses using dhcp protocol.

Diagram

Description automatically generated

Using nat the modem knows who sent request and waiting for response.

Which application from device make a request can be known through port number .

This port helpds in finding applications.

Port number is 16 bit number represention,total port number thart are possible with 16 is 2^16

Webpages are using http done in port no 80

Mongodb is on port 2707

Ports from 0-1023 are reserved port in manchine.

1024-49152 are reserved for some applications.

The remaining ones we can use.

Isp will connect our machine with entire internet.

Speed of internet:

1mbps=mega bits per seconds=1000000 bits/sec

1gbps =10^9 bits/sec

1kbps=10^3 bits/sec

Download vs upload.

Communication between two computers are can be established by two ways: guided(wires) and unguided way(Bluetooth,wifi)

Physically they are connected through Wires are running under ocean int that way all countries are connected ,spo that way our internet is so fast (submarine cable).

Using optical cables,coaxial cables

Wireless: radio channels,blur=etooth,wifi,3g,4g lte,5g

Why cant we use satellite because these are fast in action so we use cables.

Lan -local area network (small house or office in an area) through ethernets need a network adapter,wifi box.

Man-metropolitian area network is across countries.

Wan- wide area network use to connect across countries using optical fibres using Synochronous optical network(Sonet),frame relay (lan to wan connection).

Internet is combo of these three .

What is modem:used to comvert digital to analog data.

Router routes the packet .

Tata is largest isp in india and the airtel etc;

How to compurters are connected using topologies:-

1.bus topology(one person can send data at one time and back bone wire breaks communication stops)

2.ring topology( intermeduiate data accessors are present in ring topology and one of the connection breaks communication stops)

3. star topology(center device which all other devices are connected ,this is the centrailized devices)

4.tree toplogy ( combination of a star and bus topology)

5.mesh ( every single computer is connected with every single computer ,it is very expensive and scalability issues etc; )

Structure of the network

1. Application layer( which is ui how to use application)

Osi model(how intenet works)

Open systems interconnection model

1. application

2.presentation

3. session layer

4.transport layer

5.network

6.datalink

7.physical layer

Application layer is implemented in software-> sent data from application to presentation layer in form of words and characters and sentences.

Presentation layer converts to binary(translation ) enconded ,encrypts the Data provides the abstraction,compresses the data lossy or losslkess depend on application.(ssl layer)

Then to session(authentication and authorization happens connects session followed by termination)->data packets etc;

Transport data using protocols (segmentation(port,seq,flow control,eror control,check sum,source and des tip address) tcp(acknowledgemt from receiver like gmail) and udp(like video conferencing).

Router lives in network layer,logically addressing this assigns source and dest address for every segmentation and make it as data packet)dijikistras algorithm ,load balancing

Data link layer receive packet from network layer

A piece of paper with writing on it

Description automatically generated with medium confidence

Physical addressing(mac addresses(12 digit alpha-numeric of network interface of computer) assigned to packet to form a frame)- data unit of data link layer

Physical layer have a hardware contains wires data in the form of 0 and 1 s.