

# How the Web Works: A Guide for Anyone Who's Left It Too Late to Find Out and Is Now Afraid to Ask



A **Blue Mouse Monkey** guide

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Just a few short years ago you could proudly proclaim ignorance of how all this website stuff works, and feel okay because it didn't affect you and you couldn't imagine what you'd ever need a website for. But now the Blue Mouse Monkey sees an increasing number of clients who've realized they need a website in their professional lives, and they blush and admit to her they really don't understand what is involved.

This in itself is not a problem, the problem is that the resources available for helping people understand Internet technologies are mostly created by people who were born knowing all about them. But like you, the Blue Mouse Monkey was not born with this knowledge. She set out one day to learn, and after a long journey she is able to report back (in a super-simplified way) to her fellow artists about what she knows.

## **THE INTERNET and THE WEB**

The words 'Internet' and 'Web' get used interchangeably, but they mean different things. The Internet (always spelled with a capital) was invented in the 1960s by DARPA. Yep, those wacky defense folks who are continually coming up with paranoid solutions to problems the

Blue Mouse Monkey could never imagine, realized that a nuclear strike could wipe out the centralized communications systems of the time. So, they wondered, how can we create a decentralized communications system, one that is constructed out of a network, so that even if major cities were destroyed, enough of the network would remain intact?

The Internet began with four nodes, i.e. separate computers on the network. It expanded within the military, then during the 1970s moved into education. Pretty much like the telephone, which no one dreamed would be used for general public communication (it was invented to transmit musical concerts) the Internet grew as a tool for communicating about research, while no one paid much attention to the habit researchers were developing of using it for personal communication too.

The rest, as they say, is history. The rise of the personal computer, email, and then the invention of the World Wide Web in the 1990s have all contributed to the remarkable cultural, social, communications and lifestyle phenomenon we now take for granted.

So, you're wondering, what is the difference between the Internet and the Web?

The Internet is an umbrella term for all technologies that use the decentralized publicly accessible network of networks. This includes email, telnet, ftp (file transfer protocol) newsgroups, bulletin boards, chat groups, and remember gopher? That was the way you searched for information on the Internet before the Web came along. All these technologies are text-based, and were invented when bandwidth (i.e. the amount of information that can be transmitted) was narrow and computers were slow. Then in the early 1990s the World Wide Web was born. The Web is distinguishable from other Internet services in that it allows for graphics, sound, video, animation, and a non-linear organization of information through 'hyperlinks', i.e. the ability to click on a word or image and be taken to another page. We access the Web through programs called Web 'browsers'. Internet Explorer, Firefox, Safari, and Netscape are all examples of browsers. And for the past few years some of the early

Internet services such as email and newsgroups now have web-based counterparts so you can access them through your web browser.

## **WEBSITES: WHAT ARE THEY MADE OF AND HOW DO THEY WORK?**

Websites are collections of digital files hosted on computers called Web servers. Web servers are connected to each other over the Internet and communicate using a language called HTTP. This stands for 'hypertext transfer protocol', and the Blue Mouse Monkey mentions it only because you'll notice http at the beginning of web addresses and you might be wondering what it means.

'Hypertext' is text that contains links to other pages, which is pretty much sums up text on the Web. And 'transfer protocol' just means a particular way of schlepping information around between computers.

So, you ask, when I'm at my computer, and have a Web browser open such as Internet Explorer or Safari or Firefox, and I type in a website address or click on a link and a new page pops up, how does that work?

What happens is your browser sends off a request for that page out over the Internet. That page is identified by its unique address so it is able to be located. Web addresses are called URLs, which stands for Uniform Resource Locator. It just means the standardized way of addressing things on the web, much like '1234 SE Main, Portland, OR 97214' is a standardized way of addressing mail carried by the post office.

So a request for <http://www.bluemousemonkey.com> will send a message to your ISP (Internet Service Provider, e.g. Earthlink, Comcast, Verizon, etc.), which relays the message to the server hosting the Blue Mouse Monkey domain, then the host server replies by sending

the various files associated with that particular address back to your ISP, your ISP sends it to your computer, and the files pop up on your browser screen.

And isn't it incredible that it all happens in seconds?

But wait! There's more! The information transmitted around the Internet, whether the requests for files or the files themselves, is broken up into pieces called 'packets', and different packets take different routes through the network of the Internet. And each time you request the same page, the information will arrive in your browser via a different set of journeys, to be reassembled in front of you by your web browser. Amazing!

## YOUR WEB BROWSER

Your browser is a bit like a jigsaw-puzzle solver. It assembles websites for you on the fly out of the collection of information it receives. Despite often resembling brochures and books, websites are not created the same way. There is nothing fixed about the content of a website, it's just an illusion that it's all nicely laid out in neat blocks and images and to a certain width and so on. A web page is a collection of content that is kept in place by a set of instructions that the browser reads that allows it to assemble web pages as they come in to your computer.

The instructions the browser reads are in a language called HTML. HTML stands for Hypertext Markup Language. Remember hypertext, text that has links? And markup just means the page content is marked up with 'tags'. The tags tell the browser how to display the content. For example, if there was to be a word of text in bold, say the sentence 'You **must** see this', behind the scenes the instructions would be 'You `<b>must</b>` see this.' You guessed it, the `<b>` and `</b>` tags turn bold on and off for that one word.

Of course there is much more to HTML than simple text formatting, but you get the idea. The cool thing about HTML is that it was written for a broad standard, the lowest common denominator, if you will. It was designed to be readable by any browser of any age on any kind of operating system on any kind of computer, whether you had an old version of IE on a creaky Windows machine or the latest Safari on the fastest Mac. It was designed to be 'cross-browser and cross-platform compatible.' The flipside is that it makes HTML pretty limited as a design tool, kind of like drawing with six colors of fat wax crayons. But many partner technologies have been developed to expand the design scope of the web, such as CSS and JavaScript. The Blue Mouse Monkey respectfully directs curious readers to [Wikipedia.org](http://Wikipedia.org) to explore these terms further.

### **'STANDARDS COMPLIANCE'**

In the meantime, the Blue Mouse Monkey would like to discuss cross-browser and cross-platform compatibility some more. The reason why this is an issue is that despite the original plan for a universal web language, not all browsers are built the same way. Some read HTML and other web languages more accurately than others. The makers of web browsers are supposed to make their products 'standards compliant' according to the recommendations of the W3C, the worldwide consortium of techies and academics and consultants who make recommendations about the best way to keep the web evolving smoothly. However, some browser manufacturers prefer to make products that do not display websites according to these standards. They decide they will get their browser to interpret such-and-such a tag slightly differently from the norm, or they invent tags that web designers might find useful, yet are not readable by browsers other than theirs. And the biggest most popular browsers are sometimes the worst offenders in this area.

The Blue Mouse Monkey has wondered why, considering their resources, such major browser manufacturers appear unable to get their products right. Unfortunately, perfect standards

compliance isn't what they're after; they prefer to split the market, and make it hard for web designers to make websites that truly look the same on every browser. So web designers are forced to make compromises, such as design for one browser and hope for the best about the rest. Or leave certain innovative design ideas aside because they won't work in all browsers.

## MACROMEDIA FLASH

One of the easier ways around this problem is to make websites in Flash.

What is Flash, you ask? Flash is an animation program that can make entire websites. One of the cool things about Flash-based websites is that all the content, including the interactivity, sits inside one single file. That file is going to look exactly the same on a PC as on a Mac, on Internet Explorer, on Firefox, on Safari, and elsewhere. So cross-platform compatibility becomes a cinch when websites are built in Flash.

But, you say, isn't the language of the web HTML?

Yes it is, and a Flash file on the web is still nested inside a small HTML package, enough to deliver the file to your browser and explain what it is and what to do with it. But the content the web user sees on their screen is all embedded within the Flash file, rather than assembled by your browser on the fly.

So, you might ask, if Flash is so great, why hasn't it taken over the web?

Good question. One of the main problems with Flash files is that they are hard for search engines (e.g. Google, Yahoo, Alta Vista) to read. The content embedded in a Flash file remains invisible to most search engines, so it's hard to get all the details indexed. There are work-arounds, but they're usually not as effective for the 'search engine optimization' of a website as having the content in simple HTML.

However, for most creative professionals, having the entire text content of your website searchable is usually not a priority. Most artists and the like know that people will search for them by name, perhaps by medium or location, or some particular identifying classification such as 'old time music' or 'conceptual art' or 'urban murals'. Small amounts of this sort of information can easily be made accessible to search engines, even with a Flash site, and thus the site will get listed in search engines.

Another reason Flash has not taken over the web is historical, because until pretty recently Flash files were special enough that they required a 'plug-in' (an extra computer program) to view them. This was perceived as a bother by enough web users that Flash sites were aimed at a more web-savvy audience. But with browser manufacturers in the past few years routinely bundling the Flash Player plug-in in with their default browser package, this is becoming a non-issue, and it is quite acceptable to make a website in Flash and aim it at a general audience.

The Web is a huge topic, complex enough to fill many books. The Blue Mouse Monkey hopes that this short introduction has been useful to you, dear reader. If you have any further questions or comments, please email Julia at [juliah@bluemonkey.com](mailto:juliah@bluemonkey.com).

Thanks for reading!