Tech Moment

What's in a Name?

By Tom Thorpe
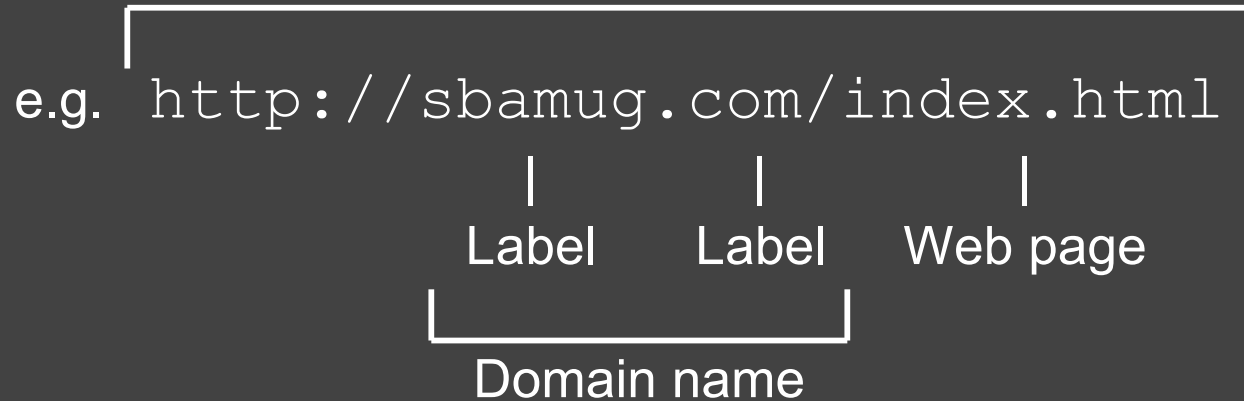
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Parts of a web page address

Uniform resource locator (URL)

e.g. `http://sbamug.com/index.html`

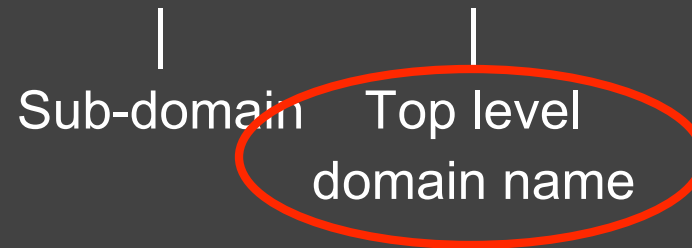| Label | Label | Web page |

Domain name

Labels consist of:

- Letters A-Z, not case sensitive
- Digits 0-9
- Can have hyphen (-), but not at start or end
- 2-63 characters

Domain names

e.g. `http://sbamug.com/index.html`

Sub-domain   Top level
domain name

`com`   <-- Top level domain
`sbamug.com`   <-- Sub-domain of domain `com`

Top level domains
- In 2011 there were 22 top level domains
- In the last few years the rules have been relaxed
- Today there are over 800 top level domains

Top level domain names fall within 5 categories
- Generic: .com, .edu, .gov, .mil, .org, .net
- Country-code: .us, .uk, .au, .de
- Internationalized country code: .中国
- Sponsored: .aero, .asia, .travel
- Infrastructure: .arpa

Top-level domains are controlled by the Internet Assigned Numbers Authority (IANA)

- Root Zone Database
    - Like a big phone book
    - Domain names vs. IP addresses
- Stored in 13 top level name servers scattered around the world

Domain names

e.g. `http://sbamug.com/index.html`

Sub-domain / Top level domain name

`com`   <-- Top level domain
`sbamug.com`   <-- Sub-domain of domain `com`

Sub-domain names

- A sub-domain name is to the left of domain name

  e.g. The SBAMUG wiki is at:

  ```
  http://linus.sbamug.com/
              |
  ```
 Sub-domain

- Sub-domains can have sub-domains
- Sub-domains can go up to 127 levels deep
- But, there is an overall domain name limit of 253 characters

So how does this name thing work?

- Each domain registration becomes part of a central domain registration database known as the Domain Name System (DNS)
  - There are 13 top level name servers around the world
  - But there are many many local DNS name servers
  - You can access this database by interrogating a local server
  - If it doesn't know the name it will ask other DNS name servers
  - Given a successful lookup, it will tell you the IP address for the domain name
- Every iMac/iPad/iPhone must be told where to find a local DNS name server (i.e. the IP address of the server)
  - Either manually
  - Or, automatically using DHCP (more later?)
- Then everything happens quietly behind the scenes!

Example:
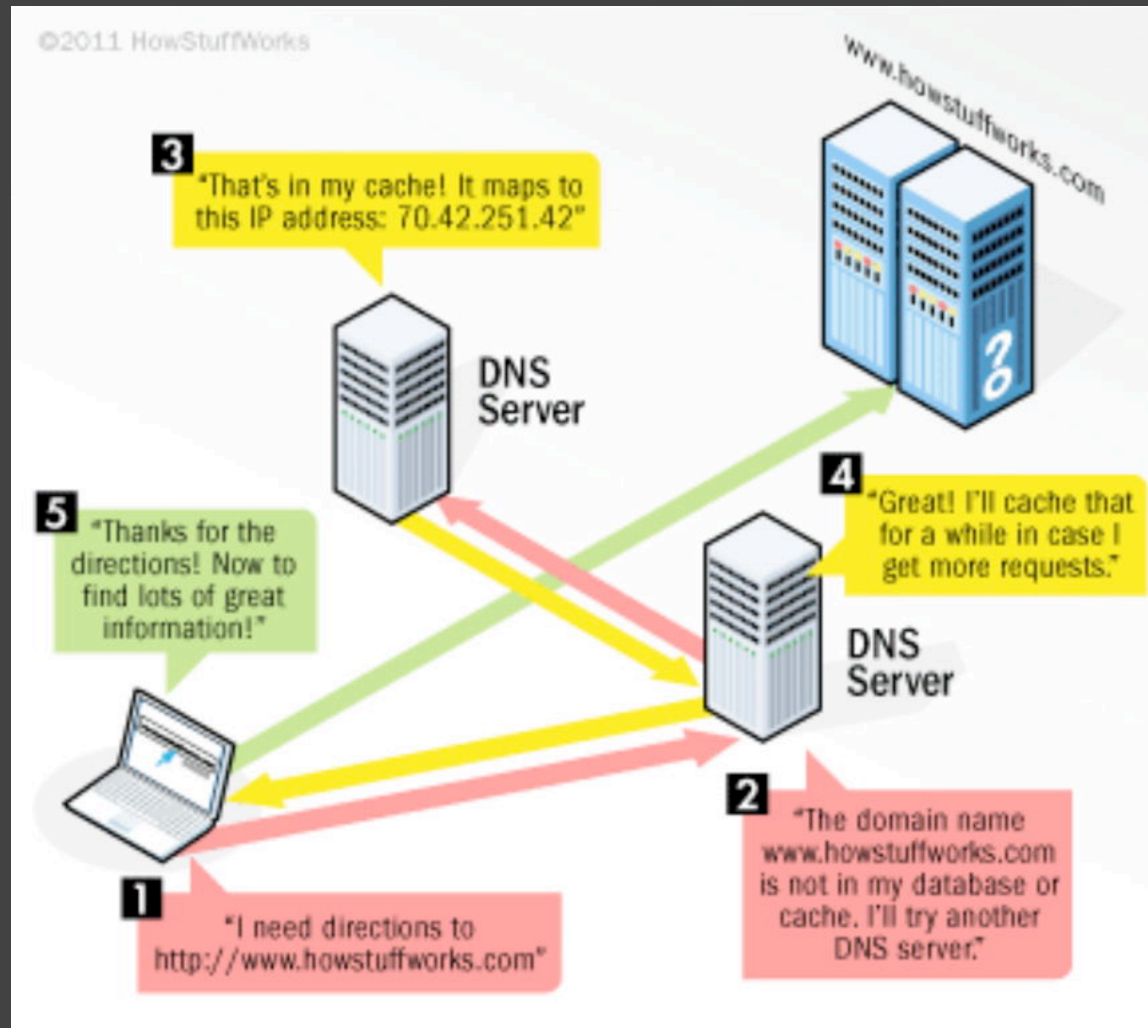
Q. How do you find out who has a domain name?

A. Use the "`whois`" utility

- Download an app for iPad/iPhone

- Available on every iMac computer
    - Open Applications/Utilities/Terminal
    - Type "`whois xxx`" where `xxx` is a domain name or an IP address
    - You will get back a listing of who they are
    - Or you'll get back a message saying there is no match (i.e. the name is unassigned)

```
$ whois sbamug.com

Whois Server Version 2.0

    Domain Name: SBAMUG.COM
    Registrar: ENOM, INC.
    Sponsoring Registrar IANA ID: 48
    Whois Server: whois.enom.com
    Referral URL: http://www.enom.com
    Name Server: NS1.DREAMHOST.COM
    Name Server: NS2.DREAMHOST.COM
    Name Server: NS3.DREAMHOST.COM
    Status: clientTransferProhibited
   http://www.icann.org/epp#clientTransferProhibited
    Updated Date: 16-oct-2013
    Creation Date: 28-sep-2000
    Expiration Date: 28-sep-2021
 ...
```

```
...
Registry Registrant ID:
Registrant Name: DAVE NATHANSON
Registrant Organization: NATHANSON NETWORK
Registrant Street: 2713 WEST 155TH STR #NC
Registrant City: GARDENA
Registrant State/Province: CA
Registrant Postal Code: 90249
Registrant Country: US
Registrant Phone: +1.3102990029
Registrant Phone Ext:
Registrant Fax: +1.3102990029
Registrant Fax Ext:
Registrant Email: MACMEDIX.NAMECHEAP@NATHANSON.ORG
...
```

How do you get a domain name?

Step 1) Use the "`whois`" database to find a domain name that isn't already registered

Step 2) Register the domain name with a registrar

– A registrar is an authority that can assign domain names directly under one or more top-level domains and register them with the Internet's Network Information Center

– Network Solutions was one of the first registrars and today there are many other companies like GoDaddy, etc.

– Registration costs $10-$30 a year

Step 3) Create your web site and upload it to a web hosting company

Step 4) Configure the registrar to point your domain name to your web hosting company

Summary

- Domain names are the first step in surfing the internet

- DNS name servers exist to translate people friendly domain names into IP addresses

- Every networked device must be configured with the IP address of a DNS name server

- "whois" is a handy utility