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Lecture 01

Introduction to Internet

Computer Network

The term **"computer network"** or simply **“network”** means a collection of autonomous computers interconnected by a single technology. Two computers are said to be interconnected if they are able to exchange information. The connection need not be via a copper wire; fiber optics, microwaves, infrared, and communication satellites can also be used.

Internet

Internet is the **network of networks** which are interconnected by using some media that can be **wire oriented** or **wireless.** It is a global computer network providing a variety of information and communication facilities, consisting of interconnected networks using standardized communication protocols. The Internet carries an extensive range of information resources and services, such as the inter-linked hypertext documents and applications of the World Wide Web (WWW), electronic mail, telephony, and peer-to-peer networks for file sharing. The Internet has no centralized governance in either technological implementation or policies for access and usage; each constituent network sets its own policies.

Distributed system and Computer network

There is considerable confusion in the literature between a computer network and a distributed system. The key distinction is that in a distributed system, a collection of independent computers appears to its users as a single coherent system. Usually, it has a single model or paradigm that it presents to the users. Often a layer of software on top of the operating system, called **middleware**, is responsible for implementing this model. A well-known example of a distributed system is the **World Wide Web**, in which everything looks like a document (Web page). In effect, a distributed system is a software system built on top of a network. The software gives it a high degree of cohesiveness and transparency. Thus, the distinction between a network and a distributed system lies with the software (especially the operating system), rather than with the hardware.

Internet and Computer Network

Neither the **Internet** nor the **World Wide Web** is a computer network because the Internet is not a single network but a network of networks and the Web is a **distributed system** that runs on top of the Internet.

Services of Internet

E-mail

Email is an important communications service available on the Internet. It offers an efficient, inexpensive and real time mean of distributing information among people. The concept of sending electronic text messages between parties in a way analogous to mailing letters or memos predates the creation of the Internet. Pictures, documents and other files are sent as email attachments. Emails can be cc-ed to multiple email addresses.

Electronic communication, because of its speed and broadcasting ability, is different from paper-based communication. Because the exchange of messages can be so fast, e-mail is more conversational than traditional letters.

Each user of email is assigned a unique name for his email account. This name is known as **E-mail address**. Different users can send and receive messages according to the e-mail address. E-mail is generally of the form **username@domainname**. For example, alice@wonderland.com is an e-mail address where Alice is username and wonderland.com is domain name.

Working of E-mail

Email working follows the client server approach. In this client is the mailer i.e. the mail application or mail program and server is a device that manages emails.

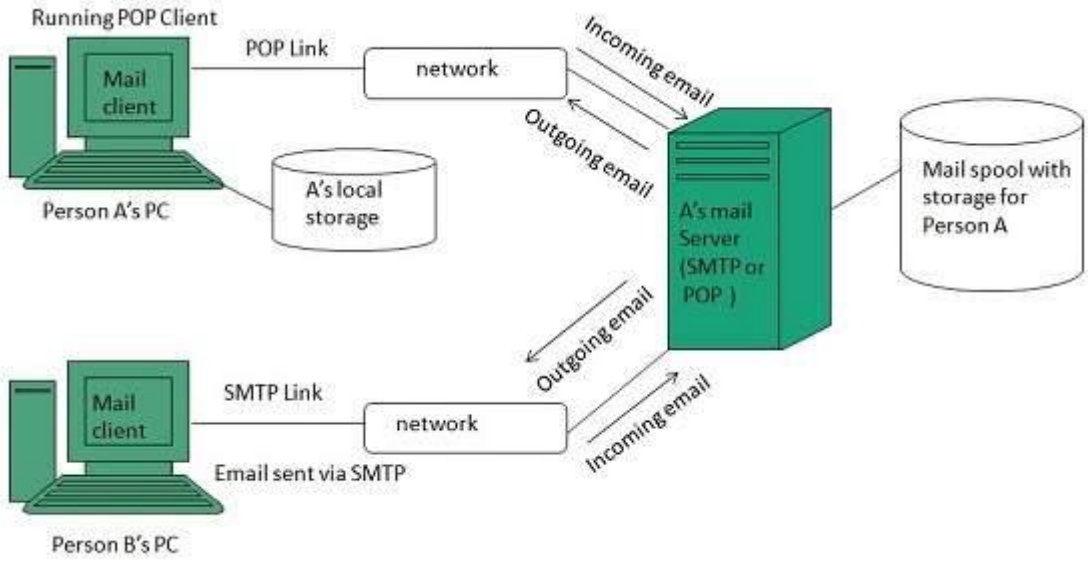
Following example will take you through the basic steps involved in sending and receiving emails and will give you a better understanding of working of email system:

- Suppose person A wants to send an email message to person B.
- Person A composes the messages using a mailer program i.e. mail client and then select Send option.
- The message is routed to **Simple Mail Transfer Protocol** to person B's mail server.
- The mail server stores the email message on disk in an area designated for person B.

The disk space area on mail server is called **mail spool**.

- Now, suppose person B is running a POP client and knows how to communicate with B's mail server.
- It will periodically poll the POP server to check if any new email has arrived for B. As in this case, person B has sent an email for person B, so email is forwarded over the network to B's PC. This is message is now stored on person B's PC.

The following diagram gives pictorial representation of the steps discussed above:



Telnet

Telnet or remote computing is telecommunication utility software, which uses available telecommunication facility and allows you to log in to a remote computer. It is a worldwide Internet Protocol for remote logins. It converts the PC in front of you into a terminal that can be connected to a remote computer. A host name or IP address of machine is required to identify the computer to which you want to connect. Once you gain access to remote computer, you can use it for the intended purpose. The TELNET works in a very step by step procedure. The commands typed on the client computer are sent to the local Internet Service Provider (ISP), and then from the ISP to the remote computer that you have gained access. Most of the ISP provides facility to TELENET into your own account from another city and check your e-mail while you are traveling or away on business.

The following steps are required for a TELNET session:

- Start up the TELNET program.
- Give the TELNET program an address to connect
    - Domain name or IP address or IP address followed by port-number of the remote machine is used to connect to the remoter machine.
      e.g: **telnet Alice.com**, **telnet 198.162.37.23**

- Log in to the remote computer (Enter valid username and password).
- Set the “terminal emulation”.
- Play around on the remote computer, and
- Quit.