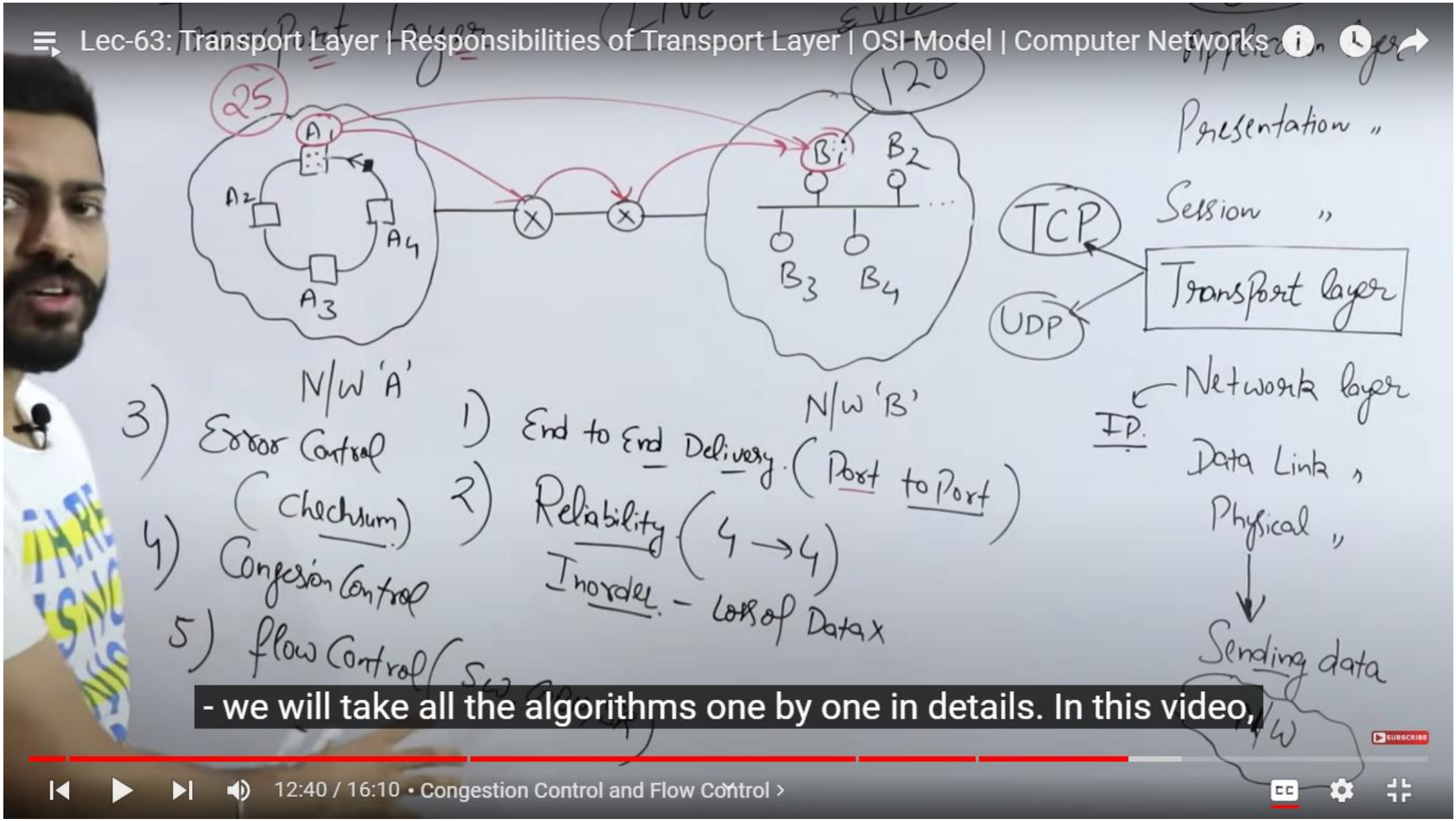
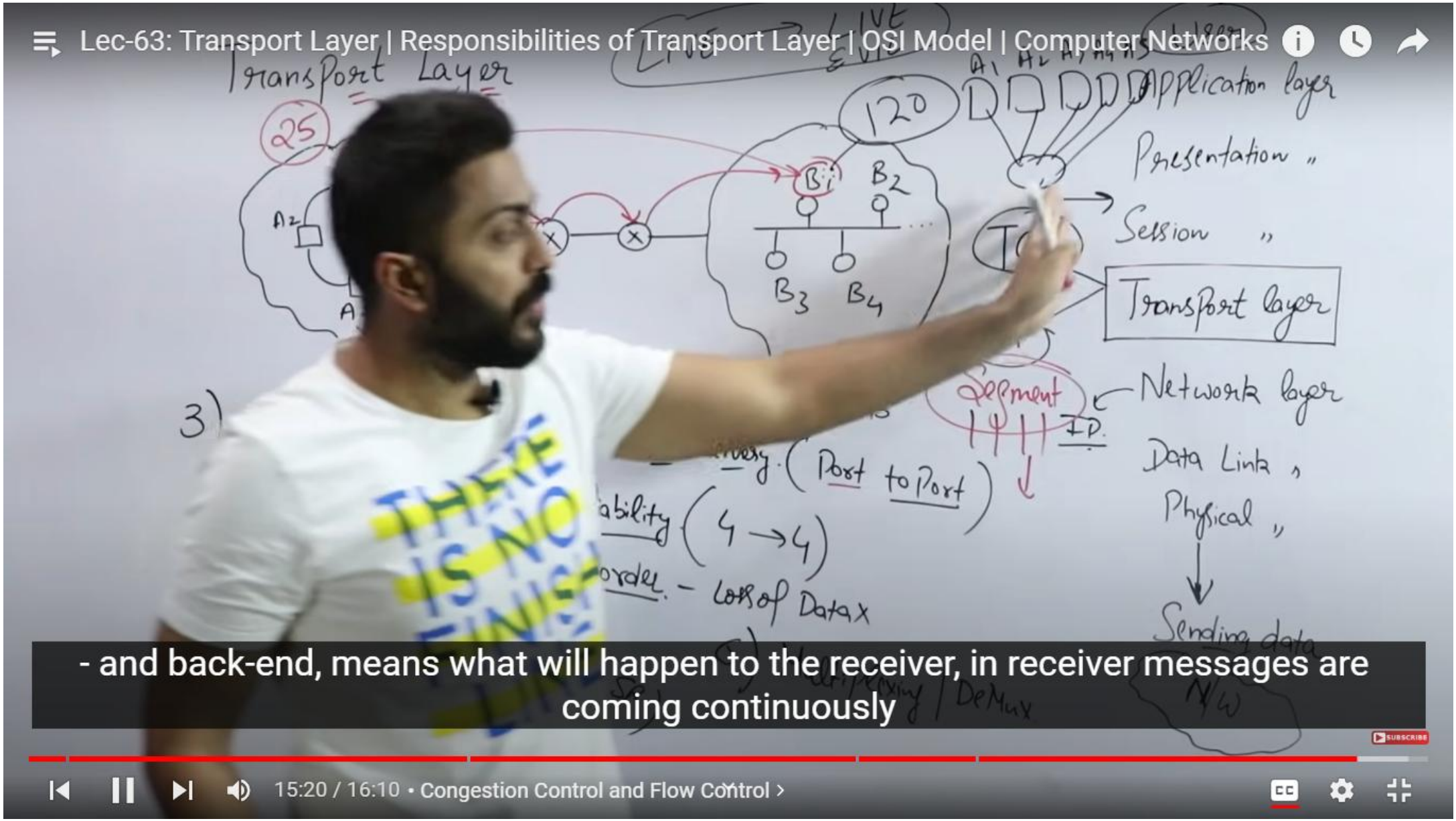
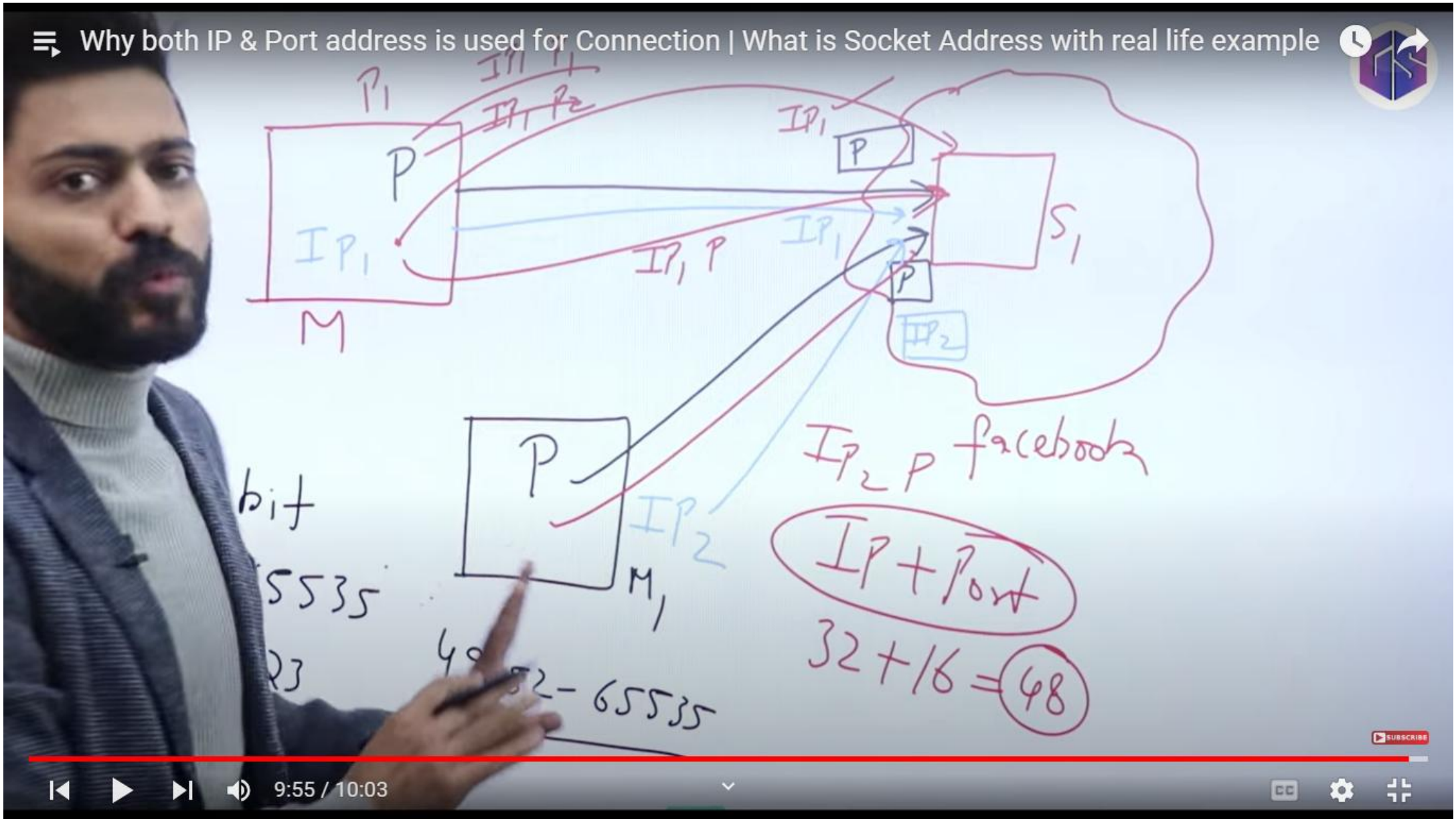
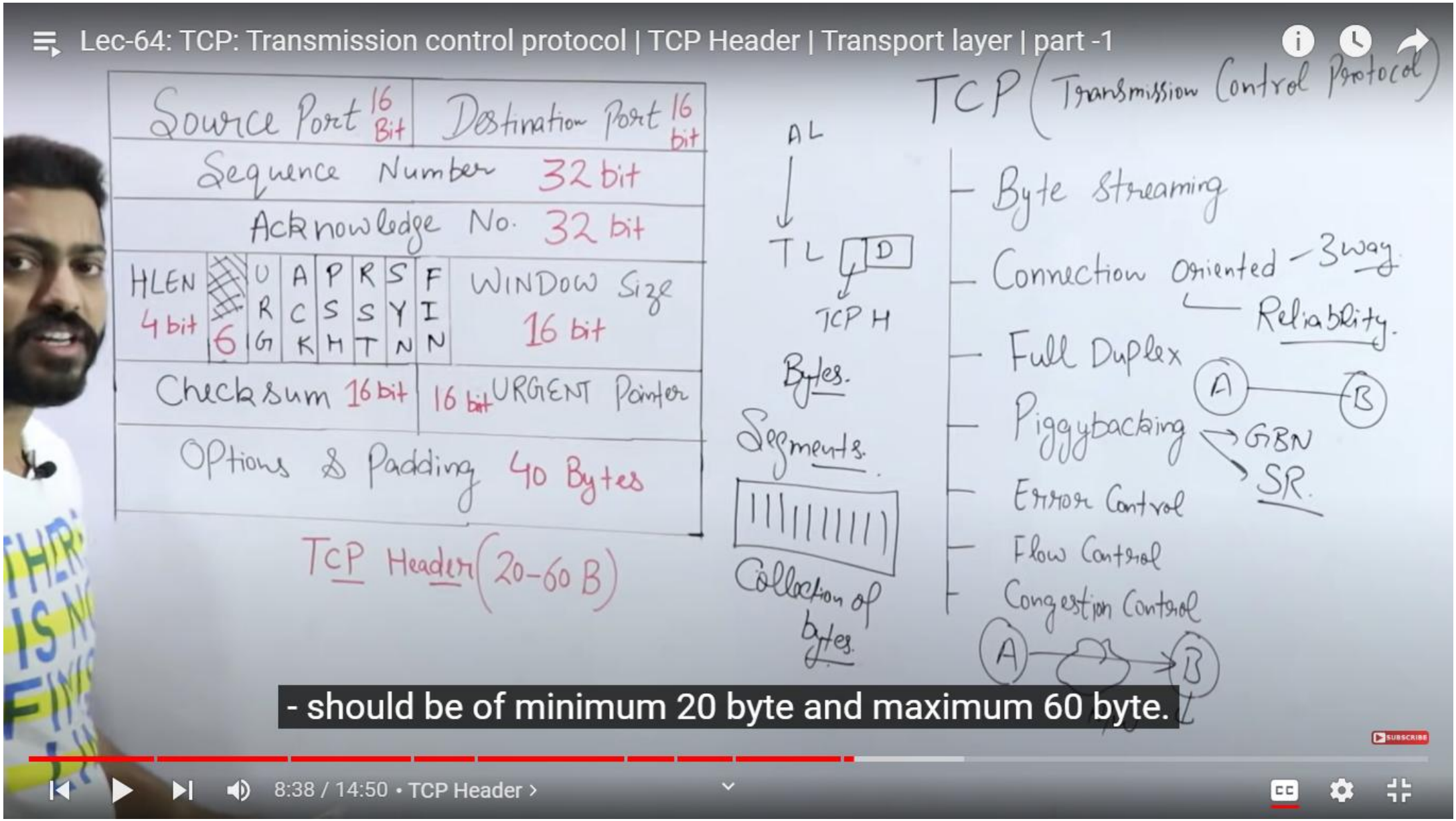
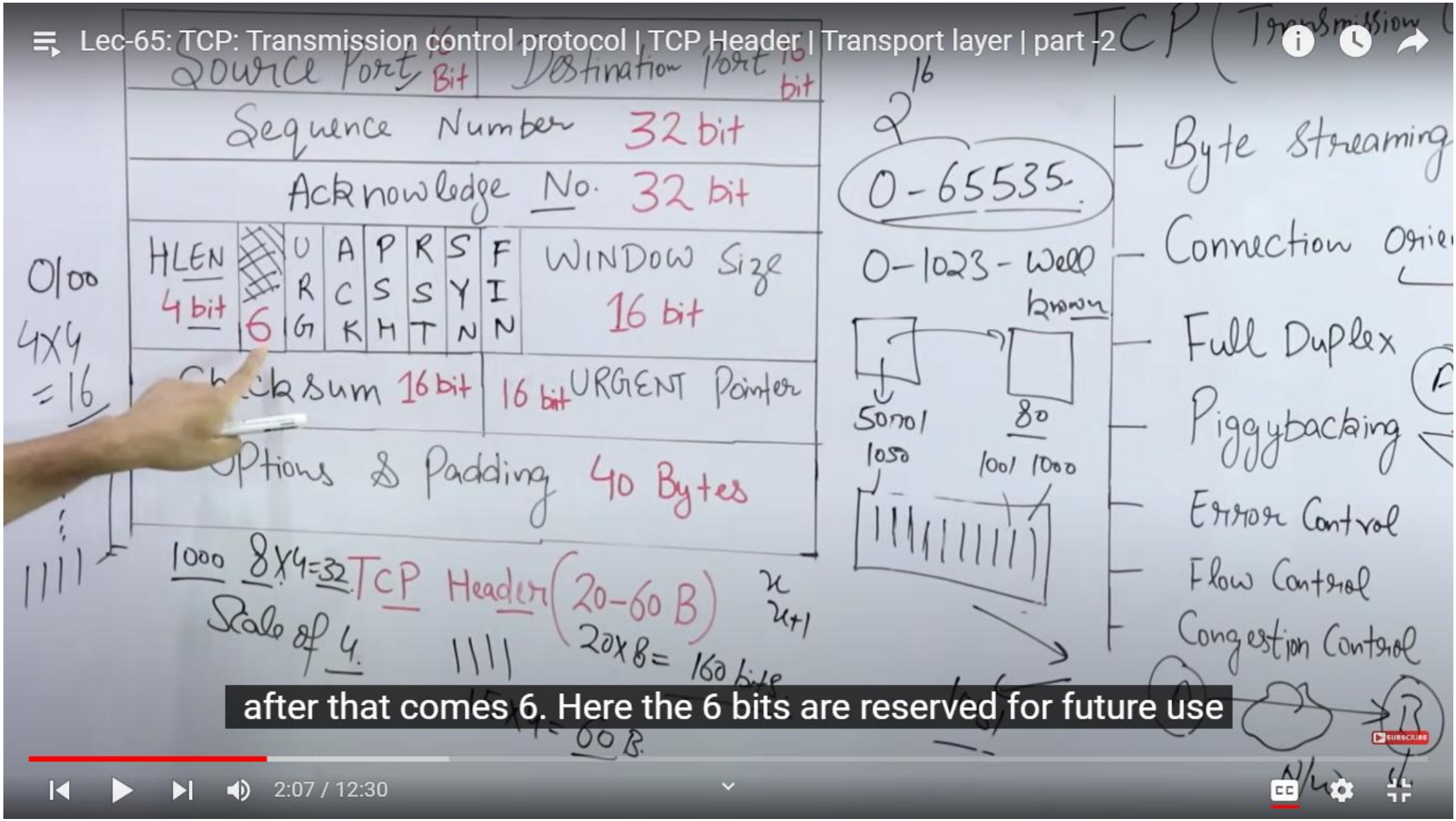
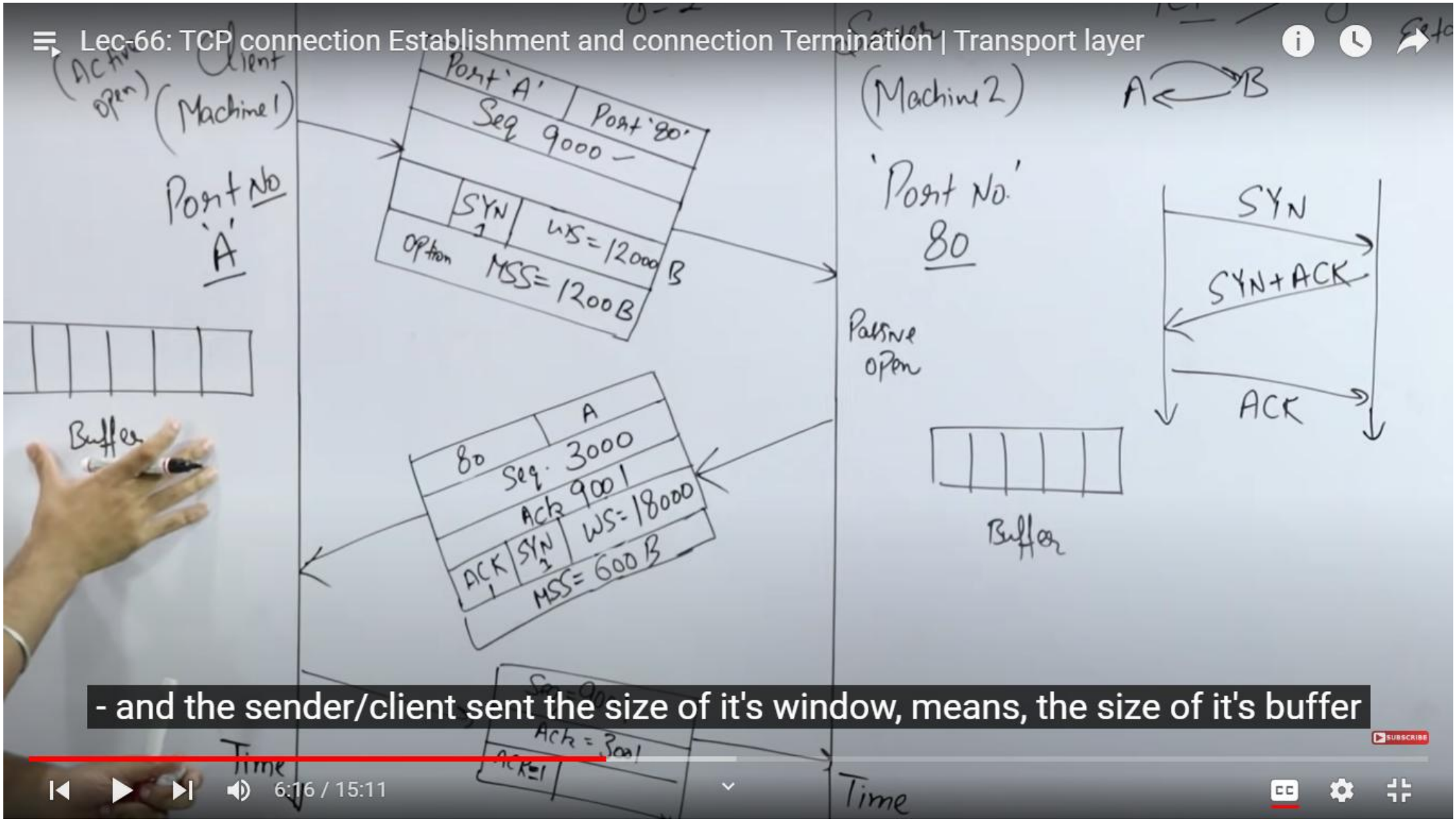

Lec-63: Transport Layer | Responsibilities of Transport Layer | OSI Model | Computer Networks
25
120
A1
A2
A3
A4
B1
B2
B3
B4
N/W 'A'
N/W 'B'
TCP
UDP
Transport layer
Presentation "
Session "
Network layer
IP.
Data Link "
Physical "
Sending data
3) Error Control
(Checksum)
4) Congestion Control
5) flow Control
1) End to End Delivery (Port to Port)
2) Reliability (4 → 4)
Inorder. - Loss of Data x
- we will take all the algorithms one by one in details. In this video,
12:40 / 16:10 • Congestion Control and Flow Control ›

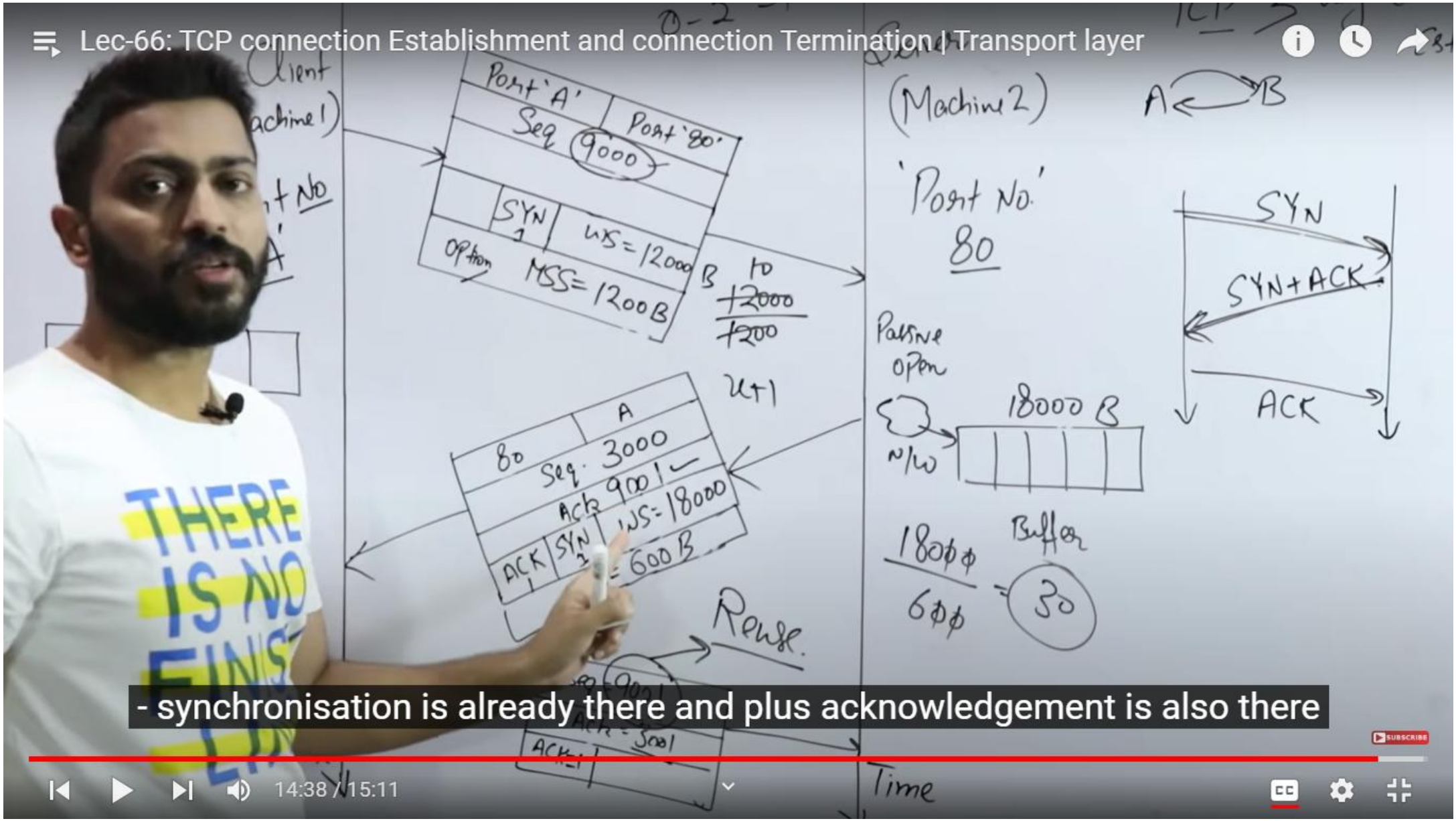

Lec-63: Transport Layer | Responsibilities of Transport Layer | OSI Model | Computer Networks
Transport Layer
Application layer
Presentation "
Session "
Transport layer
Network layer
Data Link "
Physical "
Sending data
Port to Port
- and back-end, means what will happen to the receiver, in receiver messages are coming continuously
15:20 / 16:10 • Congestion Control and Flow Control ›

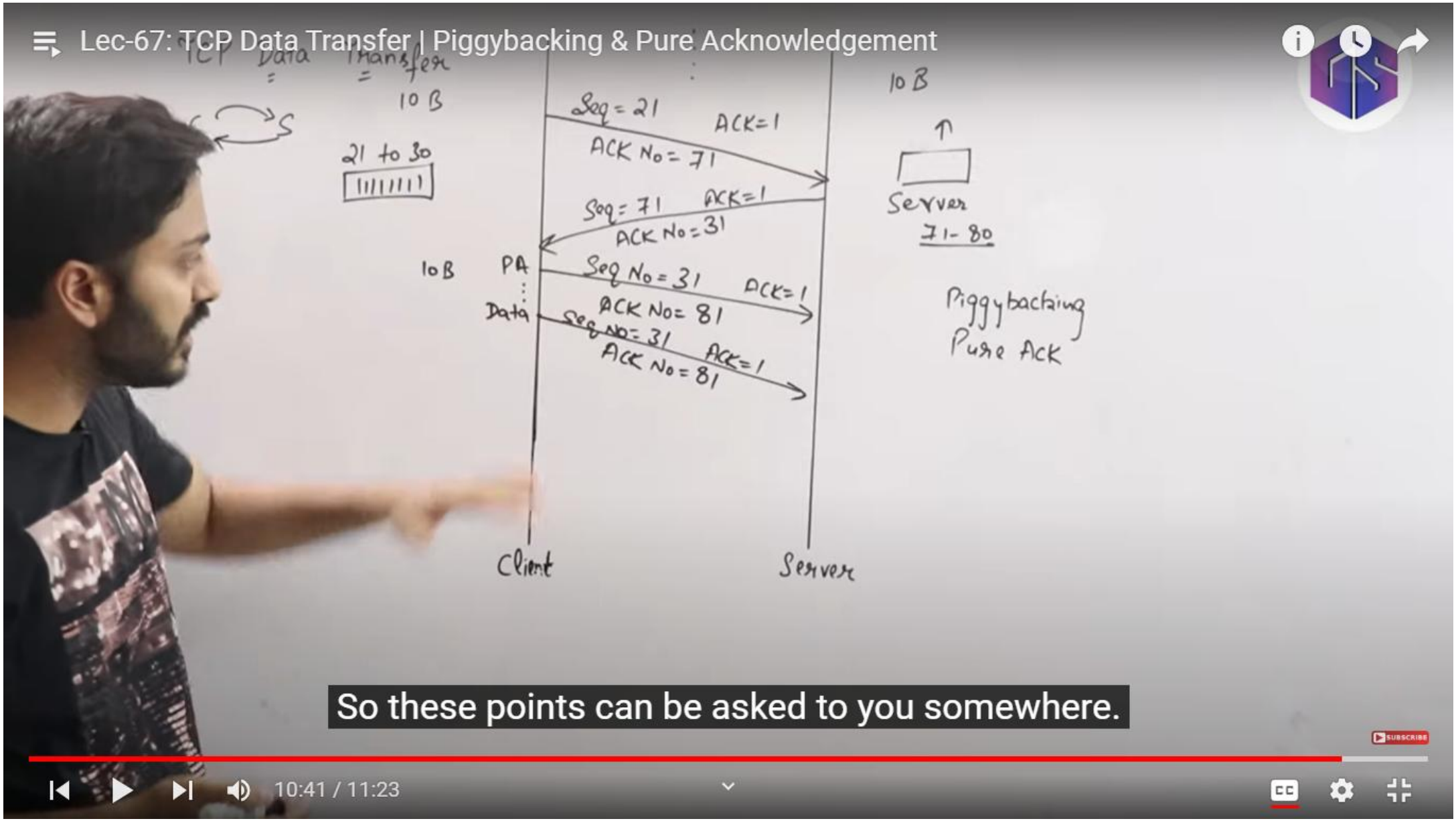

Why both IP & Port address is used for Connection | What is Socket Address with real life example
P1
P
IP1
M
IP1 P2
IP1 P
IP1
P
S1
IP2
P
M1
IP2
IP2 P facebook
IP + Port
32 + 16 = 48
bit
5535
23
2- 65535
9:55 / 10:03


Lec-64: TCP: Transmission control protocol | TCP Header | Transport layer | part -1
Source Port 16 Bit
Destination Port 16 bit
Sequence Number 32 bit
Acknowledge No. 32 bit
HLEN 4 bit
6
URG
ACK
PSH
RST
SYN
FIN
WINDOW Size 16 bit
Checksum 16 bit
16 bit URGENT Pointer
Options & Padding 40 Bytes
TCP Header (20-60 B)
AL
TL
D
TCP H
Bytes.
Segments.
Collection of bytes.
TCP (Transmission Control Protocol)
Byte Streaming
Connection Oriented - 3way
Reliability.
Full Duplex
A
B
Piggybacking
GBN
SR.
Error Control
Flow Control
Congestion Control
A
B
- should be of minimum 20 byte and maximum 60 byte.
8:38 / 14:50 • TCP Header ›

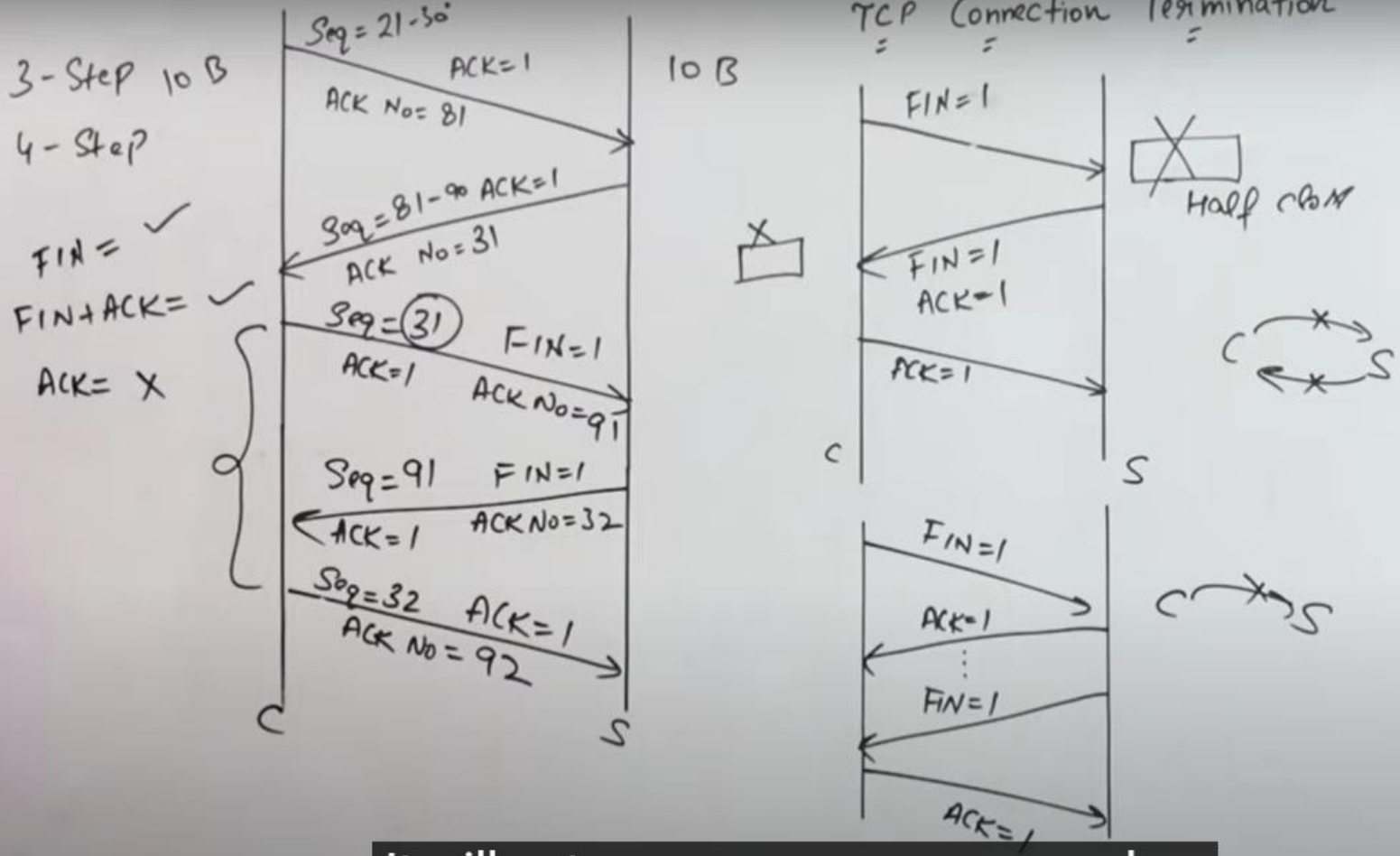

Lec-65: TCP: Transmission control protocol | TCP Header | Transport layer | part -2
Source Port 16 Bit
Destination Port 16 bit
Sequence Number 32 bit
Acknowledge No. 32 bit
HLEN 4 bit
6
URG
ACK
PSH
RST
SYN
FIN
WINDOW Size 16 bit
Checksum 16 bit
16 bit URGENT Pointer
Options & Padding 40 Bytes
0100
4x4 = 16
1000 8x4=32 TCP Header (20-60 B)
Scale of 4.
20x8= 160 bits
0-65535
0-1023 - Well known
50001
80
1050
1001 1000
Byte Streaming
Connection Orie
Full Duplex
Piggybacking
Error Control
Flow Control
Congestion Control
after that comes 6. Here the 6 bits are reserved for future use
2:07 / 12:30


Lec-66: TCP connection Establishment and connection Termination | Transport layer
(Active open)
Client
(Machine 1)
Port No
'A'
Port 'A'
Port '80'
Seq 9000
SYN 1
WS = 12000 B
Option MSS = 1200 B
Buffer
(Machine 2)
'Port No.'
80
Passive open
A
B
SYN
SYN+ACK
ACK
Buffer
80
A
Seq. 3000
Ack 9001
ACK 1
SYN 1
WS = 18000
MSS = 600 B
Time
Time
- and the sender/client sent the size of it's window, means, the size of it's buffer
6:16 / 15:11


Lec-66: TCP connection Establishment and connection Termination | Transport layer
Port 'A'
Port '80'
Seq 9000
SYN
WS = 12000 B
Option MSS = 1200 B
(Machine 2)
'Port No.'
80
A
B
SYN
SYN+ACK
ACK
Passive open
18000 B
N/W
Buffer
30
Time
- synchronisation is already there and plus acknowledgement is also there
14:38 / 15:11


Lec-67: TCP Data Transfer | Piggybacking & Pure Acknowledgement
TCP Data Transfer
10 B
21 to 30
Seq = 21
ACK = 1
ACK No = 71
Seq = 71
ACK = 1
ACK No = 31
10 B
PA
Data
Seq No = 31
ACK = 1
ACK No = 81
Seq No = 31
ACK = 1
ACK No = 81
Client
Server
10 B
Server
71 - 80
Piggybacking
Pure Ack
So these points can be asked to you somewhere.
10:41 / 11:23

Lec-68: Connection Termination in TCP in Hindi with example



It will not consume sequence number.

10:50 / 11:14 • Example ›

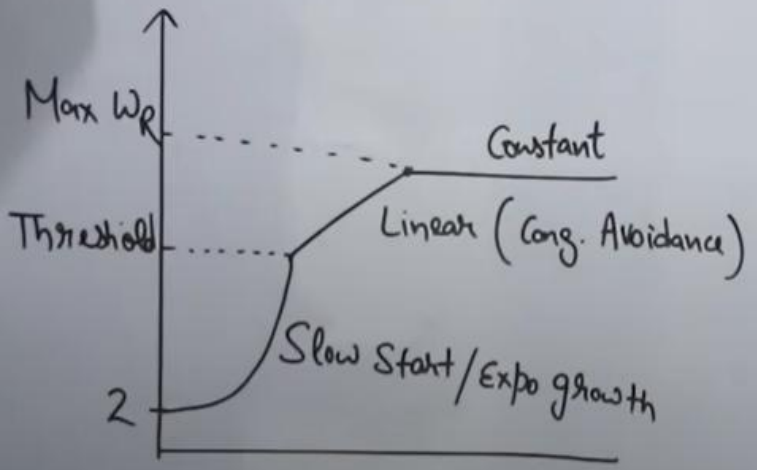
Lec-69: TCP Congestion Control in Computer Networks in Hindi

**Let the size of Congestion Window of a TCP Connection in two cases when

Case 1: Timeout occur

Case 2: 3 ACK Received

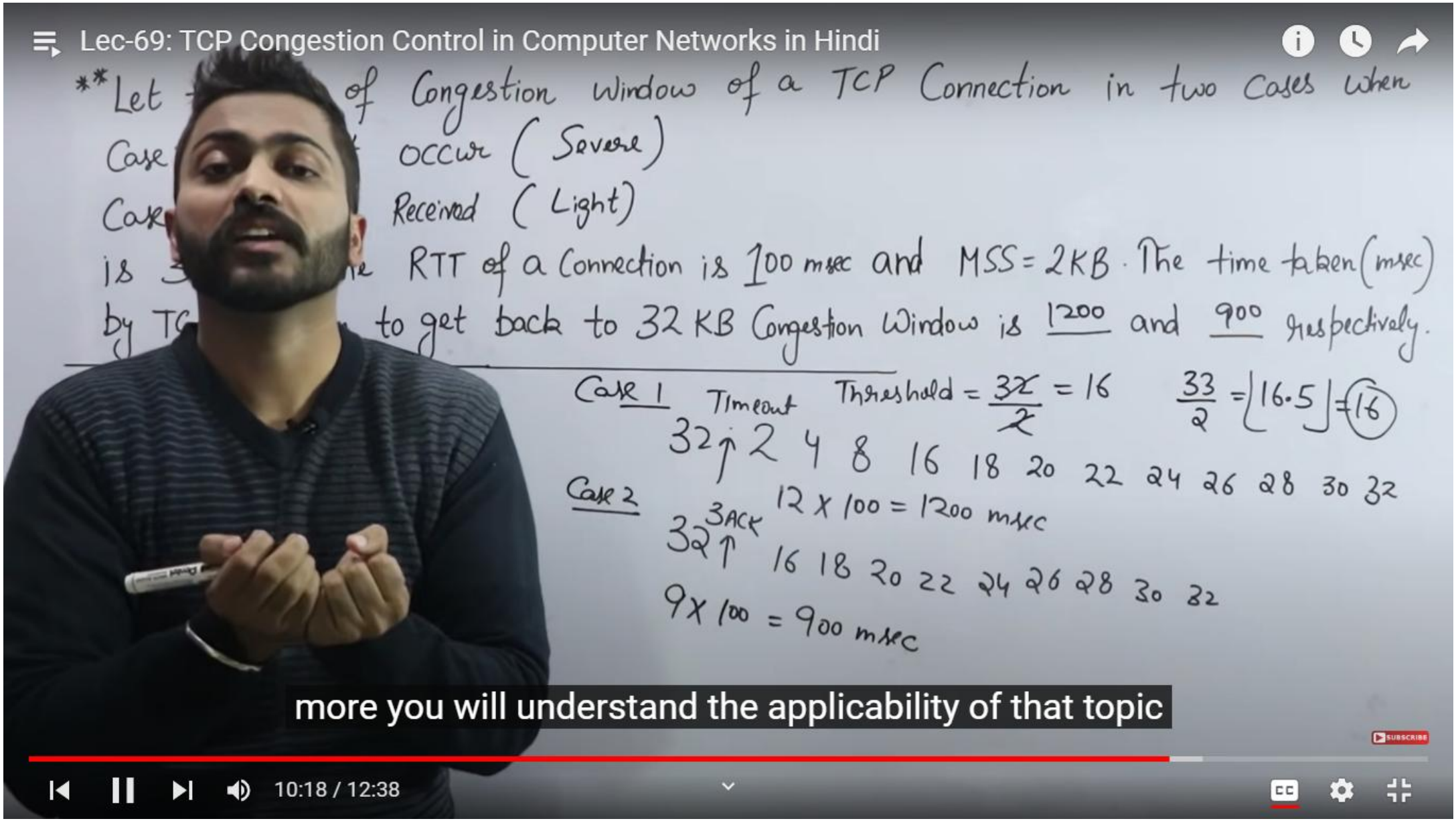
is 32 KB. The RTT of a Connection is 100 msec and MSS = 2KB. The time taken (msec) by TCP Connection to get back to 32 KB Congestion Window is ___ and ___ respectively.



Case 1 Timeout

SUBSCRIBE

0:20 / 12:38


Lec-69: TCP Congestion Control in Computer Networks in Hindi
**Let ... of Congestion Window of a TCP Connection in two cases when
Case ... occur (Severe)
Case ... Received (Light)
is ... RTT of a Connection is 100 msec and MSS = 2KB. The time taken (msec)
by TC... to get back to 32 KB Congestion Window is 1200 and 900 respectively.
Case 1 Timeout Threshold = 32/2 = 16
33/2 = ⌊16.5⌋ = 16
32 ↑ 2 4 8 16 18 20 22 24 26 28 30 32
Case 2 3 ACK
12 x 100 = 1200 msec
32 ↑ 16 18 20 22 24 26 28 30 32
9 x 100 = 900 msec
more you will understand the applicability of that topic
10:18 / 12:38

Lec-70: UDP (User Datagram Protocol) header in Computer Networks in Hindi

Source Port (16)	Destination Port (16)
Length (16)	Checksum (16)

UDP Header (8B fixed)

Checksum = UDP Header + UDP Data + Pseudo header of IP

$0-2^{16}-1$

0-65535

0-1023

C ⟶ S

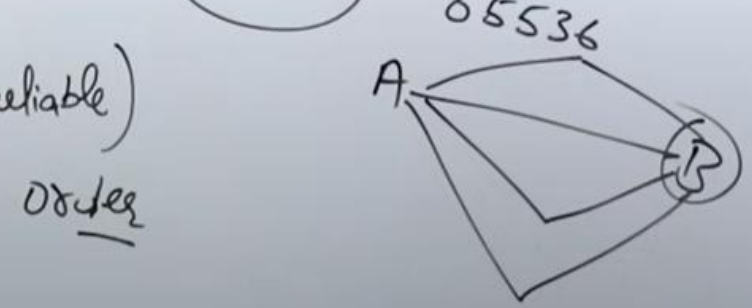
Payload

2^{16} → 65535 bytes

0-65535

4. $2^4 = 16$ (0-15)

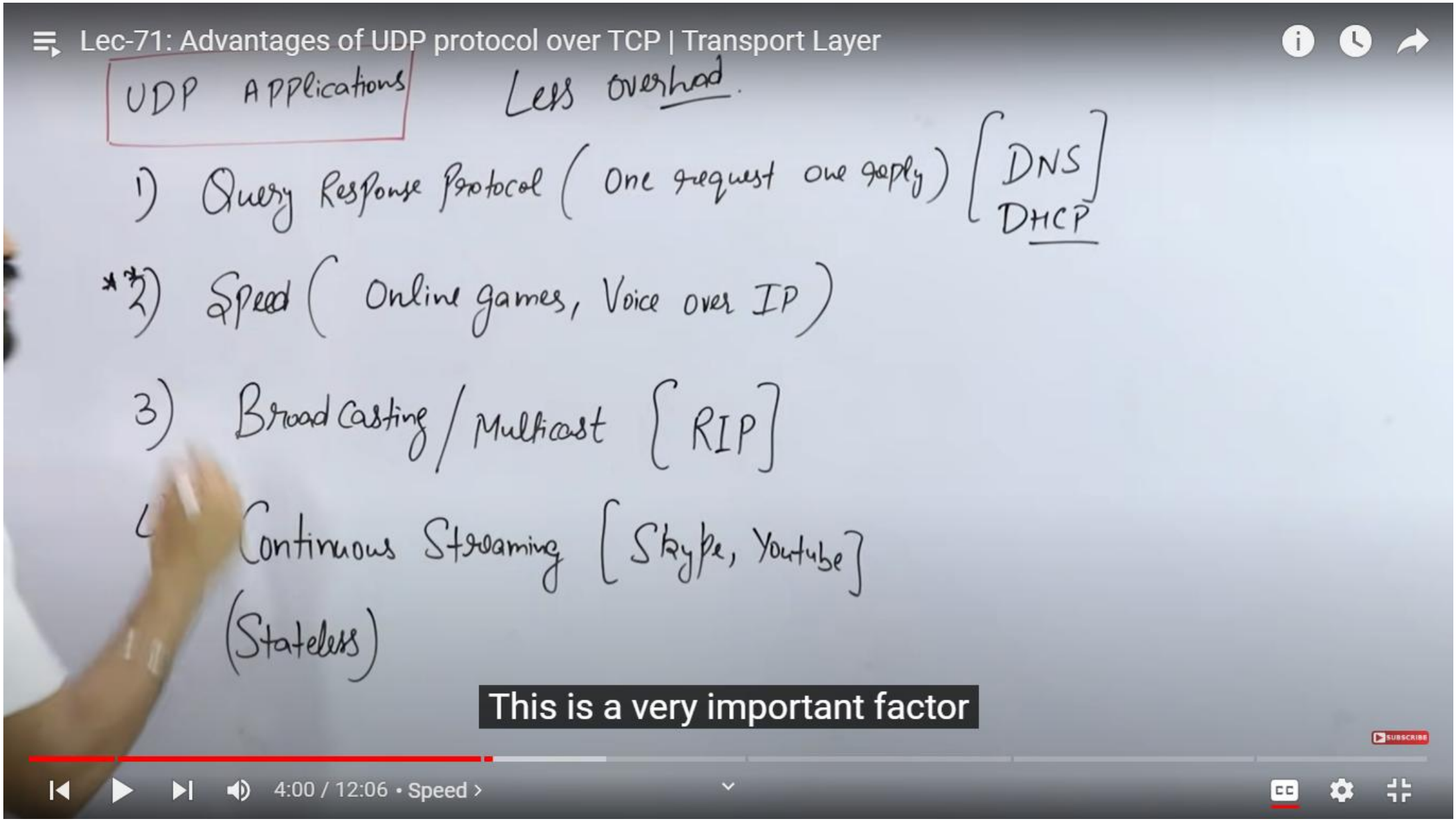
1111 = 15



ction less (Unreliable)

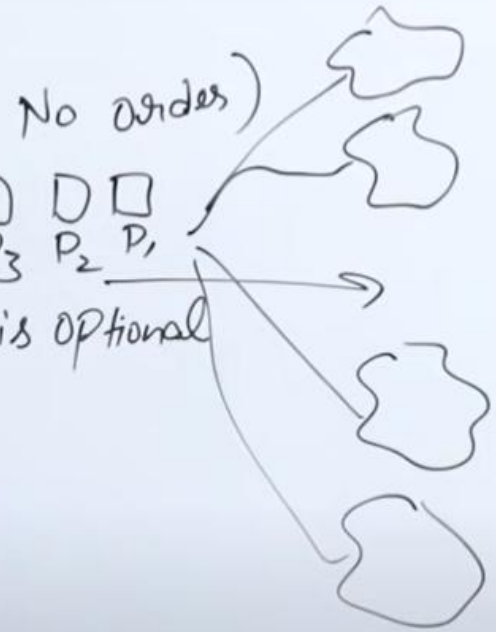
→ No order

11:26 / 11:47 • Checksum ›

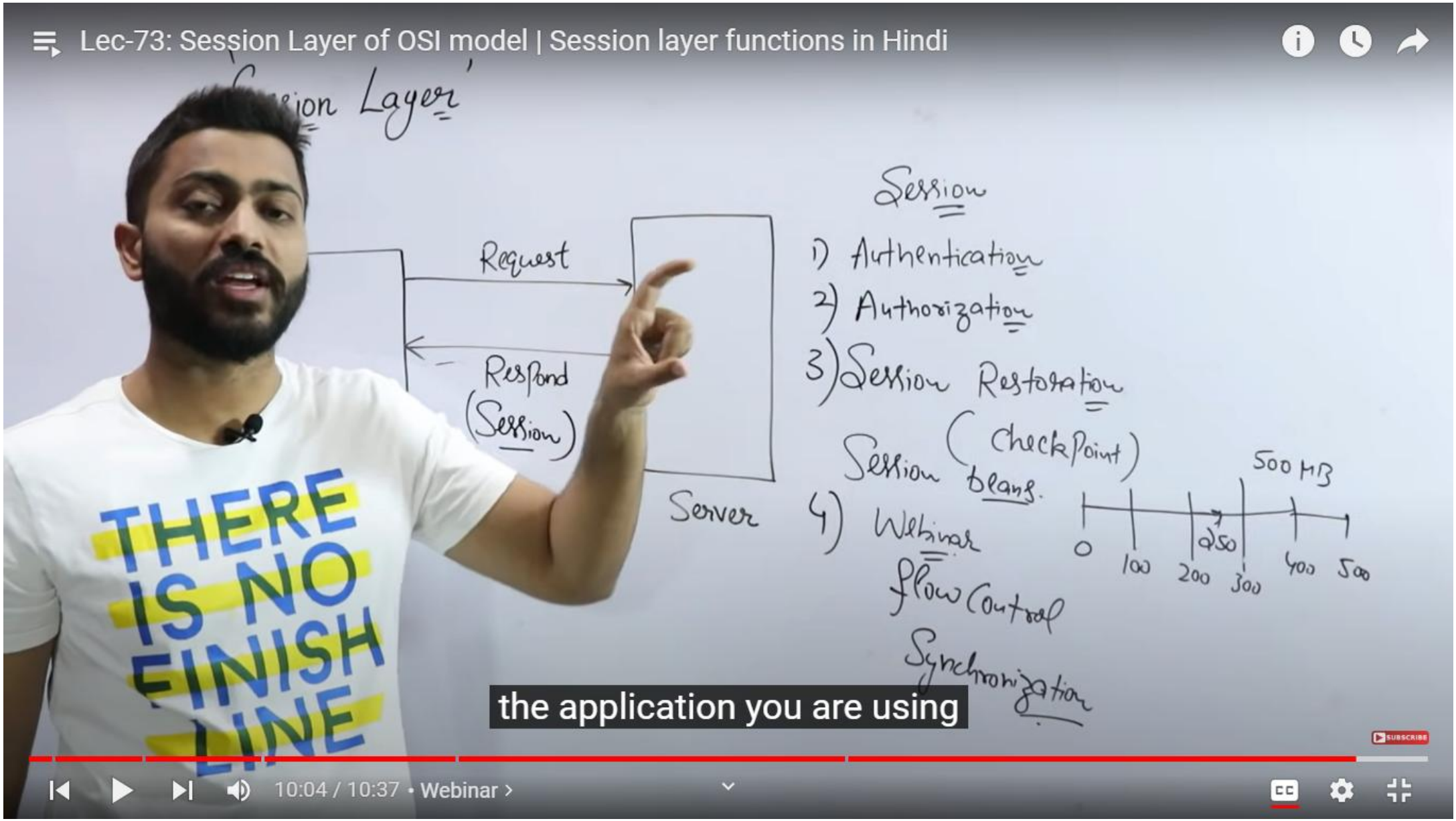

Lec-71: Advantages of UDP protocol over TCP | Transport Layer
UDP Applications
Less overhead.
1) Query Response Protocol (One request one reply) [DNS DHCP]
*2) Speed (Online games, Voice over IP)
3) Broadcasting / Multicast [RIP]
4) Continuous Streaming [Skype, Youtube]
(Stateless)
This is a very important factor
4:00 / 12:06 • Speed ›

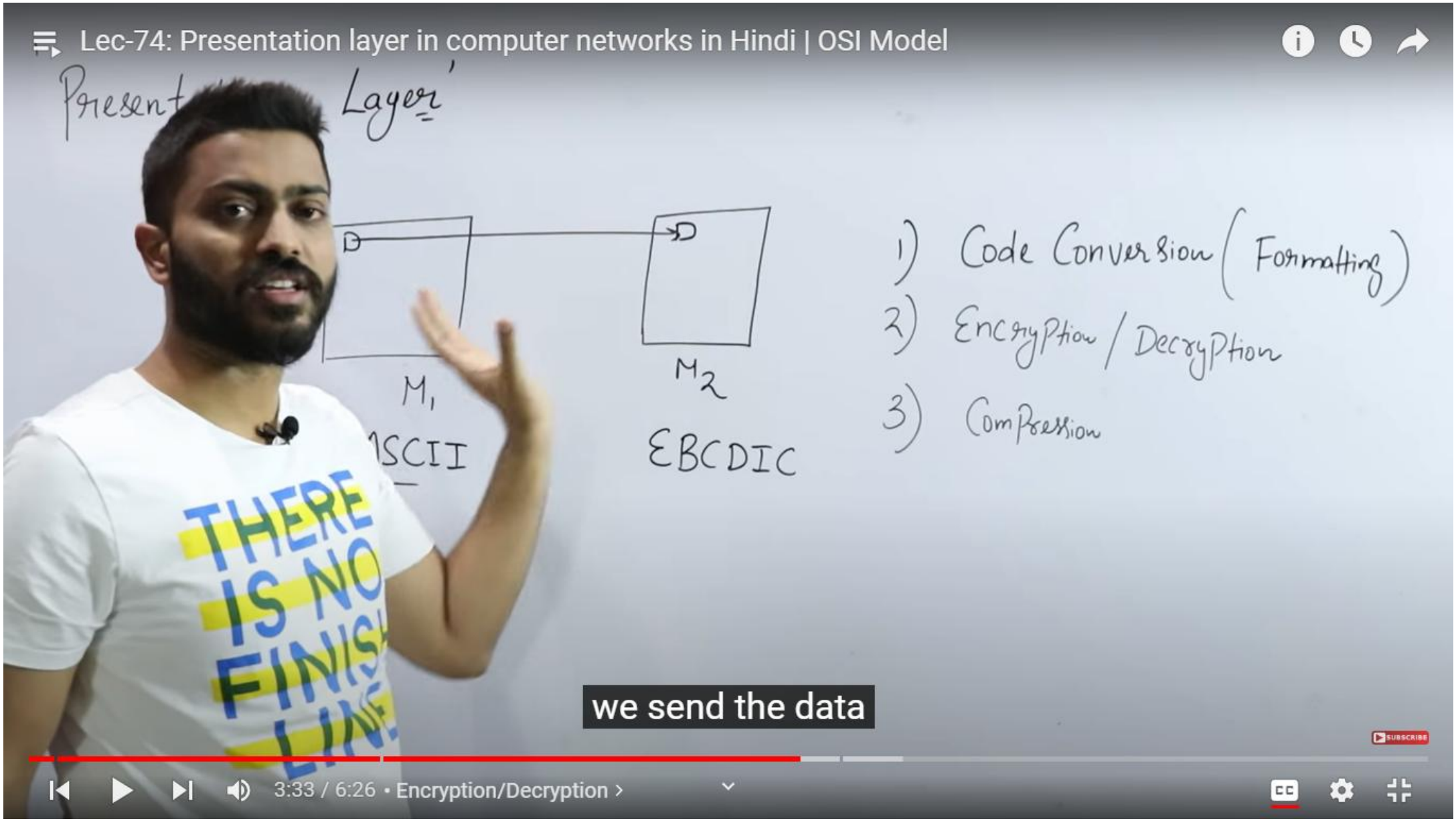
Lec-72: TCP vs UDP differences in hindi

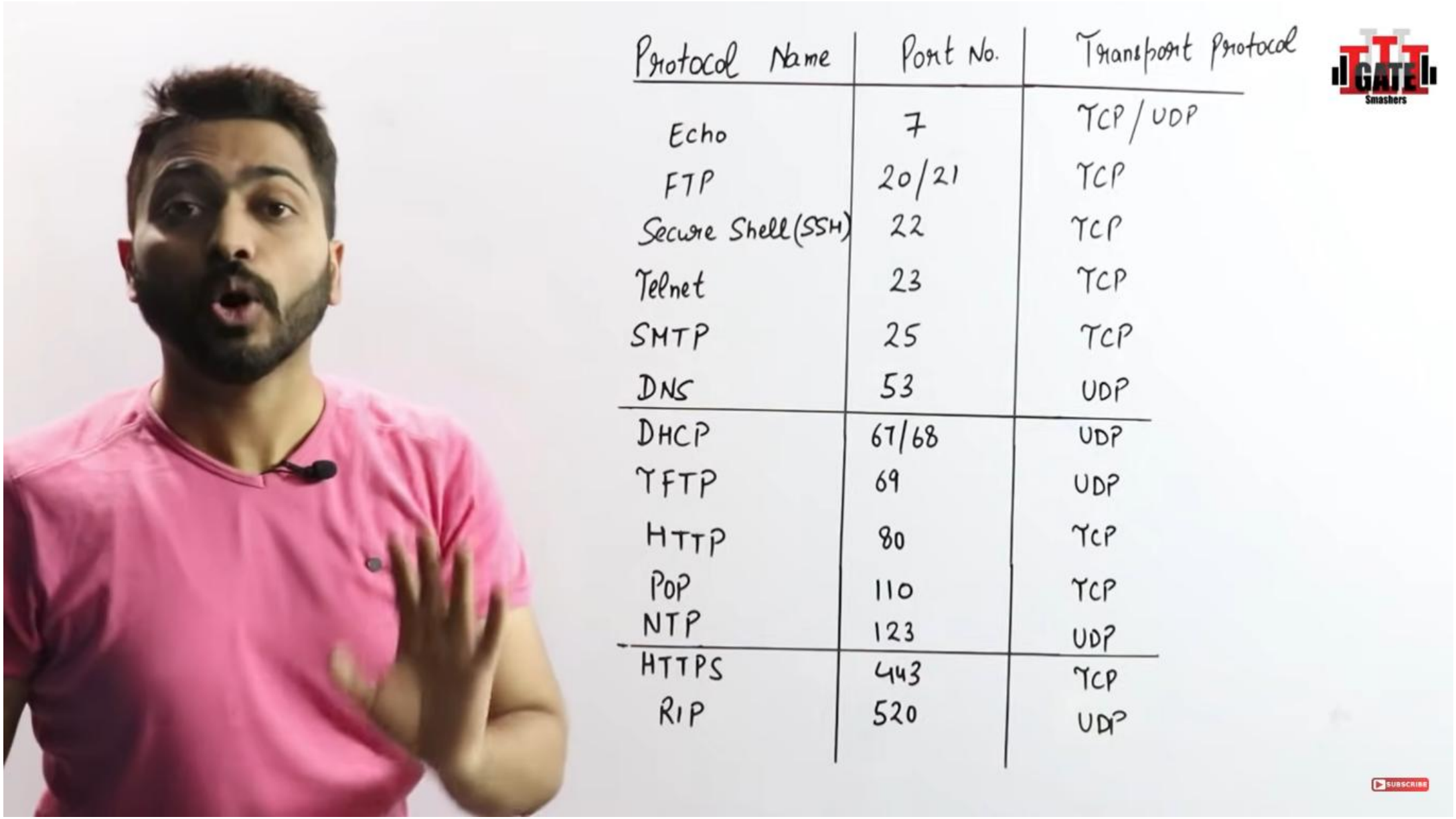
TCP	UDP
Connection oriented	1) Connectionless
Reliable Ordering.	2) Less Reliable (No order)
Error Control is mandatory	3) Error Control is optional
Slow transmission	4) Fast transmission
More overhead	5) Less overhead
flow Control, Congestion Control	6) No FC, CC



SUBSCRIBE

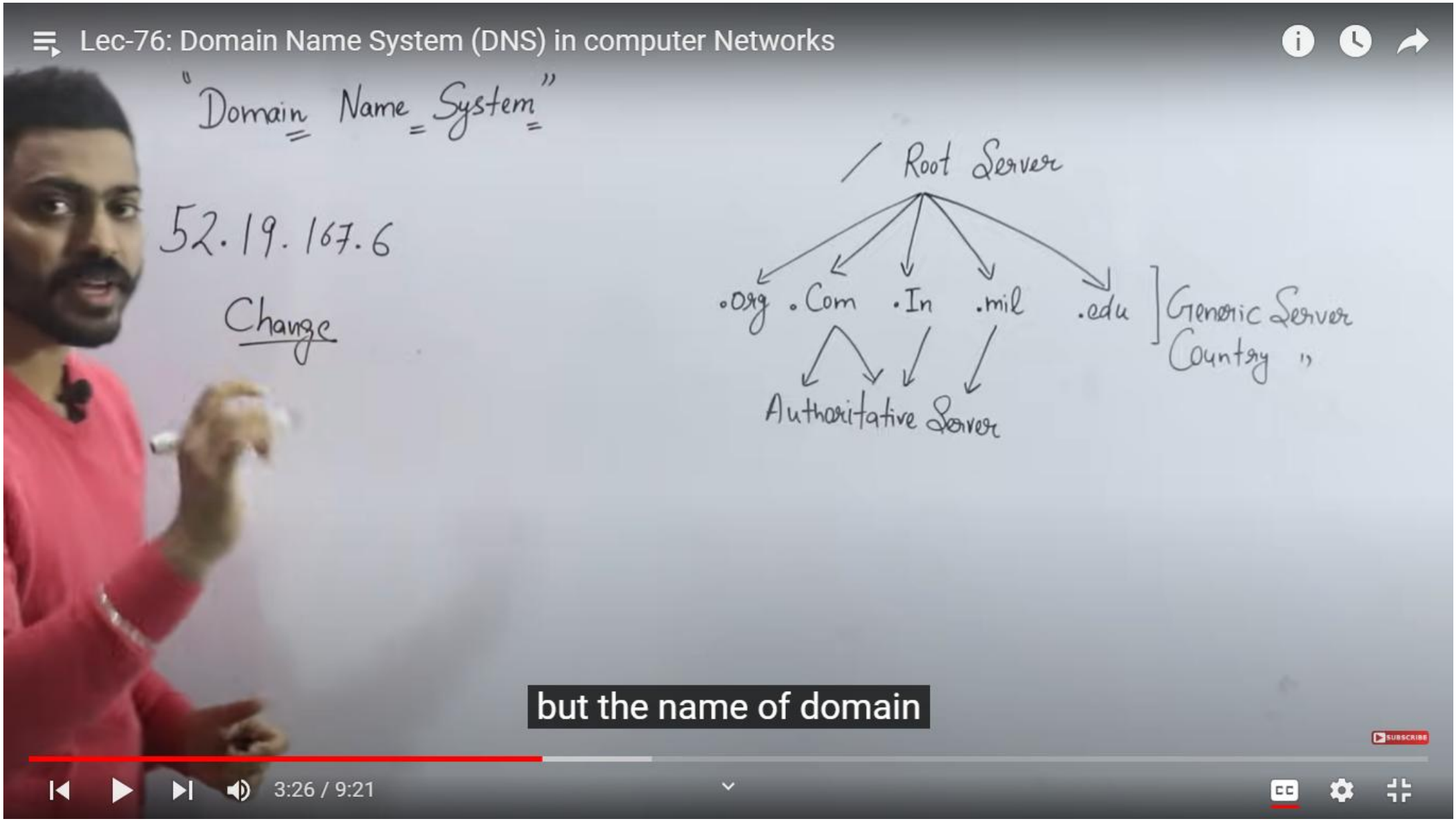

Lec-73: Session Layer of OSI model | Session layer functions in Hindi
Session Layer
Request
Respond
(Session)
Server
Session
1) Authentication
2) Authorization
3) Session Restoration
(CheckPoint)
Session Hang.
500 MB
0
100
200
250
300
400
500
4) Webinar
Flow Control
Synchronization
THERE IS NO FINISH LINE
the application you are using
10:04 / 10:37 • Webinar ›

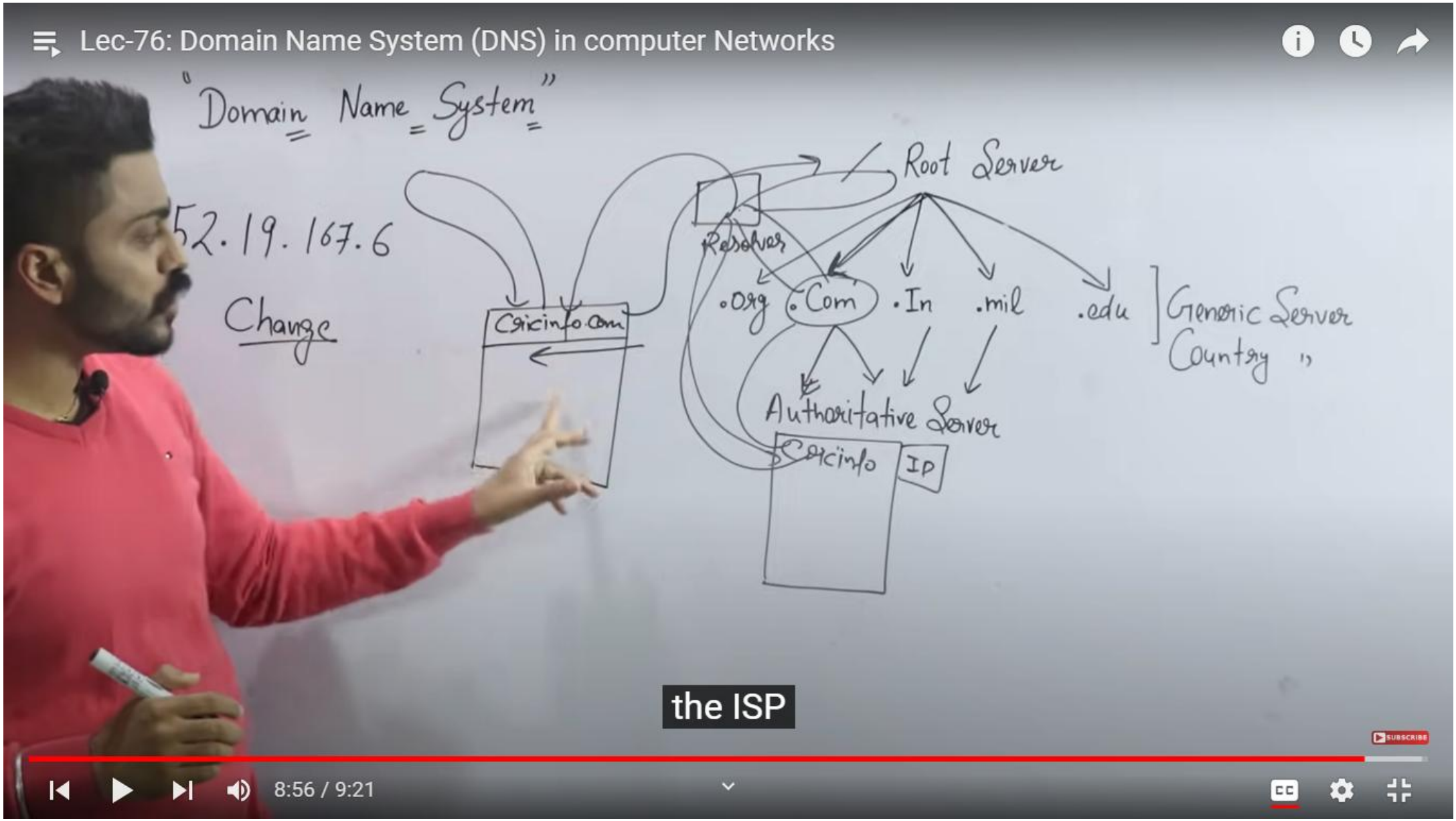

Lec-74: Presentation layer in computer networks in Hindi | OSI Model
Present Layer
M1
ASCII
M2
EBCDIC
1) Code Conversion (Formatting)
2) Encryption / Decryption
3) Compression
THERE IS NO FINISH LINE
we send the data
3:33 / 6:26 • Encryption/Decryption ›

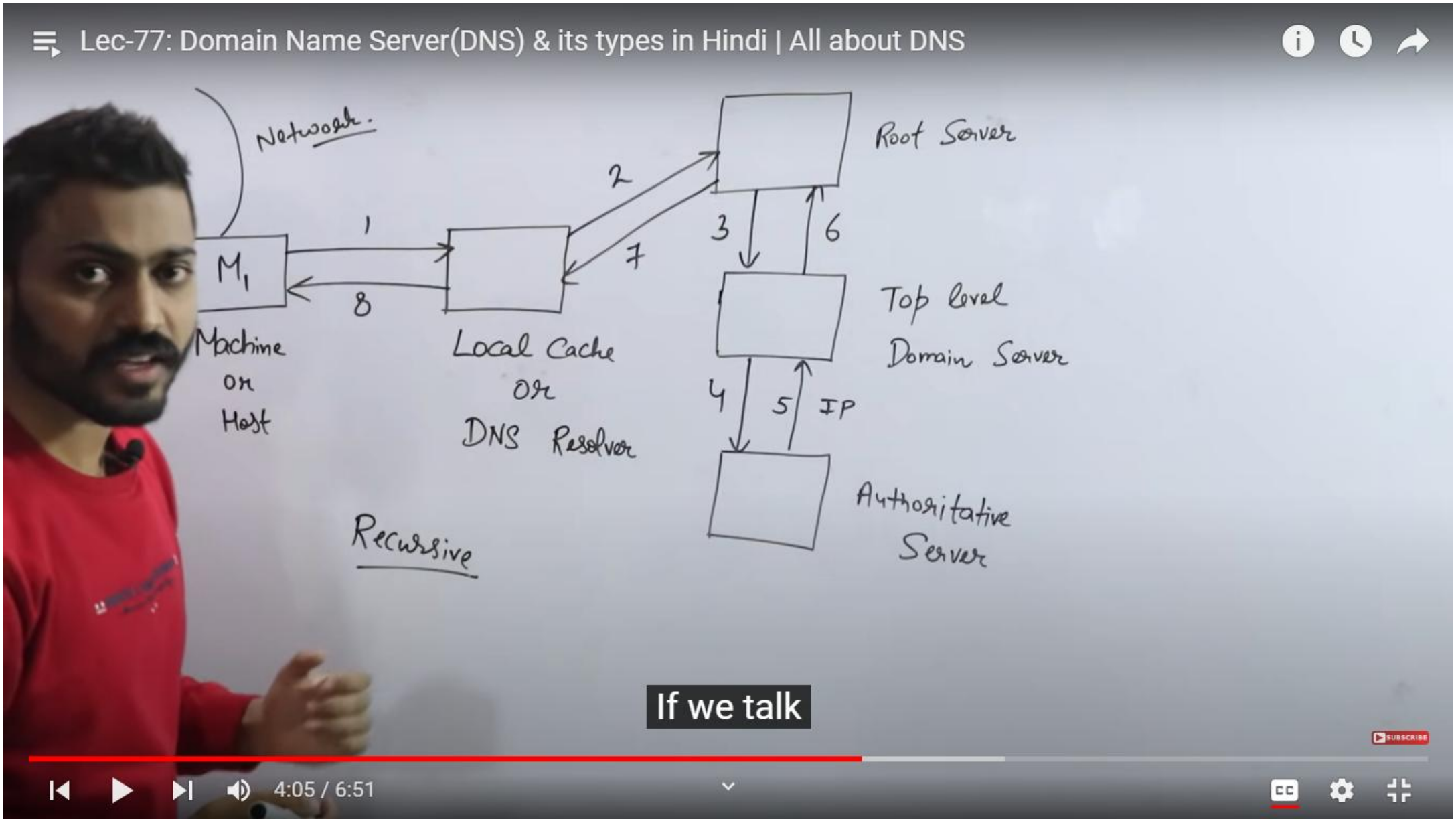


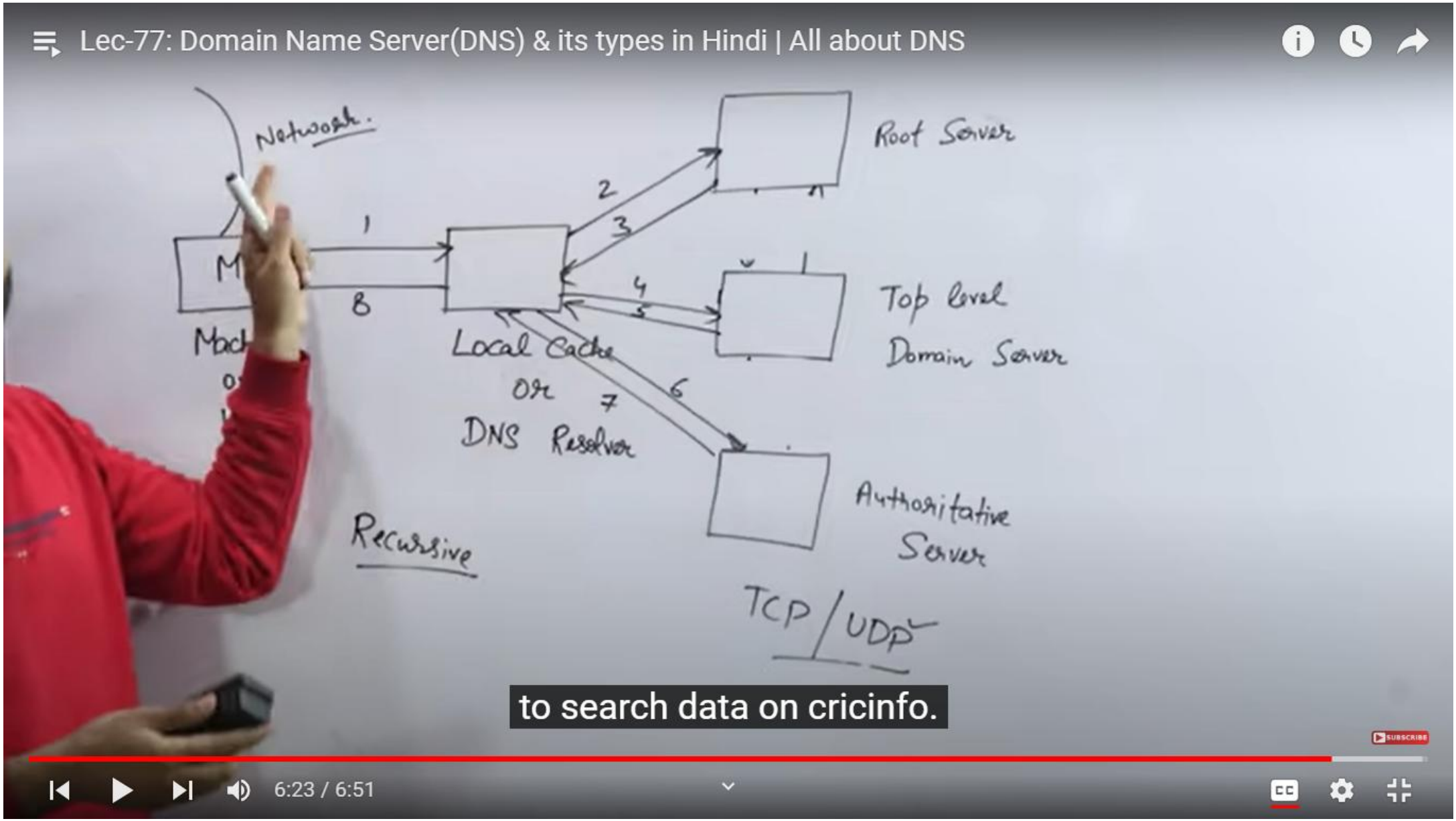
Protocol Name	Port No.	Transport Protocol
Echo	7	TCP / UDP
FTP	20/21	TCP
Secure Shell (SSH)	22	TCP
Telnet	23	TCP
SMTP	25	TCP
DNS	53	UDP
DHCP	67/68	UDP
TFTP	69	UDP
HTTP	80	TCP
POP	110	TCP
NTP	123	UDP
HTTPS	443	TCP
RIP	520	UDP

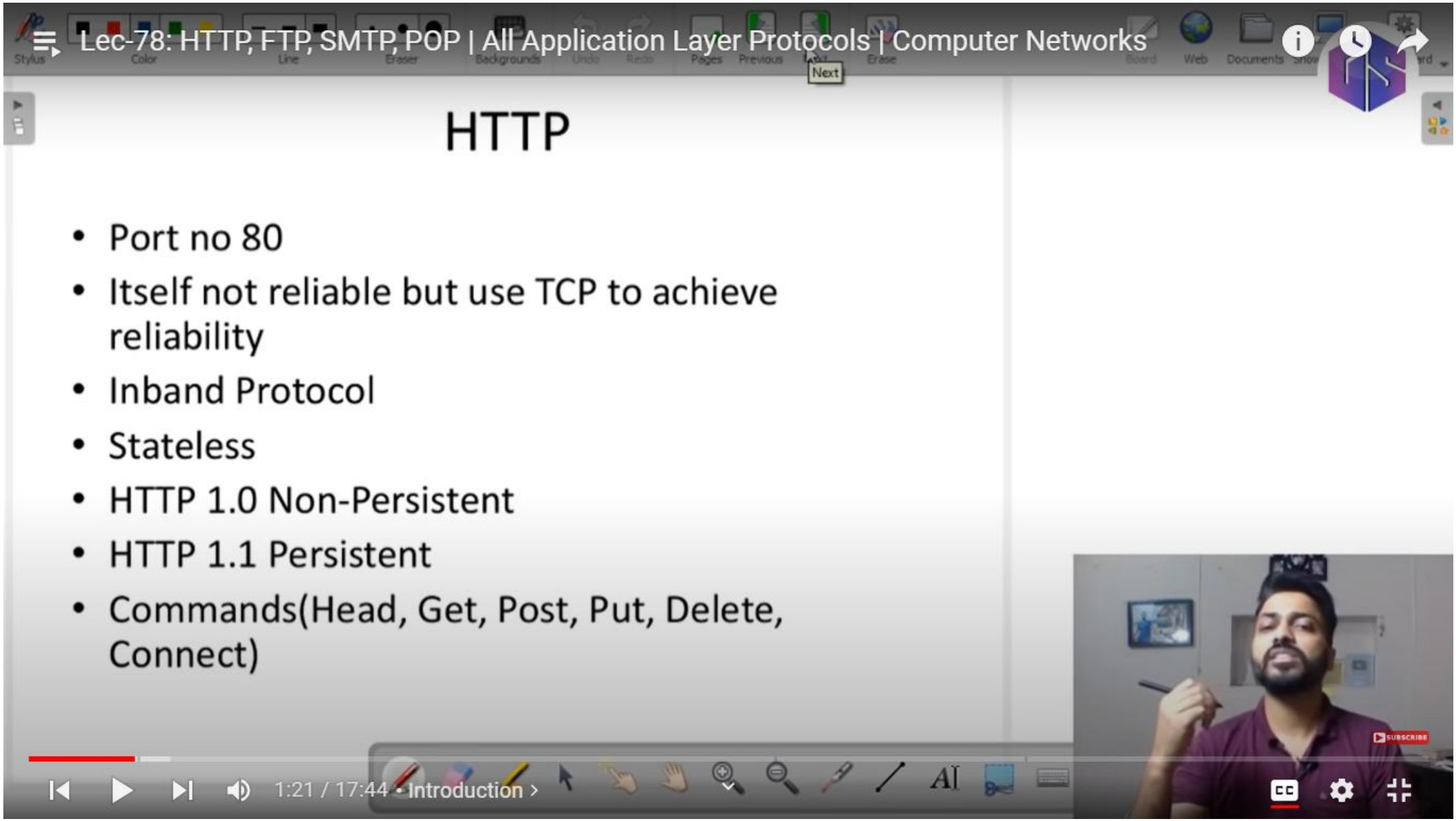
GATE Smashers
SUBSCRIBE

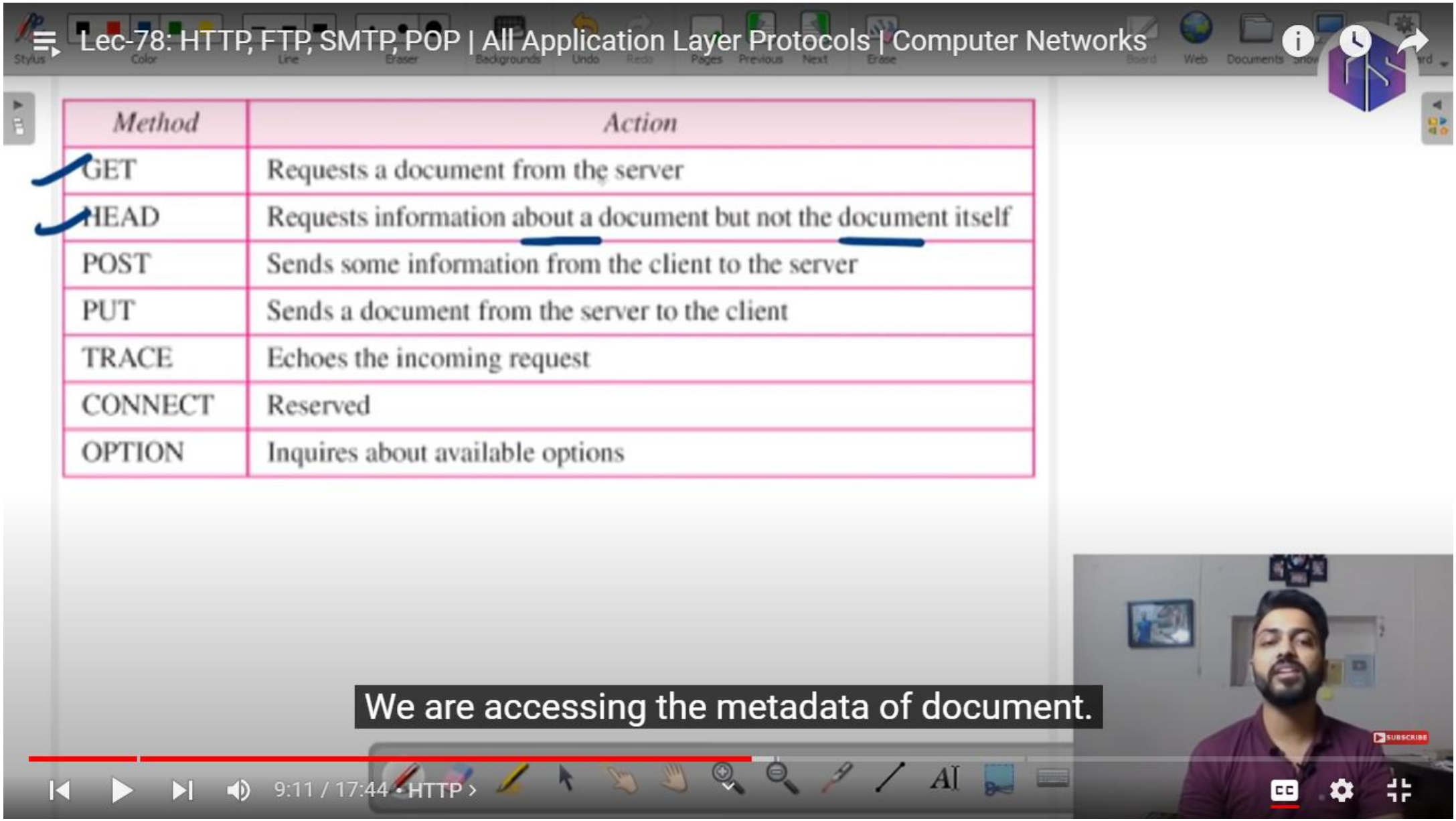

Lec-76: Domain Name System (DNS) in computer Networks
"Domain Name System"
52.19.167.6
Change
Root Server
.org
.Com
.In
.mil
.edu
Generic Server
Country
Authoritative Server
but the name of domain
3:26 / 9:21


Lec-76: Domain Name System (DNS) in computer Networks
"Domain Name System"
52.19.167.6
Change
Cricinfo.com
Root Server
Resolver
.org
.Com
.In
.mil
.edu
Generic Server
Country
Authoritative Server
Cricinfo
IP
the ISP
8:56 / 9:21


Lec-77: Domain Name Server(DNS) & its types in Hindi | All about DNS
Network.
M1
Machine
or
Host
1
8
Local Cache
or
DNS Resolver
2
7
Root Server
3
6
Top level
Domain Server
4
5
IP
Authoritative
Server
Recursive
If we talk
4:05 / 6:51


Lec-77: Domain Name Server(DNS) & its types in Hindi | All about DNS
Network.
Root Server
Top level
Domain Server
Local Cache
Or
DNS Resolver
Authoritative
Server
Recursive
TCP / UDP
1
2
3
4
5
6
7
8
to search data on cricinfo.
6:23 / 6:51


Lec-78: HTTP, FTP, SMTP, POP | All Application Layer Protocols | Computer Networks
HTTP
Port no 80
Itself not reliable but use TCP to achieve reliability
Inband Protocol
Stateless
HTTP 1.0 Non-Persistent
HTTP 1.1 Persistent
Commands(Head, Get, Post, Put, Delete, Connect)
1:21 / 17:44 • Introduction ›


Lec-78: HTTP, FTP, SMTP, POP | All Application Layer Protocols | Computer Networks
Method
Action
GET
Requests a document from the server
HEAD
Requests information about a document but not the document itself
POST
Sends some information from the client to the server
PUT
Sends a document from the server to the client
TRACE
Echoes the incoming request
CONNECT
Reserved
OPTION
Inquires about available options
We are accessing the metadata of document.
9:11 / 17:44 • HTTP ›

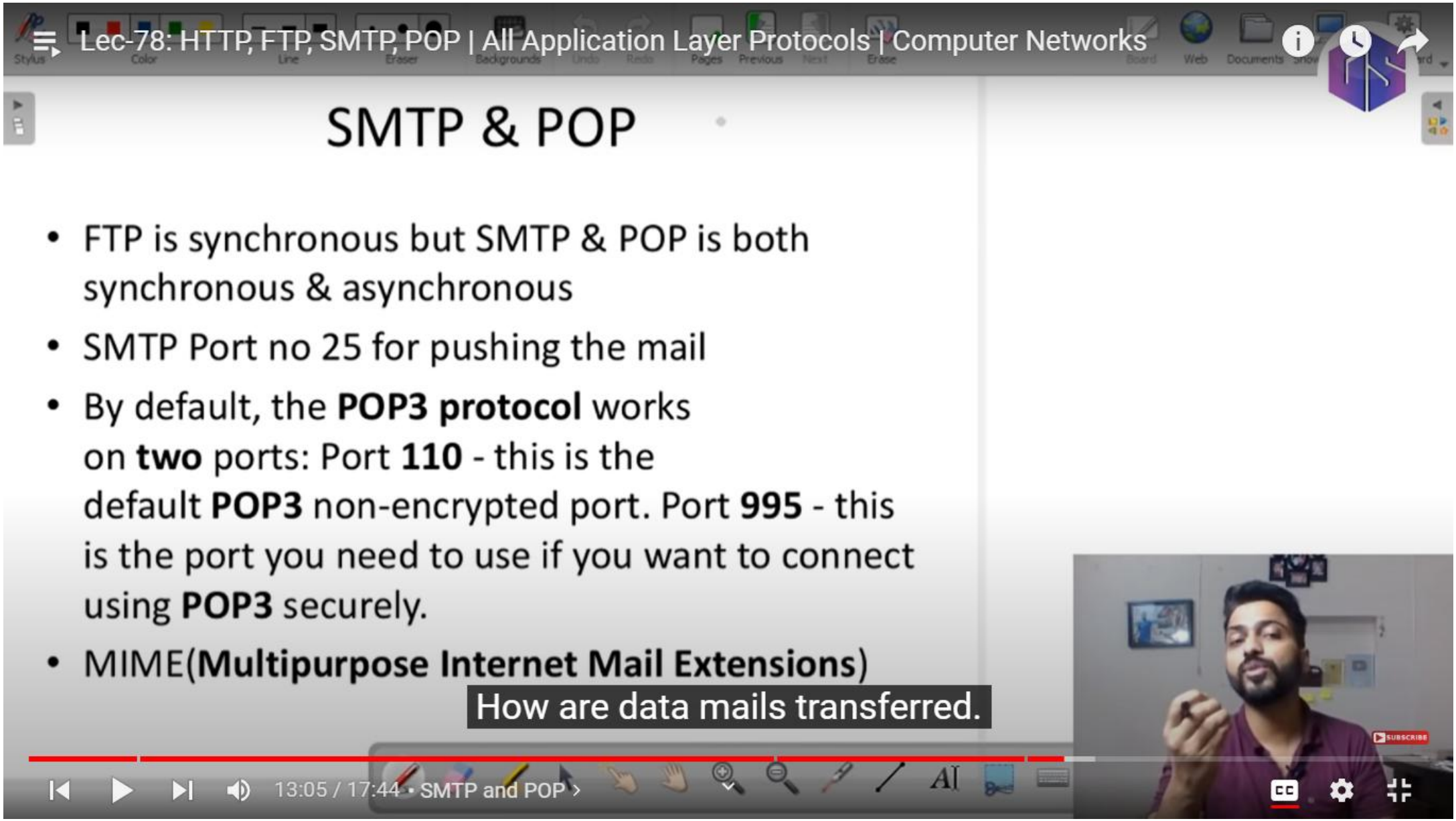
Lec-78: HTTP, FTP, SMTP, POP | All Application Layer Protocols | Computer Networks

FTP

- Port no 20(DATA) & 21(Control)
- Data connection is non-persistent
- Control connection is persistent
- Not Inband
- Reliable
- Stateful

Dragging from your system files will get sent to its system.

10:36 / 17:44 • FTP >


Lec-78: HTTP, FTP, SMTP, POP | All Application Layer Protocols | Computer Networks
SMTP & POP
• FTP is synchronous but SMTP & POP is both synchronous & asynchronous
• SMTP Port no 25 for pushing the mail
• By default, the POP3 protocol works on two ports: Port 110 - this is the default POP3 non-encrypted port. Port 995 - this is the port you need to use if you want to connect using POP3 securely.
• MIME(Multipurpose Internet Mail Extensions)
How are data mails transferred.
13:05 / 17:44 • SMTP and POP ›

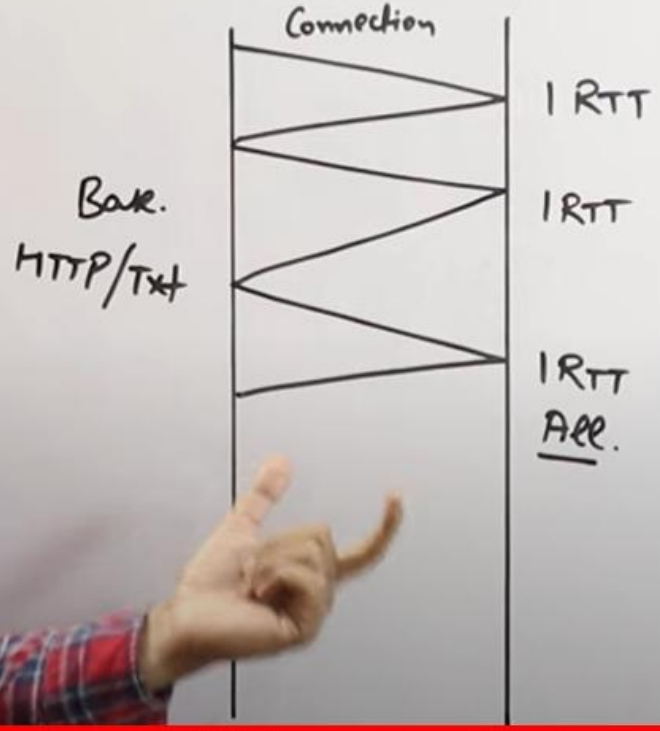
File Edit Format Run Options Window Help

```
    random_password=passwd.get()
    pyperclip.copy(random_password)

root=Tk()
root.iconbitmap(r"C:\Users\23531\Downloads\password.ico")
root.title("Password Generator")
root.geometry("680x200")
root.config(bg='gray20')
choice=IntVar()
Font=('arial',13,'bold')
passwordLabel=Label(root,text='Password Generator',font=('times new roman',20,'bold'),bg='gray20',fg='white').place(x=250,y=10)
lb=Label(root,text="select type of password",font=("times new roman",20,"bold"),bg="gray20",fg="white").place(x=20,y=50)


weakradioButton=Radiobutton(root,text='Weak',value=1,variable=choice,fg='red',font=Font).place(x=340,y=60)


mediumradioButton=Radiobutton(root,text='Medium',value=2,variable=choice,fg='red',font=Font).place(x=450,y=60)


strongradioButton=Radiobutton(root,text='Strong',value=3,variable=choice,fg='red',font=Font).place(x=570,y=60)


lengthLabel=Label(root,text='Enter  Password  Length',font=("times new roman",20,"bold"),bg="gray20",fg="white").place(x=20,y=100)

mydata=IntVar()
length_Box=Spinbox(root,from_=5,to_=18,width=5,font=Font,textvariable=mydata).place(x=340,y=110)


generateButton=Button(root,text='Generate',font=Font,bg='blue',command=generator).place(x=450,y=150)

passwd=StringVar()
passwordField=Entry(root,width=25,bd=2,font=Font,textvariable=passwd).place(x=50,y=155)


copyButton=Button(root,text='Copy',font=Font,bg='blue',command=copy).place(x=340,y=150)


root.mainloop()
```

Lec-79: Persistent vs Non-Persistent HTTP | HTTP/1.0 vs HTTP/1.1

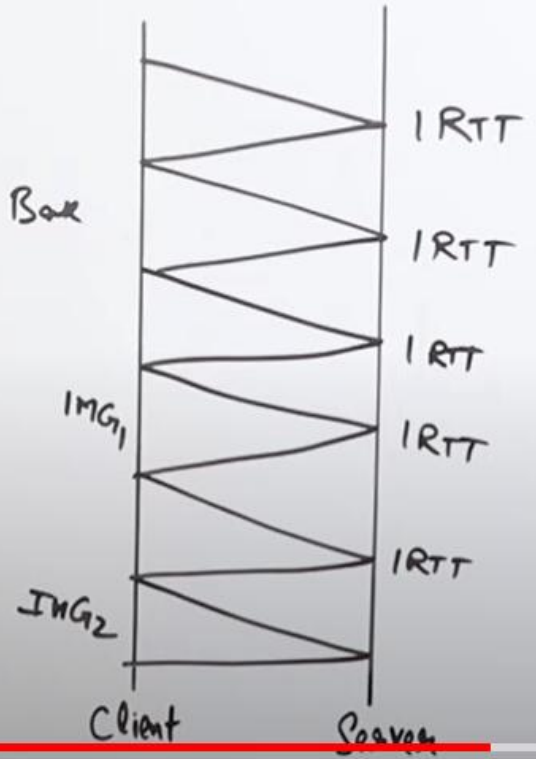
Persistant HTTP Connection (HTTP/1.1)

1) Server leaves Connection open after sending response
   1 RTT for all referenced object
2) Less overhead



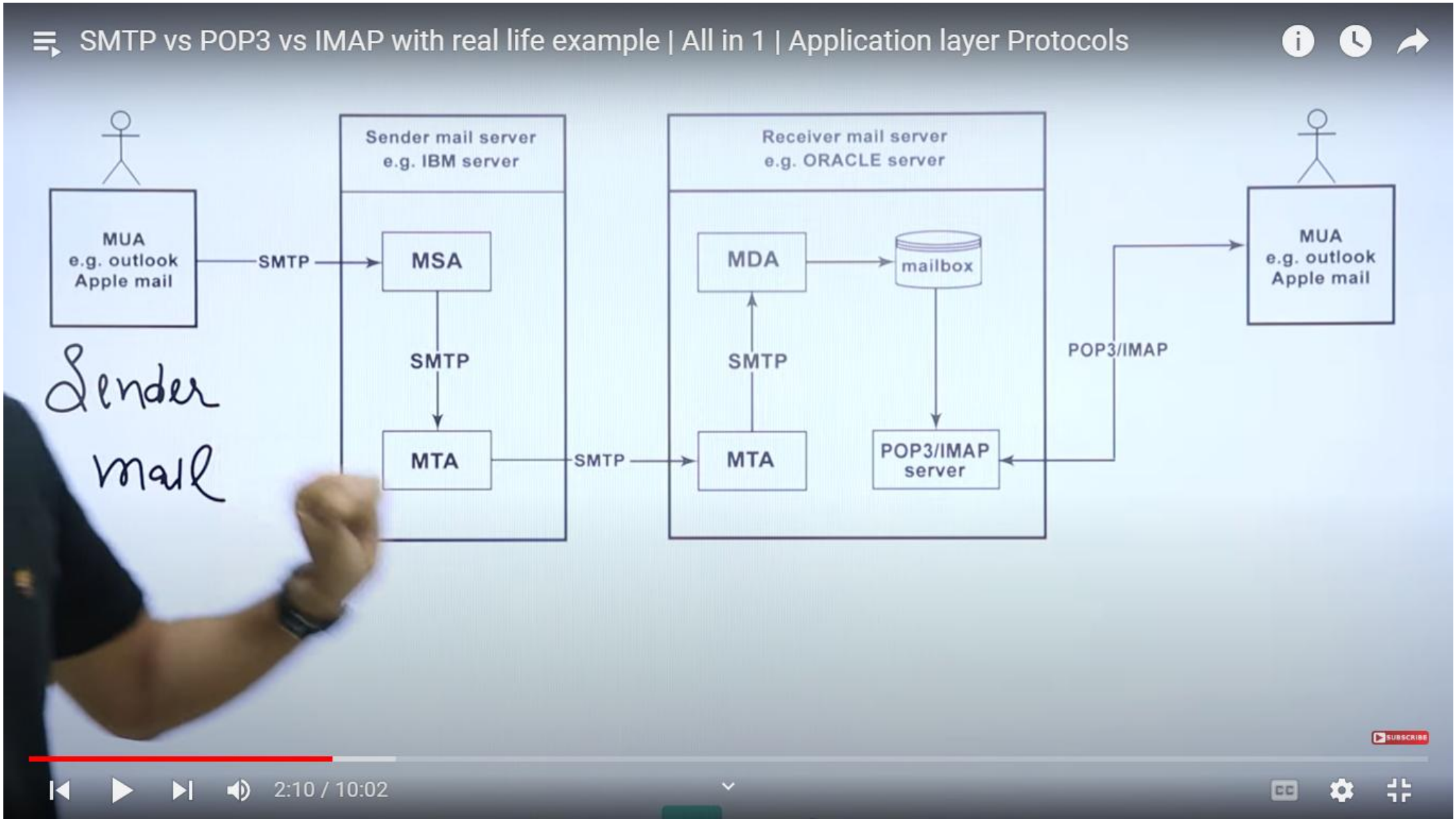
Non Persistant HTTP (HTTP/1.0)

1) It Requires 2 RTTs for object
2) More overhead



nothing like that.

6:47 / 7:50


SMTP vs POP3 vs IMAP with real life example | All in 1 | Application layer Protocols
MUA
e.g. outlook
Apple mail
SMTP
Sender mail server
e.g. IBM server
MSA
SMTP
MTA
SMTP
Receiver mail server
e.g. ORACLE server
MDA
mailbox
SMTP
MTA
POP3/IMAP
server
POP3/IMAP
MUA
e.g. outlook
Apple mail
Sender
mail
2:10 / 10:02