

# INTRO

Who uses streaming services (Netflix, D+, etc.)?

Who is annoyed that other regions have more content?

Who knows about geo-unblocking (via VPN)?

Who knows *how* they do it?

# TITLE IS NOT AVAILABLE

[← Back to Help Home](#)

## Netflix says 'This title is not available to watch in your area. (22004)'

If you see an error on your iPhone, iPad, or iPod touch that says

This title is not available to watch in your area. (22004)

It indicates that you have traveled to a country where we do not currently offer the title you've downloaded. Due to regional licensing agreements and rights, we are not able to offer all titles for download in all countries.

You will be unable to play the title until you connect to the internet in a country where it is available. In many cases, this will be the country you were in when you downloaded it.

While you are experiencing this error, you can either delete the title and download something else or keep the download stored on your device. Once you have returned to a country where the title is available, you will need to connect to the internet and launch the Netflix app so we can determine your new location.

---

Was this article helpful?

YES

NO

# ACCESS DENIED

[← Back to Help Home](#)

## Netflix says 'You seem to be using a VPN or proxy.'

You seem to be using a VPN or proxy. Please turn off any of these services and try again.

This error means your device or network connects to Netflix through a VPN, proxy, or "unblocker" app or service. [To fix the problem, try turning your VPN off.](#)

 Using a VPN is not supported with [live events on Netflix](#) or accounts with an ad-supported Netflix plan.

To learn about using VPNs with Netflix, check if a VPN might be active, or how to get help turning a VPN off, go to [Watching TV shows and movies through a VPN](#).






### What to do next

If you're still having a problem but don't use these apps or services, or if you turned them off, contact your internet service provider to help:

- Find out why your internet connection might show VPN or proxy activity.
- Update your IP address or get a new IP address that matches your current location.

Was this article helpful? [Yes](#) [No](#)

### Related Articles

-  [Internet connection speed recommendations](#)
-  [Netflix Error NQM.434](#)
-  [Netflix Error M7111-5059](#)
-  [Can't sign in to Netflix](#)
-  [Netflix thinks I'm in a different country](#)

# COMMERCIAL VPNS GOT ME COVERED

The screenshot shows the ExpressVPN website interface. At the top, there is a navigation bar with the ExpressVPN logo on the left and several menu items: 'What is a VPN?', 'What We Offer', 'Download VPN', 'Support', 'Blog', 'My Account', 'English', and a 'Get Started' button. Below the navigation bar, there is a secondary menu with links: 'WATCH NETFLIX IN 3 STEPS', 'CHOOSE BEST NETFLIX VPN', 'GLOBAL SERVERS', 'FOR ALL DEVICES', 'STOP ISP THROTTLING', 'HOW DOES A VPN WORK', and 'FAQ'. The main content area features a large heading: 'Choose the best location for your Netflix library'. Below this heading is a paragraph: 'With server locations in 94 countries, there's bound to be an ExpressVPN server close to you—whether you're in the U.S., Germany, Canada, Japan, or anywhere else.' Underneath the text is a horizontal row of 13 country flags: France, Canada, United States, United Kingdom, Australia, Germany, Taiwan, Japan, Spain, Italy, Argentina, Turkey, India, and South Korea. Below the flags, there is another heading: 'Download the best VPN for Netflix'. At the bottom of the page, there is a laptop icon displaying the ExpressVPN application interface and a 'Need help? Chat with us!' button.

# STRANGER VPNS

**Investigating the Geo-Unblocking  
Capabilities of Commercial VPN Providers**

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Anna Sperotto  
Jeroen van der Ham  
Roland van Rijswijk-Deij

# MYSTERIOUS TRACEROUTE TO NETFLIX.COM

```
traceroute to netflix.com (192.0.0.69), 64 hops max, 72 byte packets
1 192.0.0.69
```

# LIGHT AT THE END OF THE TUNNEL

```
$ curl -sLI https://ipv4-c139-ams001-ix.1.oca.netflixvideo.net
```

# LIGHT IP AT THE END OF THE TUNNEL

```
$ curl -sLI https://ipv4-c139-ams001-ix.1.oca.nflxvideo.net

HTTP/1.1 403 Forbidden
Server: nginx
Date: Sat, 18 Mar 2023 17:32:13 GMT
Content-Type: text/html
Content-Length: 146
Connection: keep-alive
Timing-Allow-Origin: *
Cache-Control: no-store
Pragma: no-cache
Access-Control-Allow-Origin: *
Access-Control-Expose-Headers: X-TCP-Info
X-TCP-Info: addr=<Our Public IP> ;port=58728;sc=
```



# LIGHT IP AT THE END OF THE TUNNEL

```
$ curl -sLI https://ipv4-c139-ams001-ix.1.oca.nflxvideo.net

HTTP/1.1 403 Forbidden
Server: nginx
Date: Sat, 18 Mar 2023 17:32:13 GMT
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Access-Control-Allow-Origin: *
Access-Control-Expose-Headers: X-TCP-Info
X-TCP-Info: addr=<Our Public IP> ;port=58728;sc=
```

# MEASURED REGIONS & PROVIDERS

Vantage Point Provider	US	DE	JP	NL
CyberGhost	✓	✓	✓	✗
ExpressVPN	✓	✓	✓	✓
NordVPN	✓	✓	✓	✓
PrivateVPN	✓	✓	✓	✓
Surfshark	✓	✓	✓	✓
WeVPN	✓	✓	✓	✓

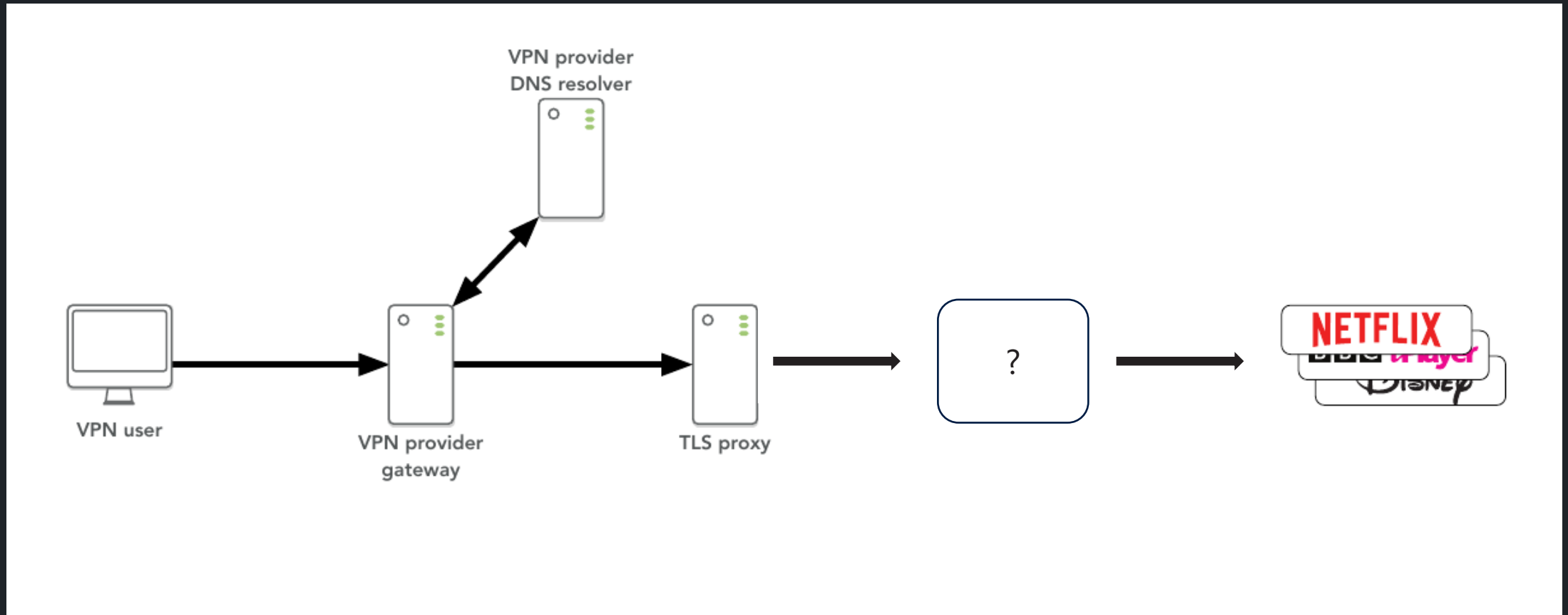
# MEASUREMENT TIMELINE

Measurement	Start date	End date	# samples
#1	24 February 2022	15 May 2022	3,810,624
#2	1 July 2022	29 October 2022	7,059,110

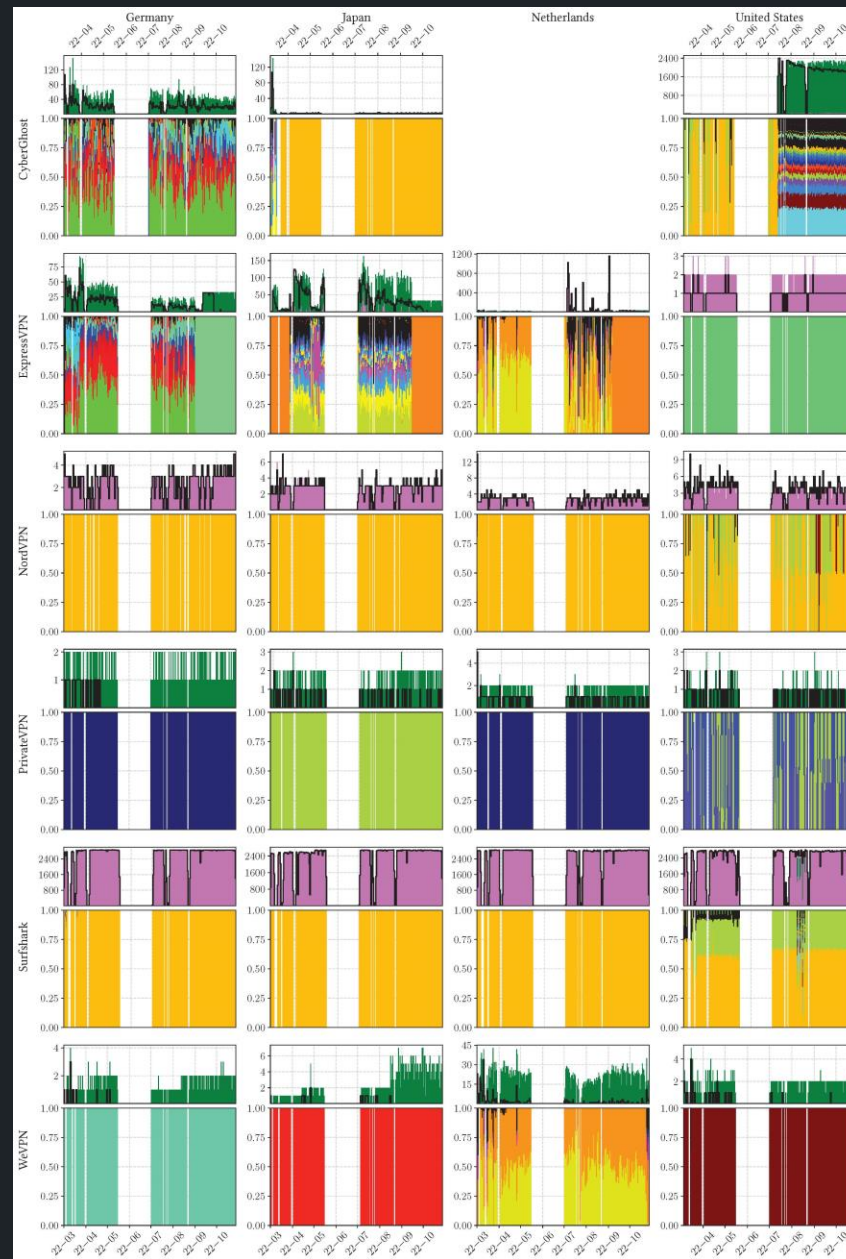
Raw sample structure:

<Unix Timestamp>, <Status>, <IP Address>

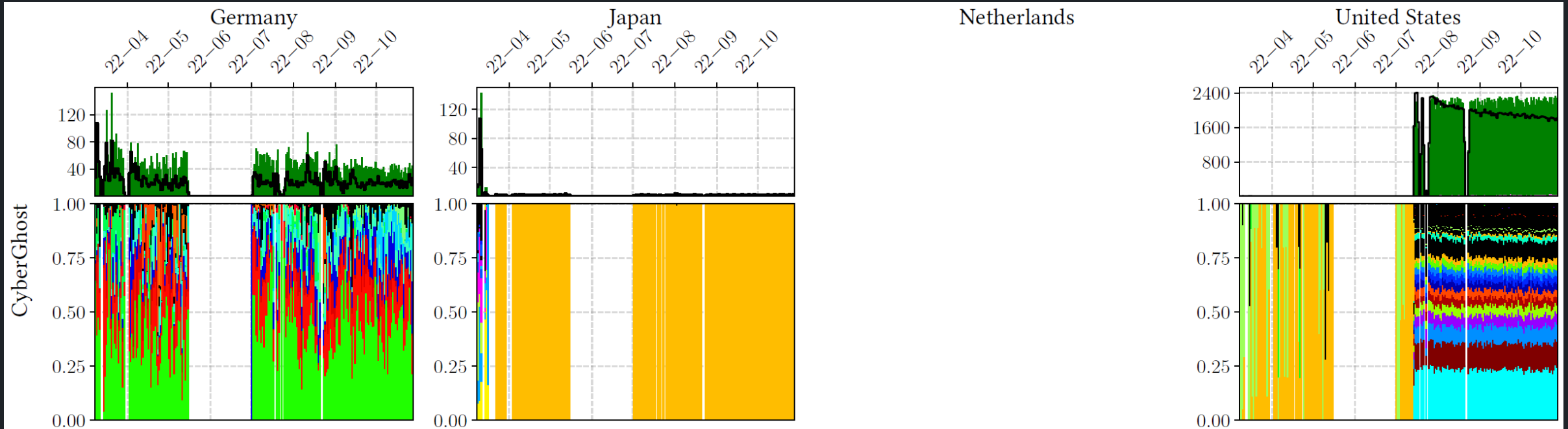
# INFERRED GEO-UNBLOCKING SYSTEM



# RESULTS



# RESULTS - CYBERGHOST



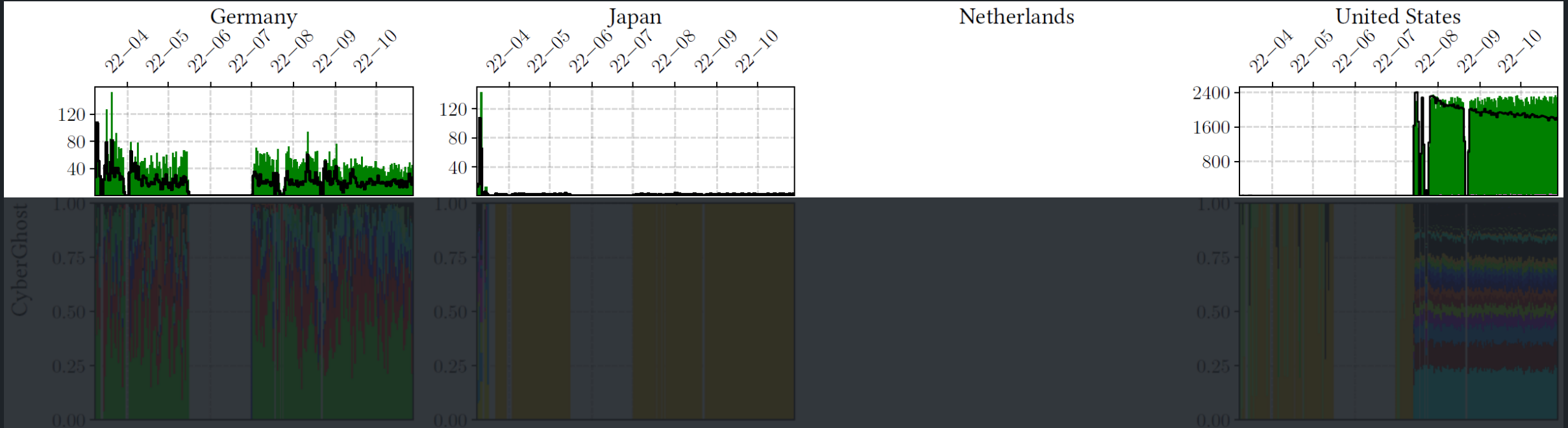
# RESULTS - CYBERGHOST

Top Graph: Unique IPs per day

Green → IPv4

Pink → IPv6

Black line → IP churn (fresh IPs/day)



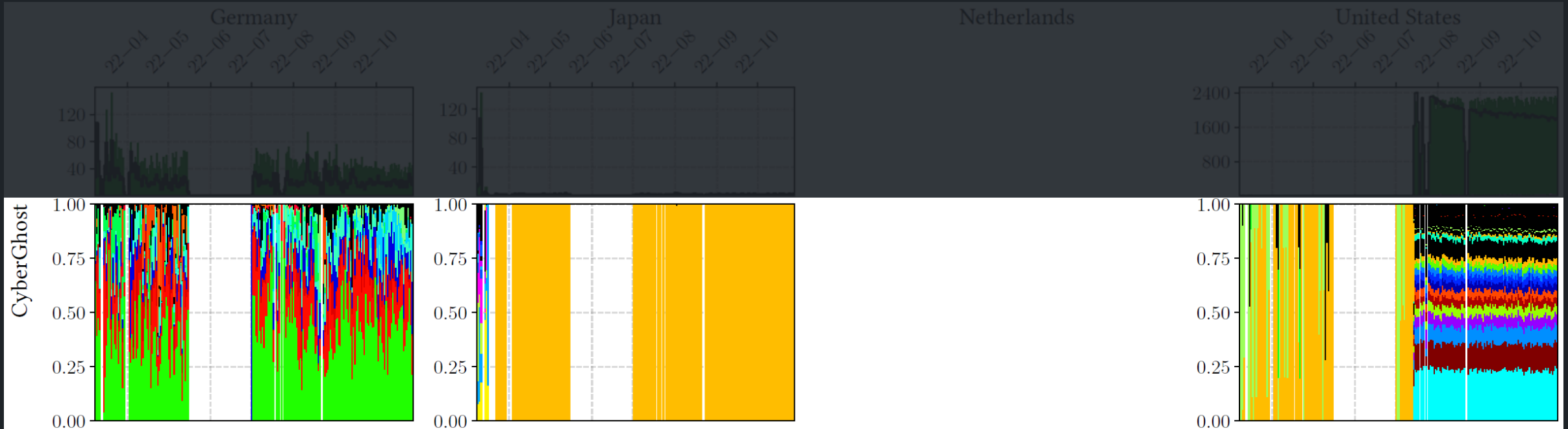
# RESULTS - CYBERGHOST

Top Graph: Unique IPs per day

Green → IPv4

Pink → IPv6

Black line = IP churn (fresh IPs/day)



Bottom graph: ASNs per day (relative)

Same color → same ASN

Black color ↴

ASNs outside of top 50 observed ASNs



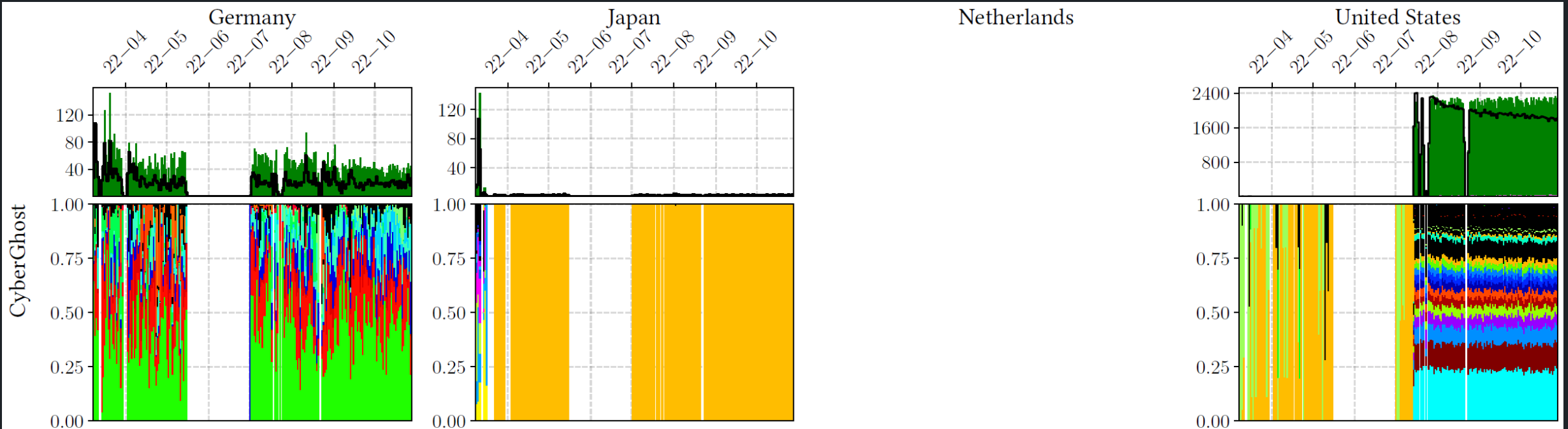
# RESULTS - CYBERGHOST

Top Graph: Unique IPs per day

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Pink → IPv6

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Bottom graph: ASNs per day (relative)

Same color → same ASN

Black color ↴

ASNs outside of top 50 observed ASNs

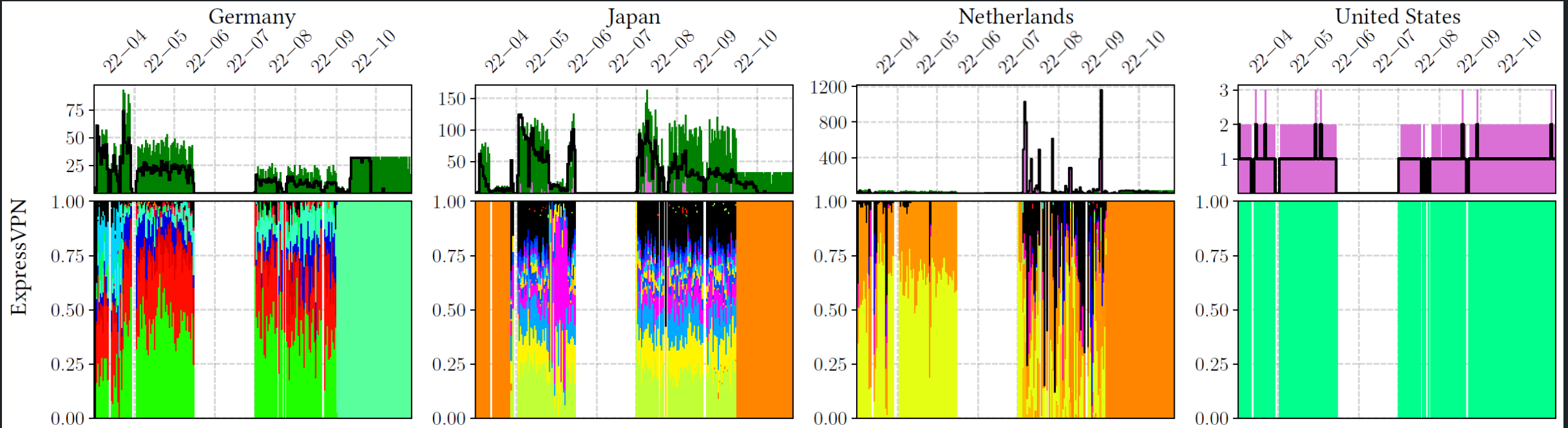
# RESULTS - EXPRESSVPN

Top Graph: Unique IPs per day

Green → IPv4

Pink → IPv6

Black line → IP churn (fresh IPs/day)



Bottom graph: ASNs per day (relative)

Same color → same ASN

Black color ↴

ASNs outside of top 50 observed ASNs

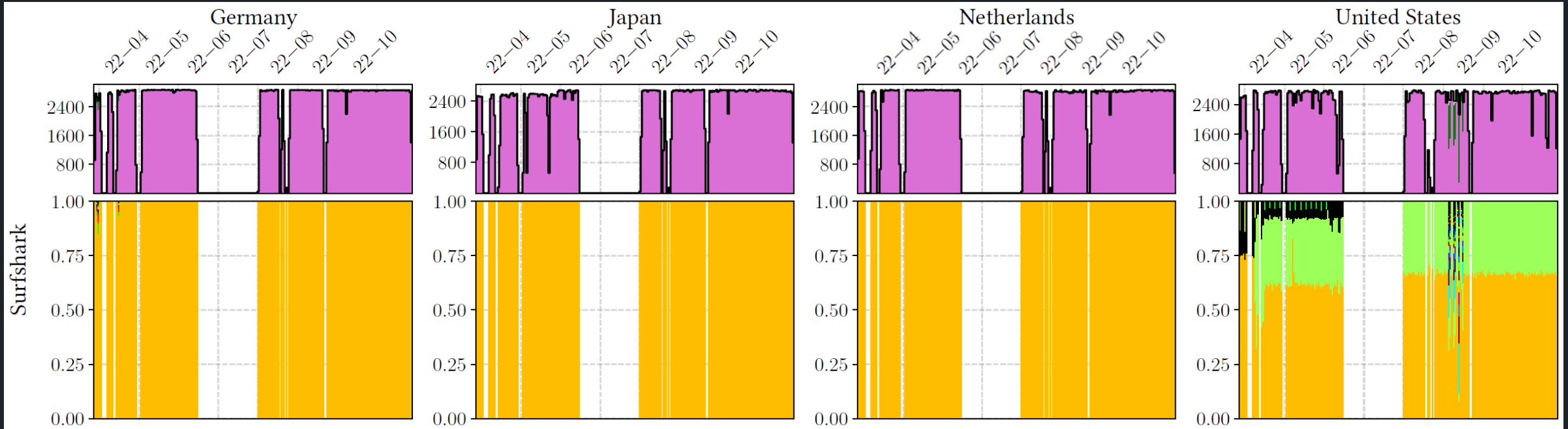
# RESULTS - SURFSHARK

Top Graph: Unique IPs per day

Green → IPv4

Pink → IPv6

Black line → IP churn (fresh IPs/day)



Bottom graph: ASNs per day (relative)

Same color → same ASN

Black color ↴

ASNs outside of top 50 observed ASNs

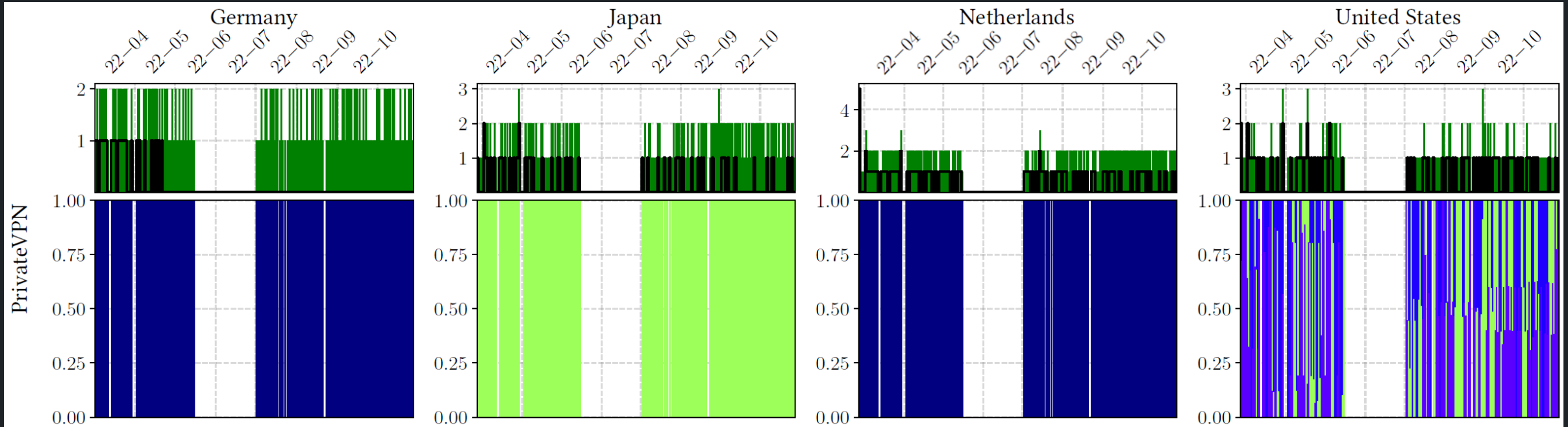
# RESULTS - PRIVATEVPN

Top Graph: Unique IPs per day

Green → IPv4

Pink → IPv6

Black line → IP churn (fresh IPs/day)



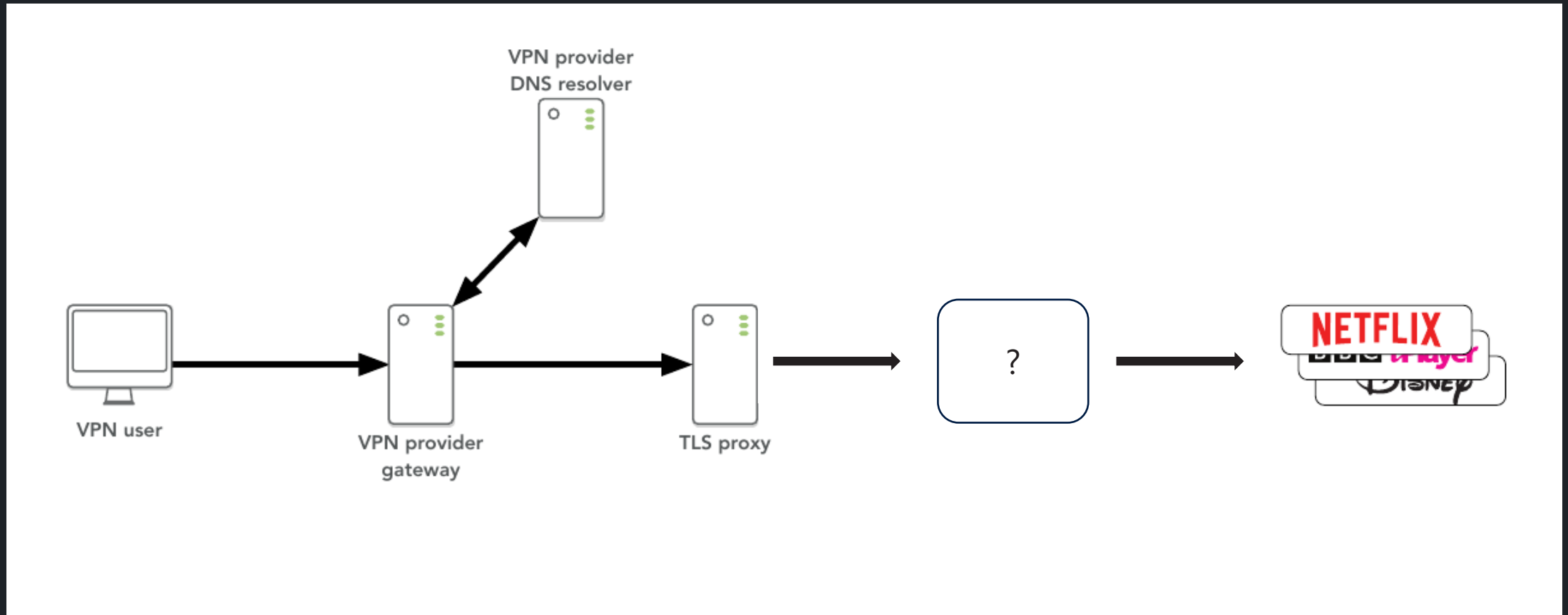
Bottom graph: ASNs per day (relative)

Same color → same ASN

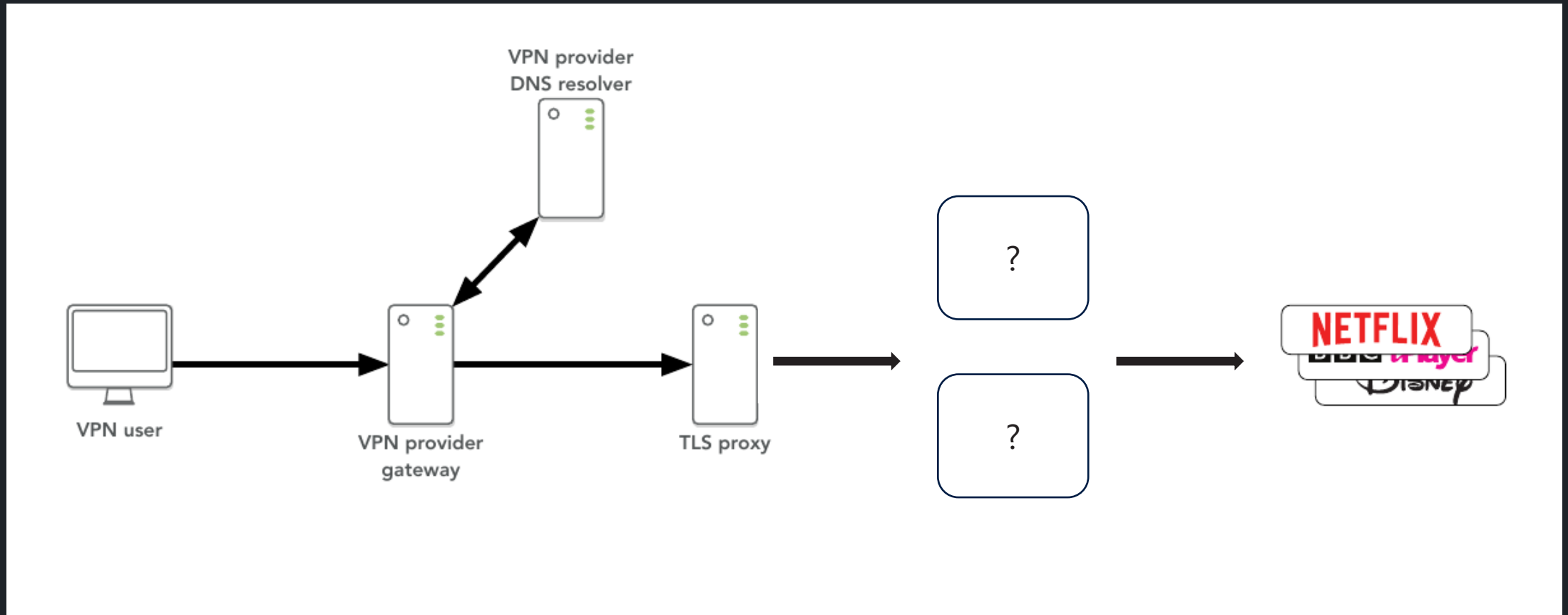
Black color ↴

ASNs outside of top 50 observed ASNs

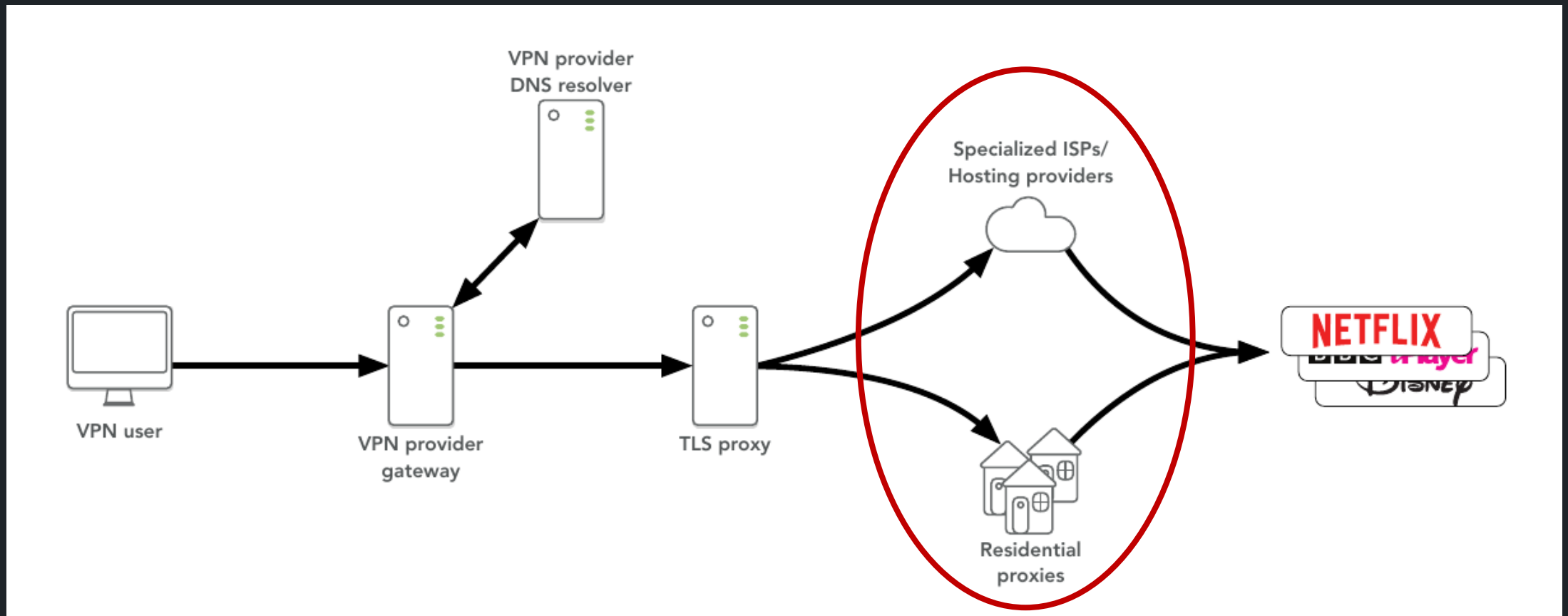
# INFERRED GEO-UNBLOCKING SYSTEM



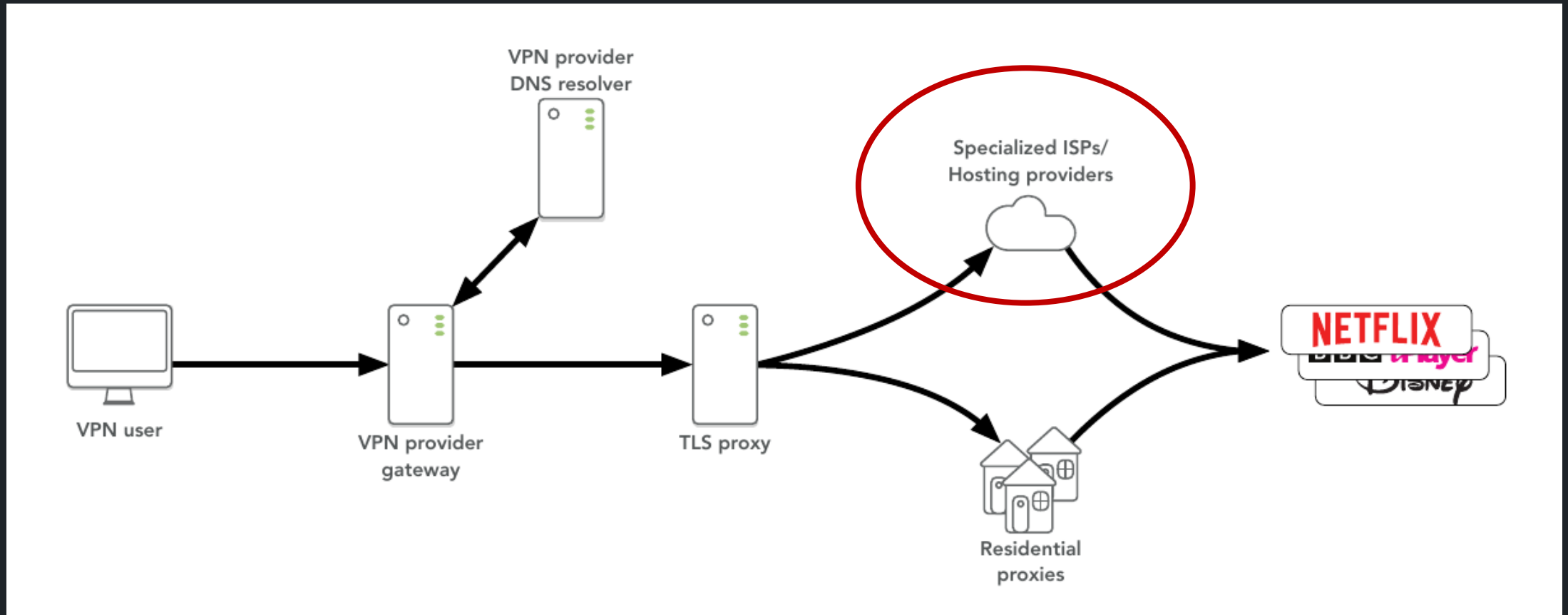
# INFERRED GEO-UNBLOCKING SYSTEM



# INFERRED GEO-UNBLOCKING SYSTEM



# INFERRED GEO-UNBLOCKING SYSTEM





# A CLOSER LOOK: PRIVATEVPN

Country	AS	IP	RIPE Maintainer
Germany	Telia Company AB (AS1299)	193.104.198.0/24	Nordic Internet Service AB
		80.239.128.0/19	Privat Kommunikation Sverige AB
Japan	Datacamp Limited (AS212238)	193.234.55.0/24	PVDataNet AB
Netherlands	Telia Company AB (AS1299)	80.239.128.0/19	Privat Kommunikation Sverige AB
United States	Telia Company AB (AS1299)	193.104.198.0/24	Nordic Internet Service AB
	PVDataNet AB (AS42201)	45.130.86.0/24	PVDataNet AB

# A CLOSER LOOK: PRIVATEVPN

UNIVERSITY  
OF TWENTE.


Connecting Minds Around The World

Grevgatan 13 4TR, 114 53 Stockholm, Sweden

sales@norisab.com

+447398975745

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# A CLOSER LOOK: PRIVATEVPN



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Bygdevägen 5 LGH1301 19148  
**Sollentuna, Sweden**



[sales@pvdatanet.com](mailto:sales@pvdatanet.com)

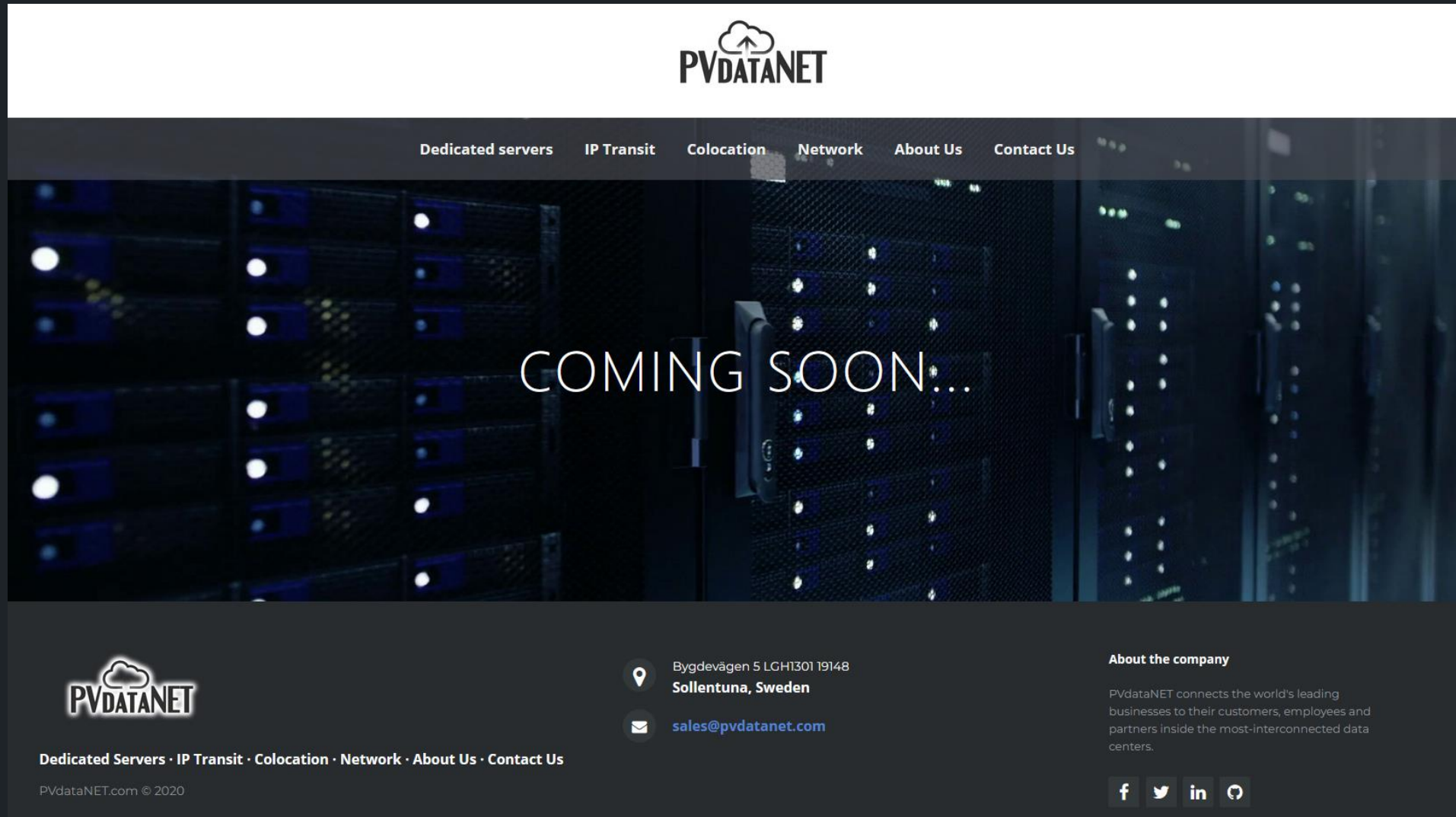
### About the company

PVdataNET connects the world's leading businesses to their customers, employees and partners inside the most-interconnected data centers.



# A CLOSER LOOK: PRIVATEVPN

UNIVERSITY  
OF TWENTE.



The image shows a screenshot of the PVdataNET website. At the top, the PVdataNET logo is centered. Below it is a navigation menu with the following items: Dedicated servers, IP Transit, Colocation, Network, About Us, and Contact Us. The main content area features a dark background with a server room image and the text 'COMING SOON...'. At the bottom, there is a footer section with the PVdataNET logo on the left, contact information in the center, and an 'About the company' section on the right. The contact information includes the address 'Bygdevägen 5 LGH1301 19148 Sollentuna, Sweden' and the email 'sales@pvdatanet.com'. The 'About the company' section states: 'PVdataNET connects the world's leading businesses to their customers, employees and partners inside the most-interconnected data centers.' Social media icons for Facebook, Twitter, LinkedIn, and YouTube are located at the bottom right of the footer.

**PVdataNET**

Dedicated servers | IP Transit | Colocation | Network | About Us | Contact Us

COMING SOON...

**PVdataNET**

Bygdevägen 5 LGH1301 19148  
Sollentuna, Sweden

sales@pvdatanet.com

**About the company**

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f t in y





TRAFFICFORCE

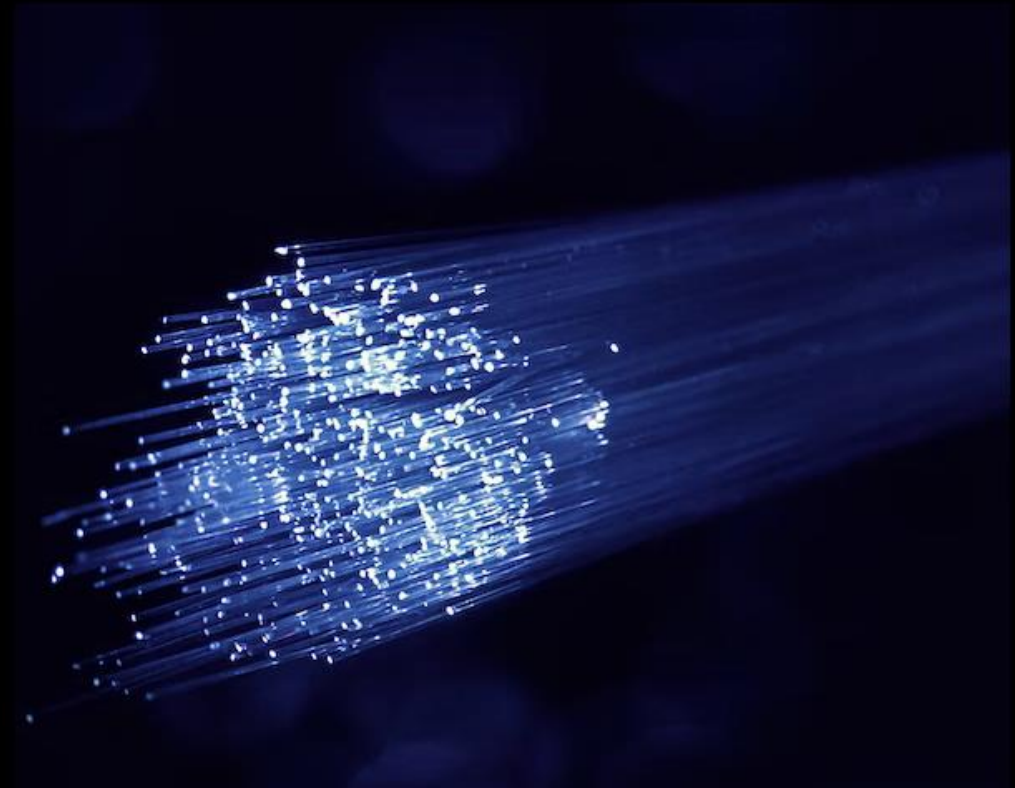
[Home](#)

OUR STORY

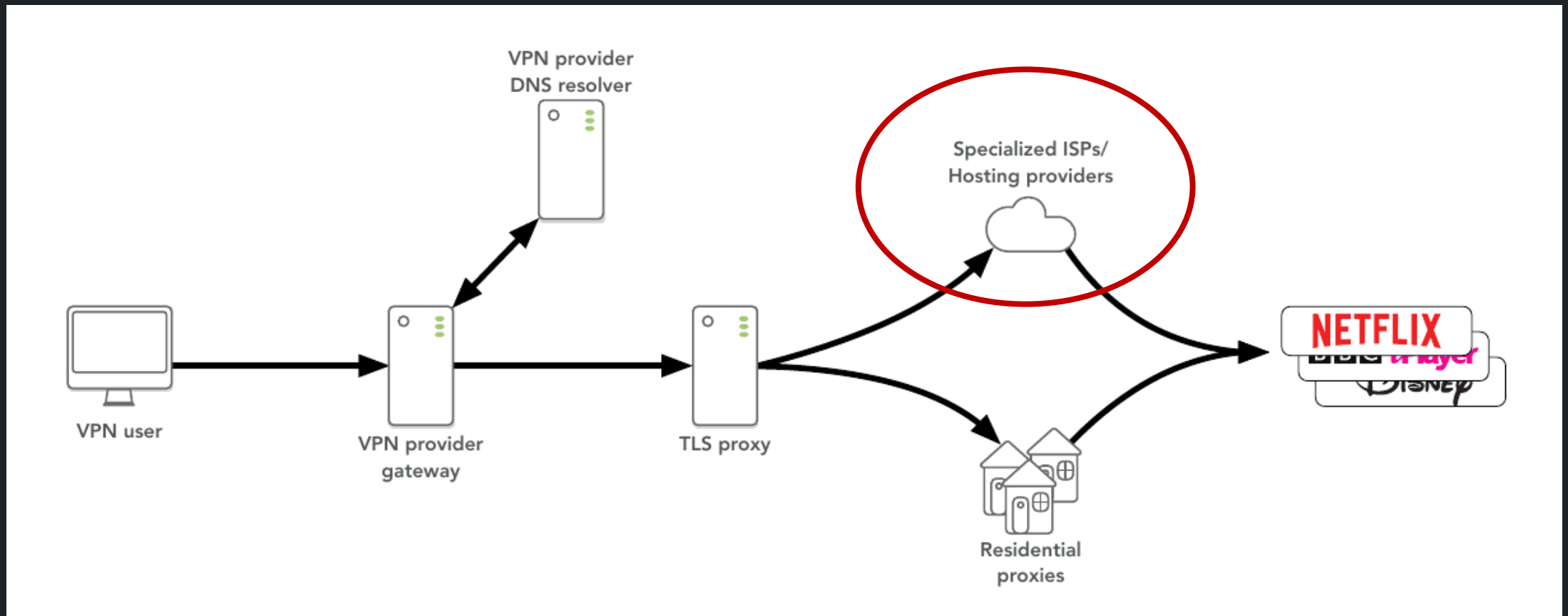
## The Internet and networks

Trafficforce provides unique solutions  
for global networks.

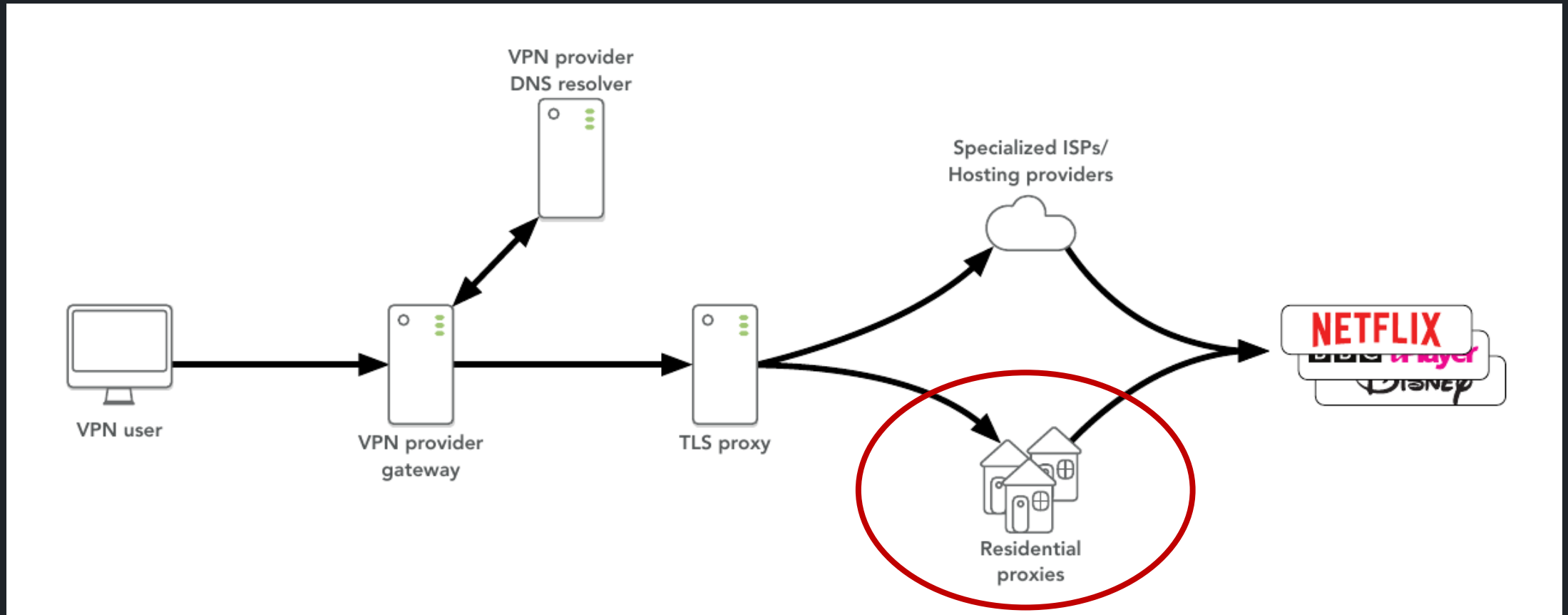
Smart solutions for any size of project.



# INFERRED GEO-UNBLOCKING SYSTEM



# INFERRED GEO-UNBLOCKING SYSTEM



# RESIDENTIAL PROXIES

Country	AS	<i>n</i>
Germany	Deutsche Telekom (AS3320)	2,412
	Vodafone (AS3209)	1,143
Japan	NTT (AS4713)	1,052
	Softbank (AS17676)	724
Netherlands	Vodafone Libertel (AS33915)	347
	KPN (AS1136)	319
United States	Comcast (AS7922)	48,288
	AT&T (AS7018)	24,306



# RESIDENTIAL PROXIES

The screenshot shows the Defensie.nl website. At the top right, there is a logo for the 'Ministerie van Defensie' (Ministry of Defense). Below this is an orange navigation bar containing the text 'Defensie.nl' on the left and a search bar with the placeholder text 'Zoeken' and a magnifying glass icon on the right. The main content area features a large background image of a soldier in a dark uniform aiming a rifle. Overlaid on the left side of this image is a white box with the heading 'Oorlog in Oekraïne' (War in Ukraine) and two blue links: 'Militaire steun aan Oekraïne' and 'Wat doet Nederland? Van dag tot dag'. In the bottom right corner of the main content area, there is a small white square icon with two vertical bars, representing a pause button. At the bottom of the page is a dark blue footer containing eight navigation items arranged in two rows of four. Each item consists of a small icon followed by the text label: 'Marine' (ship icon), 'Landmacht' (rifle icon), 'Luchtmacht' (jet icon), 'Marechaussee' (candle icon), 'Actueel' (document icon), 'Onderwerpen' (list icon), 'Organisatie' (building icon), and 'Over Defensie' (group of people icon).

Ministerie van Defensie

Defensie.nl Zoeken

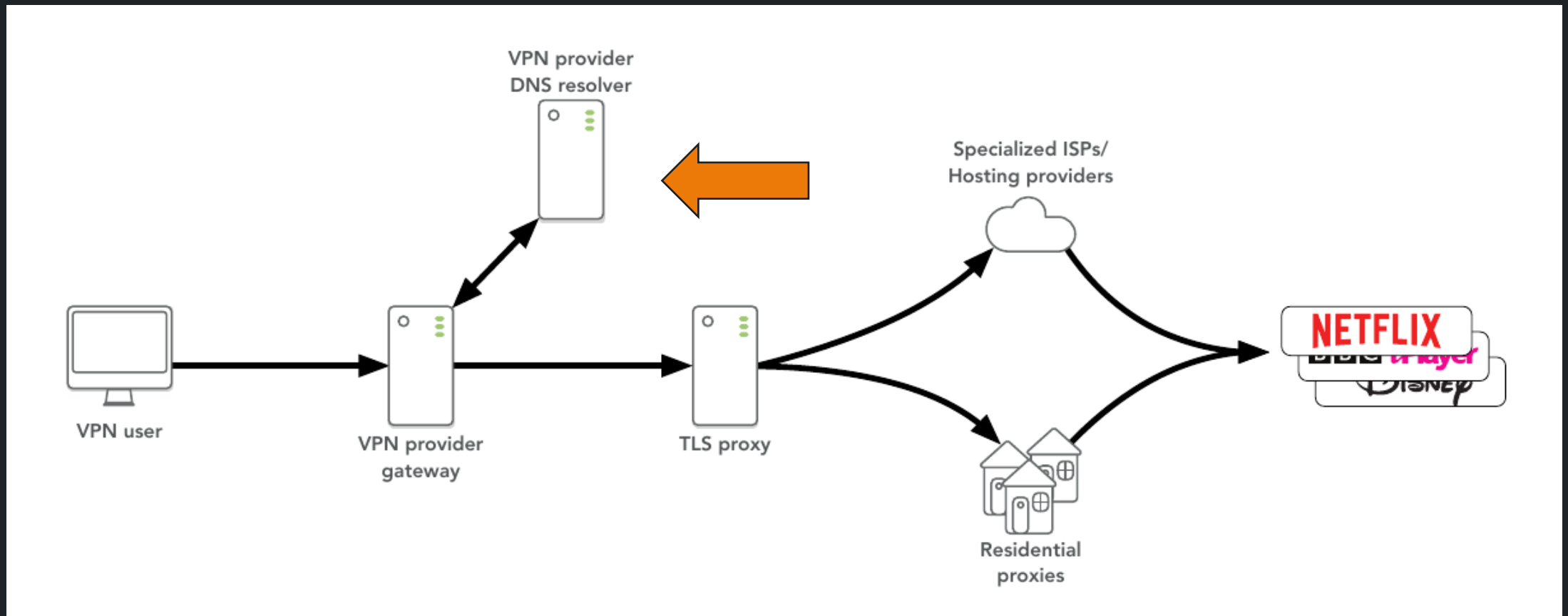
Oorlog in Oekraïne

- > Militaire steun aan Oekraïne
- > Wat doet Nederland? Van dag tot dag

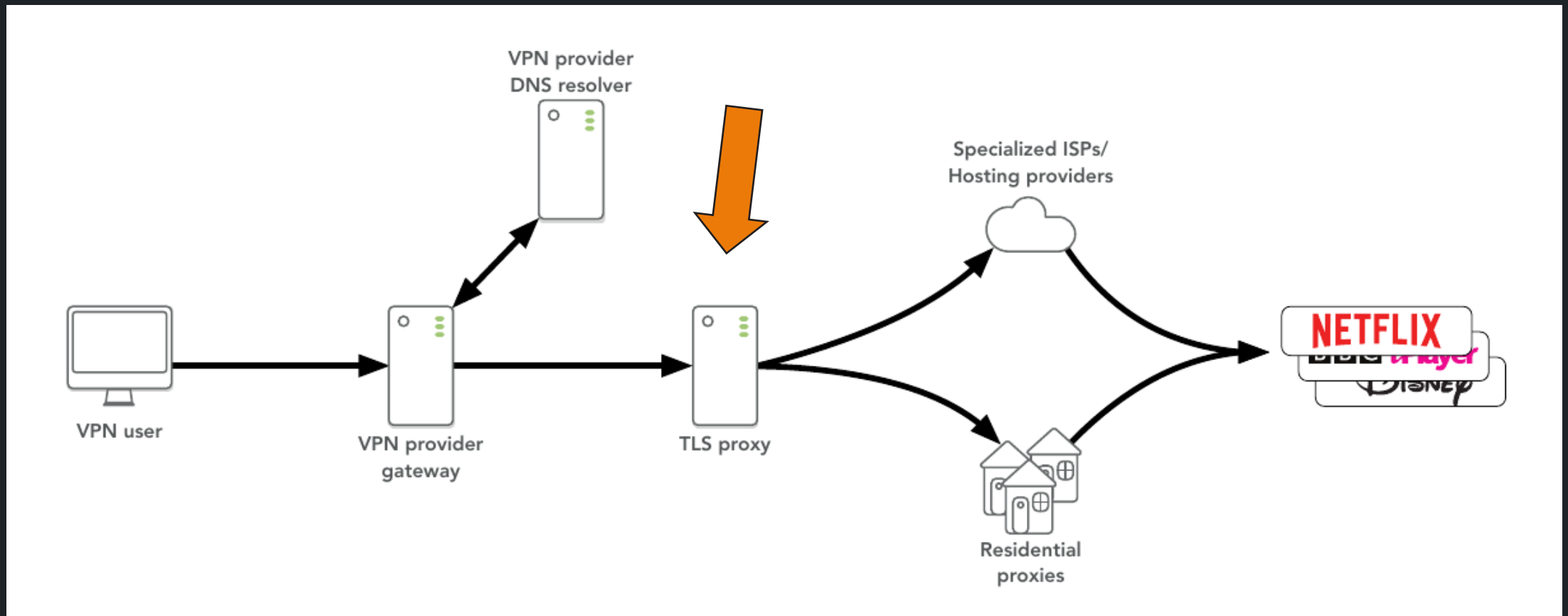
Marine Landmacht Luchtmacht Marechaussee

Actueel Onderwerpen Organisatie Over Defensie

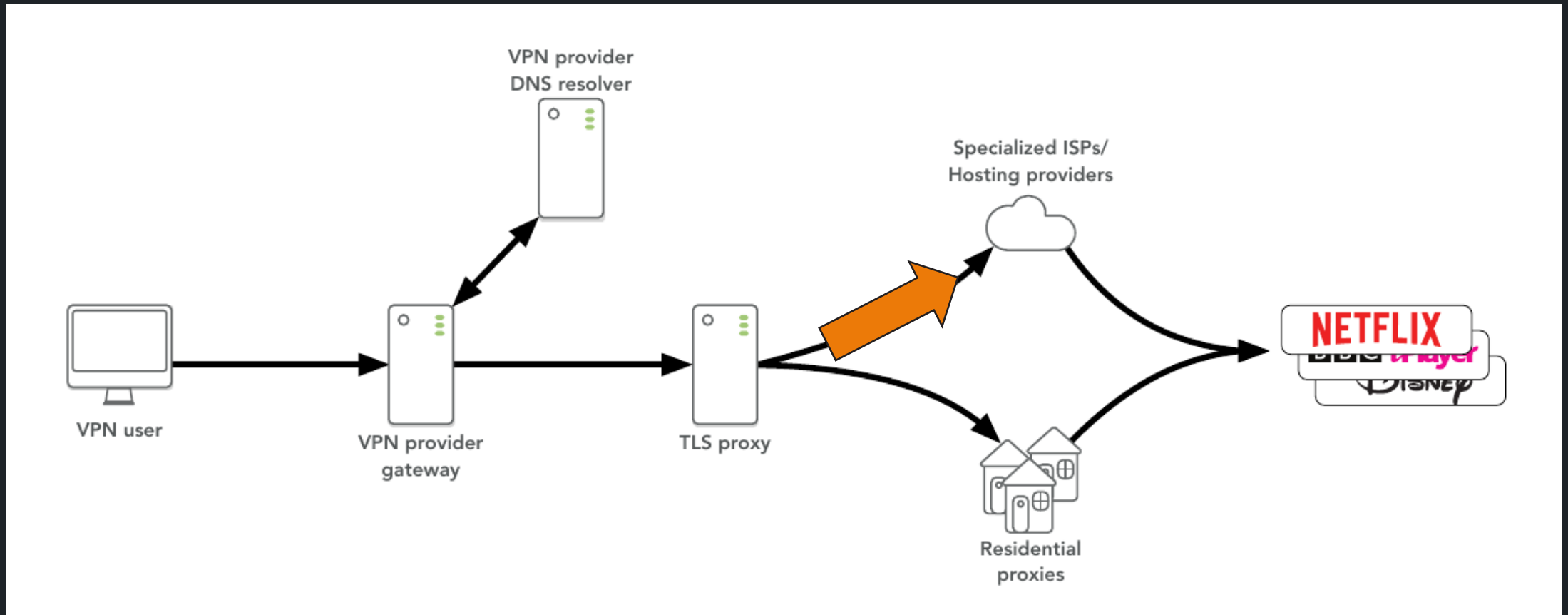
# CONCLUSION



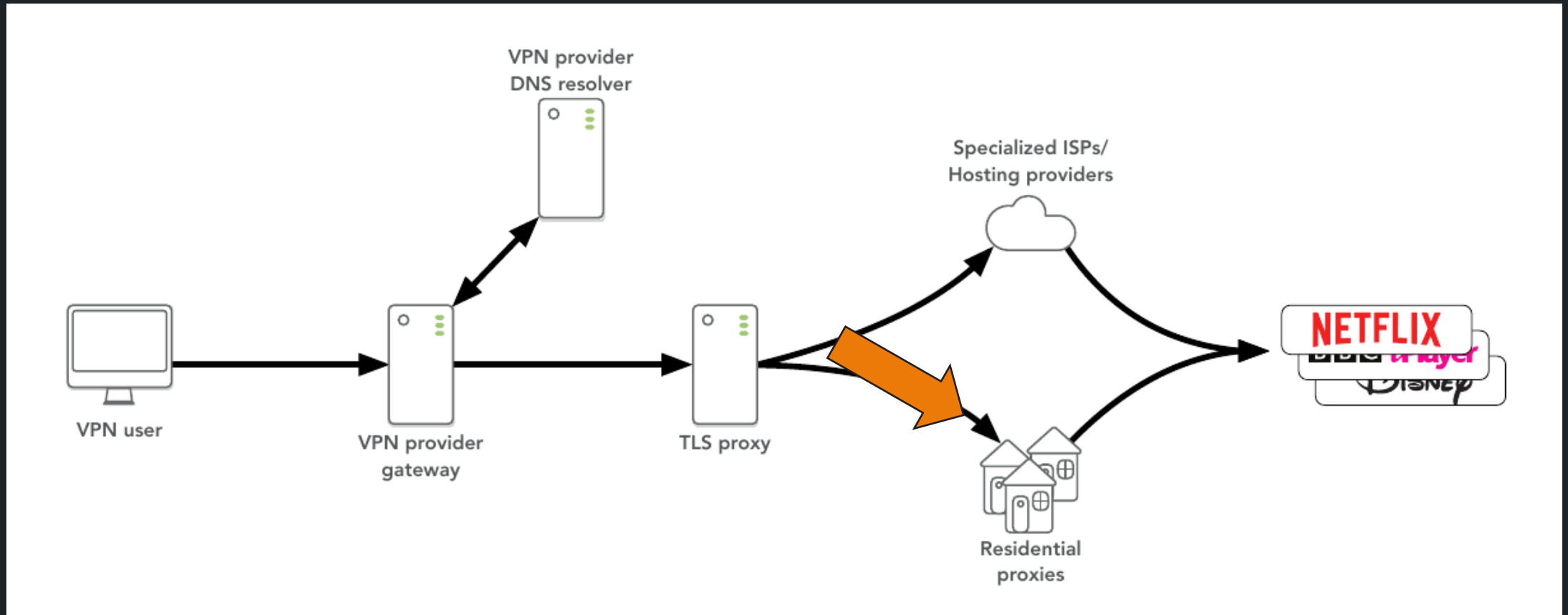
# CONCLUSION



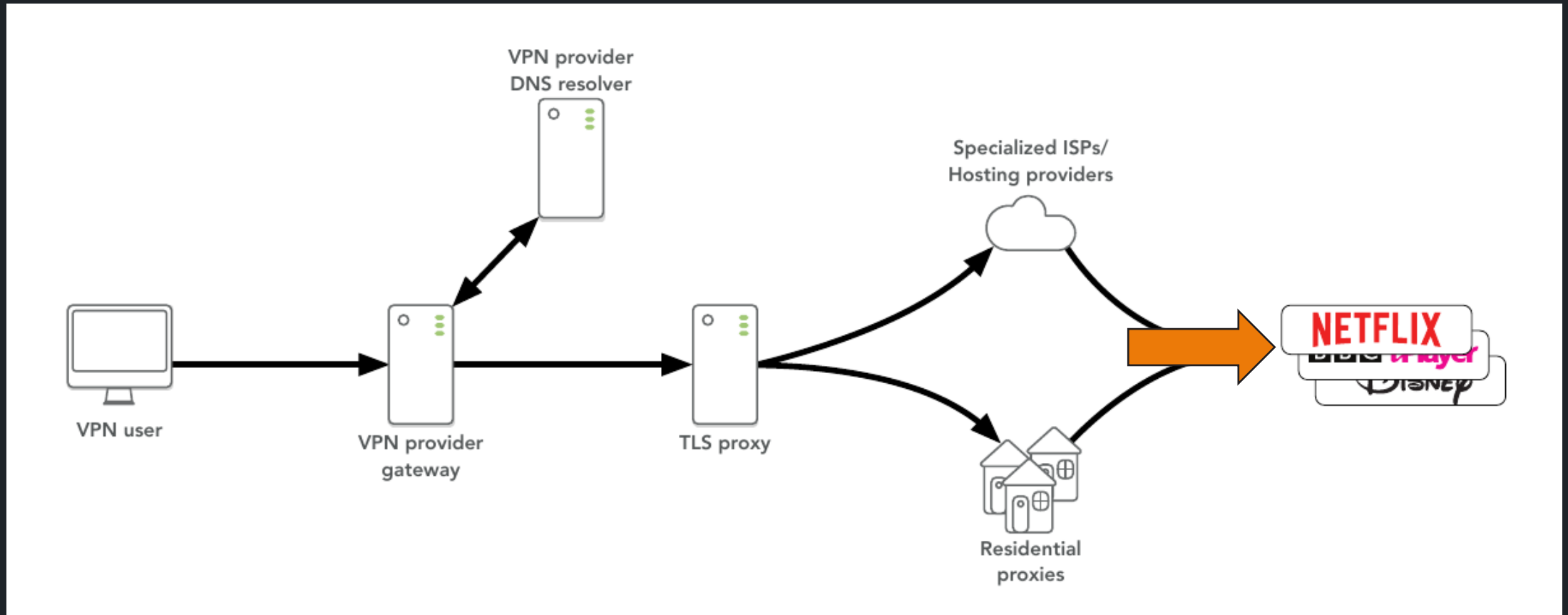
# CONCLUSION



# CONCLUSION



# CONCLUSION



# PLEASE TALK TO ME IF YOU...

Have more questions about the paper.

Are a (consumer) ISP and you are interested in aiding me in my future research.

Just want to talk.

# FULL PAPER AND VIDEO PRESENTATION

Free access if you access through the QR code



Etienne Khan  
e.khan@utwente.nl