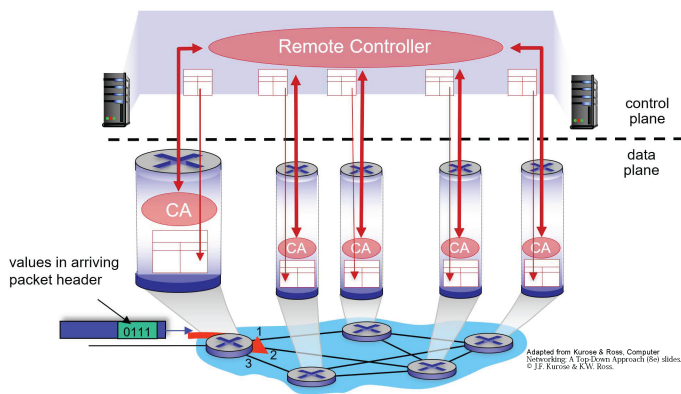


RAT Test Run

Question 1: The figure below illustrates:



- A both Traditional Routing and Software-Defined Networking (SDN) because the **forwarding tables** are present both inside each router and outside.
- B the **switching fabric**, present in both Traditional Routing and Software-Defined Networking (SDN).
- C Software-Defined Networking (SDN) because the control plane is **outside** each router (i.e. centralised).
- D Traditional Routing because the control plane is implemented **inside** each router (i.e. distributed).

Question 2: In the network layer, packet forwarding is:

- A a main function of the **control plane**.
- B is a network-wide process.
- C usually **slower** (typically seconds) than routing (typically nanoseconds).
- D a main function of the **data plane**.

Question 3: What is the role of the forwarding table within a router?

- A To hold entries that determine the outgoing link interface to which **a queued packet** at the output will be forwarded.
- B To hold routes that determine the path to which **an arriving packet** will be forwarded.
- C To hold routes that determine the path to which **a queued packet** will be forwarded.
- D To hold entries that determine the outgoing link interface to which **an arriving packet** will be forwarded.

Question 4: Consider a datagram network using 8-bit host addresses. Suppose a router uses longest-prefix matching and has the following forwarding table:

Prefix Match	Interface
11	0
101	1
110	2
otherwise	3

A datagram with the destination address 11000101 will be forwarded to:

- A interface 1.
- B interface 0.
- C interface 3.
- D interface 2.

Question 5: Active Queue Management algorithms were proposed for:

- A **reactively** dropping newly arriving packets **when** buffers are full. An example is the Random Early Detection (RED) algorithm.
- B **proactively** marking and dropping packet **before** buffers are full. An example is the Random Early Detection (RED) algorithm.
- C **reactively** dropping newly arriving packets **when** buffers are full. An example is the drop-tail policy.
- D **proactively** marking and dropping packet **before** buffers are full. An example is the drop-tail policy.

Question 6: With Non-preemptive Priority Queuing:

- A Arriving high-priority packets **may** have to wait until a low-priority packet is transmitted.
- B Arriving high-priority packets will **always** be sent before low-priority packets.
- C A queued low-priority packet **may** be transmitted even before the high-priority queue is emptied.
- D Arriving packets are **always** classified into high-priority if the high-priority queue is empty.

Question 7: Can Weighted Fair Queueing (WFQ) and Round Robin (RR) behave the same?

- A No, because WFQ depends on the weight of a given class while RR **always** alternates between classes.
- B Yes, when all classes in WFQ have the same amount of service weight.
- C Yes, when all packets arriving in WFQ are placed within the same class.
- D No, because with WFQ packets arriving to a prioritised class will **always** leave before others, while RR **always** alternates between classes.

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**Question 8:** A packet scheduler is responsible for:

- A choosing one packet, among those **yet to be queued** before transmission, at the **input** port.
- B choosing one packet, among those **queued** for transmission, at the **output** port.
- C choosing one packet, among those **queued** for transmission, at the **input** port.
- D choosing one packet, among those **yet to be queued** before transmission, at the **output** port.

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**Question 9:** Head-of-the-Line (HOL) blocking:

- A means that if "the first in line packet" is blocked while in the **input** port all packets destined to the same output port are also blocked.
- B means that packets are being blocked, even though their output port/queue is free, because "the first in line" packet is blocked while in the **output** port.
- C means that if "the first in line packet" is blocked while in the **output** port all packets destined to the same output port are also blocked.
- D means that packets are being blocked, even though their output port/queue is free, because "the first in line" packet is blocked while in the **input** port.

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**Question 10:** leave this one for last.

Consider a TCP Reno connection that exclusively uses a 20 Mbps link. Suppose that this link is **the only congested link** between the two hosts participating in the connection. Consider a **large file transfer** under the following assumptions:

- the receive buffer of the receiving host is **much larger** than the congestion window;
- the TCP segment size equals 1250 bytes;
- the RTT equals 200 ms;
- the TCP connection is **always in the congestion avoidance phase**, ignoring slow start;
- packet headers are not considered.

What is the maximum window size (**in segments**) that this TCP connection can achieve?

**Tip:** Remember that the congestion window cannot increase before an ACK for the corresponding segment is received, which takes RTT seconds.

- A 400.
- B 2000.
- C 3200.
- D 200.