

Computer Networks 2021 Quiz 2

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NOTE: Each student's work unit is unique. You must use the work that has been generated for your FAN. If you do not, then you will fail this work unit.

NOTE: You must record your answers in the answer file EXACTLY as required, and commit and make sure your changes have been pushed to the github server, as they will otherwise not be counted.

NOTE: The topic coordinator will periodically run the automatic marking script, which will cause a file called quiz2-results.pdf to be updated in your repository. You should check this file to make sure that your answers have been correctly counted. That file will contain the time and date that the marking script was last run, so that you can work out if it has been run since you last changed your answers. You are free to update your answers as often as you wish, until the deadline for the particular work unit.

1 Quiz#2: Chapters 4 – 6

For each question, you must record your answer in the quiz2-answers.txt file in your git repository. Each statement is either true or false. You must record 't' if you think the statement is true, or 'f', if you think that the statement is false. Your answer must be lower case. Uppercase answers will be marked incorrect. For example, if you believed that the answer to the following question was potato, you would put the word potato at the end of the rj= line in the file quiz2-answers.txt.

Question#	Description
rj	The potato is a white-flesh starchy vegetables from which hot chips are made

The entry in quiz2-answers.txt would thus look like:

```
# Question 'rj': The potato is a white-flesh starchy vegetables from which hot chips are made
rj=t
```

Templates for each answer are provided in `quiz2-answers.txt` for your convenience.

Are the following statements true or false?

1.1 Question ab: True or False?

Many networking functions are being absorbed into cloud services

1.2 Question ac: True or False?

Multi-Protocol Label Switching is a hybrid of virtual circuits and datagram based networks

1.3 Question ad: True or False?

The sliding window protocol is the heart of TCP

1.4 Question ae: True or False?

A network flow is an end-to-end abstraction that helps routers to manage network congestion

1.5 Question af: True or False?

Transport protocols often have to contend with networks limiting the number of messages that can be sent

1.6 Question ag: True or False?

Randomised Early Detection (RED) randomly drops packets before congestion occurs to signal to senders to slow down

1.7 Question ah: True or False?

The UDP header contains source port, destination port, checksum and length fields

1.8 Question ai: True or False?

It is common for backbone providers to interconnect with each other at a single peering point

1.9 Question aj: True or False?

Differentiated Services typically uses a label in a packet header to identify the traffic class

1.10 Question ak: True or False?

Increasing the throughput of a network by increasing the number of packets that can be in the network at any point improves both the throughput and delay of the network

1.11 Question al: True or False?

Controlled Load Service in RSVP means that the network should control the volume of packets of that service that are admitted to the network

1.12 Question am: True or False?

The advertised window field in the TCP header could be extended by several bits without messing up the sliding window protocol

1.13 Question an: True or False?

IPv6 does not support multicast, but instead uses its mobility features to provide the same functionality

1.14 Question ao: True or False?

Key network resources to be allocated include the bandwidth of links and buffers at routers and switches

1.15 Question ap: True or False?

Randomised Early Detection (RED) does not drop packets if the average queue length is below some threshold

1.16 Question aq: True or False?

TCP Fast Recovery uses outstanding ACKs following a Fast Retransmit to avoid the need for re-using the Slow Start algorithm

1.17 Question ar: True or False?

The DEC Bit with a queue length of 1 is used to attempt to optimise the throughput of the network

1.18 Question as: True or False?

It is the responsibility of switches to ensure that multicast behaves correctly on IPv4

1.19 Question at: True or False?

The DEC Bit is a mechanism for Congestion Avoidance that works by setting a congestion indication bit in packets that arrive when network queues are full, i.e., congested

1.20 Question au: True or False?

"Integrated Services" is a coarse-grained quality-of-service approach

1.21 Question av: True or False?

Network flows are streams of related packets that flow through a given Autonomous System

1.22 Question aw: True or False?

The Karn/Partridge algorithm does not sample RTT when retransmitting a segment

1.23 Question ax: True or False?

The TCP checksum field in the TCP header occurs after all other header fields

1.24 Question ay: True or False?

Exterior Gateway Protocol and Border Gateway Protocol are two inter-domain routing protocols

1.25 Question az: True or False?

TCP throughput may need to be throttled on very fast networks to prevent sliding window wrap-around occurring too frequently

1.26 Question ba: True or False?

The peak power of a network typically occurs a little below the maximum load the network can handle

1.27 Question bb: True or False?

IPv6 improves on IPv4 by reducing the header size to increase payload size

1.28 Question bc: True or False?

IPv6 uses Classless Addressing/Routing, similar to IPv4 CIDR

1.29 Question bd: True or False?

Transport protocols typically support arbitrary large messages

1.30 Question be: True or False?

Rate-based networking approaches seek to minimise the packet rate on a network, so as to avoid congestion.

1.31 Question bf: True or False?

Border Gateway Protocol speakers can cancel previously advertised paths

1.32 Question bg: True or False?

Each Autonomous System is required to have one BGP Speaker per connected AS

1.33 Question bh: True or False?

Remote Procedure Call is an example of an end-to-end protocol

1.34 Question bi: True or False?

Quality-of-Service implies that some packets will be treated differently to others

1.35 Question bj: True or False?

RPC is a protocol that sits on top of IP, similar to TCP and UDP

1.36 Question bk: True or False?

BGP solves the problem of route advertisement trust between Autonomous Systems

1.37 Question bl: True or False?

The acknowledgement, source and destination ports, and advertised window fields are all involved in TCP's sliding window protocol

1.38 Question bm: True or False?

The Internet's topology in the early 1990s was a star network

1.39 Question bn: True or False?

Flowspec can use a Token Bucket Filter to enforce average bandwidth allocations, however this does not work well for variable bitrate sources

1.40 Question bo: True or False?

Proxy ARP is used by foreign agents to intercept packets addressed to mobile nodes

1.41 Question bp: True or False?

The original TCP retransmission timeout was set to the estimated RTT of the network path

1.42 Question bq: True or False?

A host may be in multiple multicast groups

1.43 Question br: True or False?

Fair Queuing performs bit-by-bit interleaving of packets to ensure fair allocation of network bandwidth

1.44 Question bs: True or False?

Reverse Path Broadcast is used to propagate the return path for two-way multicast traffic

1.45 Question bt: True or False?

An example of one-to-many multicast would be radio station broadcast

1.46 Question bu: True or False?

The TCP slow start algorithm increases the TCP congestion window size more rapidly than if it did not exist

1.47 Question bv: True or False?

Routing Areas allow groups of backbone routers to be defined

1.48 Question bw: True or False?

FIFO Queuing maintains separate queues per network flow, to improve fairness

1.49 Question bx: True or False?

Route Propagation refers to the movement of user data over existing routes

1.50 Question by: True or False?

The TCP Slow Start algorithm exists to slow the increase in congestion window size growth before the first packet loss occurs

1.51 Question bz: True or False?

The maximum segment lifetime in a TCP connection is limited to 120 seconds to reduce the amount of data that must be buffered throughout the network

1.52 Question ca: True or False?

Congestion in networks often occurs because a connected host has a faster local connection than some other part of the network, which then acts as a bottle-neck

1.53 Question cb: True or False?

Voice, video and remote control are examples of network applications where Quality-of-Service should work to minimise latency

1.54 Question cc: True or False?

In a reservation-based system, each router allocates enough resources for a request. If the request cannot be met, the router rejects the reservation.

1.55 Question cd: True or False?

Network resource allocation is either one of router-centric or host-centric

1.56 Question ce: True or False?

Transit traffic is traffic that transits into an Autonomous System to reach a destination in that Autonomous System

1.57 Question cf: True or False?

Whenever a congestion window's worth of data has been acknowledged, the TCP congestion protocol will add one congestion window's worth of bytes to the congestion window size

1.58 Question cg: True or False?

The TCP checksum field is calculated over data from only the TCP and IP layer headers

1.59 Question ch: True or False?

Source specific multicast avoids the need for including the source IP address in multicasting forwarding tables

1.60 Question ci: True or False?

Source-based Congestion Avoidance reduces the congestion window slightly whenever the RTT increases above the average RTT

1.61 Question cj: True or False?

It is up to a TCP implementation to decide when it has enough bytes to send a segment

1.62 Question ck: True or False?

The congestion control protocol of TCP communicates the congestion window by setting the advertised window and flags in the TCP header to indicate that the value is for the congestion window

1.63 Question cl: True or False?

If the TCP Slow Start algorithm is re-started, the Congestion Threshold is reset to 0

1.64 Question cm: True or False?

The goal of inter-domain routing is to find loop-free routes between nodes

1.65 Question cn: True or False?

TCP normally buffers enough bytes to fill a reasonable sized packet on the sending side, before dispatching it

1.66 Question co: True or False?

The MSS of a TCP connection is the Maximum Segment Size, which is the MTU of the network link minus the TCP and IP header sizes

1.67 Question cp: True or False?

Scheduling disciplines and drop policies are distinct aspects of packet queuing

1.68 Question cq: True or False?

The UDP protocol demultiplexes packets arriving at a host into separate queues for each application

1.69 Question cr: True or False?

Routers maintain a table of which specific port each multicast group's traffic should be forwarded to

1.70 Question cs: True or False?

The TSpec of a flow is easier to define correctly than the RSpec

1.71 Question ct: True or False?

The role of a transport protocol is to transport packets from one host to another

1.72 Question cu: True or False?

One approach to congestion control is to allow sources to send as much data as they want, disconnecting sources when congestion occurs, until the congestion abates

1.73 Question cv: True or False?

A significant routing problem is how to make it scale to billions of end nodes

1.74 Question cw: True or False?

Multicast results in increased redundancy and bandwidth consumption

1.75 Question cx: True or False?

The TCP Slow Start algorithm is used only at the commencement of a TCP connection