BCS41
Networking by Ankit Kumar

Digital computer

1. Discontinuous data per kam karta h
2. Ye binary digit ko counting aur adding karta hai
3. Yah data ko binary format mein represent karta hai zero aur 1
4. Yah jyada accurate aur reliable hota hai
5. Ismein data pulses ki form mein flow hota hai

Analog computer

1. Yah continuous data per kam karta hai
2. Yah electrical signal ko measurer karta hai
3. Yah data ko physical quantity Current mein represent karta hai
4. Yah accurate nahin hota hai
5. Ismein data sign wave ki form mein represent hota hai

ex. sui wali clock

AMPLITUDE MODULATION

Amplitude modulation ek tarah ka wireless communication technique hai
jisme signal ka amplitude vary hota hai
taki data transmit kiya ja sake.

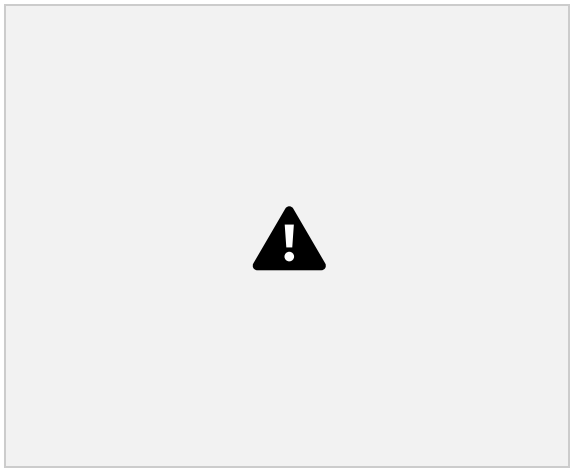
1. Yah simple hota hai
2. Isme better sound quality hoti h
3. Noise immunity ghatia hoti hai
4. Signal to noice radio badiya hota
5. Iska modulation index varies 0-1 hota hai

PHASE MODULATION

Phase modulation ek communication technique hai
jisme signal ke phase ko modify kiya jata hai
data ko encode karne ke liye.
1. Yah complex hota hai
2. Isme ghatia sound quality hoti h
3. Noise immunity badhiya hoti hai
4. Signal to Noise radio ghatiya hota hai
5. Iska modulation index varies 1 se bada hota h

Features of ATM switch

ATM Asynchronous Transfer Mode एक नेटवर्किंग process है
ek high-speed networking technology hai
jo data ko fixed-size cells mein transmit karta hai
जो डाटा पैकेट को ट्रांसफर करने के लिए use Kiya jata h



1. Cell switching

cell switch ek electronic device hai

jo wireless network mein devices ko aapas mein connect karta ha

aur data transfer ko manage karta hai.

2. Virtual circuits

Ye virtual Circuit ko support karta hai

Jo connection oriented communication ke liye hota hai

Isse data delivery reliable hoti hai

3. Qos quality of service

ek network ke traffic ko prioritise or manage karne aur optimize karta h

4. Traffic Management

network par chalne wale data ko behtar tarike se manage karna
taki network ki performance aur efficiency badh sake.
Network congestion ko kam karna
Network security ko badhana
Application performance ko optimize karna

5. Security

Unauthorised access aur data breaches se bachata h

security measures implement karta hai

Yah feature sath milkar pahle tele communication networks me high speed, multimedia data

traffic ko efficiently manage karne me madad karte h

Y 3G network

3rd generation network मोबाइल network technology h

फोन पर वीडियो कॉलिंग और इंटरनेट ब्राउजिंग जैसी चीजें करने के लिए तेज इंटरनेट स्पीड प्रदान करता है

3g ki speed 2mb / sec hoti h, 2g se fast h

fast internet, video calling, broadband, global roaming

Y lan

adv: information aur data ko high speed exchange kar sakte h
dis: cost jyaada h
Ex. school, house, building

Y Man

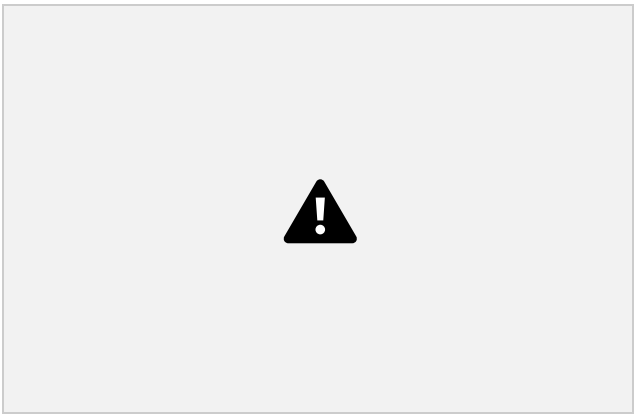
Ex. state-delhi,

Y Wan

adv: computers ko longest distance k bawjud internet se aasani se communicate kar sakte h

dis: cost bhot jyaada hoti h
network ko maintain karna difficult h
low security compared to lan and man
Ex. country, satelite,

C. What is tcp's sliding window explain silly window syndrme with the help of a diagram :



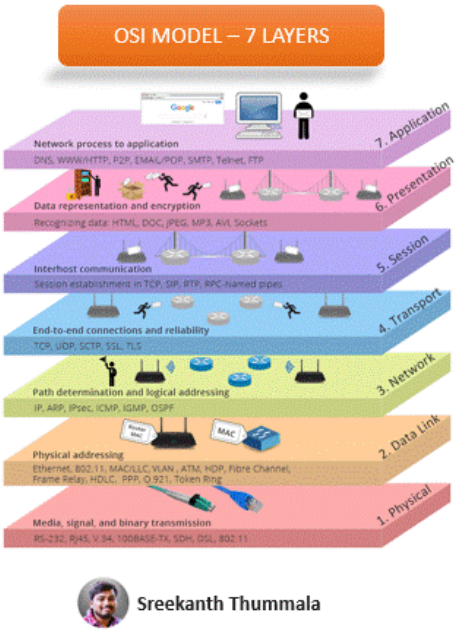
Y TOPOLOGY
1. ek network k process ke arrenagment ko describe karta h
2. ye batata h ki kese devices ek dusre se conncted hote h
STAR
isme multiple devices ek central hub ya switch se connect hota h
har devices directly hub se connect hota h
RING
1. me har device apne nighbours se directly connected hote h forming a close loop
2. har device sirf apne directly neighbours se communicate karte h
3. aur information ek hi direction circle path me flow hoti h
MESH
1. har device ko multiple connections se interconnect kiya jata h

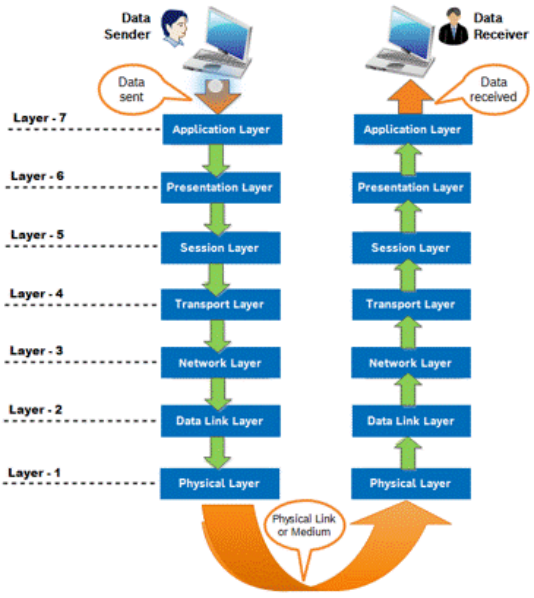
2. taki agar koi connection fail ho jata h to dusre alternate router ka istemaal ho
BUS
TREE
HYBRID

C IGMP (Internet Group Management Protocol)

Osi model

1. Ek open system interconnection model hai
2. Yah Ek conceptual framework hai, protocol h
3. Jo communication protocols ko 7 Leyers me organised karta h
4. Computer system ke bich mein data ko exchange karne ke liye use Kiya jata h
5. Network system ke function ko describe karta hai
6. Osi model mein Sevan layers hote Hain





1**. Physical**

jo hardware devices jese cables aur signals jaise चीज़ों se data ko ek devices se dusre device par transfer करता है.

Ethernet, usb, dsl, isdn

2. Data Link

application, software, website ki information ya data को स्टोर और मैनेज करता h

Mac, atm, hdml, frame relay

3. Network layer

डाटा पैकेट को एक नेटवर्क से दूसरे नेटवर्क में data भेजने का काम करता है।

Ex. ipv4, ipv6, icmp, arp

4. Transport

networking me applications k beech me reliable data transfer karta h

ek jaghe se dusri jaghe par

End to end communication aur data integrity ke liye responsible hai ismein data transfer ke liye udp aur TCP use Kiya jata h

Ex. jcp(connetion oriented), udp(connection less)

5. Session

applications के बीच communication sessions manage करता है

Yah data exchange aur synchronization ko control karta h

Rps, tls, scp

6. Presentation

Network data ka translator होता है जो applications ko data samjhakar communication karta h

Ex. jpg, png, gif, ascii, css

7. Application

Jo aapke web browser aur email jaise software को network se communicate करने mein madad करता है

Ex. http, ftp, smtp, nfs, telnet

TCP/IP Model

communication protocol hota h inernet par computer networks k liye data transmission ko handle karta h

network devices ko interconnect karta h

4. application layer

ex. http, telnet, ftp, smtp, dns, snmp

3. transport layer

ex. udp, tcp

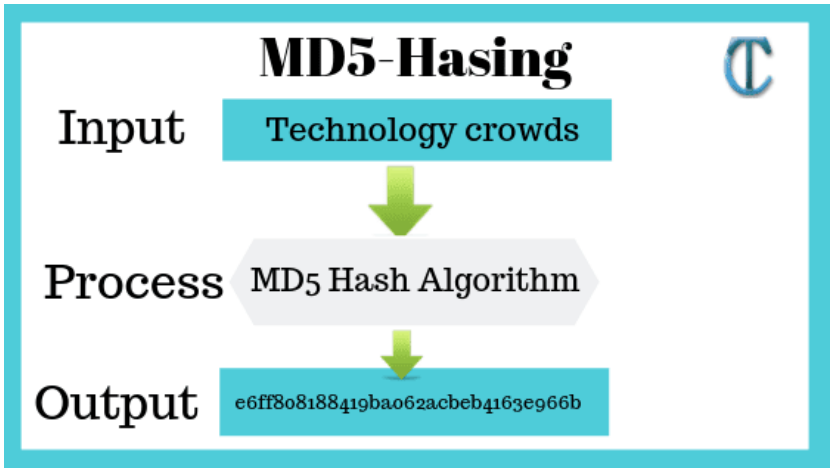
2. network layer

ex. network interface
1. network access layer
ex. network interface

DIFFERENCE
OSI model is a 7-layer wala framework hota h
jo network par data communication ko batata h
TCP/IP is a 4-layer wala protocol suite hota h
jo internet par data communication karta h

Md5 digest

Message digest algorithm 5
1. Ek hash function h
jo input data 128-bit, 16-byte ko hash value me convert karta h
2. Ye Data integrity ko verify karta h
3. Ye password ko store karta h
creating process Md5 digest -

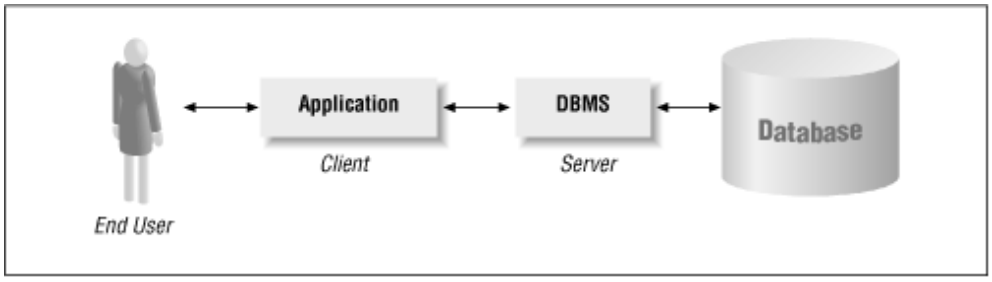


C 1. Initialization
Isse A,B,C,D aur specific constant value se denot karte Hain
Isme 32 bit ke 4 variables initialise karte Hain
2. Padding
Message ko 448 mod 512 ke length tak badhane ke liye pading add karte h
een. Pading mein original message ka length Shamil hota hai
3. Processing in block

Padded message ko 512 bit blocks mein break karte H
Har block ko bitwise operator, logic functions or constants ka use karke process karte h. ABCD ko update karte Hain
4. Final output
ABCD ke final values ko concatenate karke 128 bit md5 digest hasil karte Hain
5. Md5 ko cryptography purpose ke liye insecure Mana jata hai
Aur sha 256 Jaise strong hash functions ka istemal security sensitive applications ke liye recommend hai

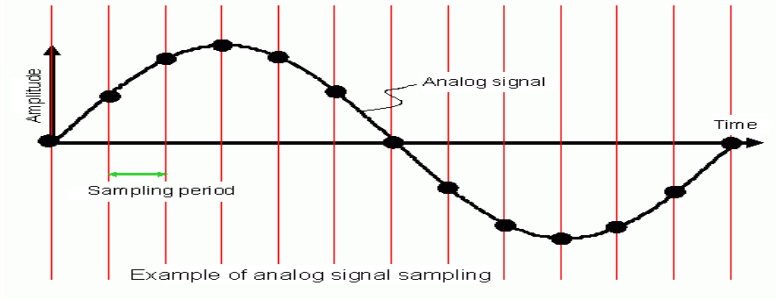
Y Client server database ya 3 tier application

3 tier application ek aisi application hoti h jisme layer hoti h
PRESENTATION LAYER
ui
APPLICATION LAYER
Application, website
DATA ACCESS LAYER
Data access, database
ex: online store ki details
presen - website
applica - order processing k liye code
data access - database



Sampling done from analog Signals

1.Analog signals ka sampling ek process hai
2.jisme continuous analog signals ko discrete digital signals mein convert kiya jata hai regular intervals par signal ki amplitude ko measure karke.
3. Ye measurements discrete points banate h
4. jo signal k values ko specific moments par represent karte h
5. Jisse digital system me asani se process aur store Kiya jata h

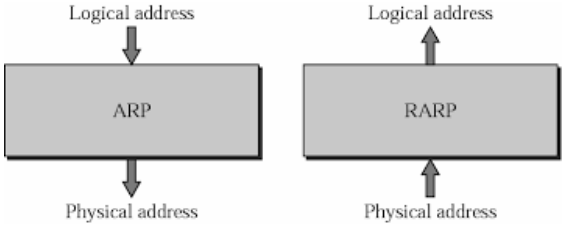


ARP

1. Address resolution protocol
IP address ko mac adress mein convert karta hai
2. Jab ek device dusre device se communication karta hain tab wo ARP ka use karte hain
3. Jise target device ko mac adress mil jata hai
4. ARP broadcast packets ka use karta hai
5. Arp table ko local host se manage Kiya jata hai

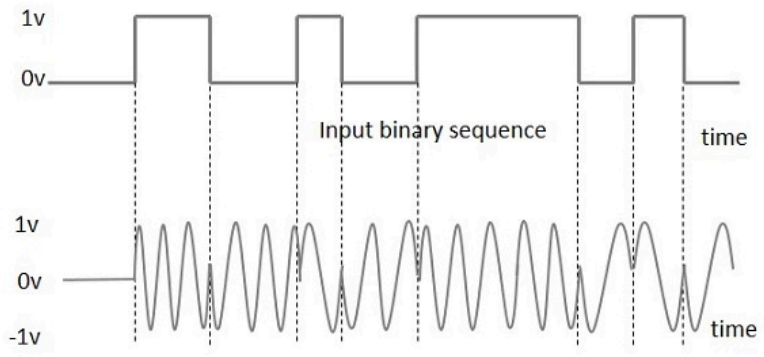
RARP

1. reverse address resolution protocol
Mac address ko IP address me convert Kiya jata h
2. Diskless workstation ya devices RARP ka use krte h
3. Jo Device apna Ip address configuration nhi kar paate wo Device apna mac address RARP server ko bhejte h jisse server unko IP address provide karta h
4. RARP unicast packets ka use karta h
5. Rarp table ko rarp server se manage Kiya jata h



Problem of PSK

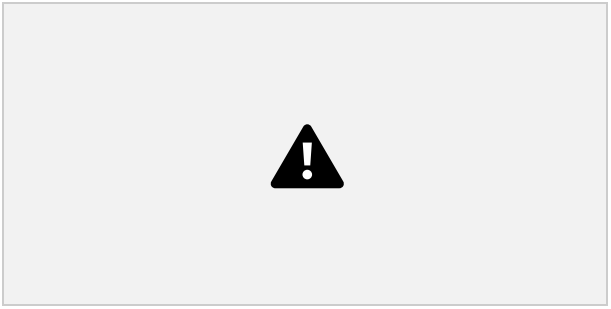
PSK (Phase Shift Keying)
ek modulation technique hoti hai
jo digital data ko transmit karne ke liye
signal ke phase ko change karti hai.
1. wireless network me PSK ka use nahin hota hai authentication ke liye
2. Agar koi bhi key leak Ho jaati hai to koi bhi network mein access kar sakta h
3. Is problem ko solve karne ke liye:
regularly pre-shared key ko update karte h
Strong aur complex password ka use karte h
Aur wpa3 additional security ka use karte h



BPSK Modulated output wave

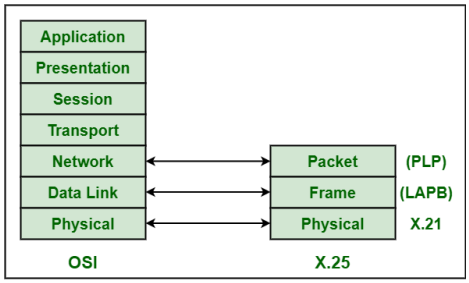
HASH FUNCTION

1. ye kisi size k data ko unique aur alphanumeric fixed size string character me transform karta h
2. ees process me ye secaure aur efficient tarika provide karta h
data ko veify, integrity, protect sensitive information karne k liye
easy to compute hota h
difficult to reverse
data integrity
password storage



X.25 architechture

1. ek packet switching protocol h
2. jo reliable data transfer karta h
3. ex: telephone lines



X.25 Layer Mapping with OSI Model

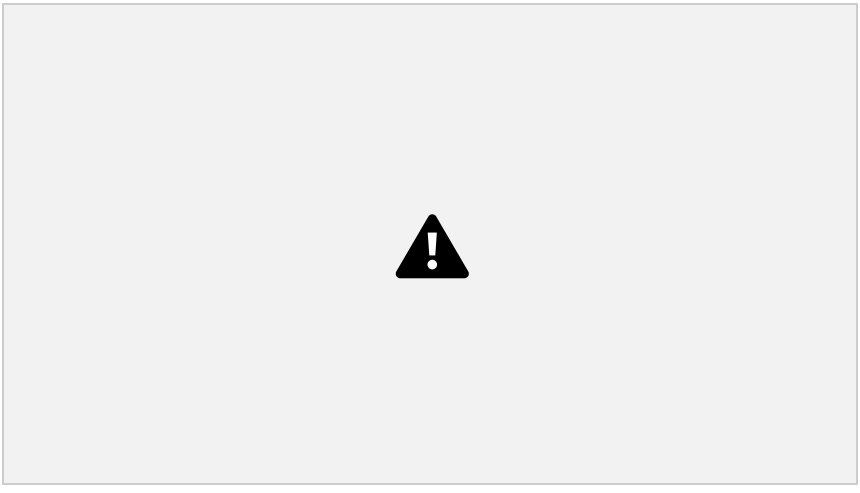
SVC

Switch virtual circuit
1. svc temprory virtual circuit hota h
4. data transfter k liye hamesha khula rheta h
5. jab data transfter complete ho jata h tab svc clear request se disconnect ho jata h
6. adv - devices k beech me pre configuration karne ki jaroorat nhi padti
7. dis - connection ko setup karna overhead hota h, har baar transfter karne par latency increase hoti h
2. har data k session ko transfter karta h
3. data ko packets me bhejta h

PVC

1. Ek permanent virtual circuit h
3. data transfter hone par khulta h

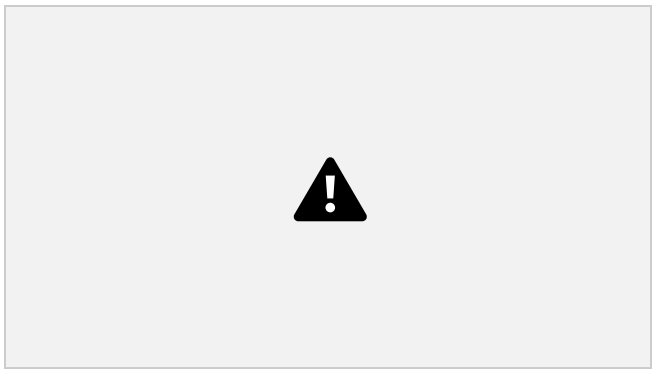
adv - isme connection setup absence hota h jisse data transfer fast hota h
dis - do devices k beech me pre configuaration require hota h jisse flexible ho sakta h - bandwidth, network capacity
2. jo phele se bana hua hota h aur lagataar juda rheta h



UTP

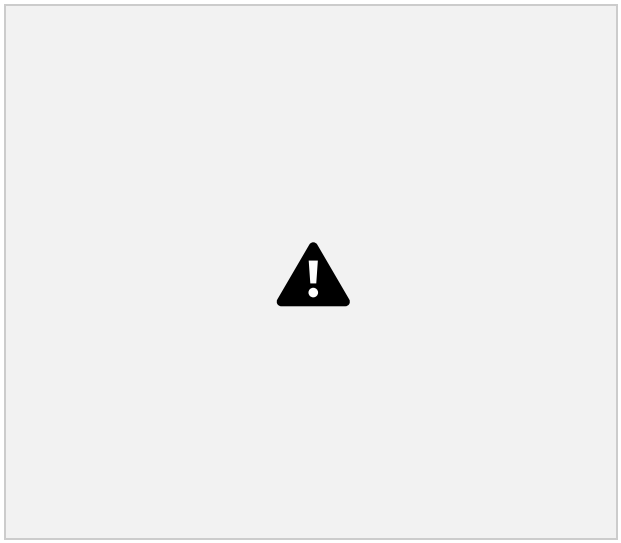
1. unshield twisted pair
2. ye computer aur networking devices ko jodta h

3. utp me do insulated copper wires hote h
4. utp cables saste hote h
5. inhe install karna aasan hota h
6. ye voice aur data ko transfter karta h
7. isme coloured wired hote h



Network management
Configuration management

1. Network ke har device ki setting ko monitor aur control karte Hain
2. Ismein track karte hain aur ensure karte Hain ki sab kuchh smooth chal raha hai
3. Network ke sab devices Jaise router switches firewall access points kaise kam karte hain yah decide karte Hain
4. Sab devices mein same settings automatic settings aur purane settings ki facility hoti h

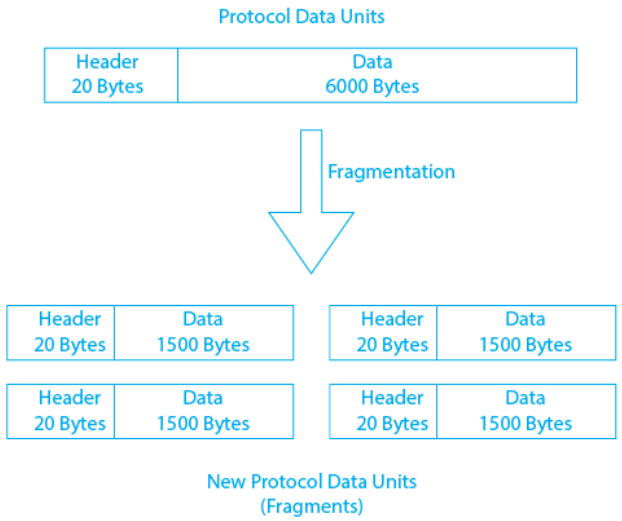


Accounting management

1. Network resources ka record rakhte Hain
2. Jaise kitni data use hui hai aur kaun sa user Kitna data consume kar raha hai
3. Ise billing aur resources allocation ko effectively manage karte Hain
4. Network use ka kharcha dekhte hain jaise bandwid charges or calls
5. Resources ka acche se use karte hain kharcha kam ho security badhati hai aage ke liye plane banana aasan

Fragmentation

1. Bade data packets ko छोटे-छोटे packets mein divide
ya Tod Diya jata hai taki data packets network mein dhang se kam Kare
2. Isse Network congestion kam hota hai
3. Ise overhead badh jata hai
4. Ise packet loss ho sakte hain



IPv4 aur IPv6 mein fragmentation

1. IP4 large packets ko chhote packets mein divide Kiya jata hai
network per transmission karne ke liye
2. Iske pass MTU maximum transmission unit hota hai
jise Mtu ke bhitar implement Kiya jata hai
Jo original packet size se Chhota hota hai

Why we use fragmentation

1. Data ko अलग-अलग network mein transmit karne ke liye
2. Network condition ko kam karne ke liye

3. Limited bandwidth ke liye

Working of Link State routing

Ek method hota hai Jahan har router network ka map share Karta hai
ek dusre ke sath jisse data packets ke liye best path calculate Kiya jata hai

1. Topology discovery

Har router Apne neighbours se connected links ka status dekhte h

2. Linked advertisement creation

Har router apna local state aur connected routers se links ke bare mein LSA banata hai

3. LSA flooding link state advertising

Lsa's network mein bheje jaate Hain taki har router ko complete topology ka pata chale

4. Database formation

5. Shortest path calculation

Dijkstra Algorithm se har router shortcut path calculate karta hai

6. Routing table construction

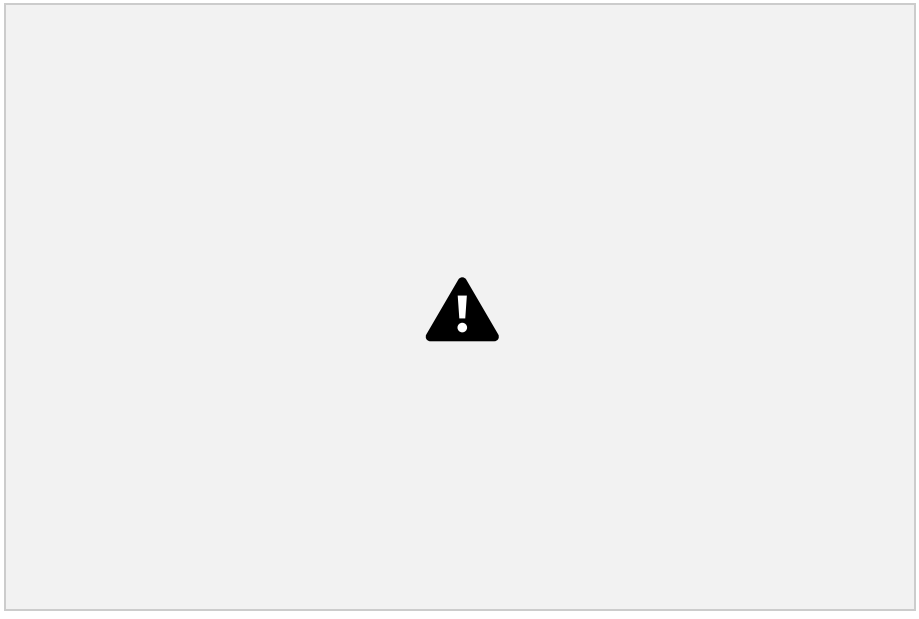
Routers shortest path se apne routing tables banate hain

7. Updating

Agar network mein kuchh change hota hai to routers Apne lsa s ko update karte Hain

computer network k advantages

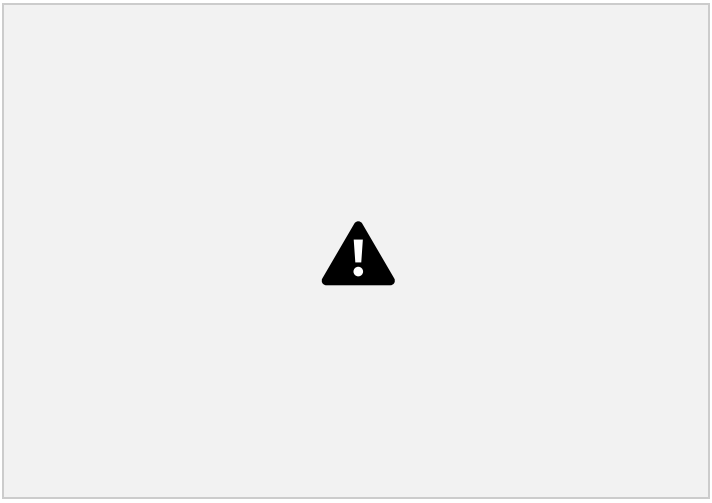
1. storage capacity jyaada hoti h
2. processing power bad jaati h
3. data aur information ko change karna aasan hota h
4. high speed
5. low cost



Leaky Bucket algorithm

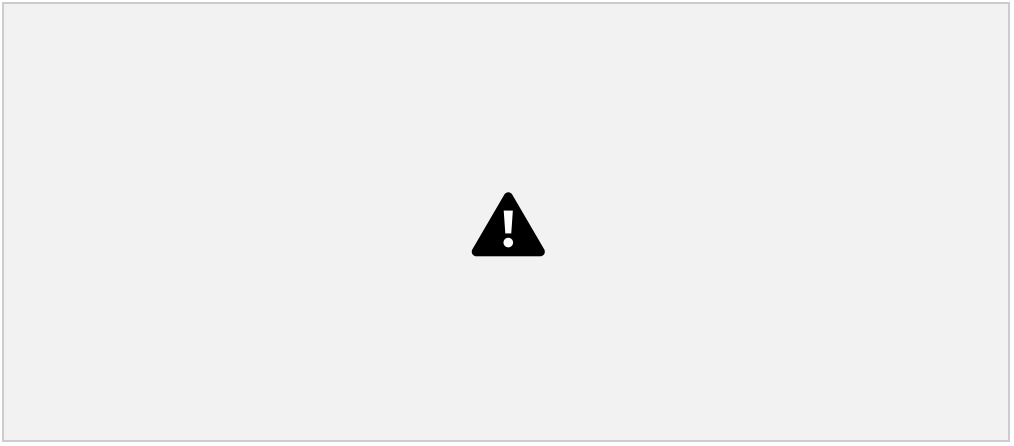
jisme data ko fixed rate se output kiya jata
Simple

Easy to understand
Jyaada data packets loss hote h
Kam adopt
ek traffic shaping technique hai
jo network congestion ko manage karne mein istemal hota hai.
Leaky Bucket algorithm ek congestion control mechanism hai
hai, jisse network congestion ko manage kiya ja sakta hai



Token Bucket algorithm

specific rate se data transmit kiya ja sake.
Complex
Hard to understand
Isme data packets kam loss hote h
Jyaada adopt
ek traffic shaping technique hai
jo network traffic ko control karne mein istemal hota hai
jisse network congestion kam hota hai
aur resources efficiently utilize hote hain.



Go back and sliding window protocol

data packets ko order mein bhejte hain aur receive karte Hain

Aur multiple data bhejte h aur error Ko control karte Hain

1. Windows concept

Networking main window concept time k period ko dikhata h
Isme sender maximum data packets ko transmit kiya ja sakta hai
traffic bhi kam hota hai
without receiving an acknowledgment

Sender aur receiver ek window maintain karte h

Jisme sender multiple data packets bhejta h

Aur Receiver data packet ke aane ka wait karta h

2. Sender operation

Sender consecutive, data packets bhejta h

aur acknowledgement(reply) ka wait karta h

Aur acknowledgement (reply) milne par window move hota h phir sender agla packet send h

3. Receiver operation

Receiver data packets ko order me recieve karta h

Aur Acknowledgement bhejta h aur out of order packets ko ignore karta h

4. Efficient network use

Sender multiple packets bhej sakta hai

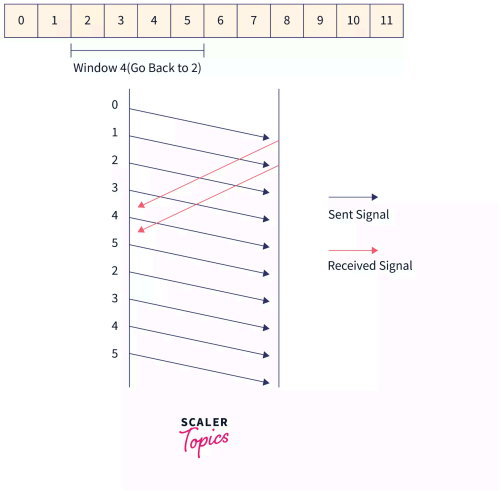
aur har data packet k aknowledgement(reply) ka wait nhi karta

5. Retransmission

Agar koi data packet lost ho jata h to sender woh saare packets dobara bhejta h which means go back karta h

6. Sliding window

Jab acknowledgement(reply) mil jata h tab window slide ho jata h jisse continuous data flow hota h



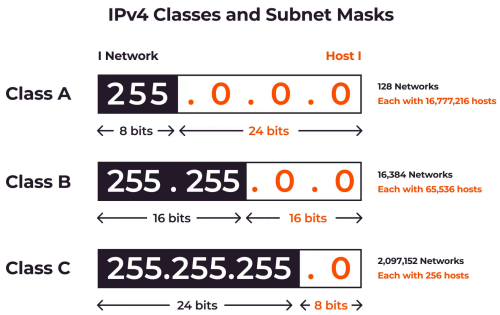
Subnet mask

ek numerical label hota hai

jo network ko chhote subnetworks me divide karta h

ek network ke andar host aur network addresses ko alag karta h

Ye 32-bit number hota hai.



Classfull address

1. IP address ko network size ke hisab se 5 classes mein divide kya jata hai

ek purana ip address system h

Ye network bits ka use Kiya jata hai

2. IP address ko fixed classes mein divide Kiya jata hai

3. Har class k liye default subnet mask use hota h

4. system mein कभी-कभी IP adress ka waste ho jata hai

5. Aur routing tables bade ho jaate Hain

Classless addressing

1. IP address ko network size k hisab divide karte h

subnet mask ka use karte h, ip address system h

Jisse ye flexible banjata h

Classless addressing classfull addressing se better hota hai

isme VLSM variable length subnet mask ka widely use hota hai

2. IP address ko fixed classes mein divide nahin kiya jata

3. Har class ko alag alag subnet mask Diya jata hai

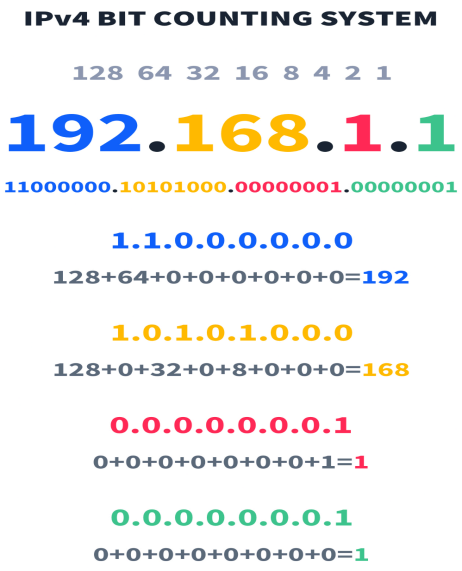
4. System mein IP adress ka waste reduce hojata

5. Aur Routing tables chhoti Ho jaati hai

Cidr

1. classless inter domain routing
2. ek ip address method h
jo ip address ko efficiently manage karta h
aur ip address k waste ko rokta h
aur internet k traffic route ko madad karta h
3. Cidr Routing tables ko shrink karne mein help Karta h

iske do methods hote Hain



1. Aggregation of routes

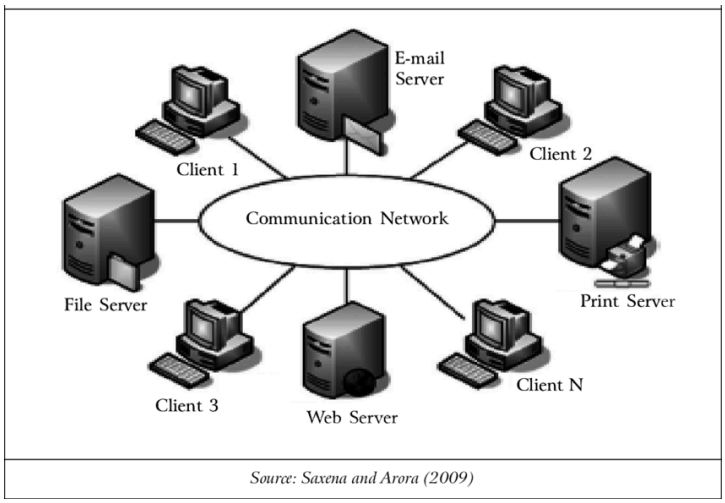
CIDr me multiple subnets ko ek simple route mein combine kiya jata h

2. Hierarchical routing

Cidr me multiple smaller network ko ek large block me combine kiya jata h

Y Computer networking

1. Computer networking ek process hai
jismein multiple computers ko ek dusre se connect hote Hain
2. jisme information ko share Kiya ja jata h
jisme data communication file sharing aur resources ko access kiya jata h



Source: Saxena and Arora (2009)

Y Features of IPV6

Vastly Larger Address Space
Simplified Header Format
Automatic Address Configuration
Enhanced Security
Improved Mobility

1. Tunning in IPv6

1. IPv6 ke packets ko iPv4 ke packets mein chhupa kar bhejta h
2. Jab kuch network devices Puri tarah se IPv6 ko support nahin karta
tab ye kam aata hai
3. IPv6 ke packet ko ipv4 ke packet mein wrape karke bheja jata h
4. Jisse ipv4 sirf router ya networks se gujarta hai
5. Ise ipv4 aur IPv6 ke network ke bich ka transition asan ho jata h

2. Dual IP stack

1. network devices me applications ya operating systems me
ip4 or IPv6 dono protocols ko support karte Hain
2. ek device same time me ipv4 aur ipv6 dono ko use karta h

3. Ipv4 se IPv6 mein smooth transition hota hai
kyunki communicate kar sakta hai
4. Ye ensure karta hai ki IPv6 ke gradual adoption ke dauran
donon version ke sath compatibility Bani rahe

Virtual circuits

1. Ek network connection hai
ismein data packets bhejne se pahle temporary pathway banaya jata h
2. Yah digital Highway hote hain
Jahan data smoothali travel karta hai
Yah logically exist Karta hai physically nahin

Router's role

Router ek traffic cop ki tarah kam Karta hai
router ka role: data ko control aur manage karta hai

Router failure

Agar router fail ho jata hai
to virtual circuit ka scene kharab ho jata hai

Traffic jam analogy

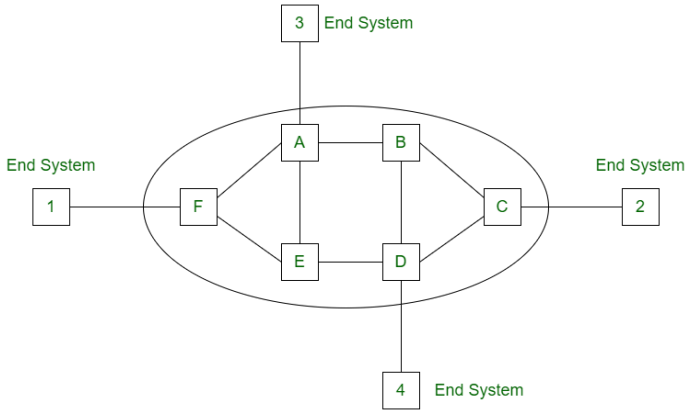
Router ki problem se data ka flow thoda sa slow ya stuck ho jata hai

Data flow effect

Isse communication mein problem aati hai
Jo data delay ya loss k Karan hota hai

Impact on efficiency

Virtual circuit ki speed aur efficiency kam Ho jati h



Difference

Virtual circuit

1. Ek connection oriented communication method hota hai
2. Pahle se define Kiya Gaya path hota hai jo data ko transfer ke liye estabilize karta h
Saare data packets ek saath kam karte h
3. Season ke duration ke liye dedicated route hota hai
4. Ise data link mein implement Kiya jata hai

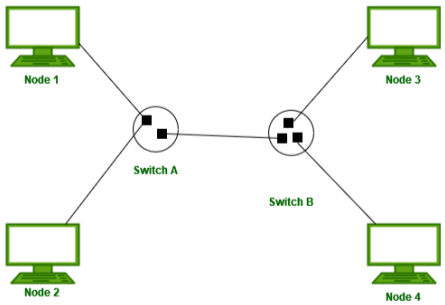
Datagram

1. Ek connection Less communication hota hai
2. Har data packet independently travel karta hai aur har packet alag route bhi le sakta hai
3. Ye network utilisation mein badhiya flexibility aur efficiency provide karta hai
4. Ise network layer mein implement Kiya jata hai

Circuit switching

ek process hota h jisme data bhejne wale और recieve करने वाले के बीच me एक stable रास्ता banaya jata h

1. Sender aur receiver ke bich mein physical connection require hota h
2. Ye more reliable hota hai
3. Har packet same route ko follow karta hai
4. Packet order mein pahunchte hain
5. Yah fixed hota hai
6.ex Telephone networks mein circuit switching ka use Kiya jata hai



Packet switching

mein data ko छोटे packets mein tod कर भेजने का तरीका hai
Yeh bandwidth ka efficient use karta hai.

1. Ismein physical connection required nahi hota
2. Ye Less reliable hota hai
3. Alag packet alag path Ko follow karta hai
4. Packets order se bahar pahunchte Hain
5. Yah dynamic hota hai

6. Internet mainly packet switching ka use karta hai
Packet switching or circuit switching se resource utilisation optimise hoti hai

TDM time division multiplexing

TDM (Time Division Multiplexing
jismein multiple data stream ya signals ko ek single communication channel par different time slots me assign karke data transmit kiya jata hai.

Advantages

1. Bandwidth ka efficient use karta hai
2. Implement karne ke liye simple hai
3. Yah cost effective hota hai
4. Ye variable users ke liye effective aur flexible hota hai

Disadvantages

1. Ismein proper synchronisation hota hai
2. Ye fix data route ko require karta hai
3. Bursty data traffic ke liye inefficient hota hai

Applications :

Telecommunications

Voice, data, video signals ko transmit karne mein use hota hai

Broadcasting

Television aur radio channels ko transmit karne mein use hota hai

Digital switch systems

Signal ko telephone exchanges mein multiplex aur demultiplex karne ke liye use hota hai

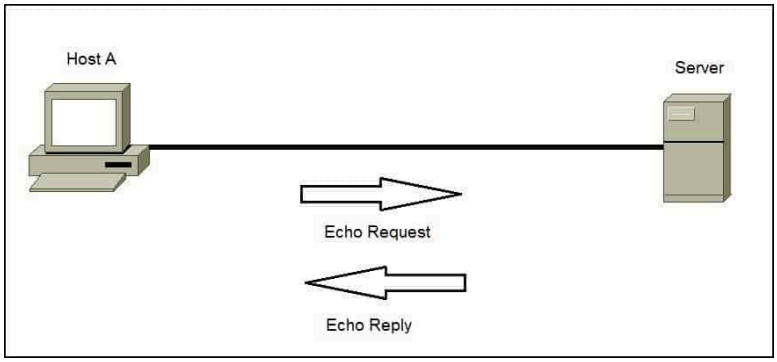
Tdma

Time division multiplexing access

ICMP Internet Control Message Protocol

1. Ek network protocol hai jo devices ko error reporting messages aur network management conditions ke baare mein jaankaari dene ke liye use kiya jaata hai.
2. yeh pata lagane mein madad karta hai ki kya data sahi tarike se phonch raha hai ya nahi.

Yah messages 2 type ke hote Hain



1. Error messages :

error messages network issues jaise destination unreachable, time exceeded, aur source quench batate hain.

Destination unreachable

destination host Tak nahin pahuncha ja sakta hai **Time exceed**

ek packet ka time to leave ya maximum hop count exceed ho jata hai

"Time exceed" ka matlab hota hai ki kisi kaam ko samay se zyada lagna.

2. Query message :

query messages network devices ke beech troubleshooting aur diagnostic information bhejne ke liye use hote h
jaise echo request aur echo reply.

Echo request ping

Iska use kisi destination Tak pahunchne k liye check karne ke liye hota h

Timestamp request

Yah recipient se timestamp mangne ki request karta hai

Y IP address

1. Internet protocol adress ek numeric label hota h

Jo network devices ko identify karta hai

2. Her device ko unique IP address milta hai jisse vo device internet ya local network mein

distinguise hota hai

3. IP address ek dusre device se communication karta hai

aur data correct destination tak pahunchta hai

4. IPv4 32 bits ka hota hai jabki IPv6 128 bit ka hota hai

RSA Rivest Shamir adleman

1. ek public-key cryptography algorithm hai

jo data ko encrypt aur decrypt karne ke liye bade prime numbers ka use karta hai

2. RSA mein encryption ke liye public key use Kiya jata hai

aur decryption ke liye private key use Kiya jata h
3. Yeh algorithm data security aur confidentiality ke liye bahut important hai
aur secure data transfer ko enable karta h
4. Ise public key cryptosystem mein widely use Kiya jata
1. Public key crypto system
Public aur private keys ka istemal encryption aur decryption mein hota hai
2. Prime factorization
Security prime numbers ke multiply ke hard per depend hota hai
3. Digital signature
Digital data ki authenticity aur integrity verify karne ke liye istemal hota hai
4. Secure communication
Data ko public key se encrypt karke sirf corresponding private key se hi decrypt Kiya ja sakta ha

What is count to infinity problem in distance vector routing protocol
1. Count to infinity problem router loop ke bich router ki vajah se hota hai
2. Ismein router ek dusre ko galat jankari bhejte rahte Hain
3. Aur infinity Tak ginti karte rahte hain
Ise solve karne ke liye kuchh points available hai :
Split horizon
Poisoning
Path vector routing

Pure Aloha

1. Ek simple wireless communicaton protocol hai
jo data packats ko random intervals par transmit karta h
jisse collision hone par data ko fir se bhejne ka try karta h
2. Ismein no time concept hote Hain
3. Ismein collisions hoti hai
4. Ismein random access hota hai

Slotted Aloha

1. Ek protocol hai
jismein devices ko data bhejne ke liye fixed time slotted ka wait karna padta hai
aur collision kam hoti h
2. Ismein fixed time slots hote Hain

3. Ismein collision reduced hoti hai

4. Ismein time synchronisation hota hai

Y Private key cryptography

Private key cryptography ek aisa encryption method hai
jisme sender aur receiver dono ek hi secret key ka istemal karte h
data ko encrypt aur decrypt karne ke liye.

1. Ek key se Sender data ko decrypt karta h aur usi key se receiver data ko encrypt karta hai

2. Yah ek secret ki hota hai

3. Data ko secure rakhta hai

4. ek key se message ko chupaya jata h aur usi key se message ko khola jata

5. ex jese tumhara personal password jo sirf tum use karte karte ho

Y Public key cryptography

jisme ek public key se data encrypt kiya jata hai aur
ek corresponding private key se decrypt kiya jata hai.
Public key cryptography ek encryption technique hai
jisme alag alag keys ka istemal hota hai
ek public key encryption ke liye aur dusra private key decryption ke liye
jo secure communication ko allow karta hai bina dono keys ko share kiye.

1. Main do alag keys hoti hai, pehli public key aur dusri private key

2. sender aur receiver donon ke pass ek key pair hota hai,

3. sender message ko encrypt kar sakta hai aur receiver private key se message ko decrypt kar sakta hai.

5. ex. jese tumhare paas ghar ki 2 chabi h ek tum apne dost ko dete ho aur ek tumhare paas h.

ye dono cryptography methods hote h jo secuare communication aur data protection me use kiya jata h

FSK Frequency shift keying

1. digital modulation, communication technique hai

2. carrier signal ki frequency ko badal kar data भेजta hai.

3. Data transmit karne ke liye frequency ko change kiya jata hai

4. 0 bit ke liye 1 frequency aur 1 bit ke liye dusri frequency use karte hai

5. Applications: cordless phones, rf remote controls

PSK Phase shifted key

1. digital modulation, communication technique hai

2. signal ki phase ko badal kar data bhejte Hain

3. data transmit karne k liye signal phase ko change kiya jata h

4. 0 bit ke liye phase change nahin hota aur 1 bit ke liye phase change hota hai
5. Application: Gps system or accurate location data

Frame relay

1. Frame Relay ek packet-switching protocol ya service h
2. long distance networks ko connect karne k liye sasta hota h
3. jo high-speed data communication ko support karta hai,
4. (LANs) ko connect karne k liye use hota h over (WANs).
5. frame relay data link par operate karta ha

IEEE 802.3

1. एक नेटवर्किंग standard है
2. ethernet नेटवर्क पर डिवाइस कैसे connect hote h और kese एक दूसरे से communicate करते हैं।
3. computer ethernet se kese conect hota h
4. ye data transmission ko control karta h

CSMA

1. stands for Carrier Sense Multiple Access
3. CSMA ek protocol hota h
2. multiple devices ko ek network par collision se bachate h
aur data transmit karne ki koshish karte h

CSMA/CD

1. stands for Carrier Sense Multiple Access with Collision Detection,
2. multiple कंप्यूटर एक ही cable पर डाटा भेजने का प्रयास करते h
aur collision ko avoid karte h
3. multiple devices ko ek network par collision se bachate h
aur data transmit karne ki koshish karte h
4. agar collision hoti h to data ko resend kiya jata h

fdm

1. FDM (Frequency Division Multiplexing) एक तरीका है
2. एक ही चैनल पर अलग-अलग फ्रिक्वेंसी पर कई सिग्नल भेजे jaate h
3. communication channel ko different frequencies me divide karta h
jisse multiple signals ko same time me carry karte h

Advantages

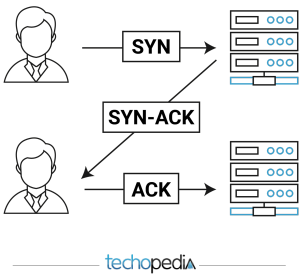
wide material support, low cost, easy to use, suitable for prototype

Disadvantages

surface quality, limited complexity, printing time, need for post processing

Three-way handshake

1. three-step process hota h
2. network par devices k beech me reliable connection ko establish karta h
3. tcp me use kiya jata h
4. connection ko establish aur terminate karte waqt communication reliable ho



Connection establishment :

Step 1 - syn

Client server ko signal bhejta hai

connection ko estabilize karne ke liye

Step 2 - syn-ack

Server acknowledge karta hai

aur ready ho jata hai

connection ko estabilize karne ke liye

Step 3 - ack

Client server ki eknowledgement confirm karta hai

aur connection estabilize ho jata hai

Connection termination :

Step 1 - Fin

Agar koi party = Client ya server connection close karna chati h

to signal bhejte Hain

Step 2 - ack

Dusri party termination request ka acknowledgement bhejta hai

Step 3 - fin

End me acknowledging party bhi connection close karne ke liye signal bhejti hai

aur dusri party ise acknowledgement karti hai

Aur connection close ho jata h

Y HUB

1. ek dumb device hota hai

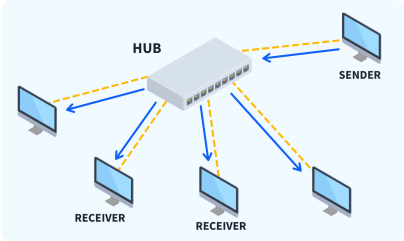
Jo data ko send aur recieve karta hai

2. Ye sare connected device ko ek saath data bhejta h

jisse network congestion badhta hai

3. hub me Traffic jyada hota hai aur Speed kam hoti hai

4. Hub thoda out dated hota h



Y Switch

1. Ek intelligent device hota hai

Do ya do se jyada network Ko jodta hai

2. Yah data ko specific device Tak pahuncha ha

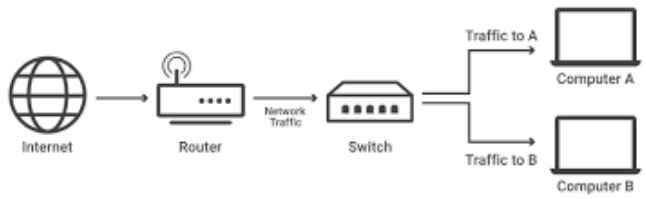
3. Har device ke liye alag channel port hota hai

4. isme Network traffic kam hota hai

aur Speed Jyada hoti hai Data ko teji se bhejta hai

jisse network Tej chalta hai

5. Switches modern network mein use Kiya jata h



Layer 2 switch

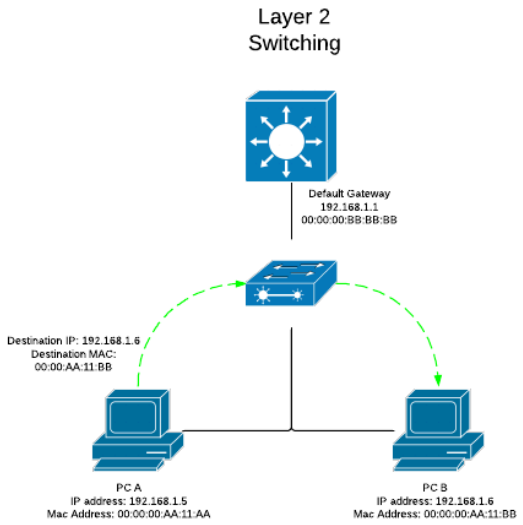
1. Network device hai

jo mac address ka istemal karke data ko ek device se dusre device mein bhejta hai

2. Data link layer per kam karta hai

3. Devices ko same network mein connect karte Hain

4. Efficient data forwarding ke liye use Kiya jata h

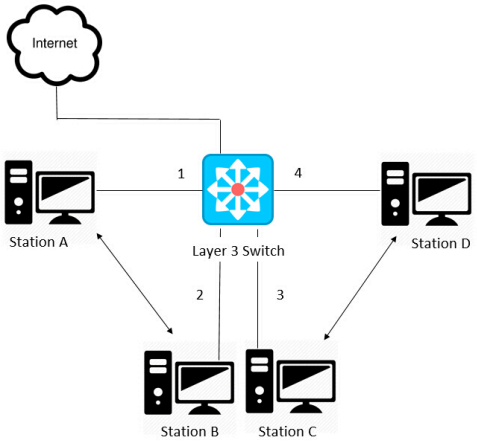


Layer 3 switch

1. Ek network device hai

jo router aur switch donon ka kam karta h

2. IP adress ka istemal karke data ko ek device se dusre device mein data bhejta h
3. Network layer per kam karta hai
4. Aur routing bhi support karta hai
5. Different network k bich mein data forwarding k liye use hota h
6. Advance networking ke liye suitable hai



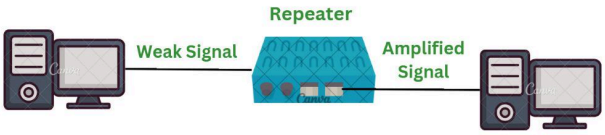
Y Networking devices

Repeater

1. Ek network device hai

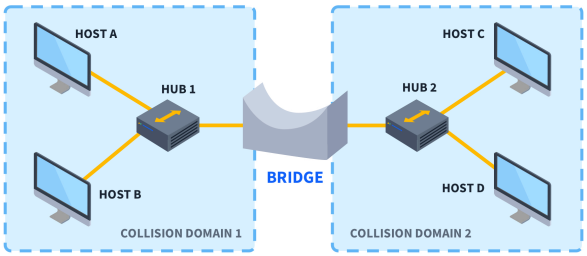
Signal booster h

2. Network ki range ko badhane ke liye use Kiya jata hai
3. Long distance network connection me use Kiya jata hai
4. Signal ko dobara bhej kar duri ko kam karta hai



Bridge

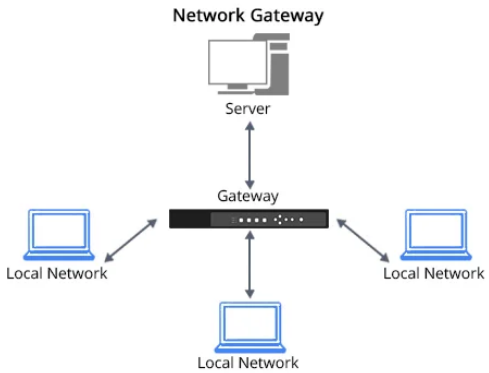
1. Do ya do se jyada network ko connect karta hai
2. bade network ko chhote network mein divide karta h
3. Network ke traffic ko kam karta hai



Gateway

1. Do network ke bich mein communication hota hai
2. Yah translater ki tarah kam karta hai
3. Ye do network ko jodta hai

aur security provide karta hai



NIC

1. Network interface card

Computer ka network card hota hai

jise network se connect karte Hain

2. NIC ka use lan ya wan Ko jodne ke liye Kiya jata hai

3. Computer k data ko network per bhejta hai

LINK STATE ROUTING lsr

Ek method hota hai

Jahan har router network ka map share karta hai ek dusre ke sath

jisse data packet ke liye best path calculate Kiya jata hai

Update

Network ke changes per router ko time per update bhejte Hain

Convergence

Router ko complete information ka pata hota h

isiliye Tej coverage hota hai

Routing table

ek data table hota hai

jo router ya network host mein store hota h

YE data packets ko network mein bhejta h

Routing table jyada accurate aur optimal hota hai

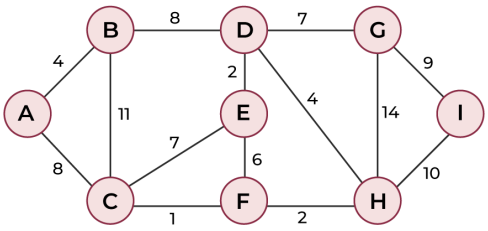
kyunki router ke pass complete information hoti hai

Overhead

Yah jyada overhead hota ha

kyunki LSAS ko data bhejna

aur network database maintain karna padta hai



DISTANCE VECTOR ROUTING dvr

Ek routing protocol hai

Jahan per har router ke bich ki duri ke base per data packet bhejne ke liye sabse best path select Kiya jata hai

Update

Network mein change ho ya na ho

per router ko time per update mil jaate Hain

Coverage

Router Apne neighbour se info lete Hain

Aur bahut bar Iterate karna padta hai

isliye coverage slow hota hai

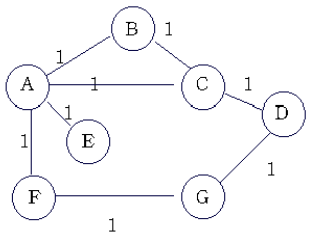
Routing Table

Routing table jyada accurate aur optimal nhi hota hai

kyunki router ke pass complete information nhi hoti hai

Overhead

Ismein kam overhead hota hai kyunki update kam frequency se hota hai



ICMP

network mein devices के बीच me connection mein problem hone par message भेजने वाला एक protocol hai.

ARP

ARP network ka ek protocol hai

जो devices ko IP address (online address) se unke MAC address (hardware address) se connect karne में मदद करता है.

types of topologies

point to point, mesh, bus, ring, tree, star

how to create adv and dis of topologies
cabling cost, bulk wiring, installation, maintenance, main device, devices dependence

URL
Uniform resource locator
URL web ka address होता है जो आपको इंटरनेट पर चीज़ें ढूंढने में मदद करता है।

absolute url
Complete web address होती है जो सीधे किसी वेबपेज तक ले जाती है.

relaive url
kisi ek website se dusre website tak jane ka pata hota h
ye complete address nhi hota h

web page
Web page internet pe info ka ek page hota h
jo browser mein Dikhta hai

website
वेबसाइट इंटरनेट पर information ka colloection h जिसे internet ya browser par देख सकते हैं.

internet addressing scheme
internet har device ko ek unique address deta hai taki her device ko data pahunchaya jata h

domain name
internet पर websites को identify करने वाले unique name hota h
ex google.com

application of internet
The internet has changed the world and the number of its applications is likely to increase in the coming years:

Information retrieval and sharing
Communication and collaboration
Education and learning
Entertainment and gaming
Business and commerce
Research and development
Government and public services
Healthcare and medicine
Environmental monitoring and protection
Social and political activism

isp
internet service provider
ISP वो companiya होती है जो आपको इंटरनेट से jodne me madad karti h ex. jese jio, airtel

Dial-up connection
jisse phone line ke zariye internet se जुड़ (jud) sakte hain

ip address
IP address internet पर devices को identify करने वाला unique number होता है

ipv4
IPv4 इंटरनेट पर डिवाइस की पहचान के लिए इस्तेमाल होने वाला 4-डॉट वाला 32-बिट का एड्रेस सिस्टम है

IPv6
8-ग्रुप वाला 128-बिट का एड्रेस सिस्टम है जो भविष्य में ज्यादा इंटरनेट डिवाइस को सपोर्ट करने के लिए बनाया गया है.

MAC address
network device ka physical adddress hota h

IMEI

आपके मोबाइल फोन की एक खास पहचान संख्या होती है

Modes of connecting Internet
Internet se judne ke liye aap wired jaise cable ya fibre optic ya wireless jaise Wi-Fi ya mobile data use kar sakte hain

Exploring the Internet
(How to become a web surfer ?)
● Surfing the web
● Open a web page in a Tab
● Navigating web pages

Search engine
woh tools hain jo internet पर aapki search mein madad karte hain jese google, bing

internet
Bhot sare interconnected computers ka network h, jo global communication and information sharing allow karta h

Client-server model
client apna काम कराने के लिए server se request karta hai, clients server se resources ya services maangte hain

Kese kaam karta h
Clients servers se resources ya services ke liye request bhejte hain. Servers woh requests process karte hain aur phir clients ko results wapas bhejta hain. Is model se resources achhe se share hote hain aur data ko ek hi jagah se manage karna आसान ho जाता hai

Wifi
WiFi एक तरह का वायरलेस टेक्नॉलजी है जो आपके फोन या लैपटॉप को बिना तार के इंटरनेट से जोड़ता है। Ye radio waves ko use karta h

WWW
World Wide Web
ek interconnected hypertext documents ka system h jise internet k through access Kiya jata h

Networking
ek tarika hai jisme computers ya devices ek dusre se connect hote hain taki information share ki ja sake.

Network Topology
devices ke arrangement ko describe karta hai
kaise devices ek dusre se connected hote hain.

Star Topology
jisme multiple devices ek central hub ya switch se connect hote hain

Ring topology
Har device apne neighbours se directly connected hota hai, forming a closed loop. Har device sirf apne direct neighbours se communicate karta hai, aur information ek hi direction mein flow hoti hai

Bus topology
ek single communication line hoti hai, jise
Agar koi device data send kare, toh wo bus ke through sab devices tak pahunchta hai

Mesh topology
har device ko multiple connections se interconnect kiya jata hai
taki agar koi connection fail ho, toh dusre alternate routes ka istemal ho sake.

Tree Topology
ek central node se multiple branches connect hote hain, jinke through devices interconnect hote hain.

Hybrid Topology
jisme do ya do se zyada alag-alag topologies ko combine kiya jata hai, jaise ki star, bus, ya ring

Networks types
lan, man wan

PAN
(Personal Area Network) ek chhota network hota hai jo ek vyakti ya device ke aas-pass ke limited area mein hota hai, jaise ki ek room

LAN
(Local Area Network) ek chhota area hai jisme computers aur devices ek dusre ke saath connect hote hain, usually ek building ya campus ke andar

MAN
(Metropolitan Area Network) ek bade geographical area, jaise ek sheher ya town, mein computer networks ko connect karne ka network hota hai.

Ip
IP address एक तरह का पता होता है जो आपके इंटरनेट से जुड़े डिवाइस की पहचान करता है.

IPv4 address
ek computer ya device ko identify karne ke liye use hota hai, jise 32 bits ka numerical label represent karta hai, commonly dot-separated four decimal numbers, jaise ki 192.168.1.1.

Protocol
network devices apas me communicate karte h

TCP
Transmission Control Protocol
ek internet protocol hai jo devices के बीच me connection बनाकर reliable data transfe ko

guarantee karta hai.
Connection based protocol h

UDP
User Datagram Protocol is a connectionless protocol that transmits data packets without any guarantees of delivery or order.
Ye connection less hota h

Gopher
ek client-server protocol hai jo text-based hypermedia documents ko access karne ke liye use kiya jata hai.

HTTP
Hypertext Transfer Protocol
ek communication protocol hai jo web browsers aur servers ke beech data transfer ke liye istemal hota hai.
Information ko display aur transmit karta h web pages ki form me browser me

FTP
(File Transfer Protocol) ek standard network protocol hai jo files ko ek computer se dusre computer par transfer karne mein istemal hota hai.
Ya files ko upload ya download karne me help karta h

Pop
Post office protocol, Email application me use Kiya jata h, email ko recieve, aur download karne k liye server se

SMTP
(Simple Mail Transfer Protocol) ek communication protocol hai jo emails ko send karne mein aur receive karne mein istemal hota hai.

NFS
(Network File System) ek distributed file system protocol hai jo network mein files ko

share aur access karne mein istemal hota hai.

Telnet
ek network protocol hai jo remote systems par terminal access provide karta hai, jisse users dusre systems par command line interface se connect kar sakte hain.

ASCII
American Standard Code for Information Interchange) ek character encoding standard hai jo text characters ko numbers se represent karta hai, jisse computers text data ko handle kar sake.

RPC
Remote Procedure Call
ek tarah ka communication protocol hai jisme ek program ek system se dusre system ke functions ko invoke kar sakta hai.

RPS
(Routing and Remote Access Service) networking mein ek Windows service hai jo routing, VPN, and dial-up services ko manage karta hai.

TLS
(Transport Layer Security) ek cryptographic protocol hai jo secure communication ko facilitate karta hai, jise commonly web browsers aur servers ke beech secure data transfer ke liye use kiya jata hai.

SCP
Secure Copy Protocol) ek network protocol hai jo secure tareeke se files ko copy aur transfer karne mein use hota hai, commonly SSH (Secure Shell) ke saath integrate hota hai.

JCP
(Java Community Process) ek organization hai jo Java programming language ke development aur evolution ko oversee karta hai, ismein Java-related standards aur

specifications define hote hain.

ICMP
(Internet Control Message Protocol) ek network layer protocol hai jo network devices ke beech communication issues ko report karne aur diagnose karne mein use hota hai, jaise ki ping requests.

ARP
(Address Resolution Protocol) ek network protocol hai jo IP addresses ko corresponding hardware addresses (like MAC addresses) se map karta hai, taki devices network communication mein sahi address pe data bhej sakein.

HDML
(Handheld Device Markup Language) ek markup language hai jo mobile devices ke liye design kiya gaya hai, taki unpar content ko display aur navigate karne mein asaan ho.

Frame relay
Frame Relay ek packet-switching network protocol hai jo high-speed data communication ko support karta hai, commonly used hota tha for connecting local area networks (LANs) over wide area networks (WANs).

Ethernet
ek widely used local area network (LAN) technology hai jo devices ko data communication ke liye connect karta hai, typically using a wired connection through coaxial or twisted pair cables.
Ye information ko digital packets me transfer karta h
It must contain nic card provide unique address

USB
(Universal Serial Bus) jo electronic devices ko connect karne aur data transfer karne mein use hota hai

dsl

digital subscriber line.
jo telephone line ka istemal karke data transmit karta hai

ISDN
Integrated services digital network
jo voice aur data donon ko transmit karne ke liye telephone line ka istemal karta h

Nat
Network Address Translation
jisse multiple devices ek common public IP address ka use karke internet access kar sakte hain.

TLS
(Transport Layer Security) ek protocol hai jo internet par data ko secure karne ke liye istemal kiya jata hai
yah data encryption ka istemal karke data ki security ko protect karta hai.

Authentication
kisi user ya device ki identity ya verify karne ki process hai.

Authorization
kisi user ya device ko kisi specific resource ya action ko access karne ki ya permission dene ki process hai.

REST API
ek software architectural style hai
jo web services ko design karne aur implement karne ke liye istemal hota hai
REST API (Representational State Transfer Application Programming Interface)