GLASGORMAN
MAKING IT EFFECTIVE

Guide to the Internet

Introduction

This document has been designed to give people who are new to the Internet, or who are confused by all the terminology, an overview of some of the major elements of the Internet and de-mystify some of the confusing technology.

However it is impossible to go through everything in a few short pages and certainly not in any depth. Each company's needs will vary and as such it is important that you get advice from your local computer professional, who will be aware of what options are available in your area and will tailor a solution specifically to address your business needs.

I hope you find this guide useful and would welcome any comments or suggestions.

John Timmons
Managing Director
GLASGORMAN : Making IT Effective

What is the Internet

The Internet is difficult to define simply because it is not a single thing. Instead, the Internet is an immensely complex conglomeration of thousands of technologies and dozens of services used by hundreds of millions of people around the word. While over simplistic the "Network of Networks" description is technically accurate. The Internet is a decentralised and highly dynamic network comprising hundreds of millions of computers throughout the world.

Guide to the Internet

The Internet is …	The Internet is not …
A complex network – this is even an over simplified definition. *Disorganised* – the Internet can be cumbersome and confusing, even for experienced users. *Composed of Billions of Files* – files relating to thousands of subjects, disciplines and professions are available in many file formats from computers around the world that are connected to the Internet. *Widely Used* – more than 300 million people use the Internet, over 80 million of whom use it daily. *International* – this global network is accessed by people in over 155 countries. *Dynamic* – changing every minute of every day. On average a new network is connected to the Internet every 30 minutes. *Expanding Exponentially* – the Internet is growing at a rate of 12% per month. It doubles in size every 18 months.	*Organised* – no central indexing scheme or comprehensive database exists for the Internet. *Centrally Controlled* – no authority presides over the Internet. Governments, Corporations and Standards Bodies serve only to *propose* policies, guidelines and standards. *Completely Authentic or Accurate* – no organisation or individual approves for publication or audits information available via the Internet. Information may be out of date, inaccurate, fabricated, deliberately misleading, distasteful or substantially biased in nature. *Static or Predictable* – resources suddenly disappear or change addresses. New areas and data appear even quicker. *Easy to Navigate* – finding specific information is often difficult and can be practically impossible due to the dynamic nature, vast size and incredible complexity of the Internet. Research skills are essential. *Free of Charge* – access to the full services of the Internet always carries an associated cost. Most users pay an access fee, even if it is just the cost of the telephone call. For students and company employees the access costs are being paid for by the colleges and employers respectively.

When people refer to the Internet they are not talking about a single entity, but a combination of services. The following table outlines the major services of the Internet.

Internet Services	Year	Description
E-mail (Electronic Mail)	1970	A text-based service of the Internet. E-mail is the most common service of the Internet and can be used on even very old PC's.
FTP (File Transfer Protocol)	1973	An Internet service designed for transferring files between computers. Files are archived on FTP servers and are available for downloading.
Newsgroups (Usenet)	1979	A public messaging and "bulletin board" system composed of over 34,000 individual forums, each about a specific topic.
Mailing Lists (Listserv)	1981	Technically a subset of e-mail, mailing lists are a group-based messaging service similar to newsgroups. Once subscribed, you passively receive mailing list messages via a standard e-mail account and regular e-mail software.
Gopher (Gopherspace)	1991	Analogous to a library on the Internet and comprised of text-based documents and searchable database. RIP: Gopher has died in popularity. Most organisations have replaced their gopher servers with Web Sites.
World Wide Web (Web, WWW, W3)	1992	A hypertext-based service of the Internet that features user-friendly publishing and multimedia documents and files. Web pages are created using HTML, XHTML, XML, JavaScript, Vbscript, Flash and Java. There are currently over 1 Billion web pages.

Major Elements of the Internet

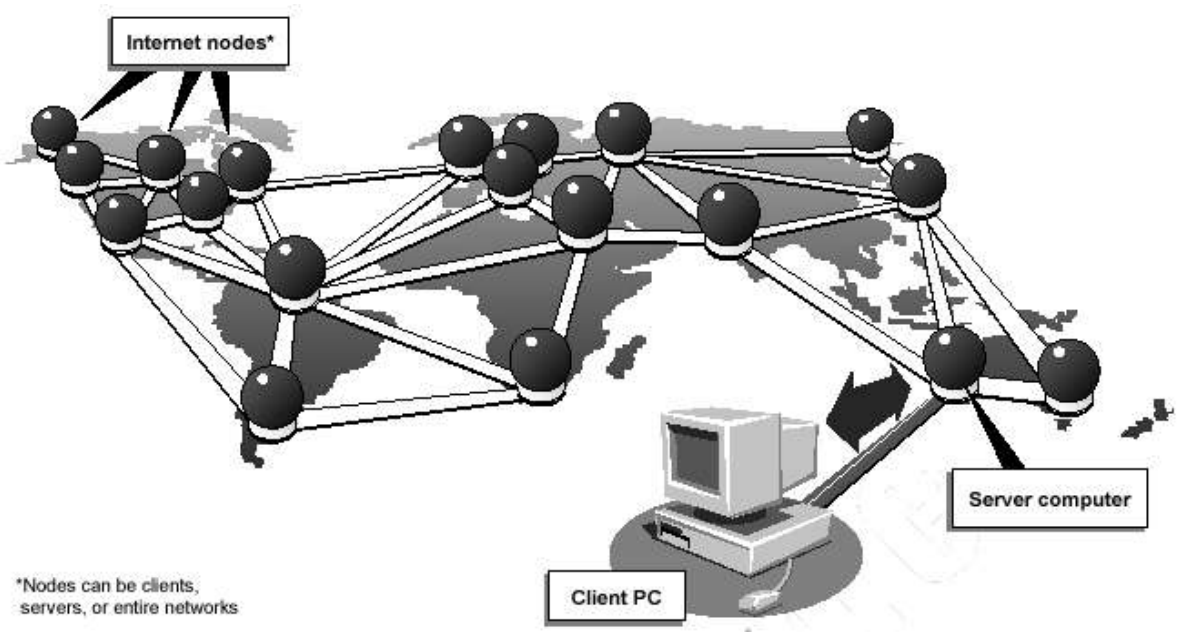
Clients, Servers & Networks

Client Computers: Computers that request information from servers. Client computers typically maintain intermittent (part-time) Internet connections. If a personal computer has access to the Internet, it is classed as a client computer.

Server Computers: Relatively powerful computers with a permanent (full-time) Internet connection, that can provide data to multiple client computers.

Networks: Composed of one or more Server Computers and multiple Client Computers (sometimes numbering in the hundreds or thousands).

Node: Is a generic term used to describe a client, server or network.

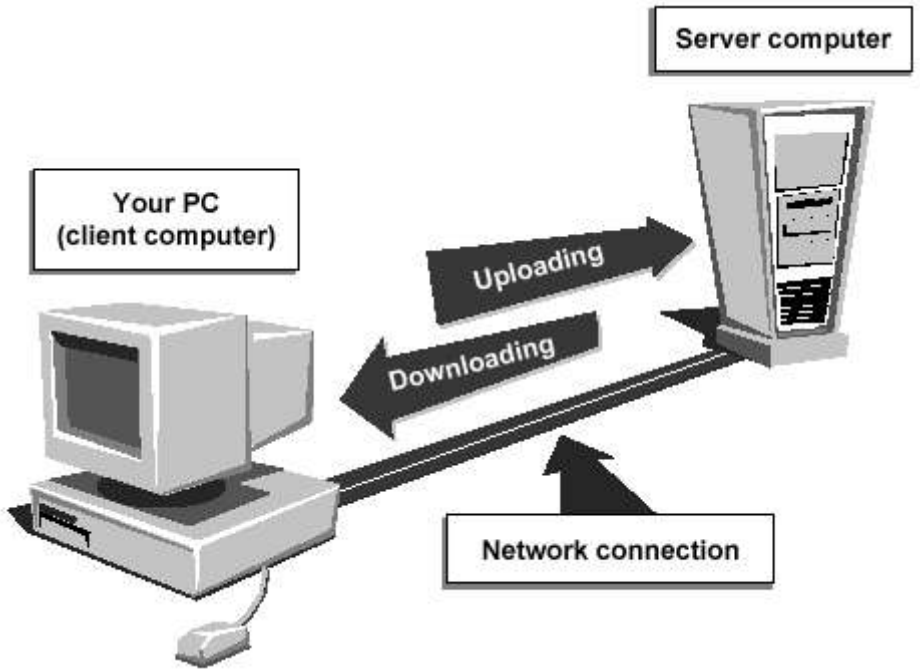


Transferring Data

The basis, if not the purpose, of the Internet is the transfer of data and information from one computer to another. National boundaries are blurred and geographical distances are irrelevant when communicating over the Internet.

Uploading & Downloading

When information is sent to your computer from a server computer, it is said to be *downloading* data to your computer. Conversely when information is sent from your computer to a server computer, the process is called *uploading*.



When you type a Web Address into your browser and press <ENTER>, your request to the server computer for a particular file is *Uploaded*. Web pages, text files and multimedia files (audio, video) are then *Downloaded* from a server to your client computer. NOTE: Most Internet traffic is downloaded.

For example, you *Upload* a request for a web page when you type www.glasgorman.com into your browser. The response from the web server is to *Download* a web page to your PC.

The Domain Name System (DNS)

Each computer and network on the Internet must have a unique address.

The *Domain Name System*, or DNS, is the system by which all Internet Addresses are created (assigned), maintained and used on a daily basis. The DNS, implemented by ARPAnet in 1984, is managed by the Internet Network Information Centre (InterNIC) based in Herndon, Virginia.

An Internet address under the Domain Name System has four discrete elements:

- Domain Prefix
- Domain Name
- Domain Extension (Domain Suffix)
- Country Code (Sometimes Optional)

Because it uses names and plain English to identify specific server computers, individual files and email addresses on the Internet, the DNS is relatively user-friendly. Any computer or file on the Internet can be specified using a domain name.

Domain Prefix

Under the DNS, each type of Internet server is denoted by it's own server prefix (domain prefix). The server prefix indicates a particular type of Internet server (from which your client PC can download information).

DNS Type	DNS Prefix
Email Address	*jtimmons*@glasgorman.com
FTP Server	*ftp*.sony.com
Web Server	*www*.glasgorman.com

Domain Name

A domain name denotes the name, often in abbreviated form, of the organisation to which the domain belongs.

Domain names are allocated by InterNIC on a first-come, first-served basis. If the domain name you (or your organisation) desire is already reserved by a different individual or organisation, you must submit a different domain name proposal. You can check the availability of domain names at *www.dnanames.com*.

Organisation	**Domain Name**
Irish Government Website	www.*irlgov*.ie
Glasgorman Computer Services	www.*glasgorman*.com
Eircom Net	www.*eircom*.net
Red Cross	www.*redcross*.org
Woodside Holiday Homes	www.*woodside*.ie

Domain Extension

Domain extensions identify the type of organisation to which the domain belongs. Domain extensions are sometimes referred to as top level domains (TLD's) or domain suffixes. For example, a domain extension differentiates an educational institution (college, university) from a corporation or business. As of December 2000, there are more than 15.7 million active domain names worldwide, 9.5 million of which are .COM domains.

Domain Extension	**Type of Organisation**	**Example**
.com	Commercial Business	www.deycom.*com*
.edu	Educational Institute	www.ubc.*edu*
.mil	U.S. Military	www.af.*mil*
.net	Internet Service Provider	www.eircom.*net*
.org	Non Profit Organisation	www.redcross.*org*

Domain names must be registered through a Registrar. This is usually done by your Internet Service Provider or Computer Services company.

Electronic Mail

Email, or electronic mail, is a plain text messaging system that has become a global electronic communications standard. Email text messages can be sent to or received from any person or organisation with a valid Internet email account. Email is replacing a substantial amount of physical post mail (called *snailmail*) in industrial nations.

Asynchronous Messaging

Email enables you to communicate without the real-time availability of the other party that is required for "live" communications, such as telephone conversations, video conferencing or face-to-face meetings. Email also offers you the ability to read and reply to messages according to your discretion and schedule. This type of communications, called asynchronous messaging, offers convenience and practicality to both sender ad receiver.

Broadcast Messaging

Email is most commonly used to send a message to a single recipient. However, it can also be used to send a message to many individuals at once. Sending a single message to multiple recipients simultaneously is called *broadcast messaging*.

Broadcast messaging can be an economical and effective means of communication within organisations, allowing a company to efficiently communicate with employees, customers and business partners. Abused broadcast messaging becomes SPAM.

Two types of Email Servers

- POP – Post Office Protocol
- SMTP – Simple Mail Transfer Protocol

POP Servers

POP stands for *Post Office Protocol* (the current revision is POP3). POP servers receive incoming email messages. When your email client checks for new mail messages, you are generally querying a POP3 server.

If new messages have arrived, the POP3 server downloads the messages to your client computer and they are received by your email software. Your email software is often referred to as a POP3 client.

SMTP Servers

SMTP stands for *Simple Mail Transfer Protocol*. SMTP servers generally handle outgoing email messages. If you compose and send a new message, it travels from your client computer to an SMTP server at your ISP. The message then travels to other mail servers on the Internet, eventually arriving at its destination (recipient's ISP mail server). The message is then stored on the recipient's POP3 server until he/she checks the POP3 server for new messages and downloads the message to the client computer.

Email Address Syntax

An email address is actually composed of two separate addresses;

- The domain name of the mail server computer on which the email account resides.
- Your username (personal identity or account name) on that mail server.

Note that there is no space in the above address. Email software and server computers will not tolerate spaces in an address. The most common reason why email does not reach it's destination is a problem with the address. Email addresses are also case sensitive.

Email Client Software

Some common email clients are;

- Microsoft Outlook Express
- Microsoft Outlook
- Netscape Communicator
- Eudora

The World Wide Web

What is the Web?

In the early 90's academic people were looking for a way to share information that was stored on computers connected to the Internet for research purposes. There was a system called Gopher that allowed the sharing of text based data, but in a lot of cases the research contained other elements of data besides text.

A professor working at CERN in Switzerland was aware of a computer language called HTML (Hyper Text Mark-up Language), that allowed documents on different computers to be linked together and was not restricted to text based data. This was particularly useful for research papers that refer to several other pieces of research and linking to rather than rewriting the information made life a lot easier. Somebody said that all these interlinked documents looked like a spiders web when drawn out on paper and the name stuck.

- *Web Page* – a document written in HTML
- *Web Site* – Is a collection of web pages stored on a server connected to the Internet

In the mid 90's the business community started to realise the potential of the World Wide Web and so it started to grow exponentially. The rest is history ……

What is a Browser?

A browser is a piece of client software that is capable of reading HTML documents stored on a server connected to the Internet. The most common web browsers are;

- Microsoft Internet Explorer
- Netscape Navigator

What is a URL?

A URL is a Universal Resource Locator used to reference pages stored on web servers. A URL is often referred to as a "web address".

- http://www.glasgorman.com

While the full address always starts with *http://,* if you were to type www.glasgorman.com, the browser will add the *http://* for you to complete the URL.

How do you connect to the Internet?

To use the services available on the Internet you must first connect your computer to the Internet, either temporarily or permanently. The quality of the services available to you will often depend on the "*bandwidth*" available to you.

What is Bandwidth?

Bandwidth is a term which refers to the data-handling capacity of an Internet connection. The greater the bandwidth of the connection, the more data that can be transferred during a given period of time (per second). Bandwidth defines the speed of an Internet connection.

Measurement of Bandwidth

Bandwidth is measured in bits per second;

- a Bit is either a 1 or a 0
- a Byte is 8 Bits which is equivalent to one computer character
- 1 Kilobit = 1024 Bits
- 1 Megabit = 1024 Kilobits
- 1 Gigabit = 1024 Megabits

When the original Internet first started the speed was approximately 300 Bits per second or 37 characters per second. Now parts of the Internet have a capacity measured in Gigabits per second or 134,217,728 characters per second.

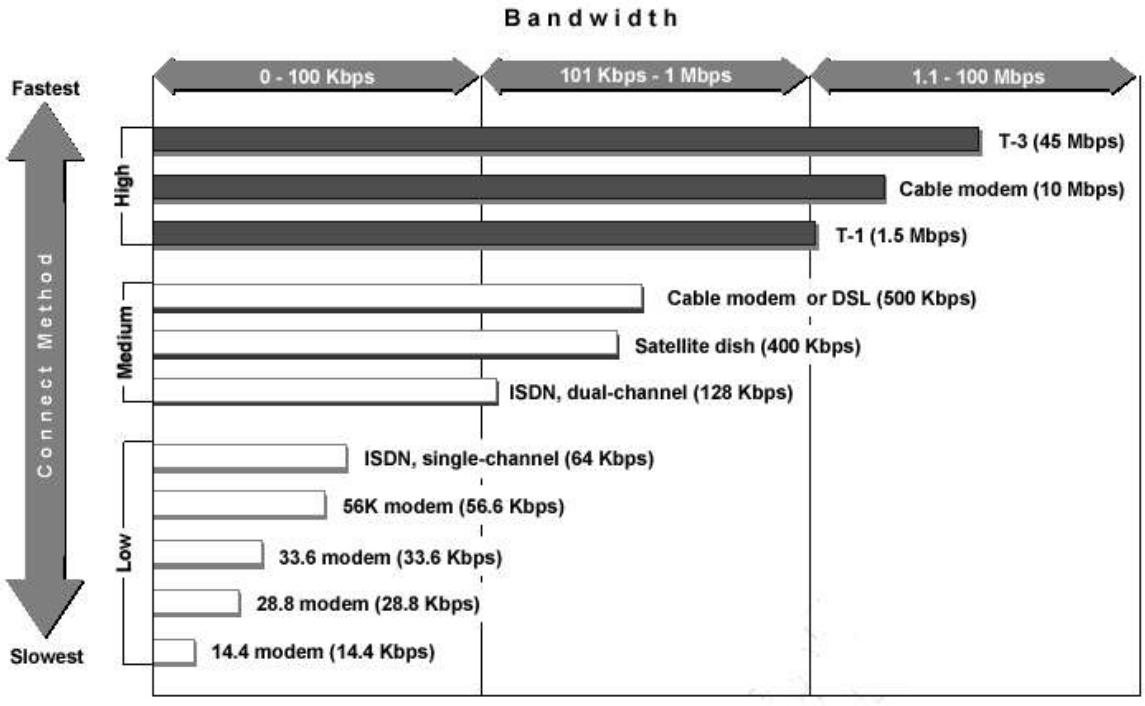


Figure 4-3: Bandwidths and categories of various connection types

Connection Types

Analog Dialup

- 14.4K to 56K
- Approximately 30 seconds to make connection
- Used by Home Users and Small Business

ISDN Dialup

- 64K to 128K
- 0.5 seconds to make connection
- Used by Home Users and Small Business
- Example, eircom Hi-Speed

DSL

- Digital Subscriber Line
- 500K
- Always connected
- Offered by cable operators

ADSL

- Asynchronous Digital Subscriber Line
- 64K Upload, 500K Download
- Always connected
- Example, eircom I-Stream

Leased Line

- 64K to Gigabit speeds
- Always connected
- Used by Large Companies

What is a Web Site?

A Web Site is one or more HTML pages stored on a web server connected to the Internet that can be accessed using a browser.

While the above definition is correct, in reality most web sites today are much more sophisticated and contain many more elements such as flash, java, JavaScript, CGI scripts, database connections, certificates, secure transactions.

While there is no strict definition for different types of web sites they can be broadly classified under several different categories.

Basic Web Presence/BrochureWare Site

While there is a huge amount of hype about the Internet and how everybody is going to buy everything over the Internet, the reality is very different.

For most small businesses all they will require is the equivalent of a basic brochure on the Internet, hence the name BrochureWare site. This type of web site typically has a relatively small number of pages that outline the company's products/services and how you can get in contact with the company.

- www.woodside.ie

Database Driven Web Site

The next level of web site in terms of complexity is are database driven sites.

In a database driven site, HTML is coupled with programming elements to link to a database that provides very feature/function rich web sites. Typically these types of sites will allow you to enter data, sort data and query sorted data.

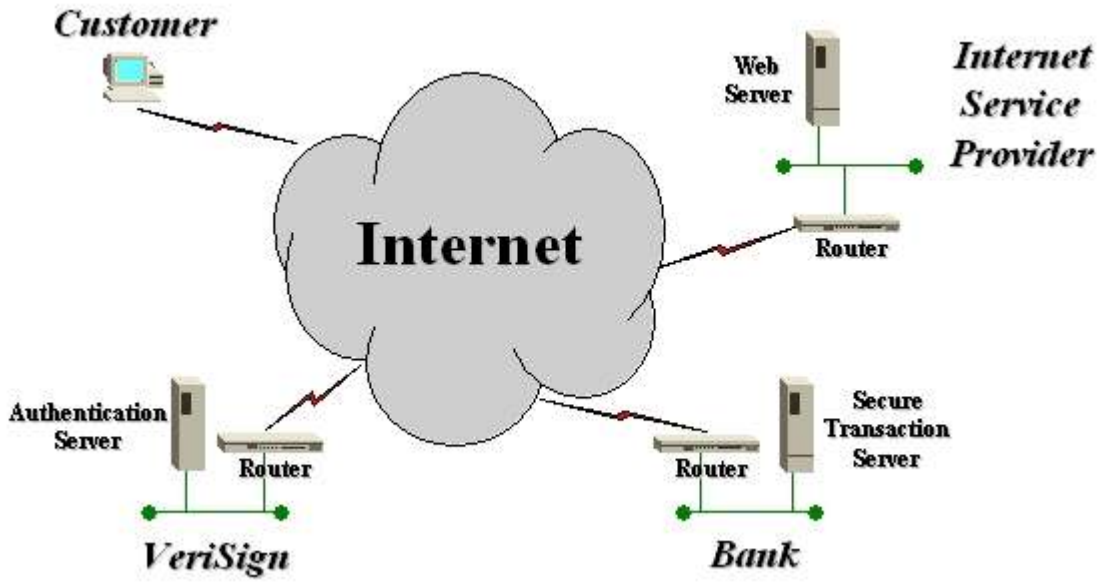
Due to the complexity and programmed nature of these sites, the associated costs are much higher than those of a typical BrochureWare site. These types of site also require more complex elements on the hosting web server and hence you can be charged more for hosting by your ISP.

- www.glasgorman.com/southeastmotors
- www.autotrader.ie

What is an eCommerce Site?

If you want to sell products over the Internet there are a number of basic requirements;

- Your site must be database driven in order to capture customer/order details.
- You have to be able to process credit card transactions, which requires a merchant bank account and a method to process secure transactions, which is usually provided by the financial institution.
- You will require security certification for your site so that your customers can have confidence that you are who you say you are.

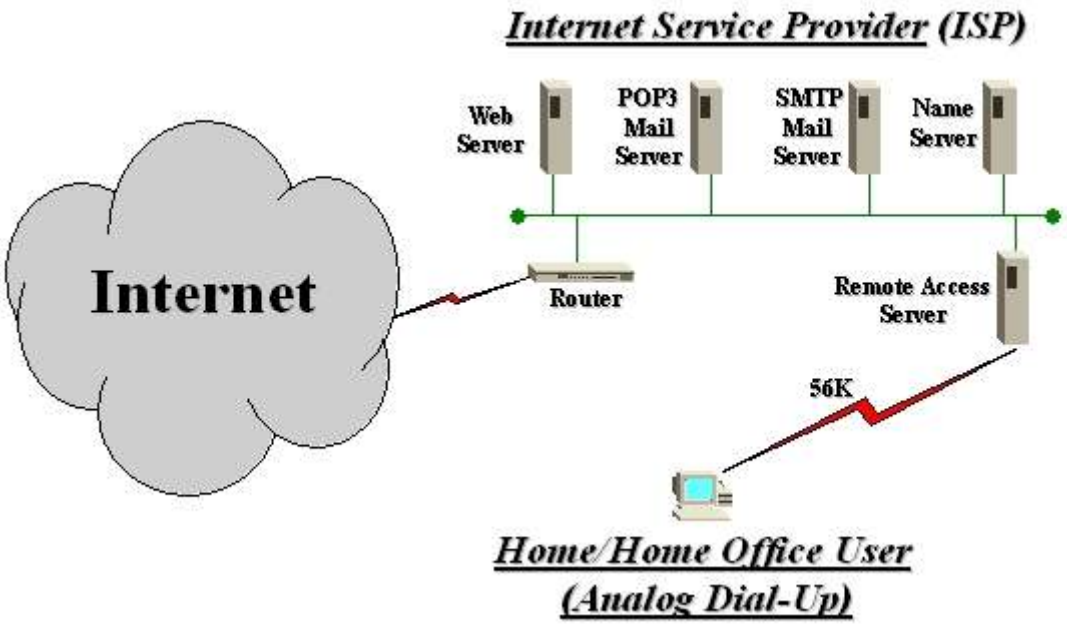


How an eCommerce Web Site works

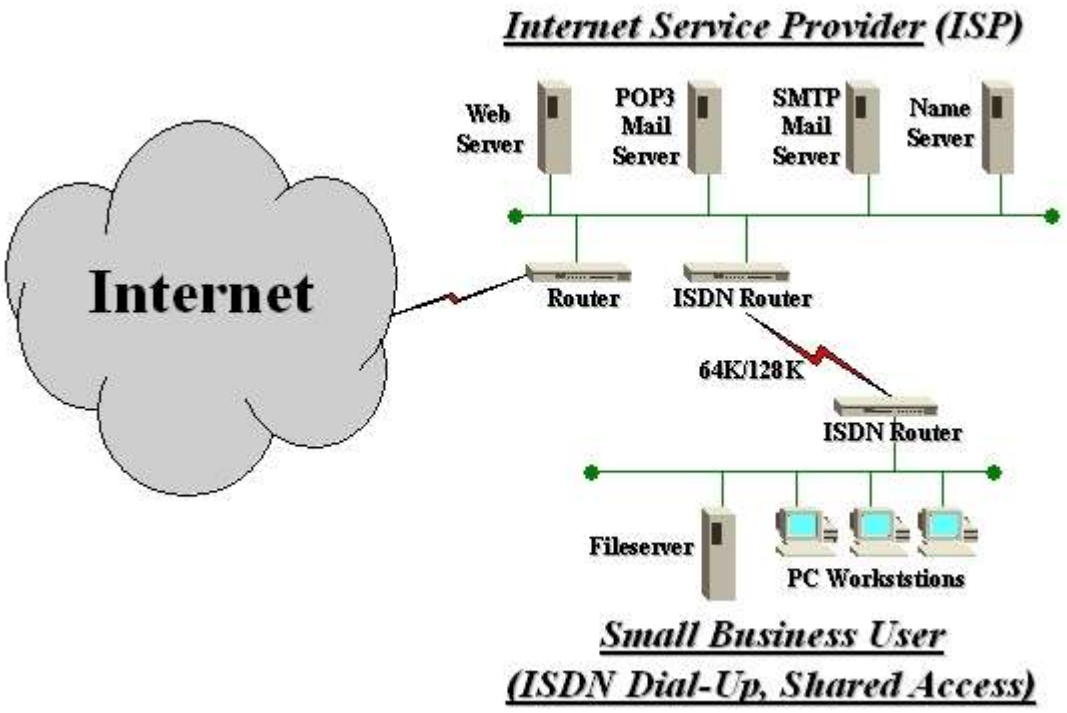
1. Customer uses browser to go onto web site located on a web server at an ISP.
2. Control is passed to an authentication server to validate the authenticity of the site and then passed back to the web site at the ISP.
3. Customer uses site to purchase product.
4. Control is passed to a secure transaction server located at the bank to process the credit card transaction.
5. After the transaction has been validated control is again passed back to the web server located at the ISP and the customer order is processed.

Typical Internet Configurations

Home/Home Office (Analog Dialup)



Small Business User (ISDN Dialup, Shared Access)



Bigger Businesses (Permanent Connection)