

Hierarchical Routing:~~Definition~~

→ Routing table ~~जूनीर वर्तमान~~, feasible route,

→ अविभागी: Individual router - \Rightarrow

उत्तम hop तक मार्ग नहीं,

Router

\hookrightarrow Region \rightarrow cluster \rightarrow Zone \rightarrow Group

Broadcast Routing:

→ flooding, ज्ञात सभी + अनियक्षण packet

→ problem \Rightarrow $\text{packet count} \geq 2^{n-1}$,
 (some route \Rightarrow same packet अधिक तो नहीं)

→ Traffic \Rightarrow Bandwidth
 worst \Rightarrow worst case

→ multi-destination routing (packet \Rightarrow list of routers) [\Rightarrow router packet में से एक list \Rightarrow सबसे बड़ा option एवं अन्य रूटर]

[Intermediate router: packet ମୁହଁରେ ଥିଲେ, ତାହା
କୌଣସି ଯାଏନ୍ତି best way to reach
କିମ୍ବା ଯାଏ, ଏବଂ କିମ୍ବା ~~ପାକେଟ~~ ମାର୍ଗୀ]

ମାର୍ଗୀ best way to
reach କିମ୍ବା କିମ୍ବା, ~~ପାକେଟ~~ ମାର୍ଗୀ
~~ପାକେଟ~~ ମାର୍ଗୀ destination
list କିମ୍ବା.

→ Spanning tree form କିମ୍ବା multi-destination go

କିମ୍ବା ରୂପ୍ୟ. (LSP ଏହି କିମ୍ବା full ~~network~~ Topology)

କିମ୍ବା ST form ~~topology~~ easy.

DVR - ଏହି କିମ୍ବା full ~~network~~, ~~topology~~ ~~path~~ forwarding

କିମ୍ବା, କିମ୍ବା reverse path forwarding
କିମ୍ବା, କିମ୍ବା Intermediate router କିମ୍ବା

କିମ୍ବା ~~packet~~ ଆଜିନ୍ତା, କିମ୍ବା ~~path~~

source - ଏହିକିମ୍ବା ~~path~~ path \rightarrow ~~path~~

କିମ୍ବା, ~~path~~, ~~path~~ path \rightarrow ଆଜିନ୍ତା,
କିମ୍ବା ~~path~~, ~~path~~ path

କିମ୍ବା receive \rightarrow ~~path~~ \rightarrow ~~path~~ path

କିମ୍ବା forward ~~path~~, But, ~~path~~ path

↪ packet ~~arrive~~ / didn't receive, forward
জোম এ, মানে ফিল্টার করে প্রিজেন্স
just extra ~~কিছু~~ packet forwarding
ক্ষেত্র (overhead).

Multicast Routing:

→ MST create ~~রাস্তা~~, router applicable
এটি, এবং prune ~~রাস্তা~~ রয়েল ক্ষেত্র।
LSR → easy, ক্ষেত্র full topology এবং
আসুন, DVF →? ক্ষেত্র রয়েল অবস্থা group
→ router packet info, check ~~ক্ষেত্র~~
ক্ষেত্র, এবং ক্ষেত্র \exists group →? 20809
~~ক্ষেত্র~~ destination → এই,
ক্ষেত্র ~~ক্ষেত্র~~ packet ক্ষেত্র
ক্ষেত্র এবং ক্ষেত্র \exists prune
~~ক্ষেত্র~~ রয়েল এ, এবং previous router →
ক্ষেত্র ক্ষেত্র এবং, previous router →
prune signal নেব্রে, problem ক্ষেত্র
⇒ ~~ক্ষেত্র~~ router → tree maintain 20809

ବେଳୁ, କାହିଁ overhead ମଧ୍ୟ, Solution

ବେଳୁ ଦିଲ୍ଲୀ ପଣ୍ଡବ ରୂଟର ->
free କିମ୍ବା ନିଜେ, ଏବଂ ଗ୍ରେ ରୂଟର
-> packet ମିଟର କି, ଏବଂ ଏବଂ multicast

କିମ୍ବା କି.

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Mobile host → ~~mobile host~~ Migrating host
Mobile host → Roaming host

* LAN -> generally ৰাখি home agent ৰাখো,
সব এই LAN -এই host ৰেখো track
কৰ্বু, ~~আবু~~ info ৰেখো foreign
agent, এবং মুকুটু কৰতে আবু host
ৰেখো track কৰ্বু।

* ৰাখো ৰাখো কৰ্বু foreign
agent -এই ৰাখো ৰেখো connect
কৰতো পাৰো
foreign agent -এই
ৰাখো broadcast ৰাখো
check কৰ্বু কৰ্বু foreign
agent ৰেখো (for reach
check)

host ৰেখো foreign
agent ৰেখো reach
কৰ্বু কৰ্বু try কৰ্বু।

* Host, foreign agent এবং home agent -এই
address আবু এভন্ট security code ৰাখো।

* security code -> timestamp includes
21800,

* Tunneling → home agent → ~~original~~
packet goes as it is new host packet
~~goes~~ ~~original~~ ~~payload~~ → final destination

flow control → Receiver goes receiving
capacity goes exceed at 2000
~~data~~ ~~data~~ data sending control
mainly subnet
Congestion control → Network goes

(~~and memory~~
improvement)

Router- \rightarrow memory infinite \rightarrow ∞

মনে রাখো প্রক্রিয়া এবং, timeout

যদি কোথাও sender \rightarrow same
packet আসে, তখন congestion \rightarrow ∞

DRAGS শুরু হলে DV নাই

Congestion control method → Open loop
Closed loop

- Buffer overflow packet এর মাত্রার percentage
queue length DRAGS, resending DRAGS এবং
timeout ফিল্টার স্টার্ডেভিশন
time delay fluctuates DRAGS
metrics.

→ Source DRAGS direct information, ACK \rightarrow DRAGS

মাত্রার bit change DRAGS মাত্রার
host frequently router DRAGS DRAGS

ask DRAGS DRAGS host DRAGS
congestion DRAGS

Admission control : In case of virtual circuit, when link \rightarrow congestion occurs,
the router limit flow of virtual circuit at its route flow
new VC limit create \rightarrow

Datagram \rightarrow source \rightarrow destination \rightarrow warning
flow limit \rightarrow congestion \rightarrow choke packet

hop-by-hop choke
packet quick relief
relief \rightarrow buffer
requirements \rightarrow

(packet) direct (bit in ack)
indirect
warning
congestion
choke packet
router warning
bit set \rightarrow
BKT destination
 \rightarrow BKT ACK \rightarrow
packet \rightarrow warning
bit set \rightarrow choke
BKT source \rightarrow
BKT source

Load shedding system -
congestion avoidance
→ packet prioritization
voice/multimedia → new packet
திடுதலை பூர்வமாக செய்ய, (zero or old
or new file) file type -
transmission → new contention, old
்கணக்கை கீழ் file contention
ஏற்று,

RED (Random Early Detection) → 100%
full congestion avoidance buffer
randomly drop packets
packet.

Jitter → delay \pm standard deviation.
Jitter நகரம் multimedia குறைப்பு
படிகள் அடிக்கார.

Service Quality increasing:

i) memory, processing power, bandwidth

Taking 3rd interest (over provisioning)

ii) Buffering

iii) Traffic shaping

iv) Leaky Bucket (hosting implement)

Alternate

Token bucket #

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Leaky bucket 2 variants →

- 38ms Packet difference rate → generate 280s, for fixed rate → network utilization 280s
- Different size →
 - 8 ms to wait for packet generate 280s, target size → send 280s

[no idle waiting time]

Token bucket → first 38ms no 280 Token
(arr) burst 280, after 1 Packet
arrives, at site 280 token
~~uses~~ than 280ms,
at site arrival of packet
280ms before send 280s,

Token bucket capacity → C

Token arrival → 8 bytes/sec

Burst length 3 sec

Max output rate $\rightarrow n$ bytes/sec

$$C + \beta s = ns$$

$$s = \frac{c}{n-\beta}$$

Duration after a burst = $\frac{\text{total} - ns}{\beta}$

Token Bucket + Leaky bucket

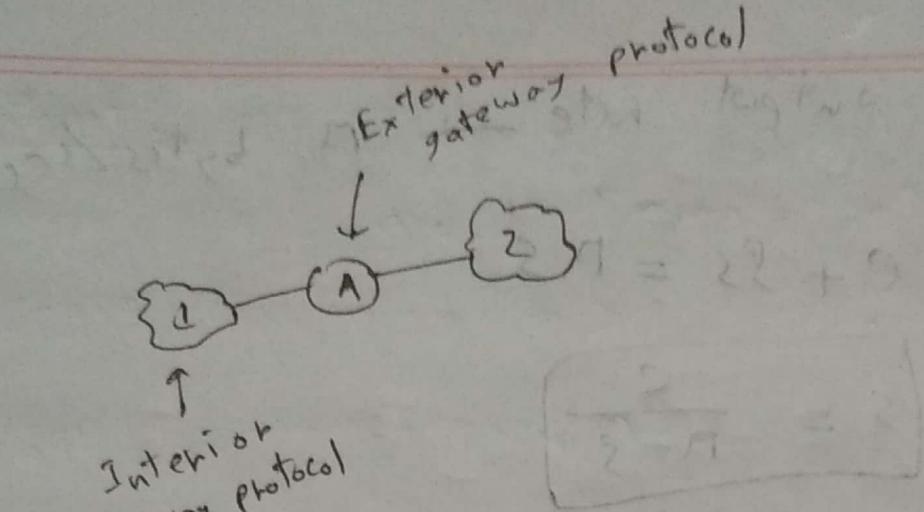
↳ max burst \leq network capacity
↳ beyond \geq max burst

* Internetwork \rightarrow इन्टरनेट क्या है?

क्या protocol \rightarrow अलग अलग
network में, एकत्र full VC को
कैसे बनाते? Step by step VC establish

पैकेट \rightarrow generally ~~VC~~

full transmission \rightarrow connection-oriented
अन्य connectionless base, \rightarrow mix-up
कैसे होते?



Transparent fragmentation →

overhead → reassemble \Rightarrow overhead, overhead,

router \Rightarrow reassemble capacity \Rightarrow 280

280 , fragment \Rightarrow same router \Rightarrow 280

exit \Rightarrow 280 to reassemble.

non-transparent fragmentation →, ~~info~~

Packet segmentation \Rightarrow header \Rightarrow 280 (over-head), header \Rightarrow 280

(over-head), host \Rightarrow 280 reassemble capacity \Rightarrow 280

280 ,

IP header length word → $853 \Rightarrow 2180$,

maximum 15 word (60 byte)

Total length \Rightarrow byte → $853 \Rightarrow 2180$
(Packet size length)

Type of service → 3 bits
delay, throughput, reliability

3 bits for priority

Priority.

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CEOS / CPE IP address

→ class A/B/C/D/E/F Prefix

ଫିଲ୍ଡ୍,

→ Loopback - ୭ ଫିଲ୍ଡ୍ ପାକେଟ ମିଳିଯ

ଆପାର୍ଟ୍ ମିଳିଯ receive ହାହ୍ନ୍, for

debugging ରୁ ~~ରୋଟର୍~~ protocol stack

ଫିଲ୍ଡ୍ ମାତ୍ର ସ୍ଥାପନ ହିଁ ଏହି

→ 350 1 සුදු නිස් නෙට්වර්ක් තුළ
broadcast පැයා, මග්‍යුල් (in slide)
network fix පැයා රෙඛ්‍ය පැයා,

Subnets

→ Signal regenerate පැයා රෙපෝටර්

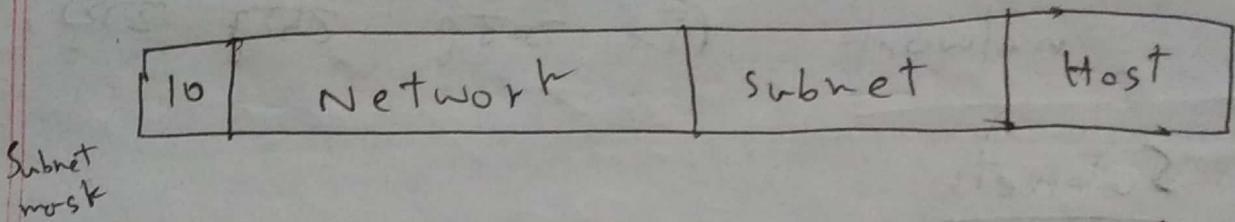
Use එය,

Packet ආර්ග්‍යෝ:

- Destination host, network පැයා,
- Destination host or, network
host, & network → මෙම පිටත
- default/main router
මෙම පැයා, එමේ router
සහ host ආත්, මෙම් පිටත

• Subnet එය ආර්ග්‍යෝ meaning → Network
එය මෙයි sub-network.

ગુરૂત્વ હોય જે એવી ફરી સબનેટ
જરૂરી પાર્ટ ફરી,



→ ગુરૂત્વ નેટવર્ક ફરી, તેનું સબનેટ, તેનું
હોસ્ટ.

- 3BR problem. 3 ગુરૂત્વીય IP class choice
→ એંથી, first availability

CIDR - Classless Inter Domain Routing

- એંથી ફરી તમે ક્લાસફૂલ. ક્લાસલેસ
→ ક્લાસ એંટી, Subnet mask ફરી
નેટવર્ક એંટું સુભનેટ
હોસ્ટ એંટી એંટું,

194. 24. 28. 1 \Rightarrow 11000010 00011000

initially 00011100 00000000

P: 11000010 00011000

(120)

00010000 00000000

Q: 11000010 00011000

(121)

00001000 00000000

R: 11000010 00011000

(121)

00011000 00000000

Tip

P & R মুক্তির সময়ের পরে এবং

case - g classless এবং longest
matching টি কল্পনা করতে হবে।

R দিয়ে send করা হবে,

→ Public ip কর্তৃতামূলিক এবং PC ৩০ same
হবে এবং ~~private~~ ~~IP~~

NAT

Network Address Translation

private
IP

class A : 10.0.0.0 - 10.255.255.
255/8

class B : 172.16.0.0 - 172.31.255.255
/12

class C : 192.168.0.0 - 192.168.255.
255/16

→ organization internally

→ don't use same IP, But
publicly don't advertise
IP, also it,

→ NAT itself is device, it
network can't see public packet
only private - public translate

Port Transport layer - \rightarrow (গোটা ip address. (গোটা output part))

- Incoming packet public-private
translate কর্য, \rightarrow 220.66.1.111

- NAT করবে এখন unused port
address ফর্মে পকেট কর্য।
 \rightarrow port এ পকেট - \rightarrow reply আওয়াজ,
কিন্তু আপন কর্মসূরি এর সময় কর্য।
[Packet - \rightarrow port number সেট রিপ্লেস
[port] ~~পকেট~~]

Internet Control Message Protocol (ICMP)

TTL \rightarrow Time to leave

DF \rightarrow Don't Fragment. [এটি set কর্য
করে পকেট বিভাজন করে একটা network
করে পকেট বিভাজন করে একটা capacity কর্য,
কিন্তু ক্ষেত্র ট্রেইন এর capacity কর্য,
OUI Destination Unreachable কর্য]

- একজন ACL, routing table \rightarrow destination
ip এর, একজন destination unreachable
কর্য,

- Data-link layer 9o address 2m
mac-address.

ARP - Address Resolution Protocol

- IP address broadcast 289, mac-address 289, host-ip 835
or 835, mac-address reply
835, 835, 835, 835, 835, 835
ip 289, router 835
mac-address 835,
- mac 835, ip, cache 835 835
835, ARP request 835
835, 835, 835, 835, 835, 835
advertise 835 835, 835
machine boot-up 835 835
ip 835 mac broadcast 835, Response
835 cache 835 835,

- Cache ৰে পিলুকাৰ ধৰণ - ধৰণ invalid
হৰাব হ'ব, কাৰণ run-time - ৰে ip
change হ'ব হ'ব।

Dynamic Host Configuration Protocol (DHCP)

- Manually ip নথি কৰণ বলৈ, Up ইত্যো
বো dynamically ip set হ'ব, DHCP
server এৰ - ip হৰাব, গোপনীয় Boot
server এৰ - broadcast কৰা,
এৰ ৩৮৮৭০০ - ৩৮৮৯৯৯ broadcast
request
1 DHCP relay machine, ৱার্ড Server
বো অফিচ (Unicast). Server ip হৰাব,

AS → Autonomous System

AS → organization বিশেষ মোট সংজ্ঞা
routing কৰিবলৈ কৰ্ত্তৃত কৰা Interior
Gateway Routing