APPLICATION LAYER

DATE: / /
PAGE NO.:

→ Xport layer provides services to 2 processes
→ AL : logical link blw 1 process in a device to another process in another device
→ In intermediate nodes, XL & AL don't take any part.
→ Examples of App^{n}s for Communication :-

Web browser, Fb (app),

different from

specialised application

AL Paradigm

1) Client - Server

WWW : http, ftp, ssh

→ One server, many clients

Imp : Server should be in active mode always to respond to requests of client appl^{n}s.

↳ Server needs to be more powerful (processor + memory)
Resources needed are higher than needed by clients.

↳ Server is always on but client need not be.

Can have max^m capability of Server. Sol^{n}s :

↳ can have ~~dibo~~ distribution. (have multiple servers)

↳ can go to Peer-to-Peer

2) Peer - to - Peer

BitTorent, Skype, Internet Telephony

↳ Both are at same level

↳ Skype : Both parties need not be always ON, can be active only when they have to communicate

→ within an app. :→ port no. is already inserted.

1.) Client - server Interfacing.

Socket interface :- combⁿ of IP add. & port no.

↳ writing www.

(Socket interface) client : IP add. of your system + The port no. for that app"

( ) server : IP add. of Google (DNS) + port you want to connect it to.

↓ if well-known services :→ have reserved port no.

at server : Pkt from client will have its (client's) IP add. & port no. ⟶ server can take info. from them.

WWW Architecture :- Distributed client-server service
↳ whatever aggregate data you're getting, you may be getting it from multiple servers

Web Browser : Controller + Protocols (at AL) + Interpreters (HTML file converted to web page for users)
↓ uses
html protocol

URL → http :// www.lnmiit.ac.in / Department / CSE

- http → protocol
- www.lnmiit.ac.in → Host name (unique) — each has IP add
- Department / CSE → Path upto depth (file name)

→ sometimes, port no. need not be written explicitly.
↓
well-known : already have reserved port no.

→ If med port no. :→ Cyberoam (don't want everyone to access it)

→ security reasons. :→ sometimes for this reason, diff. port no. are mentioned

Web Page

Static

→ Server has readymade contents

→ when client requests, server gives that content

→ everytime you make request, get same answer

→ Eg. google : everyone gets same answer for same query.

Dynamic

→ content is dynamically created.

→ People are making a request & get diff. content

Eg.: → getting live score of IPL.

↳ don't exist on server. As request arises, server creates page & send. so, diff. user can get diff data

↳ google ads

Active

→ don't have to refresh again & again

→ script file runs at client side also.

→ whatever I'm seeing, will be changing gradually (without manual intervent from user)

→ weather (keep checking regularly for an hour)

not readymade

HTTP

1.) Persistent & Non-persistent conn"

↓ ↓

establish conn" Anytime you want to communicate,

once & do comm" establish conn"

Initially → Persistent

Now → Non - "

Teacher's Signature.

2) We've an acceptable format. Request has to be in a specific format.

→ Request message : (cr + lf : new line

Version : Version of http.

→ Response message :

Status code : whether request was executed successfully at my side or not.

→ Conditional Request :

slide 17. Asking for this page only if it has been modified since...

→ Cookie :

generally, There is no ~~xxx~~ link b/w requests made subsequently.

But when using e-commerce websites (Amazon / ...) :-

we want a session to be maintained → need to link everything

↓ ↓

want to remain at same page even if we close it. using unique id. (Card in Reliance, Big Bazaar)

to link need to see everything as 1 entity.

↑

↳ Cookie has a life span. Once expired, both client & server can delete it.

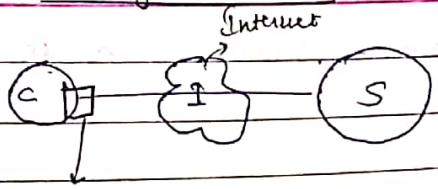
↳ Cookie is cooked by server & consumed by server.

Teacher's Signature

→ http also supports file transfer

DATE : / /
PAGE NO. :

Proxy Server



Proxy server

used to reduce traffic to / from outside world

at each google

OR.

if bandwidth ↓

↓

redundant requests are consuming

↓

send only 1 request out of all those & give answer to all

see if same request is made repeatedly, keep it at Proxy server only & whenever google is searched, it need not go to server. just get answer from proxy server.

↳ There can be Proxy Server at many levels.

limitation :

If traffic is unique to forward it to outer world, in this case, Proxy server are hardly used.

↓

useful in case of static pages

(& logged in to Amazon : 2 may get different pages)

↓

dynamic / active pages

→

FTP (File Transfer Protocol)

well-known

↳ port no. FTP uses: (2 processes ; control → 21 Data Transfer → 20) at S side

client :→ 3rd range port no.

↳ Only manages file transfer.

Teacher's Signature

DATE: / /
PAGE NO.:

↳ For next line, Windows : \n
Ubuntu : \r \n

→ File transfer ⇒ have to map 2 domains (2 different entities)

↳ FTP : specialized file transfer

→ Control process : establish & maintain connc'
→ Data Transfer " : transfer data

↳ Data connection has 3 parts :
File Type
Data structure :
Transmission mode

Slide 23 : Response ⟷ Command

27/04/18

Electronic - Mail

Neither party needs to be active 24×7. unlike client, server.
(S or R)

Sender :→ Using some interface, will send mail → Push → (gmail.com) mail server

Recipient ← Pull ← R's server (iimilt.ac.in) ← Push

Spool : Queue

Pushing mech. : client → Server

x. gmail. com
↓
id

Teacher's Signature

Not using Browser, using some 'appl^n'.

DATE: / /
PAGE NO.:

MTA → SMTP Protocol is used (Pushing)

MAA → POP or IMAP " " (Pulling)

↳ atleast 2 protocols

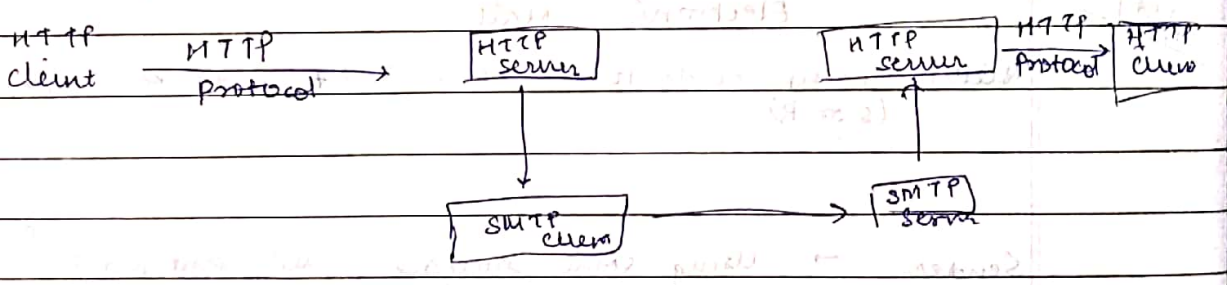
→ On phone → install gmail app containing
  ↳ user interface
  ↳ MTA client → composing & sending
  ↳ MAA client → receiving

↳ POP : disadv. :→ don't support multimedia files & other languages by default (than Eng.)

↓ Soln: include

MIME : allows non-text data & other language (non-ASCII set)

→ Not using standalone app, but web browser.



↳ Typing

↳ Appl^n layer directs Xport layer which protocol to use (TCP/UDP) & also gives IP add' to Xport layer

↓ Why? (It's N/w layer's job)
(Why Xport layer needs IP Add.)

Because checksum needs to be computed at XL which includes pseudoheader having info. about IP add.

Teacher's Signature

Part A + Part B

Wireshark

DATE: / /
PAGE NO.:

at AL

→ If don't have IP add. :

1.) go to cache of OS & see if you've some repository

if not,

2) check local DNS server (college)

if not

3.) check next level DNS server (BSNL)

& so on ...

→ don't have single DNS server at diff levels.

→ DNS names on basis of

1.) country (.in, .us)

2) characteristic (.com, .edu, .org)

.ca.us (california) ..

→ whole tree is formed