

CPTR-456
Final Exam Planning

The final exam will emphasize material in chapters 3 to 6 of the textbook which cover the Transport, Network, and Link layers of the 5-layer network model but there could be reference to concepts from the earlier chapters.

Consider, what services are provided by each layer

Concept of encapsulation

Transport layer (segments) - chapter 3

UDP

unreliable transport, best effort, error check, no acknowledgment

UDP segment structure

TCP

reliable data transport

concepts

hand shaking

round trip time

protocols

basic reliable

pipelined

go-back-n (GBN)

selective repeat (SR)

connection management

congestion control

slow start

congestion avoidance

TCP Tahoe

TCP Reno

TCP segment structure

Network layer (datagrams) - chapter 4

Two logical layers

data plane

control plane

router architecture

switching fabric

input port processing

switching

output port processing

queuing

packet scheduling

IP protocol (focus on IPv4, not so much on IPv6)

IPv4 data gram format

IP addresses

obtaining addresses - DHCP
how addresses are used to route datagrams
network address translation (NAT)

Network layer continued, control plane, routing - Chapter 5

Less detail will be expected from this chapter, but you should know the general characteristics of a centralized routing algorithm (link-state algorithm, LS, is such) and a decentralized routing algorithm such as distance-vector (DV).

The internet is organized into groups of routers with each group an autonomous system (AS). Routers within an AS use the same routing algorithm but the algorithm may vary from one AS to the next.. To route between one AS and another requires a common inter routing protocol. BGP (border gateway protocol) is the inter routing protocol that is used. There are two principle tasks of BGP and it is good to know those.

The Software Defined Network (SDN) Controller deserves some attention. Review pages 410,411 and the 3 layers it can be described having.

Link layer (frames) - chapter 6

Services provided by the link layer - 4 listed
Error checking, know what a parity check is and its effectiveness
Check sum - know how it is calculated
Cyclic Redundancy Check (CRC). Don't need to know the algorithm, but know effectiveness
Channel partitioning protocols - TDM and FDM, know w
Know what CSMA and CSMA/CD are. Know basics of Aloha.
Switched local area networks - questions certainly about this. Know how link-layer addressing works, how a switch and attached hosts learn addresses and then route frames of data, both within a subnet and between subnets.
Link layer switches vs routers - know the differences
Limited questioning about VLANs
Data center networking will not be emphasized.
Section 6.7 - A day in the life of a web page request is good review material. Go through this example.

Use the interactive exercises provided by the textbook author to review. They are found at:
http://gaia.cs.umass.edu/kurose_ross/interactive/index.php

Exam is Wednesday at 8:00am in the Linux lab.