Computer Network

Chapter 1

Communication links and packet switches

Routers and link layer switches

Link- layer -> Access networks

Routers -> network core

Each system access the internet throuh Internet Service provider

Each ISP is in itself a network of packet swirtches and communication links

Application Programming interface (API) It is a set of rule the the sending program must follow so that the Internet can deliver the data to the destination program

Hone internet access

4 types

DSL

Cable

Ftth

Dial up

Satellite

Digital subscriber line

Receives from the telephone company

Standard is 12MPBS down adn 1.2 up .

IT IS AYMETRIC

Short distances

Cable

TV

Fibre and coaxial cable

Download and upload mcuh higher than DSL

FTTH

Fibre to the home

Optical fibre

Physical medium :

Guided and unguided

Guided is by wires or soemthing like that

More like wifi or something liek that

Packet switching

All about exchanging mesages

Data is split up itno packets before being wsent

L bits is total amount of data and

R is the rate at which the data is being sent

Time taken for the data to be sent

= L/R

Store and forawrd transmission

It is not forwarded immideitly

It downloads the entire data before forwarding

Also known as Buffering

Packet forwarding

Hwo does the computer know what and which packet to reciecvve

Based on IP address

Then every router has a forwarding table that maps the destination device

Two types of moving data

Circuit switching

Packet switching

Circuit switching

First he connection is established

Bona fide or real connection

So messages are transferred at a constant rate.

It is implemented with either frequency division multiplexing or time division multiplexing

Circuit switching

So if each link between adjacent switches has a transmission rate of 1 mbps then each end to end circuit switch connection gets 250 kbps of dedicated transmission rate (each link has 4 circuits)

TDM

Transmission rate = frame rate \* NUMBER OF BITS IN A SLOT

Tdm with 24 slots and bit rate 1.536 Mbps

So we need to check how much data can be transferred in one slot or circuit so that would be

1.536 / 24 and - 64 kbps

Suppose 1 Mbps

Each user alternatives the period of activity. 100 kbps and period of inactivity

User is active 10 % of the time

10 time slots of 100 ms each every user would be allcoated one time slot per frame.

Packet swithcing is more convienient since, say if there are 35 users the probability of all being active is very low

Types of delay

Nodal processing delay

Queuing delay

Transmission delay

Propafation delay

D (end to end )= N (Dproc +D trans + d prop)