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 header can have a maximum of 60 bytes.
IPv6 header is always 40 bytes.

Q2.1

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

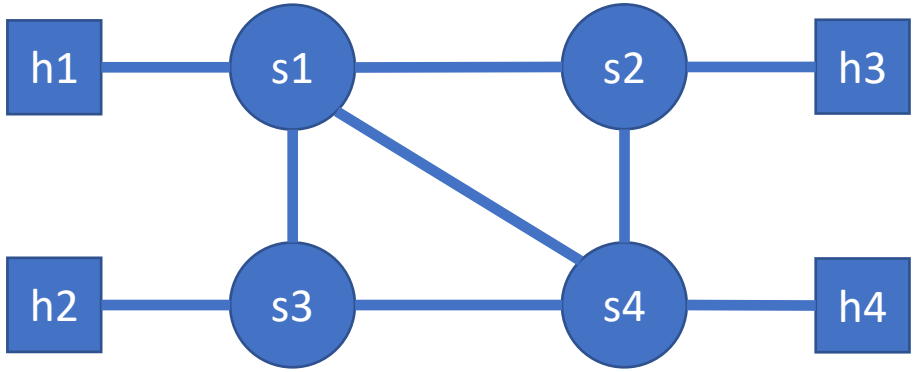
A. Addressing packets with an IP address.
B. Encapsulation
C. Guaranteed delivery
D. Routing
E. Decapsulation

Guaranteed delivery is not provided by the Network Layer

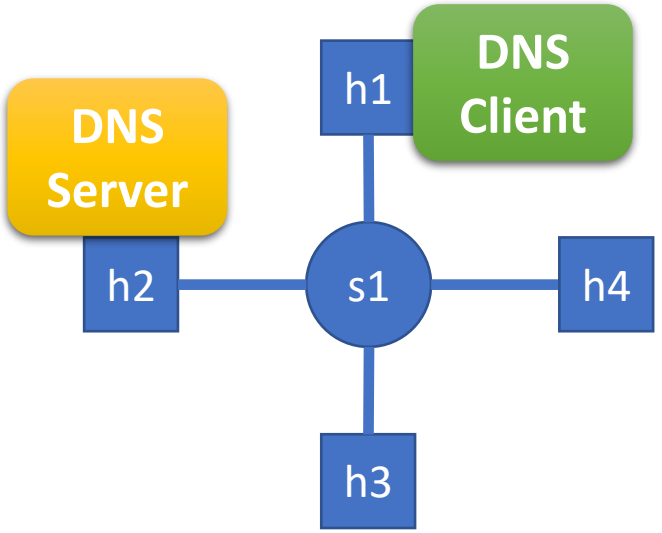
Q2.2

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?

Yes. No need for a Mininet topo that matches server_geo.txt



Alice's topology in server_geo.txt



Alice's Mininet topology

Q2.3

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

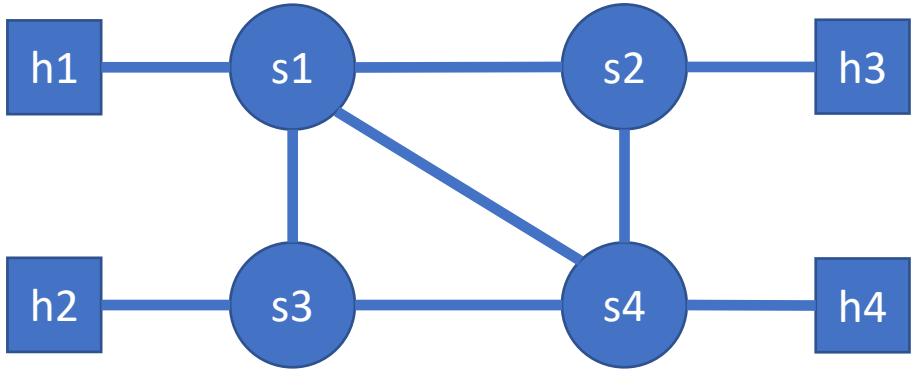
A. Guaranteed delivery
B. Addressing packets with an IP address.
C. Routing

B

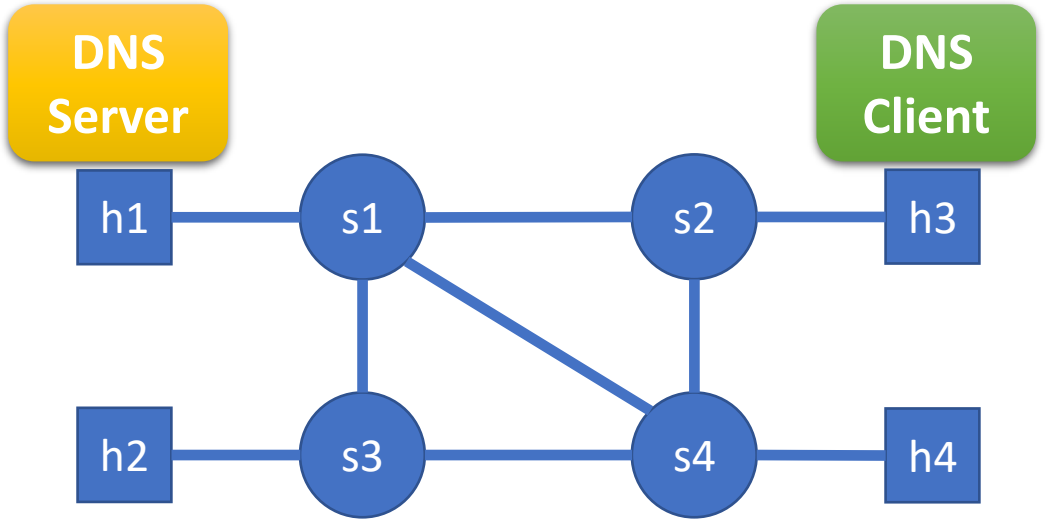
Q2.4

What if Alice use the same topo for Mininet, as shown below? Does it work? Why or why not?

No. Don't add loop to Mininet topo



Alice's topology in server_geo.txt



Alice's topology in Mininet

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

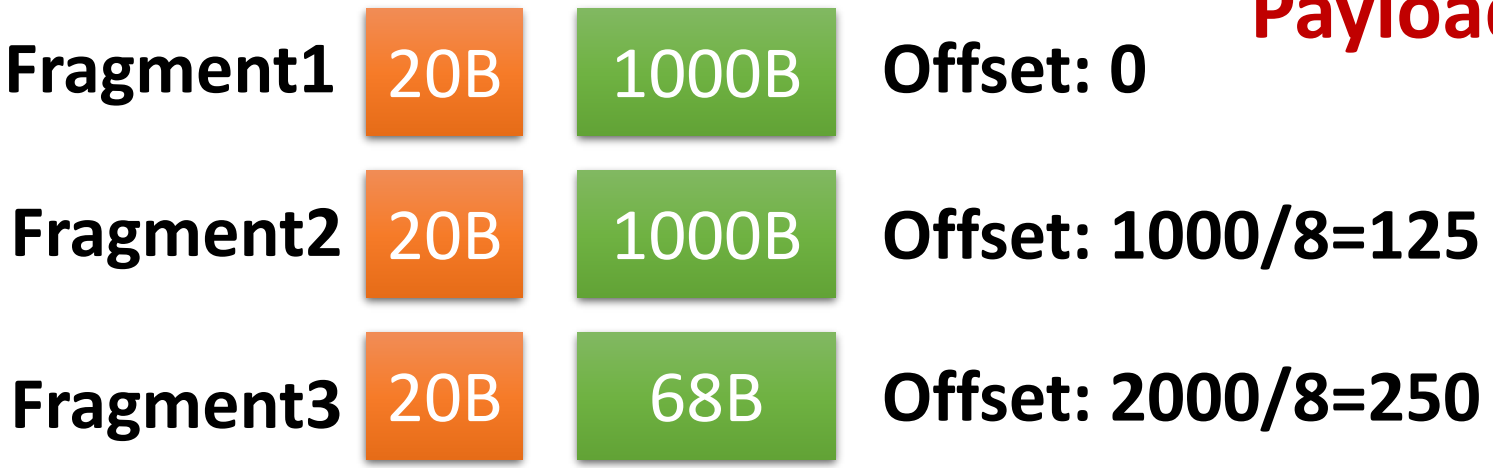
IP Payload: (2048+20) Bytes

Network 1 **MTU: 1024B**

Fragmented payload:

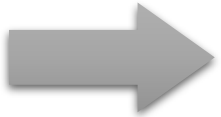
$8n < 1024 - 20, \quad n \in N$

Payload: $8n = 1000$



Q3

Network 1 **MTU: 1024B**



Network 2 **MTU: 512B**

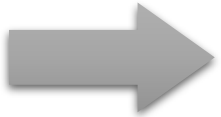
Fragment1 20B 1000B **Offset: 0**

20	488	**Offset: 0**
20	488	**Offset: 488/8=61**
20	24	**Offset: 976/8=122**

20B	1000B	**Offset: 125**
20B	68B	**Offset: 250**

Q3

Network 1 **MTU: 1024B**



Network 2 **MTU: 512B**

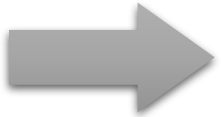
Fragment2 20B 1000B **Offset: 125**

20	488	**Offset: 125**
20	488	**Offset: 125+61=186**
20	24	**Offset: 125+122=247**

20B 68B **Offset: 250**

Q3

Network 1 **MTU: 1024B**



Network 2 **MTU: 512B**

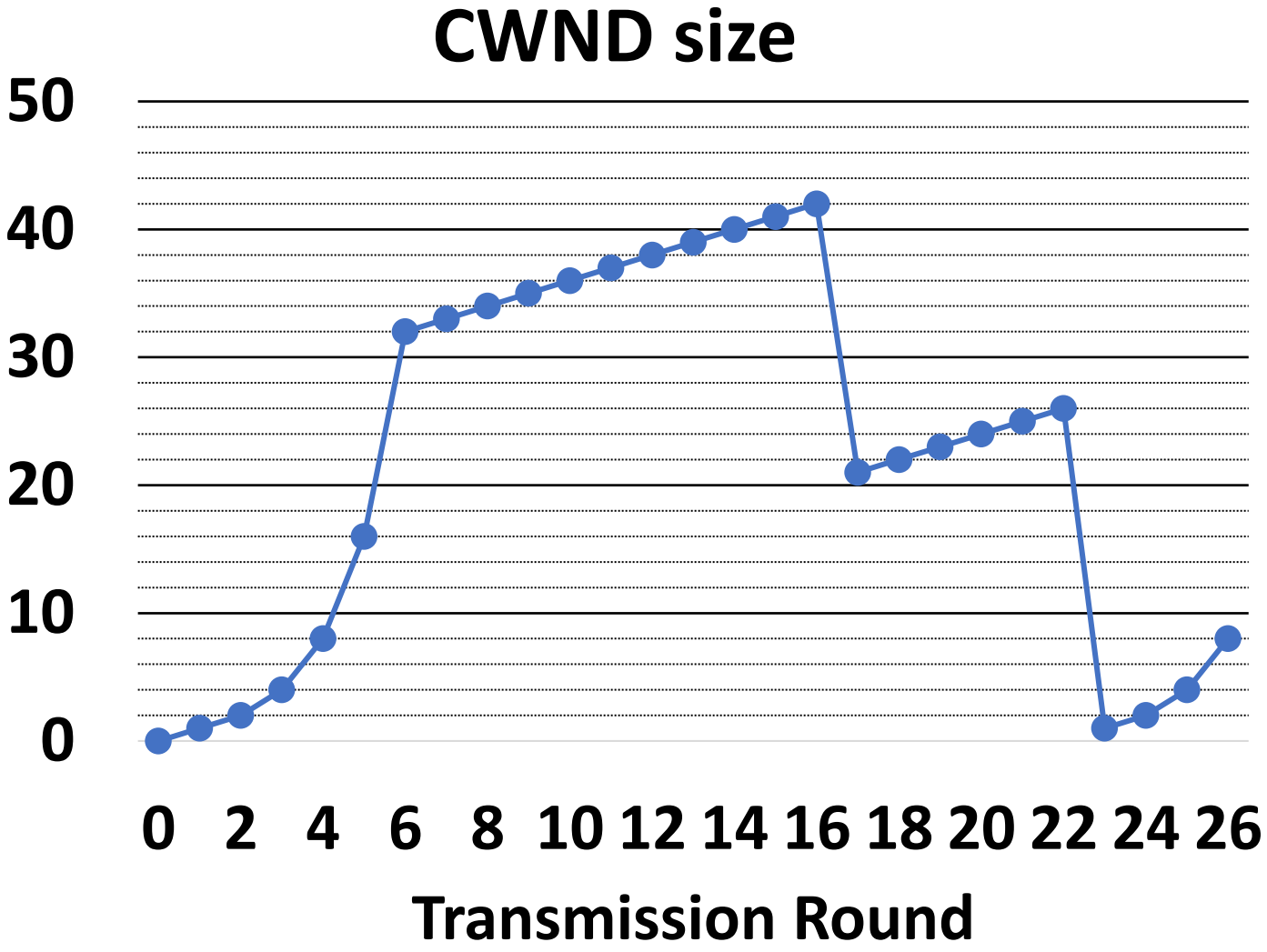
Fragment2 20B 68B **Offset: 250**

20 **68** **Offset: 250**

TCP Congestion control

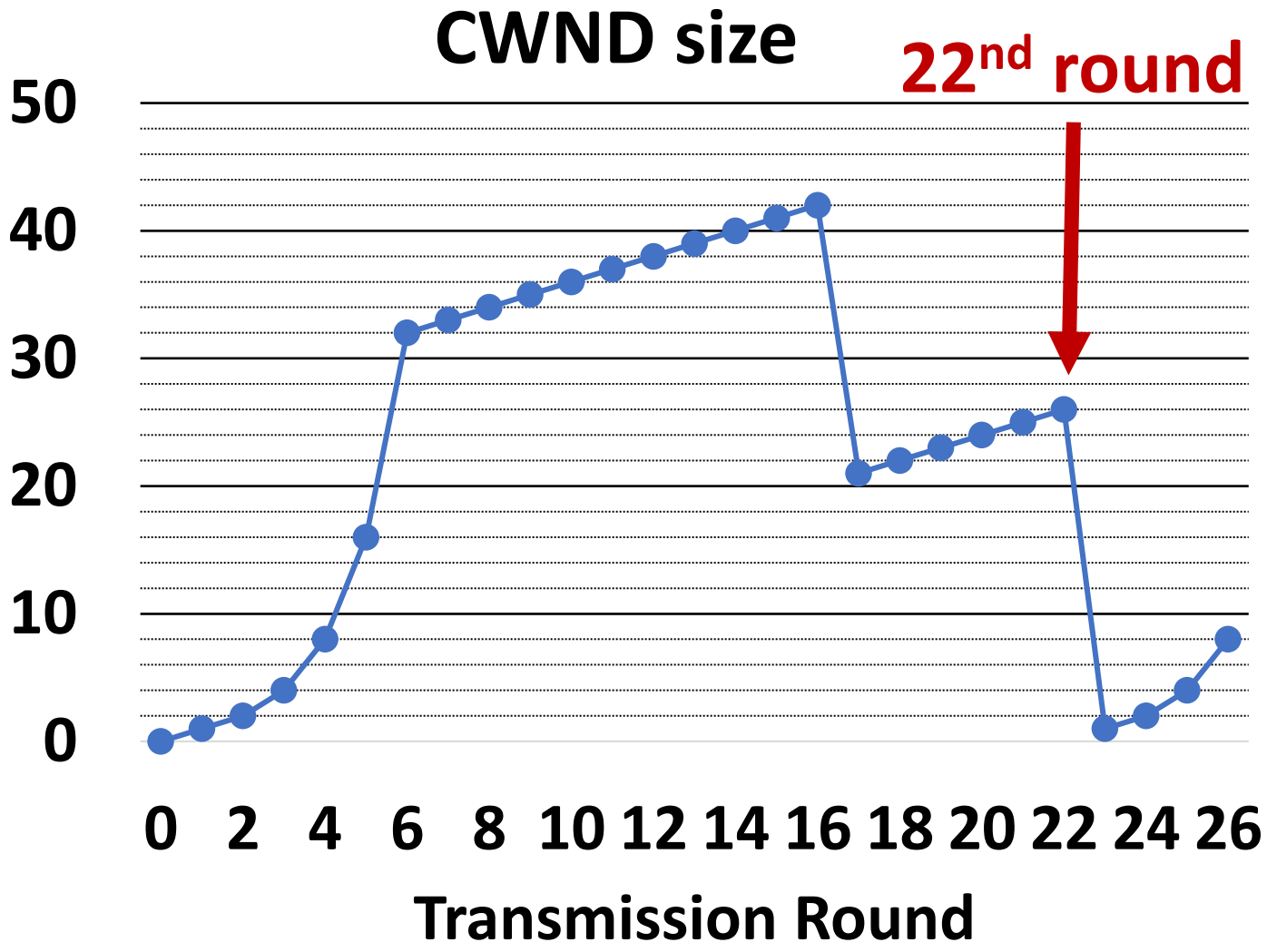
Identify:

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



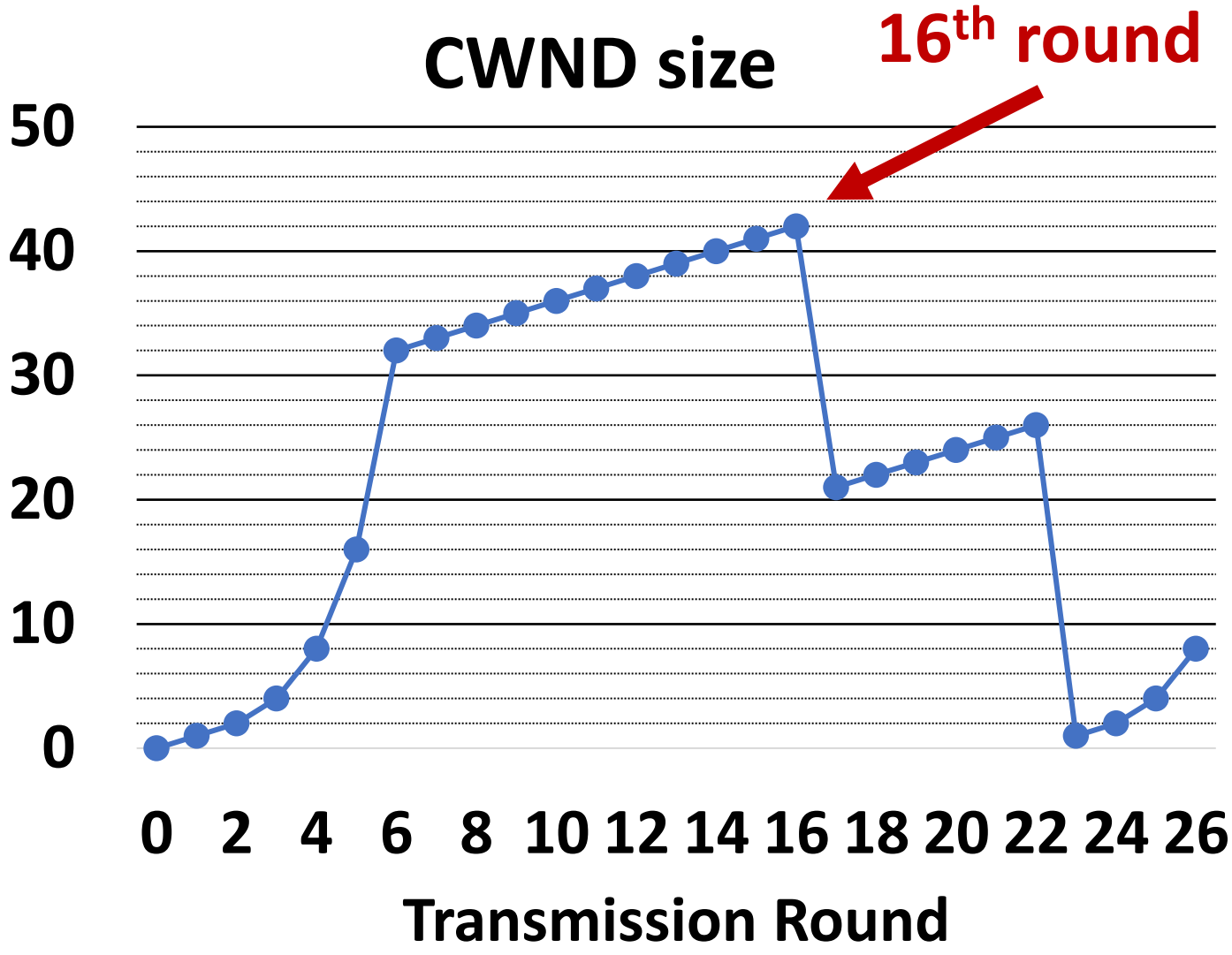
TCP Congestion control

- 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