CSE 461: Computer networks

Spring 2021

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Final review

DNS

- What does DNS do?

- What is a DNS zone?

- What is DNS caching?

- *Outline a potential sequence of steps that might happen when a host wants to resolve www.cs.washington.edu. Assume complete lack of caching.*

- *What does DNSSec protect against?*

HTTP

- What is DOM?

- Describe three changes made to HTTP to improve page load time

Physical layer

- What is the function of physical layer?
- Why problem can a sequence of zeroes cause?

- What is wireless interference?
- What is multipath?
- What is Nyquist limit?
- What is Shanon limit?

Link layer: Framing

- What problem does framing solve?
- What is the disadvantage of byte count as a framing method?

Link layer: Errors

- Why does redundancy help with error correction and detection?
- What is the hamming distance of parity bit?
- If hamming distance is D, how many errors can be detected?
- If hamming distance is D, how many errors can be corrected?
- Compute Internet checksum for abcdefgh
- Hamming code question – where is the error?
- When is error correction more efficient than detection? Vice versa?

Link layer: Multiple access

- Two ways to multiple access? TDM and FDM
- Why is it a harder problem in the Internet than the phone network?
- Describe ALOHA. Its major downside?
- Which ideas in Ethernet make it better than Aloha?
- What is CSMA persistence?
- Why are three link layer addresses needed in a WiFi packet?

Link layer: Switching

- What is hub vs switch vs router?

- How do switches work?

- Why is STP needed? How does it work?

Cryptography

- How can public key cryptography provide both confidentiality and integrity?

- What is the difference between hashing and encryption?

- How do digital signatures work?

- In TLS, how does client established the identity of the server?

Other security threats

- What security guarantees do VPN/IPSec provide beyond encryption?
- What do you need to launch a DDoS attack? How can you protect against it?

Internet design philosophy

- Describe the end-to-end principle

- When is it OK to place functionality in the network according per e2e principle?

- List top-3 goals for the Internet and explain your rationale

SDN, cloud, containers

What is the advantage of decoupling control and data plane?

What is oversubscription ratio in DC topologies?

What routing protocols are use in modern DC designs?

How does network virtualization work?

What problem is solved by container orchestration frameworks (.e.g, Kubernetes)?

What problem is solved by service meshes (e.g., Istio)?