

EECS 489 Discussion 6

Annoucements

- Assignment 2 is due in ~10 days

Q1 True or False

IPv6 packet headers have fixed size and thus are more efficient to process. However, because an IPv6 header uses 128-bit source and destination addresses instead of 32-bit ones, it is larger than any IPv4 header

False

IPv4 can be 60 bytes. IPv6 is always 40 bytes

Q2.1

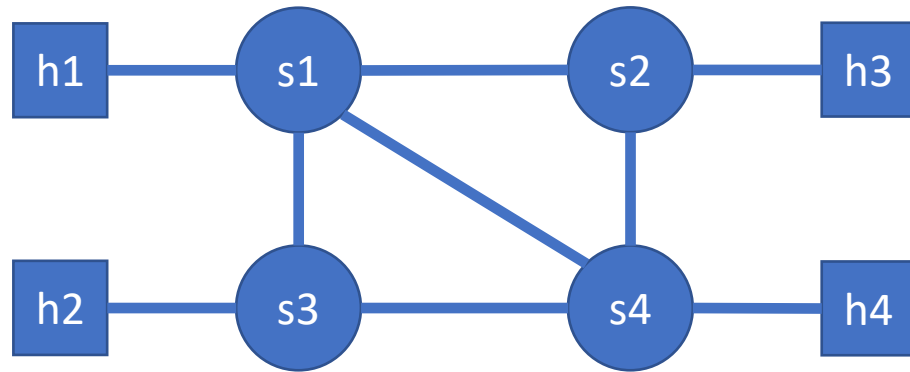
What is **NOT** the four basic processes used in the network layer to accomplish end-to-end transport?

- A. Addressing packets with an IP address.
- B. Encapsulation
- C. Guaranteed delivery
- D. Routing
- E. Decapsulation

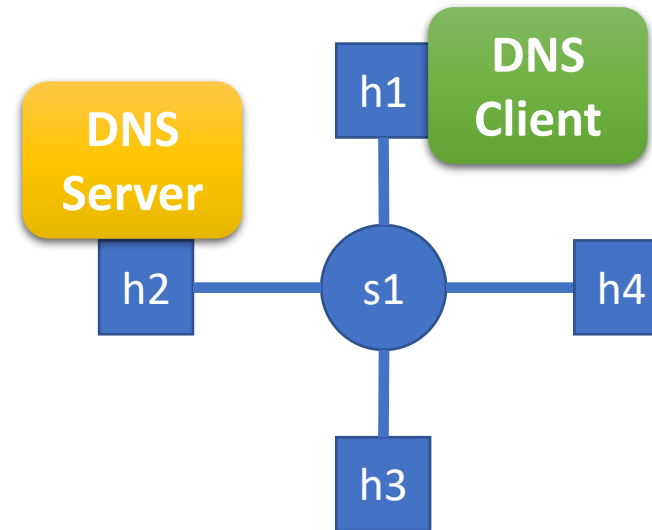
Guaranteed delivery is provided by Transport Layer (e.g., TCP)

Q2.2

In Assignment 2 part 2, Alice wants to test the Geographic Distance Load Balancing. This is how she does it.
Does it work? Why or why not? If not how do we fix it?



Alice's topology in server_geo.txt



Alice's Mininet topology

Q2.3

What function(s) do Mininet provide **in the previous example**?

- A. Guaranteed delivery
- B. Addressing packets with an IP address.
- C. Routing

B

Q3

Suppose a TCP message containing 2048 bytes of data and 20 bytes of TCP header is passed to IP for delivery across two networks of the Internet. The first network uses a 14-byte link layer header and has an MTU of 1024 bytes; the second uses a 8-byte link layer header with an MTU of 512 bytes.

Give the **sizes and offsets** of the sequence of fragments delivered to the network layer at the destination host.

Assume all IP headers are 20 bytes. Assume we send out the largest fragments whenever we can.

Q3

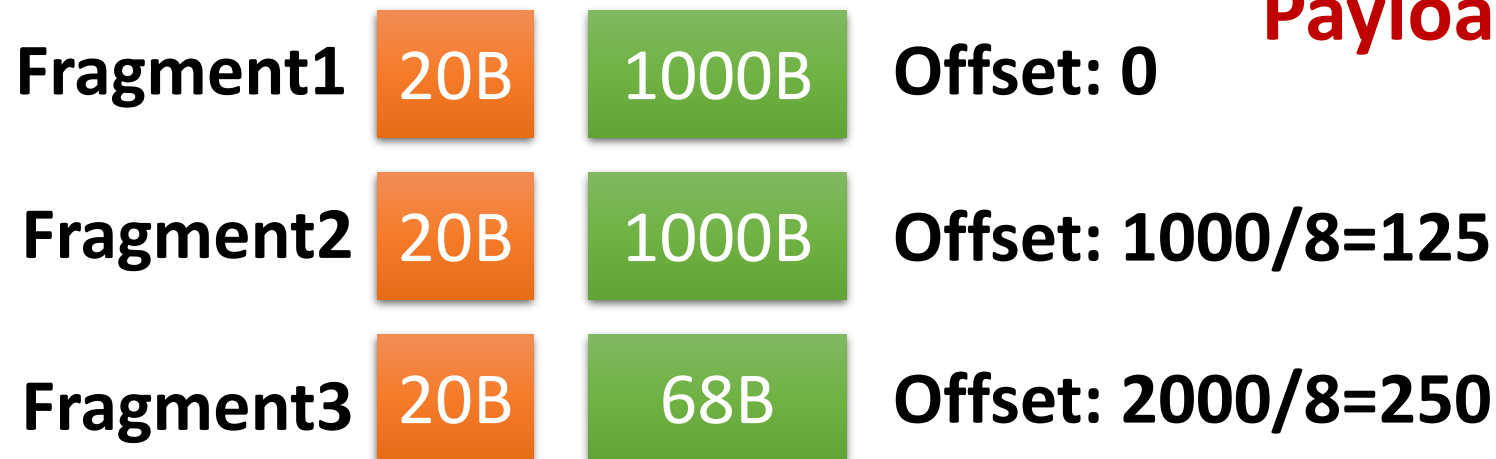


IP Datagram: (2048+20+20) Bytes
IP Payload: (2048+20) Bytes

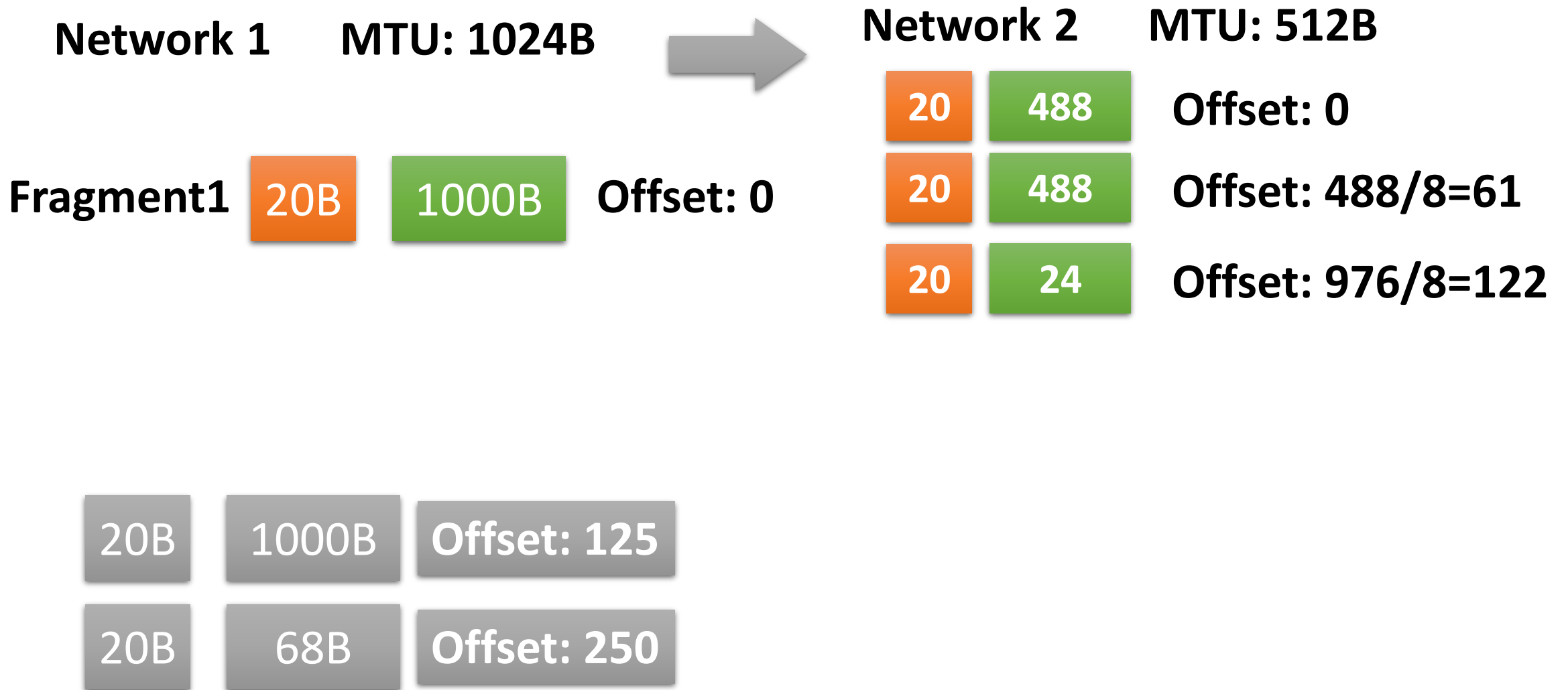
Network 1 MTU: 1024B

Fragmented payload:
 $8n < 1024 - 20, \quad n \in N$

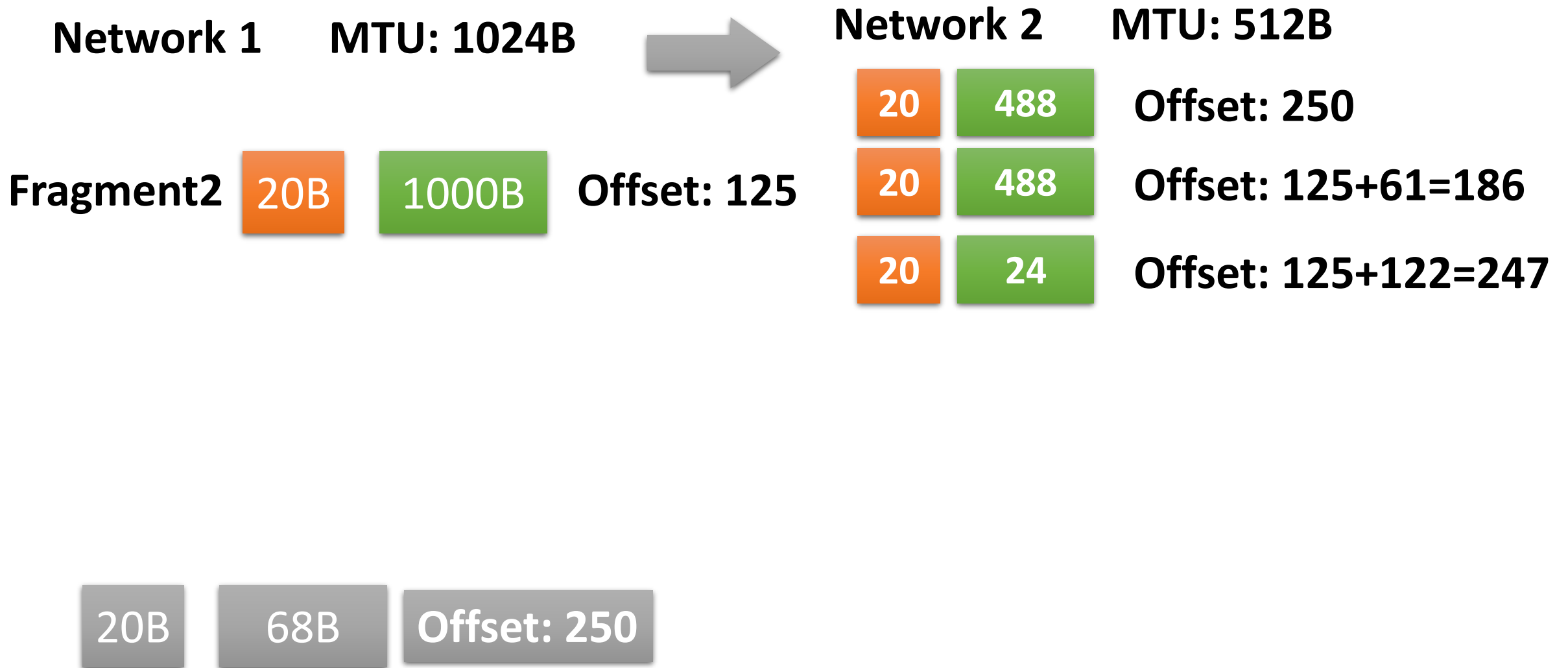
Payload: $8n = 1000$



Q3

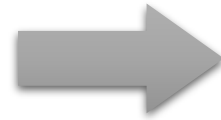


Q3



Q3

Network 1 MTU: 1024B



Network 2 MTU: 512B

Fragment2

20B

68B

Offset: 250

20

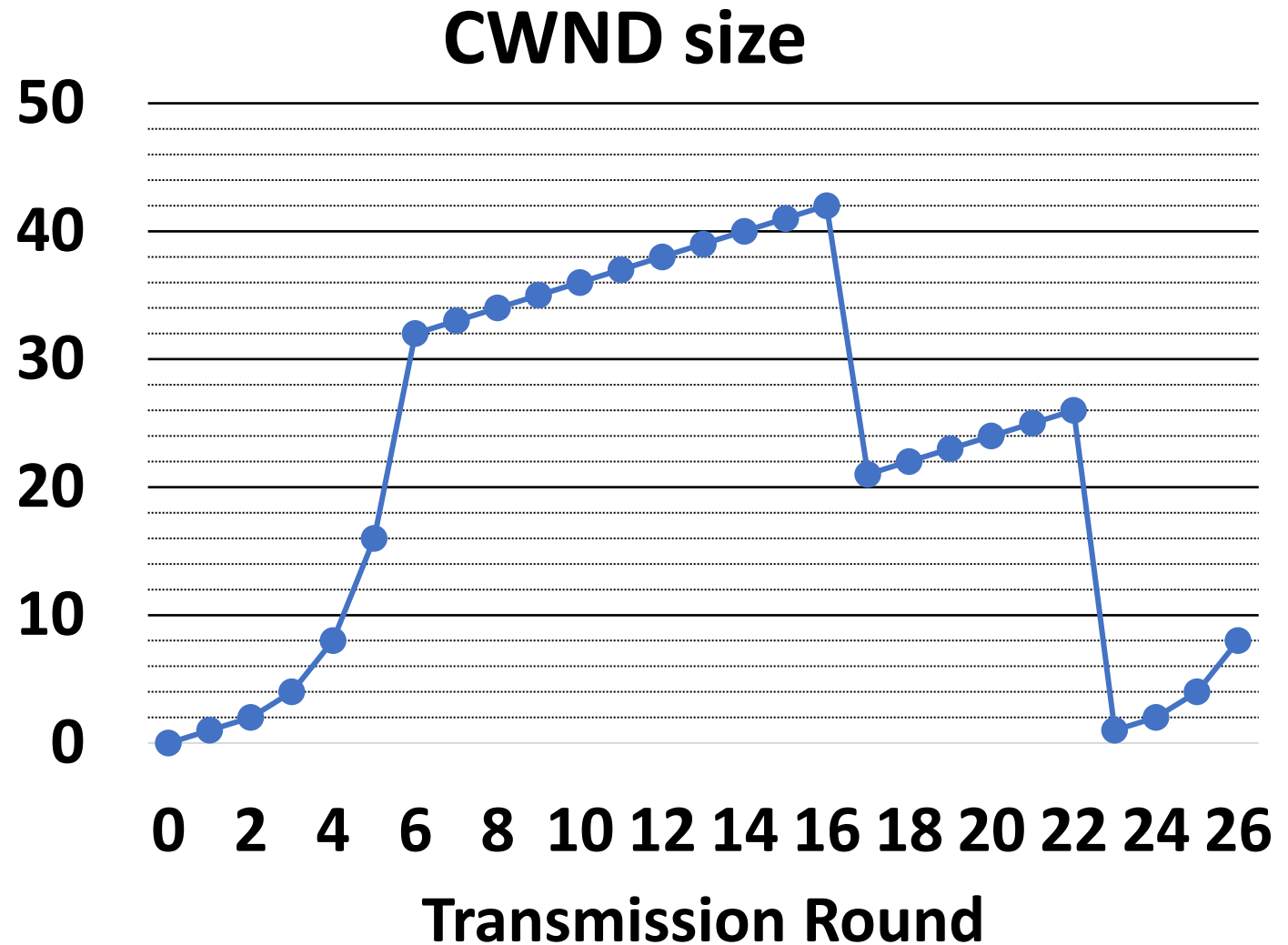
68

Offset: 250

TCP Congestion control

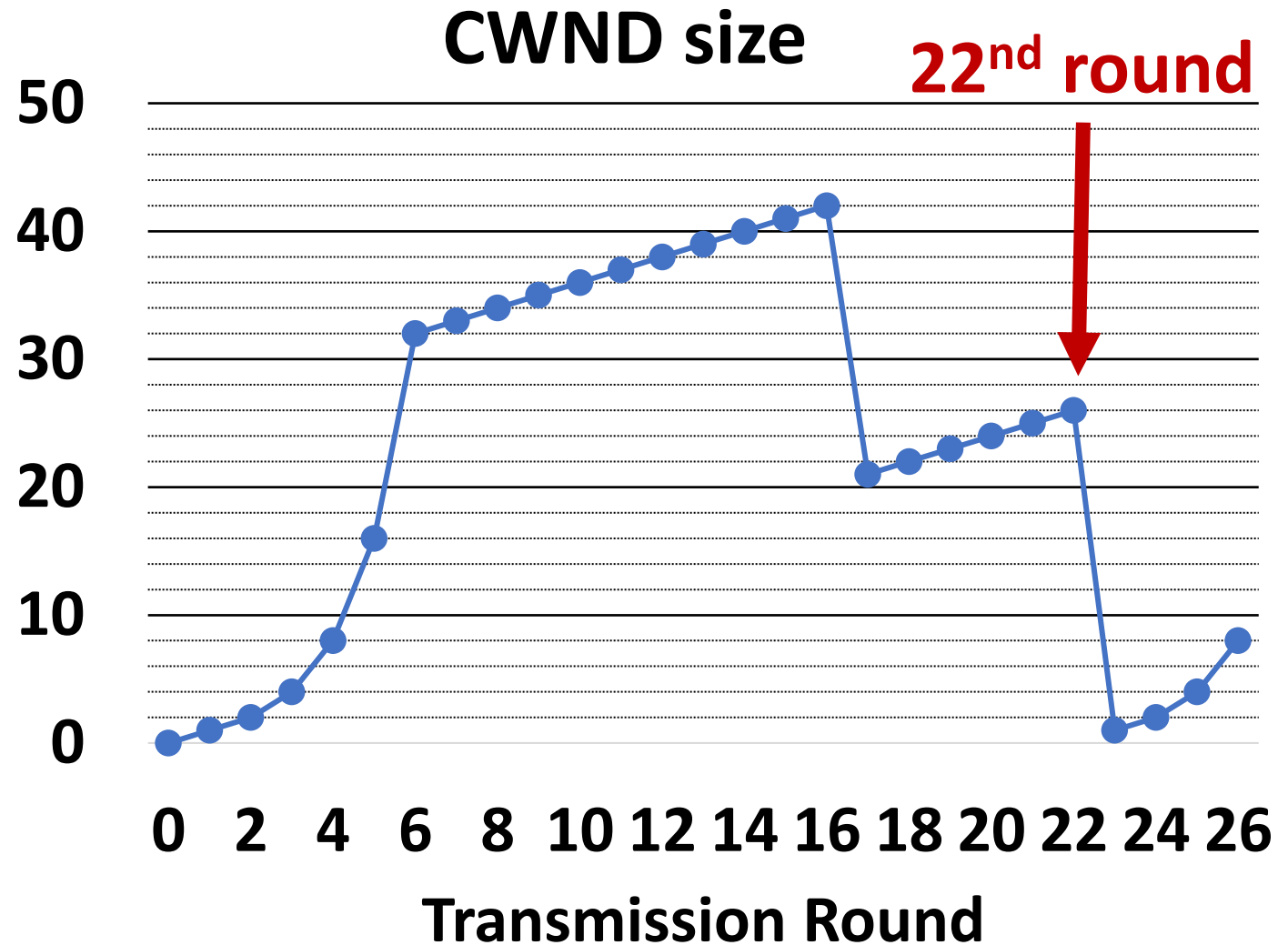
Identify:

- TCP slow start
- Congestion avoidance (AIMD)
- Retransmission



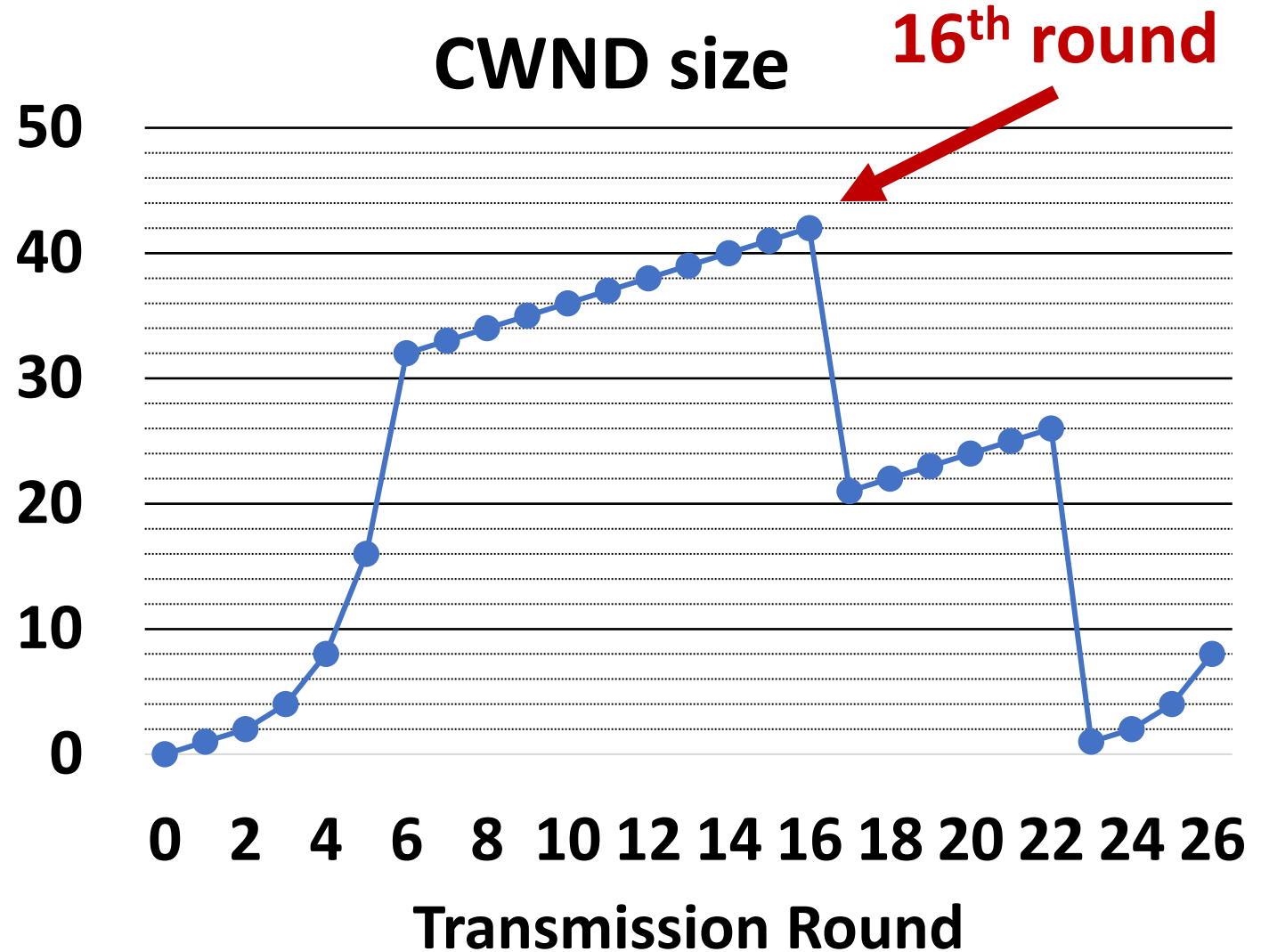
TCP Congestion control

- What triggers retransmission at 22nd round?
- **Timeout**



TCP Congestion control

- What triggers retransmission at 16th round?
- **Duplicate ACK**



TCP Congestion control

ssthresh at 1st round?

32

ssthresh at 18th round?

21

ssthresh at 24th round?

13

