

# Say What You Want Building a Full-Speed Anti-Censorship Router

Hack In The Box 2023 Phuket

twitter: @onlyxwings

## Question





### Disclaimer







## About kaijern @onlyxwings



#### **Qiling Framework**

Cross platform and multi architecture advanced binary emulation framework

- https://qiling.io
- Lead Developer
- > Founder



#### **Badge Maker**

Electronic fan boy, making toys from hacker to hacker

- Reversing Binary
- > Reversing IoT Devices
- Part Time CtF player

#### **Badge Designer for Hacking Conferences**









# \*\* AREMIUM OUALITY \*\*

#### **Some Recent Talk (Partial)**

- > 2018, HITB, Beijing/Dubai
- > 2018, beVX, Hong Kong
- > 2019, DEFCON USA
- > 2019, Zeronights, St Petersburg
- > 2020, Nullcon, GOA
- > 2020, Blackhat USA, Asia, Europe
- > 2021, Blackhat USA, Asia
- > 2022, Blackhat EU. Blackhat MEA

#### **Qiling Framework**

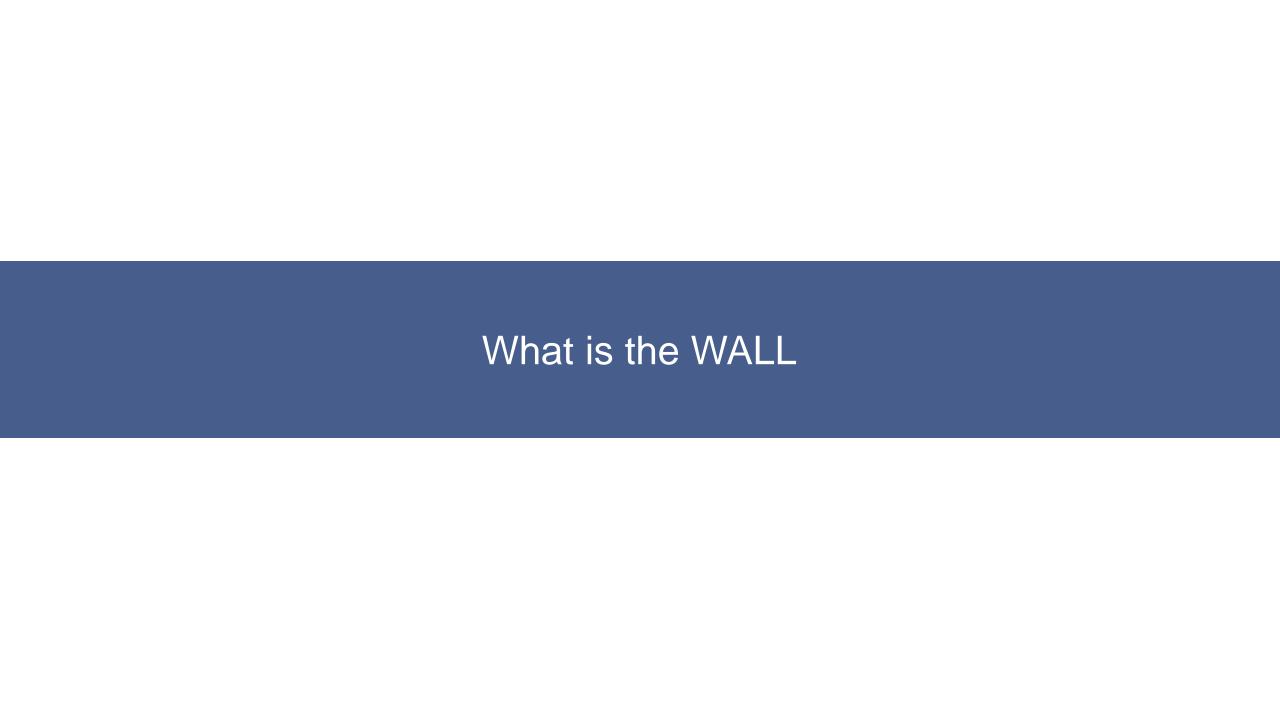
- Cross platform and cross architecture binary instrumentation framework
- > Emulate and instrument ARM, ARM64, MIPS, X86 and X8664
- Emulate and instrument Linux, MacOS, Windows and FreeBSD
- High-level Python API access to register, CPU and memory
- > 4000+ Github star, more than 100,000+ pypi download, 70+ contributors worldwide

## How It All Started

## **Entering China and stuck for 3 years**







## Facebook, year 2009

China [edit]

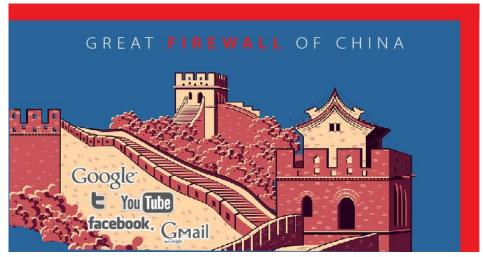
Main article: Internet censorship in China See also: Great Firewall of China

In China, Facebook was blocked following the July 2009 Ürümqi riots because protestors with the East Turkestan independence movement were using Facebook as part of their communications network to organize attacks across the city; Facebook refused to release the protestor identities and information to the Chinese government. [14] Some Chinese users also believed that Facebook would not succeed in China after Google China's problems in 2013. [15] Renren (formerly *Xiaonei*) has many features similar to Facebook, and complies with PRC Government regulations regarding content filtering.

As of 20 August 2013, there have been reports of Facebook being partially unblocked in China. However, according to the "Blocked in China" website, Facebook is still blocked as of 7 December 2019. Facebook is not blocked in Hong Kong and Macau, which are special administrative regions operating under different systems. Facebook is currently working on a censorship project for China, where a third party would be allowed to regulate Facebook and control popular stories that come around. This would be a huge attempt by Facebook to get back into China.

On 6 July 2020, Facebook announced that the company would stop reviewing requests for Hong Kong users' data while evaluating the newly imposed Hong Kong national security law by the Chinese government.<sup>[19]</sup>

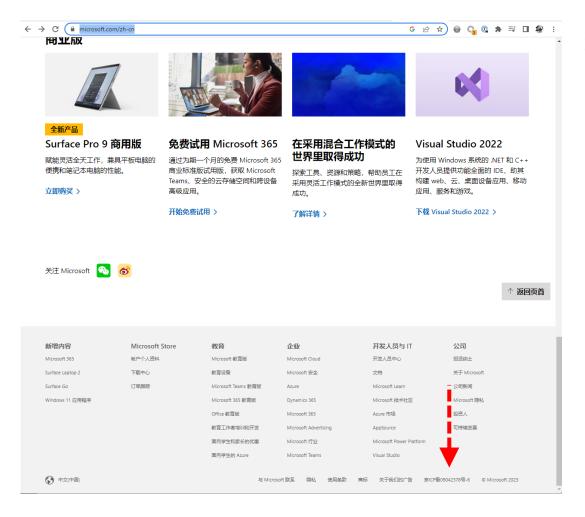


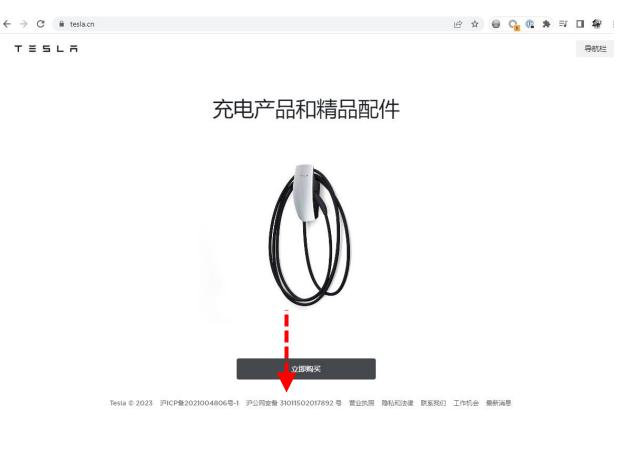




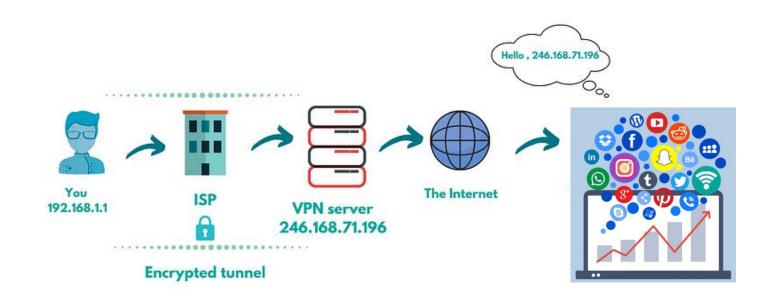
## Not Only for Users

#### **Website and Domains**

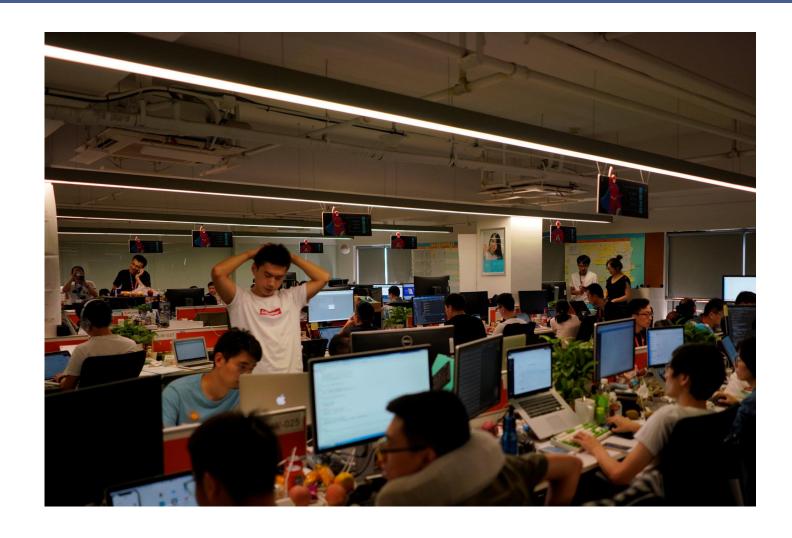




## **VPN**



## **Domain, Website and Content**



**Content Filtering** 

**But language** 

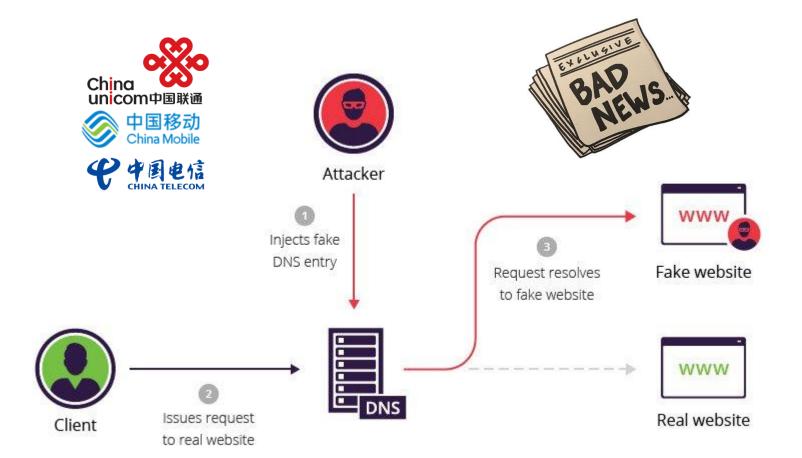
**Pictures** 

**Server connections** 

Tell me more about language

## Great Firewall ++

## **Targeted Area DNS pollution**



Run by local telco, city/town

Over block is always better

**Random Over Block** 

**Random Freedom** 

**Special Day: Next page** 

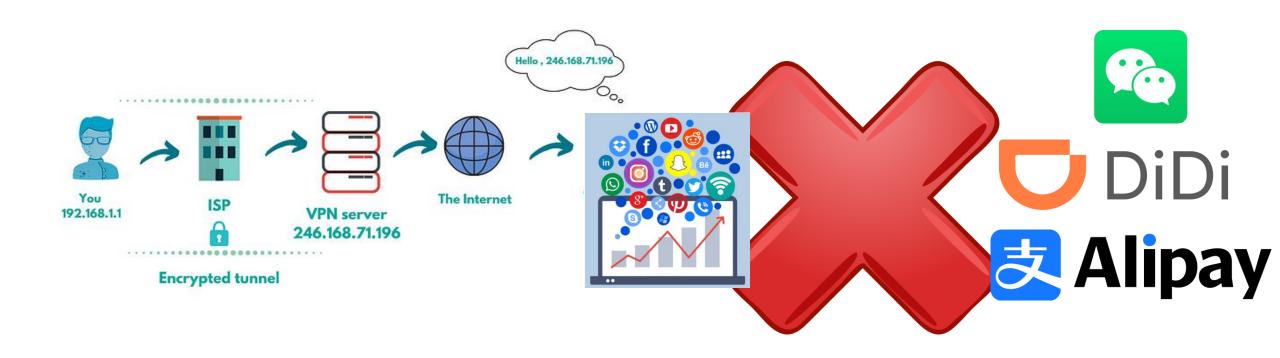
## **Special Day**





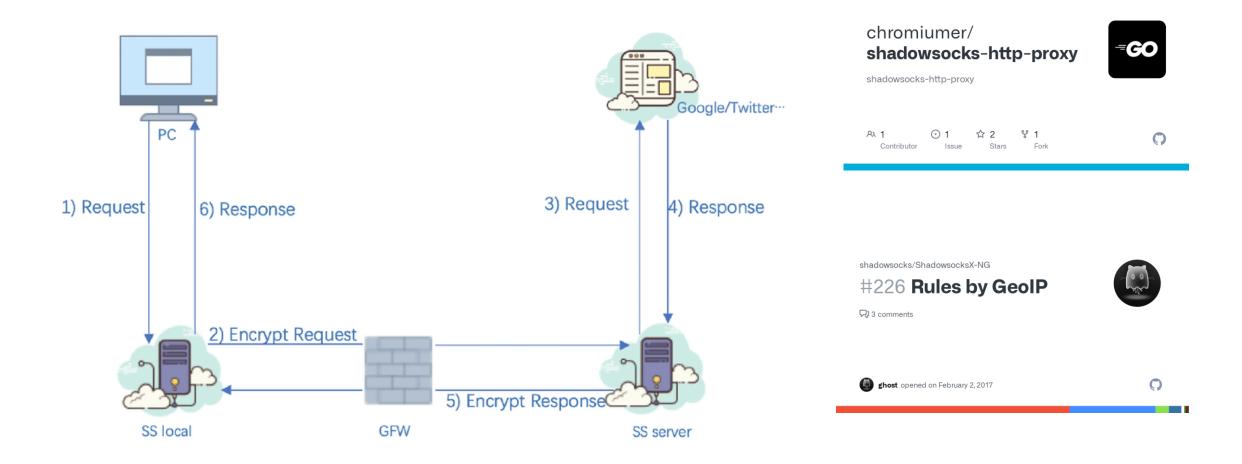
## How To Get Connected

## **VPN**



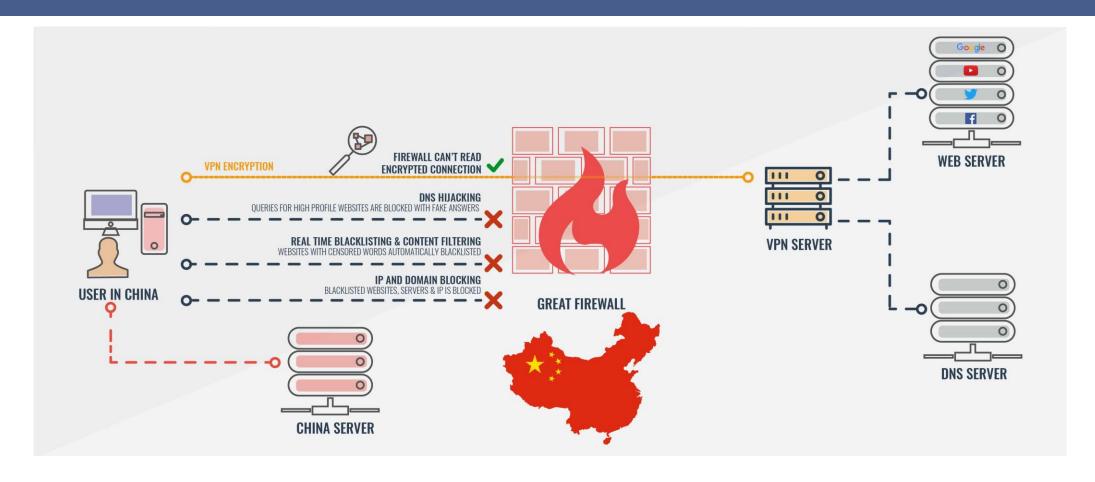
## A New Hope

## The era of Shadowsocks/SSR

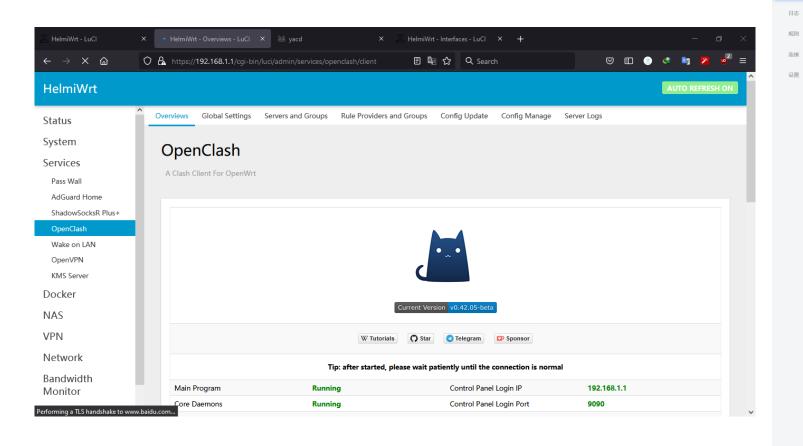


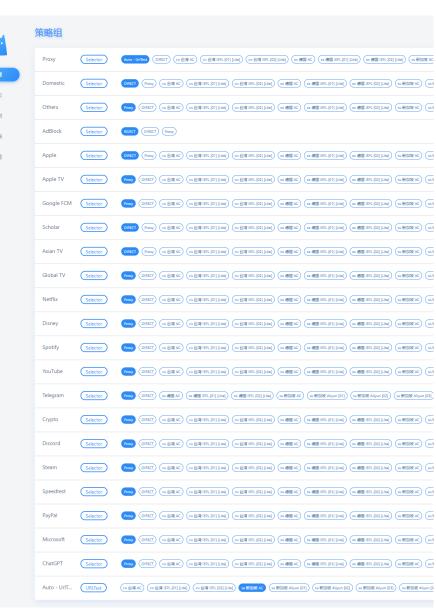
## Evolution

## Xray [ Shadowsocks/SSR/Trojan/Vmess/Vless ]



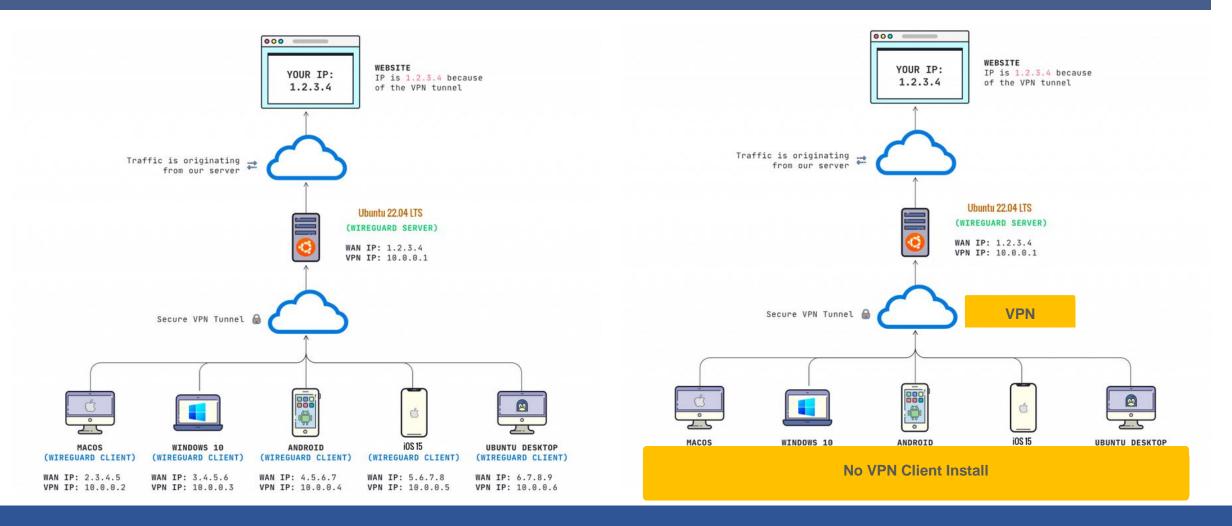
#### Clash





## How to Build Tunnel

## **Deployment: Client/Server Vs Gateway**



## Journey to Start Building a Home Router

## **Version 1**

**Resource Hungry** 

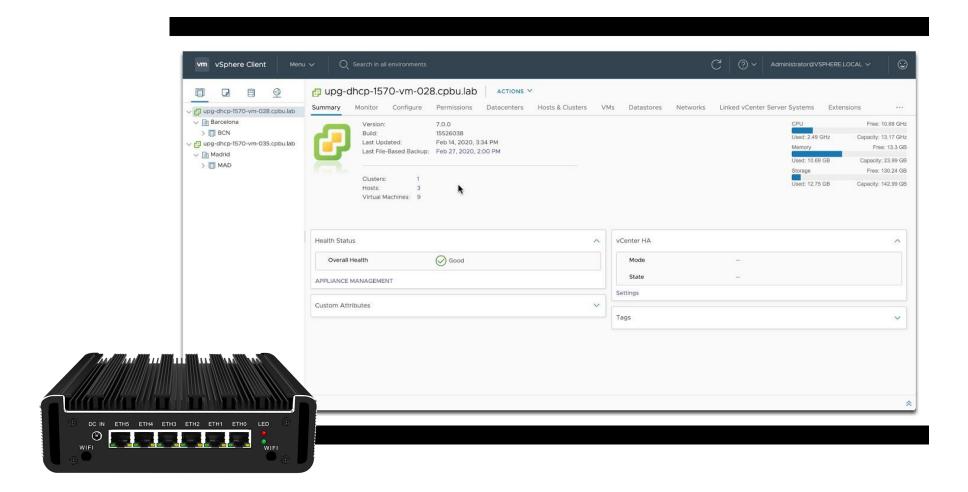
**Not Driver Friendly** 

**Support Less Arch** 

**Only Full VM** 

No Backup Build In

**Less Flexible** 



Self Hosted VPN is illegal But ...

## **Version 2**

**Customized Board** 

**Customized CPU** 

GPU

10GB NIC

6 HDD Bay

USB 3 + Type C

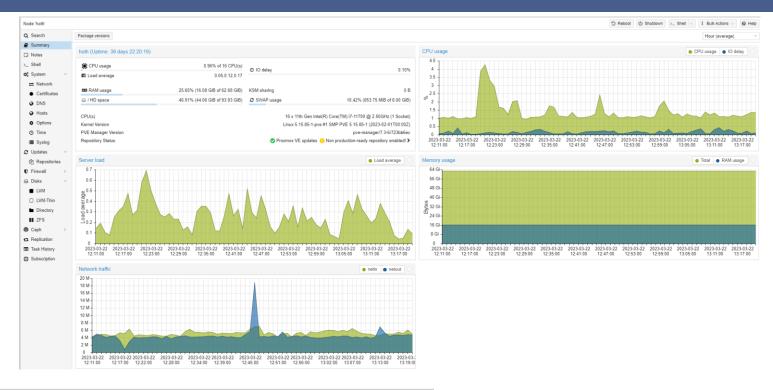


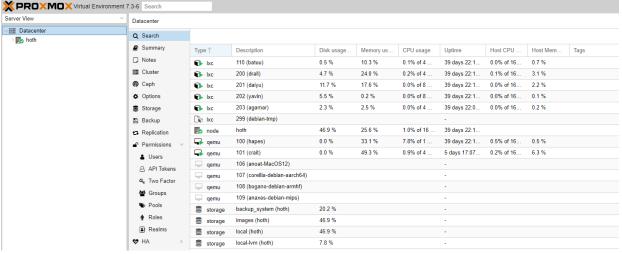


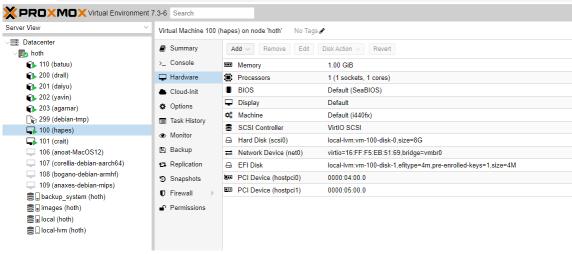




#### Proxmox

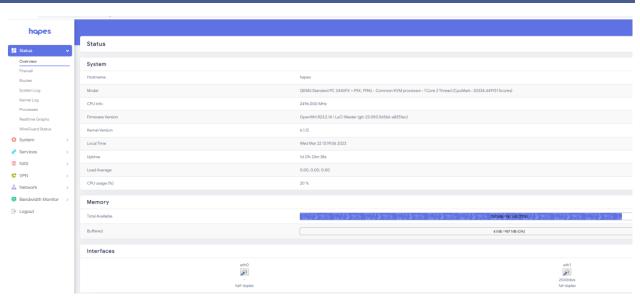






## OpenWRT aka xwingsWRT





Status System

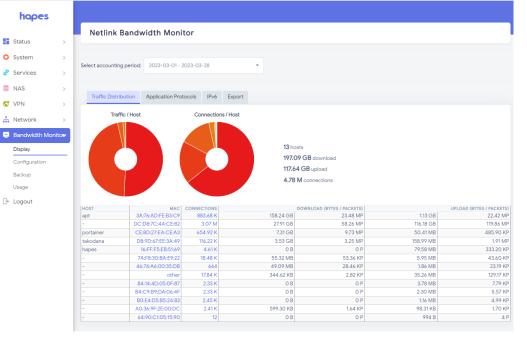
Services NAS

C VPN

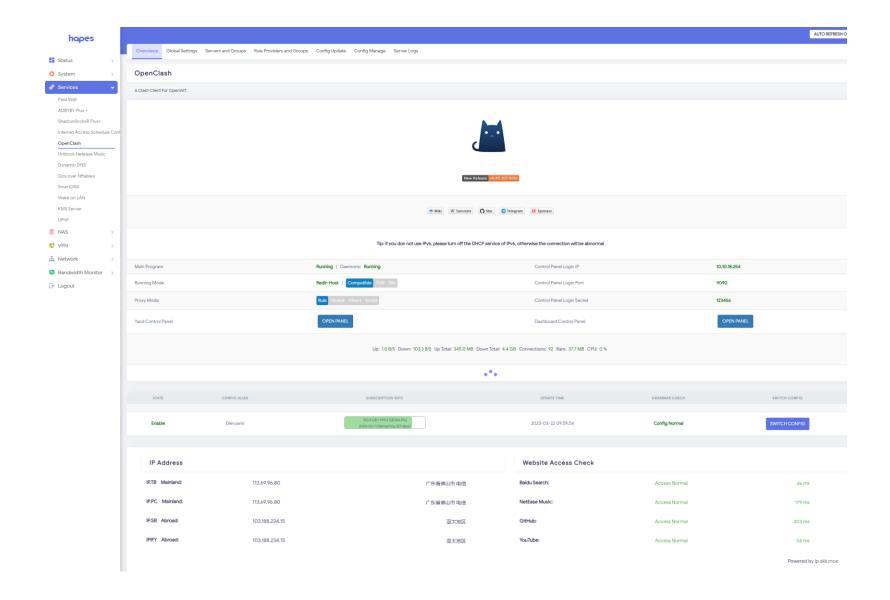
... Network

Display

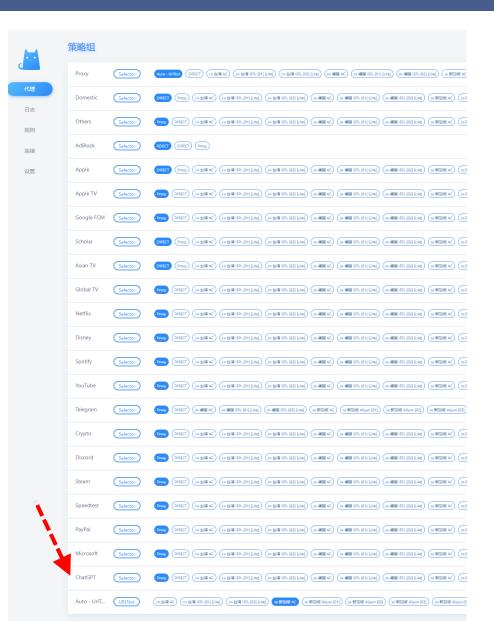
Logout

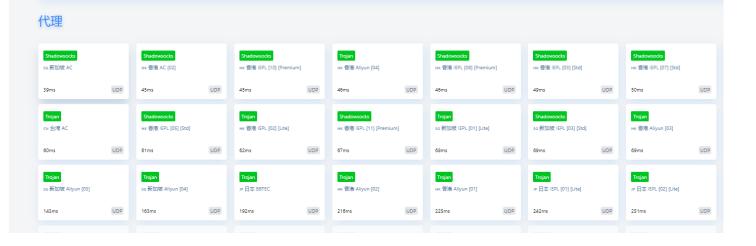


## **OpenClash**

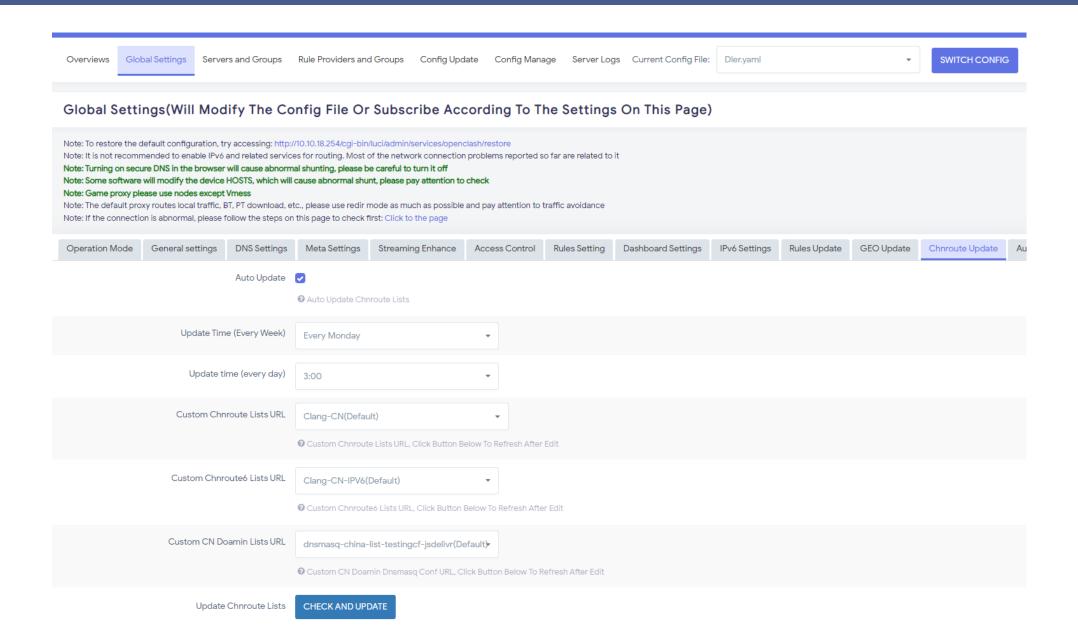


## **Web Categorization**





## **Update Chinese IP for Local Route**



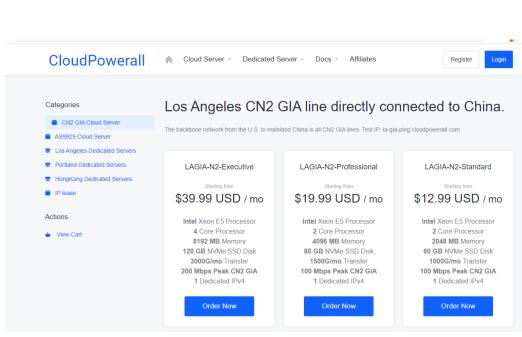
## Speed Test



## Remote Server

## **Building Your Own**





**Maintenance** 

**Protocol Update** 

**Risk To Get Block** 

**Unreliable Host** 

Real CN2/GIA?

Slow Messy and Unreliable

## **Just Buy It**





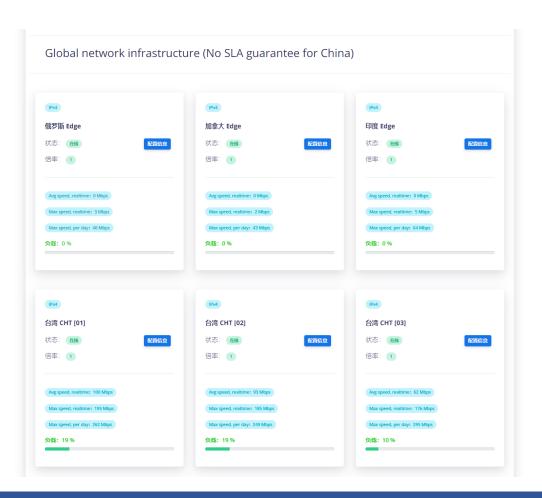
#### 【V2ray标准套餐】







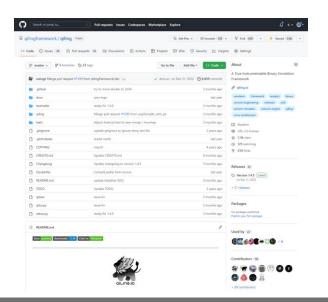




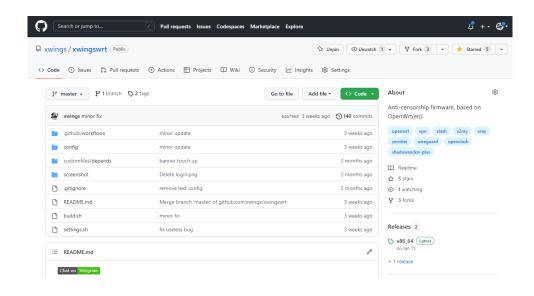
## **Everything Else**

- About Qiling Framework
  - > https://qiling.io
  - https://github.com/qilingframework/qiling
  - https://docs.qiling.io
  - http://t.me/qilingframework
  - @qiling\_io





- About xwingswrt
  - https://github.com/xwings/xwingswrt
  - https://docs.qiling.io
  - @onlyxwings





## Questions

twitter: @onlyxwings