



**Computer
PowerPlus**
IT training specialists

The Internet and eCommerce



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INTRODUCTION

This learning guide has been written with two objectives. It provides you with a structured practical training program to help you gain confidence in using the Internet and associated applications. It can also be used as a reference manual that you can consult for help and information when you start using the Internet.

There are many activities scattered throughout the learning guide and questions at the end of each section.

While you are studying this learning guide, you will have access to the Internet so you will have ample opportunity to practise all of the skills the learning guide covers. Although we encourage you to visit various sites on the World Wide Web, you are not permitted to visit sites that may be considered offensive, or to post any messages that could be construed as offensive. Students who knowingly break these rules will have their Internet access privileges withdrawn.

Learning Guide Objectives

On completion, you will be able to:

- Describe the Internet
- Identify what is needed to connect to the Internet
- Use a browser to browse the World Wide Web
- Send and view email
- Understand the basics of e-commerce
- Understand the basics of Internet security

1.0

SECTION 1 UNDERSTANDING THE INTERNET

OBJECTIVES

On successful completion of this section, you will be able to:

1. Define the Internet and understand how it was developed
2. Explain Internet services, including the Web, and how to connect to the Internet
3. Understand the purpose of a web browser

TOPICS

1. What is the Internet?
2. How Did the Internet Start?
3. Services on the Internet
4. Connecting to the Internet
5. What is the World Wide Web?
6. What is a Browser?



TOPIC 1: WHAT IS THE INTERNET?

The Internet is a global network connecting millions of computers. It is made up of millions of private, public, academic, business and governmental networks. These networks are linked in a variety of ways such as telephone lines, satellite links, digital cables, fibre etc. It is a decentralised network. In a decentralised network, no individual computer controls the entire network. Each server in the system has the same priority and shares the information equally with all the other servers. Overall security and control is hard to maintain with a decentralised network because each individual server controls which of its resources are shared or withheld.

The Internet carries a range of information resources and services, such as hypertext documents, email and file sharing. The information on the Internet can be in many formats – text, images, videos, sound files etc. Internet use has grown exponentially since the development of the Word Wide Web, which is covered later in this section.

Internet vs. internet

An internet (small i) is a group of networks connected by devices that exchange data with each other in packets. This allows those networks and the computers attached to them to communicate and exchange information with each other.

The Internet (uppercase I) is the name given to the largest set of interconnected internets in the world. Millions and millions of internets in countries around the planet are connected together to form the Internet. This allows the user of every computer on those networks to exchange information with each other, no matter where in the world those computers are located.

The following figure shows Internet users as a percentage of a country's population in 2012:

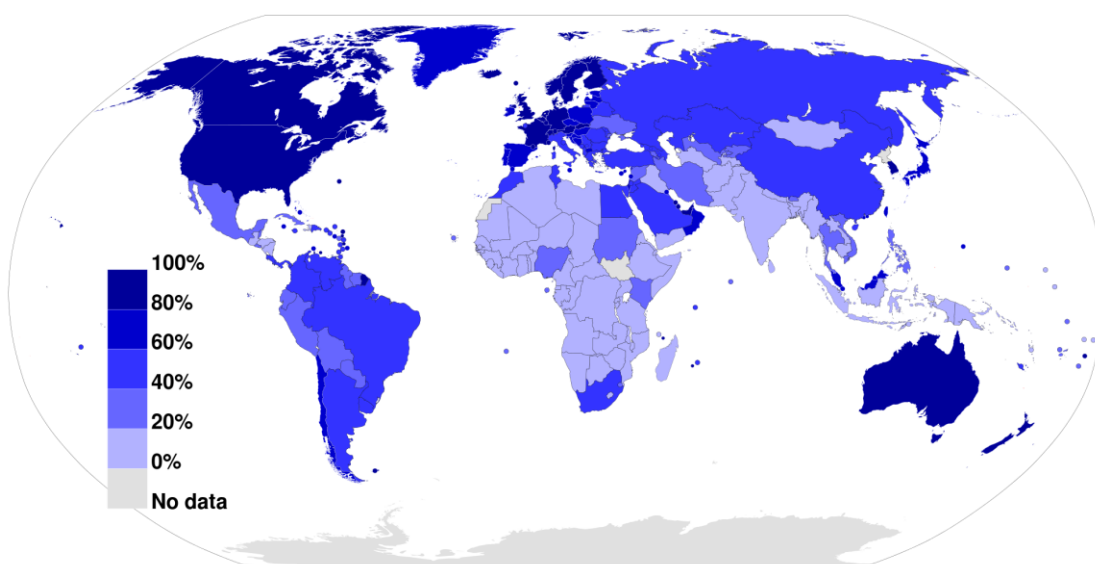


Figure 1-1

As you can see from the above figure, the Internet is available nearly everywhere.



TOPIC 2: HOW DID THE INTERNET START?

In the late 1960s, most computers were not networked. Any computer network was small and centralised. At this time, the US Government realised that their centralised network and any information stored on an individual computer were vulnerable to system failure, nuclear attack or sabotage. The **Advanced Research Projects Agency (ARPA)**, was set up to solve this problem and to provide a network which could communicate with the various government computers across the country.

ARPA, in conjunction with the US Department of Defense and the major universities of the day, developed the technology to enable computers to “talk” to each other. This network was called **ARPANET**. ARPANET was initially a small, local, decentralised network, with each of the computers sharing users and information. Over the years, the ARPANET proved very successful, particularly for communications between researchers and as a database of research information. More and more institutions, particularly universities, connected their networks to the ARPANET. As the system developed, people found other uses for this system, such as sending messages and files between computers. During the 1970s, standards were developed for exchanging messages. This created a decentralised web of interlinked networks that eventually became the Internet.

When commercial organisations saw how useful the Internet could be, they also began storing information. This led to a huge growth in the amount and diversity of information available, so the number of people using the Internet also grew. Now we see not only scientists and academics using the Internet, but also large corporations, small businesses, schools and home users.

As there is no single company, governing body or government controlling the Internet, it has become largely self-regulatory. This also means that individuals and companies can publish any information they wish. While proponents of free speech believe this is a wonderful thing, it also means that much questionable information is available on the Internet. Most questionable material on the Internet is easy to recognise and avoid. It is up to individual users to decide what they do and do not view.

The table below shows some of the major milestones surrounding the Internet and the World Wide Web:

Year	Milestone
1969	ARPANET carries its first packet of information from UCLA, Los Angeles to Stanford, San Francisco
1980	Ethernet standard introduced
1982	TCP/IP suite formalised
1983	DNS (Domain Name System) created
1985	First .com domain name registered
1991	World Wide Web protocols created
1995	IPv6 proposed
	Launch of amazon.com
	Launch of yahoo.com
	Launch of ebay.com
	Launch of msn.com
1996	Launch of hotmail.com
1998	Launch of google.com
	Launch of PayPal
1999	Wireless networking standard introduced
	Launch of Wikipedia
2001	Top level domains activated
	Launch of bit-torrent file sharing
2003	Launch of Skype Internet voice calls
	Launch of iTunes store
2004	Launch of Facebook social networking website
2005	Launch of YouTube video sharing
	Launch of Google Earth
2006	Launch of Twitter
2007	Launch of Google Street View
2008	Launch of Dropbox cloud-based file hosting
2009	Launch of Google Docs
	Launch of Bitcoin digital currency
2010	Launch of Instagram, photo sharing and social networking website

Table 1-1



TOPIC 3: SERVICES ON THE INTERNET

As mentioned in Topic 1, there are a large number of services available on the Internet. These services offer a variety of ways to retrieve information and transfer files and messages.

Service	Description
World Wide Web (WWW)	A service that uses a graphical user interface (GUI) to present information over the Internet such as images, sounds, text and videos.
Email	Email is used to send and receive text messages and files.
File Transfer Protocol (FTP)	This protocol (set of rules) is used to send and receive files across the Internet. Many types of files can be exchanged using this protocol including text, program files, images and word processed documents.
Video conferencing and file sharing	Video conferencing (or web conferencing) allows users to send and retrieve video footage of each other anywhere on the Internet. File sharing enables users of a forum to create, manipulate and share computer files (documents, images, sounds or video) on a real time basis.
Internet Relay Chat (IRC)	IRC is a text-based chat system. It allows you to “talk” with people around the world in real time. You type in a message and other people read it and reply to you straight away.
Instant messaging	Instant messaging (IM) is a form of real-time communication between two or more people based on typed text. In some cases files can also be exchanged.
Blogs	A blog is a web page that serves as a publicly accessible personal journal for an individual. Typically updated daily, blogs often reflect the personality of the author.
Newsgroups/forums	These are a form of electronic bulletin board. They allow you to post a message to a “group” relating to a particular topic. Other people visiting the group can read your message and reply to it or post a new one.
Social networking	Social networking is the business of engaging and interacting with other Internet users in a communal online space. An example of this is Facebook. It is a combination of a blog and a newsgroup.
Telnet	Telnet allows you to log into a remote computer on the Internet. This is commonly used for accessing resources in libraries around the world.
VoIP	Voice over IP (VoIP) allows for the transmission of voice through the Internet. VoIP allows users to talk to each other using their computers and in some cases to also use the regular telephone networks anywhere through any Internet Service Provider, to call normal telephone numbers. An example of this is Skype.
Video/audio streaming	Streamed video or audio is constantly received by an end-user via the Internet while it is being delivered by a streaming provider. An example of this is YouTube.
Web applications	A web application is an application or service that provides similar functionality to a program but it runs on a web server and is delivered to and used by the end user in a browser window. An example of this is Google Apps or Microsoft Office Web Applications.
Web operating systems	This is a virtual operating system that runs in a web browser. It turns a browser window into a desktop operating system, so that you can access your desktop from any computer on the Internet.

Table 1-2

From the table above, you should realise that the Internet is more than just the Web.



TOPIC 4: CONNECTING TO THE INTERNET

All modern computers and laptops are capable of connecting to the Internet, as are many other devices, including mobiles, tablets, e-readers, televisions and video game consoles.

The two main ways of connecting to the Internet are by using a wired or wireless connection. Within each of these two types there is a wide variety of technologies that can be used to provide the Internet connection.

The most popular method of getting the Internet is to connect via wired broadband. This method often uses the phone lines, but allows you to make calls at the same time. Wired connections can also use a dedicated coaxial cable line, a fibre optic line, or even power lines. These connection types are known as dial-up, ADSL, DSL, ISDN, Cable, broadband, T1 line, and Broadband over Power Lines (BPL). They all require some form of a modem.

You could also connect using mobile Internet from a mobile network provider. This can be used anywhere there is a mobile signal but is often slower and more expensive than broadband through a landline. A mobile connection uses satellite, radio waves or microwaves for transmission of data. No physical lines are required. The wireless connection is known as mobile broadband, satellite broadband, Wi-Max, Wi-Fi, LTE or HSDPA, depending on which technology it uses. These types of connection use a satellite dish, a wireless card via the mobile phone network, a USB transmitter, or a wireless device that communicates with local transmission towers.

The above information is general information about different ways to connect to the Internet. You are now going to look specifically at connecting to the Internet from home using wired broadband.

To connect to the Internet at home using wired broadband you will need:

- A computer (a reasonably up-to-date one where possible)
- A telephone socket
- You will need to choose an **ISP** (Internet Service Provider). This could be the company that provides your telephone line or a third-party broadband provider.
- You will usually need a **microfilter** - this is a device that splits the signal in the telephone wire so that you can have broadband and talk on the phone at the same time
- A **modem** (this is often built into your ADSL router)
- You will need web browsing software, such as Internet Explorer or Mozilla Firefox. A web browser often comes bundled with your operating system, but once connected to the Internet you can download a different one.

Internet Service Providers

You need to select an **Internet Service Provider (ISP)**. There are numerous ISPs available, each with individual pricing structures. An ISP provides you with an account and password and then allows you to dial-up or connect to the Internet on a pay-as-you-use basis or for a fixed fee. The charges can either be based on how many hours you connect to the Internet for (usually used with dial-up connections) or how much material has been downloaded to your computer (used with cable/broadband/wireless connections). Dial-up connection packages may also allow an unlimited connection time and no limits on the amount of material you can download for a fixed fee. Cable/broadband type packages are

usually charged based on a fixed fee for a particular monthly data download/upload limit, after which you must pay extra charges to download more data in that month.

Modems

You connect to your **ISP** using a **modem**. A modem converts the computer data into a signal that can be transmitted over the line or via the wireless signals from one computer to another. A cable modem uses a dedicated cable to transmit data, which is separate from the telephone lines. The speed of a dial-up modem is measured in **bits per second (bps)** while the speed of a Cable/broadband/mobile modem is measured in **megabits per second (Mbps)**. The higher the number, the faster the modem can transfer data.

Firewall

If your computer is attached to a network, connection to the Internet is commonly made through a firewall. A firewall is a program that controls and monitors Internet access and security. In an organisation of networked computers it usually resides on a dedicated computer on the network. Firewalls can also be installed on individual computers that have access to the Internet to provide it with security protection. An example of this software is Windows Firewall.



ACTIVITY

1. Open Internet Explorer (IE). Go to a search engine of your choice. Search for Internet Service Providers in New Zealand. Research what packages they offer. Answer the following questions.
2. Name four Internet Service Providers available in New Zealand:

3. Name a New Zealand ISP that offers Cable? Is it available all over the country?

4. Name a New Zealand ISP that offers naked broadband (Internet connection without a phone line). How much does it cost per month?



TOPIC 5: WHAT IS THE WORLD WIDE WEB?

Earlier in this section you learnt that the World Wide Web (the Web) is a service that presents information over the Internet. Most of the information that is viewed on the Web is written in **Hypertext Markup Language (HTML)**. There are other languages that are used in HTML documents such as PHP or ASP etc. but most pages that you read over the Web are written in HTML. Your web browser translates this language into readable, presentable information. The web pages are stored on many different servers throughout the world. A collection of web pages is called a **website**. They can link to each other using **hyperlinks**. A web page can contain such content as text, images, videos and other multimedia, as well as hyperlinks to navigate between pages. Hyperlinks are the main form of navigation on the Web. They can be text (usually underlined), images or buttons. When you click on the hyperlink, you load the relevant document, or go to another section of the currently loaded page. This document can be on the same computer or on a computer on the other side of the world. Each web page has a unique address that is known as the **Uniform Resource Locator (URL)**, which is used to uniquely identify it.

Some people use the word Internet synonymously with the World Wide Web. This is incorrect. It is a service that runs on the Internet infrastructure.

Before the Web, the Internet only provided screens of text. Information was shared, but not in a graphical way. HTML is what allows pages to display different fonts, colours, sizes. The Web allowed for graphics and sounds to be displayed and exchanged.

There are a number of concepts that were brought together to build the concept of the Web – using a mouse to click on words and navigate using hyperlinks, using web addresses and the Domain Name System, and using graphics and HTML. These ideas were brought together by Tim Berners-Lee in 1990 to create a more standardised method of sharing information between the institutions using the Internet. He created the **hypertext transfer protocol (HTTP)** to be able to send and receive web pages from a web server to a client computer. In 1991 web browser and web server software was available, and the following year a few intuitions had websites. By the end of 1992 there were less than 50 websites in existence. This number has grown exponentially since then, as can be shown from the graph below (data for the most recent years is not available):

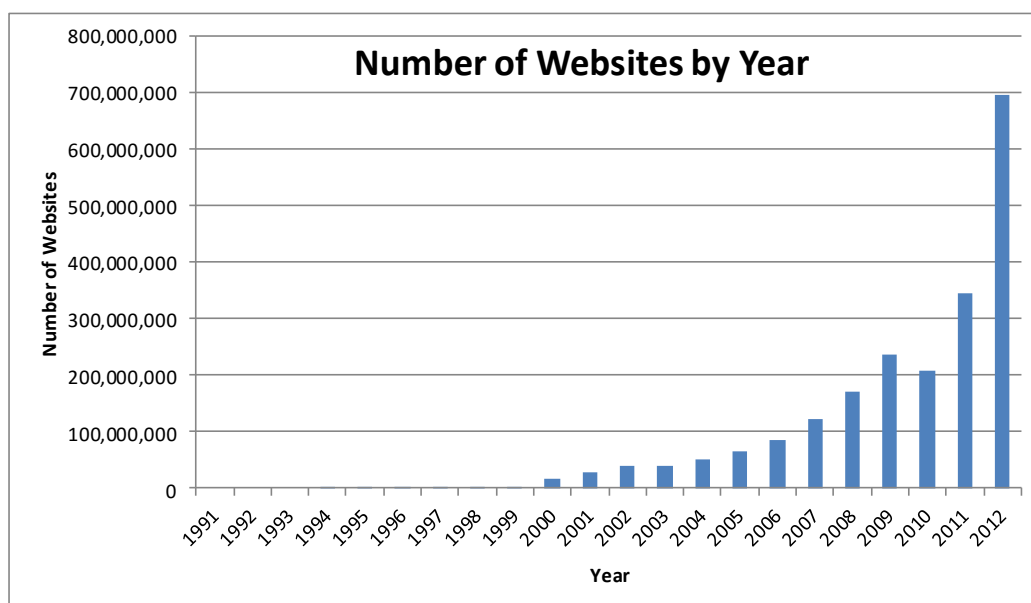


Figure 1-2

In the figure above, websites are classed as unique host names. Not all websites today are active - a domain name can be reserved (parked), i.e. someone has bought it, but is not actively using it.

The reason that the Web has become so widely used so quickly is that web technology (e.g. HTML, HTTP and web browser software) was made freely usable. By the end of 1994 there were more than a million browser copies in use. Since then, the number of websites and Web users has grown dramatically.

Most websites have a default page that is loaded when you visit that website without requesting a specific page. This default page is known as a **home page**.

Web pages can also act as front ends for information in databases, and run applications via the GUI.



TOPIC 6: WHAT IS A BROWSER?

A **web browser** is a piece of software used to retrieve, present and navigate the information held on the Web. It can interpret the HTML code (explained shortly) and hypertext links in web pages to show and access the required information. The current major web browsers are Firefox, Internet Explorer, Google Chrome, Opera, and Safari. Over time the different browsers have held the market share as shown in the figure below. In the past other browsers were popular, e.g. Netscape and Mosaic, but these browsers did not stand the test of time. In the mid-1990s Netscape had over 90% market share.

Usage share of web browsers

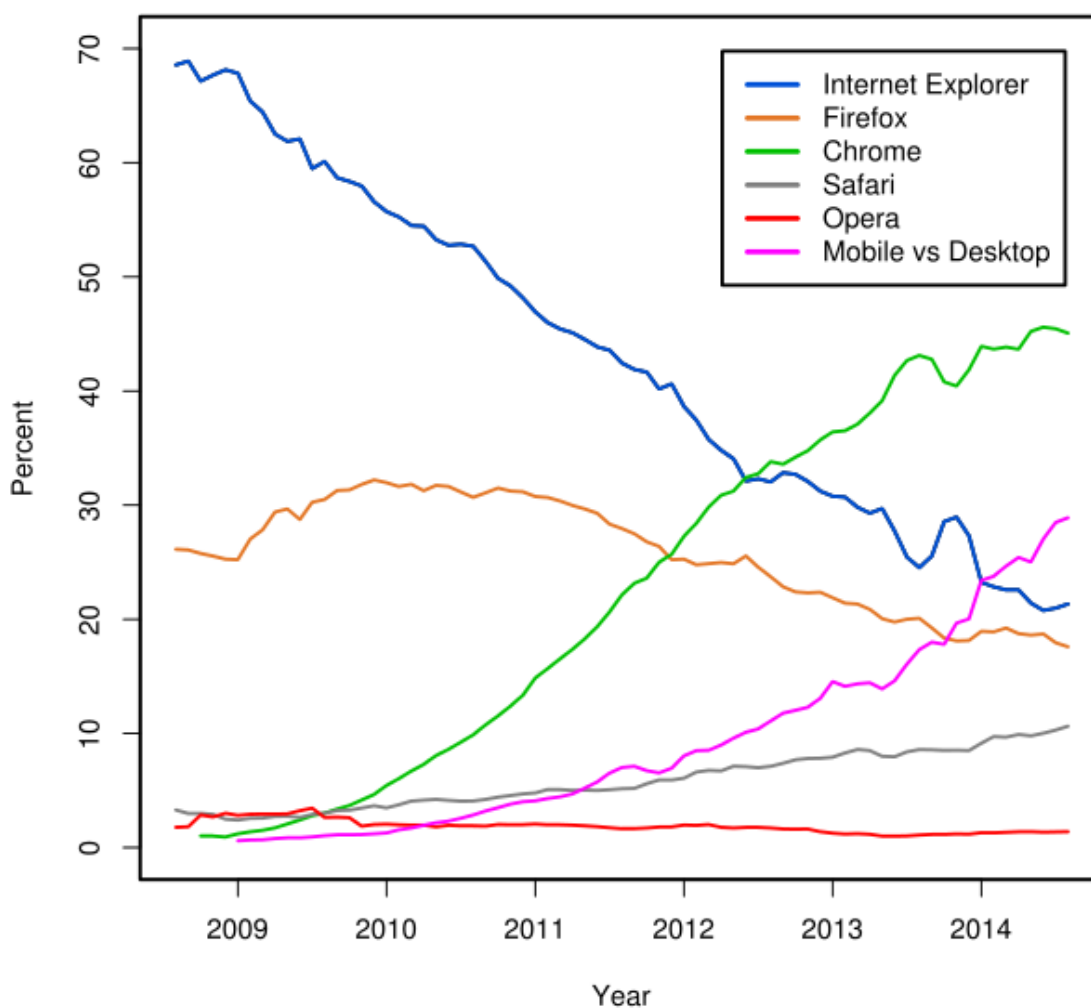


Figure 1-3

All current web browsers provide essentially the same capability and function.

The web browser software allows web clients and web servers to communicate with each other. When you type a web address into the Address bar of the browser, an HTTP command is sent to the web server at that web address instructing it to send the requested web page and display the information in your browser.

The information is written in an HTML document. The browser interprets the HTML language and then displays the page appropriately. The HTML code contains information such as what content is on the web page, fonts, colours, images etc. and how that

information is to be presented. HTML code within HTML documents can also contain programming code that allows a web page to run applications, interact with databases, display videos, and produce sound.

**SELF-TEST**

1. What five components do you need to connect to the Internet if you are not connected to a LAN?

2. What is meant by the term browser?

3. What does HTML stand for?

4. What is a URL?

5. Which service allows you to log into a remote computer?

SELF-TEST ANSWERS

1. A computer, a modem, an Internet Service Provider, a browser and a phone line or cable.
2. Software that allows the user to view material on the World Wide Web.
3. Hypertext Markup Language
4. A Uniform Resource Locator is another name for a web address.
5. Telnet

2.0

SECTION 2 BROWSING WEB PAGES

OBJECTIVES

On successful completion of this section, you will be able to:

1. Use Internet Explorer to browse the Web
2. Differentiate between the different parts of a URL
3. Use a variety of search engines to find useful information
4. Describe the features of common plug-ins

TOPICS

1. Using Internet Explorer
2. Uniform Resource Locators (URL)
3. Using the Web
4. Finding Information Using Search Engines



TOPIC 1: USING INTERNET EXPLORER

Internet Explorer is Microsoft's browser and comes built in with Windows. The default browser being used with this workstation image is Internet Explorer 9. You will learn about many of its features in this module, although it has some more advanced features that are beyond the scope of this module. Please remember that web pages can appear slightly differently when viewed in different browsers because of the different way they interpret web pages.

Internet Explorer was first launched in 1995. It soon became a free download or available with Windows operating systems. Features and technologies have been added to Internet Explorer over the years. As new releases of Internet Explorer become available older releases stop being supported, patched and updated.

The features of the early releases could be seen as simple compared to the features available in the latest release, for example:

- IE1 was advertised as having an install routine replacing a manual installation required by many of the existing web browsers
- IE2 was launched in 12 languages
- IE3 allows backwards compatibility because the installation converted the previous version to a separate directory

Whereas in contrast, later releases had cleverer features:

- IE8 allowed InPrivate browsing and Web Slices
- IE9 supported HTML5
- IE10 supported more complex CSS features
- IE11 is only available on Windows 7, 8.1, and Windows Server 2008/2012 R2 editions.



ACTIVITY: Using IE

1. Internet Explorer (IE) is not in the Windows **Start** menu pane in your workstation because it is not the default browser, so we will start it by clicking the Windows **Start** button (see below).

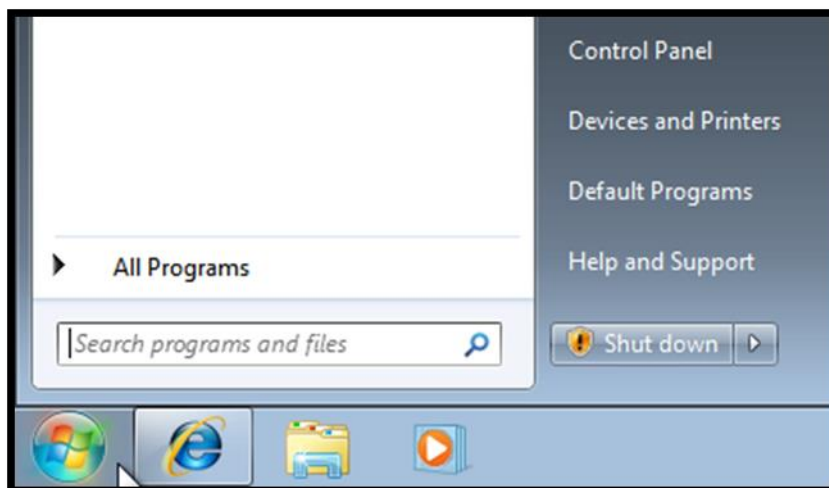
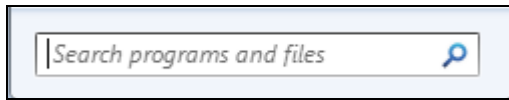


Figure 2-1

In the **Search** box: text field, type **ieexplore** and press **Enter**.



This will start the Internet Explorer browser (see the figure below). The web page you see will be different from this.

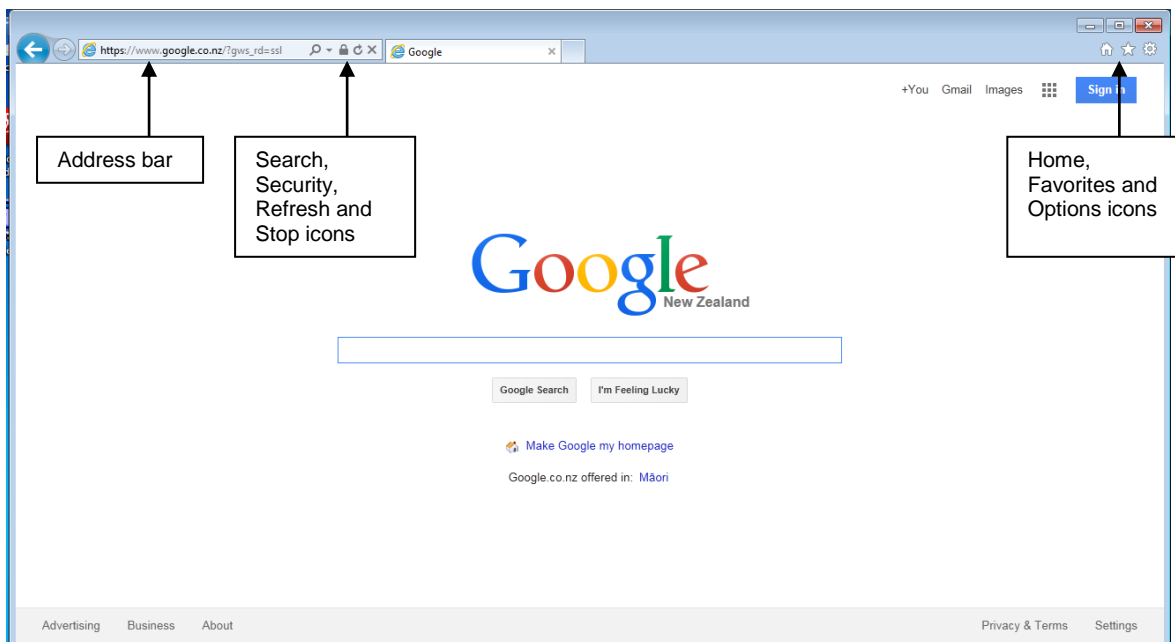


Figure 2-2

The main features of the Internet Explorer screen are as follows:

Address box - This is where you enter a URL (Uniform Resource Locator). This could be a website or a file location. The Address bar and search box are combined into one new Address bar.

Refresh button - If you get a message that a web page cannot be displayed, or you want to make sure you have the latest version of the page, click the Refresh button.

Home button - Clicking this will take you to the website you have designated as your home page. You can nominate your home page by selecting the **Tools** ⇨ **Internet Options** ⇨ **General** tab, and then changing the Home page address in the box. You can use the **Use Current** button to set it to use the current webpage open in the browser, or enter another one. Click **OK** when finished.

Navigational controls - In Internet Explorer 9 these are streamlined and simplified. The back button is larger.

Favorites Bar/ Command Bar – These bars are no longer visible automatically as they were in previous versions of IE. Where the Command bar used to be is now only three icons, Favorites, Home and the Options cog. You can view the full Favorites bar and the full Command bar by right clicking next to the three icons in the top right and choosing the bars you want.

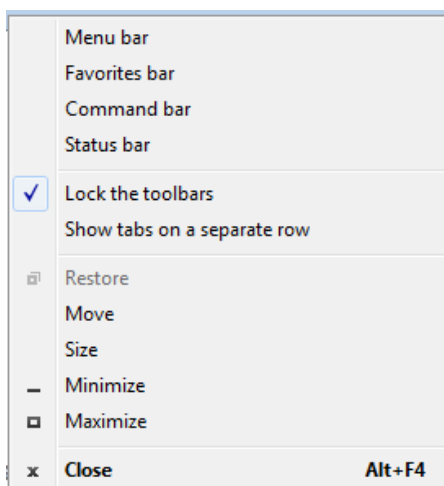


Figure 2-3

Menu Bar - On your screen in IE you may also see the Menu bar which is right underneath the Address bar. If the Menu bar does not show automatically you can right click on the blank area next to the Command bar and choose Menu bar from the menu. It contains menus named File, Edit, View, etc. The Menu bar allows you to work with IE and gives you another way to access some of the same options that are on the Favorites bar and the Command bar.

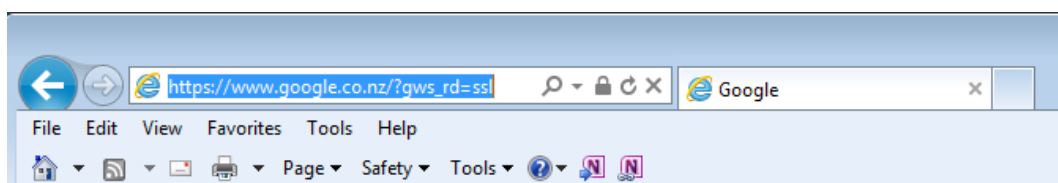


Figure 2-4

Features of Internet Explorer

There are a number of options and features available to you when you use Internet Explorer that make searching the Web more efficient, save you time or are just useful tools. A number of these are described below:

Favorites

- Click the **Favorites** button . The Favorites panel will appear on the right of the browser. From this panel you can configure your Favorites, Feeds and History. The Favorites tab will display a list of favourites down the left side of the pane. Folders can be closed and opened by clicking on them. Click the **Favorites star** above the pane again to close the Favorites panel.

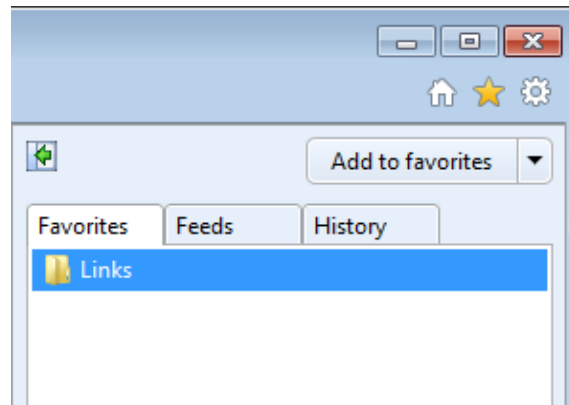


Figure 2-5

3. Clicking Add to Favorites... in the Favorites panel will display a dialog box that allows you to save the location of the current page. The name will be whatever is displayed in the browser's title bar. You can alter this to whatever you like.

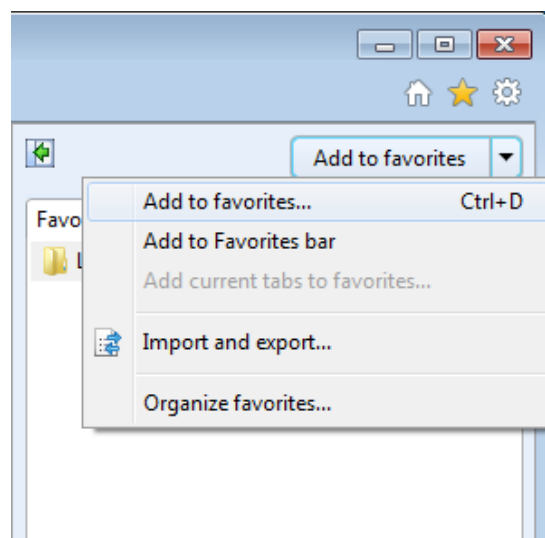


Figure 2-6

4. To save the page location so it is accessible directly from the **Favorites** panel, click the **Add** button. Alternatively, if you want to save it in one of the displayed folders, click the **Create in** list box down arrow and then click on the folder in which you wish to save it. You can also click on the **New folder** button to put the page in a new folder.

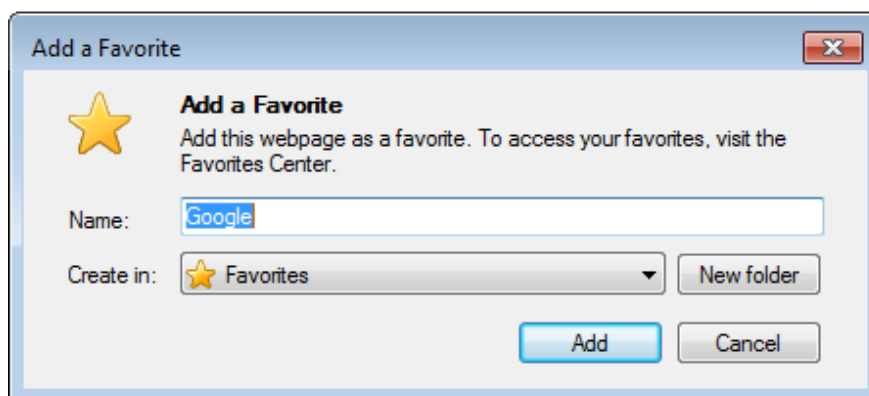


Figure 2-7

5. Since IE automatically puts your new Favorites at the bottom of the list, it is often useful to re-order them into another folder or location. It is also very easy to accumulate a large number of bookmarked websites. IE allows you to delete, rename and organise them.
6. You can create extra folders by clicking the down arrow ▼ beside the **Add to Favorites** button in the Favorites panel, and then selecting **Organize Favorites** and then clicking the **New Folder** button. If you want the new folder to appear within an existing folder, then first select that folder. If you want the folder on the same "level" as an existing folder, ensure that you have no folder selected in the window by clicking anywhere outside the list box. You can then type in the name of the folder and press **Enter**.
7. To load a bookmarked page: From the **Favorites** tab click on the required page.
8. To edit or move favorites:
 - Select the bookmark or folder to be moved.
 - Drag the bookmark to the new location or new folder. A line appears displaying the new position of the folder.
 - Release the mouse.
9. To delete a folder or page from the Favorites list:
 - Select the folder or page to be deleted.
 - Click the **Delete** button.
 - Click on the **Close** button.



ACTIVITY: Using Bookmarks

The purpose of this activity is to practise using bookmarks:


1. Ensure that IE is open.
2. Open the www.adobe.com home page.
3. Add this page to your bookmarks list.
4. Go to the www.stuff.co.nz home page.
5. Add this page to your bookmarks list, calling it **Stuff**.
6. Go to the www.google.co.nz search page and add it to your bookmarks list.
7. Go directly to www.adobe.com using the bookmarks list.
8. Go to the Stuff home page using the bookmarks list.
9. Delete www.adobe.com from your bookmarks.
10. Go to the Google search page using the bookmarks list.
11. Exit IE.

If you regularly use the Favorites feature, you might like to be able to import your favourites from another computer or export them to other computers. You can do this by clicking the down arrow ▼ beside the **Add to Favorites** button in the Favorites panel, and then selecting the **Import and Export...** option. This will start the **Import/Export Wizard**.

Managing your Favorites

Web pages are constantly being added, updated and removed, so it is likely that some entries in your Favorites list will outlive the pages they access. Favorites therefore need to be edited and deleted from time to time.

History

To find a page you have visited recently click the **Favorites** button  and then from the right hand panel, click the **History** tab.

The History tab appears, containing links for websites and pages visited in previous days and weeks. In the History tab, click a week or day, click a website folder to display individual pages, and then click the page link to display the web page. An example listing is shown in the figure below. To sort the list, click the down arrow next to the **View by Date** box at the top of the tab and select one of the options. You can hide the tab by clicking on the **Favorites** tab.

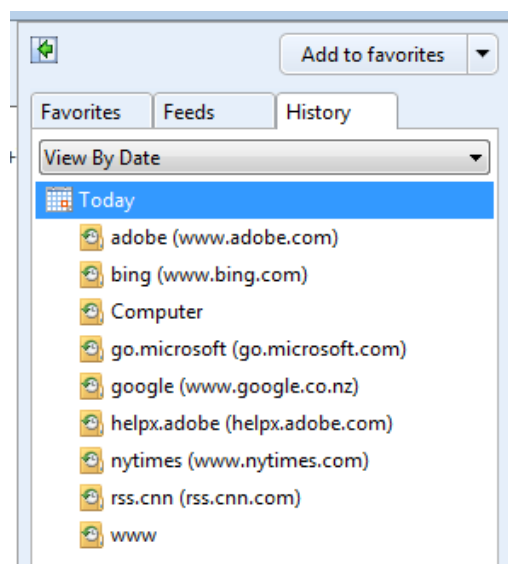


Figure 2-8

You can nominate how long the visited website information is kept by selecting the **Options cog** in the top right, then choosing **Internet Options** ⇨ **General** tab and then clicking the **Settings** button in the **Browsing history** section. In the **History** section at the bottom of this box, you can specify the amount of days IE will keep a record of the websites that you visit. The more days you specify, the more disk space is used on your computer to save that information.

Command Bar Options

Previous versions of Internet Explorer had the Command bar icons automatically showing. In IE9, the only icons showing by default are Favorites, Home and the Tools cog. To access the usual Command bar commands you can view the Command bar by right clicking next to the three icons in the top right and choosing Command bar. This will display the full Command bar below the Menu bar (if you have made that visible).

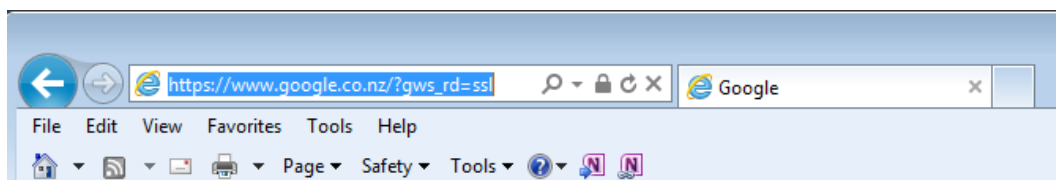


Figure 2-9

There are a number of items on the Command bar that contain useful options:

Page – You can find options such as cut, copy, paste and save. Also you can change how you view the web page from here, zooming in and out and settings a text size.

Safety – This drop down menu contains such options as Delete Browsing History... which does exactly what it says – you can choose whether to delete temporary Internet files, cookies, history, form data, passwords and InPrivate filtering data. Deleting temporary Internet files will free space up on your hard drive, and deleting passwords, cookies and form data is useful if you are using a computer in a public place.

Other useful options on this menu are InPrivate Browsing, which prevents you browser from retaining browsing history, temporary files, form data, cookies and usernames and passwords. This is different from deleting the browsing history just mentioned as it prevents the browser from storing this information in the first place, rather than deleting it afterwards.

InPrivate Filtering prevents website content providers from collecting information about websites you visit. Website content providers can use your information to build a profile of your browsing preferences. They can then use this information in targeted advertisements.

Tools – This menu contains options such as which toolbars are displayed, but one of the most useful items for configuring Internet Explorer is the Internet Options item. In the General tab is the option to set your home page. It also contains the default search options. Through the Internet Options you can add/change/remove search providers. The Security, Privacy and Content tabs have safe default security options to allow you to browse the Web safely. The Programs tab allows you to choose which default programs can be used for an action on the Internet, e.g. when you click on an email link on a web page you could open windows Live Hotmail rather than Outlook. In Internet Explorer 9, unlike some other web browsers you cannot choose where you want downloads to save to when you click on them on the Web. This is because you choose at the time of saving where you like the item saved to.

A selection of the tools described from the three menus are available to you by clicking on the Options cog icon of the small Command bar at the top right of the browser.

Using Internet Explorer to Browse the Web

Now that you have identified features of Internet Explorer and learnt about its basic configuration settings, you are going to look at how to use it to browse the Web efficiently.

Tabs

When you are browsing web pages there may be times when you would like to have different web pages open at the same time, so that you can quickly move between them. You can do this in two ways:

- Open a new Internet Explorer window
- Open a new Internet explorer tab in the same window

You can either open a new blank tab or windows and then browse to a web page, or you can right click on a hyperlink on the current page and either open the in the same window, a new windows or a new tab. The next activity will take you through these steps:

1. Open Internet Explorer, and then open the website www.google.co.nz .
2. Notice that above the pane which shows you the web page, that there are some tabs. You can have multiple tabs in the one Internet Explorer windows, each containing a loaded website that you are browsing.

The tiny right most tab is the New Tab button (if you hold your mouse over a New Tab icon is added to it), which when clicked will open a new blank tab which you can use to open another web page or to reopen previously closed tabs, or to access other tools.

Using multiple tabs allows you to quickly move between them by clicking on the tab that represents each opened web page.

3. The New Tab button is not the only way to open a tab. Click on the Google tab, and then right click on the link named Images at the top right of the page (see the figure below). This will open a menu, which has an option on it named Open in New Tab. If you select this, this will open the web page that the link points to in a new tab. Try this now.

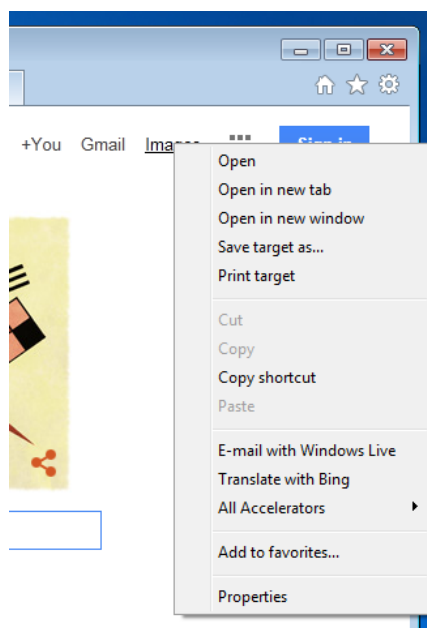


Figure 2-10

4. Once you have a few tabs open, you can reorganise them. If you move the mouse pointer toward the right edge of a tab a small x will appear, which allows you to close the tab.

If you click on the tab and hold the left mouse button and then move the mouse pointer, you can change where that particular tab is located. This allows you to place the tabs in an order that supports how you are working. Try this out now by clicking the New Tab tab and holding it and then dragging it in front of the Google tab and then dropping it there.

5. When you have lots of tabs open they will get smaller to accommodate them all to fit into the Internet Explorer window.

Windows

6. Have a look back at Figure 2-10 and you will see that the right click menu has an option **Open in New Windows** on it. You can use this option to open the web page that the link you right click on represents in an entirely new IE window. You could then open tabs within that window and move between the two IE windows to view different web pages that you have open.

You can also open a new tab or a new window from the File menu.

When you have multiple Internet Explorer windows open you can hover over them in the taskbar and you will see a description of the loaded web page that matches what is written in the tab for that page.

Zoom

7. To quickly zoom in and out when using Internet Explorer you can press **Ctrl** and **+** to zoom in and **Ctrl** and **-** to zoom out. The zoom changes in increments of 25% each time you press these keys.


Other web browsers such as Firefox and Google Chrome also have some of these features like tabs, so you can also try out these tools when you are using other browsers, but remember that they may operate slightly differently to the way they do in IE.

RSS

RSS stands for Really Simple Syndication, a two-way Web content distribution system based on **feeds** and **readers**. An RSS feed is a web page consisting of simple headlines and brief summaries of recently added or updated content (e.g., news stories, blog postings). Each item is linked to the full document at the main website. A website's RSS feeds range from general to specific, and always include a link to subscribe to the feed.



Internet Explorer 9 has a built-in RSS reader, making it easy to identify, subscribe to, and access RSS feeds.

Locating RSS Feeds

In some instances, Internet Explorer 9 will automatically indicate that a website has RSS feeds by illuminating the **Feeds** button . At other times, you will need to manually locate a website's **Feeds** page. The Feeds button is in the Command bar of IE9. If the Command bar is not visible you will have to show it (right click anywhere at the top of the browser and select Command bar).

Locating RSS Feeds Manually

The steps to do this are:

- Navigate to a website. For example, www.twincities.com (the St. Paul Pioneer Press website). Although the website has RSS feeds, we will not use the **Feeds** button.
- From the website's main page, locate the link on the website for RSS feeds page. The link for a website's RSS feeds page is often located in the side menu or in the page footer.
- Websites may refer to RSS feeds with text or the RSS  or XML  logos. Click the link. The website's specific RSS links are displayed.

- Click the link for the specific RSS feed you want to view. The selected RSS feed is displayed.



Subscribing to RSS Feeds


When you subscribe to a feed, new content is automatically downloaded from the website, so the feed is always up to date. There are many ways to subscribe to feeds. Here are a few:

- Subscribe to feeds directly from Internet Explorer. This is what is described below
- Use RSS reader software
- Click a link on personal web pages

Viewing RSS Feeds

After you have subscribed to an RSS feed, you can access it directly from the Feeds tab in the Favorites Center.

1. Click **Favorites**  **Favorites**. The Favorites panel appears.
2. Click the **Feeds** tab. The Favorites panel displays the RSS feeds you are subscribed to.
3. To determine when a feed was last updated, hover your mouse over the desired feed. A box appears telling you how many new or updated stories have been added to the feed and how recently it was updated.
4. To refresh a feed, hover your mouse over the desired feed then click the refresh icon on the right . The most current stories and updates are added to the feed.
5. To view a feed, click the feed title. Internet Explorer displays the selected feed page. The Favorites panel closes.

To read a full article, from the RSS feed page, click the article title or click the **green arrow**  under the title for the feed. Internet Explorer displays the full article at the feed provider's main website.

Due to the CPP system settings on-campus, RSS feeds may not display correctly.

Printing a Web Page

It is often useful to print the information that you find on a web page. A web page may take up more than a traditional page of paper, so the printer may produce more than one page.

To print Web pages:

- Click on the **Print** button  in the Command bar.

If you only want to print part of the page, you can achieve this easily in one of the following ways. You can either select the part of the page you want to print, then in the print options choose to print **Selection** in the Page Range area, or you can drag the mouse over the part of the page you wish to print, select **Edit**, then **Copy**, open up Word or a similar application and paste it into a new document. You can then print this document from within Word.

Plug-ins

Additional features and capabilities for web browsers are being developed all the time. These enhancements are often developed by a third party to add on to your browser. Small programs which can be added to your browser to enhance its features are called **plug-ins** or **add-ins**.

There are numerous plug-ins available with different features and uses. Some plug-ins allow streamed audio or video, so your browser can be used like a radio or TV, listening or viewing material in real time. Some can also provide 3D capabilities to your browser.

When you find a plug-in that you wish to install, you can either click a link to have it automatically installed within your browser, or you can download some plug-ins onto your computer then run a setup program to integrate the program with your browser. A page containing additional features will advise you of the need for any specific plug-in, and will often provide a link to install or download the plug-in required automatically.



TOPIC 2: UNIFORM RESOURCE LOCATORS (URL)

The term **URL** stands for **Uniform Resource Locator**. A URL is commonly called a **web address**. Every service and every page on the Web has a unique URL. When you type a page's URL into the Address bar of your browser you are telling a particular server on the Internet to send you a particular document over the Internet. Your web browser then displays that document.

You can tell a lot about a document and where it is from by looking at the URL. A URL has a number of components:

A protocol/scheme name – A number of services run over the Internet, not just the Web. A protocol is the method used by the computers to access and transfer the information. Some examples of protocols are:

- http/https – used for accessing hypertext documents. Most web pages are accessed using this protocol.
- ftp – used for file transfer protocol
- imap – used for accessing email through IMAP
- telnet – used to make a telnet connection
- news – used to access newsgroups and postings
- A sub-domain – sometimes this is referred to as the host name when combined with the domain name. For web addresses this is usually www. Some domains do not always have a sub-domain, e.g. <http://google.com>
- A domain name – Domain names are formed using the rules of the Domain Name System. They are organised in levels. In the URL <http://www.google.co.nz> google.co.nz is the domain name. The .nz part is the top-level domain. co is in the next level, and google is the domain in the level below that. Many organisations have their company name as the main part of the domain name. There are many types of domain as well as .co:
 - .edu or .ac Educational institution (school or university)
 - .gov or .govt Government department or organisation
 - .org Non-profit organisation
 - .net Networking related company (a large ISP)
 - .co Commercial organisation (sometimes this is .com)

The domain name may end with a national designator to indicate in which country the domain name is registered. If no national designator is included in the URL (as in the Microsoft home page), then the domain name usually belongs to an American-based website. National designators include:

- .au Australia
- .jp Japan
- .nz New Zealand
- .uk United Kingdom
- .us United States

You may also hear the term “Fully Qualified Domain Name” (FQDN). An FQDN consists of a host and domain name, including top-level domain. For example, www.webopedia.com is a fully qualified domain name. www is the host, webopedia is the second-level domain, and .com is the top-level domain.

- A file path and file name – after the domain name there is often a file path and/or a name to identify where on the web server the document requested is stored and what it is called. Many websites have organised their web servers so that they do not display the filename of the actual web page, but will display the file path only.

The `://` is the separator between the protocol and the remainder of the URL. You do not need to type in `http://` when you enter a URL. If you leave this out, Internet Explorer (and most browsers) will automatically add it for you.

Some domain names are very expensive due to being easy to remember and therefore getting many hits when people search the Web. Domain names can be leased for a finite period of time after which they come up for lease again. The company that owns the current lease can buy the domain again for more time or it is made available to buy by anyone else. Some domain names resell for a large amount of money. Here are the top ten:

- Insurance.com \$35.6 million in 2010
- VacationRentals.com \$35 million in 2007
- PrivateJet.com \$30.1 million in 2012
- Internet.com \$18 million in 2009
- Insure.com \$16 million in 2009
- Sex.com for \$14 million in 2010
- Hotels.com \$11 million in 2001
- Fund.com \$9.99 million in 2008
- Porn.com \$9.5 million in 2007
- Fb.com by Facebook for \$8.5 million in 2010

Some companies buy domain names that are similar to their real one and redirect people to their actual website. For example www.coke.com redirects to <http://us.coca-cola.com/home/>

There are phishing scams that use this technique. They buy a domain name similar to e.g. a bank and then make the web page look exactly the same as the bank in question. Customers of the bank type their account and password details into the fake page which are then used fraudulently by the scammers.

Some national designators can be used to make a government money. Tuvalu is a small island nation in the Pacific Ocean. Its national domain name designator is `.tv`. This is very clearly like the word television. The `.tv` domain sells for a premium price, e.g. `reddit.tv`. The Tuvalu government owns 20% of the company that issues `.tv` domain names. The government receives a quarterly payment of \$1 million for the use of the top-level domain.



TOPIC 3: USING THE WEB

Moving or navigating your way around the Web is called **browsing** or **surfing**. Browsing includes searching for topics of specific interest, following links from pages that you find interesting, and locating specific pages of information.

You can search or browse the Web for information in a variety of ways. In this section you are going to look at:

- Browsing using URLs
- Browsing using links
- Downloading files from a website
- Downloading files using FTP from within a web browser

Browsing using URLs

By typing a URL into the **Address** box as shown in the figure below, you can jump directly to the Web page required.

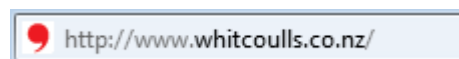


Figure 2-11

The down arrow at the end of the address/search box can be used to display a list of the previously used URLs, as shown in the figure below.

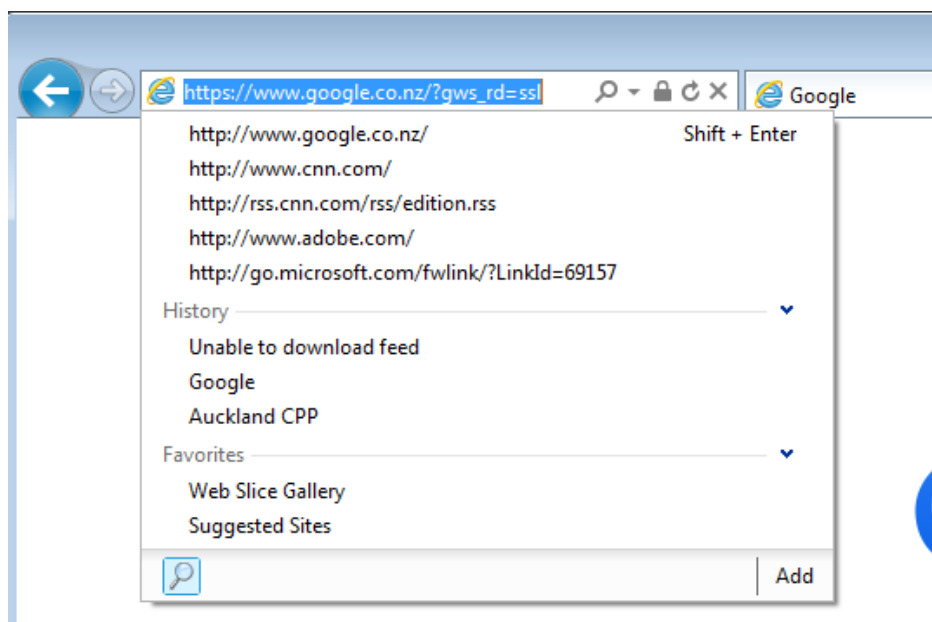


Figure 2-12

URLs may be case sensitive, depending on the website. If the web server's file system is a Windows system the URL will tend to be case insensitive as the underlying file system is case insensitive. Websites hosted by UNIX type systems tend to be case sensitive as their underlying file systems are typically case sensitive. The host/domain part of the URL is always case insensitive, but the file path and file name part is the part that could be case sensitive. If it is so, the correct case must be used when entering the URL for a specific page.

To Enter a URL:

- Click in the Address box.
- Type the required URL. Type over the existing text or delete any previous address.
- Press **Enter** or click the **Refresh** button.

Browsing Using Links

URLs have to be entered exactly, so rather than type URLs you can use **Links**. Links are incorporated into web pages to allow easy navigation. Links can often be used to find other websites of similar content, places of interest and popular Internet websites.

A link is a way of moving directly from one web page to another by clicking on linked text or a linked picture. The URL is hidden behind the text or picture. By convention, as shown in text links are underlined, are often in blue text. When picture links are created, have a blue border by default. Most websites remove this border so that the picture looks more in keeping with their colour scheme. Many websites following the convention of the hyperlinks being coloured blue or underlined, but increasingly links are more intuitive and are recognisable given the content and layout of a web page. Below are examples of text and hyperlinks – the first with the standard blue text and underlining, and the second keeping with the blue theme but not underlining unless you hold your mouse over the text.

[TVNZ: News & Weather, TV On Demand & TV Guide](http://tvnz.co.nz/)

tvnz.co.nz/ ▼

Watch your favourite shows On Demand, get more on the programmes you love, check what's on with our TV guide or catch up on the latest news & weather."

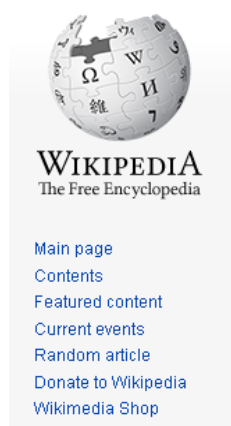


Figure 2-13

The best method of determining whether text or an image is a link is to place the mouse over the text or graphic. When the mouse pointer is positioned over a link, the cursor changes to a pointing hand, and the URL is displayed in the status bar (on the bottom left of the browser window).

When you have moved to a web page using a link and then go back to the original page, the visited link changes colour, by default to purple, although as with images, many websites change the colour of the visited hyperlink to fit in with their colour scheme. This allows you to recognise that you have accessed a link, and can be very helpful if there are a number of links on a page.

A hyperlink can point to whole document, or to a specific element within a document, including linking to elsewhere in the current document. A hyperlink has anchor text (sometimes called a link label). It is the visible, clickable text in a hyperlink. In an image hyperlink the anchor is an image rather than text. The anchor can also be part of an image (often called a hotspot). Anchor text is used to make a link clean and easy to read:

- This is a link to [Wikipedia](#) is easier to read than
- This is a link to http://en.wikipedia.org/wiki/Main_Page


When you click on a hyperlink the new document usually opens in either a new tab, a new window or in the current tab, replacing the document you linked from.

There are also programs that follow hyperlinks that collect and catalogue the visited pages. These programs are called web spiders or crawlers.

Links are also incorporated into web pages to allow you to download information to disk. If Internet Explorer is expecting to download information, a **Save As** dialogue box is displayed to determine where the information should be stored.

To open a page using a link you need to click on the underlined text or image link.



HINT: The **Stop** button  or **[Esc]** is used to stop a page from loading, and the **Refresh** button or **[Ctrl R]** is useful to reload the current page.

Downloading Files from a Website

There are many files stored on the Internet that can be downloaded to your computer. These may include software, pictures, music, and Word or Excel files. The files to be downloaded are often linked into standard web pages, so you follow the link to the file, and Internet Explorer will download it for you.



ACTIVITY: Downloading Files Using Internet Explorer

This activity will explain how to download a particular application. You may like to choose a different application.

1. Navigate to the website shown in Figure 2-17 by typing in the URL <http://www.7-zip.org/download.html> and pressing **[Enter]**.

Download

Download 7-Zip for Windows:

7-Zip 4.65 2009-02-03	Type	Windows	Description
Download	.exe	32-bit	7-Zip
Download	.msi	x64	
Download		IA-64	
Download	.zip	32-bit	7-Zip Command Line Version
Download	.tar.bz2	Any	7-Zip Source code
Download	.7z	32-bit	7z Library, SFXs for installers, Plugin for FAR Manager
Download	.tar.bz2	Any	LZMA SDK (C, C++, C#, Java)

Download links redirect to a download page on SourceForge.net.

Download 7-Zip 9.14 beta (2010-06-04):

[7-Zip files at Source Forge](#)

Other versions can be found at the Source Forge site:

[7-Zip at Source Forge](#)

Figure 2-14

2. Click on the top underlined link in the table (which will be the 32-bit .exe version as shown in Figure 2-14). This will display a new page with a download link as shown in Figure 2-15.

sourceforge FIND AND DEVELOP OPEN SOURCE SOFTWARE

Your 7-Zip download will start shortly...

Problems with the download? Please use this direct link or try another mirror.

Figure 2-15

3. Click on the **direct link** underlined link to start downloading. You may be warned that some files can harm your computer. Click **Save**. You will be prompted for a location to store the file. Navigate to a directory where you wish to store the file then click **Save** as shown in Figure 2-16.

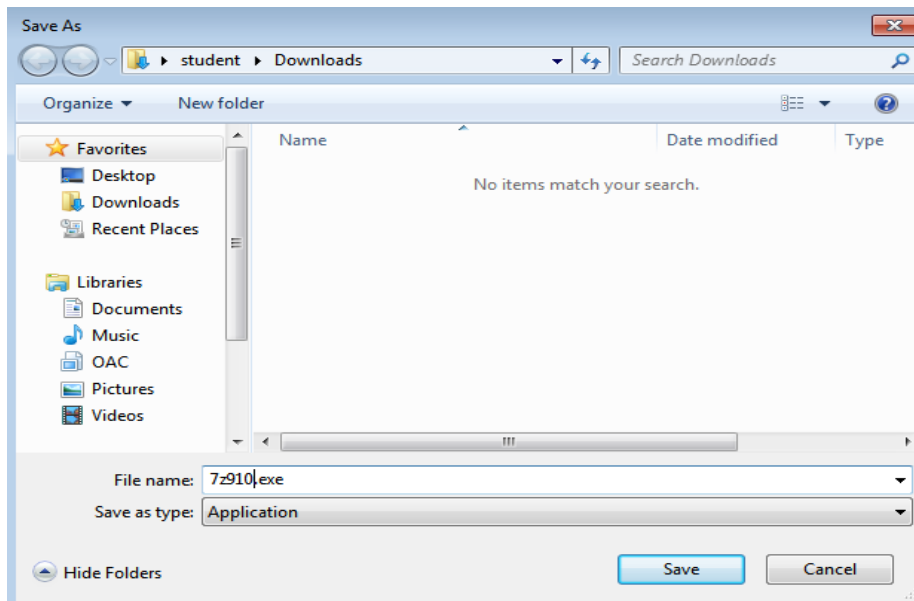


Figure 2-16

IE will display the download window showing the progress of the download operation.



NOTE: You will not be able to run this file on Institute computers, so you should delete it.



HINT: The file download may take some time (depending on the size of the file being downloaded), but you can browse another part of the Web while the file is being downloaded in the background.

Downloading Files using FTP from Within a Web Browser

In the activity above you downloaded a file from <http://www.7-zip.org/download.html>

When you clicked the **Download** button you were redirected to

http://sourceforge.net/projects/sevenzzip/files/7-Zip/9.20/7z920.exe/download?use_mirror=tcpdiag

This website still uses the HTTP protocol. In Topic 2 of this learning guide you learnt that there is a protocol available on the Internet that transfers files without using a website – the file transfer protocol FTP. In the next activity you are going to download another file, but this time it will be downloaded using FTP rather than using a direct link.

Error Messages

When using the Web, there are a number of error messages that you should be aware of. The most common of these happen when a web page that you are trying to access either does not exist, or the web server it is stored on is temporarily unavailable.

The 404 or Not Found error is the most common. It shows that your computer was able to communicate with the web server containing the file, but the server could not find what was requested. From a user's point of view, this error occurs when they click a 'dead' or 'broken' link, or if they type a URL into the address bar for a page that is no longer stored in that location.

Web pages are constantly being updated, or moved. It is common for links to no longer work because e.g. a folder on a web server containing web pages was moved from one location to another and the links were not correctly updated at the same time.

Errors can also occur if the page is taking too long to load, or if the server you are trying to access is temporarily off-line. If you encounter an error when trying to view a web page, check that the address has been typed correctly. If it has, it is often a good idea to try to refresh the page, or to access it at a later time. If the error continues, it may be because the web page no longer exists. When the attempt to reach a web server times out, you will usually see a **Fatal Error 500** error showing in your browser.



TOPIC 4: FINDING INFORMATION USING SEARCH ENGINES

Modern browsers like IE9 provide search capabilities from within the browser which allow you to use major search engines. These search engines can also be accessed by going to a website and entering the required information.

A **Search Engine** is a website created purely to index and search other web pages. A database containing the information on the web pages is created, and continuously updated and indexed.

The default search engine used in the address/search box in IE9 is **Bing** (Microsoft's own search engine), but you can make other search engines the default

To use a search engine either from the website or using IE9's address/search box, you simply enter a word, words or phrase, and the search engine returns a list of matches. The exact syntax and options for searching depend on the engine being used.

There are hundreds of search engines available on the Internet, many having unique features. Some search engines index the same information and some categorise specific web pages. There are several search engines dedicated to indexing specifically New Zealand or Australian content; however, most search engines catalogue pages globally and are based in the US.

The larger search engines catalogue many billions of pages, while smaller or national search engines index millions of pages.

The three most popular search engines (defined by the number of people using them) are Google, Yahoo Search, and Bing, however smaller search engines can sometimes locate websites that the big three cannot. This is because web pages have to be registered, and companies that offer free web hosting (discussed later) do not offer free registration with Google, Yahoo, or Bing.

Some search engines that used to be popular are no longer active, some are still very well used, and others are new. In the summer of 1993, no search engine existed for the web, although numerous specialised catalogues were maintained by hand. The first very primitive search engine, W3Catalog, was released in September 1993. It was retired in 1996. A detailed list of the different search engines available on the Web, both current and inactive can be found at http://en.wikipedia.org/wiki/Web_search_engine

Search Engines

The full search capabilities, search syntax and examples for each search engine, can be found by visiting the appropriate search page. Simply type the URL of the particular search engine you wish to use into the address box of your browser.

Each search engine returns different information, as each searches different areas of the Web. Different search engines also index pages in different ways. It is up to the individual to decide which search engine best suits their needs.

Below is a table showing the market share of the most widely used search engines:

Search Engine	Market Share (July 2014)
Google	69%
Baidu	17%
Yahoo! Search	7%
Bing	6%
Excite	0.2%
Ask	0.13%
Aol Search	0.13%

Table 2-1

The above figures do not show local popularity of search engines. East Asian countries and Russia are a few places where Google is not the most popular search engine. Soso (search engine) is more popular than Google in China.

Yandex commands a market share of 62% in Russia, compared to Google's 28%. In China, Baidu is the most popular search engine. South Korea's search portal, Naver, is used for 70% of online searches in the country. Yahoo! Japan and Yahoo! Taiwan are the most popular internet search engines in Japan and Taiwan, respectively.

The above figures will constantly change as popularity of one search engine shrinks or grows over another.

Some of the more useful search engines are described in more detail in the following pages. You are going to look at the following search engines in more detail:

- **Google:** <http://www.google.com/> (use www.google.co.nz for New Zealand)
- **Bing:** <http://www.bing.com/>
- **Yahoo:** <http://search.yahoo.com/>

Google Search Engine

If you enter www.google.com in New Zealand, you will be automatically directed to www.google.co.nz due to the popularity of this search engine (the US version cannot handle the huge number of requests that would be placed on it).

Finding out information has become much easier as search engines become more efficient. With early search engines it was always better to carefully choose key words and always use filters, but now search engines, especially Google, have become adept at removing non-keywords from searches and interpreting spelling errors etc. This can be annoying if you are searching for something quite obscure that is very similar to something that is very popular.

In order to help people search Google has more advanced search features available after you have made an initial search. You can filter by e.g. country, or how recently the article was written. Also in the top right of the screen there is an options cog that will take you to an advanced search page which will allow you to limit your search even further. The figures on the next pages show a standard Google search, the advanced settings location and the advanced search page. The advanced search page has examples of how to use it on the right of the option boxes.

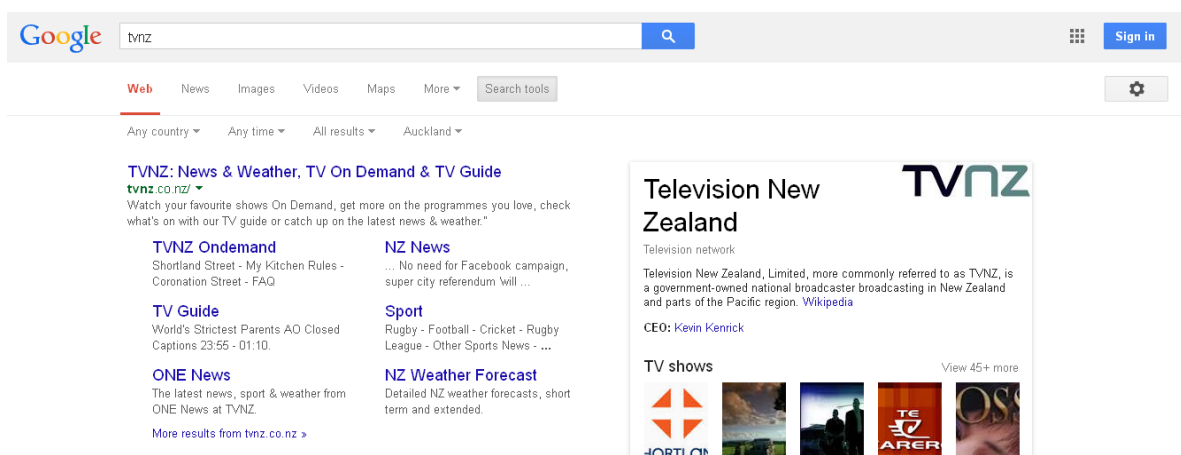


Figure 2-17

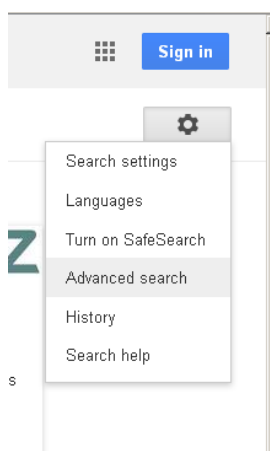


Figure 2-18

Advanced Search

Find pages with...		To do this in the search box.
all these words:	<input type="text"/>	Type the important words: tri-colour rat terrier
this exact word or phrase:	<input type="text"/>	Put exact words in quotes: "rat terrier"
any of these words:	<input type="text"/>	Type OR between all the words you want: miniature OR standard
none of these words:	<input type="text"/>	Put a minus sign just before words that you don't want: -rodent, -"Jack Russell"
numbers ranging from:	<input type="text"/> to <input type="text"/>	Put two full stops between the numbers and add a unit of measurement: 10..95 kg, £300..£500, 2010..2011

Then narrow your results by...

language:	<input type="text" value="any language"/>	Find pages in the language that you select.
region:	<input type="text" value="any region"/>	Find pages published in a particular region.
last update:	<input type="text" value="anytime"/>	Find pages updated within the time that you specify.
site or domain:	<input type="text"/>	Search one site (like wikipedia.org) or limit your results to a domain like .edu, .org or .gov
terms appearing:	<input type="text" value="anywhere in the page"/>	Search for terms in the whole page, page title or web address, or links to the page you're looking for.
SafeSearch:	<input type="text" value="Show most relevant results"/>	Tell SafeSearch whether to filter sexually explicit content.
reading level:	<input type="text" value="no reading level displayed"/>	Find pages at one reading level or just view the level info.
file type:	<input type="text" value="any format"/>	Find pages in the format that you prefer.
usage rights:	<input type="text" value="not filtered by licence"/>	Find pages that you are free to use yourself.

[Advanced Search](#)

Figure 2-19

As well as using the Advanced search, shown above, there are a number of techniques that will help you find what you are looking for:

- **Keep your search simple** – You can use questions, e.g. where is the closest airport? Or you can pick out your own key words, e.g. neatest airport
- **Choose your words carefully** – choose words that might appear on a website, e.g. my head hurts is not as good as headache, because headache is the word that might appear on a medical website.
- **Do not worry about spelling** – Google will automatically spell check and make suggestions about what you really wanted to search for. It also does not mind about capitalisation, e.g. New York is the same as new york. Also, English/US spellings e.g. neighbour/neighbour or prioritise/prioritize do not matter, as Google will search for both.
- **Using quotes** - Use exact quotes to search for an exact phrase, e.g. "New York Times" would search only for that exact string.
- **Using + and – signs** – Using the Plus sign means that the word after the + must be included in the search. Using the Minus sign means that the word after the – will be omitted from the search. The minus sign can be very useful to eliminate search results, e.g. brazil +nuts –country will return web pages that must contain the word nuts (Google sometimes does not search for all the words you type if it does not think it important) and do not contain the word country.
- **Search for images using images** – There are times when you are looking for an image, or want to recognise a place and you have an image (e.g. a friend emailed you a picture) but you do not know what it is of. You can use the camera button in Google Image search and upload an image and Google will search for similar images.

- **Filters** - As shown on the Advanced search, there are options to filter the results by e.g. website, or filetype. You can use these options to e.g. only search for .pdf documents, or to only search with tvnz.co.nz. These techniques use the filters filetype: and site: You can write these directly into your search, e.g. rugby world cup 2015 site:tvnz.co.nz will give you a list of web pages about the 2015 rugby world cup, but only pages from the domain tvnz.co.nz

Google has a number of other features that make using the Web easier. It will try to find the answer to your question where possible, without you having to then follow a link to a page. If you enter a maths equation, e.g. 3×45 , it will give you a solution. It will also calculate unit conversions, e.g. NZD to Euros. If you search for the name of a celebrity, location, or movie, it will show you information on the Google page as well as a list of links (as shown in the figure below). You can see that Google has returned many facts about Wellington, without the need for you to click on the page.

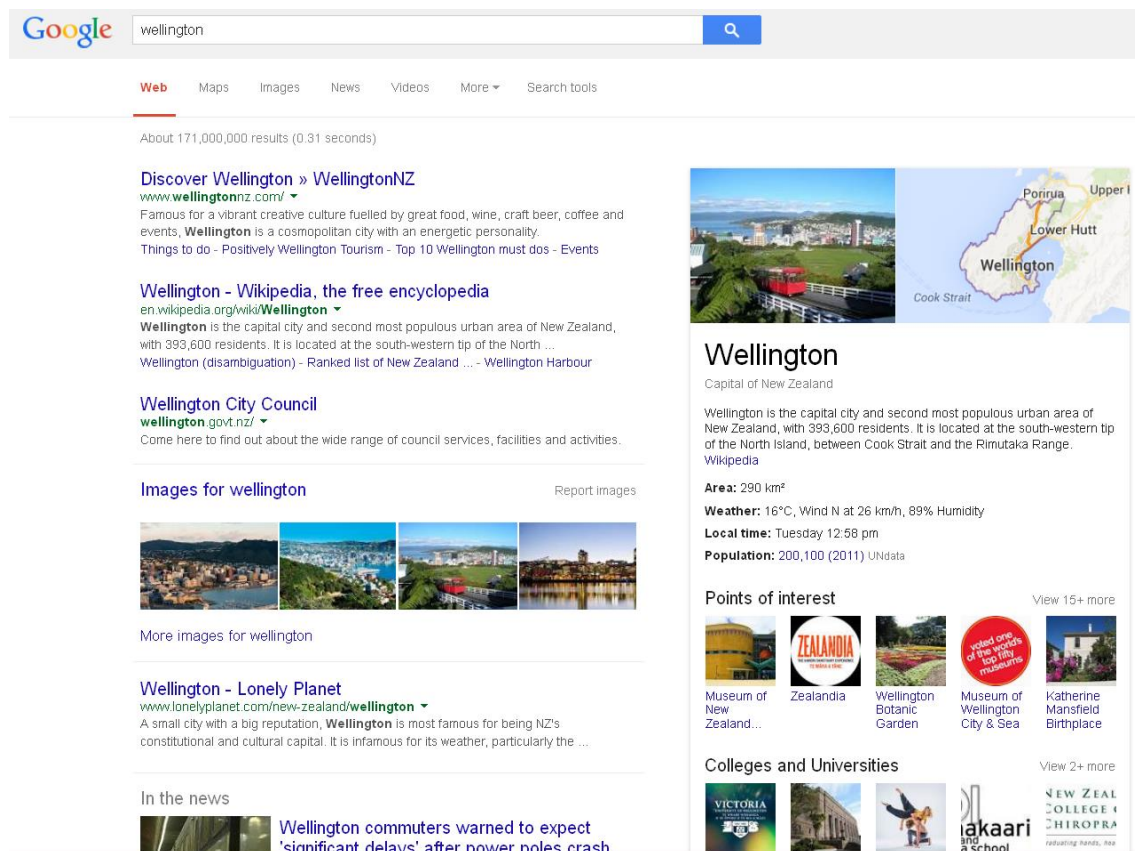


Figure 2-20

Google has a number of features like this. If you search for directions to a place, Google can show you a map with live information about traffic. If you search for public transport, Google will often display train/bus information directly without you having to click on the appropriate link.

More information about how to search using Google efficiently can be found at <https://support.google.com/websearch/answer/134479?hl=en>

Bing

Bing is Microsoft's search engine. It uses its own database, and has separate News, Images, Questions and Answers (QnA), Local, Video, Feeds, and Academic databases.

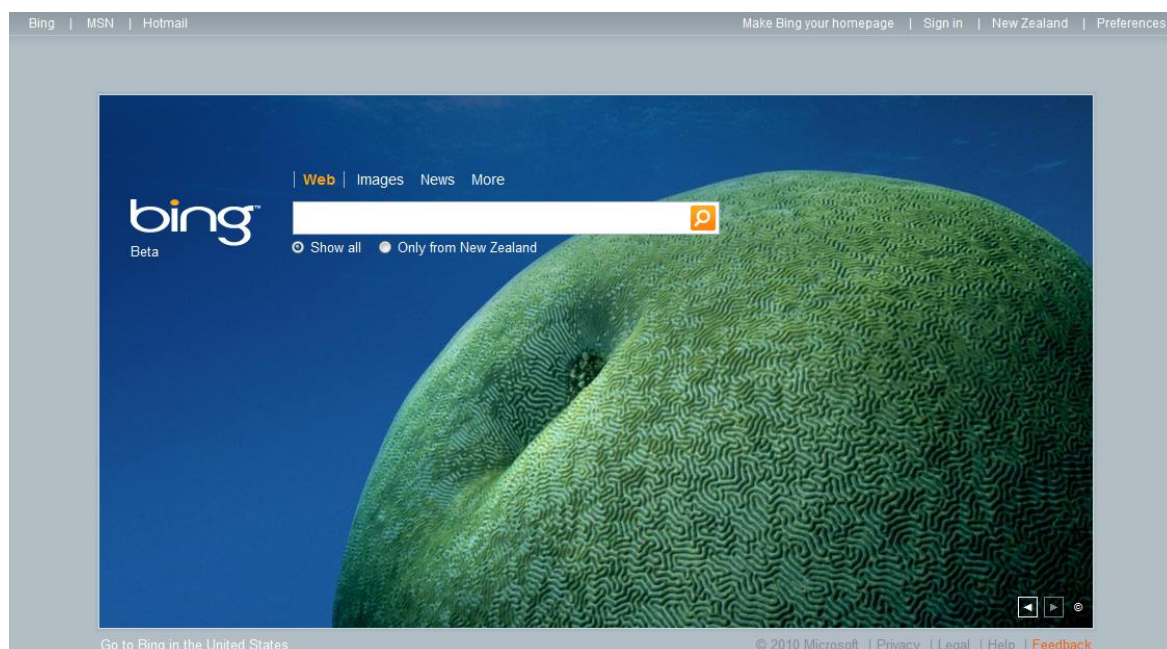


Figure 2-21

Bing is the default search engine when using IE9. You learnt how to change this setting earlier in this learning guide.

The Bing search engine works in exactly the same way as the Google search engine. You type the words or phrase etc. that you are looking for. Bing uses a number of Advanced search features:

Symbol	Function
+	Finds web pages that contain all the terms that are preceded by the + symbol. Also allows you to include terms that are usually ignored.
" "	Finds the exact words in a phrase.
()	Finds or excludes web pages that contain a group of words.
AND or &	Finds web pages that contain all the terms or phrases.
NOT or -	Excludes web pages that contain a term or phrase.
OR or	Finds web pages that contain either of the terms or phrases.

Table 2-2

A few things to note about using Bing's advanced search settings are:

- By default, all searches are AND searches.
- You must capitalise the NOT and OR operators. Otherwise, Bing will ignore them as stop words, which are commonly occurring words and numbers that are omitted to speed a full-text search.
- All punctuation marks, except for the symbols noted in this topic, are ignored unless they are surrounded by quotation marks or preceded by the + symbol.
- Only the first 10 terms are used to get search results.

- Term grouping and Boolean operators are supported in the following preferred order:
 - parentheses ()
 - quotation marks ""
 - NOT + -
 - AND &
 - OR |
- Because OR is the operator with lowest precedence, enclose OR terms in parentheses when combined with other operators in a search.
- Some features and functionality may not be available in every country or region.

Like Google, Bing also has advanced filters such as filetype: and site: A list of these can be found here: <http://onlinehelp.microsoft.com/en-us/bing/ff808421.aspx>

Yahoo! Search Engine

Yahoo! Search is a different type of search engine to Google or Bing. Google and Bing search the Web themselves for information, organising their own page rankings, cataloguing websites etc. Yahoo! Search provides a front-end interface for searching, and categorises results found by another search engine. It can then search its own categories to try to find the best information to present the user with.

Yahoo! Search was powered by Inktomi (2001-2004), then by Google (2004-2009) and is now powered by Bing.

Yahoo! assists your search by dividing information into categories. As you work through the hierarchy of categories you are directing your search and refining your search area. The advanced search option works in a similar manner to Google's equivalent.

Tools and Resources

You will generally get best results if you use a variety of search tools as well as combinations of these tools. Search engines can be classified under the following headings:

- keyword search engines - like a book index
- subject search engines - like the table of contents
- metasearch tools - these launch a number of search engines
- other tools, such as news and TELNET.

Each of the above items is discussed over the next few pages.

Keyword and Subject Search Engines

Both keyword and subject search engines consist of a searching facility to find information and an indexed database in which to store it.

The searching facility, known as a spider or crawler, searches the Web seeking out new information. The information sought consists of the URL and some or all of: the HTML title, section headings, common words, the first couple of hundred characters, a summary of the content or the entire text.

The information is consistently updated to keep it current. How frequently this occurs determines the quality of the search engine, because websites change very frequently, disappear or are replaced by new ones. Some databases are completely rebuilt at regular intervals to ensure they are up to date.

When you enter a query into a search engine, a search of this database takes place. The search incorporates all the criteria you build into your query statement. The results of this search are known as the Result Set. Each entry in the Result Set is a hit. Search queries can be keyword based or concept based.

For example, if you entered the word “law”, a keyword-based search would produce a Result Set of resources containing the precise word “law”, whereas a concept-based search would return resources containing documents on law, copyright, legislation and so on.

The criteria may be simple or complex, and include:

- a single word
- a phrase
- a substring - part of a word and the use of wildcard characters such as * and ? to broaden the search
- case sensitivity - the use of capitalisation of proper nouns
- boolean expressions - using combinations linked by “and”, “or” and “not”
- weighting - specification of the relative significance of certain terms.

Refinement

Some search engines allow you to further refine your search. Starting with your first Result Set, you can specify further criteria allowing you to dig deeper and produce further and further refinement.

Subject Directories

Subject directories, or indexes, categorise resources based on the primary themes of that resource. For this reason, the information retrieved from subject directories will generally have higher relevance than keyword indexes. However, more obscure or not easily classifiable information may be more difficult to find. Subject directories are most useful if you do not have precise search terms or are looking for information in a broad subject area. The following are generally regarded as Subject Indexes, but in addition to subjects, they may also index certain keywords, and will therefore also allow keyword searching:

YAHOO! - <http://www.yahoo.com>

- Claimed to be one of the largest Internet directories and probably is
- Entries inserted into database by manual submissions and automatically by spiders searching new websites
- Provides access to Reuters news services
- Searching with boolean “and”, “or”, substring and setting a results hit limit.

WEBCRAWLER - <http://www.webcrawler.com/>

- Sites are rated on “depth, ease of exploration and net appeal” and relevance
- Searching on words, related terms, boolean expressions
- Different levels of detail can be displayed in results
- Uses results from the big four search engines.

BUBL Subject Tree - <http://www.bubl.ac.uk/>

- Searches academic subject areas.

Internet Public Library - <http://www.ipl.org/>

- Keyword and Subject database.

Metasearch Engine

A metasearch engine is a search engine that uses other search engines to do its searching for it. It often uses more than one search engine, then combines the results to provide the best results. Examples of Metasearch engines are: Dogpile, Excite, Metacrawler and WebCrawler.

The advantages of a metasearch engine are:

- The search coverage is extended from just one engine to multiple engines, which allows more information to be found
- More results can be retrieved with the same effort on the part of the user. They only type their query once and then multiple engines are sent to find the result of their query

Disadvantages of meta search engines are:

- They are not capable of using a full range of query syntax. They often only use the syntax that is common to all the search engines they use
- The number of links generated from a single engine is often limited to ten by a metasearch engine and so the user often does not get complete results of their query
- They do not always interact with the bigger search engines for results. Instead sponsored links are prioritised and are normally displayed first.

Local Internet Search Utilities

There are search tools that only search pages from your local country. Depending on what you are searching for, it may be quicker to use a local New Zealand-based search engine, especially if there is a lot of traffic between New Zealand and the US. Some examples are:

SearchNZ

- <http://www.searchnz.co.nz>

Access New Zealand

- <http://www.accessnz.co.nz/>

Te Puna Web Directory

- <http://webdirectory.natlib.govt.nz/>

NZS

<http://www.nzs.com/>



SELF TEST

1. Which part of the URL `http://www.microsoft.com` is the protocol?

2. What does the domain type **govt** represent?

3. What two letters would you find at the end of the URL for a Japanese website?


4. How can you recognise whether a certain word on a page is a link?

5. What is a search engine?

6. Which of the following is NOT a search engine?

- (a) Web Wizard
- (b) Bing
- (c) AltaVista
- (d) Excite

7. Which protocol is associated with downloading files?

8. The  icon indicates _____.
(a) a shortcut to a link
(b) a folder of bookmarks
(c) a bookmark
(d) a website that is temporarily down
9. Can a web page be printed within IE?
(a) Yes
(b) No
10. What is the name of the feature that opens a new tab with thumbnails of all the currently opened web pages?
(a) New Tabs
(b) Quick Tabs
(c) Compatibility View
(d) Thumbnail Tabs

SELF TEST ANSWERS

1. HTTP
2. Government.
3. jp
4. Place the mouse cursor over it. If the word is a link, the pointer will change to a hand.
5. A search engine is a website created purely to index and search other web pages.
6. (a)
7. FTP
8. (c)
9. (a)
10. (b)

3.0

SECTION 3 WHAT IS E-COMMERCE?

OBJECTIVES

On successful completion of this section, you will be able to:

1. Define the term e-commerce
2. List the advantages and disadvantages of e-commerce
3. Describe methods of safeguarding sensitive information
4. List business practices and procedures that can be carried out over the Internet

TOPICS

1. What is E-Commerce?
2. Security



TOPIC 1: WHAT IS E-COMMERCE?

Not that long ago, if you wanted to buy an item, you would have to go to the local shops. If they did not have what you wanted, you would either have to order it, collect it from the shop at a later date, do without, or choose a substitute.

E-commerce is the solution to this problem. It is the sale and purchase of goods and services over electronic systems such as the Internet.

- Businesses can sell to customers
- Businesses can sell to other businesses
- People can sell directly to other people via auction websites such as Trade Me or EBay

You can buy:

- Physical goods such as books
- Digital goods such as music tracks
- Services such as access to paid web content, e.g. online learning and tutorials
- Entertainment such as buying concert tickets
- Holidays and hotels can be booked entirely online

Some e-commerce is digital from start to finish, e.g. buying music downloads for your MP3 player, but most e-commerce is still involves buying physical goods.

Almost anything is available to buy through e-commerce: groceries, cars, holidays, books, train tickets, magazine subscriptions, flowers, insurance, training courses etc. The list is endless.

Examples of different types of e-commerce websites are:

- www.amazon.com (a global online store that sells just about anything)
- www.trademe.co.nz (a New Zealand-based auction website)
- <https://www.etsy.com/> (a website that specialises in buying and selling hand-made, individual items. Items on here are often made to order)
- shop.countdown.co.nz/ (a website that enables you to order your groceries and have them delivered to your door)
- www.anz.co.nz/ (a website that gives you access to online banking)

E-Commerce and the Customer

In order to buy items online, a customer needs a computer with Internet access and payment details, e.g. credit card, PayPal, cheque. All they then need to do is go to the website they want to buy from, select their item, go to the online checkout, pay, and choose where to ship the items. Some websites require you to register with them in order to buy, some do not. An e-commerce website (www.amazon.com) is shown in the figure on the next page.

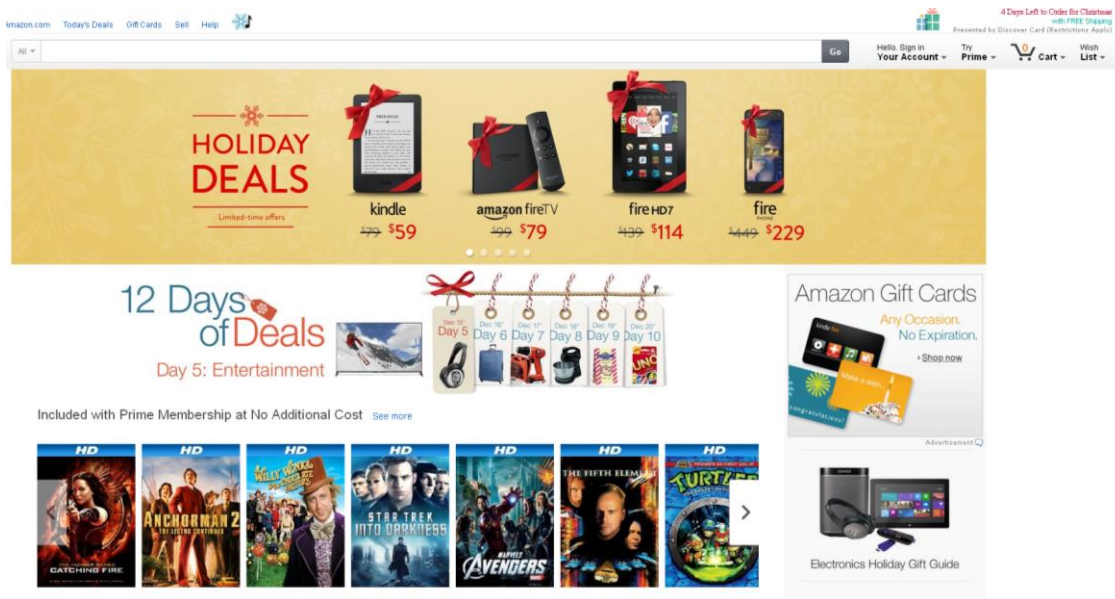


Figure 3-1

As you can see from the figure above, Amazon has advertising on their front page. If your browser is set to remember cookies, this advertising may be more directed towards you. E-commerce features such as logging in to your account and a shopping cart are shown in the top right corner on every page of Amazon.

Cookies

If you are a regular customer, you can get the website to 'remember me' so that you do not have to log in or remember your bank details next time you buy from them. This means that the website will store your details as a cookie on the computer you are using. Next time you visit, the website will look for the cookie on your computer which contains your details.

Advantages of E-Commerce

- Customers can shop anytime 24/7, 365 days a year. Although just because you place an order in the middle of the night, does not mean it is processed immediately.
- There is no need to travel, which saves time and money spent on fuel
- Customers can shop from the comfort of their own home
- Customers can buy from shops that they would not normally have access to, e.g. overseas retailers
- Customers can easily compare prices between different shops. Some websites exist to compare prices for you to save you the hassle of doing it yourself, e.g. www.priceme.co.nz
- Customers do not have to deal with heavy bags or crowds. Items are delivered straight to your door. This is especially useful if you are buying very large items such as new furniture, or if you are unable to easily leave your home and travel to shops.
- Customers can often get discounts on prices compared to normal high street shops. This is because online stores do not always have to pay to maintain a high street shop front, only a warehouse which is situated on cheaper real estate.
- Companies easily keep details about what a customer bought. If it is a downloadable item, e.g. a music track, the customer can re-download it (often for free) if they lose it because the company knows that they sold it to them.

Disadvantages of E-Commerce

- Customers often have to be at home to receive and sign for their goods
- Customers cannot check the quality of items, e.g. the feel of clothes, or the freshness of groceries
- Items bought may look different in real life to when you saw it on your screen, or you might not get sent exactly what you ordered (wrong size/shade etc.) Returning goods can be awkward and often costly
- Customers usually have to pay for delivery, which might be more than the cost saving compared to shopping on the high street. If the item does not arrive because of poor courier/postal service, the customer still has to pay for it, and has the hassle of chasing up the lost parcel.

E-Commerce and Businesses

Business needs the following to successfully implement e-commerce:

- A domain name, e.g. whitcoulls.co.nz
- A website that contains a database of all their products
- A good, user-friendly navigation system with Buy and Shopping Cart facilities
- A secure way of taking payments
- A way of sending order confirmation to the customer
- A method of sending the actual order to the customer

The secure payment part of the above list is the most technically difficult aspect for businesses. They need to guarantee that their payment system is secure. Many businesses hire a specialist company to deal with the payment-taking aspect of e-commerce. They are called **payment service providers**.

For a fee, the payment service providers provide the secure connections needed to complete the purchase. They allow customers to pay by Visa, MasterCard and other credit/debit cards. The online business itself does not keep any sensitive data such as credit card details. The payment service provider does that for them.

From a business point of view there are also advantages and disadvantages of e-commerce:

Advantages

- Businesses do not always need to pay for expensive high street premises, and the associated costs such as insurance, lighting, heating and business rates. Although many companies have both an online and high street presence, there are a number of companies that only have an online presence, e.g. www.webjet.co.nz
- Usually you would need less staff compared to a high street shop as you would need packing and processing staff, but not customer-facing staff.
- Businesses have a larger customer base, as they are potentially selling all over the world.
- Customers will often impulse buy, especially if they are shown suggestions such as 'Customer who bought this item also bought...'
- Businesses can keep track of competitors' prices quickly and price-match
- Businesses can easily create offers, such as highlighting the most popular stock, or offer bargains to clear old stock.

Disadvantages

- Businesses need to pay for professional development of the website, and have a strong service level agreement with the hosting company so that any problems get fixed quickly. They would also need a reliable host server and associated back-up. These costs can add up quite quickly.
- There is a high risk of online fraud and therefore losing money on sales
- There is no personal contact with the customer, so repeat orders may be harder to get
- If the website goes down, no-one can purchase anything
- Businesses need staff with expertise to keep the website maintained and up-to-date

Most businesses do not have the expertise to run their own server (nor do they want to) and so they hire a specialist company to host their website on a server in a data centre. There are two main types:

- **A virtual server** – The website shares a server with other companies' websites. This is a low-cost option but it may be slow to get some issues fixed. The adage 'you get what you pay for' applies here.
- **A fully managed server** – Your website is hosted on its own physical server in their data centre and they look after all the maintenance and backups. This can be quite expensive, but the level of service is often very high.

Security

Security is discussed in Topic 2 of this section, which is very important in e-commerce. The main methods of keeping data secure involve:

- **Encryption** – Data is encoded using an algorithm so that anyone who intercepts the data being transferred cannot read it. The correct recipient of the data has a key that will allow them to decipher the data sent to them. Usernames and passwords are examples of items that are encrypted before being sent.
- Using secure websites, i.e. using the https protocol rather than http
- Using usernames/passwords when customers log in to their accounts
- Using passwords for secure bank payments, e.g. 3D Secure payments (see the figure below)

Figure 3-2

As an e-commerce customer, you will see the above pop-up box when you buy an item using a Visa card. Schemes such as 3D Secure allow sellers to participate in the Verified by Visa and SecureCode from MasterCard schemes. These credit card companies make the cardholder enter a password associated with their credit card only known to them. The bank verifies the password and payment can continue.

Payment methods

There are a number of ways to make online payments:

- **Credit Cards** - All major credit cards offer their services to online shops. The customer provides the details from the card itself, either by filling out an online form or details are taken directly over the phone by the business. Some businesses offer to check a secret password which only the owner of the card and the card company (not the business you are buying from) know about. This reduces fraud. Credit cards offer a certain amount of protection, e.g. if the holiday company you booked goes out of business or if your flights are cancelled then you can claim the cost back from the credit card company. An obvious disadvantage of using credit cards is that they charge interest if you have not paid them off by the end of the month.
- **Debit cards** - The payment is made in exactly the same way as if you were using a credit card. However, the money comes directly out of your bank. You must have the money in the account to make to the payment. Debit cards offer less customer protection should the business you are buying from fail to deliver the goods.
- **Online Account** - If you are a regular customer, then a business may open an online account with you. You can keep the account topped up with money and deduct from it any purchases you make. You need to top-up the account with payments from a debit or credit card, but you do not need to enter your payment details every time you buy. From the business's point of view, they are confident you are who you say you are. However, this method of payment ties your money up in one single shop.
- **Third Party Payment** - Third party payment systems such as PayPal allow you to avoid paying using your credit card. Many online shops accept PayPal as a payment method. PayPal handles the transaction and passes it on to the shop. PayPal will then either deduct the amount from an account you hold with them, or bill your credit/debit

card for the purchase you made. Many third party payment companies charge a small percentage of the transaction price as a fee for purchasing through them.

Advertising

Advertising online for a customer's business is a big deal. Businesses try to make effective use of search engines e.g. using meta tags when designing their website, using web spiders, paying for prominence in search result listings, newsgroups and forums. They will pay for banners and pop-ups, spam and direct marketing. This can ensure maximum customer-base coverage and establish customer loyalty in a virtual environment.

Companies will also advertise to people who have already bought items from them, either through email, which the customer gave them when they bought previous items, or using cookies. When a customer buys items, the company knows what items were bought. If the customer remains logged in to the website whenever they visit (i.e. their browser stores cookies), then the company can make suggestions about what to buy based on what the customer last bought. Similarly, companies with a large customer base can make recommendations to a customer based on what other customers with a similar purchase history bought.

Social Implications of E-Commerce

There are some customers who will always prefer to look around a high street store, especially if they are buying items such as clothes where the feel and exact look is important.

However, high street shops that sell such items as DVDs and CDs have been negatively affected by the rise of e-commerce, because customers, finding cheaper items online, have changed how they shop. Many high street stores have either shut down, opened an online outlet for their goods or changed the nature of some of the items they sell, appealing to different clientele, or selling more items that need to be seen in reality before being bought.

Many products become available online before they become available in stores. An example of this is music. Songs can be available through (legal) downloads websites before they are released in shops. Songs can top the music charts but still be unavailable to walk into a music store and buy.

Large online companies such as Amazon make items available to pre-order. The company will often get the goods delivered to their warehouses in advance of the release date, and they will often ship the goods as soon as they arrive. Given the efficient courier services that large organisations use, the customer often receives their items before the release date.

Online stores will often create special pre-order prices so that they ship goods out of their warehouses faster. Higher throughput, rather than goods sitting in their warehouses is better for business, even if they make a smaller profit margin per individual item.

Pricing can change quickly online too. Airline companies often change the cost of flights at short notice, only for Web customers, when they only have a certain number of seats left on flights.

'Bricks and clicks' is a term that refers to high street stores (bricks) and online stores (clicks). Some companies are both. If a company is both, a customer often feels more confident buying from their online store, as they know they can return the goods to a physical store, or if they have an issue, speak to a person face-to-face rather than over the phone or via email. Some customers like the fact that they can try items in the store, but then go online and buy the same item (often from the same company) cheaper in a Web-only deal.

Many stores have been adversely affected by customers doing this. Sometimes customers will go into a store, try on e.g. clothes, or look at the physical quality of an item, then, they go home, look for the item on the Web and buy from someone else. Many companies feel this is unfair. However the customer's response is that before online shopping they would shop around different high street stores doing exactly the same thing. Companies with both an online and high street presence do not lose out as much as the companies who only have a high street presence. Companies have had to find the right mix of online and high street presence to maximise their profits and create a sustainable customer base.

E-commerce has had an effect on a global scale. As mentioned earlier, a customer can often buy goods from overseas. Governments often put import duties on items. Customers buying from overseas have to calculate the cost of the item they are buying and add import duty if it is applicable. Sometimes this means that an item that was cheaper to buy overseas is no longer cheaper to buy when import duties are added. Also, shipping costs can be very expensive (especially here in New Zealand). This helps to encourage some

customers to buy from within the country for certain items. But for other items, manufacture is cheaper abroad, or the particular item is unavailable in a particular country and so the customer will look further afield to buy their goods.

E-commerce has had an effect on postage and shipping too. Large online companies like Amazon globally ship items around the world. Most customers buy from them around Christmas or a birthday, and the customer needs guaranteed shipping dates. Courier services have gained customers because of e-commerce, whereas the normal mail has lost revenue due to more services and goods being available to download rather than being put in envelopes and sent through the post, and the fact that couriers are often more reliable. E-commerce companies may not want to use the normal mail service as they need to be confident that they are using a reputable delivery company as the longevity of their business relies on it.

The Dotcom Boom and Bust

Many online companies were dotcom startups – this is term used to describe the fact that they were purely Web-based companies, selling directly to the customer without a physical shop front. For a brief period, investors were willing to invest money into these ventures, without the level of detail required for companies who needed a physical presence somewhere. This was often because companies selling online goods over-promoted the numbers of customers they would have, under-budgeted for distribution costs, and over-forecast sales. The company would often forecast a fast growth based on customers revolutionising their shopping habits, and no longer using high street shops. The market surveys and analysis was often overlooked, and investors put money into dotcom companies. The dotcom companies would often run at a loss, but this was seen as satisfactory due to the future forecasted profits.

Dotcom companies also added supposed value just by being dotcom companies. It was believed that being a Web-based company was in itself a good thing. Investors were willing to back these companies on that principle alone. Investors saw future profits, not necessarily looking into the detail of how they would come about. Share prices of larger dotcom companies would rise, and investors would see the rise and buy into them thinking there would be another rise. But after a point, the companies would become over-valued and bubble burst.

When dotcom companies all lost market value when profits were not realised, some failed completely, while others lost a large portion of their value but some have since recovered. An example is Amazon, whose stock price dropped from nearly \$100 per share to around \$7 when the bubble burst in 2000. But since then, its share price has climbed to well over \$300.

Banking and Finance

So far, you have learnt about e-commerce from a retail point of view. But there are many services out there that now have a Web presence. One of these is Internet banking. The high street banks still exist, but banks have now made it possible to bank online. Many transactions are still only processed during banking hours, and there are still many things that you have to go into a bank to do, but some transactions can be done online.

There are clearly many advantages of online banking:

- You do not have to queue to use Internet banking in your own home
- You do not have to plan your day around the opening hours of the bank

- You can look at your balance anytime you want, not just when your monthly statement arrives
- You can keep daily tabs on your money and you can always be aware of what is in your accounts
- There are slightly better rates available, as less money is spent by banks on acquiring large office space on high streets. A small portion of these savings can be passed on to the customer.
- Mobile Internet banking is now available, which means the customer can bank from wherever they like, not just whenever they like
- The banks have cut down on paper statements. This is better for the environment.

There are however some drawbacks to Internet banking:

- There used to be a relationship between a bank and customers. This was useful to the customer for fast loan approval or a service that was available to them because the bank knew who they were, that was not available to everybody. The bank manager would be able to look at people on a more individual basis and have the power to waive interest fees or service fees in certain situations. The bank and the customers have now become faceless to each other, so there is less personal service.
- There are many complex transactions that still have to be done in the bank, or things that involve a physical piece of paper e.g. notarisation or bank signatures. Simple things like paying in cash or cheques also still need to be done at the bank itself (although many banks now make paying-in available in their foyers through machines rather than having to go into the bank during opening hours and talking to a bank clerk in person).
- Security is the biggest issue with Internet banking. Customers need confidence that their money is safe. Banks have sophisticated encryption software designed to protect people's accounts, but there is always the threat of hacker attacks, phishing or malware.

Some banks use a security code and secret questions to verify the user; some banks like HSBC use a physical Secure Key. It is a device smaller than a credit card, which is used to generate a unique passcode every time you log on.

The next topic will discuss e-commerce security in more detail.



ACTIVITY

This activity will show you the cost comparison of buying items both online and in shops. You are going to compare the cost of a particular book.

1. Open IE. Go to www.whitcoulls.co.nz. Search for a book/author of your choice. Make a note of the book, whether it is paperback or hard back and the price.

2. Now go to www.amazon.com

Search for the same book (you may need to use the Hardback/Paperback filter in the left hand panel). There may be some minor differences in the books on offer, but choose the same author, title and whether it is hardback/paperback. How much is this book?

3. Click on the **New & used** option when you have found the book. You will now see a list of sellers, including delivery costs. Most of these delivery costs are within the US. If you look in the Delivery column, and click on the option **International & domestic shipping rates and return policy** for any seller who will ship internationally. How much does it cost to ship the item to New Zealand? How long will it take?
-
-

4. If you add the shipping cost to the price of the item, is it now more or less expensive than buying the same item from www.whitcoulls.co.nz?
-

5. Repeat the search you made on www.amazon.com on the online book seller <http://www.bookdepository.com/>. This online seller has free world wide shipping. You may need to convert the currency into NZD. How much does the book cost if you bought it from this seller?
-

6. From all three sellers, Whitcoulls, Amazon and Book Depository, which is the cheapest, to get the book to your door, and by how much?
-



TOPIC 2: SECURITY

Anytime you view a website, information is sent from your computer to the web server and from the web server to your computer. The transmission of this information is normally sent in "plain text", meaning anyone would be able to read it should they see it. This information does not travel directly between your computer and web server, it goes through other computers (nodes) on the way. The information could then be 'read' by anyone intercepting it.

This is a big problem if the information being sent is your username and password for the bank, or your login information for your email etc.

Websites that require security information from you encrypt the sending and receiving of information, so that you can send your username and password details and if it is intercepted it cannot be read.

Websites that send and receive information using plain text use the HTTP protocol. They have website addresses such as <http://www.amazon.com>, or http://en.wikipedia.org/wiki/Main_Page. Often your web browser will not show you the http:// part of the web address, as it is assumed that it uses the HTTP protocol.

If however you visit a website that contains sensitive information the web address they use shows the secure version of this protocol, HTTPS. It will begin with https:// e.g. <https://www.facebook.com/>. Not all parts of a website need to be secure, only certain pages. www.amazon.com is an unsecure page, but as soon as you click on the checkout button, or you login, you are taken to a web page with a secure connection <https://www.amazon.com/ap/signin>

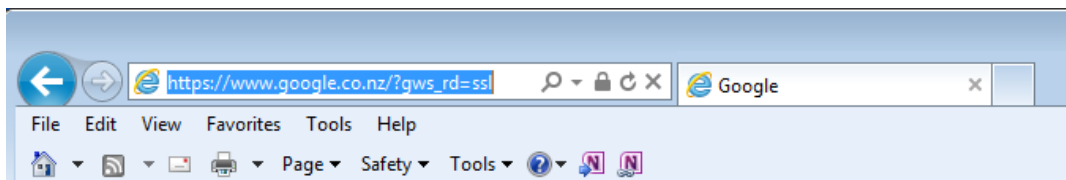


Figure 3-3

You can see from the above figure that the website is secure because its web address begins in https and there is a padlock symbol on the right hand side of the Address bar.

This icon is not just a picture. You can double click on it and find out about the security of the website. Some fraudulent websites create pages that look like there is padlock on them when you log in, but it is only an image of a padlock.

Your browser will usually examine the security certificate of the website that you are browsing. IE9 will issue a warning (as will many other browsers) that you should not continue browsing there if the website has any of the following problems:

- If the web server presents a certificate signed by an unknown authority - other browsers do this as well.
- If the web server presents a certificate that has expired - other browsers do this as well.
- If the web server presents a certificate for a different hostname - other browsers do this as well.

- If the web server presents a web page with mixed content (some insecure http and some secure https content) then IE9 will object. Firefox also does this.

If the security certificate is valid and up-to-date the Address bar often will turn green (see the figure below). If the security certificate is invalid (for any of the above reasons) the Address bar of your browser often turns red.

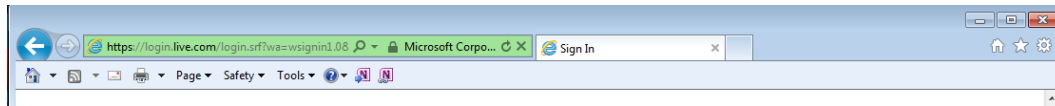


Figure 3-4

Any of the above things could be an indication that the web page you are browsing is fraudulent and that you do not want to enter your username/password details on these pages.

Phishing

Phishing is the term given to the sending of fraudulent emails that attempt to trick people into revealing details about their bank accounts, or other online accounts, e.g. Amazon, eBay etc. the email that is sent looks very convincing (it will contain the bank's logo etc.) It will often sound urgent, e.g. saying that they have discovered that someone has tried to take money from your account, or that they have detected out-of-the-ordinary payments have been made. You are often told to click a link contained in the email that will take you to a website for a fake bank. Then if you were to enter your login details, these would be recorded and then the fraudsters would use them to empty your real bank account.

Pharming

Pharming is similar to phishing, but instead of you being deceived, your computer is deceived. Malicious code is installed on your computer (often through spam email attachments). When you type in real URL to e.g. you bank you then your computer is redirected to a fake (yet looks very real) website. When you enter your details the information is stored, and again, your real bank account can then be emptied. Pharming attacks are often difficult to spot as everything looks like it is working normally. Checking to make sure the URL you are taken to is the correct one is one of the few things you can do to prevent pharming attacks.

Attempts have been made to deal with phishing and pharming, including creation of legislation to prosecute 'phishers' and 'pharmers', user training, public awareness and technical security measures. Phishing and pharming are types of **social engineering** attacks to obtain your personal details. Social engineering in the context of information security refers to any method of psychological manipulation of people to make them reveal their personal data, rather than a thief actively stealing it through e.g. breaking through your firewall and stealing your data, or breaking into your premises and stealing your computer.

**SELF TEST**

1. List at least three advantages and disadvantages of an online business compared to the traditional “bricks and mortar” type business that advertises in the more traditional ways such as newspapers, TV, radio and advertising leaflets.

2. Which of the following is the best definition of e-commerce?

- (a) Doing business over the Web
- (b) Doing business electronically
- (c) Performing money transactions over the Internet
- (d) Creating a website

3. List at least three business processes that can be performed over the Internet.

4. How can you tell if you are viewing a page from a safe website?

SELF TEST ANSWERS

1.

Advantages	Disadvantages
Can reach customers over a much larger geographical area.	Customers cannot sample the goods.
Can provide more information on products that would be economically possible with traditional advertising.	Customers hesitant in dealing with Internet companies and entering credit card numbers over the Web.
No need for a "shop front".	Can only reach people who are connected to the Internet.

2. (b)

3. Product descriptions, billing information, exchanging information (document transferral), email, customer inquiries, advertising.

4. A locked padlock will appear on the status bar or on the Address bar (depends upon the browser being used).

4.0

SECTION 4 COMMUNICATING ACROSS THE INTERNET

OBJECTIVES

On successful completion of this section, you will be able to:

1. Understand email account and state the restrictions imposed on these accounts
2. Send documents across the Internet
3. Understand various Internet communication tools

TOPICS

1. Email
2. Web 2.0
3. Internet Communication Tools



TOPIC 1: EMAIL

Introduction

Email (otherwise known as electronic mail or e-mail) is a method of exchanging messages between one person and one or recipients over the Internet (or across an internal computer network).

The author and the recipient do not have to both be online at the same time. Email servers receive, store and deliver email messages. The sender and the receiver need to connect only briefly to the email server to either send or receive their messages.

Email was not always like that. Early email required both sender and recipient to be online at the same time (much in the same way as instant messaging requires now). Originally email was only text-based. There were no attachments or the ability to send images embedded in an email. Email has been a service available on the Internet since the early days of the Internet when it was still the ARPANET back in the early 1970s.

There are many software platforms used to send/receive email, including Gmail, Hotmail, Yahoo! and Outlook.

You learnt earlier in this learning guide that different services are available on the Internet. The Web is one of them – it uses the HTTP protocol. Transferring a file is another – it uses the FTP protocol. Email is another – it uses the SMTP protocol.

There are two main types of email, client-based email and web-based email. Client-based email e.g. Microsoft's Outlook or Mozilla's Thunderbird, is often used by businesses. It requires the email client software to be installed on the computers. Some email client software costs money to buy, others are free. Web-based email can be accessed from any computer that has a web browser and an Internet connection. The user just goes to the website for the email provider, e.g. Hotmail or Yahoo! and log into their email account. The advantage of webmail is that it can be accessed from anywhere in the world. Most webmail providers provide email for free.

Email addresses identify the email box that a message is delivered to. The universal standard for email address formats has not changed since the 1980s. An email address such as john.smith@anywhere.co.nz is made up of a local part, the @ symbol (pronounced 'at') and the domain part. The domain part is not case sensitive, but the local part might be. The domain part matches the domain of the provider of your email service. If you are using webmail then the domain part could be hotmail.com, gmail.com, yahoo.co.nz etc. If you are using a company-provided, client-based email then the domain is usually the domain of the company, e.g. john.smith@microsoft.com could be the email address of John Smith who works for Microsoft.

Some mail systems dictate the characters or format that you are allowed to have as the local part of your email address. If your email address is given to you by your company you will not normally get to choose what it is. The format will be chosen for you, e.g. john.smith, jsmith, j.smith etc. At Computer Power Plus your email has been chosen for you - it is your student ID.

The allowed characters for an email that you can set up yourself with a webmail provider can be:

- Any upper or lower case English letters
- Digits 0 to 9

- These special characters: ! # \$ % & ' * + - / = ? ^ _ ` { | } ~
- A dot . provided it is not the first or last character, or that it appears consecutively
- Special characters are allowed so long as they are only used when contained between quotation marks: Space and " () , : ; < > @ [\] The backslash and quotation mark must be preceded by a backslash.

Not all webmail providers (or client-based email providers) will necessarily allow all of the above characters – they often do not allow some of the special characters listed above, e.g. Hotmail will only allow the use of the alphanumeric characters, the dot, underscore and hyphen.

The local part of the email address is limited to 64 characters. The domain part is limited to 253 characters. However an email address (64 + @ + 253) characters long is not possible as the maximum length of a path is 256 characters long. A mail box element needs < > at both ends so a 254 character email address plus the < and > characters make a 256 character maximum path length. This therefore restricts the email address length to 254 characters.

Email Features

The email features available vary depending on email provider. Many email providers have the following features:

- Automatic reply to messages
- Auto-forward and redirection of messages
- Send email to multiple recipients
- Automatic filing and retrieval of messages
- An address book
- Notification if a message cannot be delivered
- Emails are automatically date and time stamped
- Signatures can be attached
- Files can be sent as attachments, often in compressed formats

These features are in addition to the obvious create, send, reply and forward etc. abilities of the email provider.

Advantages and Disadvantages of Using Email

Advantages

- Emails are delivered extremely fast compared to traditional post
- Emails can be sent 24/7, 365 days a year
- Web-based email allow messages to be sent and received from any computer, anywhere in the world, that has an Internet connection
- Email is cheap compared to putting stamps on an envelope, especially if you want to send your message to multiple people. When using broadband, each email sent is effectively free.
- Emails can be sent to one person or several people.

Disadvantages

- The sender and recipient need access to the Internet to receive email. There are areas of the world where this is difficult, and even areas of New Zealand that are still limited to dial-up Internet.
- Viruses are easily spread via email attachments. Most email providers scan emails for viruses on your behalf. It is still sensible to have a firewall and anti-virus protection on your computer. As well as not opening attachments from people you do not know.
- Email is the conduit used for phishing scams
- Due to the nature of email addresses, it is quite easy for a program to generate a list of valid email addresses and send emails to them. This is known as spamming. The emails sent are spam. Most email providers filter for spam email and stop it ever reaching your inbox.
- If you do not use your email for a period of time, you may need to reactivate it



TOPIC 2: WEB 2.0

Web 2.0 is the term used to describe modern Web technology that allows Web users to interact collaboratively with each other, often through social media websites full of user-generated content in a virtual community.

The original vision of the Web by its creator, Tim Berners-Lee, was that it should be “a collaborative medium, a place where we could all meet and read and write”. In the early years of the Web, pages were described as static – where people were limited to the passive viewing of content. Users could not comment, reply, or have their say, unless they created their own web page to give their opinion on.

Web 2.0 is the term used to describe web pages such as social networking websites, blogs, wikis, video sharing websites, Web applications etc. These are places where people can interact, have their say and join in. Web 2.0 is not a new version of the Web, as you might infer from the name, but rather it is a term that encompasses the technologies and websites that allow for interaction on the Web. Some aspects of Web 2.0 are described below:

Social Networking

Facebook - Facebook is one of the biggest social networking websites available. Its interactive features include the ability to choose friends, liking and commenting on other people's posts and share with your Facebook friends about different apps that you are using through Facebook. It includes the concept that you have a 'wall', and both you and your Facebook friends can post to your wall. Individuals can create a Facebook page that is just about them (a profile page), or there are fan pages that are about someone/something. Websites will often let you 'Like' them or share them by clicking on a Facebook icon on their web pages.



or the thumbs up 'Like' symbol



Twitter - Twitter is an online social networking service that enables users to send and read short 140-character messages called 'tweets'. Users can 'follow' other users (the tweets of the person they follow appear in their Twitter feed as soon as they are published). Registered users can post tweets, unregistered users can only read tweets. Twitter users access Twitter through either the website interface, SMS, or through a mobile device app. Websites will often encourage you to tweet about them by clicking on a Twitter icon on their web pages:



Wikis

A wiki is a collaborative blog that anyone in a community can access, contribute to or edit. A wiki can be open to the whole world, or only made available to a select number of users. There are often moderators in a wiki community, who have more editing rights than other users, who can change more content, whose role it is to check the validity of the content of the wiki. Wikipedia is the most well-known wiki.

Blogs

A blog (a **web log**) is a commentary on a certain topic. They can be about anything. They are usually written by one or a small group of people. Visitors to the blog website can comment on entries, or respond to other comments.

Content Sharing Websites

Websites such as YouTube or Flickr allow users to share content. YouTube is mainly for sharing videos, Flickr is mainly for sharing photos. YouTube users create their own profile and post videos. Other users can comment on and rate their videos. Copyright infringement can be a problem on YouTube (and other similar websites). Many users do not upload original content.

Podcasts

Podcasting is the term used when video and audio files are made available on the Web. They can be streamed or downloaded to either a computer or mobile device. Podcasts are typically short and made available as a series. Subscribers can receive the next instalment automatically.

Video Streaming Services

There are many services on the Web that will allow you to stream videos (sometimes live, sometimes pre-recorded) to your computer. Many TV channels allow this, e.g. TV NZ has TV OnDemand, the UK's BBC has iPlayer. As well as national broadcasting corporations using video streaming, individual users can stream live video to many other users. Livestream is one such video platform. It allows users to view and broadcast video content, recorded using a digital camera. Livestream channels include everything from political party broadcasts to people live-streaming video of their cats.

Newsgroups

A Newsgroup is like an email list of discussions, news, views and announcements on a particular topic. It is a message board where users can post messages or files on a subject of common interest and where all users have access to the messages and files. Some newsgroups are moderated and other are free for all and can have a lot of abuse (flame) directed at the posters. Newsgroups are hosted on networks of computers called Usenet, and some of these servers require you to logon in order to be able to access the newsgroup hosted on the servers. A specialised program is generally required for the user to read and access the information. Some email clients can also read newsgroups.



TOPIC 3: INTERNET COMMUNICATION TOOLS

Online Chat

Online chat comes in two main types – Instant messaging (IM) and non-IM. Non-IM includes chat rooms. Both types use text-based communication between two or more participants over the Internet. IM and chat rooms differ from Internet communication such as email in that the users perceive online chat as real time. There are however some online chat systems that will allow messages to be sent to users that are not logged on, but this is not usually how people use online chat.

Online chat can incorporate features such as using webcams to see each other and using microphones. You can read more about this later in this topic under video conferencing.

Instant Message (IM)

IM, in the most widely used sense, describes how two (or more) people can communicate through text-based messages sent from one computer to another. It allows the sender to know immediately that their message has been received. Text conversation can often be saved for later reference. Early instant messages were not in real-time, character for character. Although this feature can be turned on in many modern IM programs, it is usual for a user to type a message, press Enter and then the whole message is sent to the recipient. Most IM services provide their own client software, or browser-based client. As well as text they often allow transfer of files (up to a given size), to send emoticons, hold multiple conversations at once, and have a contact list. IM differs from chat in that IM systems tend to allow communication between specified known users rather than with strangers.

Due to the real-time aspect of IM, and that fact that users often send short messages, text speak has developed to abbreviate common words to quicken conversations and reduce keystrokes. This helps the real-time conversation from slowing down too much and becoming untenable. As the conversation is not face-to-face emotional expressions have developed, e.g. typing in capitals is often interpreted as shouting, smiley faces etc. can indicate laughter, along with text abbreviations such as LOL and ROTFL. Text-speak can sometimes be interpreted wrongly, e.g. sarcasm does not always translate to written communication well.

It is not just individual users that use IM. Businesses also use IM. Lotus, Microsoft and Oracle have all developed IM platforms suitable for use by corporations. However IM in organisations needs supporting to provide safe, secure and productive instant messaging.

Examples of web-based IM clients are Windows Live Messenger, Yahoo! Messenger and Google Talk. Examples of client software that you download onto your computer are Pidgin and Instant

Chat Rooms

Users of chat rooms may be known to each other, e.g. they are collaborating on a project that is using a chat room to facilitate communication, or they may be anonymous. Chat rooms differ from IM generally speaking in that they allow multiple people to communicate with each other at the same time, rather than the usual one-to-one paradigm of IM.

Users of a chat room usually have similar interests to each other. Chat rooms exist for nearly every topic you could think of.

Visual chat rooms add graphics, either 2D or 3D, to the chat. You can 'see' who you are talking to. Each user of the chat room has an avatar. An example of a popular 3D chat room is Second Life. You can play games in chat rooms too. Chat rooms usually have rules dictating user behaviour, particularly rooms for children. They usually ban offensive language. Some people visit chat rooms deliberately to annoy people by being offensive on purpose. These people are called trolls. Some chat rooms have moderators who can ban people, but most are usually self-moderated and users sensibly choose what to say and share with others in the chat room.

Many chat rooms are web-based rather than a user downloading client software. They require you to log in, but you can usually register with a chat room in minutes. There are many chat room websites that host multiple chat rooms. You register with the website and then you can join as many of their chat rooms as you like.

VoIP

Voice over IP (VoIP) is a set of protocols which allow voice and multimedia communication sessions over IP networks such as the Internet. The term is often used synonymously with Internet telephony.

VoIP is a way of referring to making calls and communicating using audio and often video using the Internet rather than the public switched telephone network (PSTN). The calls are digitised, broken up into packets and sent via the Internet. At the other end, the packets are converted back to audio data for the receiver to hear.

One of the main benefits of VoIP is that because it uses the Internet rather than the telephone network the calls are essentially free (depending on your Broadband plan). VoIP is available on PCs and mobile devices alike.

There are a number of ways to use VoIP:

You can subscribe to a VoIP phone company, whereby you make VoIP calls in much the same way as you would if you had subscribed to the telephone provider. Many VoIP companies offer unlimited local or nationwide calls for a flat monthly rate, but will often charge for international calls. They will often provide free calls between the same provider. A VoIP phone is needed to connect to a VoIP service provider. This can be done in the following ways:

- VoIP phones connect directly to the IP network
- An analogue telephone adapter can be used to connect your standard phone to your computer or Internet
- Software is installed on your Internet-ready computer that has a microphone/speakers or a headset. The application is simple and will display a number pad to use for dialing. The application is usually controlled with the mouse.

There are free VoIP providers (they may also provide a paid-for service to dial landlines or use some of their more technical features like conference calling). Examples of these are Skype and Microsoft Netmeeting

Skype software makes it possible for people around the world to communicate via voice, video and IM over the Internet, and at a lower cost than traditional methods. Skype-to-Skype calls (between Skype users), video calls (videoconferencing) and instant messaging are free. The software can also be used to call regular phone lines from anywhere in the world (but there are charges for this).

Video Conferencing

Video conferencing allows two or more locations to communicate using two-way video and audio transmissions. It allows two or more people at different locations to see and hear each other at the same time. It is often used in organisations to conduct meetings or training without all members of the meeting/group to be in the same place.

In order to conduct a video conference you will need the following:

- An Internet connection
- Standard computer hardware
- A webcam
- A microphone (this is often part of the webcam)
- Speakers
- Video conferencing software (all users will need compatible software, usually from the same vendor)

Each participant sits at their computer and connects to the conference by clicking a link (meeting invitation) often sent out via email.

Typical features of a web conference include:

- View slide presentations from programs like PowerPoint. Markup tools and a remote mouse pointer are used to engage the audience while the presenter discusses slide content
- Draw or write on a common whiteboard by using their computer mice or typing
- Annotate images and diagrams using the same whiteboard principle
- Transmit still pictures or video to other attendees via a webcam
- View information from the moderator's computer desktop using screen sharing
- Share documents, often even if attendees do not have the software that created them, using application sharing
- Hold interactive question-and-answer sessions that integrate video and audio
- Send public or private messages through instant messaging
- Annotate or modify documents and spreadsheets from compatible applications
- Transfer files between attendees
- Ask and answer questions through audio chat (as an integrated part of the software) or by phone.

Skype software is able to conduct basic web conferencing sessions, but there are also specialised software products that provide a full range of web conferencing features. Examples of this type of software include Adobe Acrobat Connect, Cisco Unified Meeting Place, Elluminate, Microsoft Live Meeting, and WebEx to name a few.

**SELF TEST**

1. One of the limitations of a webmail account is that it only works in the country in which the account was created.

True/False

2. An email account created with one ISP can be carried over to another ISP.

True/False

3. What happens if you do not use your free email account for an extended period of time?

4. What is another name for Newsgroups?

SELF TEST ANSWERS

1. False
2. True
3. This is dependent on the email provider. It is no unusual for an email provider to 'suspend' your account. No-one else can use that email address but next time you log in you may have to answer security questions. Email will still arrive in the inbox (so long as the inbox does not have a size limit that is exceeded)
4. Usenet

5.0

SECTION 5 OTHER INTERNET ISSUES

OBJECTIVES

On successful completion of this section, you will be able to:

1. Manage, and describe the causes of, delays and errors on the Internet
2. Describe security issues and the impact of viruses

TOPICS

1. Internet Access Speed
2. Internet Security



TOPIC 1: INTERNET ACCESS SPEED

There are many ways to access the Internet. Different methods of connection will allow different maximum Internet speeds. Internet access has got much quicker since its inception. Speeds that it is capable of now, were not considered possible in the beginning. Some common methods to access the Internet are given below:

- **Dial-up** – This method of access is old and outdated. Very few Internet connections in New Zealand today are dial-up. Its technology is based on old copper phone lines. It is capable of Internet connection speeds of up to 56Kbps
- **Broadband** – This is the most common method of accessing the Internet. ADSL Broadband (the method many New Zealand land lines use) is capable of speeds of up to 20Mbps. This is much faster than dial-up. ADSL is being replaced by Fibre-To-The-Home which will be even faster.
- **Cable** – Cable is only avail in certain areas of New Zealand and through certain providers. This uses fibre technology which is capable of much higher speeds than ADSL Broadband, up to 250Mbps in residential areas in some countries.
- **Mobile Broadband** – Mobile Broadband is an emerging market. There are multiple generations of Mobile Broadband: 2G, 3G and 4G. As with cable, only some areas of the country have coverage, usually the bigger metropolitan areas. Some areas of 4G coverage in New Zealand are capable of connecting to the Internet at speeds of over 100Mbps, according to the provider.

As you can see from the very brief list above, speed varies dramatically. Speed will also vary depending on what you are using the Internet for, where you are getting files from, and how far you are from either a telephone exchange or fibre cabinet.

Large files take up a lot of bandwidth and take time to transfer. Compressing files will alleviate this problem. Many email providers have a limit on the size of individual files or the total amount of data attached to a single email, e.g. Hotmail allows up to 200 attachments up to 50MB each (allowing 9.8 GB in total). The advent of cloud storage where users can upload larger files and store them in the cloud, e.g. on Microsoft's SkyDrive means that users often do not need to send large files via email as the files can be uploaded to the cloud and then accessed from somewhere else at a later date.

Internet Traffic Management

There are many utilities available on the Web that allow scheduling of downloads. This means you can configure the program to dial up your ISP or connect to the Internet and download a particular file or files at a particular time. For example, if you need to download a large file, you can schedule it to download at e.g. 3 a.m. This is useful as Internet Service Providers (ISP) base available bandwidth on a contention ratio. This is the number of users in an area who share the bandwidth at the same time. The lower the ratio means the better the connection. A 50:1 ratio is often quite normal. ISPs often prioritise Internet traffic based on its type by operating a fair usage policy. Regular browsing is prioritised, however users who regularly stream TV and movies, play many hours of online games, download large files or upload large files may find that at certain peak times of day their Internet connection is throttled. They then have to wait until a quieter time of day to do these activities.

Mirror Websites

Downloading information from the Internet is quick when you think about how far that information is travelling in seconds. However, getting information from further away still

takes longer than if you are getting information from a local web server. This is where mirror websites are useful. Many popular websites have a number of mirror websites across the world. These mirror websites provide the same information and facilities at different locations. This enables users to visit a local website rather than accessing the website on the other side of the world, and improves the time taken to access the page.



ACTIVITY 5-1

1. Open IE. Go to <http://www.speedtest.net/>
2. Click the Begin Test button.

The speed test will find out the ping, download speed and upload speed of your computer. The results will look like the figure below:

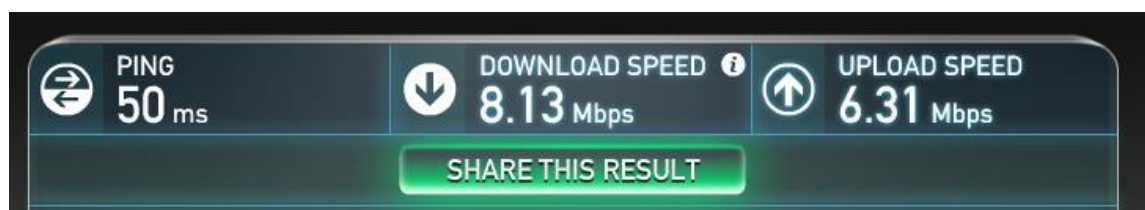


Figure 5-1

3. What are your results?

Ping

Download Speed

Upload Speed

Ping, download speed and upload speed vary depending on your location, your method of connection and your ISP. If you run this test from home you will get different results to if you run it on campus. Upload speeds are usually small compared to download speeds. If you are using an ADSL connection a download speed of up to around 20Mbps is fairly normal. Ping should usually be less than 100 ms. 100 ms is quite a high ping.

If you run a speed test at different times of day you may also get different results due to different contention ratios on your connection.



TOPIC 2: INTERNET SECURITY

People exchange information across the Internet. The Internet is not a secure method of information interchange. There is a high risk of the information being intercepted and then used for fraudulent purposes. Methods of securing data have been developed including encryption and firewalls.

There is a variety of dangers of using the Internet that encryption and firewalls are designed to prevent:

- **Malware** – This is a term which describes all of the software and code which is designed to infect or attack your computer. It includes all of the other dangers mentioned below.
- **Viruses** – A virus is a small piece of software that hides in a real program. For example, a virus might attach itself to a program such as a spreadsheet program. Each time the spreadsheet program runs, the virus runs too, and it has the chance to reproduce (by attaching to other programs) or damage files. Viruses can also spread via e-mail.
- **Worms/Trojans/Backdoor** - These are small programs that can do damage to your computer when run and some can replicate themselves also and spread via a network. They can also make use of holes in security or allow a remote user to get access to your computer.
- **Spyware/Loggers/Adware** (together they are known as grayware) – This type of software installs itself on your computer to monitor your activities, steal data/information, or to display advertising banners.

Since the Internet is a vast web of interconnected computers, the potential for virus transmission from one computer to another is quite high. While web pages are written in HTML, which is just standard text that is marked up by your browser, web pages can also include scripts and programming language commands so viruses or malware can be transmitted to your computer simply by visiting a basic web page. Your computer cannot get a virus from a picture you view from a web page on the Internet, unless you click it and it runs a file.

For enhancement and to provide special features, many web pages contain small and simple programs often written in ActiveX or Javascript. Javascript and ActiveX and other programming languages developed for use on the Internet can be used to load malware and install a virus from an active page. IE warns you when you try to visit a website that is a possible security risk to your computer. You can then choose whether or not you wish to load the page.

Files downloaded from the Internet may contain a virus or malware/spyware. All files downloaded from the Internet (from a web page or by using FTP or email) should be scanned for viruses and malware before being run or opened. Many popular virus scanning programs can be set to check automatically anything downloaded from the Internet, and to scan every file before it is opened.

Further Information about the Internet and the Web

The Internet and the Web are very large topics, and this module has just given you an introduction. The Computer Power Plus exam for this module will only cover the contents of this learning guide. However if you would like to look at some further information about the Internet and the Web, and how it has developed, which will help you to consolidate your learning, you can find some interesting podcasts here. Watch as many of them as you wish/have time for:

<http://www.bbc.co.uk/programmes/b00n4j0r/clips>

**SELF TEST**

1. What is a general term to describe viruses, trojans and spyware that can adversely affect your computer?

2. What should be done to speed up the transfer of large files?

3. Which of the following is the main reason for having a mirrored website?

- (a) allows for downloading from a local or nearby website
- (b) enables worldwide coverage of the website
- (c) provides a backup in case the original website is down
- (d) improves security with regard to validating passwords

SELF TEST ANSWERS

1. Malware
2. Zip them up, send them at night.
3. (a)