

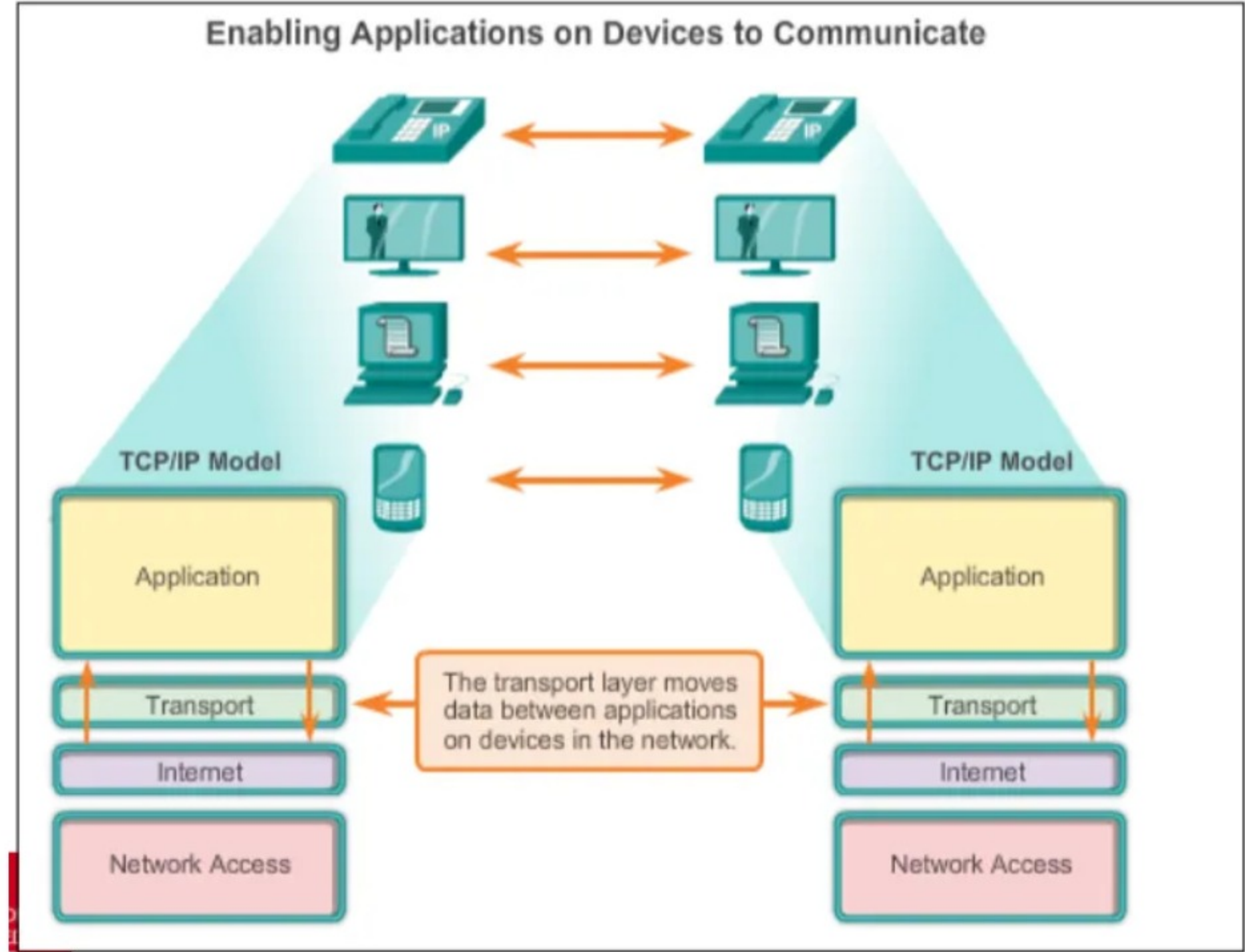
Lecture 11a - Transport Layer

- TypeLecture
- MaterialsEmpty
- Reviewed

1. The Role of the Transport Layer
2. Basic Characteristics
3. Supporting Concurrent Applications

1. The Role of the Transport Layer

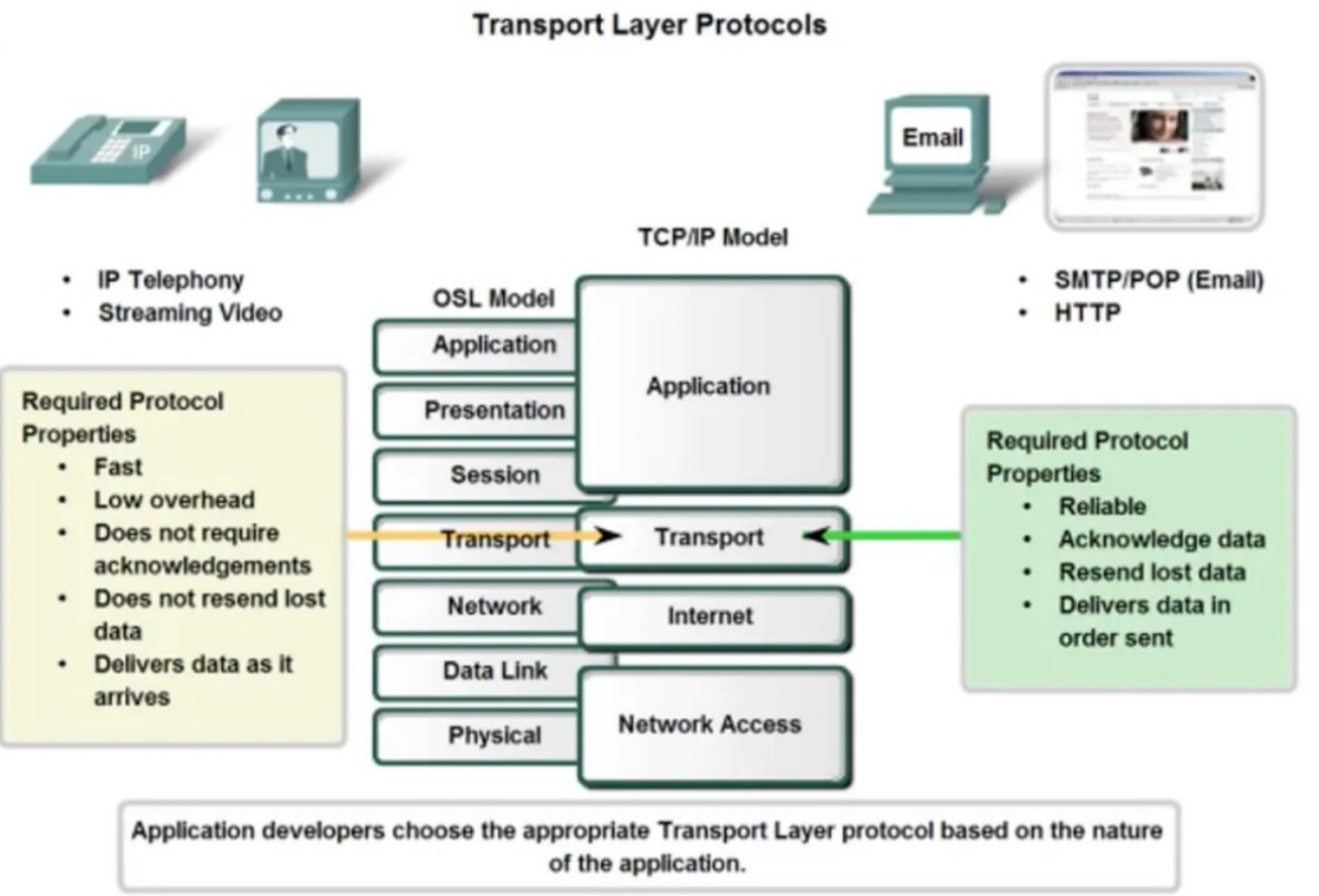
- The main role of the transport layer is to establish a conversation between two applications running on two network devices.



- The Internet layer enables network connectivity between the hosts, but the transport layer is the one connecting the source and destination applications.
- Some responsibilities:
 - Track individual conversations between a source application and a destination application. *For example, a Web browser to a website.*
 - Segment and reassemble the data.

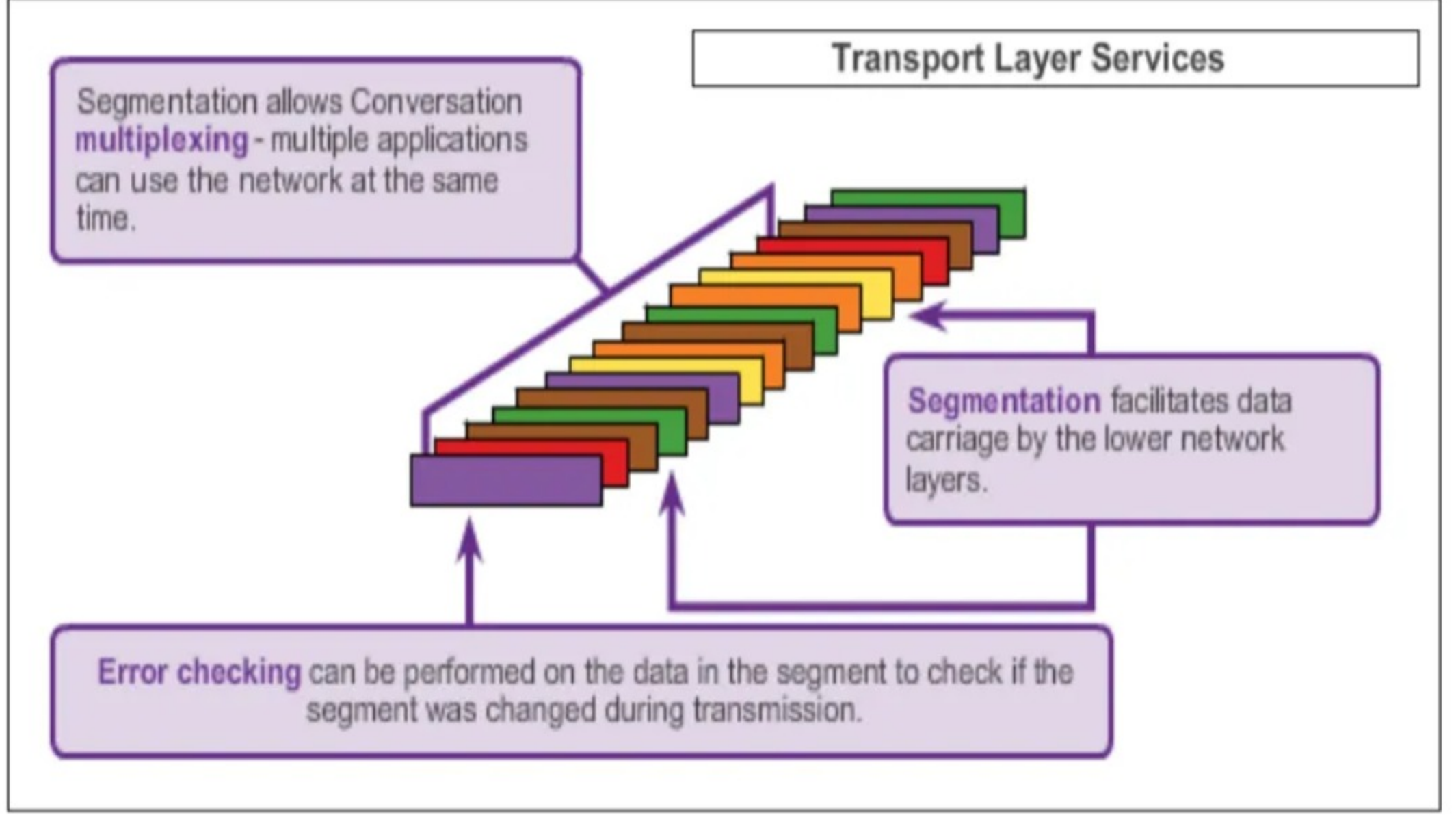
2. Basic Characteristics

- Primary role – Allow applications to communicate.
- Different categories of applications.

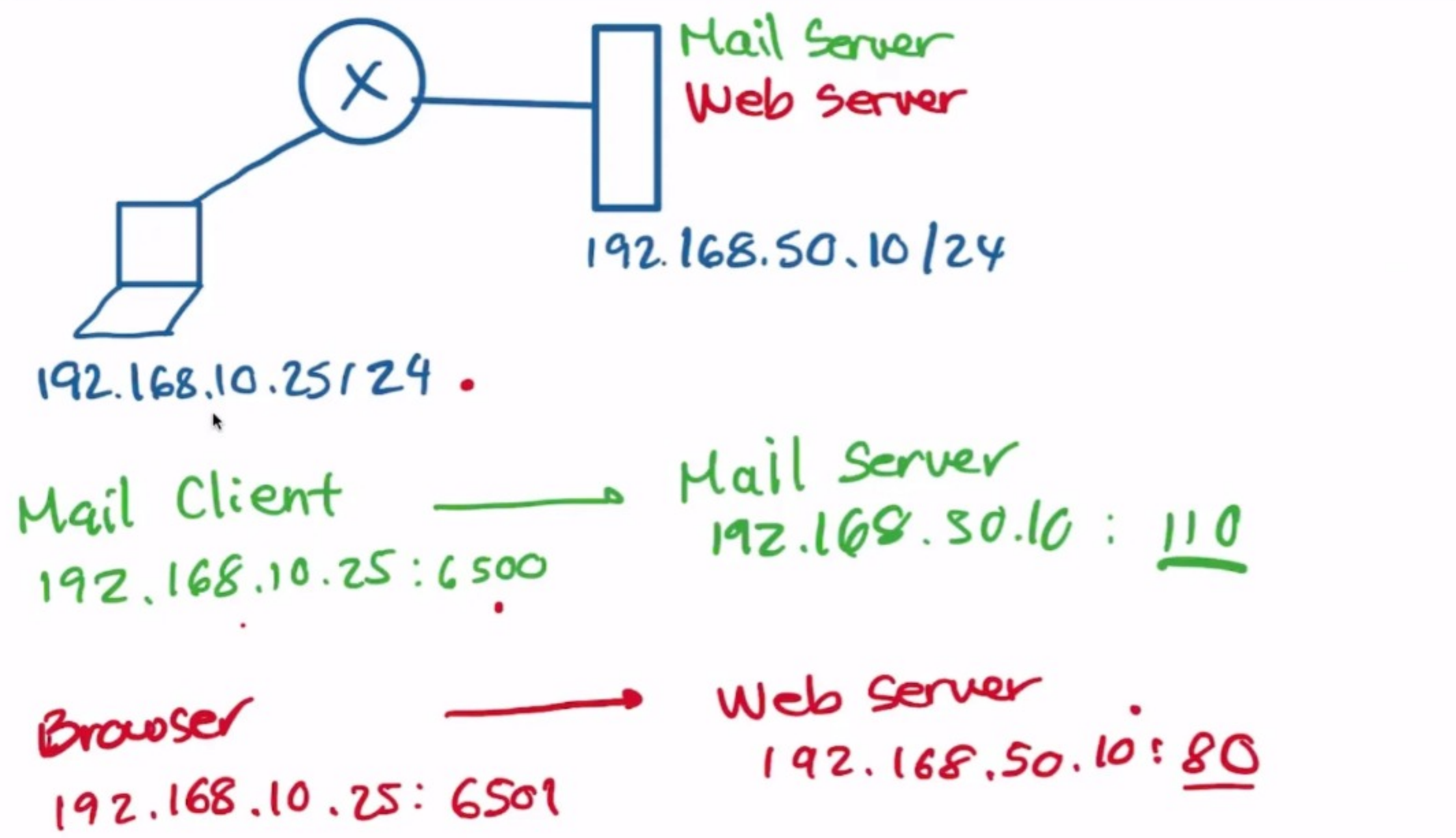


- Application categories serviced by TCP or UDP
 - UDP – Real-time applications (streaming, phone call, etc)
 - TCP – Reliability required (email, etc)
- Has an impact on
 - How these protocols behave under varying network conditions
 - Subsequent impact on applications
- Other Transport Layer Protocols exist

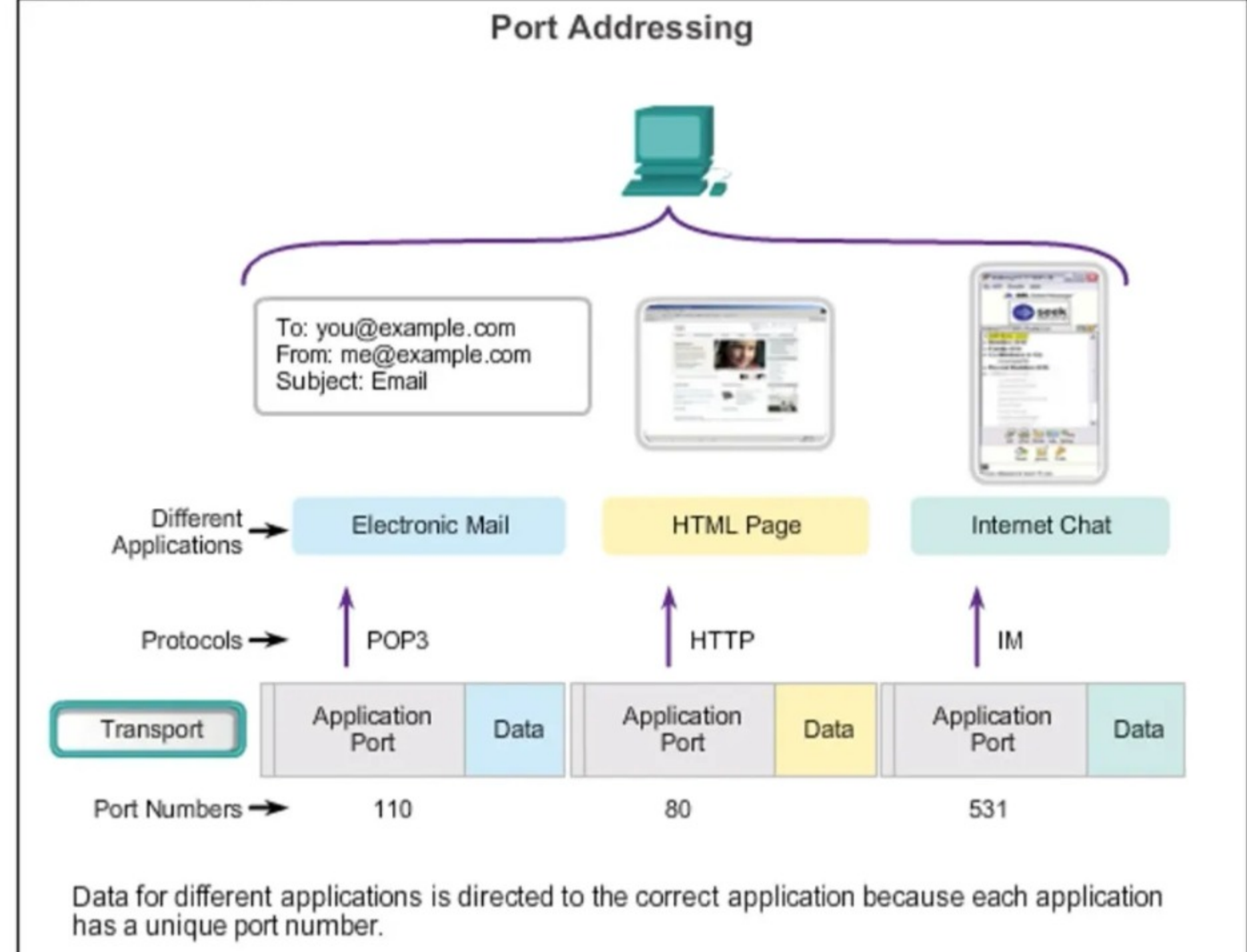
3. Supporting Concurrent Applications



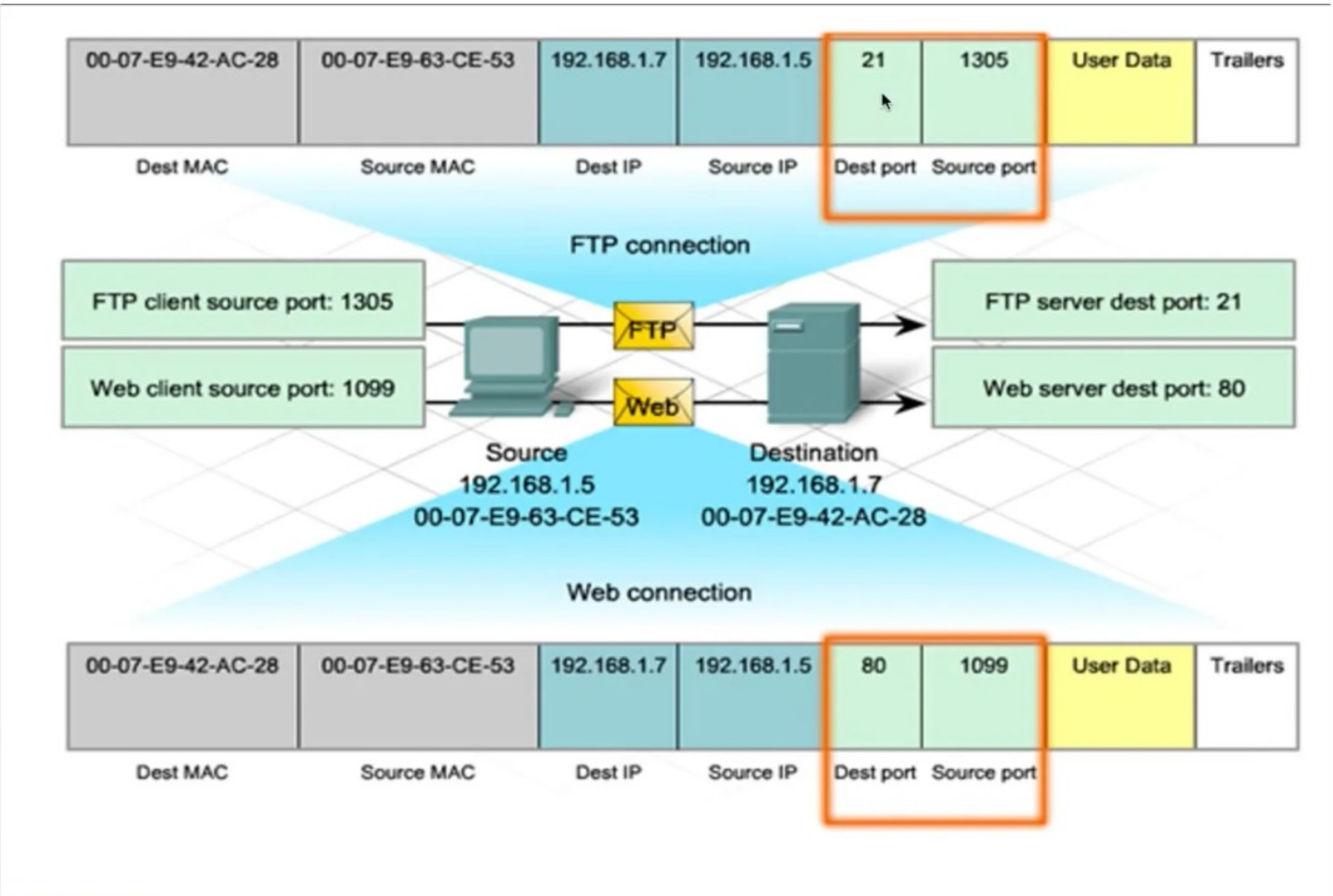
- At the same time, the client wants to establish multiple streams of communication
⇒ Transport layer use port numbering to identify different applications running in a host



- Port Numbers
 - The Transport Layer Address



- Define a tuple (source/destination IP-address/port number pairs)
- Uniquely identify separate flows
- For server-type applications
 - Server-side port standardized
 - Client-side port random



- Some port numbers:

Port Numbers

Port Number Range	Port Group
0 to 1023	Well Known (Contact) Ports
1024 to 49151	Registered Ports
49152 to 65533	Private and/or Dynamic Ports

Registered TCP Ports: 1863 MSN Messenger 2000 Cisco SCCP (VoIP) 8008 Alternate HTTP 8080 Alternate HTTP	Well Known TCP Ports: 21 FTP 23 Telnet 25 SMTP 80 HTTP 110 POP3 194 Internet Relay Chat (IRC) 443 Secure HTTP (HTTPS)
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Registered UDP Ports: 1812 RADIUS Authentication Protocol 5004 RTP (Voice and Video Transport Protocol) 5040 SIP (VoIP)	Well Known UDP Ports: 69 TFTP 520 RIP
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Registered TCP/UDP Common Ports: 1433 MS SQL 2948 WAP (MMS)	Well Known TCP/UDP Common Ports: 53 DNS 161 SNMP 531 AOL Instant Messenger, IRC
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