

Computer Networks 2021 Quiz 2

FAN: mcgh0008

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?

The TCP destination port field is at byte offset 16 in the TCP header

1.2 Question ac: True or False?

Assuming a 10ms RTT, the 16-bit advertised window field of the TCP header is sufficient to keep a network link of upto about 26Mbit/sec full

1.3 Question ad: True or False?

Modern routers allow setting the Jain's Fairness Index to control the fairness of congestion control

1.4 Question ae: True or False?

Guaranteed-Service in RSVP means that the network should guarantee that all packets of this service class are not to be dropped

1.5 Question af: True or False?

The original TCP retransmission timeout was based on double the estimated RTT of the network path

1.6 Question ag: True or False?

Merriton's Algorithm is typically used to solve the fairness of resource allocation in networks

1.7 Question ah: True or False?

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

1.8 Question ai: True or False?

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

1.9 Question aj: True or False?

The power of a network is often expresses as the throughput divided by the delay

1.10 Question ak: True or False?

TCP is byte-oriented

1.11 Question al: True or False?

Multi-provider Internet topologies typically involve peering points

1.12 Question am: True or False?

Autonomous Systems refer to the large junction points on the Internet

1.13 Question an: True or False?

Optimality of routes is less important than reachability for inter-domain routing

1.14 Question ao: True or False?

In a feedback-based system, a host sends data, and then waits for feed-back on network conditions, before sending more data

1.15 Question ap: True or False?

IPv6 includes specific provision for mobility

1.16 Question aq: True or False?

Packet lengths should be taken into account with Fair Queuing (FQ), to ensure actual fair sharing of bandwidth

1.17 Question ar: True or False?

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

1.18 Question as: True or False?

TCP normally buffers enough bytes to fill a reasonable sized packet on the receive side, to reduce the number of times an application must poll for data

1.19 Question at: True or False?

Packet loss is a problem that equally impacts on all real-time applications

1.20 Question au: True or False?

A host may be in multiple multicast groups

1.21 Question av: True or False?

BGP relies on providers being able to trust the advertisements provided by other providers

1.22 Question aw: True or False?

Transport protocols often have to contend with networks delivering duplicate copies of a given message

1.23 Question ax: True or False?

Multicast allows a sender to send only one packet, and have it be received by multiple recipients

1.24 Question ay: True or False?

Internet routing is largely divided based on intra-AS and inter-AS routing

1.25 Question az: True or False?

Transport protocols typically support synchronising sender and receiver

1.26 Question ba: True or False?

Internet Group Management Protocol (IGMP) is used to signal the intent to join or leave a multicast group on IPv6

1.27 Question bb: True or False?

The DEC Bit is a mechanism for Congestion Avoidance that works by setting a congestion indication bit in packets when network queues grow, thus allowing senders to actively avoid congestion

1.28 Question bc: True or False?

MPLS, the Multiple Path Link Status protocol, is used to provide traffic engineering to the Internet

1.29 Question bd: True or False?

The maximum number of unacknowledged bytes in a TCP connection is the maximum of the Advertised Window and Congestion Window

1.30 Question be: True or False?

Source Specific Multicast is used to specify the kind of content that a host wishes to receive from a particular multicast node

1.31 Question bf: True or False?

Within an Autonomous System, all internal and border routers must run an intra-domain routing protocol

1.32 Question bg: True or False?

TCP must be able to handle widely varying Round-Trip Times on networks

1.33 Question bh: True or False?

The Jacobson/Karels algorithm simplifies the TCP retransmission delay, by tracking only the variance in RTT, rather than the RTT itself

1.34 Question bi: True or False?

"Integrated Services" is a quality-of-service scheme for packet switched IP networks. It does not support reservations

1.35 Question bj: True or False?

When too many packets are contending for the same link, queues overflow and packets get dropped, resulting in congestion

1.36 Question bk: True or False?

Mobile IP uses home agents, home addresses and foreign agents to facilitate mobility

1.37 Question bl: True or False?

The role of Quality-of-Service is to ensure that sufficient bandwidth is available to network applications that have special needs, even if it means that latency must increase

1.38 Question bm: True or False?

The congestion control protocol of TCP determines the congestion window size by observing when packets are not delivered

1.39 Question bn: True or False?

Multiple priority queues in FIFO queuing are typically used to ensure that an equal number of packets from each queue are sent per unit time

1.40 Question bo: True or False?

Reverse Path Broadcast is used to prune networks that contain no members in a given multicast group

1.41 Question bp: True or False?

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

1.42 Question bq: True or False?

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

1.43 Question br: True or False?

Border Gateway Protocol is the only inter-domain routing protocol

1.44 Question bs: True or False?

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

1.45 Question bt: True or False?

The TCP Slow Start algorithm runs at the start of a connection, until the first packet loss occurs

1.46 Question bu: True or False?

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

1.47 Question bv: True or False?

UDP allows the multiplexing of traffic from multiple applications on a single host

1.48 Question bw: True or False?

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

1.49 Question bx: True or False?

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

1.50 Question by: True or False?

A Stub Autonomous System is analogous to a stub function in a program, and contains only exterior interfaces, and lacks internal nodes, and thus exists primarily to carry transit traffic.

1.51 Question bz: True or False?

Congestion Collapse was implemented in TCP to improve network performance

1.52 Question ca: True or False?

Multicast forwarding table collectively specify a set of paths

1.53 Question cb: True or False?

Voice and video are the only network applications where Quality-of-Service should work to minimise latency. For all other applications bandwidth is the primary consideration

1.54 Question cc: True or False?

Soft-state of network flows helps routers to better handle traffic from that flow

1.55 Question cd: True or False?

The TSpec of a Flowspec describes the network service that has been requested

1.56 Question ce: True or False?

TCP uses a four-way handshake when establishing a connection

1.57 Question cf: True or False?

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

1.58 Question cg: True or False?

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

1.59 Question ch: True or False?

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

1.60 Question ci: True or False?

Neither TCP nor UDP is ideally suited to the needs of Remote Procedure Call (RPC)

1.61 Question cj: True or False?

Source-based Congestion Avoidance works by having routers provide a separate packet queue for each source

1.62 Question ck: True or False?

Allocating network resources with sufficient precision to avoid congestion is difficult

1.63 Question cl: True or False?

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

1.64 Question cm: True or False?

Congestion control exists to prevent senders from overrunning the capacity of intermediate devices and links on a network

1.65 Question cn: True or False?

Border Gateways are the routers through which packets enter and leave an Autonomous System

1.66 Question co: True or False?

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

1.67 Question cp: True or False?

It is common for intolerant real-time applications to mitigate their intolerance through delay adaptivity

1.68 Question cq: True or False?

When a mobile IP device moves networks, the home agent may need to send a binding warning notice

1.69 Question cr: True or False?

The role of a transport protocol is to present an unreliable network to applications as a reliable data transport

1.70 Question cs: True or False?

TCP will typically send a segment when it has the number of bytes required to fill a packet, the application has specifically requested it, or a timeout has occurred

1.71 Question ct: True or False?

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

1.72 Question cu: True or False?

It is common for large corporations to connect directly to one or more backbones

1.73 Question cv: True or False?

The TCP checksum field is calculated over data from only the TCP header

1.74 Question cw: True or False?

Border Gateway Protocol speakers must provide a replacement path when deleting a previously advertised path

1.75 Question cx: True or False?

IPv6 uses Classless Addressing/Routing, similar to IPv4 CIDR