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COMPUTER NETWORKS

TUTORIAL 05

1)

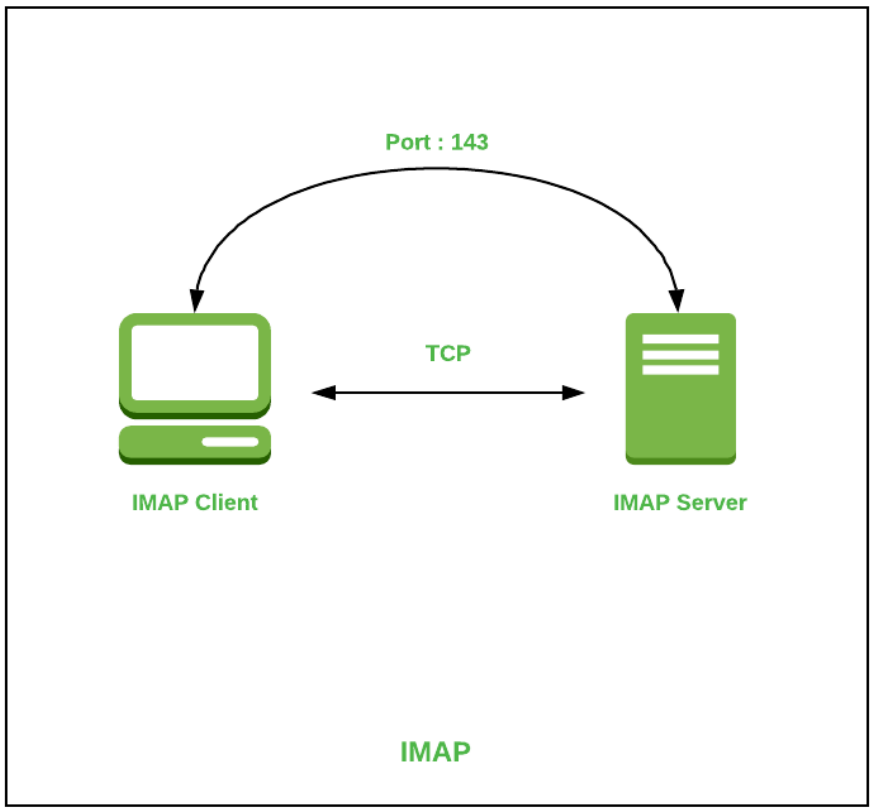
Internet Message Access Protocol (IMAP) is an application layer protocol that operates as a contract for receiving emails from the mail server. It was designed by Mark Crispin in 1986 as a remote access mailbox protocol, the current version of IMAP is IMAP4 which is most recently defined in RFC 3501.

Features of IMAP :

- ➔ It is capable of managing multiple mailboxes and organizing them into various categories.
- ➔ Provides adding of message flags to keep track of which messages are being seen.
- ➔ It is capable of deciding whether to retrieve email from a mail server before downloading.
- ➔ It makes it easy to download media when multiple files are attached.

Working of IMAP :
IMAP follows Client-server Architecture and is the most commonly used email protocol. It is a combination of client and server processes running on other computers that are connected through a network. This protocol resides over the TCP/IP protocol for communication. Once the communication is set up the server listens on port 143 by default which is non-encrypted. For the secure encrypted communication port, 993 is used.

Architecture of IMAP :



Advantages :

- It offers synchronization across all the maintained sessions by the user.
- It provides security over the POP3 protocol as the email only exists on the IMAP server.
- Users have remote access to all the contents.
- It offers easy migration between the devices as it is synchronized by a centralized server.
- There is no need to physically allocate any storage to save contents.

Disadvantages :

- IMAP is complex to maintain.
- Emails of the user are only available when there is an internet connection.
- It is slower to load messages.
- Some emails don’t support IMAP which makes it difficult to manage.
- Many browser-based solutions are unavailable due to no support for IMAP.

2)

Hypertext Transfer Protocol (HTTP) for websites.

File Transfer Protocol (FTP) for transferring files from computer over a network.

Post Office Protocol (POP) to retrieve email from an email server for the client application.

Simple Mail Transfer Protocol (SMTP) to transmit email between email servers and email client-servers

Domain Name System (DNS) to translate requests for names into IP addresses

3)

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4)

A client-server application is run over the TCP, and the server program is executed first, because the server must accept the request from the client and has to be ready to execute the client's program. If the server is not ready (not running) then the client fails to establish the connection with the server.

For UDP, there might be a reason to not start a server as the need to set a connection from the server side is unnecessary.

5)

Web cache or otherwise called proxy server is a network entity used for satisfying the client request without involving the origin web server. Hence, we can reduce the delay in receiving a requested object across the internet, because it doesn't involve the origin server again and again.

Web cache may not reduce the delay in requesting some objects which are not available or not updated in its storage.

6)

When a user visits the e-commerce site for the first time, the website will return a cookie number, which is stored on the user's host, managed by the browser. The cookie number is present in the cookie header and is generated by the server of the e-commerce website, and the number is unique for every customer. The client receives the response along with the header and the number with a line appended to a special cookie file. The file contains the server name and the user's associated ID number.

In the subsequent request to the same server the client includes a cookie header which consists of a header line which specifies the id number for that server. During each visit or purchase from the e-commerce website, the browser sends the cookie number back to the website server. This cookie number is used to identify the user (or browser) who is visiting the site.

7)

Alice -> HTTP -> Web-based mail server -> SMTP -> Bob's mail server -> POP3 -> Bob