Homelab Escapades

Newcastle Cybersecurity Group

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Public speaking skills: a solid 2.5/10 - remind me now that I should slow down and chill-out

If you have questions at any point feel free to jump in!

$whoami: I work for nib as part of the cybersecurity function

Previous lives as:

- developer
- retail assistant
- pizza cutter
- lawn mower

What am I not?

- A sysadmin
- Good at making presentation slides

Does any of this matter?

Just keep in mind, I'm just some dude throwing some things together and hoping for the best

But why am I here presenting?

¯_(ツ)_/¯

- Home networks are fun
- Breaking your own stuff will assist in teaching you
- Can run some cool services for yourself/family/friends

I originally started writing this presentation deck in a manner that I reflected on and felt it was going to be telling some of the audience to suck eggs.

Instead at the end of these slides we'll open to discussion on the content and have a look at some of the home network protections I've setup

I totally won't regret this.

Who is currently running their own hobby networks?

What are you currently running?

Are there reasons to not run a service on your home network?

What might we do to a home network to not secure it?

- Disparate, inconsistent, or no authentication on services
- Failure to segment devices based on use-case or trust of the devices
- Not implement any basic IPS/IDS
- Not ensure egress traffic utilising insecure protocols are managed suitably (DNSSEC, DoH or DoTLS enforcement)
- No analysis of traffic patterns

What services might we want to run?

Should we expose these services?

I want to be able to access my services from anywhere!

Cheatsheet for building a home network:

1. Buy a domain, or use a freebie
2. Pester your ISP for a static address (or big-brain it with some dynamic DNS)
3. Setup some port forwards
4. ????
5. Profit!

fin

Okay, cool, I have the things available on the interwebs...

Should we leaving our applications in a default state?

Nope! Let's apply some defence in depth!

I happen to have killed hours of my spare time implementing:

- Overkill network segmentation (sorry Sarah, I'll fix your chromecast connectivity one day)
- Traffic analysis via Snort
- Transparent DNS request rewrites via a DoH proxy
- Consistent authentication for my exposed services (there are limits here)

I am still looking to kill hours of my time with:

- Analysis of traffic patterns to identify potential issues (Zeek)

Is anyone currently utilising Zeek or have any insight into traffic pattern analysis?

Let's talk about free options that preserve privacy and security while imposing very little technical barrier to entry:

- Authelia (strong authentication protections on all yo' things)
- Pfsense/OPSense (or why you shouldn't accept your ISPs garbage)
- Snort (proactive blocking of script kiddies)

If we have time at the end of this talk I'd love to talk about some items that are less about homelab security and more about individual security:

- Approaches to backups
- Self management of secrets (getting out of the potential trap that is SaaS Password Managers)
- Implementing your own VPN (should you?)

Ever looked at the dumpsterfire that is an nginx config?

```
user www-data;
worker_processes auto;
pid /run/nginx.pid;
include /etc/nginx/modules-enabled/*.conf;

events {
        worker_connections 768;
        # multi_accept on;
}

http {

        ##
        # Basic Settings
        ##

        sendfile on;
        tcp_nopush on;
        tcp_nodelay on;
        keepalive_timeout 65;
        types_hash_max_size 2048;
        # server_tokens off;

        # server_names_hash_bucket_size 64;
        # server_name_in_redirect off;

        include /etc/nginx/mime.types;
        default_type application/octet-stream;

        ##
        # SSL Settings
        ##

        ssl_protocols TLSv1 TLSv1.1 TLSv1.2; # Dropping SSLv3, ref: POODLE
        ssl_prefer_server_ciphers on;

        ##
```

I don't actually mind them, but we'll assume that we ain't got time for that

Get some SWAG!


Self-Adhesive
Name Badge

This SWAG...
https://github.com/linuxserver/docker-swag

Why SWAG?

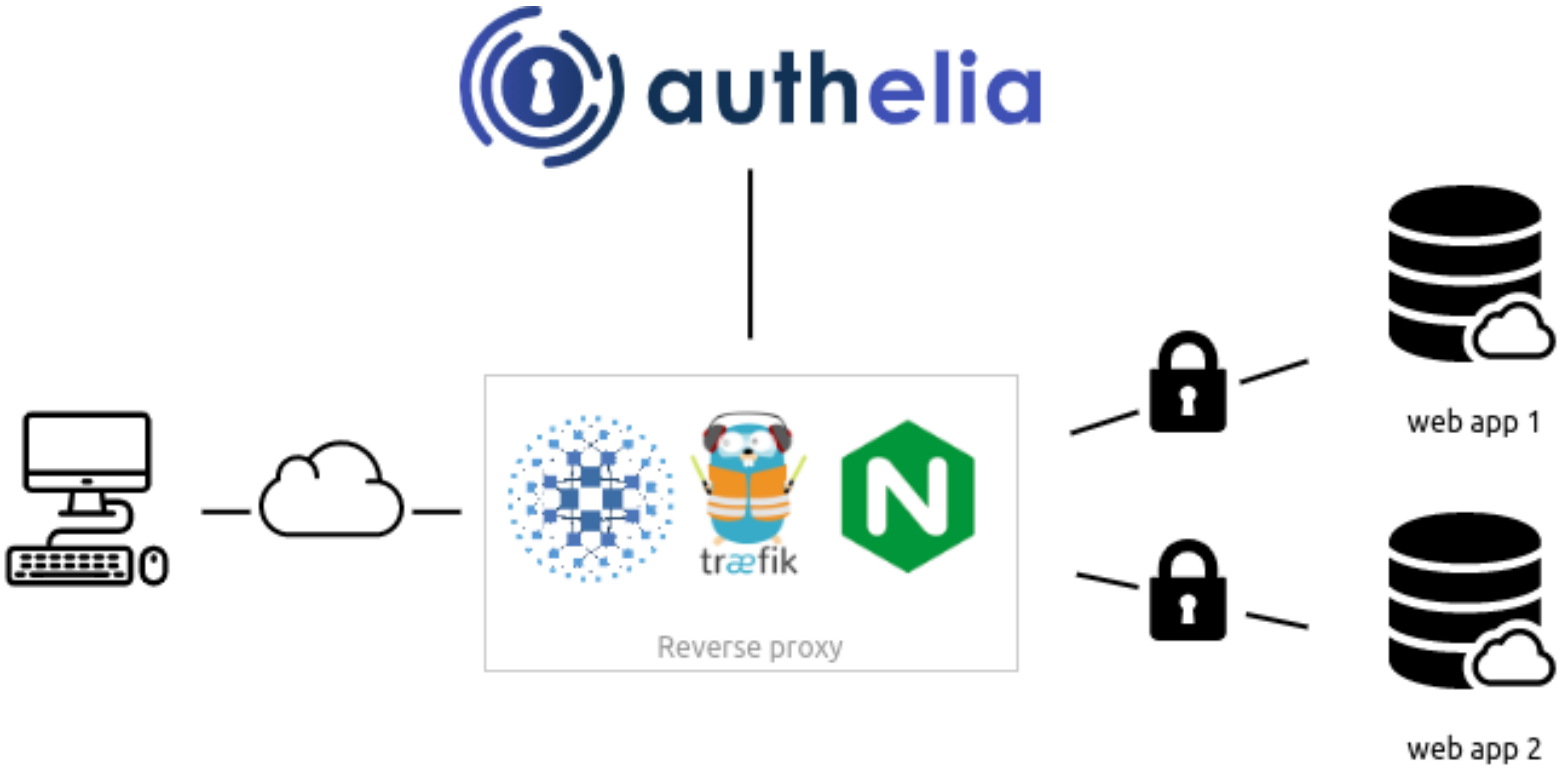
- It's a batteries included approach to us getting Authelia in the mix.
- It contains default configs for nginx come with options for Authelia included but disabled.
- Includes Let's Encrypt automation in the box

Note: **SWAG is not required, it will just make your life easier in managing your reverse proxy & Authelia**

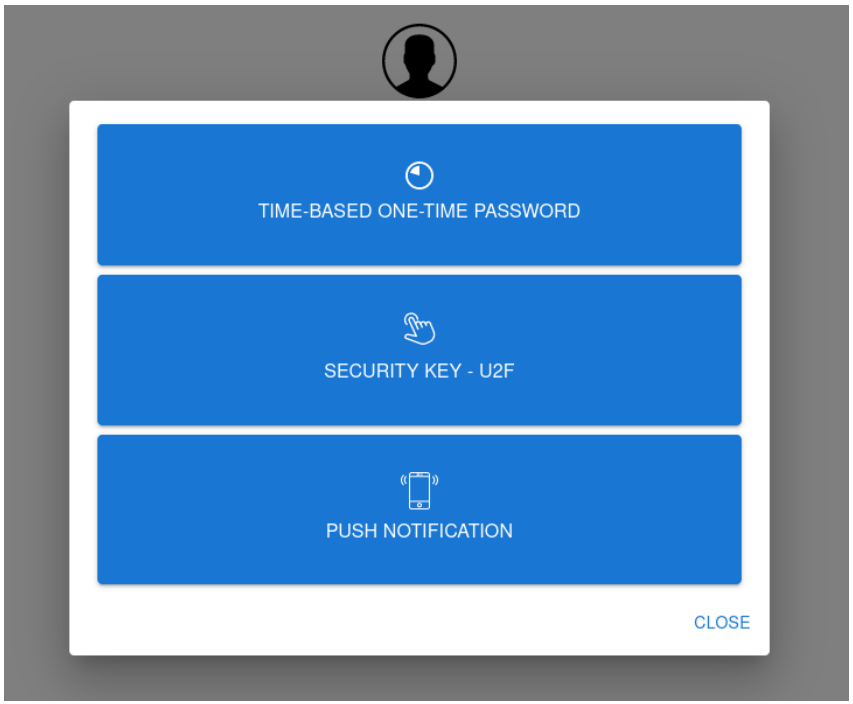
If you have the know-how of setting up a reverse proxy of your choosing, you could do so.

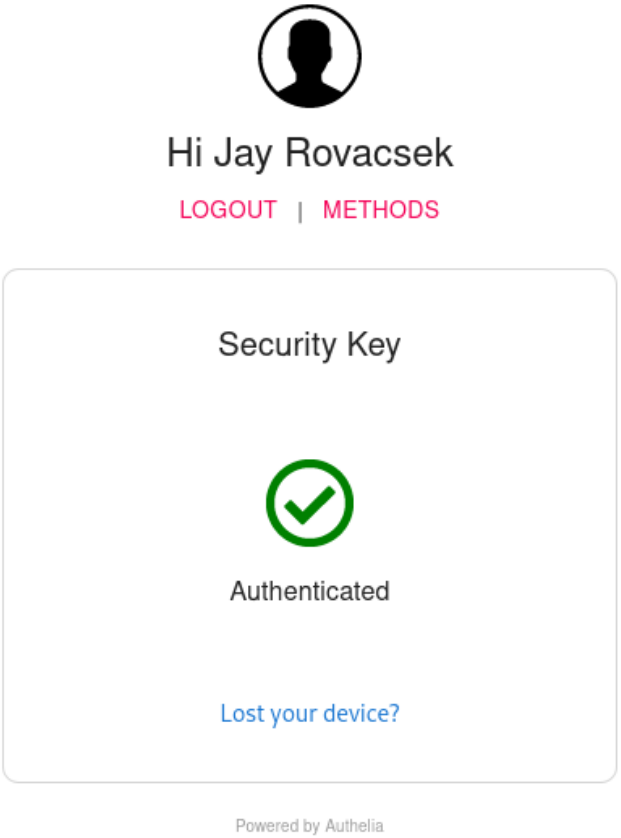
You could use HAProxy or Traefik instead if you're inclined

We're looking to deploy this model to our network:



So we've got SWAG and Authelia setup, what does this achieve?





Does this mean I could remove authentication from my exposed services?

Yup! (well, kinda)

What does the authentication flow look like? (do we chance a live demo?)

Cool, that's pretty much Authelia

Any questions?

Let's discuss home networks some more:

- Open Source Firewalls
- IPS/IDS
- Backups
- Self management of secrets
- Implementing your own VPN
- Something else?