

DNS Stands for Domain Name System

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Introduction

This document is one in a series of "Technical White Papers" that attempts to interpret and explain in non-technical language the workings of computers on the Internet. The topic of this document is the Domain Name System, which is a necessary element to internet interaction. Other documents in the series are mentioned and referenced, and further reading to support the concepts introduced here may be necessary.

Non-Technical Overview

To the average user of the Internet, there is an astronomical amount of computer activity that is taken for granted. What goes on 'under the hood' in a typical web page request and interaction can and does span volumes of technical manuals. From the viewpoint of the average user, this is good. The complexities could easily obscure the beauty of actually receiving a search result or reading the latest news. This paper addresses the Domain Name Service segment of the internet's process for those who might be curious, or for those have a need to know more about these mysterious mechanisms.

Computers and their mysterious workings prefer to think in terms of numbers. The use of Domain Names on the Internet makes the process 'human-friendly', permitting us to relate to the process and the outcome with names, and not as numbered machines. A computer attaches much more and deeper significance to a series of numbers like 216.109.118.72, than it does to a string of characters like "www.yahoo.com". From the computer's perspective, there can be much more significance placed in any one of or a portion of the digits of the dotted numbers (called a dotted quad) of numbers shown above. However, to a human being, these numbers have little or no more meaning than any other string of numbers. We as humans create mental images based upon names, words, and concepts much more readily that we do for certain assemblies of digits and numbers. The way these two polar opposite ways of relating come together in regards to computing on the Internet is through what is called the Domain Name System and Domain Name Resolution. The essentials are not hard to remember: *computers think best in terms of numbers, humans think best in terms of names or mental images.*

Addressing

There is a concept in the real world that relates well to how the computer world, especially computer networks and the Internet, works. It's the concept of how the addressing system works for your house. In the real world, your house sits on a piece of dirt somewhere, perhaps an individual lot. The lot has an address, which is well known to the Post Office. You do not have to tell the Post Office where your house is, they know because the address is already mapped to that particular lot. However, you can get your mail forwarded if you should so desire by telling the Post Office where to forward the mail. A map of this correlation could be considered thus:

- Lot = Web Host, or Web Server
- House = Web Site, or files, scripts, and images that compose the web site
- Address = Domain Name, which is mapped through DNS to the IP address xxx.xxx.xxx.xxx

Either the Web Host or the Web Site is assigned an IP number like xxx.xxx.xxx.xxx

In the overall scheme of establishing, constructing, and launching a website, the three items above are involved. See the Website Construction paper by [webpointmorpheus](#) for more information on this part of the process.

Domain Names

Unlike the real world, where you never need to purchase the address to your house, in the world of the Internet, you must purchase, or otherwise acquire, a Domain Name. Once purchased, you must then establish a relationship between your Domain Name and the Web Server where the files are located. This is done through your Domain Name Server, and is where the Domain Name System comes into play. In the 'under-the-hood' magic of computer workings, the Domain Name is magically mapped to your website files, and *voila!* you can type your name into a browser to get to your website. "DNS handles mapping between host names, which we humans find convenient, and internet addresses, which computers deal with."*

Domain Names are somewhat similar to copyrights & trademarks, and are governed by an internet authority ICANN: Internet Corporation for Assigned Names & Numbers. In order to maintain credibility of Domain Names, their purchase and oversight is governed by several entities. Please see the webpointmorpheus document 'What's Involved in Launching a Website?' for more on these organizations. webpointmorpheus offers Domain Name services which include Domain Name purchase, administration, and

configuration. [webpointmorpheus](#) uses Name Registrars ([www.nameregistrars.net](#)) as it's accredited Domain Name Reseller.

Top Level Domains

Originally there were seven(7) Top Level Domains:

- *.com commercial designation* - hp.com, ibm.com, yahoo.com, etc.
- *.edu educational designation* - berkley.edu, purdue.edu, utexas.edu, etc.
- *.gov governmental designation* - nasa.gov, nsf.gov, etc.
- *.mil military designation* - army.mil, navy.mil, etc.
- *.net network(ing) designation* - nsf.net, etc.
- *.org non-commercial or non-profit designation* - eff.org, etc.
- *.int international designation* - nato.int, etc.

These have recently been expanded, and now include .biz, and others. The origins of networked computers, and the Internet in general, was initiated by grants from the United States Federal Government. These top level domains pertain as shown to entities within the United States. As the Internet developed, and with the World Community at large embracing a universal naming system, other countries adopted naming techniques which are similar but sometimes different than those outlined above. One example is Australia's top-level domain, [au](#), which has subdomains such as [edu.au](#), and [com.au](#).

Conclusion

The original effort to network computers was based upon a file which was called 'hosts.txt', and it individually listed each of the computers with the corresponding IP address. Each time there were more computers added to the network system, the file had to be updated and copied to the system of the Host computer. With the expansion of the Internet, the obvious limitations of that system were recognized early in the history of computing. The current system that is (almost) universally in use, the DNS - or Domain Name Service - system, has proven to be workable, effective, and scalable. The entire system is based upon thirteen (13, at the time of this writing) top level Domain Name System servers, which are strategically located around the world as distributed databases, and are indexed by domain names. Without this system, the process that we use to surf the Internet would not be possible as we know it.

This article has covered (very briefly and non-technically) the bare essentials of the Domain Name System. The article has been truncated for brevity. To get a glimpse of how the process of a typical web page request works, see the .pdf file Block View of Typical Web Page Request..

Additional

The website process, way the web works, Search Engines, and other web & internet concepts are often very confusing, especially for the typical non-technical person. [webpointmorpheus](#) has assembled several documents hoping to simplify these topics. This series of documents are the result of a consistent set of questions posed by current, past, and potential webpointmorpheus clientele. The documents are listed below, and are available online at www.webpointmorpheus.com.

Documents available from [webpointmorpheus](#):

- Why Would I Want a Website?
- What's Involved Launching a Website?
- Block view of the Web Site Design Process
- Block View of Typical Web Page Request on the Web
- What is Web Hosting?
- DNS Stands for Domain Name System
- Web & Internet Security Considerations
- E-commerce 101: Is it for me?
- What are Search Engines?
- webpointmorpheus Search Engine Services
- What is PHP Server Side Scripting?
- Databases and the World Wide Web

SOURCES:

*DNS and BIND, Paul Albitz & Cricket Liu, O'Reilly Publishing, 3rd Edition
TCP/IP Jumpstart, Andrew G. Blank, Sybex, Second Edition