

CS 360 Exam 2 Review

Transport Layer

Why do we need the transport layer? Why not just push down all the functionality of the transport layer into the network layer?

Describe the differences between TCP and UDP.

Describe how the network can fail and why this causes TCP to be complicated to implement.

TCP presents a byte stream to the Application. What is a byte stream? How is a byte stream different from a datagram? What stress does this put on the Application that is using TCP?

Describe the TCP handshake protocol. Be sure to describe the sequence numbers involved and any bit flags set in the TCP Segment header. Describe why each message used in the handshake is required.

Describe the security vulnerabilities inherent in the handshake above. Describe at least one way to mitigate this vulnerability.

Describe why the initial sequence number should not be a predictable number.

Describe connection tear-down in TCP. Make sure to note how failures in the network are handled.

What is the sliding window protocol?

Describe two instances where the sliding window protocol causes problems, and list solutions for these instances.

What is the Maximum Window for TCP (pre-RFC 1323)? Why is this a problem? How does RFC 1323 fix this problem?

How is reliability implemented in TCP? Describe the timers used and when packets are retransmitted.

How does TCP track the Round Trip Time for a connection?

What congestion control is done by TCP? What triggers congestion control to begin? How can IP help with congestion control?

Why is RED better than Tail-drop?

Network Layer

What is the goal of the networking layer?

What is a router?

Why might the telephone company want connection-based network layers while the Internet wants a

connection-less network layer? If a network is connection based, which part of the network becomes more complicated and how?

Why would an IP packet get fragmented? Describe the fragmentation process that happens if a 3000 byte (data + header) IP packet is sent to a link that can handle only 2000 byte (data + header) IP packets. How many packets are generated? What flags are set in each packet? When does the packet get reassembled? What other fields in the header are useful to fragmentation?

Why might an IP packet set the DF bit?

Define internetworking.

What is classful addresses? Why was this a bad idea? What does the CIDR 64.59.232.0/22 mean?

What is a subnet mask?

What is a forward table?

How do forward tables get populated?

What is NAT? Why is it useful?

What is link state routing?

What is distance vector routing?

What is an Autonomous System?

Describe RIP, OSPF, BGP and where each is used.

How does IP deal with congestion control?