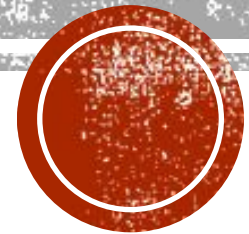


DOMAINS AND HOSTING

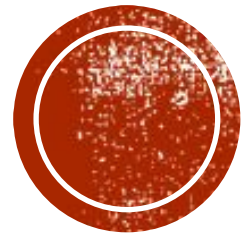
Web Application Development



AGENDA

- A bit about **domain names**
- A bit about **web hosting**
- A bit about DNS info used in web hosting





DOMAIN NAMES

Web Application Development

Duh

WHAT IS A DOMAIN NAME?

- The human-readable identifier of a web site address
- Must be mapped to an IP address
- Example: www.cis255.com



WHY ARE DOMAIN NAMES IMPORTANT?

- The domain name is an essential part of an **organization's identity**
- As a corporate web developer you may need to configure domain settings
- As a freelance web developer, you may be asked to **register** or even **purchase** domain names for clients
- A domain name can sell for any amount but most domain names sell for around **\$5,000** to **\$20,000** - premium domains, category killers and short domains however can easily command **\$100,000** or more. See: [The top 20 most expensive domain names](#).



Domains are organized into zones
ICANN controls root zone

DNS Root Zone

DOMAIN NAME SYSTEM (DNS) ZONES

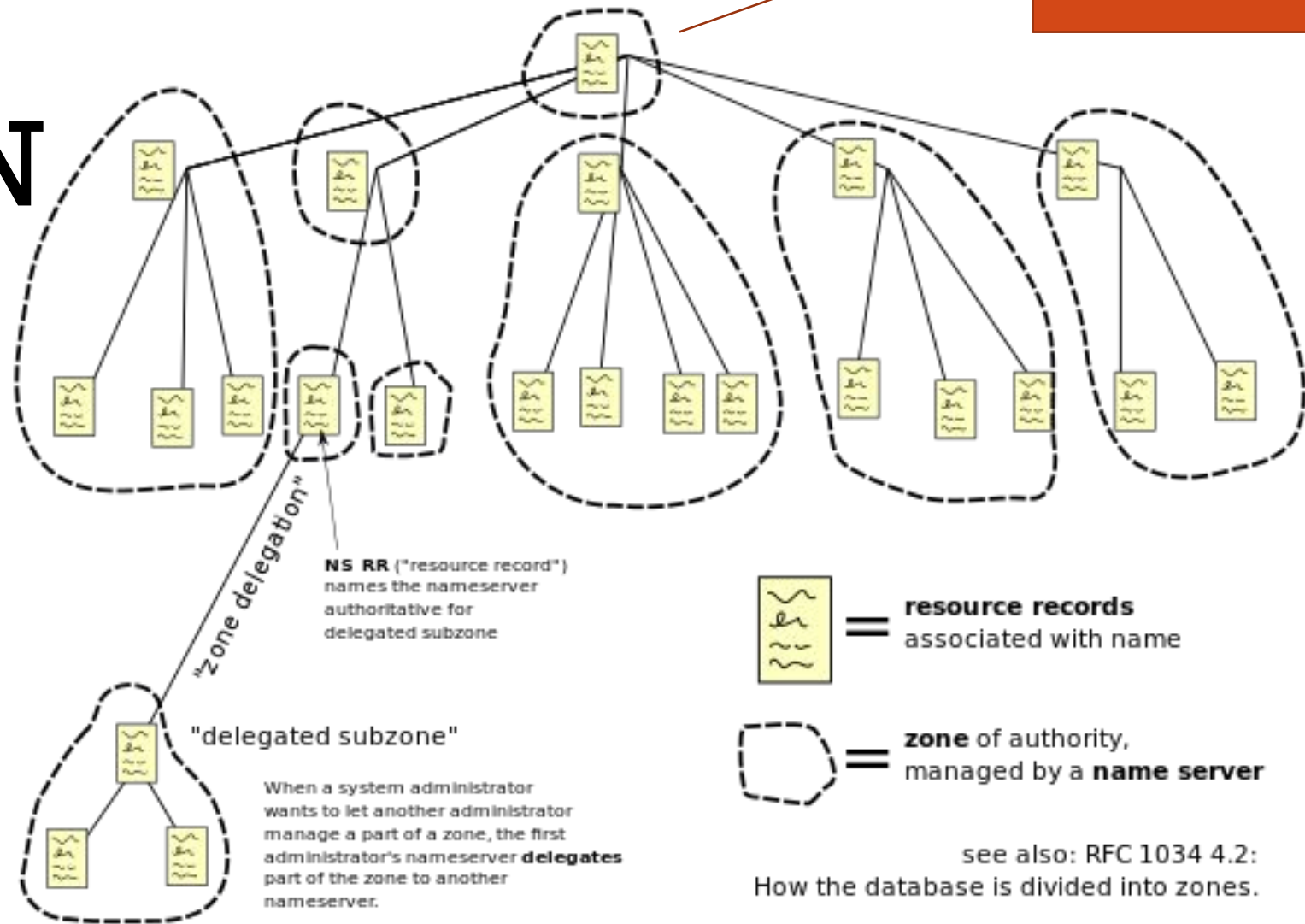


Image source:
Wikipedia



ICANN decides who owns domain names and what their IP addresses will be

ICANN

- Internet Corporation for Assigned Names and Numbers (ICANN) - Nonprofit organization that controls domain names. HQ in Los Angeles
- Internet Assigned Numbers Authority (IANA) - Owned by ICANN until 2016. Before ICANN was established, IANA was administered by one person, Jon Postel, at the Information Sciences Institute (ISI) of the University of Southern California (USC).
- As of 2016 IANA functions are performed by Public Technical Identifiers (PTI), an affiliate of ICANN. PTI supports a “global multistakeholder community.”
- Sources: <https://pti.icann.org/> and <http://www.iana.org/>



The Internet governed by volunteers

IETF

- The **Internet Engineering Task Force (IETF)** develops and promotes voluntary [Internet standards](#), in particular the standards that comprise the [Internet protocol suite](#) (TCP/IP).
- It has no formal membership or membership requirements.
- All participants and managers are volunteers, though their work is usually funded by their employers or sponsors.
- **Internet Architecture Board (IAB)** is "a committee of the [Internet Engineering Task Force](#) (IETF) and an advisory body of the [Internet Society](#) (ISOC). Its responsibilities include architectural oversight of IETF activities, Internet Standards Process oversight and appeal, and the appointment of the [Request for Comments](#) (RFC) Editor.
- Source: [Wikipedia](#)



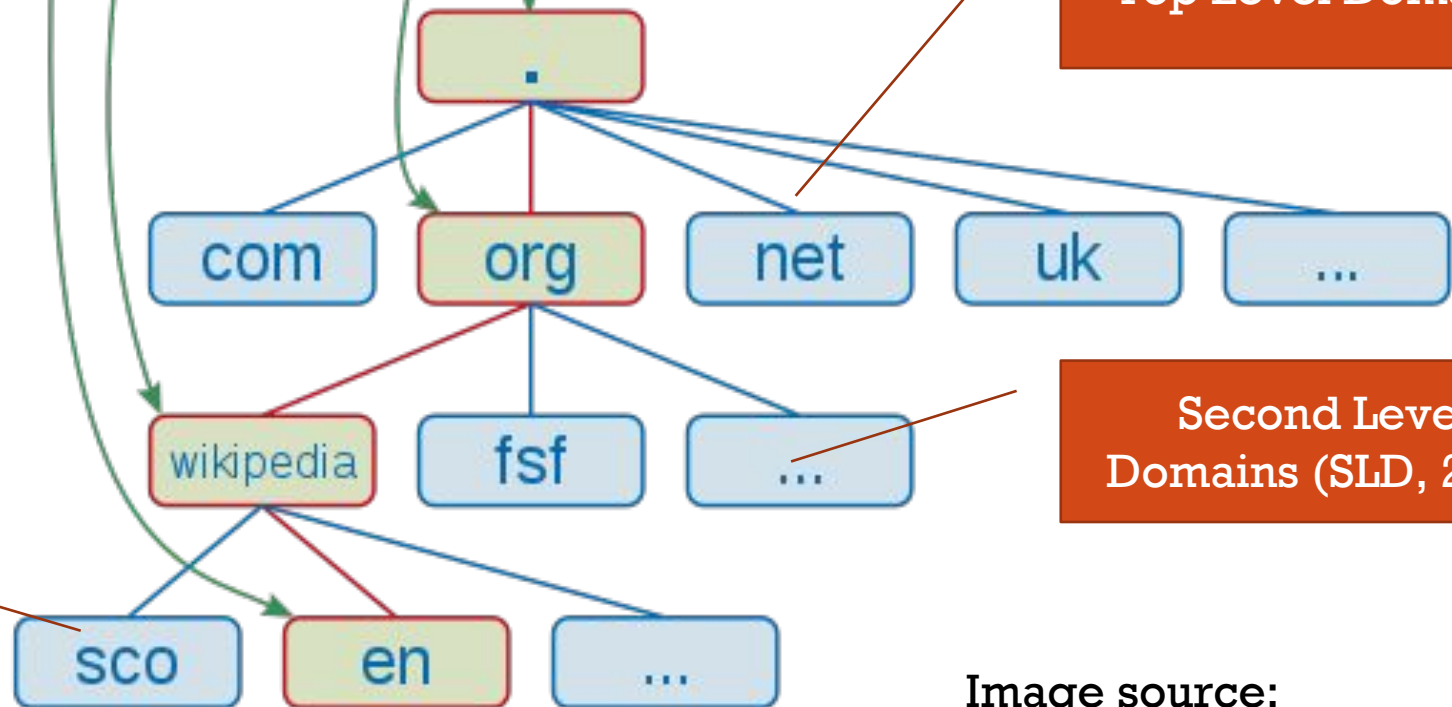
Domain names organized into "levels"

DOMAIN NAMES

- Generic Top Level Domain (gTLD): COM, ORG, MIL, ...
- Country Code Top Level Domain (ccTLD): US, UL, DE, ...

Subdomains

en.wikipedia.org.



Root Domain

Top Level Domains

Second Level Domains (SLD, 2LD)

Image source:
Wikipedia



ICANN delegates control of lower level domains
IP addresses allocated by country

INTERNATIONAL 2LD'S



Example: Republic of Turkey

- In Turkey, domain registrations, including the registration of second-level domains is administrated by nic.tr.
- There 17 active second-level domains under the [.tr](http://tr) TLD.
- The registration of domains is restricted to Turkish individuals and businesses, or foreign companies with a business activity in Turkey.
- Second-level domains include *.com.tr* for commercial ventures, *.edu.tr* for academic institutions and *.name.tr* for personal use.
- Source: Wikipedia.

Major IP Address Blocks For Turkey



In the following table, you can find all major IP addresses blocks for Turkey. Most of these IP blocks are assigned for Internet providers and you can click the column header in order to sort the list by another criteria. If you want to download this IP addresses list in comma-separated file, [click here](#).

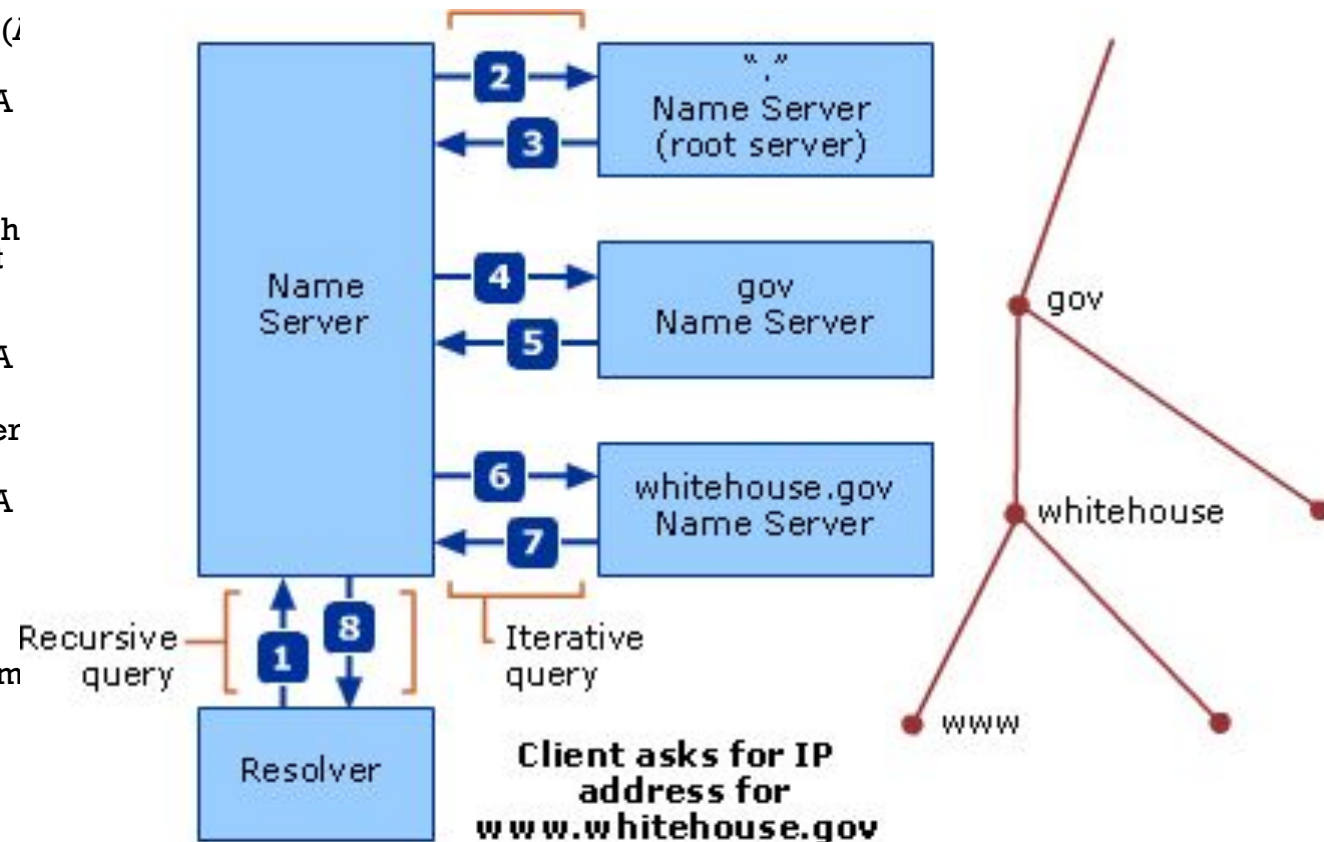
From IP	To IP	Total IPs	Assign Date
5.11.128.0	5.11.255.255	32768	02/05/12
5.24.0.0	5.27.255.255	262144	02/05/12
5.44.80.0	5.44.95.255	4096	23/05/12



When your computer locates the IP address for a domain, the NS looks through **levels** of DNS servers

DNS LOOKUP (DNS QUERY)

1. Recursive query for www.whitehouse.gov (i resource record)
2. Iterative query for www.whitehouse.gov (A resource record)
3. Referral to the .gov name server (NS resource records, for .gov); for simplicity, iterative A queries by the DNS server (on the left) to resolve the IP addresses of the Host names of the name server's returned by other DNS servers have been omitted.
4. Iterative query for www.whitehouse.gov (A resource record)
5. Referral to the whitehouse.gov name server (NS resource record, for whitehouse.gov)
6. Iterative query for www.whitehouse.gov (A resource record)
7. Answer to the iterative query from whitehouse.gov server (www.whitehouse.gov's IP address)
8. Answer to the original recursive query from local DNS server to Resolver (www.whitehouse.gov's IP address)



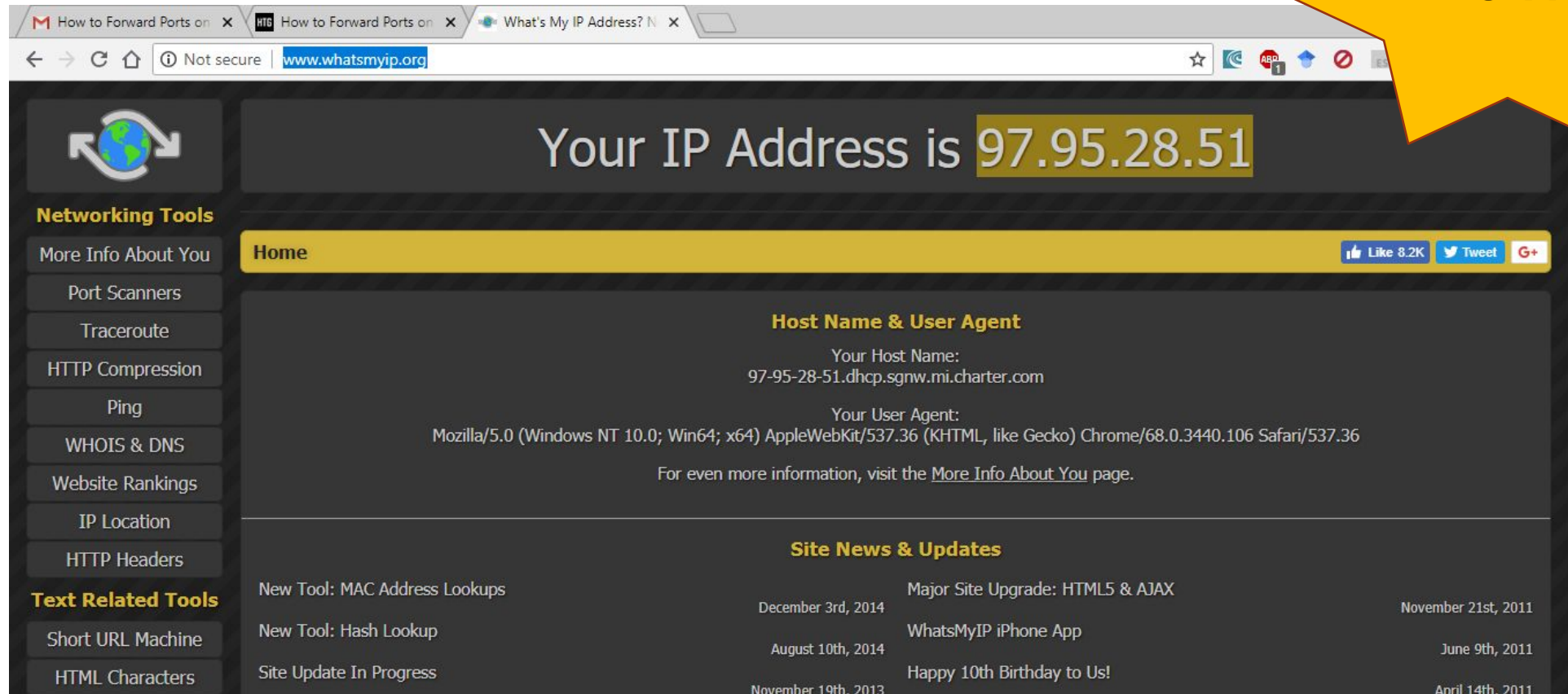
Source: Microsoft



You can find your IP address online

DNS LOOKUP ONLINE

Try it
now!



The screenshot shows a web browser window with the address bar displaying www.whatsmyip.org. The page has a dark theme with a yellow sidebar on the left containing a list of tools under two categories: "Networking Tools" and "Text Related Tools". The main content area features a large header stating "Your IP Address is 97.95.28.51". Below this is a yellow "Home" button and social media sharing links. The "Host Name & User Agent" section displays the host name "97-95-28-51.dhcp.sgnw.mi.charter.com" and the user agent string "Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/68.0.3440.106 Safari/537.36". A link to "More Info About You" is provided. The "Site News & Updates" section lists three items: "New Tool: MAC Address Lookups" (December 3rd, 2014), "New Tool: Hash Lookup" (August 10th, 2014), and "Site Update In Progress" (November 19th, 2013). It also mentions a "Major Site Upgrade: HTML5 & AJAX" (November 21st, 2011), the "WhatsMyIP iPhone App" (June 9th, 2011), and a "Happy 10th Birthday to Us!" (April 14th, 2011).

Networking Tools

- More Info About You
- Port Scanners
- Traceroute
- HTTP Compression
- Ping
- WHOIS & DNS
- Website Rankings
- IP Location
- HTTP Headers

Text Related Tools

- Short URL Machine
- HTML Characters

Your IP Address is 97.95.28.51

Host Name & User Agent

Your Host Name:
97-95-28-51.dhcp.sgnw.mi.charter.com

Your User Agent:
Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/68.0.3440.106 Safari/537.36

For even more information, visit the [More Info About You](#) page.

Site News & Updates

New Tool: MAC Address Lookups	December 3rd, 2014	Major Site Upgrade: HTML5 & AJAX	November 21st, 2011
New Tool: Hash Lookup	August 10th, 2014	WhatsMyIP iPhone App	June 9th, 2011
Site Update In Progress	November 19th, 2013	Happy 10th Birthday to Us!	April 14th, 2011

Source:
whatsmyip.org



REVERSE DNS LOOKUP

You can lookup the IP address for a domain name, or you can lookup the domain name for an IP address

- In computer networks, a **reverse DNS lookup** or **reverse DNS resolution (rDNS)** is the querying of the Domain Name System (DNS) to determine the domain name associated with an IP address – the reverse of the usual "forward" DNS lookup of an IP address from a domain name.
- Source: Wikipedia.



155.138.4.191 Reverse Lookup ▼

Type	IP Address	Domain Name	TTL
PTR	155.138.4.191 Saginaw Valley State University (AS26174)	t4web1c.svsu.edu	60 min

Screenshot above from: <https://mxtoolbox.com/ReverseLookup.aspx>



REVERSE DNS LOOKUP

Your "looked up" IP address might not be your "real" IP address

```
Command Prompt
Microsoft Windows [Version 10.0.14393]
(c) 2016 Microsoft Corporation. All rights reserved.

C:\Users\gpconser>ipconfig

Windows IP Configuration

Wireless LAN adapter Wi-Fi:

    Connection-specific DNS Suffix  . : 
    Link-local IPv6 Address . . . . . : fe80::351b:3088:8acf:4563%9
    IPv4 Address. . . . . : 10.0.0.6
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 10.0.0.1

Ethernet adapter VMware Network Adapter VMnet1:

    Connection-specific DNS Suffix  . : 
    Link-local IPv6 Address . . . . . : fe80::e89d:bc5d:e214:23e7%19
    IPv4 Address. . . . . : 192.168.153.1
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . :
```

```
NetRange: 97.80.0.0 - 97.95.255.255
CIDR: 97.80.0.0/12
NetName: NETBLK-CHARTER-NET
NetHandle: NET-97-80-0-0-1
Parent: NET97 (NET-97-0-0-0-0)
NetType: Direct Allocation
OriginAS:
Organization: Charter Communications (CC04)
RegDate: 2007-03-21
Updated: 2012-03-02
Ref: https://rdap.arin.net/registry/ip/97.80.0.0
```



NETWORK ADDRESS TRANSLATION (NAT)

Routers can manage multiple computers using the one IP address

- **IPv4 address exhaustion** is the depletion of the pool of unallocated IPv4 addresses. Because there are fewer than 4.3 billion addresses available, depletion has been anticipated since the late 1980s, when the Internet started to experience dramatic growth. This depletion is one of the reasons for the development and deployment of its successor protocol, IPv6. Currently IPv4 and IPv6 coexist in the Internet.
- **Network address translation (NAT)** is a method of remapping one IP address space into another by modifying network address information in the IP header of packets while they are in transit across a traffic routing device.
 - **One to many NAT:** The router tracks basic data about each active connection (particularly the destination address and port). When a reply returns to the router, it uses the connection tracking data it stored during the outbound phase to determine the private address on the internal network to which to forward the reply.



DNS system not perfectly secure

DNS SPOOFING

Cache Poisoning

- Normally, a networked computer uses a DNS server provided by an Internet service provider (ISP) or the computer user's organization.
- DNS servers are used in an organization's network to improve resolution response performance by caching previously obtained query results.
- Poisoning attacks on a single DNS server can affect the users serviced directly by the compromised server or those serviced indirectly by its downstream server(s) if applicable.

See also: [Wikipedia](#). Article source: [The Register](#)



Profiteers sometimes try to abuse the system

DOMAIN SQUATTING

- **Cybersquatting** (also known as **domain squatting**), according to the United States federal law known as the [Anticybersquatting Consumer Protection Act](#), is registering, trafficking in, or using an [Internet domain name](#) with [bad faith](#) intent to profit from the goodwill of a [trademark](#) belonging to someone else. The cybersquatter then offers to sell the domain to the person or company who owns a trademark contained within the name at an inflated price.
- Cybersquatters sometimes register variants of popular trademarked names, a practice known as [typosquatting](#).
- Source: [Wikipedia](#).

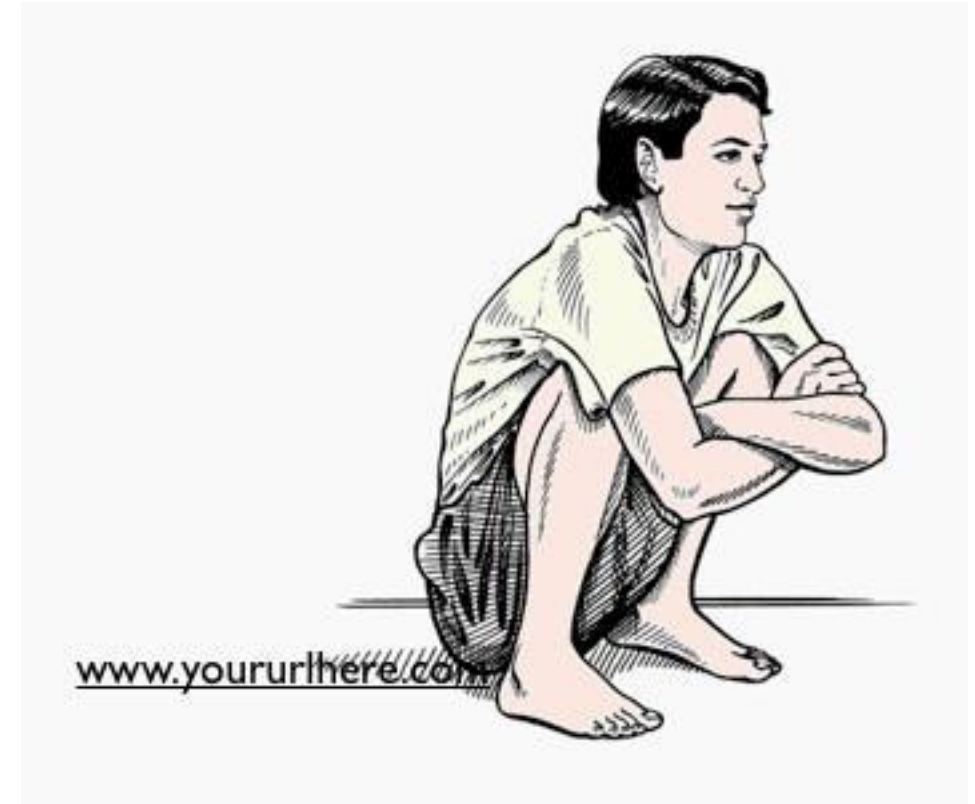
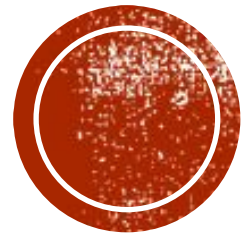


Image source: [Fast Company](#)



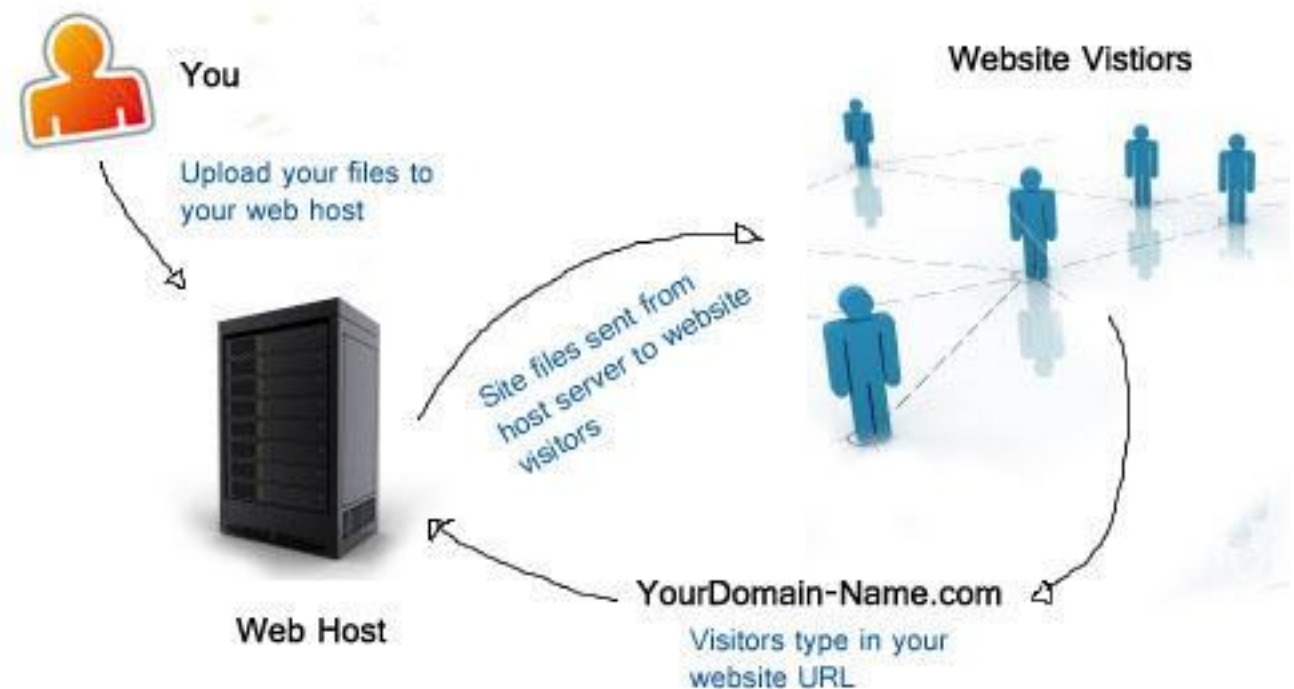


WEB HOSTING

Web Application Development

WHAT IS WEB HOSTING?

- A **web site** is a collection of (1) files that can be processed by a browser, or(2) programs whose output can be processed by a browser
- **Web hosting** is a computerized storage location that enables Web browsers to access files
- You can set up a computer in your home to store your files and programs, but most people use a **web hosting service**.



WHY IS WEB HOSTING IMPORTANT?

Tradeoffs

- Monetary cost
- Technical control
- Security
- Uptime/accessibility
- Upload/download speed
- Storage space
- Analytics
- *More...*

Options

- Home server ([Dynamic DNS](#))
- Dedicated server. Example: GoDaddy.
- Shared server Example: GoDaddy.
- Virtual Private Server (VPS). Example: Microsoft Azure.
- Cloud. Example: Amazon Web Services (AWS)
- *More...*



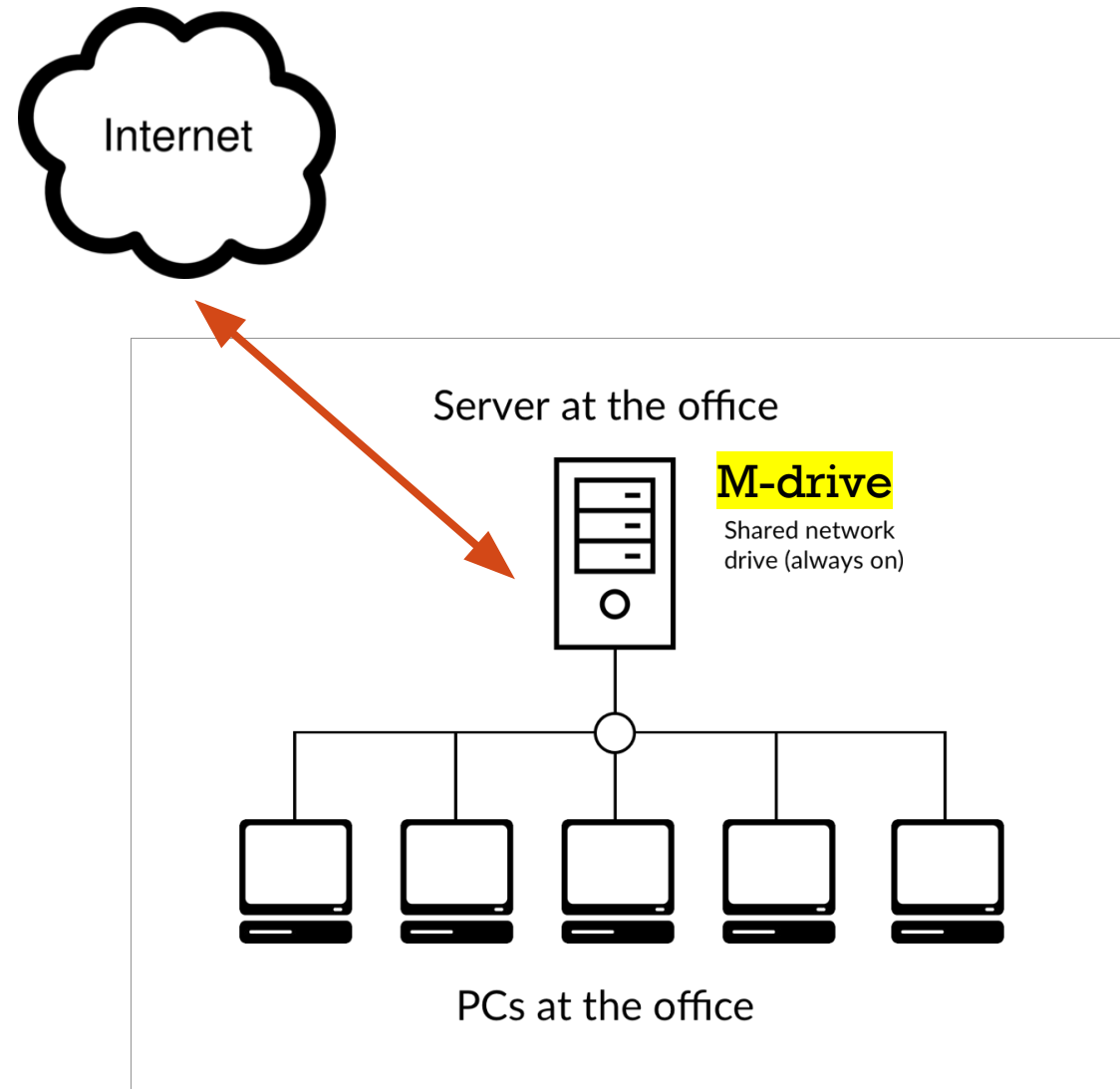
GITHUB PAGES

- Free
- Can edit files in browser (limited)
- Only allows “static” pages
- No FTP (File upload, WinSCP)
- No SSH (Secure remote login, Putty)
- Very accessible to web users (fast servers)
- No tech support.
- No control over server.
- **Version control!**



M-DRIVE

- Not free. Requires enrollment in university.
- Can edit files in browser (limited: vdrive)
- Allows “static” and **limited** “dynamic” pages (can run PHP scripts, bit no MySQL)
- No FTP
- No SSH
- Very accessible to web users (fast servers)
- ITS provides good tech support.
- No control over server.



CSIS SERVER

- Not free. Requires enrollment in CSIS department.
- Cannot edit files in browser
- Allows **full** “dynamic” pages, PHP programs, etc.
- Allows FTP (WinSCP)
- **Allows SSH**
- IT department provides support (which is good) but does not allow control

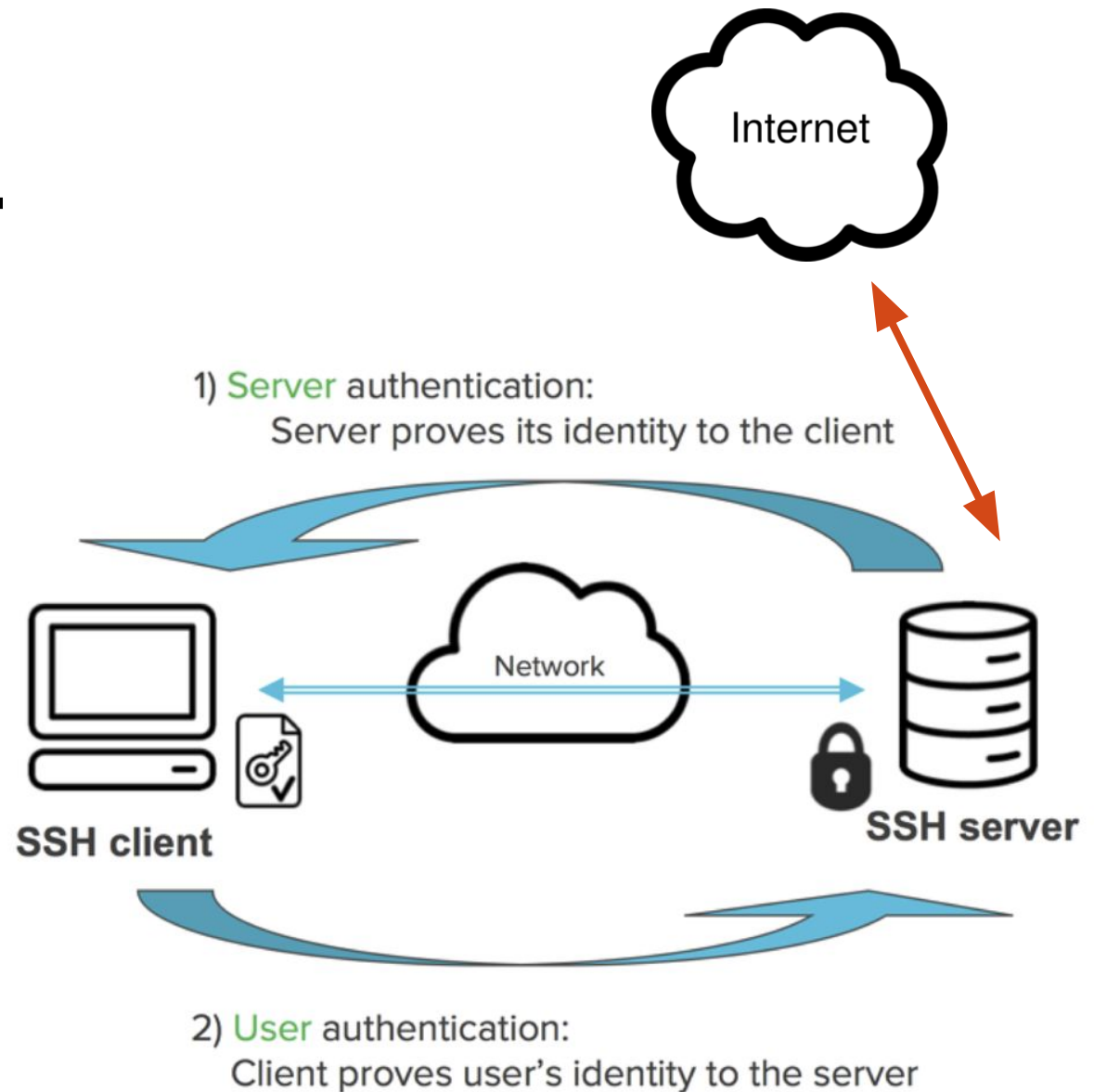


Image source: ssh.com



HOME SERVER

Home servers usually require Dynamic DNS

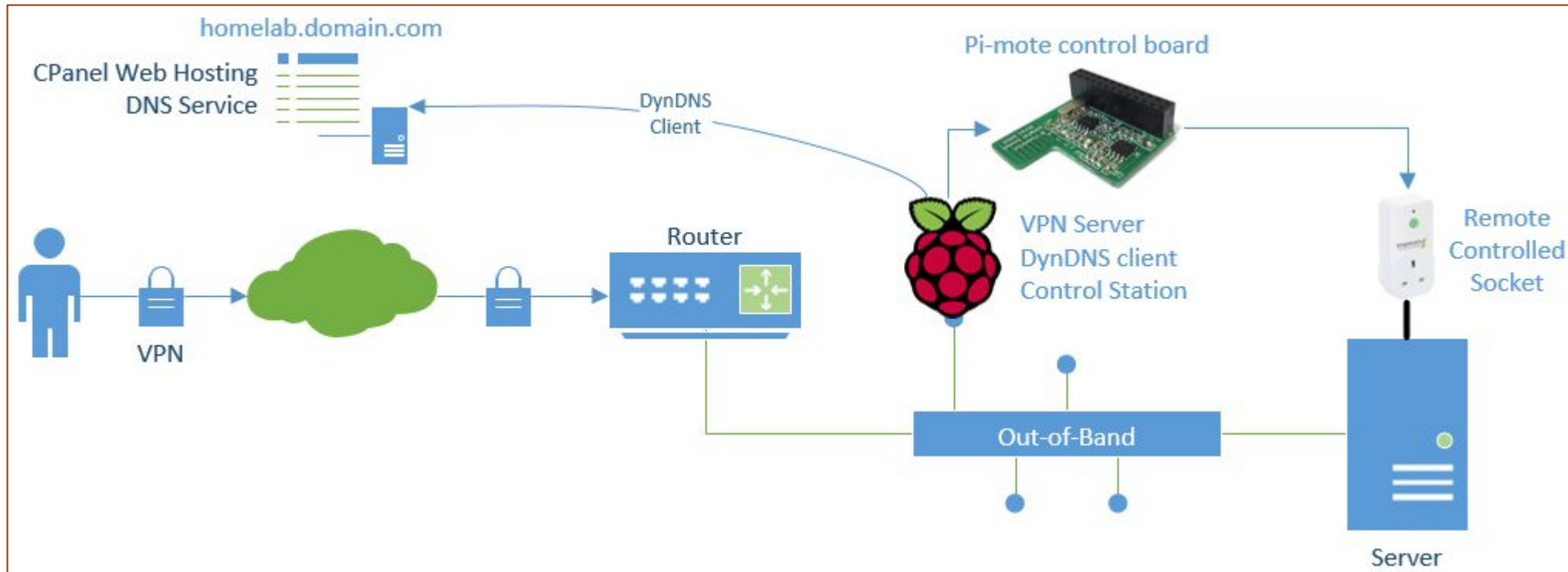


Image source: joseluisgomez.com



WORDPRESS.COM

WordPress.com (online/browser) is not the same as
WordPress (download/install on hosting/server)

- Free
- Cannot edit files in browser
- Static pages only
- No FTP
- No SSH
- No tech support
- **Collaboration!** (multi-user editing)
- **Mobile first design!**

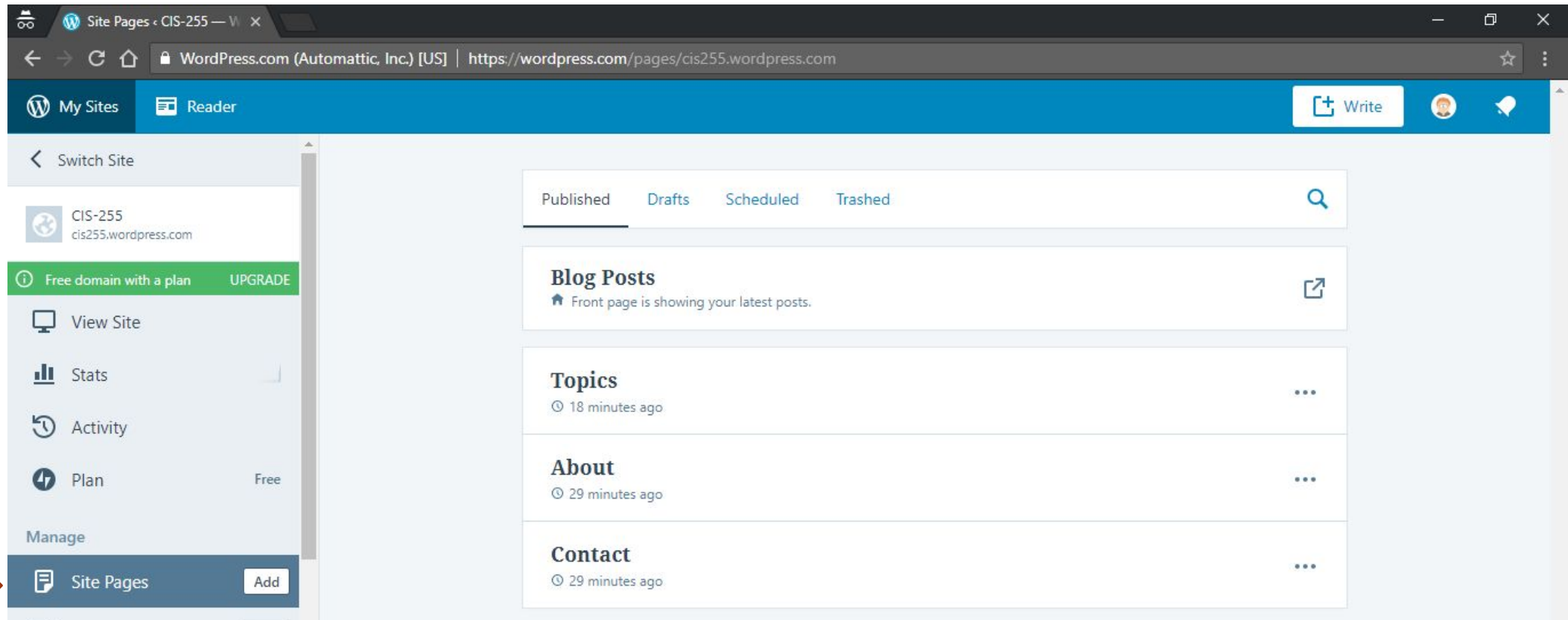


Try it
now!



WORDPRESS.COM EDITOR

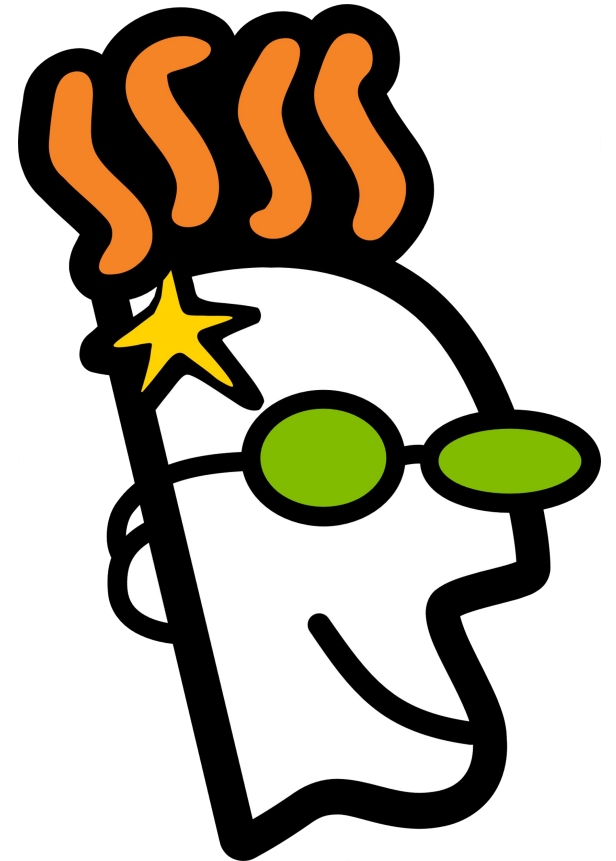
1. Add a page: your topic (title should be one or two words)
2. Add a post (current event/info)
3. Update "Topics" Page with link to your page and post





GODADDY




Hosting services like Godaddy allow developers to manage **multiple web sites** for **multiple clients**


- Not free. Flexible pricing.
- Can edit files in browser. Use File Manager in CPANEL.
- Allows “dynamic” pages, PHP programs, MySQL databases, many other features
- Allows FTP (WinSCP)
- **Allows SSH**
- Godaddy provides support (which is good) but does not allow control unless you get expensive pricing.



GODADDI

GoDaddy  EN 

Contact Us 24/7  Help Blog  Sign In 

Domains Websites WordPress Hosting Web Security Online Marketing Email & Office Phone Numbers Promos 

Search Domain

.info \$2.99* **.life** \$1.99* **.CLUB** \$0.99* **.co** \$2.99


Limited-time offer! .com and .co now just \$2.99**/1st yr.

GoCentral Website Builder

Build a better website in under an hour.

Start for Free


No credit card required.




Welcome back!

Sign In


[Q365 Email](#)
[Webmail](#)
[My Products](#)



SSL Certificates



Web Hosting



Sale! Now \$2.99*/1st yr

Transferring your domain to us is easy. Learn How



GODADDY: REGISTER DOMAIN NAME

GoDaddy

EN

Contact Us 24/7HelpBlogSign In

DomainsWebsitesWordPressHostingWeb SecurityOnline MarketingEmail & OfficePhone NumbersPromos

csis503

Continue to Cart

Yes! Your domain is available. Buy it before someone else does.

csis503.com

\$14.99*

\$2.99*

Add to Cart

when you register for 2 years or more. 1st year price \$2.99 Additional years \$14.99

☐ csis503.us Add this:\$1.00

when you register for 2 years or more. 1st year price \$1.00 Additional years \$19.99

Buy 3 and Save 70%

\$60.97*

\$18.00*

Add to Cart

csis503.net

csis503.org

csis503.info

GODADDY: DOMAIN NAME TAKEN

The screenshot shows the GoDaddy website interface. At the top, there's a navigation bar with the GoDaddy logo, a language selector (EN), and links for 'Contact Us 24/7', 'Help', 'Blog', 'Sign In', and a shopping cart icon. Below this is a secondary navigation bar with links for 'Domains', 'Websites', 'WordPress', 'Hosting', 'Web Security', 'Online Marketing', 'Email & Office', 'Phone Numbers', 'Promos', and a hand icon.


The main search area features a text input field containing 'cis255', a blue search button with a magnifying glass icon, and a green 'Continue to Cart' button. Below the search bar, a message states: 'Sorry, **cis255.com** is taken. Still want it? [Here's what you do.](#)'

Under the heading 'Selected just for you:', there are two columns. The left column, titled 'Extensions', contains a list of domain extensions with checkboxes: 'All extensions' (checked), '.org', '.net', '.shop', '.info', and '.online'. The right column displays a list of available domain names with their prices and 'Add to Cart' buttons:

Domain Name	Price	Action
cis255.org	\$19.99* \$7.99*	Add to Cart
cis255.net	\$18.99* \$12.99*	Add to Cart
cis255.shop <small>ad</small>	\$44.99* \$2.99*	Add to Cart
cis255.info	\$21.99* \$2.99*	Add to Cart



GODADDY: WHOIS



[Continue to Cart](#)

[* ** ***.††.++.^+. Click here for product limitations](#)**Need help? Call our award-winning support team 24/7 at (480) 505-8877**

GODADDY: WHOIS RESULTS

WHOIS search results

Domain Name: **CIS255.COM**
Registry Domain ID: 1872389829_DOMAIN_COM-VRSN
Registrar WHOIS Server: whois.godaddy.com
Registrar URL: <http://www.godaddy.com>
Updated Date: 2017-07-03T10:41:17Z
Creation Date: 2014-08-23T17:52:50Z
Registrar Registration Expiration Date: 2019-08-23T17:52:50Z
Registrar: GoDaddy.com, LLC
Registrar IANA ID: 146
Registrar Abuse Contact Email: abuse@godaddy.com
Registrar Abuse Contact Phone: +1.480.624.2505
Domain Status: clientTransferProhibited
<http://www.icann.org/epp#clientTransferProhibited>
Domain Status: clientUpdateProhibited
<http://www.icann.org/epp#clientUpdateProhibited>
Domain Status: clientRenewProhibited
<http://www.icann.org/epp#clientRenewProhibited>
Domain Status: clientDeleteProhibited

Want to buy this domain?

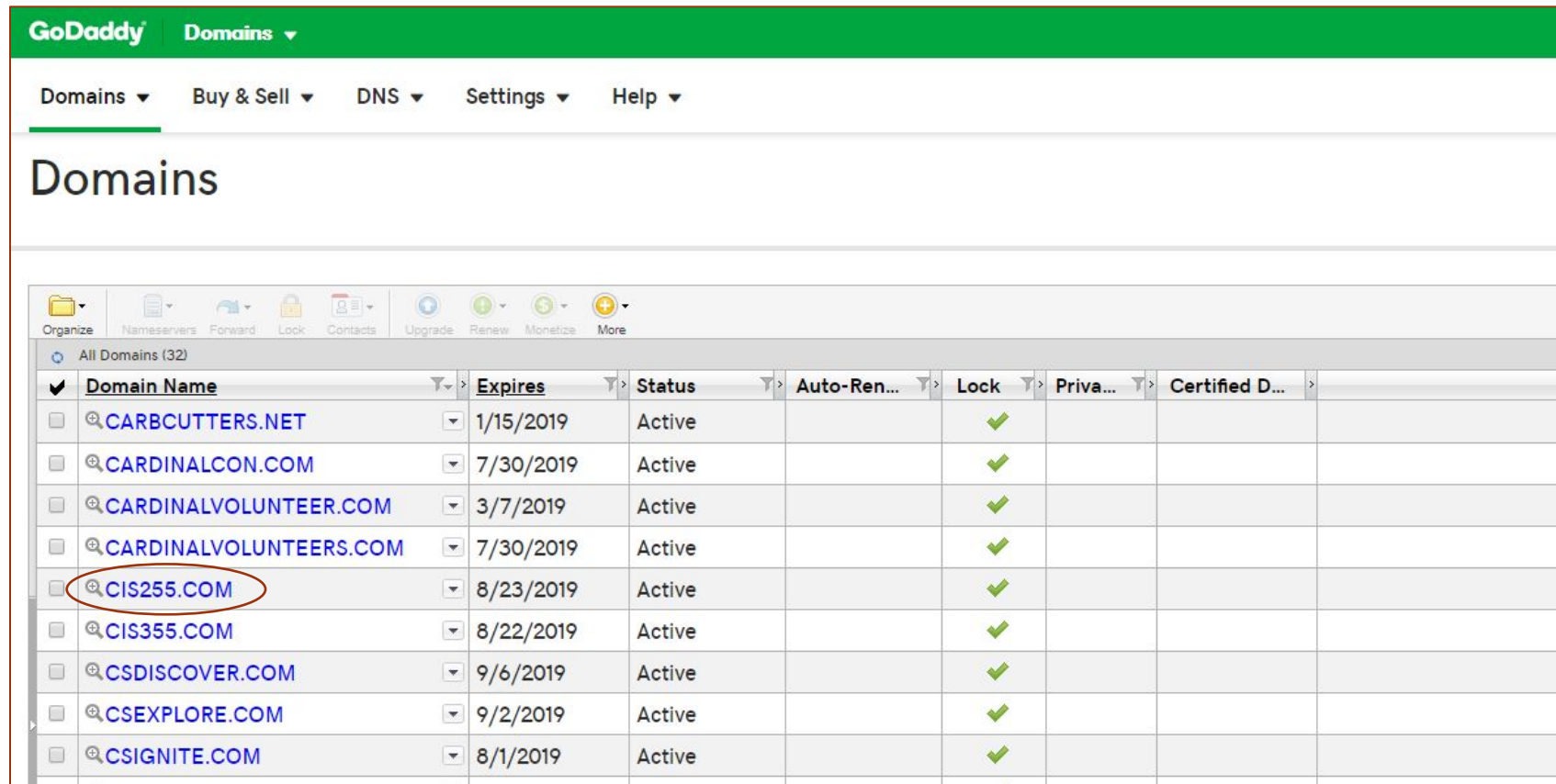
Get it with our Domain Buy Service.

[Go](#)

<http://www.icann.org/epp#clientDeleteProhibited>
Registry Registrant ID: Not Available From Registry
Registrant Name: **George Corser**
Registrant Organization: Corser Communications
Registrant Street: 45019 Elmhurst Ct
Registrant City: Shelby Township
Registrant State/Province: Michigan
Registrant Postal Code: 48317
Registrant Country: US
Registrant Phone: +1.989.780.3168
Registrant Phone Ext:
Registrant Fax:
Registrant Fax Ext:
Registrant Email: george@corser.com



GODADDY: MULTIPLE DOMAINS



The screenshot shows the GoDaddy Domains management interface. At the top is a green header with the GoDaddy logo and a 'Domains' dropdown menu. Below this is a navigation bar with links for 'Domains', 'Buy & Sell', 'DNS', 'Settings', and 'Help'. The main heading is 'Domains'. Below the heading is a toolbar with icons for 'Organize', 'Nameservers', 'Forward', 'Lock', 'Contacts', 'Upgrade', 'Renew', 'Monetize', and 'More'. The main content area displays a table of domains under the heading 'All Domains (32)'. The table has columns for 'Domain Name', 'Expires', 'Status', 'Auto-Ren...', 'Lock', 'Priva...', and 'Certified D...'. The domain 'CIS255.COM' is circled in red in the original image.

Domain Name	Expires	Status	Auto-Ren...	Lock	Priva...	Certified D...
CARBCUTTERS.NET	1/15/2019	Active		✓		
CARDINALCON.COM	7/30/2019	Active		✓		
CARDINALVOLUNTEER.COM	3/7/2019	Active		✓		
CARDINALVOLUNTEERS.COM	7/30/2019	Active		✓		
CIS255.COM	8/23/2019	Active		✓		
CIS355.COM	8/22/2019	Active		✓		
CSDISCOVER.COM	9/6/2019	Active		✓		
CSEXPLOR.COM	9/2/2019	Active		✓		
CSIGNITE.COM	8/1/2019	Active		✓		



GODADDY: DOMAIN FORWARDING

The screenshot shows the "Forwarding and Masking" configuration interface for the domain CIS255.COM. The page has a dark header bar with the title "Forwarding and Masking". Below the header, the domain name "CIS255.COM" is displayed. A descriptive text states: "Domain name forwarding lets you automatically direct your domain name's visitors to a different website." There are two input fields: "Domain" (containing "http://www.cis255.com") and "Subdomain" (empty). An "Add Forwarding" button is located below these fields. At the bottom right, there are "Save" and "Cancel" buttons.



GODADDY: FORWARDING DETAILS

Domain Details

48 Domains + C\$12.55 CPM

CIS255.COM

Status: Active Created: 8/21/2016

Buy & Sell Account Change

Settings DNS Zone Files

Auto-Renew # Standards: 0 Extended: 0

Lock # On

Nameservers # NS07.COM NS08.COM

Add Forwarding

* Required

Forward to: * [Preview](#)

https:// webp.svsu.edu/~gpcorser/cis255home.html

Redirect type: * ⓘ

☒ 301 (Permanent) ☐ 302 (Temporary)

Forward settings: * ⓘ

Forward only

☒ Update my nameservers and DNS settings to support this change. (Recommended)

Add Cancel

Account Snapshot

HOSTING
Learn more

EMAIL
Get it all in one place. Learn more

WEBSITE BUILDER
Ready for activation. Activate

Domain Enhancements







Monitor	Protect	Promote
✓	PRIVACY Not owned Add	#
✓	DOMAIN OWNERSHIP PROTECTION Not owned Add	#
✓	PREMIUM LISTING Not owned Add	#
✓	CASH PARKING Not owned Add	#
✓	GODADDY AUCTIONS Not owned Add	#



GODADDY: DNS INFO

Records

Last updated 7/31/2018 5:44 AM

Type	Name	Value	TTL	
A	@	184.168.131.241	600 seconds	
CNAME	email	email.secureserver.net	1 Hour	
CNAME	ftp	@	1 Hour	
CNAME	www	@	1 Hour	
CNAME	_domainconnect	_domainconnect.gd.domaincontrol.com	1 Hour	
MX	@	smtp.secureserver.net (Priority: 0)	1 Hour	
MX	@	mailstore1.secureserver.net (Priority: 10)	1 Hour	
NS	@	ns67.domaincontrol.com	1 Hour	
NS	@	ns68.domaincontrol.com	1 Hour	



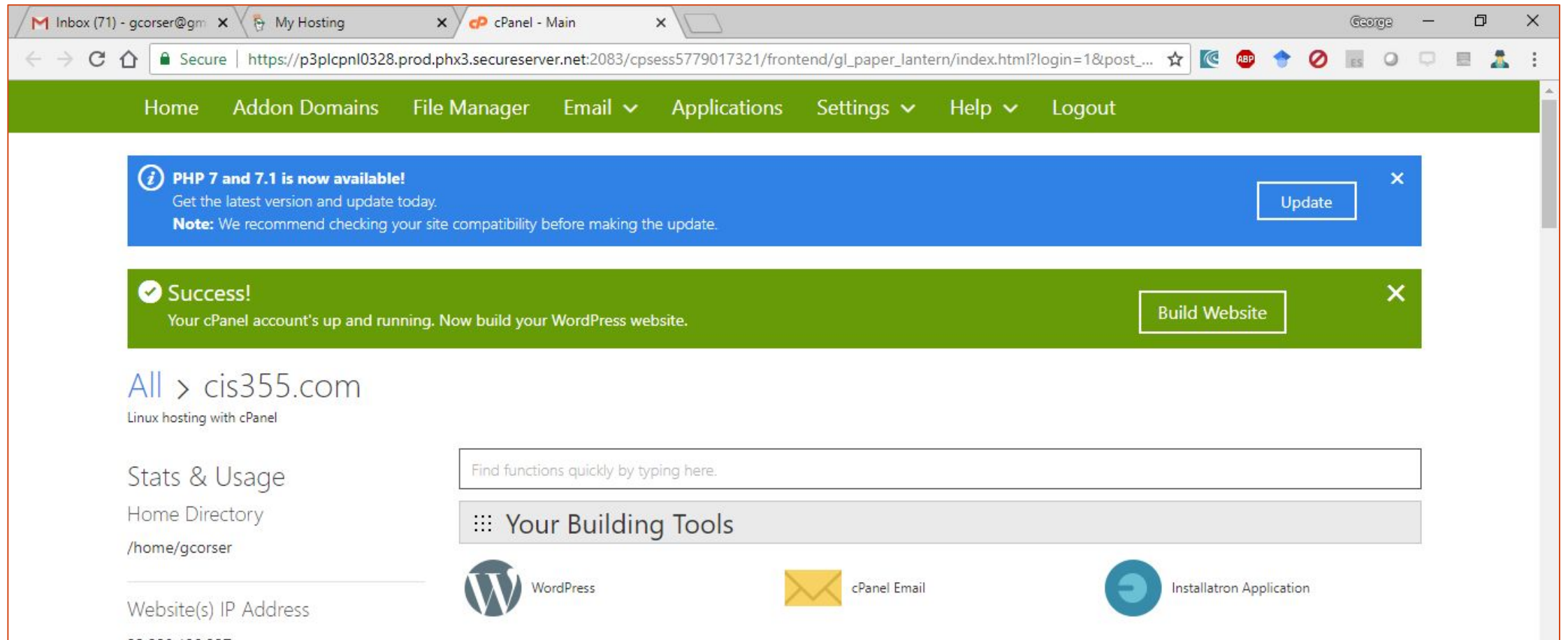
DNS TERMINOLOGY FOR WEB HOSTING

- “A” RECORD – Address Record – Maps domain name to IPv4 address.
- “AAAA” RECORD – Same as above, but for IPv6.
- CNAME RECORD – Canonical Name Record – **Alias** of one name to another: the DNS lookup will continue by retrying the lookup with the new name. CNAME records must always point to another domain name, never directly to an IP address.
- MX RECORD – Message Exchange Record – Maps a domain name to a list of message transfer agents (mail servers) for that domain.
- NAME SERVER (NS) – Delegates a DNS zone to use the given authoritative name servers

Source: dnsimple.com



GODADDY: CPANEL



The screenshot shows the cPanel interface in a web browser. The browser's address bar displays a secure connection to a Godaddy server. The cPanel navigation menu at the top includes links for Home, Addon Domains, File Manager, Email, Applications, Settings, Help, and Logout. Two notification banners are present: a blue one for PHP 7 and 7.1 availability and a green one for account success. The main content area shows the domain 'cis355.com' with a 'Build Website' button. A sidebar on the left lists 'Stats & Usage', 'Home Directory', and 'Website(s) IP Address'. A 'Your Building Tools' section at the bottom features icons for WordPress, cPanel Email, and Installatron Application.

Inbox (71) - gcorser@gm x My Hosting x cPanel - Main x George

Secure | https://p3plcpnl0328.prod.phx3.secureserver.net:2083/cpsess5779017321/frontend/gl_paper_lantern/index.html?login=1&post_...

Home Addon Domains File Manager Email v Applications Settings v Help v Logout

PHP 7 and 7.1 is now available!
Get the latest version and update today.
Note: We recommend checking your site compatibility before making the update. [Update](#)

Success!
Your cPanel account's up and running. Now build your WordPress website. [Build Website](#)

All > cis355.com
Linux hosting with cPanel

Stats & Usage
Home Directory
/home/gcorser

Website(s) IP Address

Find functions quickly by typing here.

Your Building Tools

WordPress cPanel Email Installatron Application

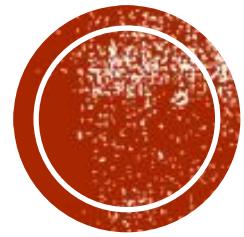


HOW TO DELIVER A COMPLETED PROJECT

In the real world

- When you start a project, create a new email account.
- Use the new email account to register for all other accounts for the project.
- When the project is complete, give the customer the password to the new email account and all other accounts. (And receive payment!)





SUMMARY

Web Application Development

NOW YOU KNOW

- A bit about **domain names**
- A bit about **web hosting**
- A bit about DNS info used in web hosting



THANK YOU

- The End

