CSC/CPE 138

Optional Study Guide (Mid-term Exam)

Lecture 1_1 and 1_2: Brief list of topics

1. Components of network infrastructure and their function: Network edge, network core and access networks.
2. Different access network types and their use cases.
3. Given the packet length and the link's speed, compute the packet transmission delay.
4. Differentiate between packet switching and circuit switching. Why is packet switching better for internet communication than circuit-switching?
5. Define types of delays in the networks. How different is transmission delay than queueing delay? Provide two examples/points.
6. Caravan analogy scenario to compare the nodal delay, transmission delay, queueing delay and propagation delay. Scenario-based questions. Compute the delays given speed, packet size and distance. Look for related questions in homework and lecture slides.
7. Analyze effect of queueing delay with respect to traffic intensity. Evaluate the queuing delay when traffic intensity is close to 1. Additionally, analyze the behavior of transmission delay and propagation delay using their formulae.
8. Describe advantages and disadvantages of layered architecture? Define the different layers of Internet Protocol Stack?
9. Types of access networks and their use cases (Cable network, DSL, enterprise access network, wireless access network)
10. Determining throughput of a network given link speeds and connections.
11. TDM multiplexing examples (Homework and slides).
12. Internet structure and the definition of IXP, POP and their use cases.
13. Expect scenario-based and analytical questions from any of the above topics.

Note: Binomial probability computation is excluded from the exam.

Lecture 2_1 and 2_2 : Brief list of topics

1. Differentiate between client-server model and the peer-to-peer model.
2. Define sockets in computer network communication. Describe how socket functions to connect a client to server. Addressing processes.
3. Define some of the transport services in applications. Why do we need them?
4. Differentiate Internet transport protocol services (TCP and UDP). Provide at least three points for your answer. Identify the applications that use UDP/TCP. Justify your answer.
5. Describe the mechanism of HTTP 1.0 protocol. Persistent and non-persistent connections. What are different request messages of HTTP? Define their functions. Differentiate between HTTP 1.1 and HTTP 2.
6. HTTP response codes and their meanings.
7. Use case of cookies, study the scenario where cookies are used. Advantage and disadvantage of cookies.

8. Web-cache and the advantage of using web-cache instead of a faster link. Computations of link utilizations and evaluations.
9. Components of Email application and their functions.
10. Hierarchical DNS name servers in the distributed DNS architecture. Life of a new DNS request for an unknown website such as www.google.com?
11. Functionality of DNS records and their use cases.
12. Compute and evaluate file distribution time for P2P and client-server model given the parameters.
13. Expect scenario-based and analytical questions from any of the above topics.

Note:

- The mid-term study guide provides general topics that are of high importance to prepare for the exam.
- You must not expect the questions to be exactly same as what is defined here.
- You must review scenarios that were discussed in class for exam questions.
- You must review homework solutions, quizzes, activities and any other examples discussed in class.