Group 10

Introduction to Computer Networks

Group Activity #01

Assignment Solutions

SWE3022 - Sungkyunkwan University

1. Example

A. Explain the Internet protocol stack, and the encapsulation and the decapsulation of a user’s data by using air travel example

Application Layer (Ticketing Service)

At this highest layer, the user expresses a travel request similar to **purchasing an airline ticket**. In networking, this corresponds to user applications like web browsers requesting services such as accessing a web page.

Transport Layer (Baggage Service)

This layer ensures that the user's “luggage” (data) is safely tagged and tracked. Protocols like TCP guarantee reliable delivery **similar to how checked baggage is carefully managed**, while UDP is like carry-on luggage that travels faster with fewer guarantees.

2. Example

A. What is the packet switching? What is this method for?

In a network application, end systems exchange messages with each other. To send a message from a source end system to a destination end system, the source breaks long messages into smaller chunks of data known as packets. Between source and destination, each packet travels through communication links and packet switches, of which there are two predominant types: routers and link-layer switches. This packet switching method enables efficient utilization of network resources by allowing multiple communications to share the same physical infrastructure simultaneously, rather than dedicating entire communication paths to individual conversations.

3. Example

A. Explain HyperText Transfer Protocol (HTTP)

The HyperText Transfer Protocol (HTTP) is the Web's application-layer protocol. It is implemented in two programs: a client program and a server program. The client program and server program, executing on different end systems, communicate by exchanging HTTP messages. HTTP defines the structure of these messages and how the client and server exchange them. This protocol follows a client-server model where browsers act as clients that send requests, and web servers respond with the requested content.

4. Example

A. Explain the Web Caches and its benefits.

A web cache is a network entity that satisfies HTTP requests on behalf of an origin web server. To fulfill client requests without involving the origin server, a web cache maintains its own disk storage and keeps copies of recently requested objects in this local storage. When a client sends an HTTP request, the cache checks whether the requested object is stored locally. If found, it returns the object directly; if not, it forwards the request to the origin server, stores the response, and delivers the content to the client.