شبکه‌های کامپیوتری - مخابراتی

دکتر رجبی

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دانشگاه صنعتی همدان

گروه مهندسی برق و کامپیوتر

لایه انتقال
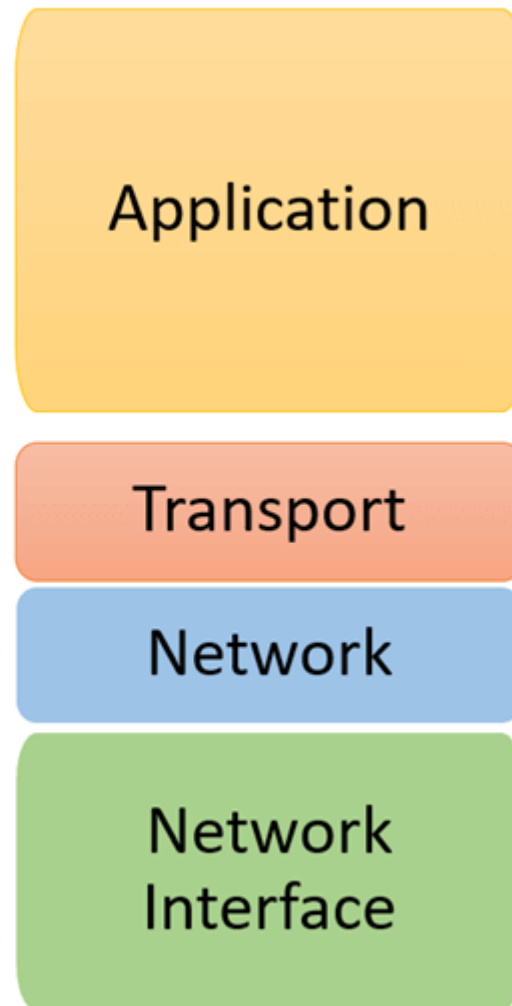
جایگاه لایه انتقال

OSI Reference Model

7 Application
6 Presentation
5 Session
4 Transport
3 Network
2 Data Link
1 Physical

TCP/IP Conceptual Layers

Application

Transport

Network

Network Interface

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سرفصل

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❑ Logical Port Address
❑ Connection Oriented and Connectionless
❑ Error Control
❑ Flow Control
❑ Buffering

Important Protocols

- TCP
- UDP
- DCCP
- SCTP
- RSVP

Logical port Adressin

- Assigned by Internet Assigned Numbers Authority (IANA)

- Before: Internet Corporation for Assigned Named and Numbers (ICANN) before March 21, 2001.

- 16 bit : 0 – 65535

- Ports: 0-1023 , well known ports

- مشخص کننده سرویس مورد نظر است.

- Ports: 1024-49151 – registered ports: vendors use for applications

- Ports: > 49151 Dynamic or private ports

Socket

- **IP Address + port**
- **192.168.1.12:21**
- **192.168.1.20:3389**

سرویس ها

- Transmission Control protocol (TCP)

- User Datagram Protocol (UDP)

  - Connection-oriented
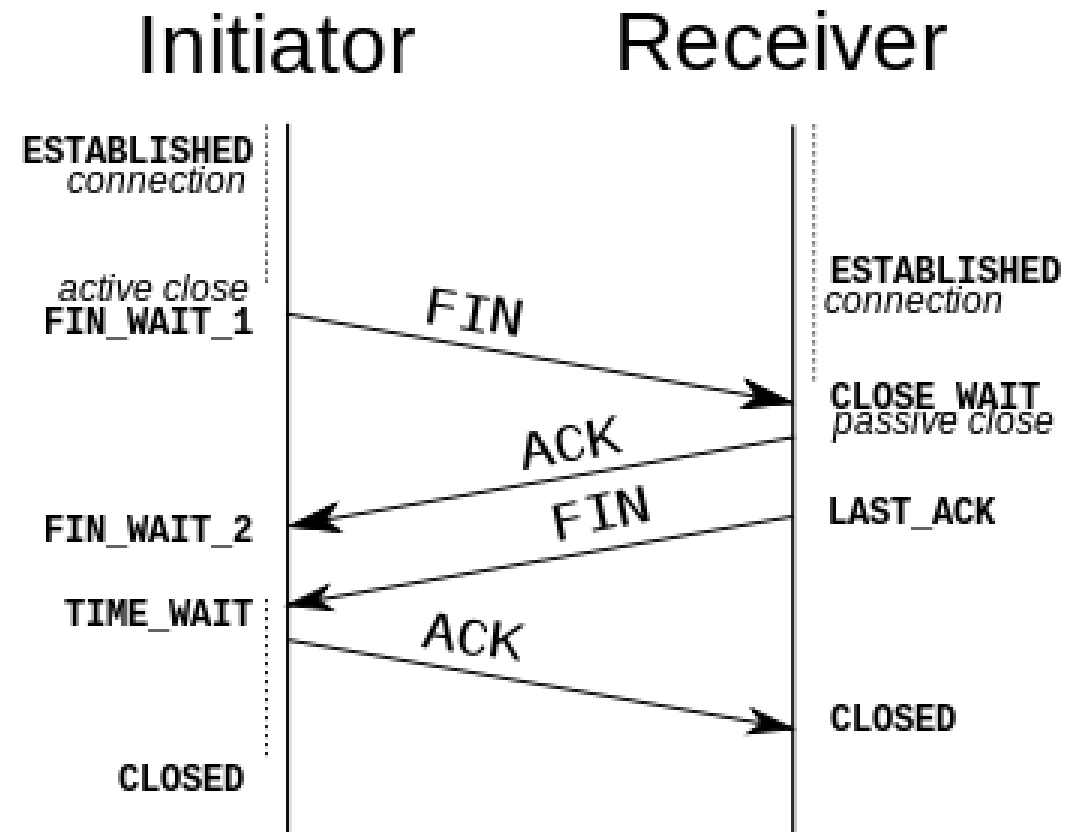 - Reliability
  - Flow control
  - Multiplexing

TCP vs UDP

Protocol	TCP	UDP
Connection	connection-oriented	connectionless
Usage	high reliability, critical-less transmission time	fast, efficient transmission, small queries, huge numbers of clients
Ordering of data packets	rearranges packets in order	no inherent order
Reliability	yes	no
Streaming of data	read as a byte stream	sent and read individually
Error checking	error checking and recovery	simply error checking, no error recovery
Acknowledgement	acknowledgement segments	no acknowledgment

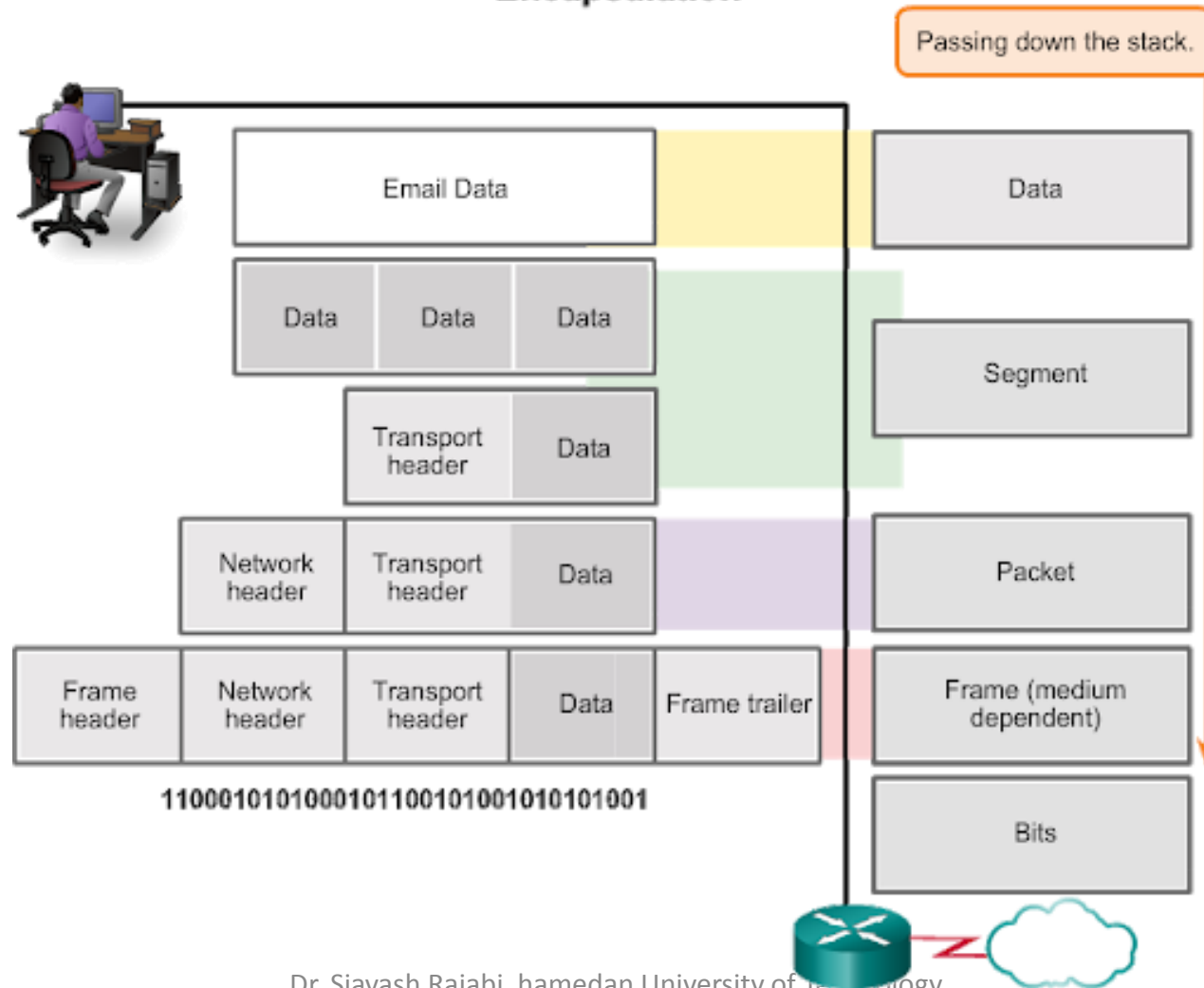# TCP- 3-way handshake
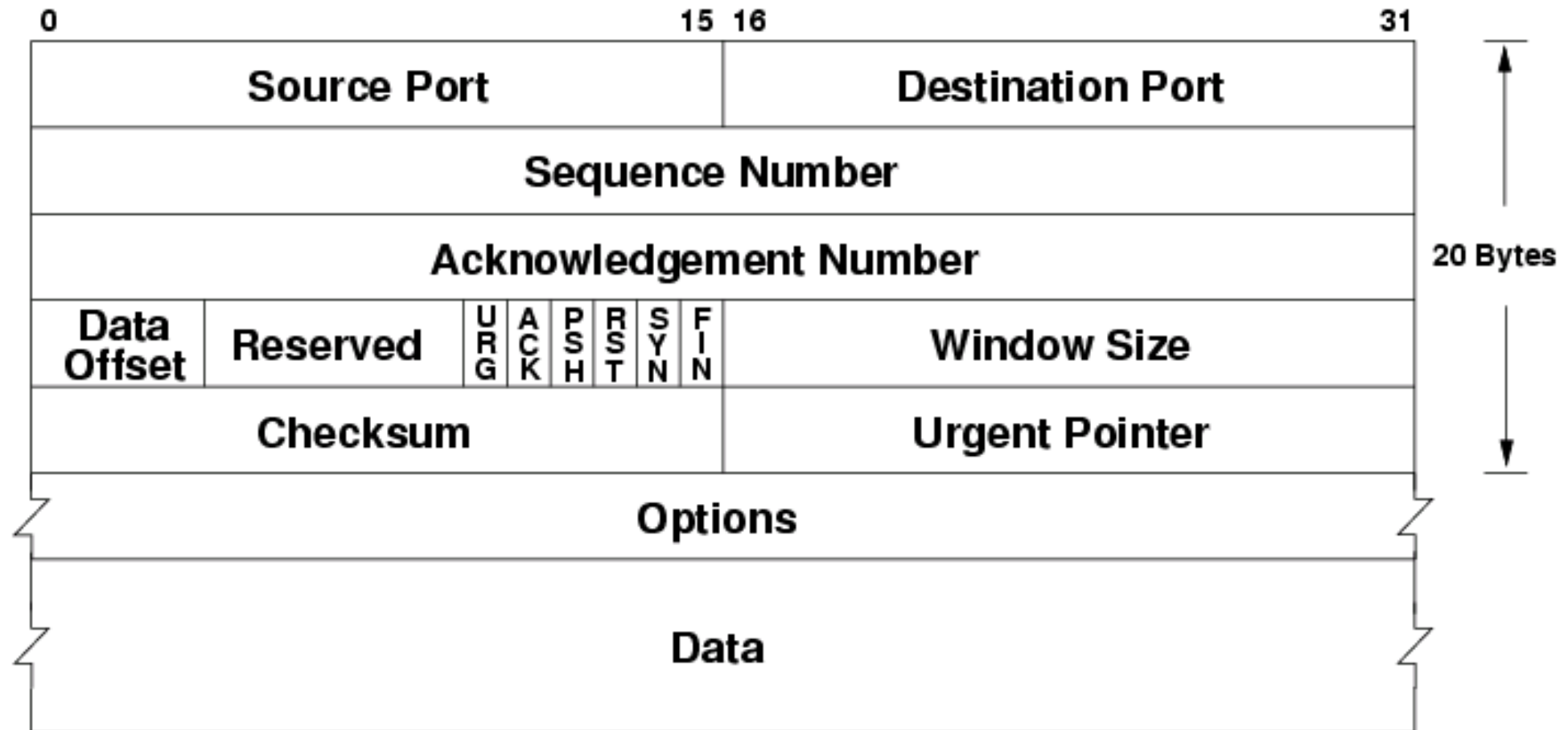
- SYN
- SYN-ACK
- ACK

Client   Server

SYN seq=x

SYN-ACK ack=x+1 seq=y

ACK ack=y+1 seq=x+1
[data]
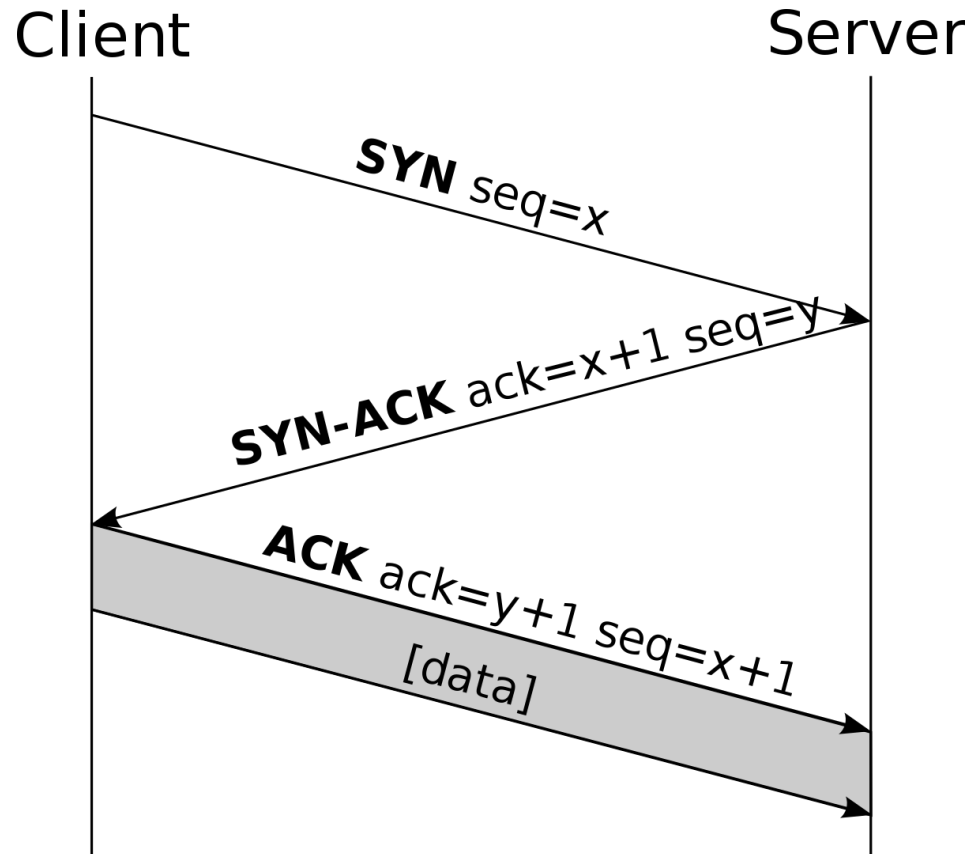
TCP Finish Phase

Transport Layer Header

TCP Header

UDP Header

UDP header format

32 bits

source port	destination port
length	checksum