Instructions

There are **60 total points**. When asked to provide your answer within a figure or table, be careful to not exceed box boundaries. Bubbles must be filled out completely: ● is correct, ⊘ ⊙ ⊗ are incorrect All answers must be given within the provided circles, answer boxes, figures or tables.

1. [1 point]: Write your full name in the box to acknowledge the instructions.

Net Neutrality

2. [4 points]: Which of the following are commonly considered "bright line" rules for Net Neutrality. (Select all that apply.)

◯ No blocking

◯ No content moderation

◯ No throttling

◯ No paid prioritization

◯ Transparency of practices

3. [4 points]: An Internet service provider notices a sudden uptick in streaming video (e.g., Netflix, Amazon, etc.) traffic that is congesting certain network links and interfering with other traffic, including latency-sensitive applications such as gaming and video conference traffic.

To improve the performance of the network, the ISP decides to throttle streaming video traffic so that the peak utilization never exceeds a couple of megabits per second. Would such throttling typically be considered a net neutrality violation? ◯ Yes ◯ No

4. [4 points]: Why or why not?

(Answer inside the box)

5. [4 points]: Comcast and Netflix have, in the past, entered what is known as a "paid peering" agreement. In such an agreement, Netflix pays Comcast to connect directly to Comcast's network, rather than going through intermediaries. What are some reasons that Netflix would want to do this?

◯ Moving content closer to Comcast customers is likely to improve streaming performance.

◯ Interconnecting with Comcast at an exchange point is completely free.

◯ Comcast would otherwise throttle Netflix traffic, unless it paid.

◯ Directly connecting to Comcast saves the cost of transit through another ISP.

6. [4 points]: Explain why paid peering agreements are not typically considered a net neutrality violation. (Answer inside the box)

DNS Security and Privacy

7. [4 points]: Which of the following are true about DNSSEC?

◯ DNSSEC provides integrity and authenticity for DNS records.

◯ DNSSEC provides confidentiality for DNS records.

◯ DNSSEC uses public key cryptography.

◯ DNSSEC uses symmetric key cryptography.

8. [4 points]: Which of the following are true about DNS over HTTPS (DoH)?

◯ DoH provides integrity and authenticity for DNS records.

◯ DoH provides confidentiality for DNS records.

◯ DoH uses public key cryptography.

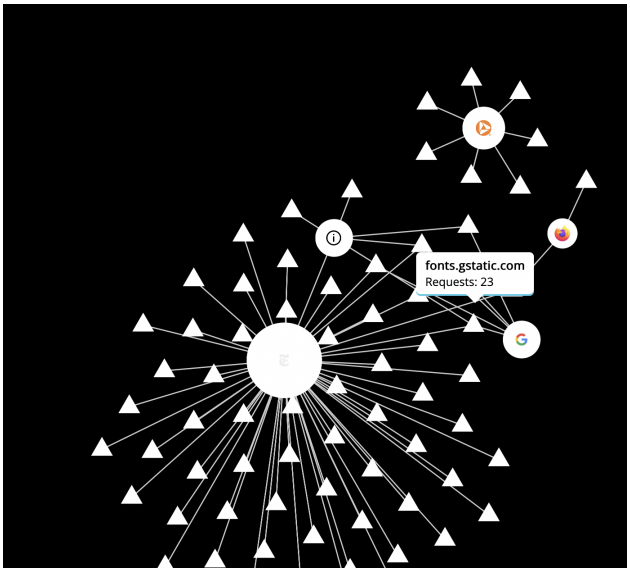
◯ DoH uses symmetric key cryptography.

9. [2 points]: Is it possible to use both DNSSEC and DoH at the same time?

◯ Yes ◯ No

Web Privacy and Tracking

Shown below is an image from the Lightbeam plugin, which we discussed in class. It shows, for example, that `fonts.gstatic.com` (a domain maintained by Google) is a third-party tracker that is contacted by many different websites.



10. [4 points]: Why is it a potential problem that `fonts.gstatic.com` is contacted by many different websites?

(Answer inside the box)

11. [4 points]: What types of information might Google be able to collect or infer about a user, given the ability to track them across many different websites?

◯ Browsing history

◯ Interests

◯ Credit card number

◯ Name

Vulnerability Disclosure

12. [2 points]: It is common practice to allow a company some period of time to fix a vulnerability before disclosing it publicly. ◯ Yes ◯ No

13. [2 points]: Why or why not?

(Answer inside the box)

To improve security and catch vulnerabilities earlier, a company decides to run a bug bounty program. The company will pay $1000 for each vulnerability that is reported to them.

14. [4 points]: What are the potential benefits of such a program?

(Answer inside the box)

15. [4 points]: What are the potential drawbacks?

(Answer inside the box)

Digital Equity

This topic was not covered as much in class, but there was an assignment on it. So, there are not many points assigned to this section, and the questions should be straightforward!

16. [1 point]: Unreliable Internet access is only a problem in rural areas (i.e., not in cities). ◯ Yes ◯ No

17. [2 points]: A common metric to measure Internet performance is throughput, which is measured in bits per second. What is a definition of throughput?

(Answer inside the box)

18. [4 points]: In the assignment, you worked with data from the FCC's Measuring Broadband America program, which measures the performance of Internet service providers (ISPs) in the United States. What are some reasons that the FCC might want to measure the performance of ISPs?

◯ To ensure that ISPs are providing the service that they advertise.

◯ To ensure that ISPs are not providing service to customers in other countries.

◯ To ensure that ISPs are providing service to customers in rural areas.

◯ To ensure that the service that ISPs are providing is affordable.

Feedback

19. [1 point]: Interest (1=Boring!; 10=Amazing!): [ ] Difficulty (1=Too easy; 10=Too hard): [ ]

20. [1 point]: 1. One topic you'd like to see covered that wasn't covered. 2. One other suggestion for improvement.

(Answer inside the box)