

## INTRODUCTION TO INTERNET

### 3.1 INTRODUCTION

In the present age of information Technology, use of Internet is becoming quite popular for accessing information on any topic of your interest. It also provides tremendous opportunities to students, researchers and professionals for getting information on matters related to academic and professional topics and lot more. In the present world, most of the people who have computers around themselves use Internet to access information from the World Wide Web, exchange messages & documents and e-services.

### 3.2 OBJECTIVES

After going through this lesson, you would be able to:

- explain various terminology used in internet
- use various services provided by internet
- search the desired information over internet
- define e-mail and its various features
- explain the process of downloading file.

### 3.3 INTERNET

The **Internet** is a global system of interconnected computer networks that use the standard Internet protocol suite (TCP/IP) to serve billions of users worldwide. It is a *network of networks* that consists of millions of private, public, academic, business, and government networks, of local to global scope,

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that are linked by a broad array of electronic, wireless and optical networking technologies. The Internet carries a vast range of information resources and services, such as the inter-linked hypertext documents of the World Wide Web (WWW) and the infrastructure to support electronic mail.

### 3.3.1 Uses of Internet

Internet has been the most useful technology of the modern times which helps us not only in our daily lives, but also our personal and professional lives developments. The internet helps us achieve this in several different ways.

For the students and educational purposes the internet is widely used to gather information so as to do the research or add to the knowledge of various subjects. Even the business professionals and the professionals like doctors, access the internet to filter the necessary information for their use. The internet is therefore the largest encyclopedia for everyone, in all age categories. The internet has served to be more useful in maintaining contacts with friends and relatives who live abroad permanently.

### 3.3.2 Advantages of Internet:

- **E-mail:** Email is now an essential communication tools in business. With e-mail you can send and receive instant electronic messages, which works like writing letters. Your messages are delivered instantly to people anywhere in the world, unlike traditional mail that takes a lot of time. Email is free, fast and very cheap when compared to telephone, fax and postal services.
  - **24 hours a day - 7 days a week:** Internet is available, 24x7 days for usage.
  - **Information:** Information is probably the biggest advantage internet is offering. There is a huge amount of information available on the internet for just about every subject, ranging from government law and services, trade fairs and conferences, market information, new ideas and technical support. You can almost find any type of data on almost any kind of subject that you are looking for by using search engines like google, yahoo, msn, etc.
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- **Online Chat:** You can access many 'chat rooms' on the web that can be used to meet new people, make new friends, as well as to stay in touch with old friends. You can chat in MSN and yahoo websites.
- **Services:** Many services are provided on the internet like net banking, job searching, purchasing tickets, hotel reservations, guidance services on array of topics engulfing every aspect of life.
- **Communities:** Communities of all types have sprung up on the internet. Its a great way to meet up with people of similar interest and discuss common issues.
- **E-commerce:** Along with getting information on the Internet, you can also shop online. There are many online stores and sites that can be used to look for products as well as buy them using your credit card. You do not need to leave your house and can do all your shopping from the convenience of your home. It has got a real amazing and wide range of products from household needs, electronics to entertainment.
- **Entertainment:** Internet provides facility to access wide range of Audio/Video songs, plays films. Many of which can be downloaded. One such popular website is YouTube.
- **Software Downloads:** You can freely download innumerable, softwares like utilities, games, music, videos, movies, etc from the Internet.

### 3.3.3 Limitations of Internet

- **Theft of Personal information:** Electronic messages sent over the Internet can be easily snooped and tracked, revealing who is talking to whom and what they are talking about. If you use the Internet, your personal information such as your name, address, credit card, bank details and other information can be accessed by unauthorized persons. If you use a credit card or internet banking for online shopping, then your details can also be 'stolen'.
  - **Negative effects on family communication:** It is generally observed that due to more time spent on Internet, there is a decrease in communication and feeling of togetherness among the family members.
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- **Internet addiction:** There is some controversy over whether it is possible to actually be addicted to the Internet or not. Some researchers, claim that it is simply people trying to escape their problems in an online world.
- **Children using the Internet** has become a big concern. Most parents do not realize the dangers involved when their children log onto the Internet. When children talk to others online, they do not realize they could actually be talking to a harmful person. Moreover, pornography is also a very serious issue concerning the Internet, especially when it comes to young children. There are thousands of pornographic sites on the Internet that can be easily found and can be a detriment to letting children use the Internet.
- **Virus threat:** Today, not only are humans getting viruses, but computers are also. Computers are mainly getting these viruses from the Internet. Virus is is a program which disrupts the normal functioning of your computer systems. Computers attached to internet are more prone to virus attacks and they can end up into crashing your whole hard disk.
- **Spamming:** It is often viewed as the act of sending unsolicited email. This multiple or vast emailing is often compared to mass junk mailings. It needlessly obstruct the entire system. Most spam is commercial advertising, often for dubious products, get-rich-quick schemes, or quasi-legal services. Spam costs the sender very little to send — most of the costs are paid for by the recipient or the carriers rather than by the sender

### 3.4 SERVICES OF INTERNET -E-mail, FTP, Telnet

Email, discussion groups, long-distance computing, and file transfers are some of the important services provided by the Internet. Email is the fastest means of communication. With email one can also send software and certain forms of compressed digital image as an attachment. News groups or discussion groups facilitate Internet user to join for various kinds of debate, discussion and news sharing. Long-distance computing was an original inspiration for development of

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ARPANET and does still provide a very useful service on Internet. Programmers can maintain accounts on distant, powerful computers and execute programs. File transfer service allows Internet users to access remote machines and retrieve programs, data or text.

### **(a) E-Mail (Electronic Mail)**

E-mail or Electronic mail is a paperless method of sending messages, notes or letters from one person to another or even many people at the same time via Internet. E-mail is very fast compared to the normal post. E-mail messages usually take only few seconds to arrive at their destination. One can send messages anytime of the day or night, and, it will get delivered immediately. You need not to wait for the post office to open and you don't have to get worried about holidays. It works 24 hours a day and seven days a week. What's more, the copy of the message you have sent will be available whenever you want to look at it even in the middle of the night. You have the privilege of sending something extra such as a file, graphics, images etc. along with your e-mail. The biggest advantage of using e-mail is that it is cheap, especially when sending messages to other states or countries and at the same time it can be delivered to a number of people around the world.

It allows you to compose note, get the address of the recipient and send it. Once the mail is received and read, it can be forwarded or replied. One can even store it for later use, or delete. In e-mail even the sender can request for delivery receipt and read receipt from the recipient.

#### **(i) Features of E-mail:**

- One-to-one or one-to-many communications
- Instant communications
- Physical presence of recipient is not required
- Most inexpensive mail services, 24-hours a day and seven days a week
- Encourages informal communications

#### **(ii) Components of an E-mail Address**

As in the case of normal mail system, e-mail is also based upon the concept of a recipient address. The email address

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provides all of the information required to get a message to the recipient from any where in the world. Consider the e-mail ID.

john@hotmail.com

In the above example john is the username of the person who will be sending/receiving the email. Hotmail is the mail server where the username john has been registered and com is the type of organization on the internet which is hosting the mail server.

### **(b) FTP (File Transfer Protocol)**

File Transfer Protocol, is an Internet utility software used to upload and download files. It gives access to directories or folders on remote computers and allows software, data and text files to be transferred between different kinds of computers. FTP works on the basis of same principle as that of Client/Server. FTP "Client" is a program running on your computer that enables you to communicate with remote computers. The FTP client takes FTP command and sends these as requests for information from the remote computer known as FTP servers. To access remote FTP server it is required, but not necessary to have an account in the FTP server. When the FTP client gets connected, FTP server asks for the identification in terms of User Login name and password of the FTP client (Fig. 3.1). If one does not have an account in the remote FTP server, still he can connect to the server using anonymous login.

Using anonymous login anyone can login in to a FTP server and can access public archives; anywhere in the world, without having an account. One can easily Login to the FTP site with the username anonymous and e-mail address as password.

#### **(i) Objectives of FTP :**

- Provide flexibility and promote sharing of computer programs, files and data
  - Transfer data reliably and more efficiently over network
  - Encourage implicit or indirect use of remote computers using Internet
  - Shield a user from variations in storage systems among hosts.
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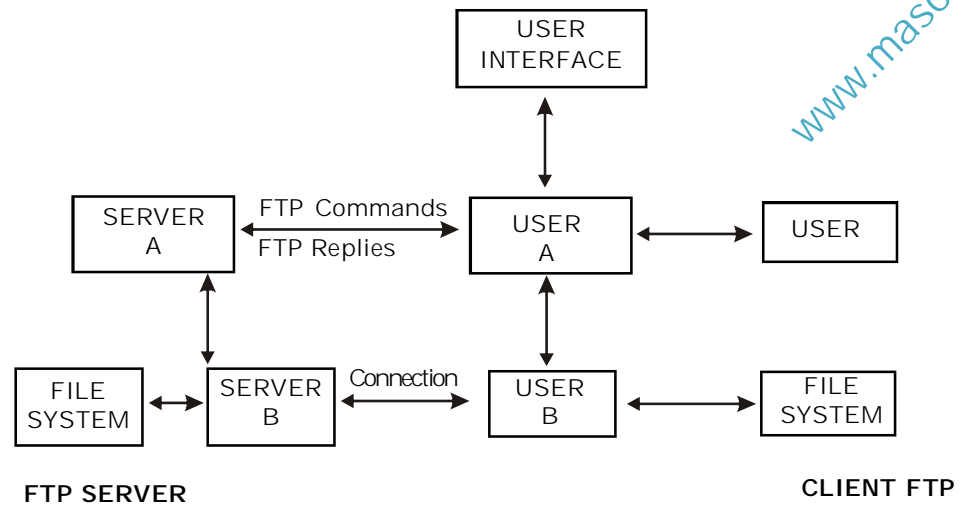


Fig. 3.1

### (ii) The basic steps in an FTP session

- Start up your FTP client, by typing ftp on your system's command line/'C>' prompt (or, if you are in a Windows, double-click on the FTP icon).
- Give the FTP client an address to connect. This is the FTP server address to which the FTP client will get connected
- Identify yourself to the FTP remote site by giving the Login Name
- Give the remote site a password
- Remote site will verify the Login Name/Password to allow the FTP client to access its files
- Look directory for files in FTP server
- Change Directories if required
- Set the transfer mode (optional);
- Get the file(s) you want, and
- Quit.

### (c) Telnet (Remote Computing)

**Telnet** or remote computing is telecommunication utility software, which uses available telecommunication facility and allows you to become a user on a remote computer. 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 TELNET into your own account from another city and check your e-mail while you are travelling 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 (some really nifty TELNET packages allow you to combine steps 1 and 2 into one simple step)
- Make a note of what the "escape character" is
- Log in to the remote computer,
- Set the "terminal emulation"
- Play around on the remote computer, and
- Quit.

## **3.5 TYPES OF INTERNET CONNECTIONS**

There are five types of internet connections which are as follows:

- (i) Dial up Connection
- (ii) Leased Connection
- (iii) DSL connection
- (iv) Cable Modem Connection
- (v) VSAT

### **3.5.1 Dial up connection**

Dial-up refers to an Internet connection that is established using a modem. The modem connects the computer to standard phone lines, which serve as the data transfer medium. When a user initiates a dial-up connection, the modem dials a phone number of an Internet Service Provider (ISP) that is designated to receive dial-up calls. The ISP then establishes the connection, which usually takes about ten seconds and is accompanied by several beepings and a buzzing sound.

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After the dial-up connection has been established, it is active until the user disconnects from the ISP. Typically, this is done by selecting the "Disconnect" option using the ISP's software or a modem utility program. However, if a dial-up connection is interrupted by an incoming phone call or someone picking up a phone in the house, the service may also be disconnected.

### **Advantages**

- Low Price
- Secure connection – your IP address continually changes
- Offered in rural areas – you need a phone line

### **Disadvantages**

- Slow speed.
- Phone line is required.
- Busy signals for friends and family members.

### **3.5.2 Leased Connection**

Leased connection is a permanent telephone connection between two points set up by a telecommunications common carrier. Typically, leased lines are used by businesses to connect geographically distant offices. Unlike normal dial-up connections, a leased line is always active. The fee for the connection is a fixed monthly rate. The primary factors affecting the monthly fee are distance between end points and the speed of the circuit. Because the connection doesn't carry anybody else's communications, the carrier can assure a given level of quality.

For example, a T-1 channel is a type of leased line that provides a maximum transmission speed of 1.544 Mbps. You can divide the connection into different lines for data and voice communication or use the channel for one high speed data circuit. Dividing the connection is called multiplexing.

Increasingly, leased lines are being used by companies, and even individuals, for Internet access because they afford faster data transfer rates and are cost-effective if the Internet is used heavily.

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### **Advantage**

- Secure and private: dedicated exclusively to the customer
- Speed: symmetrical and direct
- Reliable: minimum down time
- Wide choice of speeds: bandwidth on demand, easily upgradeable
- Leased lines are suitable for in-house office web hosting

### **Disadvantages**

- Leased lines can be expensive to install and rent.
- Not suitable for single or home workers
- Lead times can be as long as 65 working days
- Distance dependent to nearest POP
- Leased lines have traditionally been the more expensive access option. A Service Level Agreement (SLA) confirms an ISP's contractual requirement in ensuring the service is maintained. This is often lacking in cheaper alternatives.

### **3.5.3 DSL connection**

**Digital Subscriber Line (DSL)** is a family of technologies that provides digital data transmission over the wires of a local telephone network. DSL originally stood for *digital subscriber loop*. In telecommunications marketing, the term DSL is widely understood to mean Asymmetric Digital Subscriber Line (ADSL), the most commonly installed DSL technology. DSL service is delivered simultaneously with wired telephone service on the same telephone line. This is possible because DSL uses higher frequency bands for data separated by filtering. On the customer premises, a DSL filter on each outlet removes the high frequency interference, to enable simultaneous use of the telephone and data.

The data bit rate of consumer DSL services typically ranges from 256 kbit/s to 40 Mbit/s in the direction to the customer (downstream), depending on DSL technology, line conditions, and service-level implementation. In ADSL, the data throughput

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in the upstream direction, (the direction to the service provider) is lower, hence the designation of *asymmetric* service. In Symmetric Digital Subscriber Line (SDSL) services, the downstream and upstream data rates are equal.

#### Advantages:

- **Security:** Unlike cable modems, each subscriber can be configured so that it will not be on the same network. In some cable modem networks, other computers on the cable modem network are left visibly vulnerable and are easily susceptible to break in as well as data destruction.
- **Integration:** DSL will easily interface with ATM and WAN technology.
- High bandwidth
- Cheap line charges from the phone company.
- Good for "bursty" traffic patterns

#### Disadvantages

- **No current standardization:** A person moving from one area to another might find that their DSL modem is just another paperweight. Customers may have to buy new equipment to simply change ISPs.
- **Expensive:** Most customers are not willing to spend more than \$20 to \$25 per month for Internet access. Current installation costs, including the modem, can be as high as \$750. Prices should come down within 1-3 years. As with all computer technology, being first usually means an emptier wallet.
- **Distance Dependence:** The farther you live from the DSLAM (DSL Access Multiplexer), the lower the data rate. The longest run lengths are 18,000 feet, or a little over 3 miles.

#### 3.5.4 Cable Modem Connection

A **cable modem** is a type of Network Bridge and modem that provides bi-directional data communication via radio frequency channels on a HFC and RFoG infrastructure. Cable modems

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are primarily used to deliver broadband Internet access in the form of cable Internet, taking advantage of the high bandwidth of a HFC and RFoG network. They are commonly deployed in Australia, Europe, Asia and Americas.

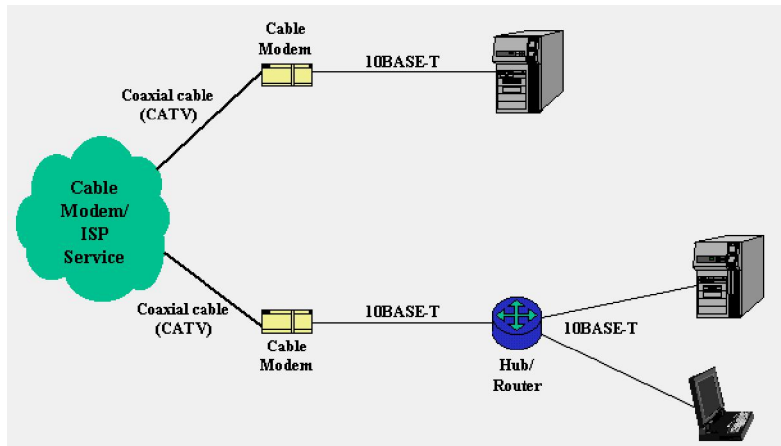


Fig.3.2 : Cable modem connection

Figure 3.2 shows the most common network connection topologies when using cable modems. The cable TV company runs a coaxial cable into the building to deliver their Internet service. Although fed from the same coax that provides cable TV service, most companies place a splitter outside of the building and runs two cables in, rather than using a splitter at the set-top box. The coax terminates at the cable modem.

The cable modem itself attaches to the SOHO computing equipment via its 10BASE-T port. In most circumstances, the cable modem attaches directly to a user's computer. If a LAN is present on the premises (something many cable companies frown upon), some sort of router can be connected to the cable modem.

### Advantages

- **Always Connected:** A cable modem connection is always connected to the Internet. This is advantageous because you do not have to wait for your computer to "log on" to the Internet; however, this also has the disadvantage of making your computer more vulnerable to hackers.
- **Broadband:** Cable modems transmit and receive data as

digital packets, meaning they provide high-speed Internet access. This makes cable modem connections much faster than traditional dial-up connections.

- **Bandwidth:** Cable modems have the potential to receive data from their cable provider at speeds greater than 30 megabits per second; unfortunately, this speed is rarely ever realized. Cable lines are shared by all of the cable modem users in a given area; thus, the connection speed varies depending upon the number of other people using the Internet and the amount of data they are receiving or transmitting.
- **File Transfer Capabilities:** Downloads may be faster, but uploads are typically slower. Since the same lines are used to transmit data to and from the modem, priority is often given to data traveling in one direction.
- **Signal Integrity:** Cable Internet can be transmitted long distances with little signal degradation. This means the quality of the Internet signal is not significantly decreased by the distance of the modem from the cable provider.
- **Routing:** Cable routers allow multiple computers to be hooked up to one cable modem, allowing several devices to be directly connected through a single modem. Wireless routers can also be attached to your cable modem.
- **Rely on Existing Connections:** Cable modems connect directly to preinstalled cable lines. This is advantageous because you do not need to have other services, such as telephone or Internet, in order to receive Internet through your cable modem. The disadvantage is that you cannot have cable internet in areas where there are no cable lines.

### Disadvantages

- Cable internet technology excels at maintaining signal strength over distance. Once it is delivered to a region, however, such as a neighborhood, it is split among that region's subscribers. While increased capacity has diminished the effect somewhat, it is still possible that users will see significantly lower speeds at peak times when more people are using the shared connection.
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- Bandwidth equals money, so cable's advantage in throughput comes with a price. Even in plans of similar speeds compared with DSL, customers spend more per Mb with cable than they do with DSL.
- It's hard to imagine, but there are still pockets of the United States without adequate cable television service. There are far fewer such pockets without residential land-line service meaning cable internet is on balance less accessible in remote areas.

### 3.5.5 VSAT

Short for very small aperture terminal, an earthbound station used in satellite communications of data, voice and video signals, excluding broadcast television. A VSAT consists of two parts, a transceiver that is placed outdoors in direct line of sight to the satellite and a device that is placed indoors to interface the transceiver with the end user's communications device, such as a PC. The transceiver receives or sends a signal to a satellite transponder in the sky. The satellite sends and receives signals from a ground station computer that acts as a hub for the system. Each end user is interconnected with the hub station via the satellite, forming a star topology. The hub controls the entire operation of the network. For one end user to communicate with another, each transmission has to first go to the hub station that then retransmits it via the satellite to the other end user's VSAT.

#### Advantages

Satellite communication systems have some advantages that can be exploited for the provision of connectivity. These are:

- Costs Insensitive to Distance
- Single Platform service delivery (one-stop-shop)
- Flexibility
- Upgradeable
- Low incremental costs per unit

#### Disadvantages

However like all systems there are disadvantages also. Some of these are

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- High start-up costs (hubs and basic elements must be in place before the services can be provided)
- Higher than normal risk profiles
- Severe regulatory restrictions imposed by countries that prevent VSAT networks and solutions from reaching critical mass and therefore profitability
- Some service quality limitations such the high signal delays (latency)
- Natural availability limits that cannot be mitigated against
- Lack of skills required in the developing world to design, install and maintain satellite communication systems adequately

### 3.6 DOWNLOADING FILES

Downloading is the process of copying a file (such as a game or utility) from one computer to another across the internet. When you download a game from our web site, it means you are copying it from the author or publisher's web server to your own computer. This allows you to install and use the program on your own machine.

Here's how to download a file using Internet Explorer and Windows XP. (This example shows a download of the file "dweepsetup.exe" from Dexterity Games.) If you're using a different browser such as Netscape Navigator or a different version of Windows, your screen may look a little different, but the same basic steps should work.

1. Click on the download link for the program you want to download. Many sites offer multiple download links to the same program, and you only need to choose one of these links.
  2. You may be asked if you want to save the file or run it from its current location. If you are asked this question, select "Save." If not, don't worry — some browsers will automatically choose "Save" for you. (Fig. 3.3(a))
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3. You will then be asked to select the folder where you want to save the program or file, using a standard "Save As" dialog box. Pay attention to which folder you select before clicking the "Save" button. It may help you to create a folder like "C:\Download" for all of your downloads, but you can use any folder you'd like.
4. The download will now begin. Your web browser will keep you updated on the progress of the download by showing a progress bar that fills up as you download. You will also be reminded where you're saving the file. The file will be saved as "C:\Download\dweepsetup.exe" in the picture below. (Fig. 3.3(b))
 

**Note:** You may also see a check box labeled "Close this dialog box when download completes." If you see this check box, it helps to **uncheck** this box. You don't have to, but if you do, it will be easier to find the file after you download it.
5. Depending on which file you're downloading and how fast your connection is, it may take anywhere from a few seconds to a few minutes to download. When your download is finished, if you left the "Close this dialog box when download completes" option unchecked, you'll see a dialog box as shown in fig. 3.3(c) :

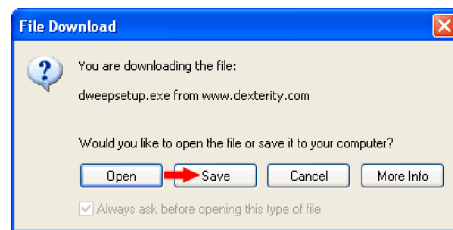


Fig 3.3.(a) Downloading Window

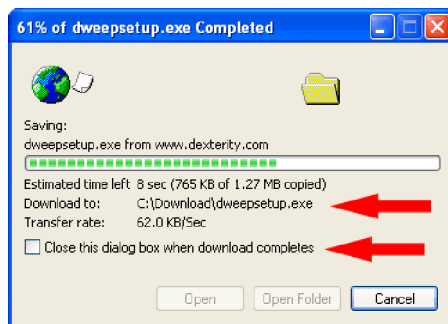


Fig 3.3.(b) Downloading Window

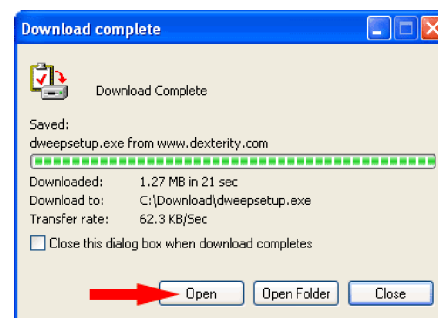


Fig 3.3.(c) Downloading Window



6. Now click the "Open" button to run the file you just downloaded. If you don't see the "Download complete" dialog box, open the folder where you saved the file and double-click on the icon for the file there.

What happens next will depend on the type of file you downloaded. The files you'll download most often will end in one of two extensions. (An extension is the last few letters of the filename, after the period.) They are:

- **.EXE files:** The file you downloaded is a program. Follow the on-screen instructions from there to install the program to your computer and to learn how to run the program after it's installed.
- **.ZIP files:** ZIP is a common file format used to compress and combine files to make them download more quickly. Some versions of Windows (XP and sometimes ME) can read ZIP files without extra software. Otherwise, you will need an unzipping program to read these ZIP files. Common unzipping programs are WinZip, PKZIP, and Bit Zipper, but there are also many others. Many unzipping programs are shareware, which means you will need to purchase them if you use them beyond their specified trial period.

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### INTEXT QUESTION 3.1

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1. What are the different types of Internet Connection?
  2. Fill in the blanks:
    - (a) A \_\_\_\_\_ is a type of Network Bridge and modem that provides bi-directional data communication via radio frequency channels on a HFC and RFoG infrastructure.
    - (b) The \_\_\_\_\_ is a global system of interconnected computer networks that use the standard Internet protocol suite (TCP/IP) to serve billions of users worldwide.
    - (c) VoIP stands for \_\_\_\_\_, referring to the protocol that underlies all Internet communication.
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### 3.7 WHAT YOU HAVE LEARNT

In this lesson you learnt about the Internet, its importance and types of internet services and different types of internet connections have also been discussed along with their advantages and disadvantages.

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### 3.8 TERMINAL QUESTIONS

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1. What is Internet? What are its advantages and disadvantages?
2. What are the various services of internet?
3. Explain in brief different types of internet connection.

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### 3.9 ANSWER TO INTEXT QUESTIONS

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#### Intext Question 3.1

1. The types of internet connection are:
    - Dial up Connection
    - Leased Connection
    - DSL connection
    - Cable Modem Connection
    - VSAT
  2. (a) cable modem (b) Internet (c) Voice-over-Internet Protocol
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