1. The Internet - An Introduction

In recent years there has been a significant move towards using computers as entrances to the vast world of the Internet. A day hasn't gone by without some public discussion of the Internet and its user-friendly offshoot - the World Wide Web (WWW). Millions of computer users around the world now have access to and frequently use the applications provided by the Internet and the WWW. Terms such as WWW, E-Mail, Search Engine, Home Page, ISP, Intranet and URL have come into common usage.

This was not always the case; the Internet originally was a collection of loosely coupled computer networks (a collection of connected computers) spread around the world that mainly used the Unix operating system. This meant that users of the fledgling Internet needed to have some Unix command knowledge to be able to use the Internet. The great majority of computer users who were familiar with MSDOS/Windows and Macintosh based PCs were therefore not able to easily access the Internet. The Internet for a while remained largely a domain of the "computer nerd".

In the early 1990s Tim Berners-Lee of the CERN laboratories recognised the need to make the Internet more user-friendly. He proposed the concept of a hyper-text environment called the World Wide Web. In 1993 Mosaic, the world's first browser software was developed at CERN to achieve this goal. Mosaic was graphically oriented software that allowed users to use Windows-like capabilities to easily interact with the Internet.

In 1994 Netscape Corporation was set up to exploit the commercial use of this new, hypertext-based, graphical user interface. The Netscape browser software was the first truly useful Internet product that allowed the ordinary computer user to discover the Internet.

Much of what has happened since has been the rapid evolution of Netscape and its chief rival, Microsoft's Internet Explorer into the browser environments that we know today.

This great success of the Internet and the WWW has been largely due to the:

- general usage of the TCP/IP communication protocols;
- user-friendliness of the browser software;
- non-control of the Internet by commercial groups;
- small cost to implement and maintain;
- wide variety of content available.
In more recent years the Internet and the browsers that access the Internet have seen the integration of some sophisticated capability, including:

- Electronic Mail (E-Mail)
- Online Chat
- News Groups
- Search Engines
- Voice and Video Conferencing
- Sound and Video Streaming

Much of what will be covered here will be based around these capabilities.

The Internet and WWW operate on the basis of packets of data (in text form) being transmitted from one internet server (a special PC set up for the task) to another. Web Servers are particular internet servers that deliver packets of HTML formatted data.

They negotiate the transfer of packets of data according to a complex set rules described as the TCP/IP protocols. The rules describe the structure of the packets and the procedures by which the software on the machines communicate with each other.
Typically the software operates on a client-server basis—one machine receives the text data packets while the other sends them. Much of the detailed operation of the client-server process is taken care of by **Web Server software** residing on the web server and **Client Web software** installed on a user's workstation.

There are many web software applications, each with their own protocols rules. These include:

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In a web environment these applications can run and operate at the same time. In fact, many web software packages have been built to make use of these web protocols, some using only one protocol (e.g. WS-FTP) while others, such as the web browsers, Internet Explorer and Netscape use multiple protocols.

Connecting to the Internet depends mainly on where you are connecting from—from home or a remote site through to an **Internet Service Provider** or from a workstation on a network connected via a gateway straight through to the Internet.

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**TIPS! ISPs**

An **ISP** or **Internet Service Provider** is an organisation that has established specialised equipment and telephone lines to provide a web server capability for dial-in users. ISPs charge the subscriber for usage of their services. The rates depend on the type of service provided—usually on a time basis or a download size basis. A well-known ISP service in Australia is provided by Telstra’s Big Pond at:

http://www.bigpond.com
This method of connecting to the Internet is also known as a **dial-up connection**. In the early days of the Internet dial-up connecting a lot of technical knowledge was required. Fortunately this process is much simpler now.

This method of connecting to the Internet is also known as a **network connection**. It requires some knowledge about the Internet settings used by your organisation and is best left for the IT support staff or the network administrator.
The Internet Environment

2. A Browser - Internet Explorer

One of the main reasons that the Internet has become so popular is the widespread availability of user-friendly software. The most popular of these software packages are the web browsers. The two most popular web browsers are Microsoft's Internet Explorer and Netscape's Navigator/Communicator products. Both of these packages provide a Graphical User Interface (GUI) which allows all kinds of users, novices and experts, to navigate their way around the Internet without the need to know complex text-based commands or how the Internet is structured. These packages have in fact developed to the stage that knowing where the web pages reside has become secondary to the activity. In fact, these packages have become so widely used that the World Wide Web (WWW) which is associated with the hypertext environment within the Internet has become synonymous with the Internet.

To get a feel for the capabilities of the web browser we will have a close look at Microsoft's Internet Explorer. The capabilities of Internet Explorer are similar to those of Netscape Navigator.

1. Click the Start button.
2. Select Programs then the Internet Explorer button.
The Internet Explorer window has five sections:

**Menus:**
A display of drop-down menu options from which all of the Internet Explorer commands can be accessed.

**Toolbar:**
Contains a selection of commonly used command options displayed as **Toolbar Buttons**.

**Address Bar:**
Area where a user can type a web page address or URL to access web page documents.

**Status Bar:**
Area where a user can keep an eye on web activity. The left-hand side shows the loading process while the right-hand side indicates security status.

**Viewing Window:**
Area where web content is displayed.

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**The Toolbar Buttons** each have a specific use.

- **Back**
  Returns to previous displayed web page.

- **Forward**
  Go to the next page in a series of pages to which a user has already been.

- **Stop**
  Stops downloading activity of current web page.

- **Refresh**
  Update the current displayed page with the latest information.

- **Home**
  Takes you to your Home page, that is, the first page a user sees when the browser starts.

- **Search**
  Opens the Search bar, which allows a user to choose a search service that can be used to search the Internet.
Opens the favorites Bar where you can store and organise links to your most often used Web sites.

Displays a record of all the web sites you have recently visited.

Opens up your Outlook Express electronic mail and newsgroups package.

Prints the current displayed web page.

Opens up a web page editor allowing a user to edit the HTML web document currently displayed.

Attaches to a discussion forum through a discussion server (Only if activated).

To navigate around the WWW browsers can use a Universal Resource Locator (URL) or WWW address. WWW addresses generally follow the format:

3. Click into the address bar and type the URL http://www.bom.gov.au/

4. Press <ENTER> to accept this address location.
This WWW site is a fairly sophisticated example of what can be done with modern web pages. It includes **hyperlinks** which are text references on the current web page that link other web pages. In fact this first web page is a window into a number of web pages that are linked together by many hyperlink references. The combination of web pages that reside on the one machine are called a **web site**.

5. Move your mouse cursor over the top of the **Weather Charts hyperlink**.

Notice that the hyperlink changes colour and the cursor changes to indicate that you are able to select this option by clicking on the hyperlink. Also while the cursor is over the top of the hyperlink the bottom left-hand side of the **status bar** indicates the details about the web location or page to which this hyperlink refers.

![Image Map with Hotspots](image1)

![Tabbed Sub-Sections](image2)

![Hyperlinks](image3)
6. Move your mouse cursor over to the map of Australia, to the state of Victoria.

The map of Australia is a graphic image that has been created as an Image Map. The Image Map has Hot Spots located on it that act as hyperlinks to other documents. Check out the left-hand side of the status bar again to verify this.

7. Click on the Victoria Hot Spot.

Notice that on the new web page displayed the hyperlinks are indicated with underlines.

8. Click on the **Current and Forecast** hyperlink.

9. Click on the **Latest Analysis Chart** hyperlink.
If this is a site you would like to visit on a regular basis then the most efficient way would involve using this web page's URL to come straight here. This would be preferrable to trying to remember a series of click steps involved in getting here. The major problem with this though, is the need to remember a complex URL. Fortunately Internet Explorer has a a simple way of saving the URLs of sites that you visit. This is the purpose of the **Favorites** button and Favorites folder system.

10. Click the **Favourites** button.
The Favorites Bar appears in the left-hand side of the Internet Explorer window.

11. Click the Add... button to add the URL to your Favorites list.

12. Click the OK button to register the URL.

A URL that is used extensively can be made the starting page of the browser—most often called the Home Page. Internet Explorer recognises that a user may need to get back to the start and provides a toolbar button to take the user "home" quickly.

13. Click the Home button to take your browser back to the start.

Note: The Home Page is usually different for each browser and can actually be set from within the browser.

14. Double-click the Favorites link back to the Weather Bureau's click weather chart page.

15. Click on the link just above and to the right of the chart.

This takes you to the Forecasted Chart.

16. Click the button to take you one step back in the URL pathway.

Internet Explorer remembers the URL pathway you have chosen—it keeps a history of a user's travels.

17. Click the button get back to the Forecasted Chart.
18. Click the button to add this URL to the Favorites list.

19. Click the button.

Organising Links

It is easy within Internet Explorer to keep on adding URLs to the Favorites list, but eventually you would have so many that it would be difficult to keep track of them. The Favorites list can be organised into folders.

20. Click the button within the Favorites Bar.

21. Click the button.

22. Type Weather Charts for the new folder name.

23. Press <ENTER>.

24. Drag both of the weather chart URLs into the new Weather Charts folder.
25. Click the **Close** button.

Your Favorites bar should now look something like this:

![Favorites](image)

26. Click on the **Weather Charts** folder.

You should now see the two weather chart URLs inside the opened folder. These of course, can be accessed at any time and are now organised in an orderly fashion. More folders can be added and URLs organised at any time.

The ability to store the URLs of where a user has been on the internet is exploited to its fullest by Internet Explorer's history facility. The History button is a quick and easy way of organising and searching for the sites a user has visited.

27. Click the **History** button.

![History](image)
Shown is a list of previously visited URLs organised in time order.

28. Click the **Last Week** hyperlink folder.

29. Click on one of the **sub-folders**.

30. Click on one of the links.

Internet Explorer provides a number of other views of your visited URLs.

31. Click the **button**.

32. Select **By Most Visited**.

The URLs are now organised in the Most Visited order.

*Note: You might like to experiment with some of the other views.*

Despite being able to freely wander through the Internet using the hyperlink method to try and find information, users are mostly in need of information that is much more specific to their needs at the particular time that they need it. "Browsing" is inadequate for this task. Something akin to a search that you would do in a library would be much more preferrable. Microsoft's Internet Explorer has the ability to search the Internet for information using easy to formulate search terms. The term that is used to describe this activity is using a **search engine**. In practice a search engine is a software application that searches for words in documents or in a database. The documents are on many sites and have been indexed using keywords. The search engine software allows the keywords to be "looked up" via the index with the corresponding URL returned. The URLs returned and displayed then act as a basis for retrieving the web pages.
33. Click the button in the Internet Explorer toolbar.

You will notice the Search Bar appears on the left-hand side of the Internet Explorer.

34. Click into the search query text box.

35. Type the query weather chart.

36. Click the Search button.
The results shown appear to be too general in nature as results are from sites all over the world.

37. Click on the Four Day Weather Forecast hyperlink.

*Note:* The colour of the hyperlink changes once you have used it. This is useful in knowing where you may have already been.

As you can see this is a different link to one that you might expect (i.e. the Australian Bureau of Meteorology's Weather Chart). Search engines can do a good job but because of the vast array of information that they can now access, it is important to be able to narrow down the queries that you might use. For example, the query Australian Weather Chart brings up a better set of responses.

38. Click into the search query text box.

39. Type the query australian weather chart.

40. Click the Search button.
Apart from the in-built search facility that Internet Explorer provides, there are a number of well known web server based search tools. That is, search tool software that resides at other locations other than at Microsoft's web site. Most of them operate in a similar fashion to the Microsoft version but can differ significantly in the results they give. This is due to the way they find the information. There are three types of search tool **Search Directories, Search Engines** and **Metasearch Engines**.

Search Directories

These are hierarchical databases that store details about web sites selected and classified according to content experts. Two well-known examples of these are Yahoo and Looksmart. Searching these directories doesn't find the text information contained in the pages but searches the site title and description of the site contained on the database record of the site.

41. Type the URL www.yahoo.com into Microsoft Explorer's address bar and press <ENTER>.
42. Type "australian weather chart" into the search box.

43. Click the Search button.

As you can see the results are quite different to what we obtained earlier using Microsoft’s built-in search engine.

Note: You would need to be more site specific to get to the same results as you did earlier. Try "australian bureau of meteorology" as your query instead.

Search Engines

The second type of search tool uses "robots" or "spiders" to crawl through the Web looking for new web pages. They read these pages and put the text or parts of the text into a large database or index that the engines allow users to access. Examples of this type of search tool include Alta Vista, Excite and Google. Search engines are usually the first choice when the user knows what they are looking for.

44. Type the URL www.google.com into Microsoft Explorer's address bar and press <ENTER>.
45. Type **australian weather chart** into the search box.

46. Click the **I'm Feeling Lucky** button.
Metasearch Engines

These tools search several search engines and directories at the same time trying to get the most relevant hits from all of them. Examples include Search.com and Metacrawler.

47. Type the URL www.search.com into Microsoft Explorer's address bar and press <ENTER>.

48. Type australian weather chart into the search box.

![Start your metasearch](image.png)

49. Click the Go button.

Note: The Metasearch engine also appears to be a bit off track but try again a little later and you might have better luck.

50. Click the button at the top right hand side of the Internet Explorer window. This will shut down Internet Explorer.
The process of browsing through the world wide web involves the use of browser software to take much of the tedium of interpreting the HTML documents and dealing with the ftp access to files that need to be downloaded by the browser. In many instances web sites contain links to files that are meant for direct download or a user might want a picture downloaded to areas that a user may have organised for local storage. Let's try and do this now.

51. Click the button from the toolbar.

52. Select the BoM - Forecast Chart option from the Weather Charts folder in Favorites.

53. Right-click anywhere on the chart to display a context menu.

54. Click .

55. Type Today's Chart in the File name: box.

56. Click the button to save the chart picture file (in GIF format) into the area on your hard disk.

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**INTERNET GRAPHICS FORMATS**

The Internet uses two main types of graphic file formats:

- **GIF** - Used for smaller graphic files.
- **JPG** - Used for larger photograph files.
The browser is a very useful piece of software able to interpret HTML documents, download graphics files (static or animated) directly or indirectly and keep track of hyperlinks and much more. The consumer though has increasingly asked for more—notably the incorporation of sound, animation and video capability. These forms of information are very memory intensive and take a lot of time to be downloaded to the browser and then played. To handle this type of information the browser enlists the help of two types of application:

- A **helper application** which opens the file in a separate window and does not involve the browser software at all. An example of this type of application is **Winzip**. A file that is downloaded via the browser that is in .zip format can enlist the help of the winzip program to uncompress the contents.

- **Plug-in** software that enhances the browser to enable the performance of the task. Examples of this type of software are **Windows Media Player** (to listen to streaming audio and video), **Adobe Acrobat Reader** (to read PDF formatted files) and **Macromedia Flash** (to display flash animations).

Let's illustrate how you would implement one of these plug-in applications.

57. Type [http://www.adobe.com/products/acrobat/readstep2.html](http://www.adobe.com/products/acrobat/readstep2.html) as the URL into your address bar and press <ENTER>.

58. Scroll down the page until all of the following form is visible:
59. Type and select the details as shown above (*Put in your own name and E-Mail address*).

60. Click the **DOWNLOAD** button.

61. Click the first radio button option.

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62. Click the **OK** button.

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63. Click the **Yes** button in response to the security dialog box.

64. Click the **Next** button *twice* to complete the Acrobat Reader 5.0 Plug-in setup.
65. Click the OK button.

Let's try a plug-in application:


67. Click on one of the archived video links - they are labelled \texttt{28-56k}.

A plug-in window pops up. In this case it is \textbf{Windows Media Player} which then proceeds to play a short video clip along with its accompanying sound.

68. Click on the \textbf{X} button to shut down the plug-in.

69. Click on the \textbf{X} button to shut down the browser.

Sound plug-ins and many other plug-ins and helper applications operate in a similar fashion.

Much of the current success of the internet has been the use of these various forms of media to help enrich the environment that is available to the general user. There is no doubt that much of the 'hype' associated with the internet is due to not just the multi-media delivery but also the promise of being able to do business using the internet as the vehicle for distribution of products and services to a vast customer base - the much heralded \textbf{electronic commerce}. Although there are a number of different types of electronic commerce transaction (Business-to-Business or B2B, Business to Consumer or B2C and m-business or mobile phone based transactions) let's look at a typical transaction that many businesses use to present to a customer.

70. Type the following URL into the Internet Explorer Address Bar and press <ENTER>.

\texttt{http://mall.mp3.com.au/}
71. Scroll down this page a little.

72. Click on the Limp Bizkit t-shirt icon.

This page is typical of the shopping cart approach that many EC sites use—the customer selects items from the catalogue range and adds the items to a virtual shopping cart.

73. Click the Buy Now button.
74. Click on the **BUY THESE ITEMS >>** button.

A security alert dialog box appears.

*Note:* Security is a major concern for most Internet customers.

With the completion of your order the goods or service are supplied to you through normal delivery channels.

75. Close **Internet Explorer** when you have finished.
One of the ways you can see how the Internet operates is to observe the various connections that are made in getting to a remote server. The Microsoft Windows products offer a crude way of seeing this - using the tracert DOS text command.

1. Click the button and select the Run... option.

2. Type the DOS text command tracert www.microsoft.com into the command box.

   ![Tracert Command Output]

   What does this window tell you about the times it takes to make the connections?

Another useful DOS text command often used by networking people is the ping command.

3. Type the DOS text command ping www.microsoft.com into the Run... command box.

   What does this command tell you?
One of the issues when setting up the Internet from home is to find out which Internet Service Provider gives the best deal. One way of comparing is to check out the ISP’s web site for prices and plans.

1. Open Internet Explorer and type http://www.bigpond.com/Home/Signup/ into the URL address bar. This will take you to Telstra's web site.

2. Select the Pricing Plans hyperlink.

3. Click the Premium Plans hyperlink.

4. Calculate how much it would cost on the Frequent User Plan to operate through Big Pond when you are using Big Pond for 17 hours per month?

5. How does this compare with the Power Plan and the Professional Plan?

The data that is used throughout the internet is simple text. HTML is pure text - it is interpreted by the browser using special HTML codes.

1. Open Internet Explorer and type http://www.looksmart.com into the URL address bar. This will take you to Looksmart's web site.

2. Select View then Source from the menus.

3. Click the button to close the Notepad Window.
Experienced users of browsers use their Favorites folder extensively. They organise their favourite links into easily used and recognised folders. Let's investigate this further:

1. Open Internet Explorer and type http://www.looksmart.com into the URL address bar. This will take you back to Looksmart's web site.

2. Click the button from the toolbar.

3. Click the Organise button.

4. Click the Create Folder button and create a new folder with the title My Search Engines.

5. Close this dialog box.

6. Click the ‘Add...’ button in the Favorites Bar.
7. Select the My Search Engines folder to add Looksmart’s page to the folder.

8. Type www.google.com URL into the Address Bar.

9. Add this page to the new My Search Engines folder.

10. Type www.altavista.com URL into the Address Bar.

11. Add this page to the new My Search Engines folder.

12. Test the new links out by opening the My Search Engines folder and going to each of the pages.
The Shopping Cart model is widely used to buy goods on the internet. There are others emerging, for example the use of auctions.

1. Open Internet Explorer and type `www.ebay.com.au` URL into the address bar. This will take you to Ebay's web site.

2. Click on the `Help` button in the toolbar.

3. Click on the `tutorial hyperlink`. Follow the instructions.

4. Click on the `tutorial hyperlink`. Follow the instructions.

5. Click on the `tutorial hyperlink`. Follow the instructions.