Pergunta 1

Correta Pontuou 1,00 de 1,00 Destacar pergunta

The transport protocol TCP (Transmission Control Protocol) receives from the IPv6 network layer

a. A connectionless unreliable service. ✔
b. A connection-oriented reliable service.
c. A connectionless reliable service.
d. A connection-oriented unreliable service.

A resposta correta é: A connectionless unreliable service.

Pergunta 2

Correta Pontuou 1,00 de 1,00 Destacar pergunta

Assume a data transmission of 8 ksymbol/s. If we aim to transmit 32 kbit/s using a phase modulation, we must use a number of phases equal to

a. 32000.
b. 16. ✔
c. 4.
d. 8000.

A resposta correta é: 16.

Pergunta 3

Correta Pontuou 1,00 de 1,00 Destacar pergunta

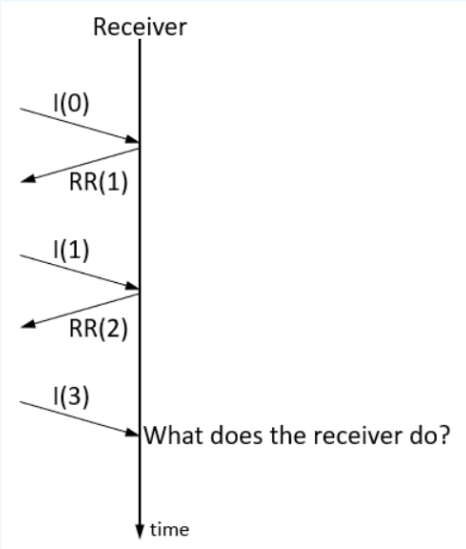
Assume a transmission system using **bit stuffing**. The FLAG is 0x7E (represented in binary by 01111110 or 01^60). ESC is the escape character. During the transmission of the frame information field, the following substitution is made:

a. $FLAG \rightarrow ESC\ ESC$
b. $1^6 \rightarrow 1^60$
c. $1^5 \rightarrow 1^50$ ✔
d. $FLAG \rightarrow ESC\ FLAG$

A resposta correta é: $1^5 \rightarrow 1^50$

Pergunta 4

Correta Pontuou 1,00 de 1,00 Destacar pergunta



Consider the ARQ Go-Back-N mechanism using a window W=3. The receiver's behaviour is described in a notation in which ?I(0).!RR(1) represents the reception (?) of the I(0) message followed (.) by the transmission (!) of the RR(1) message. After the occurrence of the events ?I(0).!RR(1).?I(1).!RR(2).?I(3), the receiver

a. Discards the received I(3) message and transmits RR(2).
b. Discards the received I(3) message and transmits REJ(2). ✔
c. Stores the received I(3) message and sends REJ(2) to the sender.
d. Stores the received I(3) message but does not transmit REJ nor RR.

A resposta correta é: Discards the received I(3) message and transmits REJ(2).

Pergunta 5

Correta Pontuou 1,00 de 1,00 Destacar pergunta

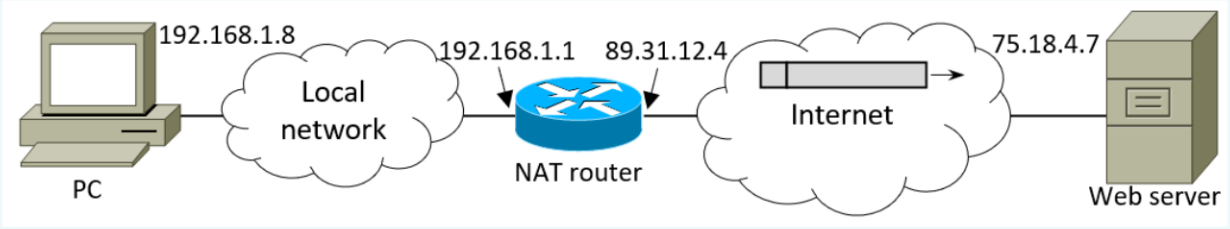
When a frame is received by an Ethernet Switch and the forwarding table **does not contain** an entry for this frame, the Switch

a. Forwards the frame based on its source MAC address.
b. Forwards the frame to all ports except the incoming port. ✔
c. Invokes an Address Resolution Protocol (ARP) procedure.
d. Forwards the frame based on its destination IP address.

A resposta correta é: Forwards the frame to all ports except the incoming port.

Pergunta 6

Incorreta Pontuou -0,10 de 1,00 Destacar pergunta



As illustrated in the figure, a PC on a local network behind a NAT router sent a packet to a web server on the Internet. The addresses in the IP header of the packet after it crossed the NAT router are

a. 192.168.1.8 (source) and 75.18.4.7 (destination).
b. 89.31.12.4 (source) and 75.18.4.7 (destination).
c. 192.168.1.8 (source) and 89.31.12.4 (destination).
d. 192.168.1.1 (source) and 75.18.4.7 (destination). ✖

A resposta correta é: 89.31.12.4 (source) and 75.18.4.7 (destination).

Pergunta 7

Correta Pontuou 1,00 de 1,00 Destacar pergunta

At a certain instant, the sender of a TCP connection which had a congestion window of 8000 and a slow start threshold of 20000 and changed both values to 4000. This happened because

a. a timeout occurred.
b. the application wrote 4000 bytes to send.
c. it received a third duplicate ACK for the same sequence number. ✔
d. the receiving application read 4000 bytes.

A resposta correta é: it received a third duplicate ACK for the same sequence number.

Pergunta 8

Incorreta Pontuou -0,10 de 1,00 Destacar pergunta

The sequence number sent in the header of a TCP segment with data is

a. the total number of segments received at the moment that segment is sent.
b. the number of the first byte of data in that segment.
c. the total number of segments sent up to (and including) that one. ✖
d. the number of the last byte of data in that segment.

A resposta correta é: the number of the first byte of data in that segment.

Pergunta 9

Incorreta Pontuou -0,10 de 1,00 Retirar destaque

Among the following, only one **does not** apply to Link State routing protocols. Which one?

a. Hello messages are periodically sent in each link, which can be used to detect link failures. ✖
b. Each router uses Dijkstra's algorithm to compute the shortest paths to other routers.
c. Each router periodically sends to its neighbors the estimated cost to reach all known destinations.
d. Each router floods the network with information on its links to other routers.

A resposta correta é: Each router periodically sends to its neighbors the estimated cost to reach all known destinations.

Pergunta 10

Correta Pontuou 1,00 de 1,00 Retirar destaque

When a terminal needs to find the IP address of a web server, it starts the process by sending

a. a non-recursive query to the Top-Level Domain (TLD) DNS server.
b. a recursive query to a root DNS server.
c. a non-recursive query to a root DNS server.
d. a recursive query to the local DNS server. ✔

A resposta correta é: a recursive query to the local DNS server.

Pergunta 11

Correta Pontuou 1,00 de 1,00 Destacar pergunta

Two stations communicate using a **Go-Back-N** ARQ mechanism. The time required to transmit a frame is 8 ms, the propagation delay between stations (one direction) is 160 ms and the frames have a length of 600 Bytes. Assume BER=0 and consider that the frames are numbered modulo 16.
The maximum throughput (débito) is

Tmax= 219,51 ✔ kbit/s.

Resposta correta: 220

Pergunta 12

Correta Pontuou 1,00 de 1,00 Destacar pergunta

For the above situation, the minimum number of numbering bits that would allow the maximum efficiency, is

$K \geq$ 6 ✔ .

Resposta correta: 6

Pergunta 13

Correta Pontuou 1,00 de 1,00 Destacar pergunta

For the same scenario, consider now that **Selective Repeat** ARQ is used, frames are numbered modulo 128 and $BER = 10^{-4}$. The maximum efficiency for this case is S= 61,9 ✔ %.

Resposta correta: 62

Pergunta 14

Correta Pontuou 1,00 de 1,00 Destacar pergunta

In an Ethernet switch, the traffic received in 5 input ports is forwarded to 1 output port. The output port has a capacity of 100 Mbit/s and the 5 input ports forward the same average bitrate. Assuming that the output port is modeled by a $M/M/1$ queue and the frames have an average length of 1000 Bytes, calculate the average bitrate each input port forwards so that the output port has an utilization of 80 %.

Average **bitrate** forwarded by each input port = 16 ✔ Mbit/s.

Resposta correta: 16

Pergunta 15

Correta Pontuou 1,00 de 1,00 Destacar pergunta

The average waiting delay of a frame in the queue, not considering the transmission time, is T_w = 320 ✔ μs.

Resposta correta: 320

Pergunta 16

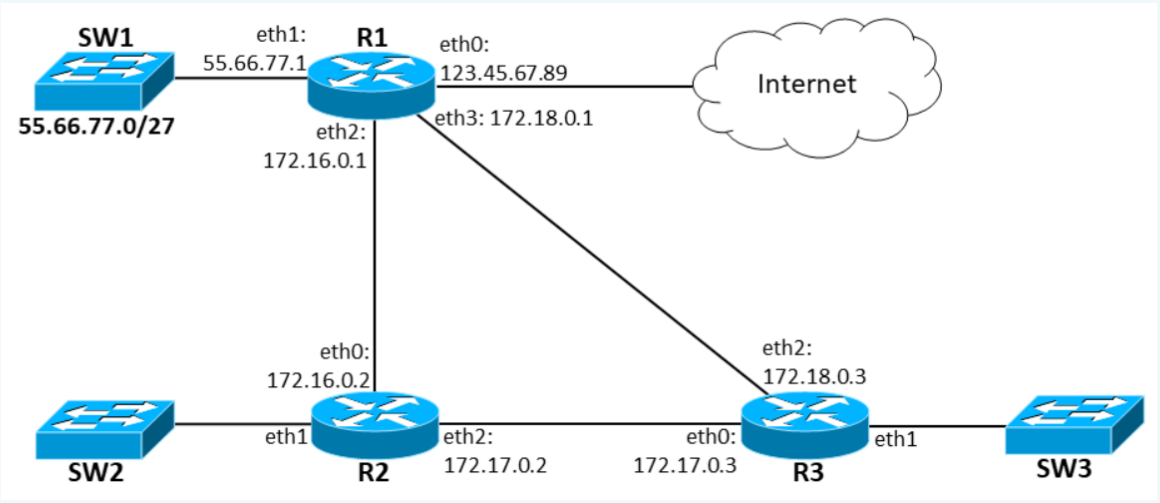
Correta Pontuou 1,00 de 1,00 Destacar pergunta

If the queue has only 2 buffers, the probability of a frame being lost is P = 26,2 ✔ %.

Resposta correta: 26

Pergunta 17

Correta Pontuou 1,00 de 1,00 Destacar pergunta



The figure shows a diagram of the network of a company, containing three routers (R1, R2, R3) and three Ethernet switches (SW1, SW2, SW3). The company bought the public IP address block 55.66.77.0/26 for assigning addresses to the LANs corresponding to each switch, which is a work in progress. If you want to assign equal sized address blocks to the LANs of SW2 and SW3 allowing for the largest possible number of hosts, what network address and prefix length would you assign to SW2? Use the format a.b.c.d/n.

Resposta: 55.66.77.32/28

Resposta correta: 55.66.77.32/28

Pergunta 18

Correta Pontuou 1,00 de 1,00 Destacar pergunta

What is the (directed) broadcast address of the LAN of SW1?

Resposta: 55.66.77.31

Resposta correta: 55.66.77.31

Pergunta 19

Correta Pontuou 1,00 de 1,00 Destacar pergunta

Knowing that R1 has an interface in subnet 55.66.77.0/27 (SW1), what is the maximum number of terminals we can connect to the LAN of SW1?

Resposta: 29

Resposta correta: 29

Pergunta 20

Correta Pontuou 1,00 de 1,00 Destacar pergunta

Considering that shortest path routing is used and that all the links between routers have the same cost, the default gateway of router R2 should be (use format a.b.c.d)

Resposta: 172.16.0.1

Resposta correta: 172.16.0.1