

CNT 4700C Computer Networks Fundamentals, Fall 2019,

Homework 1 Rubric

There are a total of 100 points and 11 extra points, out of 100.

1. (6 points + 2 extra)
 - (a) (2 points) +2 Gave reasonable definition, e.g. mentioned something along the lines of rules for communication.
 - (b) (1 point) +1 Mentions IETF.
 - (c) (3 points) +1 for English, +1 for pointing out this leads to ambiguous interpretation, +1 for explaining why an ambiguous interpretation would cause problems.
 - (d) (Extra 2 points) +1 for protocol that is correct in spirit but missing details such as initiation etc., +1 for a correct protocol.
2. (5 points)
 - (a) (3 points) +1 for each.
 - (b) (2 points) +1 for client process, +1 for server process.
3. (9 points)
 - (a) (3 points) +1 for naming a few, +1 for naming all, +1 for giving brief explanations of those named.
 - (b) (3 points) +1 for naming less than two in each category, +1 for naming at least two in each category, +1 for giving brief explanations.
 - (c) (3 points) Same as previous.
4. (4 points + 1 extra)
 - (a) (2 points) +1 for describing what the term means, +1 for correct illustration.
 - (b) (2 points) +1 few protocols in the middle, +1 relatively many on the ends.
 - (c) (Extra 1 point) +0.5 for each protocol.
5. (5 points) +1 No it cannot, +2 reason for no delivery guarantee, +2 reason for no bandwidth guarantee.
6. (6 points)
 - (a) (4 points) +1 for each requirement and how it is met.
 - (b) (2 points) +1 for each missing requirement.
7. (4 points) +2 Mention addresses are assigned according to location using prefixes, +1 routers only need to store prefix information, +1 you don't need to therefore scale routing tables for every new address.

8. (6 points) If they did the connectivity reason: +3 For pointing out that the wired internet is continuously connected but wireless networks are not necessarily, +2 pointing out that this affects worm spreading, +1 for pointing out this is because worms can only spread within islands of well connected devices in a network. Alternatively, if they did the spatial reason: +3 For pointing out that connected wireless devices engaging in P2P may be physically proximate, +2 this implies that there are alternative ways to validate identity like face-to-face, +1 but in a wired connection there is not usually such verification.
9. (6 points)
 - (a) (4 points) +1 stat mux assigns capacity on demand, +1 therefore can allow many more users on the network in contrast to TDM which must pre-allocate resources. +1 For numerical example that is correct in spirit, +1 for numerical example that is completely correct.
 - (b) (2 points) +1 The load on the network could exceed the capacity, +1 leading to queues which can cause delays, jitter, and loss.
10. (3 points) +1 Define DDoS attack, +2 describe why it is harder to control than DoS (single point of failure).
11. (Extra 3 points) +1 Morris worm, +1 infected large number of computers on the internet, +1 sometimes prevented them from booting up or functioning properly.
12. (5 points)
 - (a) (3 points) +1 VoIP is sensitive to delay or delay jitters, +1 it is less sensitive to loss, +1 UDP provides less delay than TCP and therefore is better suited for VoIP.
 - (b) (2 points) +1 Many firewalls block or rate-limit UDP, +1 Skype does setup connections, so TCP could be used for that.
13. (5 points) +1 Yes, +2 for each correct example.
14. (6 points) +1 for each correct identifier, +2 drawing.
15. (5 points) +2 HTTP is stateless, +2 But cookies can be added to have state, +1 but HTTP can function without cookies.
16. (4 points) +2 for user perspective (reduces response time for client), +2 points for network perspective (reduce traffic on access link).
17. (6 points) +2 for explaining proxy caching takes advantage of users on network requesting same content, +2 customized content means users aren't requesting exactly the same thing so makes cache less useful, +2 video streaming is copyrighted content so can't just be re-sent to different users by the cache, +2 encrypted content can be read.
18. (7 points)
 - (a) (3 points) +1 don't need central server, +1 private content, +1 server with limited resources (scalability).
 - (b) (2 points) +2 searching for resources, other users is the new difficulty.
 - (c) (2 points) +1 for a reasonable but ineffective solution, +1 for valid solution.
19. (8 points)
 - (a) (3 points) +2 Show described trace, +1 identify transoceanic link.
 - (b) (3 points) +3 for correct results.
 - (c) (2 points) +2 for correct results.
20. (Extra 5 points)

- (a) (Extra 2 points) +1 Wireshark is a packet sniffer and analyzer, +1 which means it captures packets and tries to display the content.
- (b) (Extra 2 points) +0.5 for each valid reason.
- (c) (Extra 1 point) +0.5 for each valid unintended use.