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# *Principles of Internet Technologies*

## *Lecture 1: An Introduction*

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## *Course Objectives*

- 1. To understand the working Principles of Internet*
- 2. Explore the basic concepts of the Internet, Internet Services and Protocols.*
- 3. How Internet Addresses and Domains Work.*
- 4. How the World Wide Web works. Common Internet tools.*
- 5. Safeguarding the Internet.*

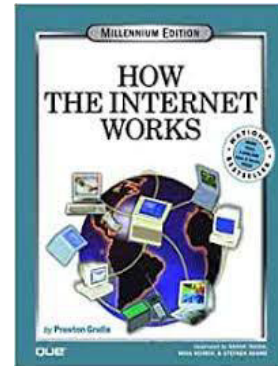
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## Recommended book

- *How the Internet Works, Preston Gralla, Pearson Education, Eighth Edition.*
- *Internet for Everyone, Alexis Leon, S. Chand (G/L) & Company Ltd; Second Edition.*



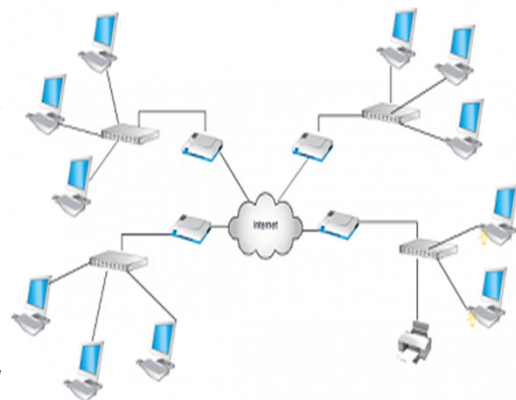
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## Internet an Overview

- *The Internet is a global system of interconnected computer networks, to access information over the web. It interconnects billions of Users. For example: Businesses, Citizens, Governments, Academic Institutions Research Centers, Etc.*
- *Internet uses the standard Internet Protocol suite (often called TCP/IP) to serve billions of users worldwide. Every computer in internet is identified by a unique IP address.*



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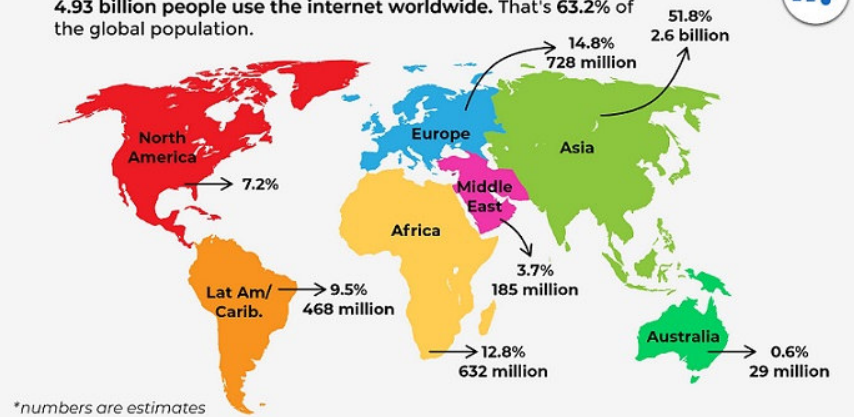


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## Internet Usage Statistics

### Total Internet Users Worldwide Statistic

4.93 billion people use the internet worldwide. That's 63.2% of the global population.



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## Internet History

- *The concept of Internet was originated in 1969 and has undergone several technological & Infrastructural changes as discussed below:*
- *The origin of Internet devised from the concept of Advanced Research Project Agency Network (ARPANET).*
- *ARPANET was developed by United States Department of Defense.*
- *Basic purpose of ARPANET was to provide communication among the various bodies of government.*
- *Initially, there were only **four** nodes, formally called Hosts. In 1972, the ARPANET spread over the globe with **23** nodes located at different countries and thus became known as Internet.*

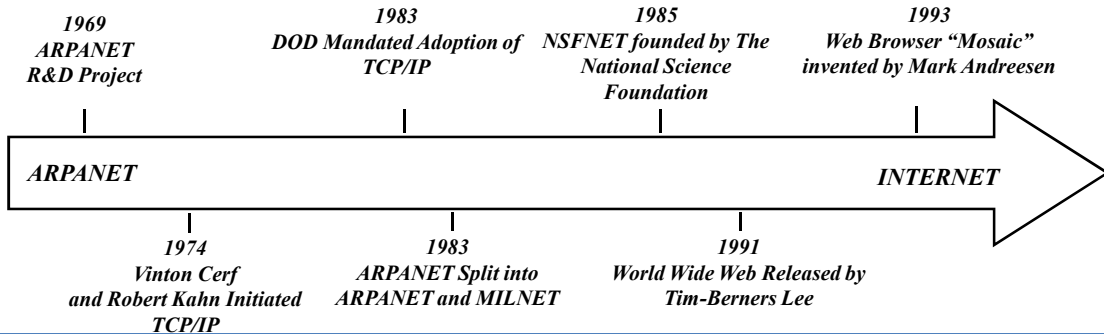
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## Internet History Milestones

- By the time, with invention of new technologies such as *TCP/IP protocols, DNS, WWW, browsers, scripting languages etc.* the following timeline show a brief summary of the evolution of the Internet:



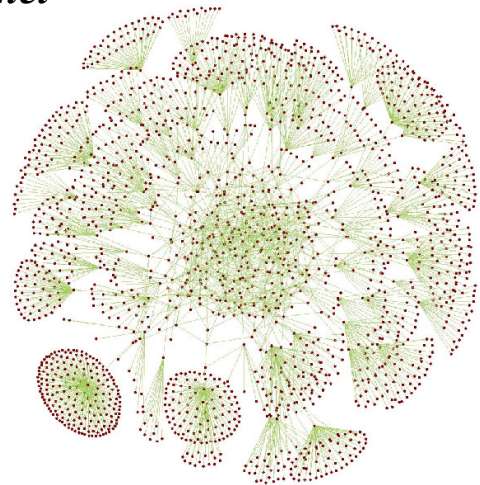
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## Who owns the Internet

- Either nobody owns the Internet, or everybody owns the Internet. **There isn't an owner or an organization that controls the internet and its users. The internet is a public ownership that can be used by anyone, but countries can control the internet by blocking sites that can be inappropriate for users.**
- In theory, the internet is owned by everyone that uses it.**

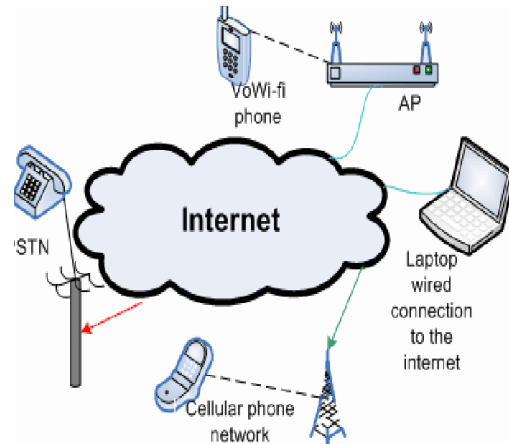


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## *How do we connect to the internet*

- *Before we can connect to the Internet and access its services, we need to have **certain equipment**. In brief, we must have a **computer**; a **modem** and access to a **telephone line** or a **local area network (LAN)** that is in turn connected to the Internet; and connection software that will allow you to establish an account with a service provider and access the Internet.*



## *How do we connect to the internet*

- *There exist several ways to connect to the internet. these connection types available are:*
  1. *Dial-up Connection*
  2. *ISDN (Integrated Services Digital Network) Connection*
  3. *DSL (Digital Subscriber Line).*
  4. *Cable TV Internet connections.*
  5. *Satellite Internet connections.*
  6. *Wireless Internet Connections.*
  7. *3G and 4G Internet Connections.*
  8. *Mobile Cellular Modems (4G or 5G):*



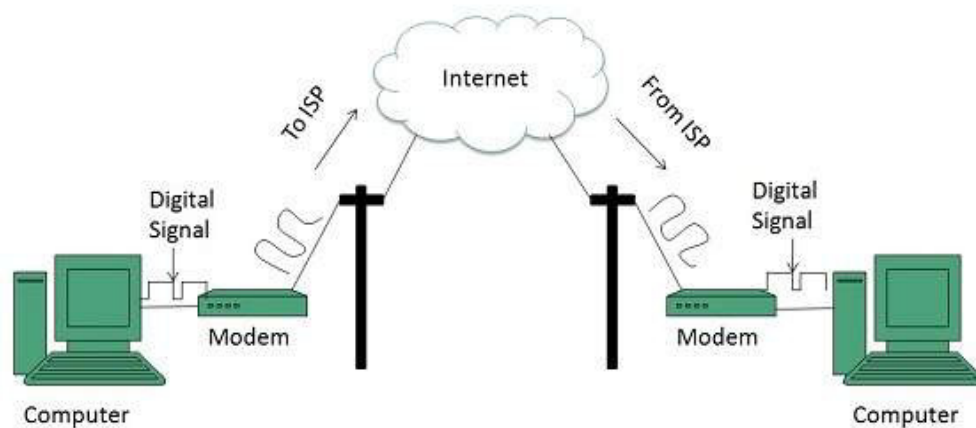
## Dial-up Connection

### 1. Dial-up Connection:

- *Dial-up connection uses telephone line to connect PC to the internet.*
- *It requires a **modem** to setup dial-up connection. This modem works as an interface between PC and the telephone line.*
- *This is generally the **slowest type of Internet connection**, and you should probably avoid it unless it is the only service available in your area.*
- *Dial-up Internet uses your phone line, so unless you have multiple phone lines you will not be able to use your landline and the Internet at the same time.*



## Dial-up Connection





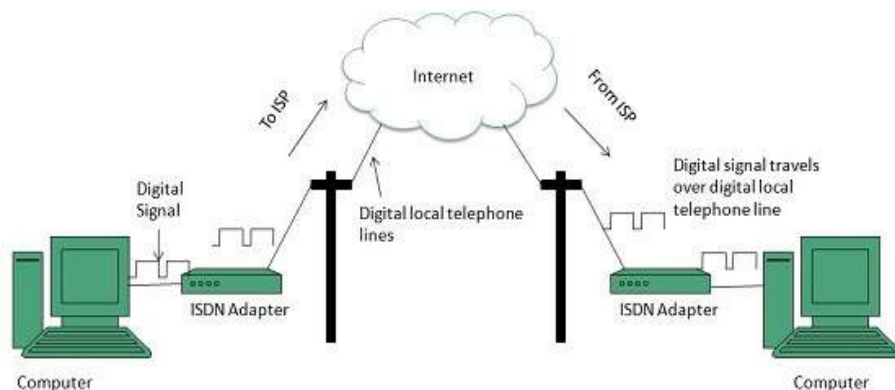
## *ISDN (Integrated Services Digital Network)*

### *2. ISDN (Integrated Services Digital Network) Connection:*

- *ISDN establishes the connection using the phone lines which carry digital signals instead of analog signals.*
- *ISDN enables the transmission of both voice and data in same time.*
- *There are two types of ISDN networks:*
  - 1. BRI (Basic Rate Interface) and*
  - 2. PRI (Primary Rate Interface).*
- *The major difference between BRI and PRI is the level of service and reliability.*



## *ISDN (Integrated Services Digital Network)*





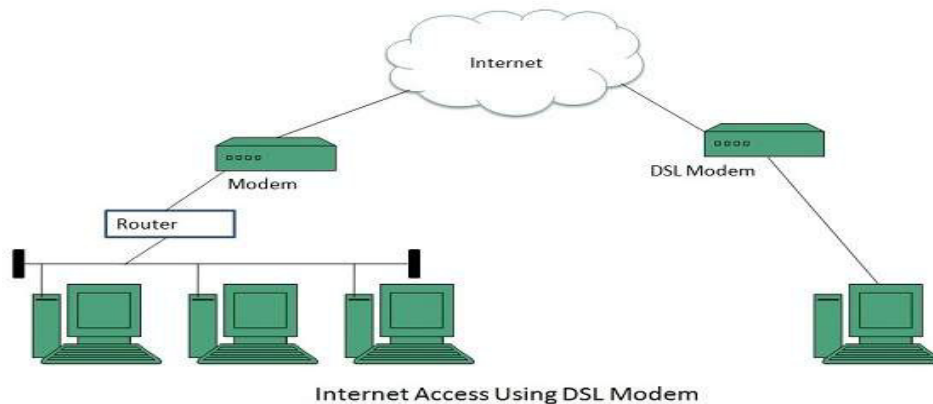
## DSL (Digital Subscriber Line)

### 3. DSL (Digital Subscriber Line):

- **DSL** provides high-speed networking over ordinary Telephone lines using **broadband modem technology** (Any data connection faster than 56 Kbps).
- **DSL** capable of sending and receiving data with speeds as low as **128Kbps** and as high as **100 Mbps**. On the other hand, **ISDN** is only capable of delivering a maximum speed of **128Kbps**.
- **DSL** uses existing telephone lines alongside a modem. However, **ISDN** lines need to be installed since **they require an adapter at each end of the wire**.



## DSL (Digital Subscriber Line)



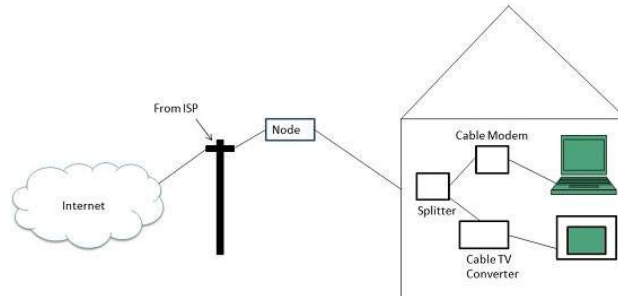




## Cable TV Internet Connection

### 4. Cable TV Internet Connection:

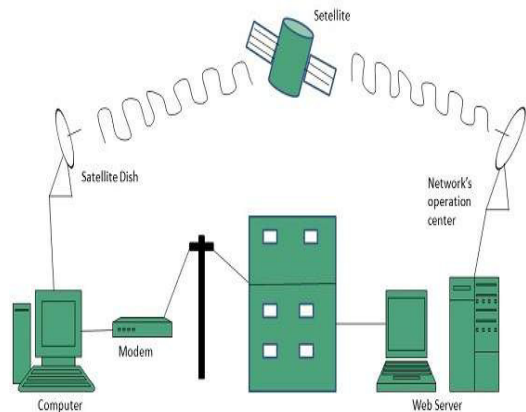
- **Cable TV Internet connection is provided through Cable TV lines. It uses coaxial cable which is capable of transferring data at much higher speed than common telephone line.**



## How do we connect to the internet

### 5. Satellite Internet connections:

- **A satellite connection uses broadband but does not require cable or phone lines.**
- **it connects to the Internet through satellites orbiting the Earth. As a result, it can be used almost anywhere in the world, but the connection may be affected by weather patterns. Satellite connections are also usually slower than DSL or cable.**

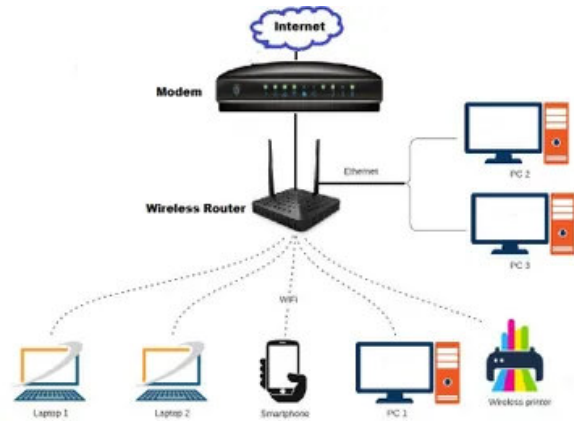




## Wireless Internet Connections

### 6. Wireless Internet Connections:

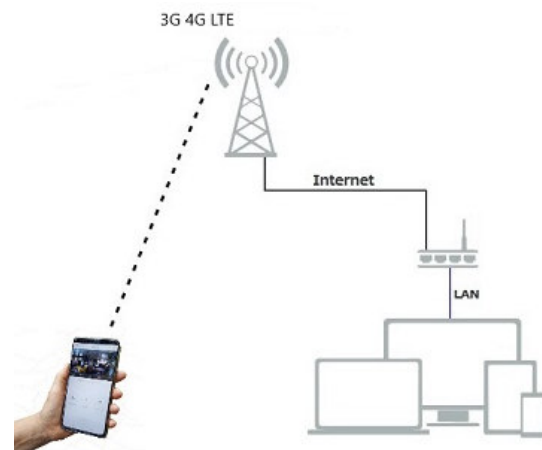
- *Wireless Internet Connection makes use of radio frequency bands to connect to the internet and offers a very high speed. The wireless internet connection can be obtained by either WiFi or Bluetooth.*



## 3G and 4G Internet Connections

### 7. 3G and 4G Internet Connections:

- *3G and 4G service is most commonly used with mobile phones, and it connects wirelessly through your ISP's network. However, these types of connections aren't always as fast as DSL or cable. They will also limit the amount of data you can use each month.*





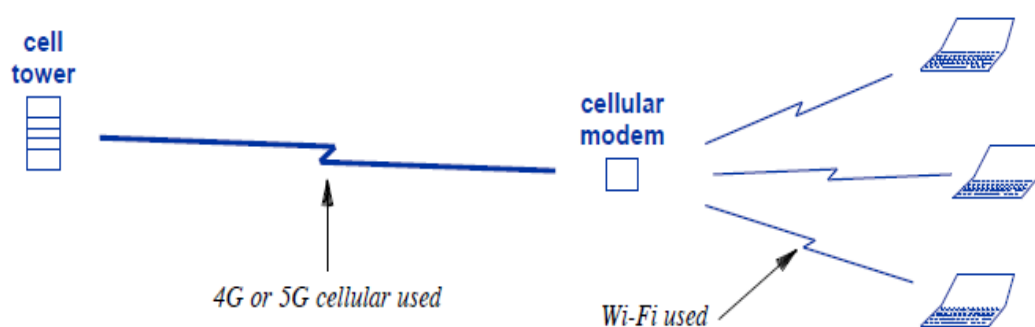
## Mobile Cellular Modems

### 8. Mobile Cellular Modems (4G or 5G):

- A mobile broadband modem, which is available with both 4G and 5G, consists of a small device that is designed to be easy to carry when traveling.
- Mobile modems can be battery-powered, which permits their use without requiring a power cord.
- A cellular modem contains two basic circuits: one that acts like a cell phone, and one that connects to a device.
- Most cellular modems use Wi-Fi for device connections.



## Mobile Cellular Modems





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*The End*

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