Chapter 14
Internet

14.1 TYPE OF INTERNET ACCESS

ISPs provide Internet access, employing a range of technologies to connect users to their network. Available technologies have ranged from computer modems with acoustic couplers to telephone lines, to television cable (CATV), wireless Ethernet (Wi-Fi), and fiber optics. For users and small businesses, traditional options include copper wires to provide dial-up, DSL, typically asymmetric digital subscriber line (ADSL), cable modem or Integrated Services Digital Network (ISDN) (typically basic rate interface). Using fiber-optics to end users is called Fiber to The Home or similar names.

14.2 ONLINE SERVICES

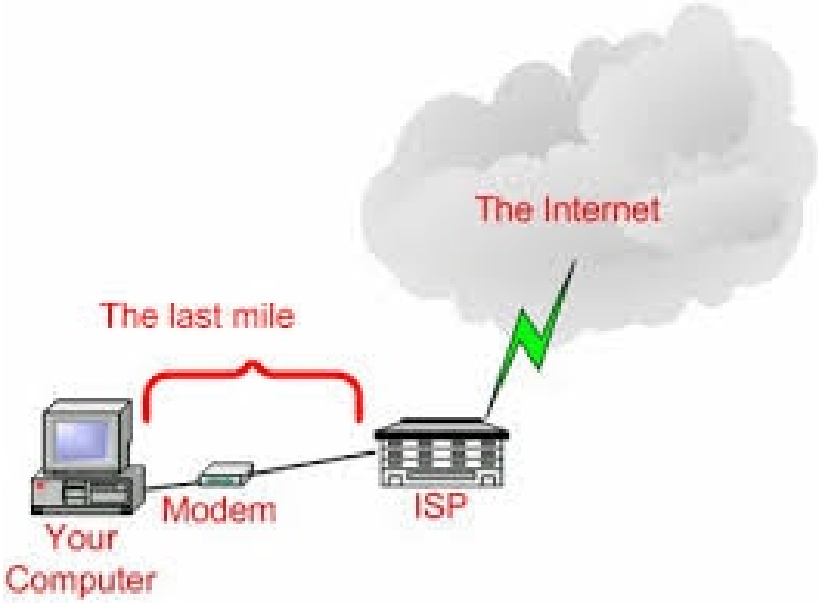
Online services are those services provided by various companies such as Google, Microsoft, and Yahoo etc. through ISP (Internet Service Provider) over the internet. Some popular online services provided by various providers are:
Gmail, YouTube, Google Drive etc. by Google.
Microsoft Outlook, Hotmail, Live services by Microsoft.
Yahoo mail and also other online services.

14.3 INTERNET SERVICES PROVIDER

An Internet service provider (ISP) is a company or organization that provides services for accessing and using the Internet. These organization may be in many forms, such as commercial, community-owned, non-profit, or otherwise privately

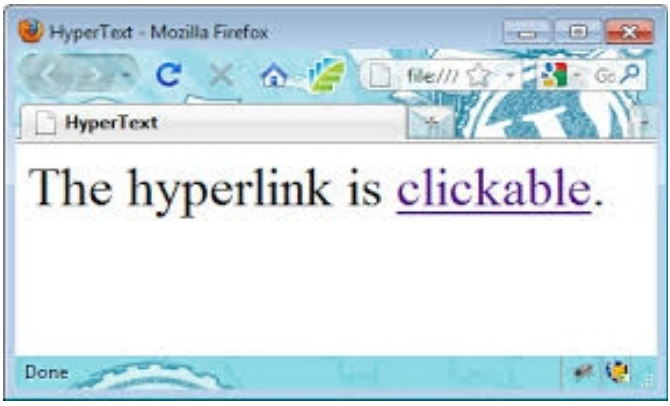
owned. In 1989, the first ISPs were established in Australia and the United States. In Brooklyn, Massachusetts, The World became the first commercial ISP in the US. Its first customer was served in November 1989. Following are the some Internet Service Provider in India

- BSNL
- Reliance
- Airtel
- Idea
- Vodafone etc.



14.4 HYPERTEXT AND HYPERLINKS

Hyperlinks and Hypertexts are used in order to send your reader to a site that might help them better understand the topic you are talking about. Unlike the typical printed book, which is read sequentially from beginning to end, hypertext is inherently nonlinear. It is comprised of many interlinked chunks of self-contained text. Readers are not bound to a particular sequence, but can browse through information intuitively by association, following their interests by following a highlighted keyword or phrase in one piece of text to bring up another, associated piece of text. Figure illustrates this difference.



14.5 FAVORITES OR BOOKMARKS

All modern web browsers include bookmark features. Bookmarks are called favorites or Internet shortcuts in Internet Explorer. Bookmarks or Favorites are used to save the link of useful web pages while accessing the internet. It makes the browsing on internet simple.

14.6 COOKIES

An HTTP cookie (also called web cookie, Internet cookie, browser cookie or simply cookie) is a small piece of data sent from a website and stored on the user's computer by the user's web browser while the user is browsing. Cookies were designed to be a reliable mechanism for websites to remember information (such as items added in the shopping cart in an online store) or to record the user's browsing activity (including clicking particular buttons, logging in, or recording which pages were visited in the past).

14.7 BLUETOOTH

Bluetooth is a wireless technology standard for exchanging data over short distances (using short-wavelength UHF radio waves in the ISM band from 2.4 to 2.485 GHz) from fixed and mobile devices, and building personal area networks (PANs). Invented by telecom vendor Ericsson in 1994, it was originally conceived as a wireless alternative to RS-232 data cables. It can connect several devices, overcoming problems of synchronization.

Bluetooth is managed by the Bluetooth Special Interest Group (SIG), which has more than 25,000 member companies in the areas of telecommunication, computing, networking, and consumer electronics. The IEEE standardized Bluetooth as IEEE 802.15.1, but no longer maintains the standard.

14.8 WI-FI

Wi-Fi or Wi Fi (Wireless Fidelity) is a technology that allows electronic devices to connect to a wireless LAN (WLAN), mainly using the 2.4 gigahertz (12 cm) UHF and 5 gigahertz (6 cm) SHF ISM radio bands. A WLAN is usually password protected, but may be open, which allows any device within its range to access the resources of the WLAN network. Devices that can use Wi-Fi technology include personal computers, video-game consoles, smartphones, digital cameras, tablet computers, digital audio players and modern printers. Wi-Fi compatible devices can connect to the Internet via a WLAN network and a wireless access point.

14.9 DHCP

The Dynamic Host Configuration Protocol (DHCP) is a standardized network protocol used on Internet Protocol (IP) networks. The DHCP protocol is controlled by a DHCP server that dynamically distributes network configuration parameters, such as IP addresses, for interfaces and services. A router or a residential gateway can be enabled to act as a DHCP server. A DHCP server enables computers to request IP addresses and networking parameters automatically, reducing the need for a network administrator or a user to configure these settings manually. In the absence of a DHCP server, each computer or other device (eg. a printer) on the network needs to be statically (i.e., manually) assigned to an IP address.

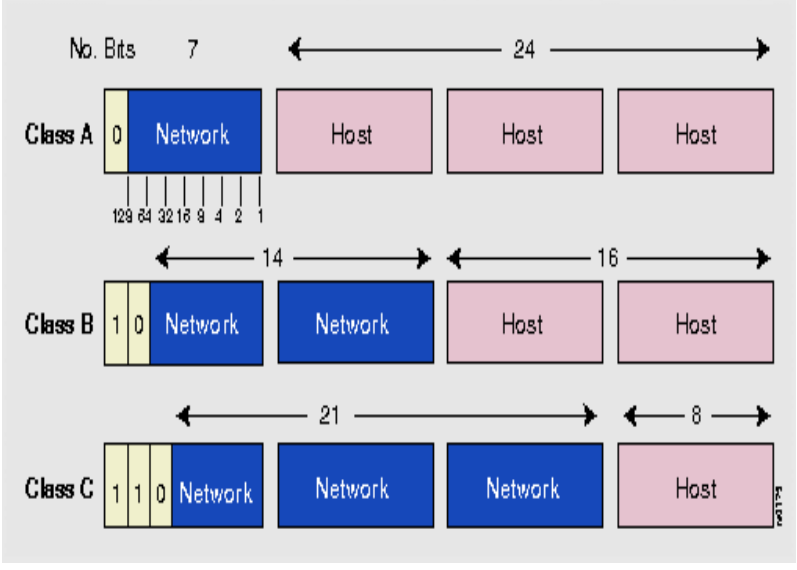
14.10 PROXY SETTING

A Proxy or Proxy server is basically another computer which serves as a hub through which internet requests are processed. By connecting through one of these servers, your computer sends your requests to the proxy server which then processes your request and returns what you were wanting. In this way it serves as an intermediary between your home machine and the rest of the computers on the internet. Proxies are used for a number of reasons such as to filter web content, to go around restrictions such as parental blocks, to screen downloads and uploads and to provide anonymity when surfing the internet.

14.11 IP ADDRESS

An Internet Protocol address (IP address) is unique numerical address assigned to each device (e.g., computer, printer) participating in a computer network that uses the Internet Protocol for communication. Two versions are defined of IP addresses IPv4 and IPv6. IPv4 has size of 32 bit and IPv6 has size 128 bit. IPv4 address space of 32 bit is divided into 4 octet. Each octet has 8 bit. There are five

classes of IPv4 addresses class A, B, C, D and class E. Classes A, B and C use frequently. Octet are divided into host portion and network portion as shown.



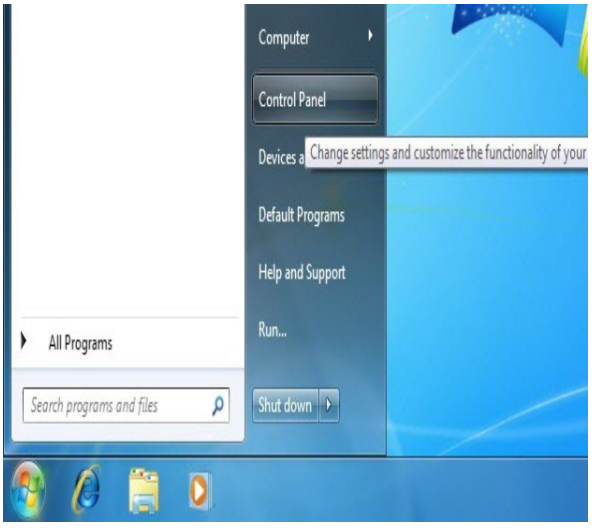
Address range in IPv4

Following figure shows the addresses range in each class.

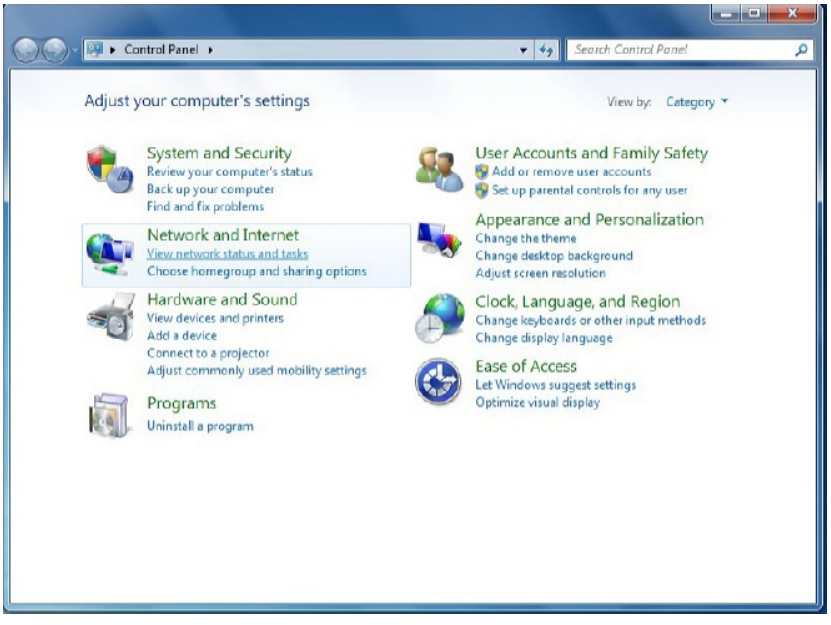
Class	Address Range	Supports
Class A	1.0.0.1 to 126.255.255.254	Supports 16 million hosts on each of 127 networks.
Class B	128.1.0.1 to 191.255.255.254	Supports 65,000 hosts on each of 16,000 networks.
Class C	192.0.1.1 to 223.255.254.254	Supports 254 hosts on each of 2 million networks.
Class D	224.0.0.0 to 239.255.255.255	Reserved for multicast groups.
Class E	240.0.0.0 to 254.255.255.254	Reserved for future use, or Research and Development Purposes.

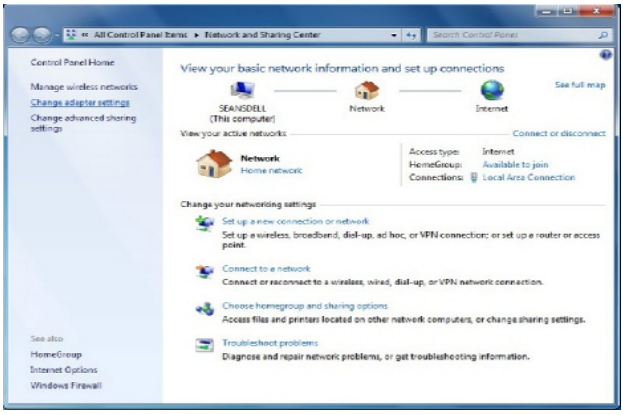
Configuring IPv4 address in windows PC

1. Go to Control Panel.

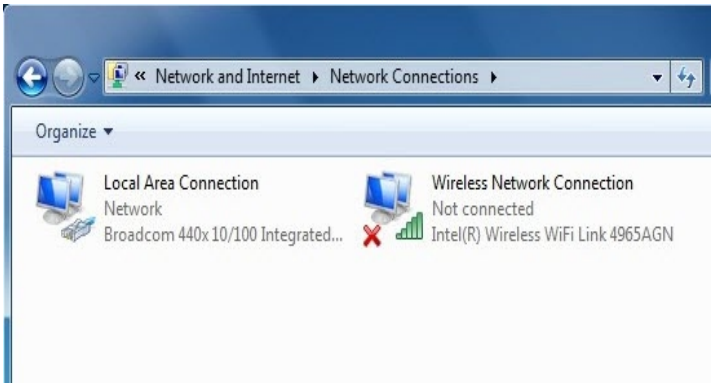


2. Select the Network and Internet tab.

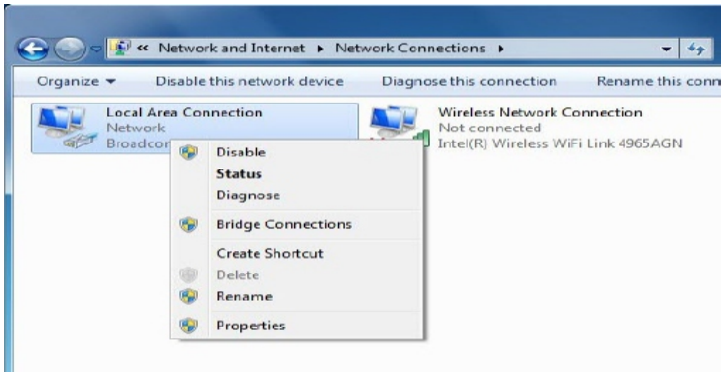


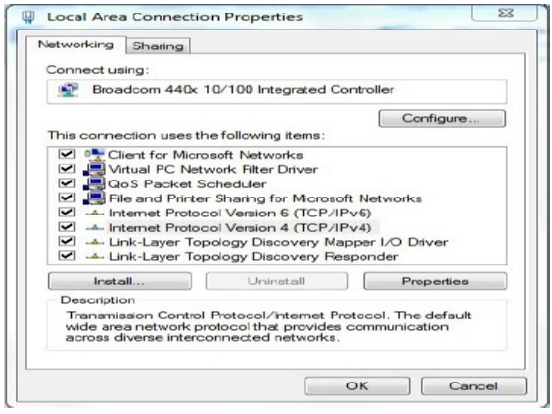


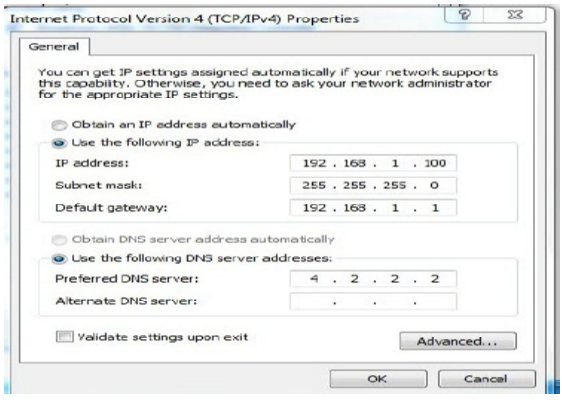
3. There are various networks on Network and Internet window.

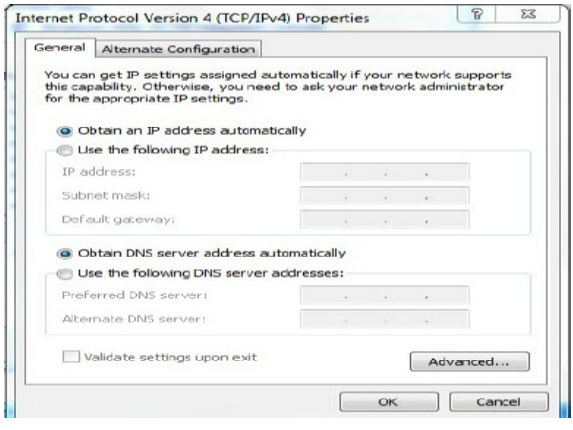


4. Right click on any network for which you want to change IP address.




Local Area Connection Properties
Networking
Sharing
Connect using:
Broadcom 440x 10/100 Integrated Controller
Configure...
This connection uses the following items:
Client for Microsoft Networks
Virtual PC Network Filter Driver
QoS Packet Scheduler
File and Printer Sharing for Microsoft Networks
Internet Protocol Version 6 (TCP/IPv6)
Internet Protocol Version 4 (TCP/IPv4)
Link-Layer Topology Discovery Mapper I/O Driver
Link-Layer Topology Discovery Responder
Install...
Uninstall
Properties
Description
Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.
OK
Cancel


Internet Protocol Version 4 (TCP/IPv4) Properties
General
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address: 192 . 168 . 1 . 100
Subnet mask: 255 . 255 . 255 . 0
Default gateway: 192 . 168 . 1 . 1
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server: 4 . 2 . 2 . 2
Alternate DNS server:
Validate settings upon exit
Advanced...
OK
Cancel


Internet Protocol Version 4 (TCP/IPv4) Properties
General
Alternate Configuration
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address:
Subnet mask:
Default gateway:
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server:
Alternate DNS server:
Validate settings upon exit
Advanced...
OK
Cancel

14.12 SUBNET MASK

Subnet mask is used to find out the network address from given IP address. By default every class has its Subnet mask given in figure.

IP Class	Network & Host	Default Subnet Mask
A	N H H H	255.0.0.0
B	N N H H	255.255.0.0
C	N N N H	255.255.255.0

IP address in decimal notation

IP address 192.168.1.10
Subnet mask 255.255.255.0

We can find out network address by logical ANDing of given IP address and subnet mask

IP address in Binary notation

IP address 11000000.10101000.00000001.00001010
Subnet mask 11111111.11111111.11111111.00000000
Network Address 11000000.10101000.00000001.00000000

14.13 GATEWAYS

In telecommunications, the term gateway refers to a piece of networking hardware that has the following meaning: In a communications network, a network node equipped for interfacing with another network that uses different protocols.

- A gateway may contain devices such as protocol translators, impedance matching devices, rate converters, fault isolators, or signal translators as necessary to provide system interoperability. It also requires the establishment of mutually acceptable administrative procedures between both networks.

- A protocol translation/mapping gateway interconnects networks with different network protocol technologies by performing the required protocol conversions.

Loosely, a computer or computer program configured to perform the tasks of a gateway. For a specific case, see default gateway. Gateways, also called protocol

converters, can operate at any network layer. The activities of a gateway are more complex than that of the router or switch as it communicates using more than one protocol.

14.14 DNS

The Domain Name System (DNS) is a hierarchical decentralized naming system for computers, services, or any resource connected to the Internet or a private network. It associates various information with domain names assigned to each of the participating entities. Most prominently, it translates more readily memorized domain names to the numerical IP addresses needed for the purpose of locating and identifying computer services and devices with the underlying network protocols. By providing a worldwide, distributed directory service, the Domain Name System is an essential component of the functionality of the Internet, and has been in use since the 1980s.

IMPORTANT POINTS

- ISPs provide Internet access, employing a range of technologies to connect users to their network.
- Internet service provider (ISP) is a company or organization that provides services for accessing and using the Internet.
- Hyperlinks and Hypertexts are used in order to send your reader to a site that might help them better understand the topic you are talking about.
- Bluetooth is a wireless technology standard for exchanging data over short distances.
- Wi-Fi or Wi Fi (Wireless Fidelity) is a technology that allows electronic devices to connect to a wireless LAN (WLAN).
- Subnet mask is used to find out the network address from given IP address.
- The Domain Name System (DNS) is a hierarchical decentralized naming system for computers, services, or any resource connected to the Internet or a private network.

Practice Questions

Objective type questions:

Q.1 Which one of the following service is provided by Google?

A. Gmail B. Yahoo mail
C. Outlook D. Hotmail

Q.2 Where is the first ISP ‘The World’ formed?

A. Brooklyn B. Austria

C. Mumbai D. Moscow

Q.3 What is the size of IPv6 header?
A. 24 Bit B. 64 Bit
C. 32 Bit D. 128 Bit

Q.4 How many classes are there in IPv4?
A. 2 B. 5
C. 3 D. 4

Q.5 Which medium is used to access the internet?
A. Wi-Fi B. Cookies
C. Proxy D. Internet Protocol

Very short answer type questions:

Q.1. How Internet is accessible? Write down names of medium for accessing Internet?
Q.2. What is ISP? Give the names of ISP's (any four)?
Q.3. Write any two differences between hypertext and hyperlink?
Q.4. What is HTTP cookie?
Q.5. What is Bluetooth? What are the frequency band on which Bluetooth operates?
Q.6. Why DHCP is used?
Q.7. What are default subnet mask for different classes?
Q.8.How to obtain network address by using subnet mask?
Q.9. What is meaning of gateways in communication networks?

Short answer type questions:

Q.1. Discuss different type of internet access and also online services?
Q.2. What is an Internet Service Provider (ISP)? Explain with help of suitable diagram?
Q.3. What are Hypertext and Hyperlinks?
Q.4.Define following terms in context of web browser?
i. Favorites or Bookmarks
ii. Cookies
Q.5. Explain in brief? (i) Bluetooth (ii) Wi-Fi
Q.6. What is DHCP? How is it used?
Q.7. What is IP address? Define range for each class in IPv4?
Q.8.How to configure IP address in widows PC?
Q.9. Define subnet mask? How to write IP address in decimal notation. Give an example?

Q.10. What are gateways? Explain DNS in brief?

Essay type questions:

Q.1. Explain the following internet services in detail?\

- Wi-Fi
- Bluetooth
- DHCP
- Proxy or Proxy server

Q.2.Explain various classes of IP address and subnet mask in detail?

Answer key for objective type questions:

1. A
2. A
3. D
4. B
5. A