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**16/SCI01/035**

**CSC 402**

**ASSIGNMENT 2**

**Question 1**

What is File Transfer?

File Transfer Protocol (FTP) is a standard Internet protocol for transmitting files between computers on the Internet over TCP/IP connections. FTP is a client-server protocol where a client will ask for a file, and a local or remote server will provide it.

The end-users machine is typically called the local host machine, which is connected via the internet to the remote host—which is the second machine running the FTP software.

Anonymous FTP is a type of FTP that allows users to access files and other data without needing an ID or password. Some websites will allow visitors to use a guest ID or password- anonymous FTP allows this.

How FTP Works

FTP is a client-server protocol that relies on two communications channels between client and server: a command channel for controlling the conversation and a data channel for transmitting file content. Clients initiate conversations with servers by requesting to download a file. Using FTP, a client can upload, download, delete, and rename, move and copy files on a server. A user typically needs to log on to the FTP server, although some servers make some or all of their content available without login, known as anonymous FTP.

FTP sessions work in passive or active modes. In active mode, after a client initiates a session via a command channel request, the server initiates a data connection back to the client and begins transferring data. In passive mode, the server instead uses the command channel to send the client the information it needs to open a data channel. Because passive mode has the client initiating all connections, it works well across firewalls and Network Address Translation (NAT) gateways.

**Question 2**

What is Simple Mail Transfer Protocol?

SMTP is part of the application layer of the TCP/IP protocol. Using a process called "store and forward," SMTP moves your email on and across networks. It works closely with something called the Mail Transfer Agent (MTA) to send your communication to the right computer and email inbox.

SMTP spells out and directs how your email moves from your computer's MTA to an MTA on another computer, and even several computers. Using that "store and forward" feature mentioned before, the message can move in steps from your computer to its destination. At each step, Simple Mail Transfer Protocol is doing its job. Lucky for us, this all takes place behind the scenes, and we don't need to understand or operate SMTP.

How SMTP Works

SMTP provides a set of codes that simplify the communication of email messages between email servers (the network computer that handles email coming to you and going out). It's a kind of shorthand that allows a server to break up different parts of a message into categories the other server can understand. When you send a message out, it's turned into strings of text that are separated by the code words (or numbers) that identify the purpose of each section.

SMTP provides those codes, and email server software is designed to understand what they mean. As each message travels towards its destination, it sometimes passes through a number of computers as well as their individual MTAs. As it does, it's briefly stored before it moves on to the next computer in the path. Think of it as a letter going through different hands as it winds its way to the right mailbox.

**Question 3**

What is Internet Protocol?

The Internet Protocol (IP) is a protocol, or set of rules, for routing and addressing packets of data so that they can travel across networks and arrive at the correct destination. Data traversing the Internet is divided into smaller pieces, called packets. IP information is attached to each packet, and this information helps routers to send packets to the right place. Every device or domain that connects to the Internet is assigned an IP address, and as packets are directed to the IP address attached to them, data arrives where it is needed.

Once the packets arrive at their destination, they are handled differently depending on which transport protocol is used in combination with IP. The most common transport protocols are TCP and UDP.

What is User Datagram Protocol?

UDP uses a simple connectionless communication model with a minimum of protocol mechanisms. UDP provides checksums for data integrity, and port numbers for addressing different functions at the source and destination of the datagram. It has no handshaking dialogues, and thus exposes the user's program to any unreliability of the underlying network; there is no guarantee of delivery, ordering, or duplicate protection. If error-correction facilities are needed at the network interface level, an application may use Transmission Control Protocol (TCP) or Stream Control Transmission Protocol (SCTP) which are designed for this purpose.

UDP is suitable for purposes where error checking and correction are either not necessary or are performed in the application; UDP avoids the overhead of such processing in the protocol stack. Time-sensitive applications often use UDP because dropping packets is preferable to waiting for packets delayed due to retransmission, which may not be an option in a real-time system.