

How to make your own website

Mike Kunz

No one:

Squarespace:



Do you want to build a website

We can add some ads,
it'll only cost you 16 to 99 dollars every month

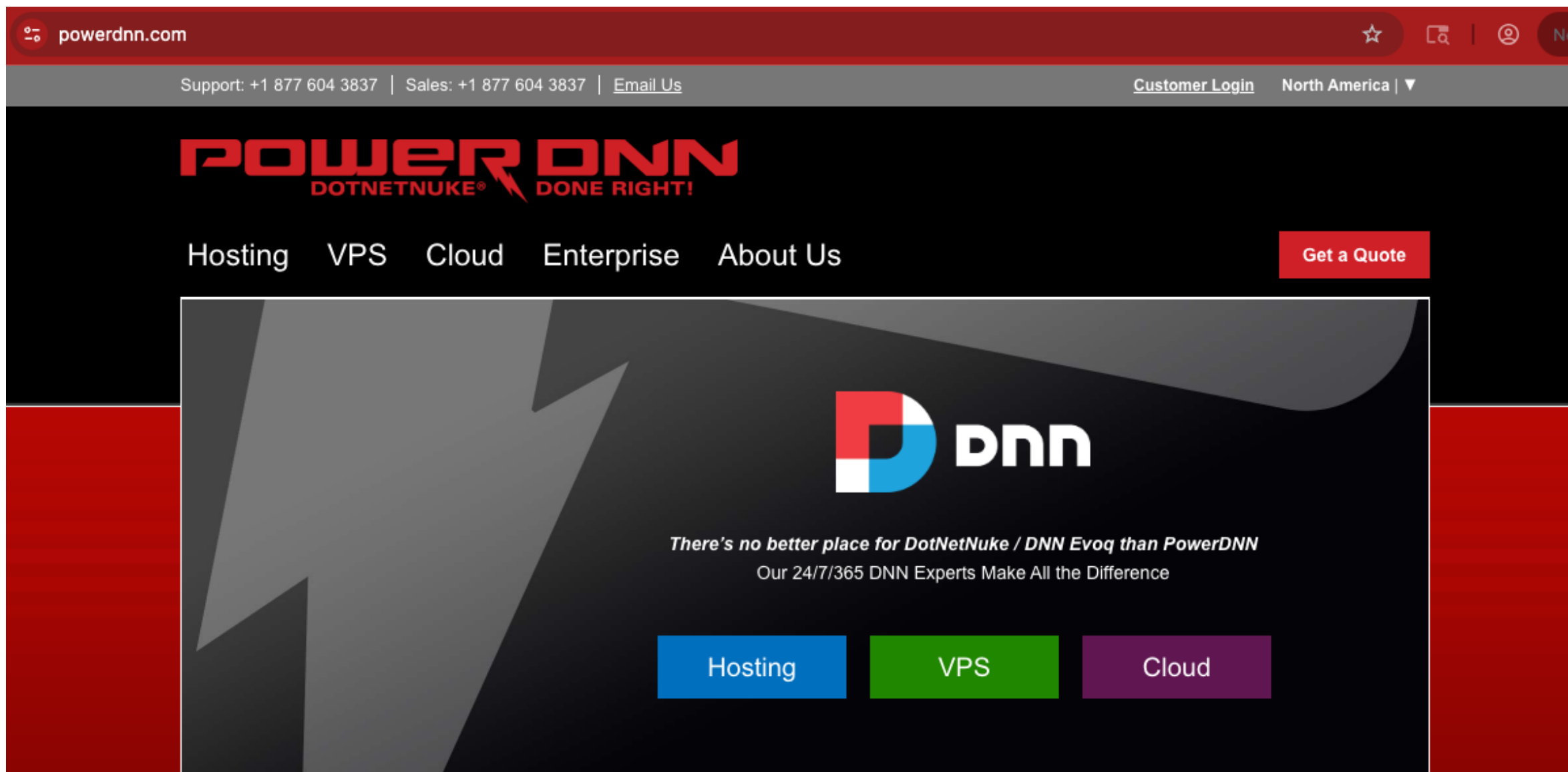
Apologies about my voice

- I don't normally sound like this
- Defcon, drinking, idk

Intro

- I'm mike kunz
- Principal security engineer at Microsoft
- I've worked at Oracle, AWS, and now Azure
- Freshman year of college, one of my first jobs I was call center tech support fixing websites





Open source asp.net

~50k websites across ~100 servers

Small team of 8 or so freshmen in college trying to keep it all running

- Open source?
- Microsoft?



2008.

We learned a lot together

- How to fix things very quickly
- How to talk on the phone
- How to manage stress and angry customers
- How to drive a motorcycle in the rain
- How to rack a server
- How to maintain a servers hardware and do upgrades
- How to rebuild an operating system
- How to migrate data
- What happens when you pull the ram when the servers running
- What to do with the FBI calls

Why would you want to build your own website?

- Build your brand
- Learn a new skill
- Have an easy set of resources for you to use
- It was the literal cool thing to do back in the myspace days
- Tbh for me I think the new tech today has really lowered the barrier to entry and you can do some really fun things that feels a bit like the old school 1990s wild west internet
- Defcon spam?

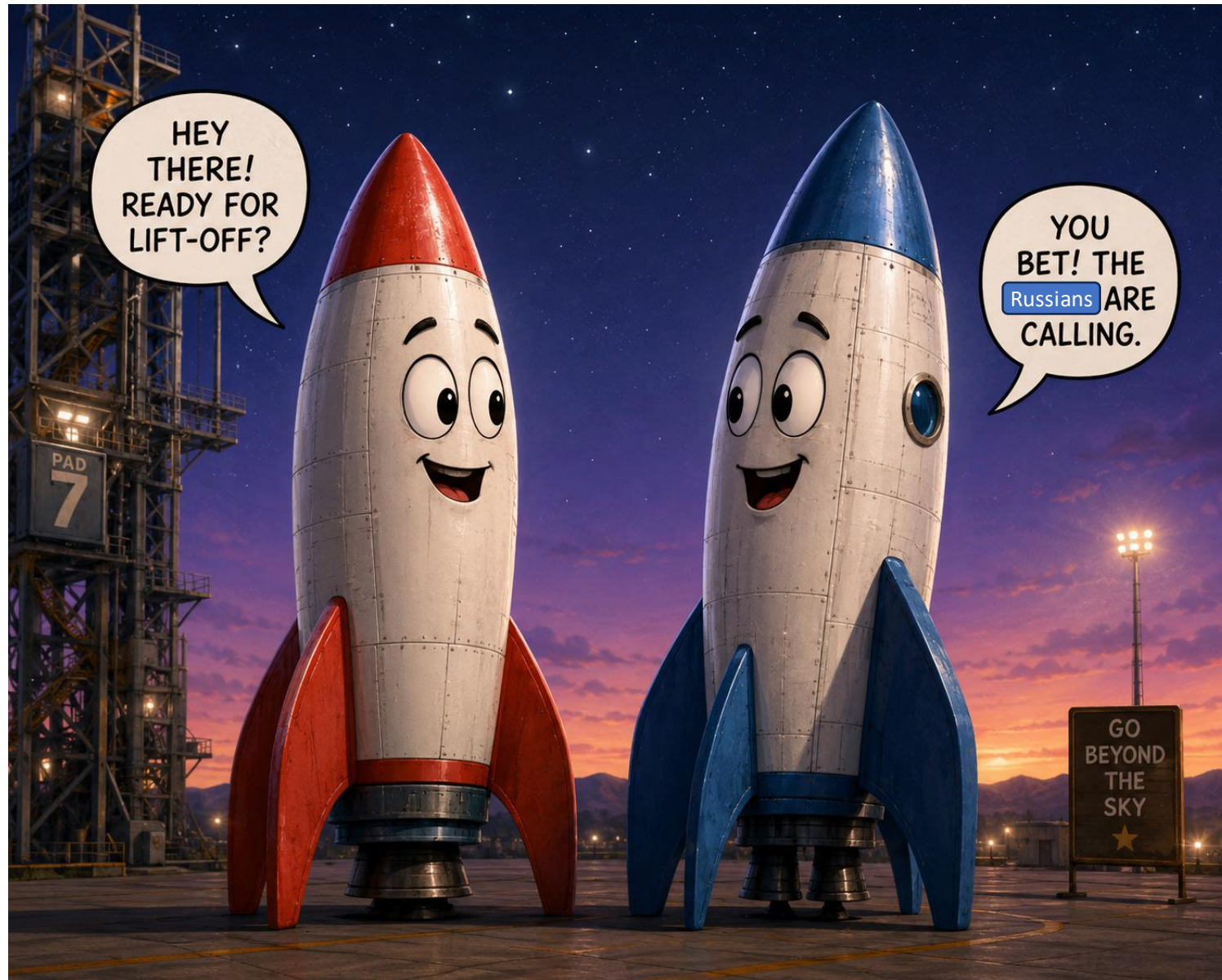
So I've convinced you?

You want to build your own website? Good.

- We'll need to choose a name, but before we get there, let's dive into a little background and go on a history lesson
- Take notes there's a pop quiz later



The US government created the internet in 1969 as a way for nukes to talk to each other and be able to survive attacks

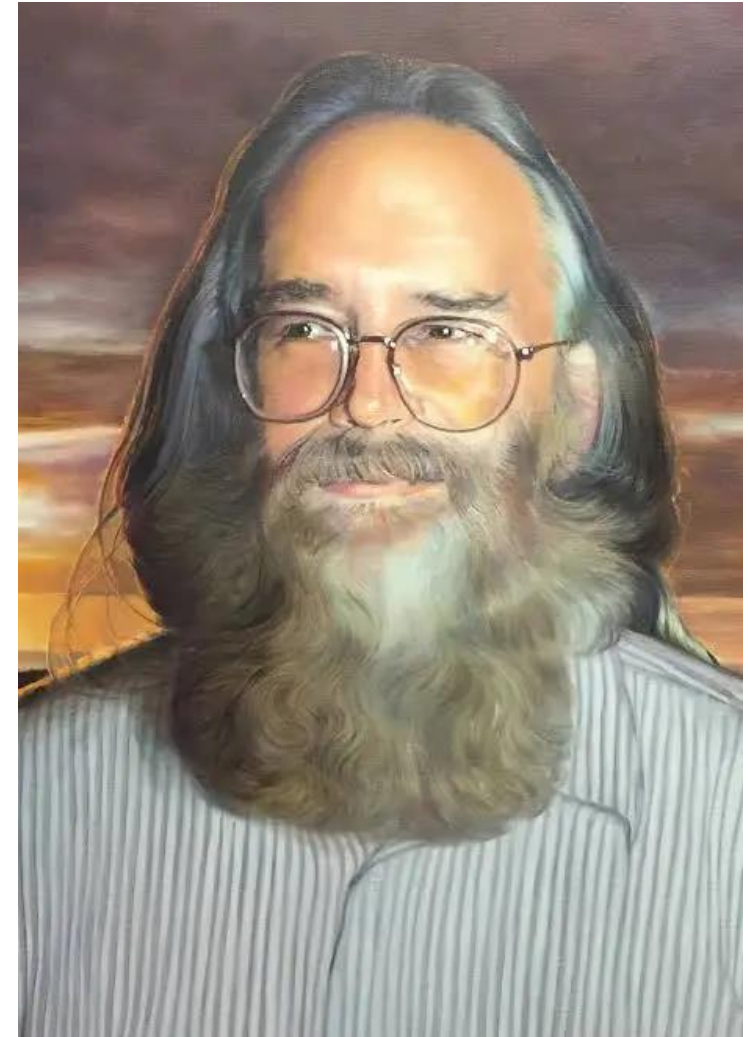


"The Internet is not a big truck. It's a series of tubes." – Ted Stevens 2006

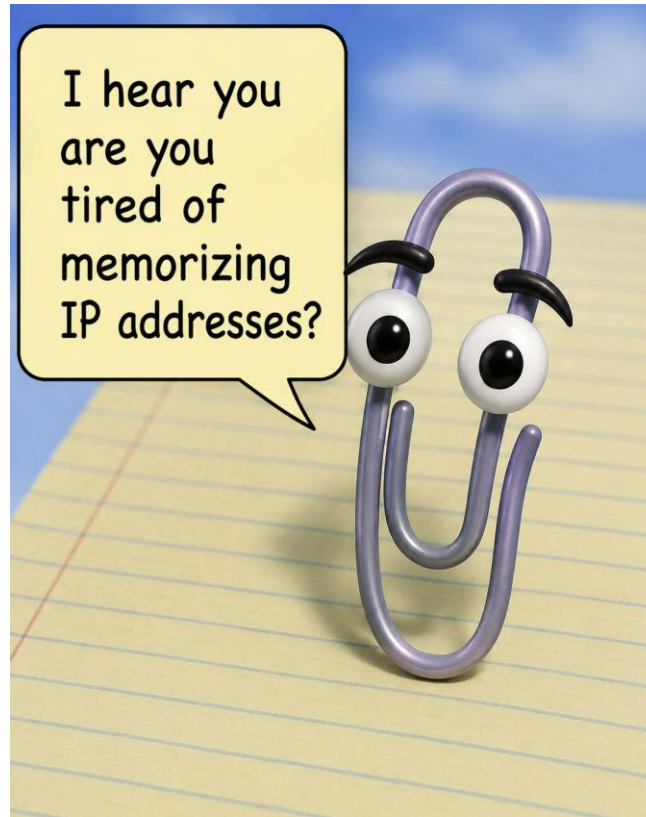


In 1972 a guy Dr Jon Postel started a notebook tracking names to ip addresses

- Often referred to as the “god of the internet”
- Born Aug 6, 1943 and grew up in California
- Studied Engineering and got a Computer Science PHD from UCLA in 1974 while working on ARPANET
- Went to work for the government at Mitre, then 4 years later joined the University of Southern California where he spent the rest of his career
- He needed a heart valve replacement at 48 and died from heart surgery complications at 55 on October 16, 1998
- In the early days if you wanted a domain name on the internet this was the guy you would talk to



In 1983 Domain Name Service (DNS) was created which digitized Postel's notebook



What is DNS?

DNS stands for **Domain Name System**. It's often described as the Internet's phone book.

When you type:

google.com



your computer doesn't actually know where Google is. It needs an IP address, such as:

142.250.190.78



DNS is the system that translates human-friendly names into IP addresses that computers can use.

DNS History

- In 1985 there were 4 servers that mapped names to computers
- 1987-1991 there were 7
- 1993 they added an 8th and then quickly decided we we should have 13
- And to this day there are 13 root dns servers
- These servers are the authority that say this website should go to this computer

Letter	Domain Name	Operator Origin	Operator	
A	a.root-servers.net	United States	Verisign	
B	b.root-servers.net	United States	USC Information Sciences Institute	
C	c.root-servers.net	United States	Cogent Communications	
D	d.root-servers.net	United States	University of Maryland	
E	e.root-servers.net	United States	NASA Ames Research Center	
F	f.root-servers.net	United States	Internet Systems Consortium	
G	g.root-servers.net	United States	Defense Information Systems Agency	
H	h.root-servers.net	United States	U.S. Army Research Laboratory	
I	i.root-servers.net	Sweden	Netnod	
J	j.root-servers.net	United States	Verisign	
K	k.root-servers.net	Netherlands	RIPE NCC	
L	l.root-servers.net	United States	ICANN	
M	m.root-servers.net	Japan	WIDE Project	



DNS Propagation

- If you wish to push a change to one of these servers it can take up to 24-48 hours for all the downstream systems in the world to agree, we call this propagation delay. When you make a domain it takes time for it to work and there's nothing you can do to speed it up.
- AWS was down for 15 hours on Nov 27, 2025 because of a DNS race condition



Meaningful dates

- In 1984 the first top level domain was created **.arpa**
- On March 15, 1985 the first .com was made ***symbolics.com***
- In 1986 **InterNIC** was formed to allow companies to register domains
- In 1988 Postel created **IANA** (Internet Assigned Numbers Authority) to better manage this
- The soviet union domain **.su** was added Sept 19, 1990
- Orange.com was made Dec 9, 1993
- Yellow.com was made Aug 19, 1994
- Michael.com was made Sept 4, 1994
- Jesus.com was made Oct 23, 1994
- Google.com was made Sept 4, 1998

Rank ↕	Date of registration ↕	Domain ↕	Registered to ↕
1	March 15, 1985	symbolics.com	Symbolics
2	April 24, 1985	bbn.com	BBN Technologies
3	May 24, 1985	think.com	Thinking Machines
4	July 11, 1985	mcc.com	Microelectronics and Computer Technology Corporation
5	September 30, 1985	dec.com	Digital Equipment Corporation
6	November 7, 1985	northrop.com	Northrop Corporation
7	January 9, 1986	xerox.com	Xerox PARC
8	January 17, 1986	sri.com	SRI International
9	March 3, 1986	hp.com	Hewlett-Packard
10	March 5, 1986	bellcore.com	Bell Communications Research
11	March 19, 1986	ibm.com	IBM
12	March 19, 1986	sun.com	Sun Microsystems
13	March 25, 1986	intel.com	Intel
14	March 25, 1986	ti.com	Texas Instruments
15	April 25, 1986	att.com	AT&T
16	May 8, 1986	gmr.com	General Motors Research Laboratories
17	May 8, 1986	tek.com	Tektronix
18	July 10, 1986	fmc.com	FMC Corporation
19	July 10, 1986	ub.com	Ungermann-Bass
20	August 5, 1986	bell-atl.com	Bell Atlantic
21	August 5, 1986	ge.com	General Electric
22	August 5, 1986	grebyn.com	Grebyn Corporation
23	August 5, 1986	isc.com	Interactive Systems Corporation
24	August 5, 1986	nsc.com	National Semiconductor
25	August 5, 1986	stargate.com	Stargate Information Services ^[2]

So some people were getting domains registered that weren't companies, what changed?

- In 1991 this ATT DOD contract funded the creation of a company called Network Solutions
- In 1993 the National Science Foundation decided they could be the sole company that was allowed to register domains
- From May 1993 to March 1995 they registered 60k domains for free.
- This wasn't sustainable, someone has to pay to manage all the registrations, so in Sept 1995 they were then sold to a gov contractor SAIC for 4.7 million and they decided if you want to register a domain you need to pay us \$100 every 2 years.
- Name registration was heavily restricted as Network Solutions claimed they had first amendment rights to could pick and choose who got what.
- They famously allowed shit.com to be registered, but not shitakemushrooms.com
- Getting a domain was a matter of emailing networksolutions and hoping they would let you on a first come first serve basis
- Eventually the world realized the mistake and in 1998 ICANN was formed and by Nov 4, 1999 you could register a domain for \$6/year without using Network Solutions ending the monopoly.

Top Level Domains (TLDs)

- In 2012 ICANN launched custom TLD's and today for about \$250,000 you can create your own tld, there's a bunch of rules you have to follow and yearly maintenance fees you have to pay
- But if you wanted to create **.dc402** you could totally can do so and break yourself free from the usual
- Currently for every .com registered icann charges \$0.20 to register your name.
- In 2014 the new zealand tld opened up to the public by the new zealand government and I somehow managed to win the race and acquired **ku.nz**

Alright so if ICANN only charges \$0.20 why does it cost \$10/year for a .com domain?

1. That's capitalism baby. Be thankful it's only \$10 most places. Godaddy race cars aren't cheap.
2. IMO Registrars do charge way too much to update the records to point a website to a server. I do acknowledge managing all the billing systems and infrastructure to connect to various TLD's isn't easy. If you wanted to go through all the legal effort you can become your own Registrar. You have to accept public registrations and I only know one person who has done so and he used to run some of the networks at UNO and his business squatted a lot domains to make it worth his while.
3. DNS records have a technical learning curve and making a business requires educating people.
4. Private Registration. For most TLD's ICANN requires name and address registration for each domain in something called a WHOIS database. There is a simple website people can go to and lookup who owns a website. Registrars can optionally proxy this info to hide it so it is not easily available. When Google operated a name registrar they were breaking the status quo by doing this for free for people.

Pop Quiz

- Who is the god of the internet?
- How many root DNS Servers are there?
- How many hours did it take AWS to fix a dns outage on Nov 27, 2025?
- What organization manages who owns what domains today?
- Who owns shitakemushrooms.com?

- https://www.godaddy.com/whois/results.aspx?itc=dlp_domain_whois&domain=shitakemushrooms.com+

ⓘ Premium Domain

Call (480) 366-3343 for buying assistance.

shitakemushrooms.com is available.

\$4,999.00 + \$22.99/yr ⓘ

ⓘ What are premium domains?

Why it's great.

- ✓ "shitakemushrooms.com" is easy to remember.
- ✓ Uses the .com extension.
- ✓ Includes Basic Privacy Protection.

Buy It Now

History lesson over, let's get into it

- pick a TLD
- pick an ideally non trademarked name



Cheapest recommended option

- The **.xyz** tld let's you can buy a numerical domain for \$0.85/year
- When I worked at AWS I bought hex encoded "AWS" 415753.xyz for \$0.85/year and recently bought hex "aws" 617773.xyz



The temporary option

- A number of registrars have promo rates for the first year
- When I worked at powerdnn I bought mikekunz.info for \$1 for the first year
- Every year you can just buy a new domain
- Be careful what domains you buy, some are very expensive, looking at you .io at \$50/year

Fun option

- Find a play on your name ie: ku.nz or adamschaal.com
- I pay \$20/year

Fun option #2 - Find a Unicode domain

- GHz.ms (3 characters but resolves to 4 sometimes)
- <https://github.com/franckferman/PunyPwn.git>
- adamschaal.com xn--damschaal-zyh.com
- adamschaal.com xn--aamschaal-qoj.com
- adamschaal.com xn--admschaal-1yh.com
- adamschaal.com xn--adaschaal-i2h.com
- adamschaal.com xn--adamchaal-o9h.com
- adamschaal.com xn--adamshaal-z3h.com
- adamschaal.com xn--adamscaal-v3i.com
- adamschaal.com xn--adamschal-6yh.com
- adamschaal.com xn--adamschal-7yh.com

Free option – Phone a friend (subdomains)

- Hey mike can you make me a subdomain?
 - <https://freedns.afraid.org/>
 - People buy domains and then change their name servers to ns1-4.afraid.org allowing anyone to host free subdomains
 - Currently 20k domains available
- <http://mikekunz.moook.com/>
- Duckdns.org
 - Myaddr.io -> mclovin.myaddr.io

Showing 1-100 of 20,291 total				SEARCH
Domain	Status	Owner	Age	
Sorted by: Popularity				
moook.com (858050 hosts in use) website	public	josh	9247 days ago (03/15/2001)	
chickenkiller.com (441108 hosts in use) website	public	josh	9319 days ago (01/02/2001)	
strangled.net (117101 hosts in use) website	public	josh	9318 days ago (01/03/2001)	
ignorelist.com (110769 hosts in use) website	public	josh	8905 days ago (02/20/2002)	
crabdance.com (103535 hosts in use) website	public	josh	7534 days ago (11/22/2005)	
twilightparadox.com (53723 hosts in use) website	public	josh	8380 days ago (07/30/2003)	
jumpingcrab.com (49932 hosts in use) website	public	josh	7535 days ago (11/21/2005)	
record-point.com.au (32394 hosts in use) website	private	comlinkit	3073 days ago (02/08/2018)	
my.to (32023 hosts in use) website	private	an0nym	4428 days ago (05/25/2014)	
axsetubal.pt (24337 hosts in use) website	private	kosmys	6706 days ago (02/27/2008)	
barabesta.is (21976 hosts in use) website	public	oseice	436 days ago (04/29/2025)	
privatedns.org (19619 hosts in use) website	public	four2theizz0	7214 days ago (10/08/2006)	
ftp.sh (18321 hosts in use) website	public	n8walker	7469 days ago (01/26/2006)	
mine.bz (16285 hosts in use) website	public	carlb613	6889 days ago (08/29/2007)	
undo.it (12535 hosts in use) website	public	lyranet	7989 days ago (08/24/2004)	
bot.nu (12312 hosts in use) website	public	icekung	8008 days ago (08/05/2004)	
yao.cl (11775 hosts in use) website	private	joneryao	5244 days ago (02/28/2012)	
info.gf (11722 hosts in use) website	public	carlb613	6156 days ago (08/31/2009)	

Arguably best option

- Just pony up the \$10/year and a buy a .com .net or .org
- Warning: if you take the prescription drug approach to naming your website you might find yourself buying .com/.net/ and .org and establishing an LLC to protect your name rights which is annoying

How should I buy it?

- There are a lot of registrars out there, I would use cloudflare.com
- Some registrars charge extra for private registration, CF does not and is very competitive cost wise
- Some registrars make it really hard to move your website to someone else, cloudflare does not
- Some are really bad at sending renewal notices, cloudflare is good with grace periods and have strong security in preventing stolen account transfers
- Some registrars see you searched for domain and steal it from you CF does not
- Porkbun, Namecheap/Spaceship are ok options
- Google sold their name business to Squarespace and out of principal I will not support them
- Godaddy is known for charging insane renewals and extorting on accidental expirations

I have a domain, what now?

- You need to choose who you are going to trust with your dns records
- I would set the domain up in cloudflare
 - It's free
 - It's fast
 - It's load balance very well and protects from DDOS attacks
 - It's commonly used with plenty of documentation
 - You can easily change servers at any time
 - You can easily change records very quickly
 - You can host a small html website for free with workers.
 - You can setup email receivers for free
- To use CF you simply make an account and add the domain and it'll walk you through moving the name servers over. You just need to update your registrar to use the cloudflare nameservers and wait the 4-48 hours for the change to take effect.
- You can make your own nameservers, but I strongly advise against it. I ran a virtualmin server for years and there's some neat things you can do with like rebind attacks, but they are very fragile from a management perspective and really up the required resources needed to do so.

What's the catch?

- Cloudflare isn't doing all of this just out of the goodness of their hearts
- They want you to buy their enterprise options
- They want to sell you on services
- Who is going to your website is sometimes very valuable data for people
- They are trying to build a monopoly
- They want to make it so if you want your website to load faster you will pay them extra and use their Content Delivery Networks

How do I put something on my website?

This is called Hosting. Somewhere in the world someone has to have a computer share a file to be shown

- 1. Free option
- 2. Pay money options

Free Option (Cloudflare pages)

- Cloudflare -> Compute -> Workers and Pages -> Create application -> Upload your static files -> Upload a ZIP of your website -> Deploy
- This will host your website on something.pages.dev which you can then set a custom domain to one of the ones added to your account.
- This hosts the website for free
- Only requires basic html knowledge and AI can help you build a static website.
- Your website has HTTPs enable for free, no servers to maintain
- This does not enable server side processing so only basic applications are possible

Free Option (github pages)

- Github Pages allows you to host markdown out of a repo for free
- Giving you a free `account.github.io` page
- Custom domains are free



2. Pay money option

There are whole businesses around this you might have heard of them

- Amazon Web Services
- Oracle Cloud
- Azure
- Google Cloud



Downsides

- They are in the money making business
- Yes for about \$5/month you can make a virtual machine and they will put it on the internet, but there are so many hidden costs and this is just the drug to get you in the door to buy more
- Amazon charges insane fees for bandwidth, every time someone goes to your website, or you put a file on your website Amazon charges you money. \$0.09/gB is the starting rate which is insane. They also charge you a lot of money to store files. I don't know how they get away with it. Large customers do not pay this and have negotiated rates, it does not cost nearly this much. This is largely to punish and prevent you from leaving. Azure has the same business model.
- Oracle gives you 10TB/month bandwidth for free
- Google charges \$10/month to store 2TB on Google Drive with unlimited bandwidth, but \$40/month on Google Cloud plus \$0.01/gb (\$20) to \$0.19/gb(\$380) for transfer to just get the file there. The system is wild.
- Sadly at it's core this model is designed to stifle innovation and prevent competition

It costs a lot of money to put a computer on the internet or so they will make you think

- The reality is that is, that is not the case

Let's do the math

- I pay \$60/month for gigabit internet at home. I can use 2TB/month with no complaints from my ISP.
- I can buy a cheap \$100 mini pc 4 core intel n150, 512gb of storage, 16gb of ram for about \$300 now thanks to ai jacking up the prices. Over 4 years this equates to \$6.25/month
- At load this uses 28w at \$3/month of electricity
- If I can do this for \$9/month at my house, why am I risking paying thousands on using too much bandwidth?
- There are limited ports on your ISP and hosting a website is not something that is commonly allowed. You can get around this with something like cloudflare tunnels. But even then you can't do some things like send emails and let's be honest running a computer in your house isn't for everyone.
- But why does it cost so much to put a bunch of these together in a room?

Answer: It really doesn't

Case Study #1 - Shared Hosting

- When I worked at powerdnn in 2008 we used to charge \$20/month and we would provide instructions to update your dns records and we would put your website on a server with 100 other websites.
- We didn't charge for bandwidth
- We did have limited storage, but it was also 2008
- You never had to worry about success hurting your bottom dollar and you had technical support that knew the specialized language for when your website broke and had a number to call to fix it
- Each server was probably \$200/month to run and that server generated about \$2000/month in revenue.
- I made \$8/hour. The owner made hand over fist on this.
- The owner ran this out of his house until he could scale and started buying space at data centers

Case Study #2 - Colo facilities

- There's a colocation facility in Kansas City called Patmos which used to be called Joes Data Center
- Today for \$35/month they will let you put a giant 1U server 1.75"x19"x30" in their data center
- They will pay for 400w of power constant
- They will provide 33TB/month of bandwidth on a fast link
- They will cool the server
- They will host the server 24/7 in a secure facility
- For \$200-\$300 you can get an old dell r630 28 core 32gb/ram 1u from some company retired
- You can ship them the server direct from ebay and they will plug it in and give you a remote KVM to set it up
- Or they have servers you can just buy straight up from them already installed
- If I divided this up with 30 people I only pay about \$1.36 month for the server over 4 years and this is a non optimal reseller setup.
- They now operate in Dallas and Phoenix as well for the same price



Dell Poweredge R630 2x Xeon E5-2680 v4 2.4ghz 28-Cores | 32GB | H730 | 2x 1100w
Good - Refurbished

\$279.99

Buy It Now

Free delivery Jun 18 - Jun 22

Free returns

13 watchers

 garlandcomputer 99.9% positive (100.1K)

 **eBay Refurbished**

How do I get something on the internet
cheaply?

Solution: People who build data centers

- There are people out there that are trying to grow their business
- They are trying to establish a presence and build a large datacenter so they can attract better deals and compete so they do case study #2 in hopes of getting more money to build a business supporting premium case study #1 people. They can run things at very low costs.
- They typically advertise on this website called lowendbox.com
- Currently you can get a VPS on RackNerd, DediRock, CloudServer, or ServerHost for \$1/month with unlimited bandwidth
- Sometimes these companies go under and your data is lost forever, but this is a price you pay to just make backups frequently. They do usually warn you so you have a chance to move things over.

Its not for everyone

- You aren't getting latest generation hardware
- You aren't getting top of the line speeds
- You aren't getting backups of your data on 6 different servers across 3 geographic regions
- You may have the occasional day of downtime
- You don't know when the aging hdd storing your data will die
- You don't know who is operating your box and could potentially access your data
- You get assigned IP blocks that might flag firewalls because of other users sending spam
- You don't get big brother looking out for you when you leave something exposed, there's no customer support number for you to call, there's no enterprise security team making sure things are not broken into
- It's a wild west, it's raw, it's unfiltered, and it's just plain beautiful
- For me, it's perfect, and it's where I host my websites

If you want to be a premium customer do so

- I would recommend going with Oracle because for \$8* per month you can get an arm 1 core 1 gb vm with 10tb bandwidth
<https://www.oracle.com/cloud/compute/arm/cost-estimator/>
- Digital ocean is \$6/month free 1 core 1gb 1tb bandwidth
- Linode is \$5/month 1 core 1gb 1tb bandwidth
- AWS got in this business because they discovered they had a lot of computers for black friday, but didn't need them the rest of the year and they could resell unused compute to recoup costs



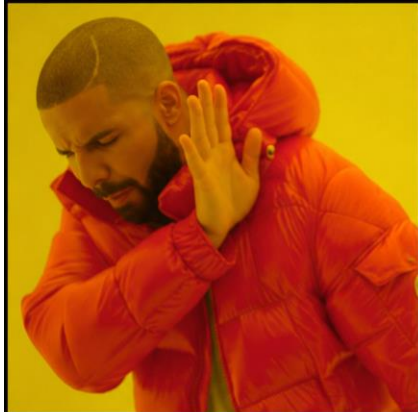
If you head over to lowendbox

- We can take a trip on the wild side
- Buy your VPS for a year
- Select your operating system image
- Within minutes you will get an email with your ssh password
- If things break or get hacked you can go to the website and reimage the box within minutes
- Go to cloudflare and create an A record pointing to the ip address they gave you
- And ssh in



Make it a little more secure

- Generate a local ssh key with `ssh-keygen`
- Copy over your ssh key and enforce key based login with `ssh-copy-id`
- Create an ssh config so you can ssh by name
- Enable automatic upgrades of security features
 - apt update
 - apt install unattended-upgrades
- Install a firewall
 - apt install ufw
 - ufw allow http
 - ufw allow https
 - ufw allow ssh
 - ufw enable
- Enable auto purging of logs
 - journalctl --vacuum-size=100M
 - journalctl --vacuum-time=7d

	SHIP FAST INSERT CODE
	SHIP SMART  INSERT SECURITY ☒ Threat Modeling ☒ Input Validation ☒ Least Privilege
A SECURE SYSTEM TODAY > A BREACHED SYSTEM TOMORROW	

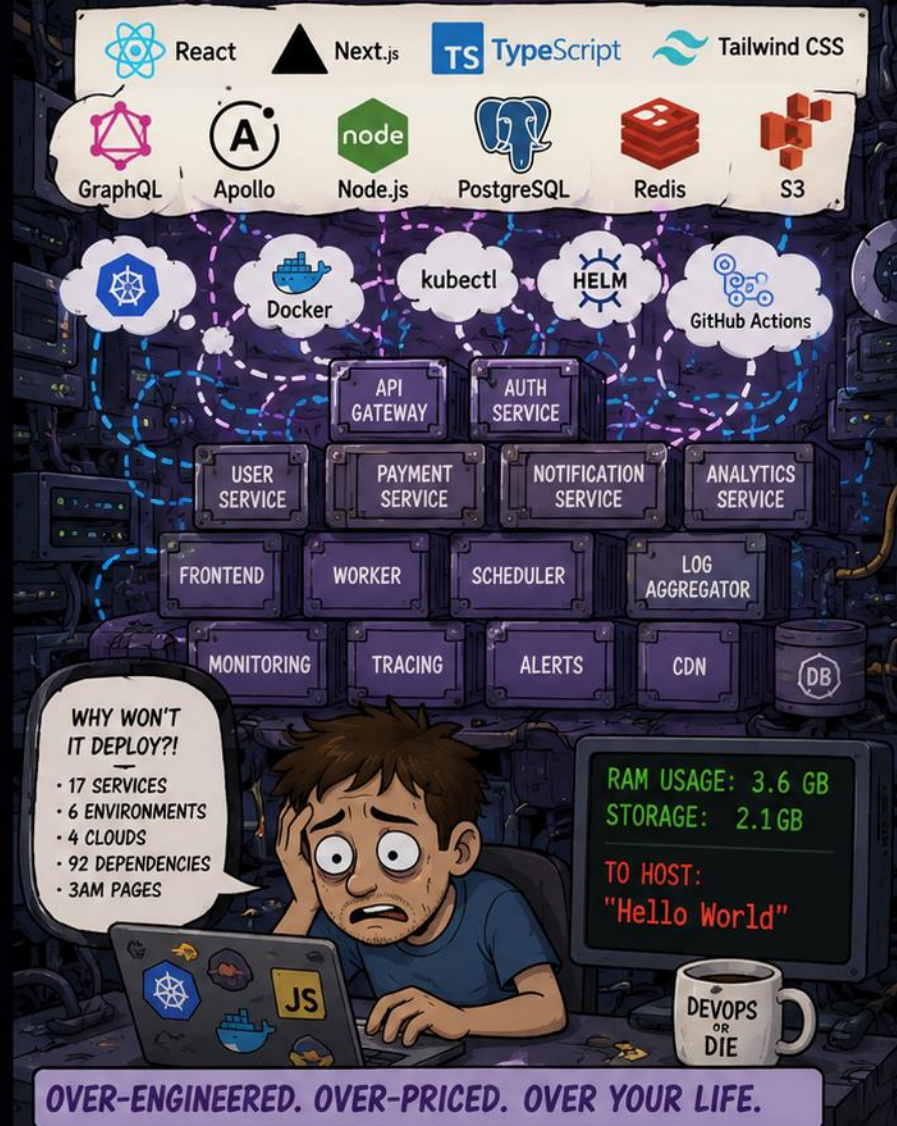
Checkpoint

- With this alone we have our own VPN
 - `ssh -D 1234 jumpbox`
 - Open firefox and set the socks proxy and we can tunnel all our traffic
 - Ever run into a website that only allows 1 download per ip, bam we have a new ip and it doesn't belong to a VPN provider that's commonly blocked, unable to go to a certain website because of state you live in, bam now you are elsewhere
 - We can setup a reverse ssh proxy and expose local services to the internet



HOSTING A WEBSITE IN 2026

THE "ENTERPRISE GRADE" WAY



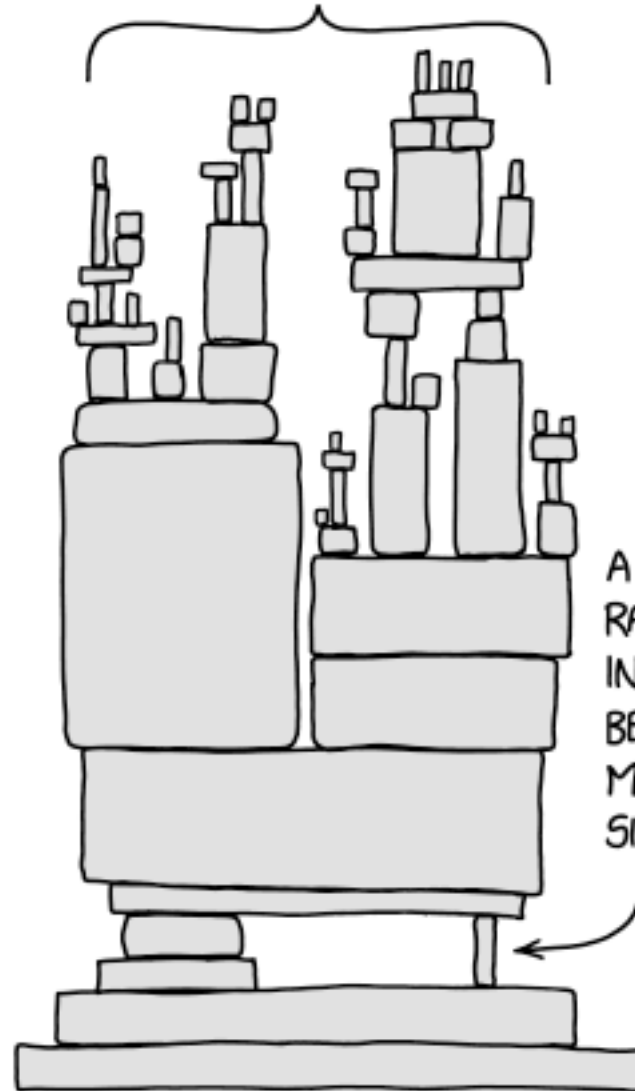
THE "I JUST WANT IT TO WORK" WAY



★ THIS ISN'T SILICON VALLEY. THIS IS THE WILD WILD WEB.

BUILD COOL STUFF.
NOT INFRASTRUCTURE GRAVEYARDS.

ALL MODERN DIGITAL
INFRASTRUCTURE



A PROJECT SOME
RANDOM PERSON
IN NEBRASKA HAS
BEEN THANKLESSLY
MAINTAINING
SINCE 2003

BACK IN 2008

THE GO-TO STACK FOR WEB HOSTING

LAMP STACK



LINUX

The rock-solid operating system



APACHE

The world's most popular web server



MYSQL

The proven, reliable database



PHP

Server-side scripting made easy

OR

LEMP STACK



LINUX

The rock-solid operating system



ENGINE (NGINX)

Lightweight, high-performance web server / reverse proxy



MYSQL

The proven, reliable database



PHP

Server-side scripting made easy

- ✓ Open Source
- ✓ Easy to set up

- ✓ Well documented
- ✓ Worked. Just worked.

```
$ sudo apt install lamp-server  
# (or setup nginx + php-fpm)
```

APACHE / NGINX

PHP

MYSQL

LINUX

A few commands.
A few configs.
You're live.

It didn't need 50 services
or 10 containers.
It just needed solid
fundamentals.

REALITY CHECK

- ✓ No vendor lock-in
- ✓ Low cost
- ✓ Low complexity
- ✓ High availability
- ✓ Developer friendly

≡ SIMPLE STACK. SOLID FOUNDATION. ≡
MASSIVE IMPACT.



FACEBOOK RAN ON LAMP



EASY TO BUILD FAST

Ship features
at lightning speed



SCALED HORIZONTALLY

Add more servers.
Handle more users.



LIGHTWEIGHT & EFFICIENT

Low resource usage.
High performance.

FROM A DORM ROOM TO THE WORLD.

Users → Web Servers → MySQL Master → Replicas

Focus on Product. Not Complexity.

facebook
Connecting the world.

facebook

MOVE FAST AND BREAK THINGS.

★ NO MICROSERVICES. NO CONTAINERS. NO K8S.
JUST SOLID ENGINEERING & SMART ARCHITECTURE.



**LESSONS WE CAN
STILL LEARN TODAY**



FOCUS ON SIMPLICITY.
Solve real problems.



**BUILD THINGS
THAT LAST.**



**TECHNOLOGY CHANGES.
PRINCIPLES DON'T.**



**KEEP IT SIMPLE.
BUILD IT RIGHT.**

INTRODUCING THE **LEGSC** STACK

LINUX • NGINX • GOLANG • SQLITE • CERTBOT



```
$ ls -lah /var/www/html
total 12K
-rw-r--r-- 1 www-data www-data 1.1K May 20 12:00 index.html
$ systemctl status nginx
● nginx.service - A high performance web server
   Active: active (running)
```

1 LINUX – THE FOUNDATION



```
# Use your favorite distro
# Keep it minimal
$ sudo apt update && sudo apt upgrade
```

2 NGINX – WEB SERVER & REVERSE PROXY



A SINGLE WORKER CAN
HANDLE 50K USERS



```
$ sudo apt install nginx
```

★ BAM! WE HAVE A WEB SERVER HOSTING A WEBSITE ON OUR SITE!
PUT YOUR HTML IN /var/www/html

3 GOLANG – FAST & SCALABLE



EVERYTHING COMPILES
TO A SINGLE BINARY!



```
$ sudo snap install go --classic
```

4 SQLITE – FILES > SERVERS



WHY USE A DB SERVER
WHEN FILES DO THE TRICK?



```
$ sudo apt install sqlite3
```

5 CERTBOT – LET GOOGLE MANAGE THE CERTS



AUTOMATIC HTTPS.
ZERO PAIN.



```
$ sudo snap install --classic certbot
```

★ **THAT'S IT.**
WE HAVE EVERYTHING WE NEED.

SIMPLE. LIGHTWEIGHT. SECURE. MAINTAINABLE.

BUILT FOR HUMANS, NOT ENTERPRISE SALES PITCHES. 😎

Adding a little AI

- From ssh run ``curl -fsSL https://chatgpt.com/codex/install.sh | sh`` and login
- Install the Codex app locally and pay \$20/month
- Codex -> Settings -> Connections -> SSH -> Add (select from ssh config)
- Under projects -> add -> remote project -> devbox
- Codex now has the ability to build code on your dev server and run commands



Build me a homepage

- Prompt: My website is hosted in /var/www/html can you build me a fun fractal art html demo homepage
- Update it with whatever you want, no html experience needed
- Take inspiration from other developers:
 - Kiledonley.com -> Old roommate of mine
 - codewithmel.com -> Former Microsoft intern I worked with who took a code camp
 - Bryantotty.com -> coworker
 - Adamschaal.com -> dc402
 - Jfloren.net – vintage 1990s academic themed
 - <https://contemporary-home-computing.org/prof-dr-style/>
 - mavsoc.com - fake website for defcon spam

Add https

- Prompt: certbot is installed add https to my website
- It'll look up the command and website from nginx's config and determine we need to run: ``certbot --nginx -d example.com`` and then do so
- Bam our website is now accessible via https
- This used to cost \$50/year, you would have to pass a background check, and we would literally charge \$150/hr to install this at powerdnn. Now it's a single cli command.



Adding more domains

- Prompt: modify my nginx config to also host this new domain
- It'll go through and make the changes to add a new nginx config to `/etc/nginx/sites-enabled/` that will host both websites at the same time to different folders so we can host multiple websites at once
- You can also add subdomains ie: `dev.617773.xyz` (they need their own certs)

Build me a url shortener

- Prompt: deploy <https://github.com/mkunz7/shortener> on my server with the project in /var/www/shortener, make the program listen on 127.0.0.1:3000 locally using an nginx reverse proxy with /s as the url, start the program using a systemd service, use the user admin with a temporary password I'll change
- It's a golang website with a sqlite db for storage

Build me a file storage website

- Prompt: deploy <https://github.com/filebrowser/filebrowser> on my server, with the project in /var/www/filebrowser, make the program listen on 127.0.0.1:3001 locally using a nginx reverse proxy for /files as the url, start the program using a systemd service, make the user admin with a temporary password I'll change

Build me a temporary email service

- Prompt: deploy <https://github.com/mkunz7/tempmail> on my server, with the project in /var/www/tempmail, make the program listen on 127.0.0.1:3002 locally using a nginx reverse proxy for /mail as the url, start the program using a systemd service, tell me what dns records I need to add, install maddy from git tarball using instructions on <https://maddy.email/tutorials/setting-up/>
- It is a goLang website that interfaces with a goLang email server <https://github.com/foxcpp/maddy>

Good citizen internet practices

- Add a robots.txt -> Discourage rule following bots
- Add a security.txt -> Add a security point of contact
- Add a llms.txt -> tell the ai how your data is structured
- Add an ai.txt -> prompt ai not to do things
- Add a pgp-key.txt -> secure key to send you an encrypted message

Other ideas

- Tell it to use playwright to validate things
- Add a static html website that can convert base64
- Add a static html website that can convert heic images to jpg using heic2any
- Here's my resume build me a static html version of my resume
- Add a blog to /blog/index.html using <https://cdn.jsdelivr.net/npm/marked/marked.min.js>
- Add a totp generator using <https://github.com/tommyvange/Local-TOTP-Generator>
- Add a QR generator using <https://github.com/six-two/qr.html>
- Add a pdf editor using <https://github.com/samcurryllc/freepdf>
- Here's a picture of an idea of a website I would like to make, can you make it?
- Build me a script to backup /var/www, /etc/system/system, nginx sites-enabled
- Make /influencer-mode.html where you add frivolous unicode linkedin formatting

Prompt this better to build a html shoot em up raiden style game game in 3d javascript ->

- Build a 3D top-down shoot 'em up game in a single HTML file using JavaScript and Three.js.
- 1. Camera & Scene: Top-down orthographic camera angled at 45 degrees, looking down at a 3D battlefield. Include a dark space background with a particle-field effect for moving stars.
- 2. Player Controls: Allow the player's ship (a low-poly jet model) to move smoothly along the X and Z axes using the Arrow keys or WASD. Clamp the movement so the ship cannot leave the screen boundaries.
- 3. Combat Mechanics: Implement auto-shooting where the player's ship fires glowing laser projectiles forward every 150 milliseconds. Include a secondary "bomb" ability with a cooldown.
- 4. Enemy AI: Spawn wave groups of enemy drones at the top of the screen that travel downwards in choreographed sine-wave and looping patterns.
- 5. Collision Detection: Implement bounding-box collision logic to detect when player lasers hit enemies, and when enemies crash into the player. Include particle explosions on impact.
- 6. User Interface: Display a heads-up display (HUD) on top of the canvas for Score, Lives, and Bombs.

Richard ELO Rankings

- I'm an avid fan of Richard Nixon and I have collected an assortment of Richard Nixon photographs, the problem is I'm very bad determining which one is best. One of my friends had the idea of making a website where we would be shown two photos at random and we could rank the photos and choose which of them is best. That way we know which Richard Nixon photo is best. Can you fetch 25 Richard Nixon photos online for me, then build a website for me in golang storing the winners in a sqlite db, pick the next open port after 3000 and host it at /rickpics. Thanks!



Mike's free hosting hack

Free Approach

- Oracle has had a free vm you can use just attach a real cc:
 - signup.oraclecloud.com
 - Login to cloud.oracle.com and setup 2fa
- 2 x 1cpu arm, 6gb ram, 200gb storage, 10tb/month bandwidth all free
 - Or 1 cpu x86, 1gb ram, and network at 50mbps (lame option)
- Used to be 4cpu, 24gb, 200gb storage, 10tb/month (Changed 6/12/2026)

Idle Compute Instances

✓ Important

Reclamation of Idle Compute Instances

Idle **Always Free** compute instances may be reclaimed by Oracle. Oracle will deem virtual machine and bare metal compute instances as idle if, during a 7-day period, the following are true:

- CPU utilization for the 95th percentile is less than 20%
- Network utilization is less than 20%
- Memory utilization is less than 20% (*applies to A1 shapes only*)

- Once every 7 days it gets reclaimed unless
 - Cpu >20% average (stress-ng --cpu 1 --cpu-load 20)
 - Ram > 20% average (use a ram drive to get to 1.2GB)
 - Network > 65tb/month? / had 20% utilization at some point in 7 days?
- <https://github.com/layou233/NeverIdle> ->
 - program made to meet these requirements and occasionally runs speedtests

The real magic

- If you migrate from the free tier to pay as you go (still free) things do not get reclaimed
- Simply click upgrade in the banner and change to pay as you go
 - Puts an auth on your credit for \$100, but refunds instantly
 - It takes about a day for them to upgrade your account
 - Once done you won't have capacity issues deploying
 - Things are still free just be careful to only use always free resources
 - This might go away someday, but has been available for 4+ years now

Deploying

- Networking -> IP Management -> Reserved Public Ips -> Make an ip reservation
- Compute -> instances -> create instance
- Change image to ubuntu 24.04 aarch min
- Default should be: always free tier eligible -> 1 core 6gb
- Create new virtual cloud network
- Paste public ssh key from ssh-keygen
- Specify a custom boot volume size, 100gb (you can do 200 I'm just splitting between two vms), 120 vpu (no cost to turn up the ssd speed)
- Says \$23/month, but is actually free
- Feels like a cheat code to get \$46/month for free. You get two 1 core 6gb with a shared 200gb storage and 10tb bandwidth all free.

Warning about Oracle

- Outgoing 25 is blocked so you cannot send email without a relay like smtp2go or emailing them and asking for it to be opened
- OCI's instance has a firewall you need to allow ports through. Once setup from the instance, there should be a network tab, then subnet hyperlink, security tab, default security list hyperlink, security rules tab, add ingress rules allow 0.0.0.0/0 on ports 80/443/25.
- Additionally the ubuntu vm itself has a separate firewall. Flush the existing iptables rules on the machine then add your ufw rules.

Free azure hosting

- Azure also has free hosting too if your work pays for visual studio enterprise
- It's a bit of a rip off and you only get 100GB of free traffic before it's like \$0.09/gb aka \$90/tB
- I only get \$150/month in credit as an employee and can't use the much cheaper free tier vms

Free aws hosting

- AWS has free hosting too, 1cpu 1gb/per month for free
- Same bandwidth rip off as azure, you only get 100gB of free traffic before it's like \$0.09/gb aka \$90/tB
- As an employee I could have used \$20k/month in credit without justification
- Internal costs are no where close to what they billed

Free gcp hosting

- Google has free hosting too, 1cpu 1gb/per month for free
- Be sure to select standard disk
- You only get 1gb of bandwidth, but I think if you add your credit card it becomes close to the same bandwidth rip off as azure/aws, you only get 200gB of free traffic before it's \$0.04-\$0.19/gb

Word of warning

- If you do use a cloud provider, be sure to set billing limits so it turns things off automatically.
- You can move 1tb in 2hrs on single 1gbps connection easily burning \$45/hr
- You never know when you get hacked, DDOS'd, or make a mistake, AWS is known to surprise people with \$100k bills. You don't want to be in a position where you have to beg Jeff Bezos for forgiveness.
- Each cloud provider have spent years making billing very difficult to understand
- I like my \$1/month know what I'm paying for ghetto clouds

Any good ideas to add to my website?

- demo

Questions?

Hobocon

- Blog.adamschaal.com

Defcon

Highlights

- Talks were on twitch.tv
- Slides are live at qr code
- ~30k people
- Ctf everywhere
- James kettle talk on agentic burp
- Msrc not at pwnie awards
- Preorder linecon line was longer than cash line (28min)
- Various ms talks pnp to pwn
- Ctf was a whole lot of ai
- Goons were nicer
- Con felt more 24/7 as people stayed at lvcc super late

