# 5. Concepts of Internet

## 5.1 Concepts of Internet and WWW

**Internet:**

The Internet is the global system of interconnected computer networks that uses the Internet protocol suite (TCP/IP) to communicate between networks and devices.

The Internet is a global network of billions of computers and other electronic devices. With the Internet, it's possible to access almost any information, communicate with anyone else in the world, and do much more.

You can do all of this by connecting a computer to the Internet, which is also called going online. When someone says a computer is online, it's just another way of saying it's connected to the Internet.

**WWW:**

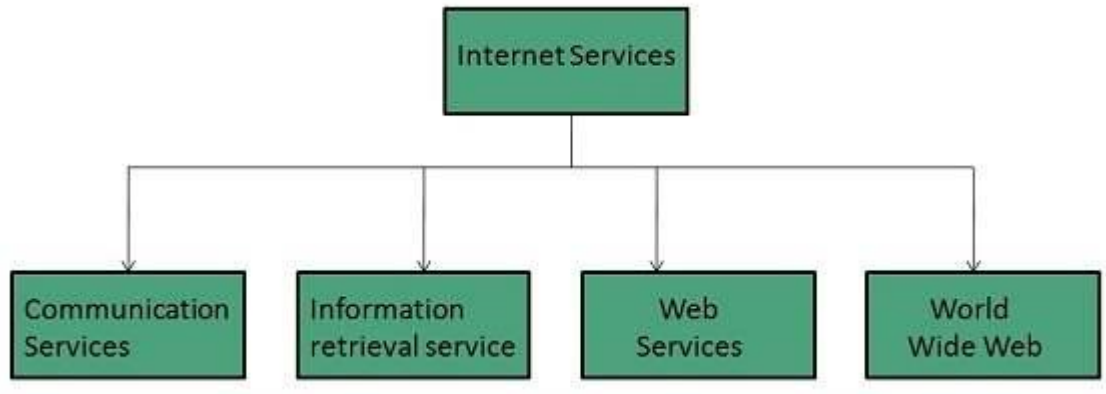
The World Wide Web—usually called the Web for short—is a collection of different websites you can access through the Internet.

A website is made up of related text, images, and other resources. Websites can resemble other forms of media—like newspaper articles or television programs—or they can be interactive in a way that's unique to computers.

The purpose of a website can be almost anything: a news platform, an advertisement, an online library, a forum for sharing images, or an educational site.

Once you are connected to the Internet, you can access and view websites using a type of application called a web browser.

### 5.1.1 Types of Internet Services





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Internet Services allows us to access huge amount of information such as text, graphics, sound and software over the internet.

**1. Communication Services:**

Communication services offers exchange of information with individuals or groups. For example: Electronic mail - Used to send electronic message over the internet. Instant Messaging - Offers real time chat between individuals and group of people. Eg. Yahoo messenger, MSN messenger.

**2. Information Retrieval Services:**

Information Retrieval Services offers easy access to information present on the internet. For example: File Transfer Protocol (FTP) – enables the users to transfer files.

**3. Web Services:**

Web services allow exchange of information between applications on the web. Using web services, applications can easily interact with each other. For example: some websites used online weather web services to display weathers (eg. AccuWeather API).

**4. World Wide Web:**

WWW is also known as W3. It offers a way to access documents spread over the several servers over the internet. These documents may contain texts, graphics, audio, video, hyperlinks. The hyperlinks allow the users to navigate between the documents.

## 5.1.2 Hardware

Hardware devices that are used to connect computers, printers, fax machines and other electronic devices to a network are called network devices. These devices transfer data in a fast, secure and correct way over same or different networks.

**Modem:**

Modem is a device that enables a computer to send or receive data over telephone or cable lines. The data stored on the computer is digital whereas a telephone line or cable wire can transmit only analog data.

The main function of the modem is to convert digital signal into analog and vice versa. Modem is a combination of two devices − modulator and demodulator. The modulator converts digital data into analog data when the data is being sent by the computer. The demodulator converts analog data signals into digital data when it is being received by the computer.

**Types of Modem:**

1. Simplex − A simplex modem can transfer data in only one direction, from digital device to network (modulator) or network to digital device (demodulator)

2. Half duplex − A half-duplex modem has the capacity to transfer data in both the directions but only one at a time.

3. Full duplex − A full duplex modem can transmit data in both the directions simultaneously.

**Router:**

A router is a network layer hardware device that transmits data from one LAN to another. a router is typically connected to at least two LANs and the internet service provider (ISP).

It receives its data in the form of packets, which are data frames with their destination address added. Router also strengthens the signals before transmitting them. That is why it is also called repeater.

Routing Table: A router reads its routing table to decide the best available route the packet can take to reach its destination quickly and accurately.

**Switch:**

Switch is a network device that connects other devices to Ethernet networks through twisted pair cables.

**Gateway:**

Gateway is a network device used to connect two or more dissimilar networks.

**Bluetooth:**

Bluetooth is a standardized protocol for sending and receiving data via a 2.4GHz wireless link. It's a secure protocol, and it's perfect for short-range, low-power, low-cost, wireless transmissions between electronic devices.

These days it feels like everything is wireless, and Bluetooth is a big part of that wireless revolution. You'll find Bluetooth embedded into a great variety of consumer products, like headsets, video game controllers, or (of course) livestock trackers.

In our world of embedded electronics, Bluetooth serves as an excellent protocol for wirelessly transmitting relatively small amounts of data over a short range (<100m).

**Fire-stick:**

FireStick is an Android-based device. However, unlike most Android devices, FireStick does not support Google Play Services. It uses the modified Android OS and supports Amazon Store. With FireStick, you can stream movies, shows, live TV, and just about anything you can think of. It is a one kind of streaming device.

## 5.1.3 Internet connections using HotSpot, Wifi, cable

**HotSpot:**

A hotspot is a physical location where people may obtain Internet access, typically using Wi-Fi technology. A hotspot can be in a private location or a public one, such as in a coffee shop, a hotel, an airport, or even an airplane.

Public hotspots may be created by a business for use by customers, such as coffee shops or hotels. Public hotspots are typically created from wireless access points configured to provide Internet access, controlled to some degree by the venue.

A private hotspot, often called tethering, may be configured on a smartphone or tablet that has a network data plan, to allow Internet access to other devices.

**Mobile hotspot:** A mobile hotspot (sometimes called a portable hotspot) is a hotspot that's just that—mobile! While a "regular" Wi-Fi hotspot is tied to a physical location, you can create a mobile hotspot by using your smartphone's data connection to connect your laptop to the Internet. This process is called "tethering."

**Access point (wireless access point):** A wireless access point (WAP) is a networking device that allows a Wi-Fi compliant device to connect to a wired network. The WAP can either be physically connected to a router or be integrated into the router itself. A WAP is not a hotspot, which is the physical location where Wi-Fi access to a WLAN is available.

**Wi-Fi:**

Wi-Fi is the technology that allows your smartphone or computer to access the Internet through a wireless connection. It uses radio signals to send and receive data between your enabled device and the WAP.

**Internet connectivity using cables:**

Cable internet service uses the same coaxial cable network as cable television to provide your home with internet.

First, your internet service provider sends a data signal through the coaxial cable, or coax cable, into your home—specifically, to your modem.

The modem then uses an Ethernet cable to connect to your computer or router, which is what gives you access to high-speed internet. If you choose to use a router, you can then broadcast a Wi-Fi signal throughout your home.

## 5.2 Introduction of Cloud

Cloud Computing provides us means by which we can access the applications as utilities over the internet. It allows us to create, configure, and customize the business applications online.

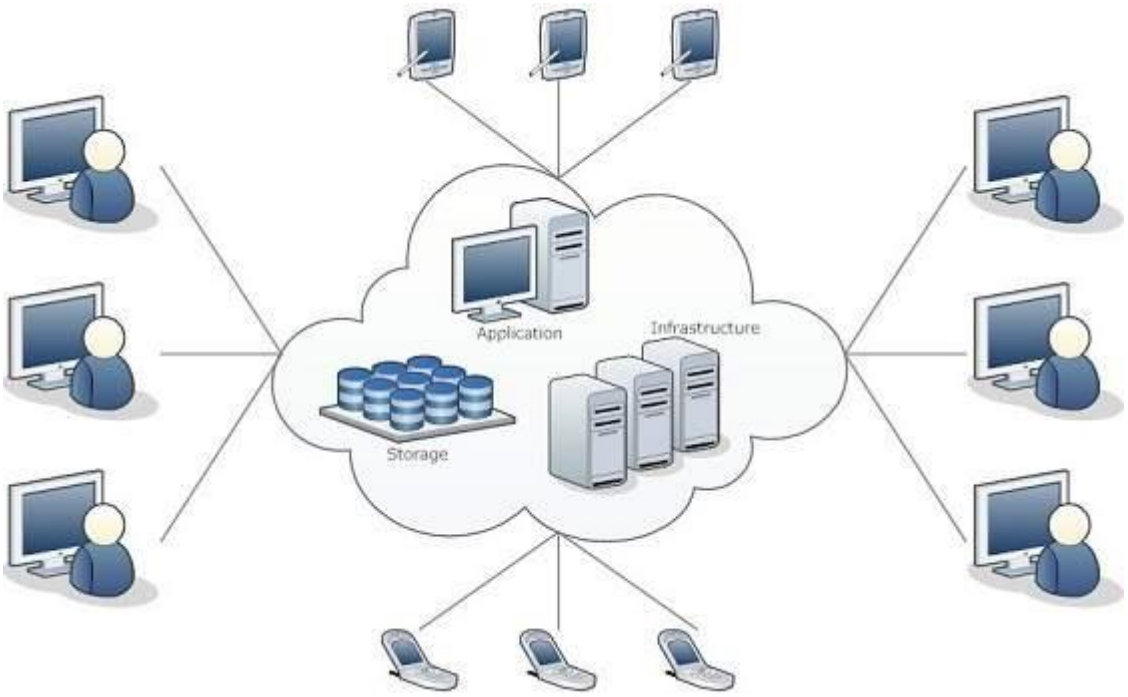
### 5.2.1 Concepts of Cloud

### What is Cloud?

The term Cloud refers to a Network or Internet. In other words, we can say that Cloud is something, which is present at remote location. Cloud can provide services over public and private networks, i.e., WAN, LAN or VPN.

Applications such as e-mail, web conferencing, customer relationship management (CRM) execute on cloud.

Cloud Computing refers to **manipulating, configuring,** and **accessing** the hardware and software resources remotely. It offers online data storage, infrastructure, and application.




Cloud computing offers **platform independency,** as the software is not required to be installed locally on the PC. Hence, the Cloud Computing is making our business applications **mobile** and **collaborative.**

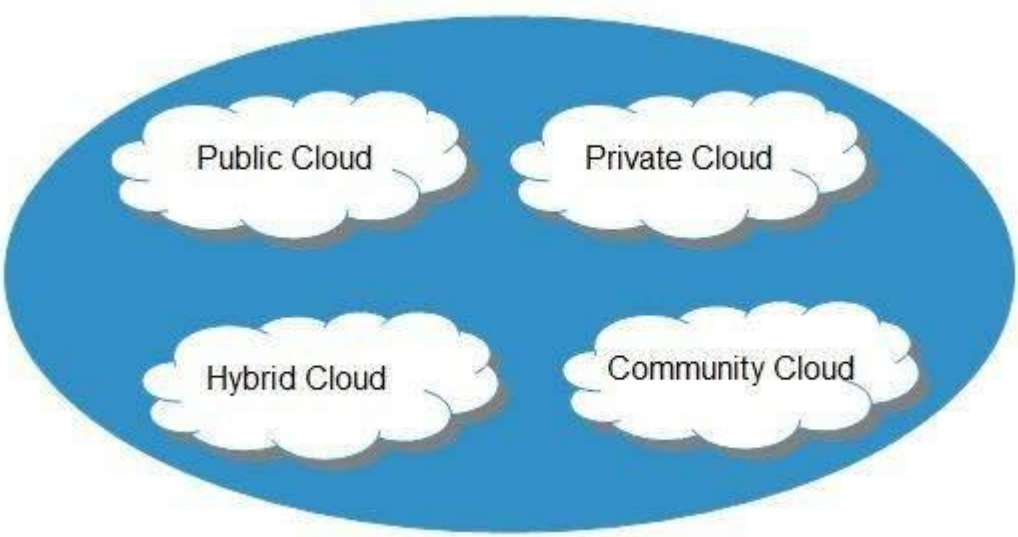
**Basic Concepts**

There are certain services and models working behind the scene making the cloud computing feasible and accessible to end users. Following are the working models for cloud computing:

- Deployment Models
- Service Models

### Deployment Models

Deployment models define the type of access to the cloud, i.e., how the cloud is located? Cloud can have any of the four types of access: Public, Private, Hybrid, and Community.




### Public Cloud

The **public cloud** allows systems and services to be easily accessible to the general public. Public cloud may be less secure because of its openness.

### Private Cloud

The **private cloud** allows systems and services to be accessible within an organization. It is more secured because of its private nature.

### Community Cloud

The **community cloud** allows systems and services to be accessible by a group of organizations.

### Hybrid Cloud

The **hybrid cloud** is a mixture of public and private cloud, in which the critical activities are performed using private cloud while the non-critical activities are performed using public cloud.

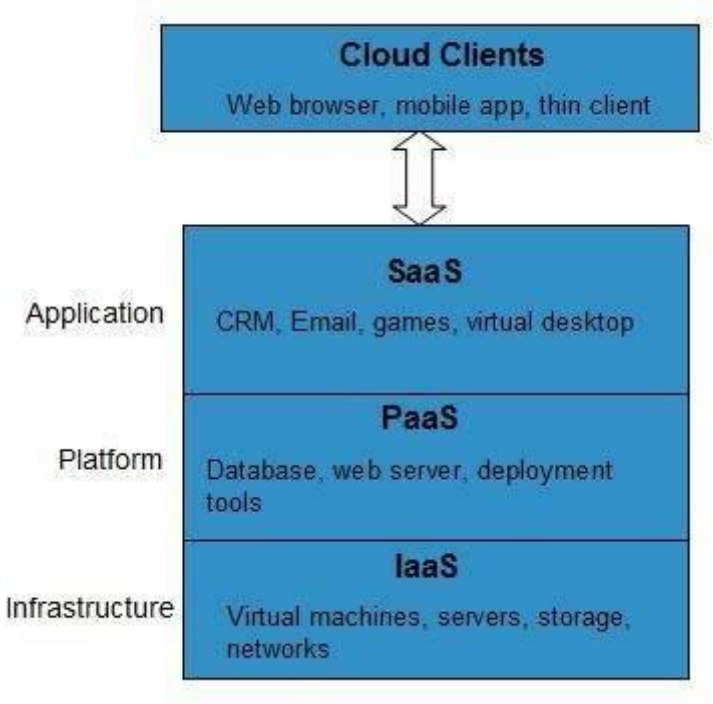
## Service Models

Cloud computing is based on service models. These are categorized into three basic service models which are -

- Infrastructure-as–a-Service (IaaS)
- Platform-as-a-Service (PaaS)
- Software-as-a-Service (SaaS)

**Anything-as-a-Service (XaaS)** is yet another service model, which includes Network-as-a-Service, Business-as-a-Service, Identity-as-a-Service, Database-as-a-Service or Strategy-as-a-Service.

The **Infrastructure-as-a-Service (IaaS)** is the most basic level of service. Each of the service models inherit the security and management mechanism from the underlying model, as shown in the following diagram:




**Infrastructure-as-a-Service (IaaS)**

**IaaS** provides access to fundamental resources such as physical machines, virtual machines, virtual storage, etc.

**Platform-as-a-Service (PaaS)**

**PaaS** provides the runtime environment for applications, development and deployment tools, etc.

**Software-as-a-Service (SaaS)**

**SaaS** model allows to use software applications as a service to end-users.

### 5.2.2 Purpose and application of cloud

Applications of cloud:

1. Art Applications
2. Business Applications
3. Data storage and backup Applications
4. Education Applications
5. Entertainment Applications
6. Management Applications

7. Social Applications

### 1. Art Applications:

Cloud computing offers various art applications for quickly and easily design attractive cards, booklets, and images. Eg. Vistaprint - Vistaprint allows us to easily design various printed marketing products such as business cards, Postcards, Booklets, and wedding invitations cards.

### 2. Business Applications:

Business applications are based on cloud service providers. Today, every organization requires the cloud business application to grow their business. It also ensures that business applications are 24*7 available to users. Eg. Salesforce - Salesforce platform provides tools for sales, service, marketing, e-commerce, and more, Paypal - Paypal offers the simplest and easiest online payment mode using a secure internet account. Paypal accepts the payment through debit cards, credit cards, and also from Paypal account holders.

### 3. Data Storage and Backup Applications:

Cloud computing allows us to store information (data, files, images, audios, and videos) on the cloud and access this information using an internet connection. As the cloud provider is responsible for providing security, so they offer various backup recovery application for retrieving the lost data. Eg. Google G Suite - Google G Suite is one of the best cloud storage and backup application. It includes Google Calendar, Docs, Forms, Google+, Hangouts, as well as cloud storage and tools for managing cloud apps. The most popular app in the Google G Suite is Gmail. Gmail offers free email services to users.

### 4. Education Applications:

Cloud computing in the education sector becomes very popular. It offers various online distance learning platforms and student information portals to the students. The advantage of using cloud in the field of education is that it offers strong virtual classroom environments, Ease of accessibility, secure data storage, scalability, greater reach for the students, and minimal hardware requirements for the applications.

### 5. Entertainment Applications:

Entertainment industries use a multi-cloud strategy to interact with the target audience. Cloud computing offers various entertainment applications such as online games and video conferencing. Eg. Online Games.

### 6. Management Applications:

Cloud computing offers various cloud management tools which help admins to manage all types of cloud activities, such as resource deployment, data integration, and disaster recovery. These management tools also provide administrative control over the platforms, applications, and infrastructure. Eg. GoToMeeting - Video Conferencing and online meeting apps.

**7. Social Applications:**

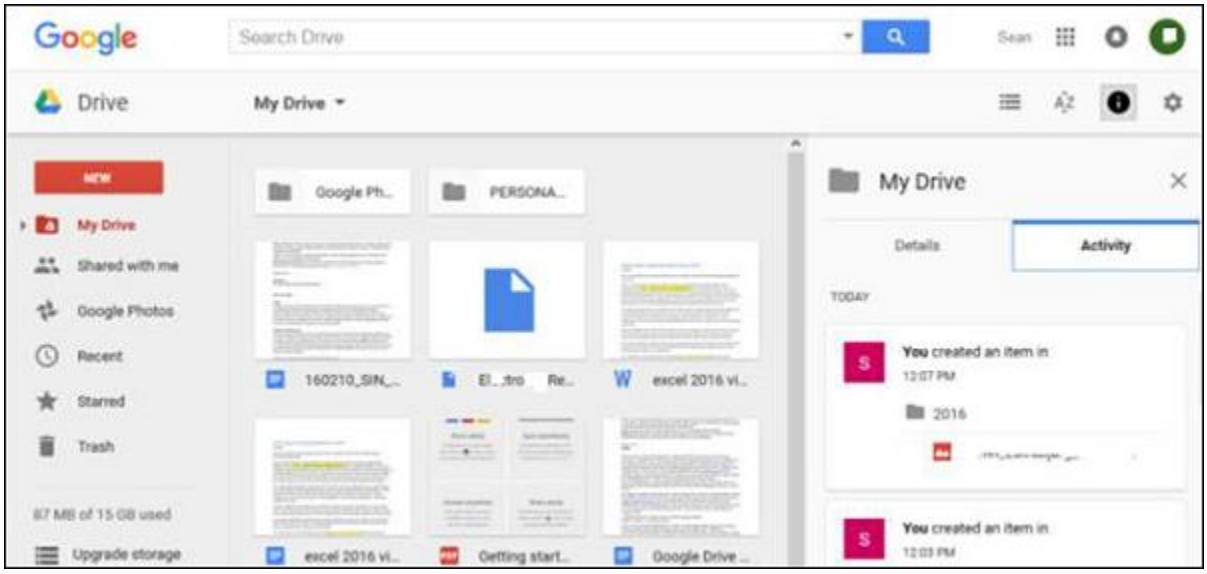
Social cloud applications allow a large number of users to connect with each other using social networking applications such as Facebook, Twitter, Linkedln, etc.

## 5.2.3 Concept of Online Data Backup

One of the biggest trend is online storage where the companies and users can store their data somewhere in the cloud, and it is cheaper as well rather than doing it all by yourself. There is also no need for any backup infrastructure and maintenance.

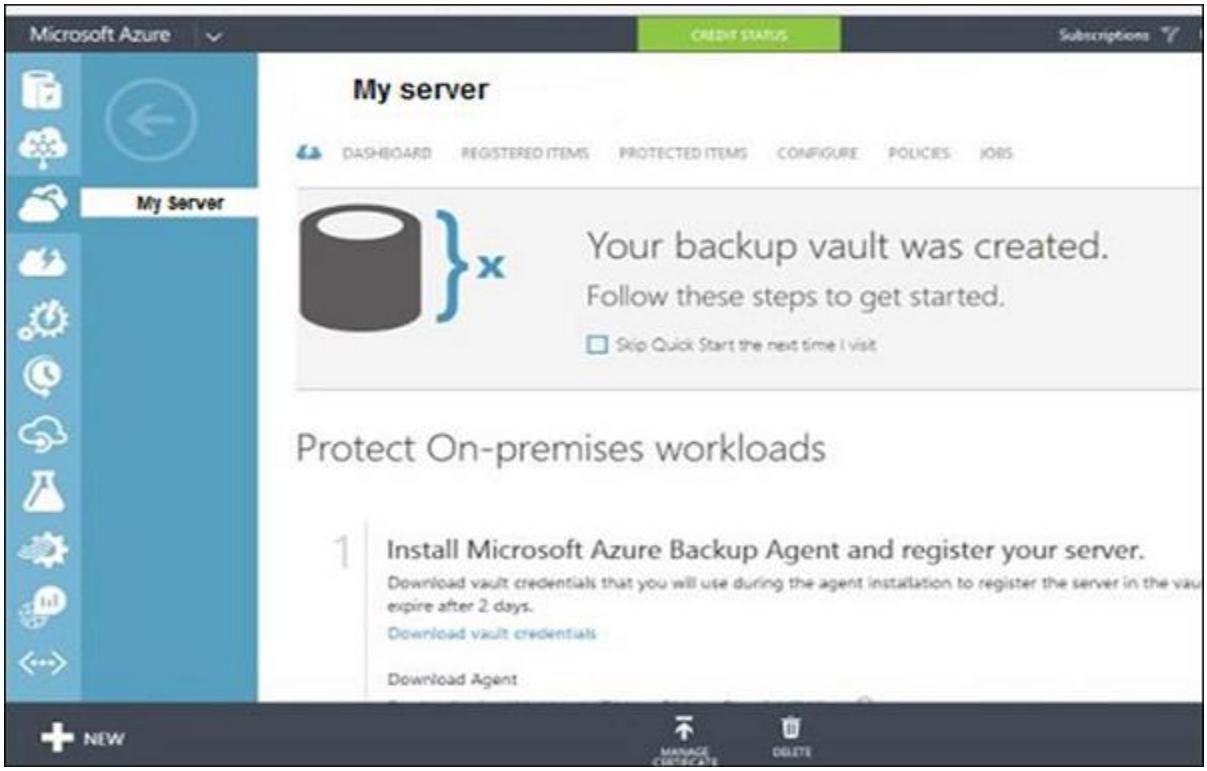
For a personal user it is offered for free by the biggest vendors like Microsoft. It offers OneDrive and you can store up to 5GB in their cloud and it has an interface for different Operating Systems.

The second is the Google Drive, which is a product by google, wherein the files synchronizes automatically.




The full list can be seen in PCMagazine – http://www.pcmag.com/article2/0,2817,2413556,00.asp#. For small or big companies, mentioned before, online or cloud backup solution are a good solution for them because of the cost and the liability.

The biggest vendors offering such service are Microsoft with AZURE solution – https://azure.microsoft.com/en-us/documentation/scenarios/storage-backup-recovery/ which is offering a very high performance and scalability for this solution.

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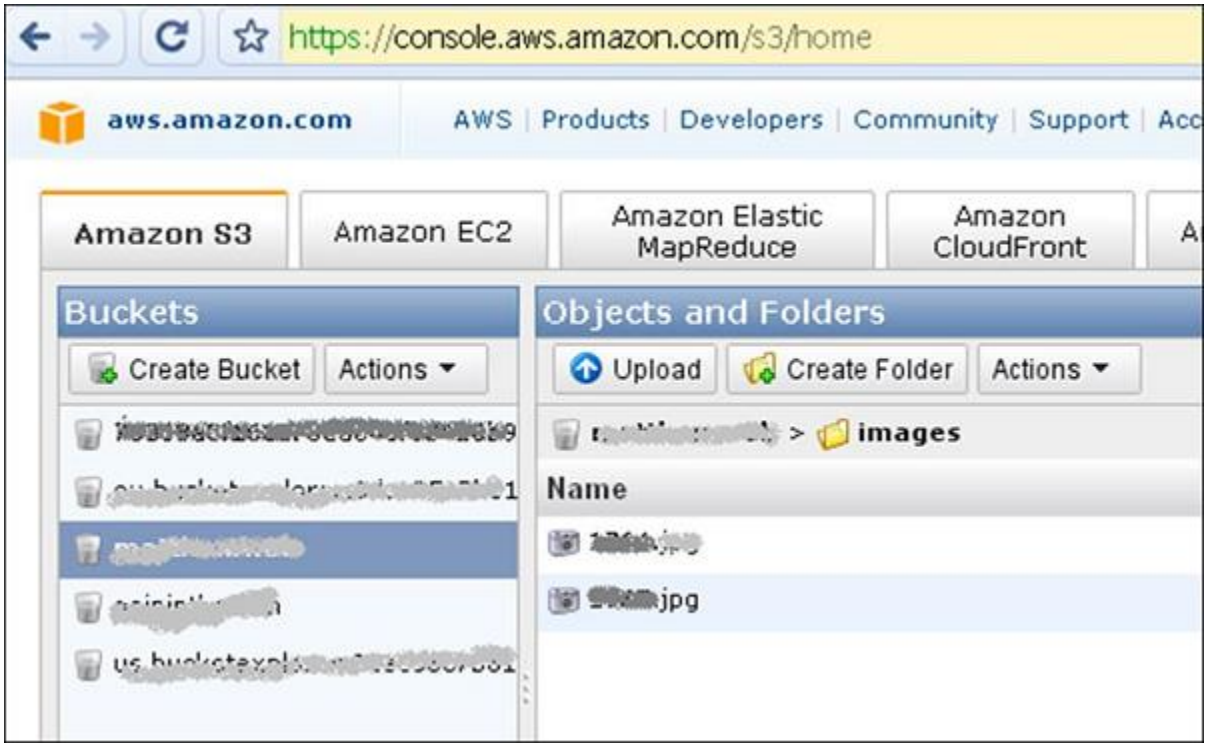


## 5.3 Introduction of web browser and relevant terminologies

### Web Browser:

Web Browser is application software that allows us to view and explore information on the web. User can request for any web page by just entering a URL into address bar.

Web browser can show text, audio, video, animation and more. It is the responsibility of a web browser to interpret text and commands contained in the web page.

### URL:

URL Stands for "Uniform Resource Locator." A URL is the address of a specific webpage or file on the Internet. For example, the URL of the TechTerms website is "http://techterms.com." The address of this page is "http://techterms.com/definition/url" and includes the following elements:

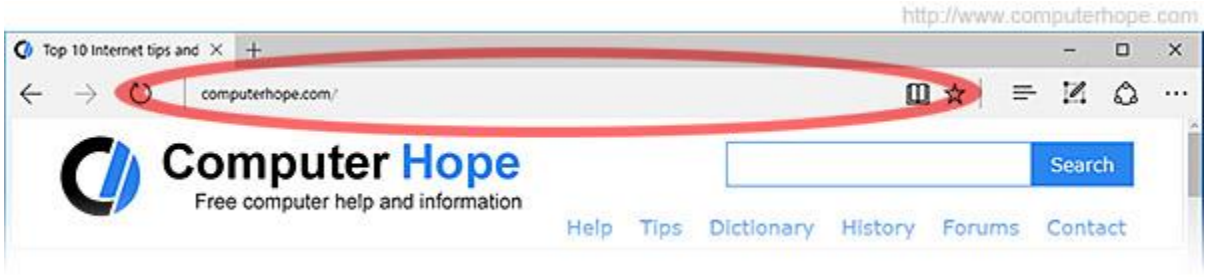
1. http:// – the URL prefix, which specifies the protocol used to access the location.

2. techterms.com – the server name or IP address of the server.

3. /definition/url – the path to the directory or file.

### Address bar:

The term address bar refers to the text field in a web browser that identifies the user's location on the web and allows them to access different websites. The address bar is known as a location bar. All address bars are located at the top of the browser window.




The user can edit the text to navigate to a new location. For instance, clicking the mouse in the address bar allows you to change the address or delete it and enter a new one. The address should be a URL, such as computerhope.com.

### Domain:

A domain name is an identification string that defines a realm of administrative autonomy, authority or control within the Internet. Domain names are used in various networking contexts and for application-specific naming and addressing purposes.

Domain names are formed by the rules and procedures of the Domain Name System (DNS). Any name registered in the DNS is a domain name.

**Links:**

A link (short for hyperlink) is an HTML object that allows you to jump to a new location when you click or tap it. Links are found on almost every webpage and provide a simple means of navigating between pages on the web.

Links can be attached to text, images, or other HTML elements. Most text links are blue, since that is standard color web browsers use to display links.

**Tabbed Browsing:**

Tabbed browsing is a relatively new feature found in some Web browsers. Tabbed browsing is a function of some Web browsers that allow uses to surf and view multiple pages by loading the Web sites into “tabbed” sections of one page, rather than multiple pages.

Tabs usually display in a row at the top or bottom of a browser window and include short titles for identification.

Tabbed browsing was initially offered in 1994 as part of the InternetWorks browser. In 2003, tabbed browsing was officially introduced by Mozilla and has become a popular Web browser feature.

Tabbed browsing is a useful Web browser feature for the following reasons:

- ➔ Multiple website tabs may be opened simultaneously.
- ➔ A slow-loading Web page or website may be opened and loaded in the background, which allows a user to remain engaged in another tab.
- ➔ Because tabs are neatly arranged, tabbed browsing reduces desktop clutter.

**Bookmark:**

A bookmark is a saved shortcut that directs your browser to a specific webpage. It stores the title, URL, and favicon of the corresponding page. Saving bookmarks allows you to easily access your favourite locations on the Web.

All major web browsers allow you to create bookmarks, though each browser provides a slightly different way of managing them.

For example, Chrome and Firefox display your bookmarks in an open window, while Safari displays them in a list in the sidebar of the browser window.

Internet Explorer uses the name "favourites" to refer to bookmarks, and like Safari, it displays all your favourite in a list within the browser window sidebar.

**How to create it?**

To create a bookmark, simply visit the page you want to bookmark and select Add Bookmark or Bookmark this Page from the Bookmarks menu. In Internet Explorer, you can click the star icon to open the Favourites sidebar and click Add to Favourites to add the current page to your bookmarks.

The website title will show up in your bookmarks list along with the website's favicon if available. As your collection of bookmarks grows, you can create folders to organize your bookmarks into different categories.

It is helpful to bookmark frequently visited websites and useful references since you don't have to remember the URLs. Additionally, you can just click the bookmarks instead of typing in the full web addresses.

**Web Browsing History:**

Web browsing history refers to the list of web pages a user has visited, as well as associated data such as page title and time of visit. It is usually stored locally by web browsers in order to provide the user with a history list to go back to previously visited pages.

It can reflect the user's interests, needs, and browsing habits. Web browsing history could also be collected by third-party organizations and used to provide services such as targeted advertising and carry out research. The provision of these services could cause privacy harder to protect.