



RIPE NCC

RIPE NETWORK COORDINATION CENTRE

RIPE 88 Technical Report

Ondřej Caletka | RIPE 88 Kraków | 24 May 2024

Meet the team



- Ondřej Caletka
- Andrea di Menna
- Luca Gentile
- Xavier Le Bris
- Rob de Meester
- Sjoerd Oostdijck
- Ihor Marhitych
- Marco van Tol



Preparations



- Three days to set up
- We brought:
 - 2 SuperMicro Servers (E300-9D-8CN8TP)
 - Wi-Fi Access Points
 - 300 ethernet cables (ranging from 1 to 30 meters)
 - Several 300 meter boxes of ethernet cable
 - 20 Raspberry Pi's
 - 3 presentation kits
 - power blocks (schuko 6-way power extension)
 - Lots of gaffer tape





The Power

Power blocks



- Since RIPE 84, we deploy power blocks **only to the desks**
- Power blocks in the theater part are **very difficult to deploy**
- In most venues we have issues with reliability of power sockets
 - more public sockets are making the problem worse
- The battery lifetime of mobile devices is getting longer



Power outages of the hotel



- We sent our router one month before the meeting
- It lost power **twice** during that time
- We are glad it did not happen during the meeting



RIPE Meeting powered by a generator



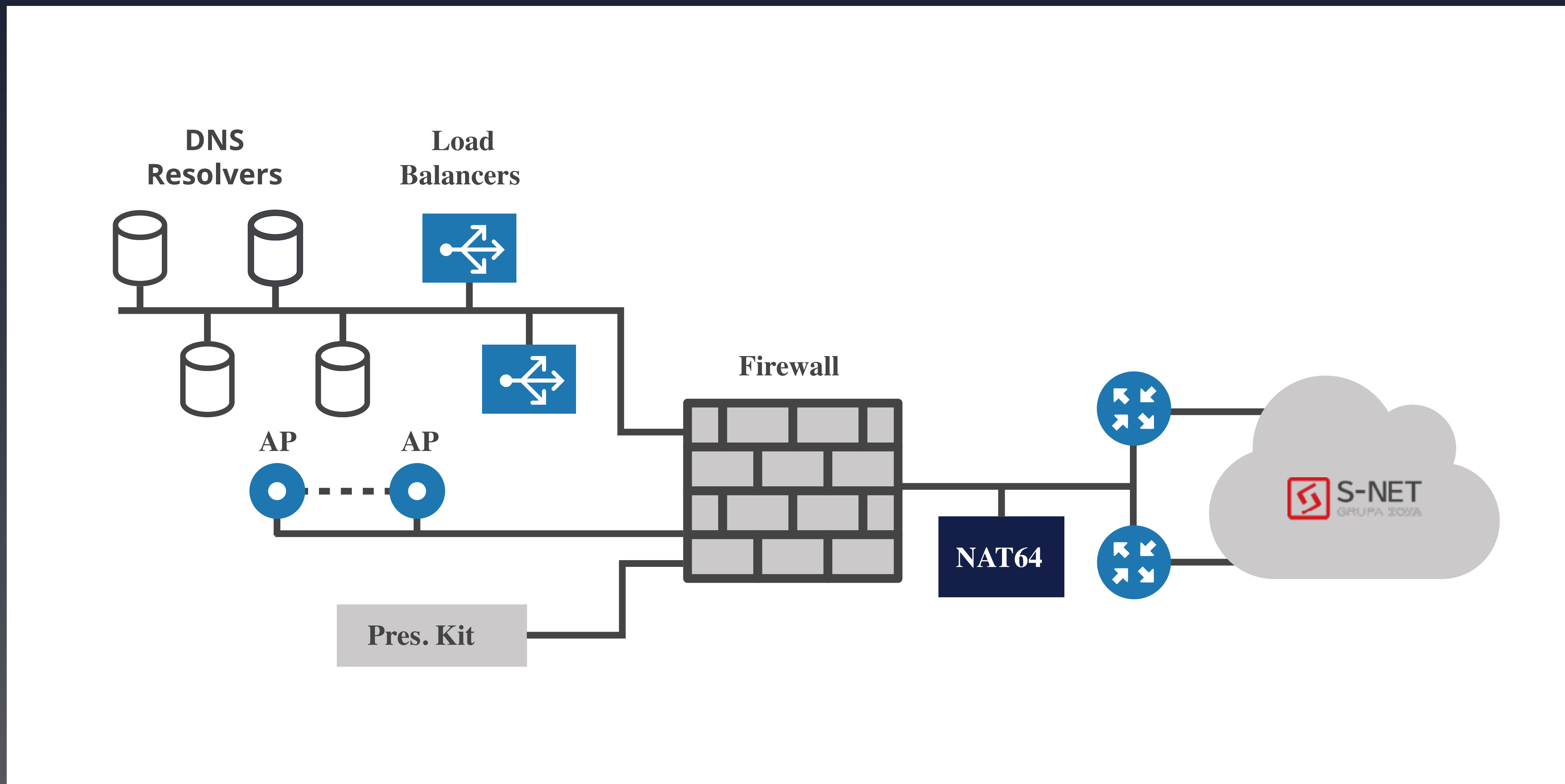
- “I would not plug even an iPhone charger into the hotel power.”
- New challenge: shut down everything gracefully every evening
- Reported load: 10 kW





The network

Logical network topology



The network runs Open Source



- Edge routers running **BIRD**
- Firewall using **nftables**
- DNS load balancer running **keepalived**
- DNS resolvers running **Knot Resolver**
- DHCP servers running **Kea**
- NAT64 using **Jool**
- Statistics collected using **collectd + InfluxDB + Grafana**
- Deployed using **Ansible**

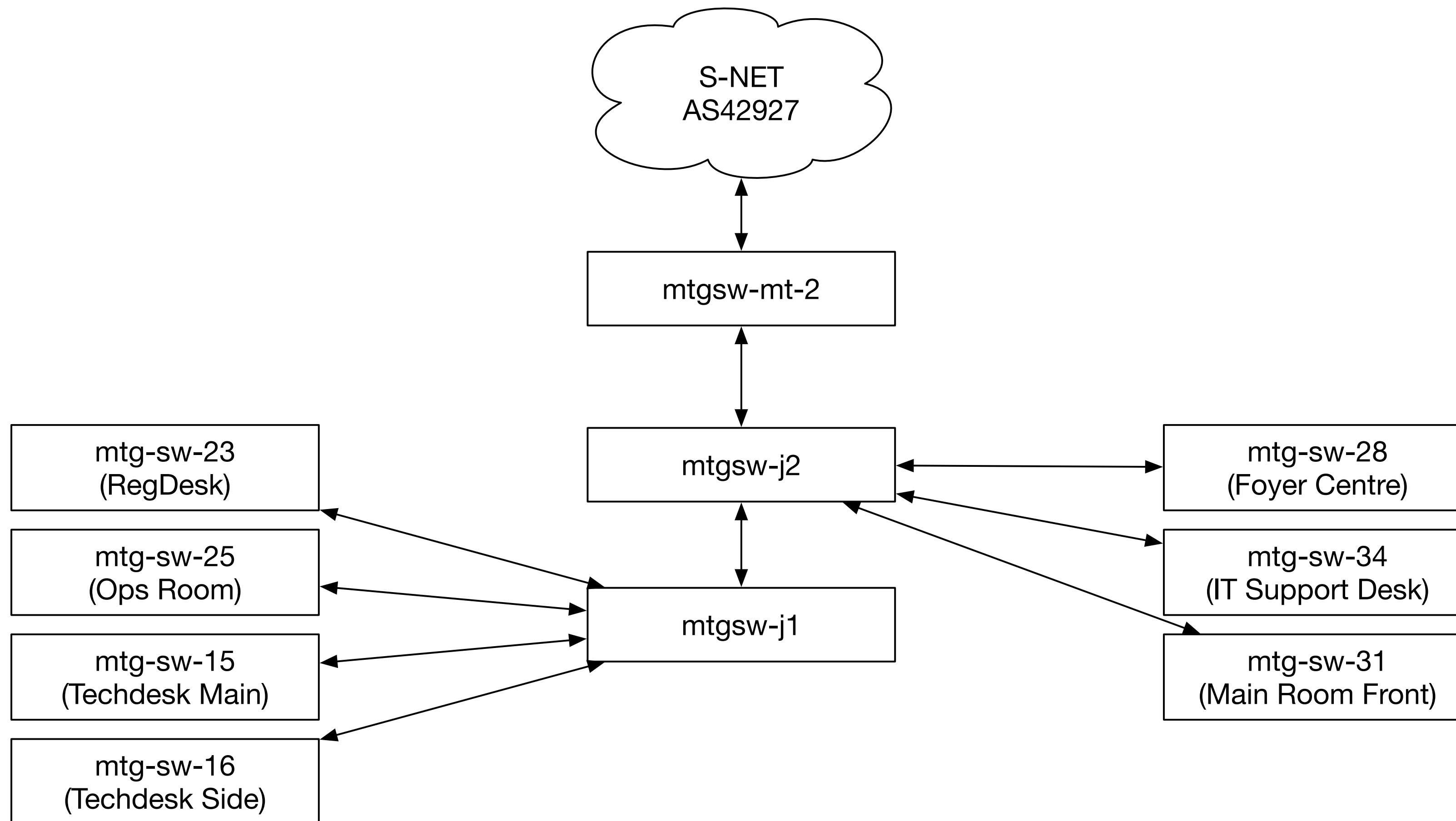
Edge router running Oracle Linux 9



- NetworkManager does not like full BGP feed in the routing table
- Stopping it removes a lot of CPU stress
- Developers are aware of the issue



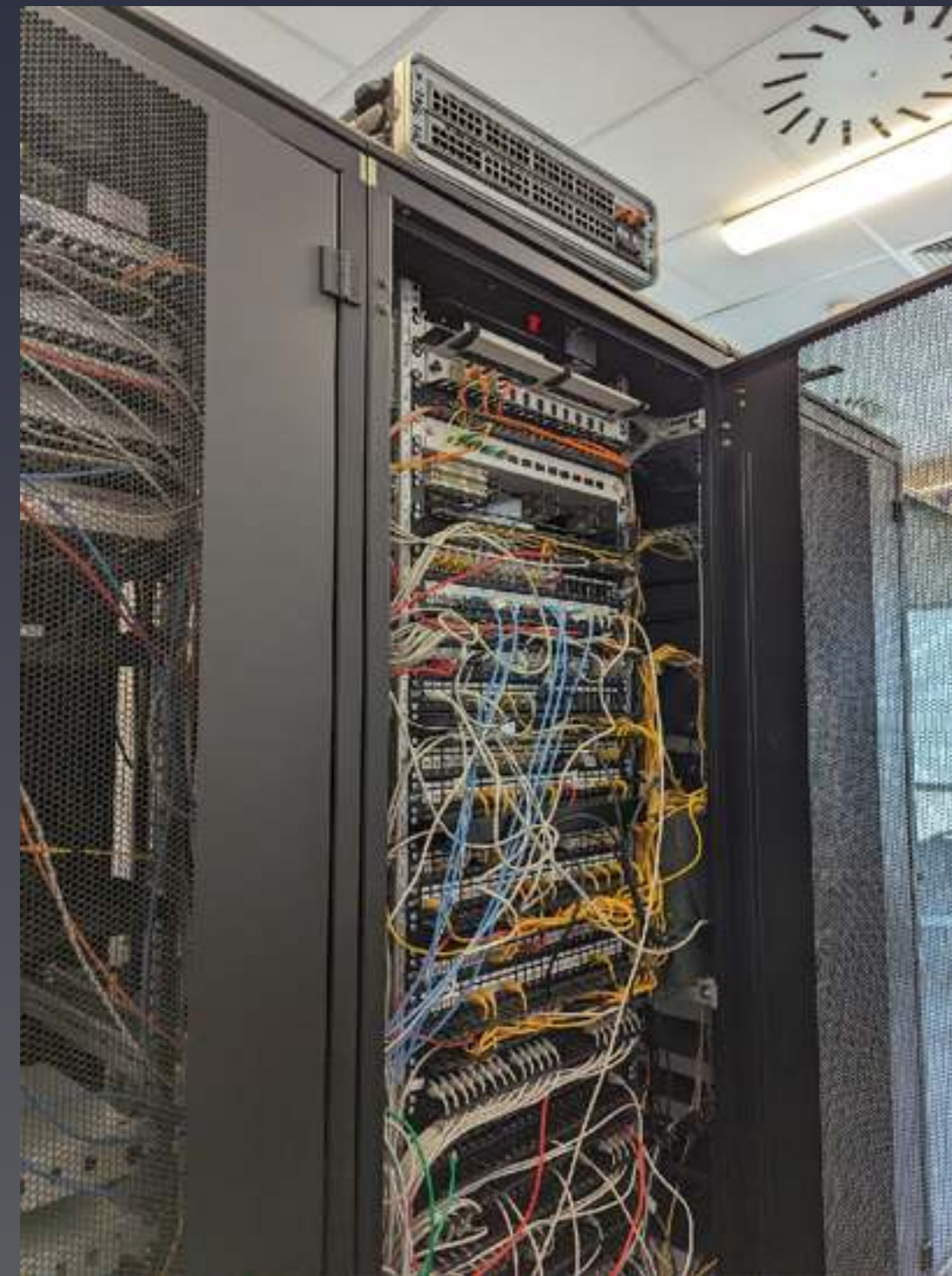
Physical network topology



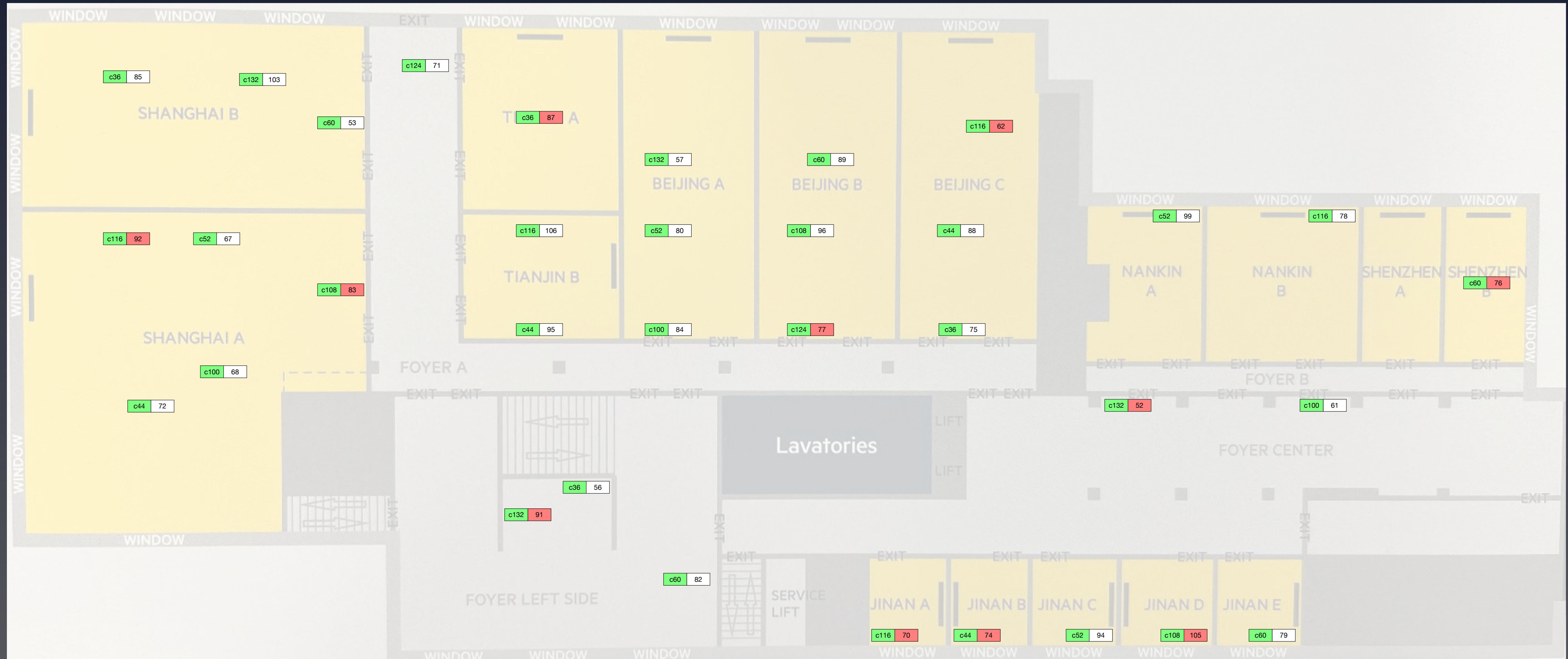
Physical infrastructure worked well



- All patch cables end in one server room
- Excel sheet mapping socket numbers to patch panel ports



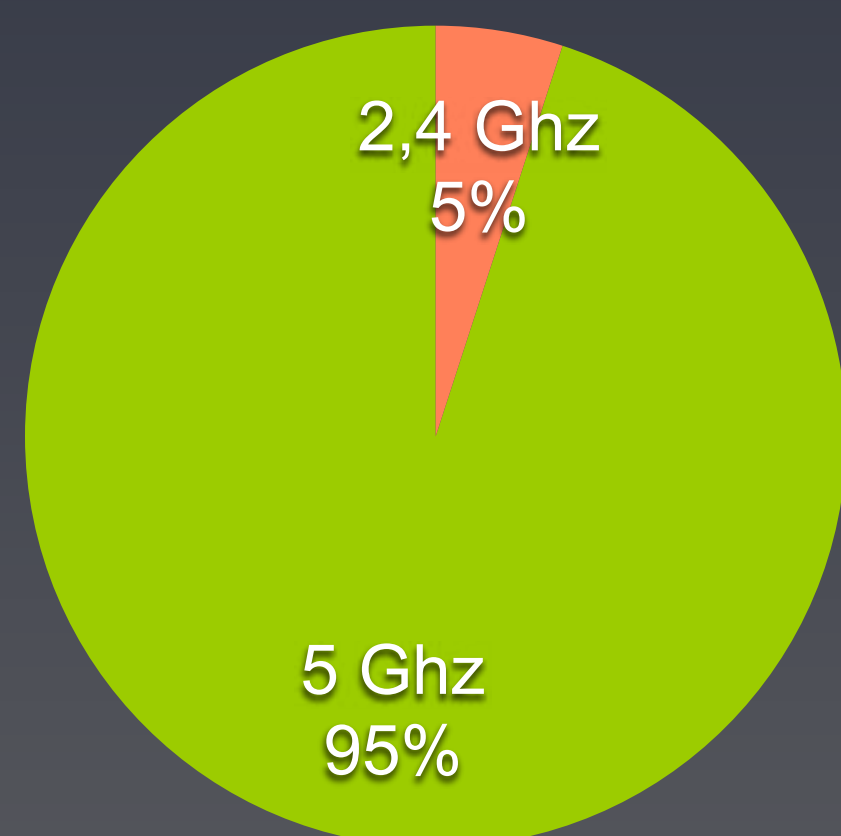
Wi-Fi Access Points



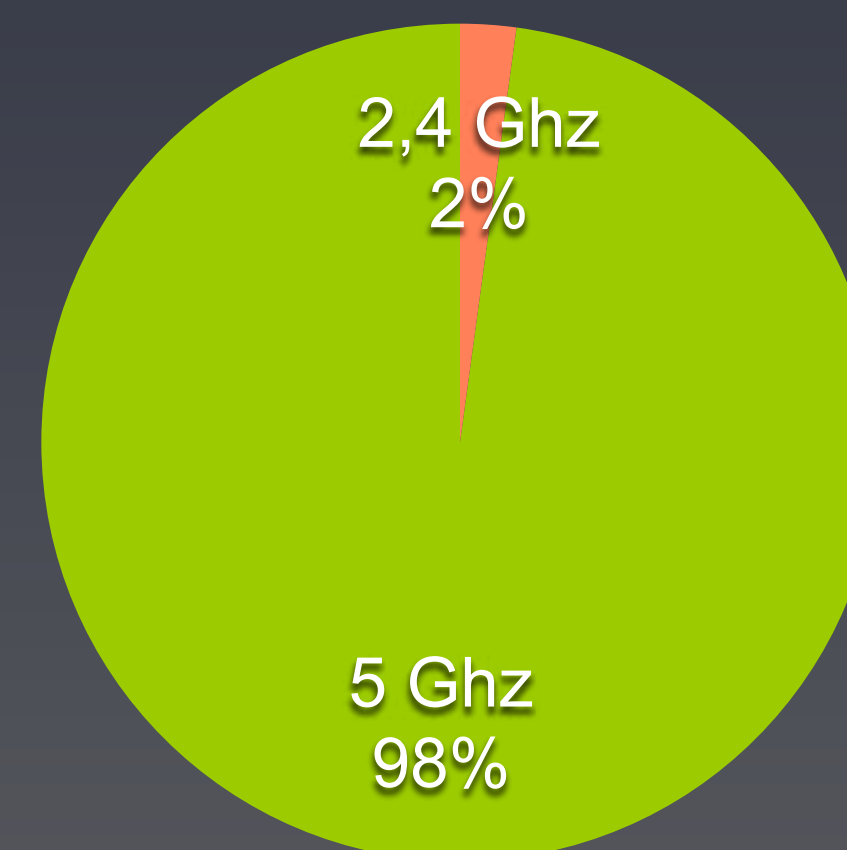
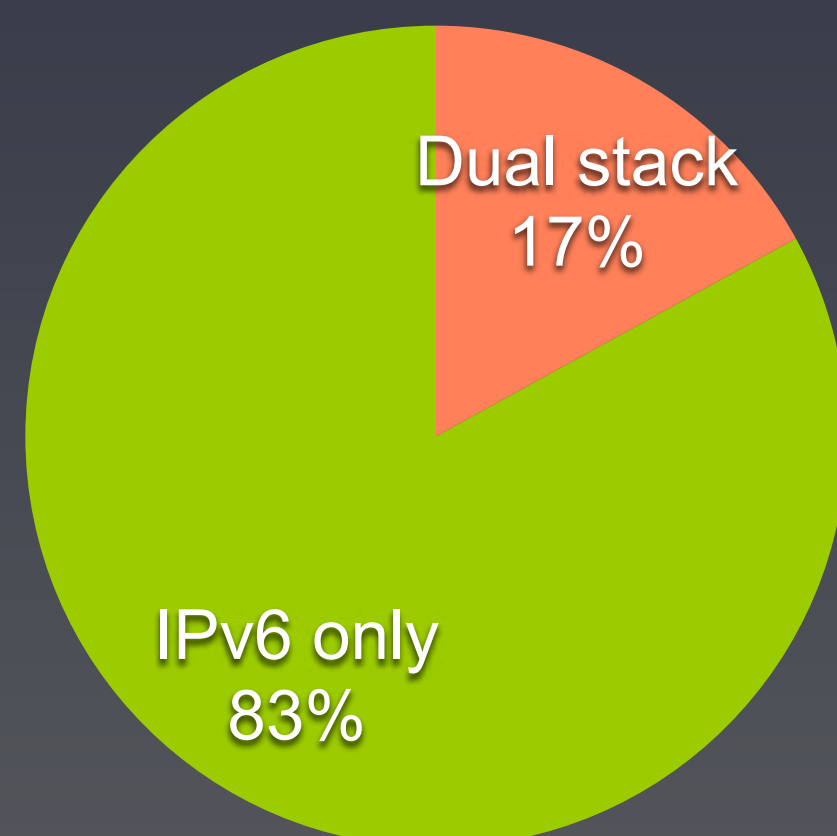
Wi-Fi network



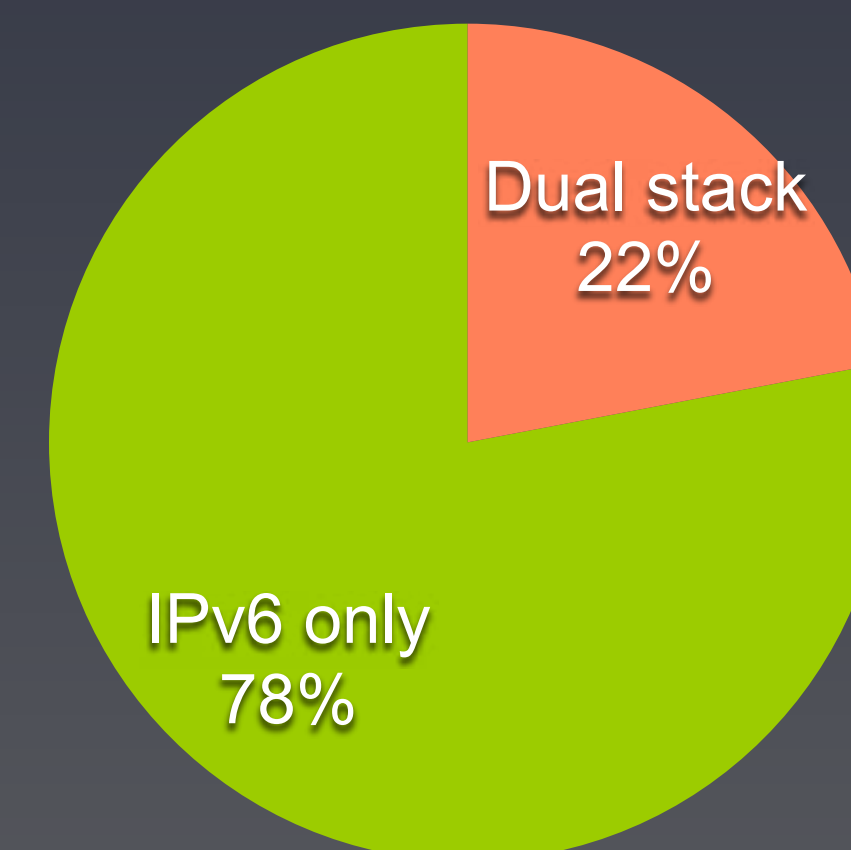
- Main network: 5 GHz-only, IPv6-mostly
- Legacy network: 5 GHz and 2.4 GHz, dual-stack
- IPv6-only experiment: 5 GHz-only, no IPv4



RIPE 87



RIPE 88



The efficiency of IPv6-mostly network



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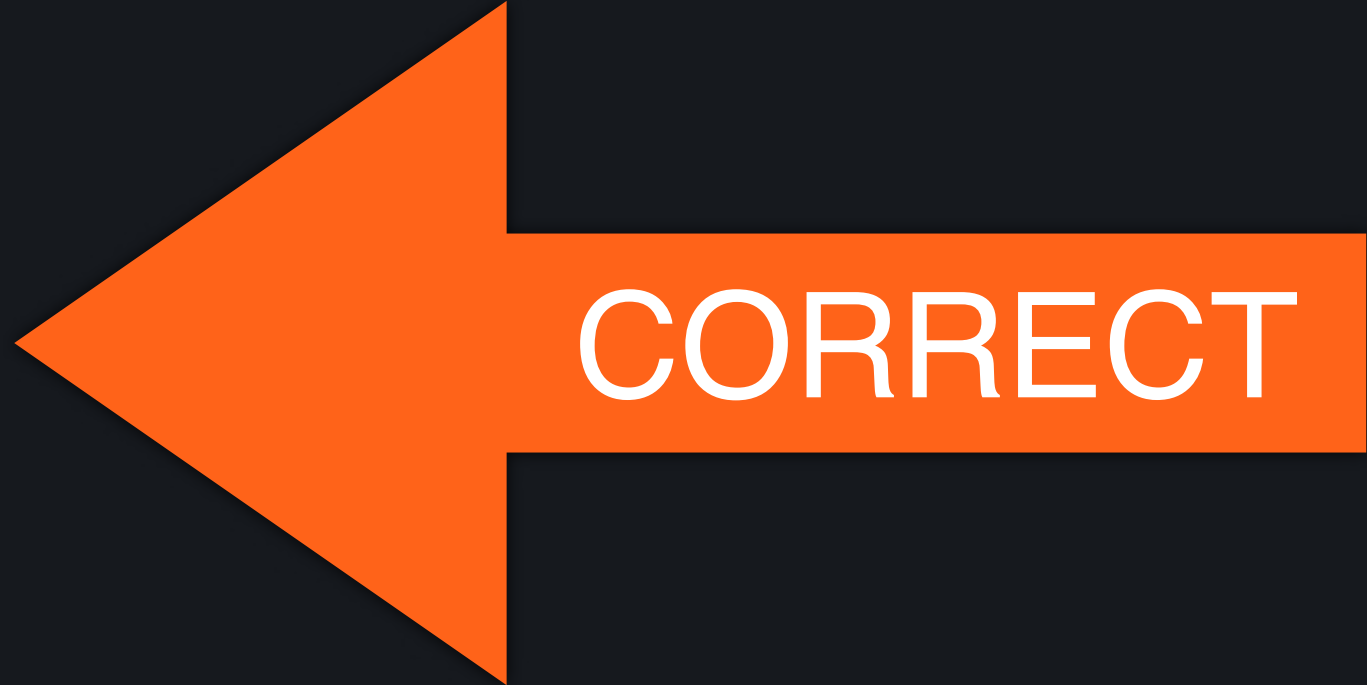
#ripe88 network quiz: There are now 527 devices connected to the main meeting network. How many active DHCP leases are there? (Lease time is 4000 seconds.)

13% Less than 50

7% 50 - 100

17% 100 - 550

63% More than 550



	max	avg	current
Total	555	107	0
ripemtg	527	103	527
ripemtg-legacy-88	18	8.50	18
ripemtg-v6onlyexp	7	3.50	5
ripemtg-legacy-2.4-88	6	3.10	5

	max	avg	current
mtg-legacy	31	14	31
mtg-public	85	16	85
wifi-mgmt	45	42	45
Total	161	61	161

[Obnovit](#) · 76 lidí · Uzavřeno

Standard complaints regarding Wi-Fi



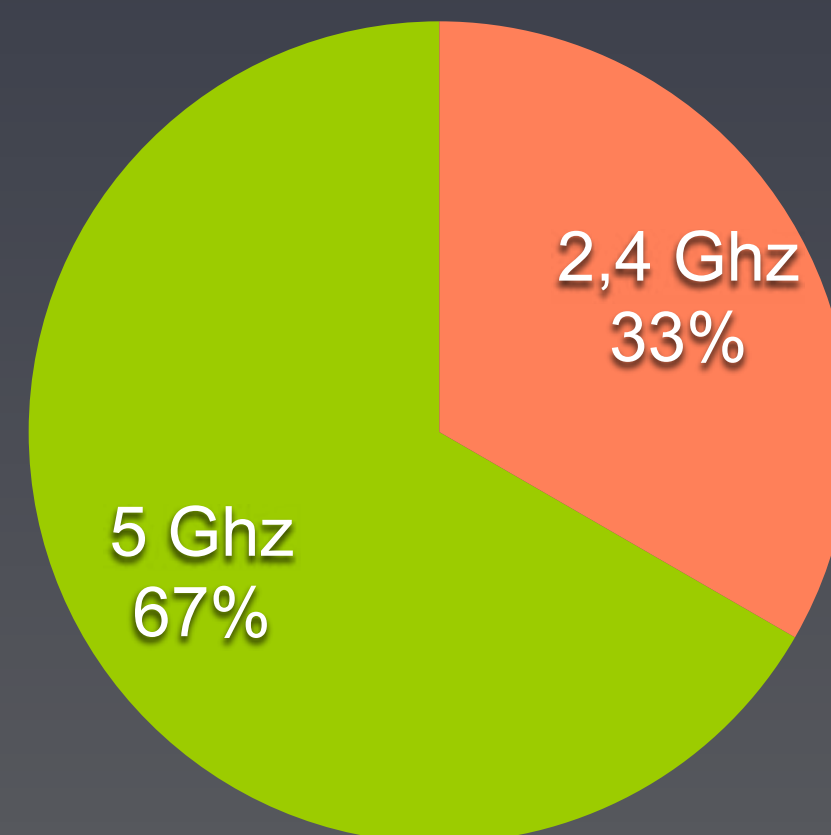
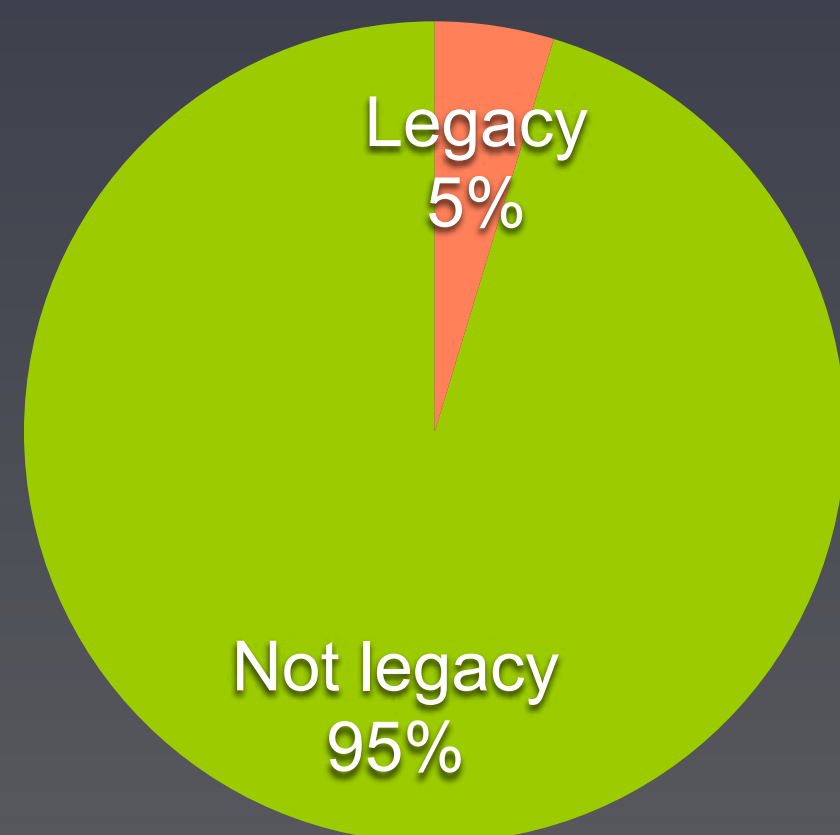
- No coverage in the toilets
- No coverage in the lunch area



The Legacy network



- The only 2.4 GHz and WPA2 Wi-Fi
- Mostly issues with (wrong) VPN configuration
- We are always happy to hear your reason for using it



Remember RIPE 87?



A concurrency bug in Knot Resolver



- When:
 - queried name is an apex name with A but no AAAA record
 - dns64 module is loaded
 - queried rrset nor the nsset of the zone is in cache
 - client is using doh2 and asking concurrently for A and AAAA record
- Then Knot Resolver sometimes returns referral in place of an answer
- Reported as Knot Resolver [bug #905](#)

Looking for a stand-in resolver



- Required features:
 - DNSSEC validation
 - DNS64 only for particular client subnets
 - DoT (for Android) and DoH (for macOS and Windows)
- The winner is... **BIND 9.18**
- But we don't have graphs showing DoH usage

DNSSEC Validation gotcha!



- On Monday it was pointed out that our resolvers are **not validating DNSSEC**
- Turned out this was caused by the wrong setup of the `dnssec-validation` configuration option of BIND

```
dnssec-validation ( yes | no | auto );
```

If set to `auto`, DNSSEC validation is enabled and a **default trust anchor** for the DNS root zone is used.

If set to `yes`, DNSSEC validation is enabled, but a trust anchor **must be manually configured...**

Source: BIND 9 Administrator Reference Manual

DNS64 brown-out on Thursday



- DNS64 should not be necessary anymore
 - except when you run old versions of Apple software
- See **Jen Linkova's** talk during IPv6 Working Group
- For Thursday morning, we **turned off DNS64 temporarily**
- Nothing broke on our side, but **it got noticed**
 - by users of macOS 12 and 13 as well as some Linux users with specific config



Presentation system

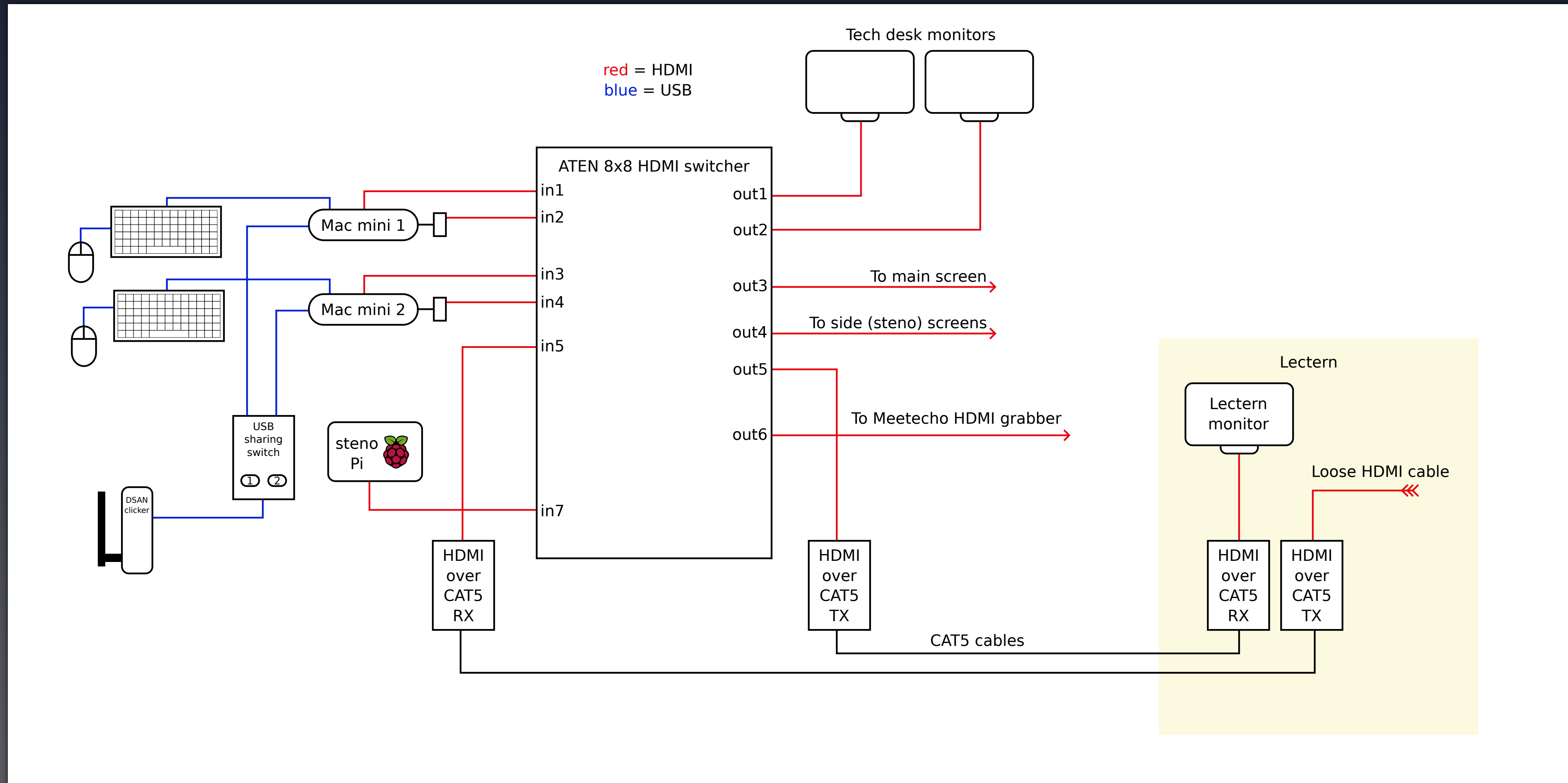
Presentation system



- Two MacMini's, ATEN HDMI Matrix switcher
- DSAN clicker, Limitimer console and clock
- HDMI grabber for Meetecho



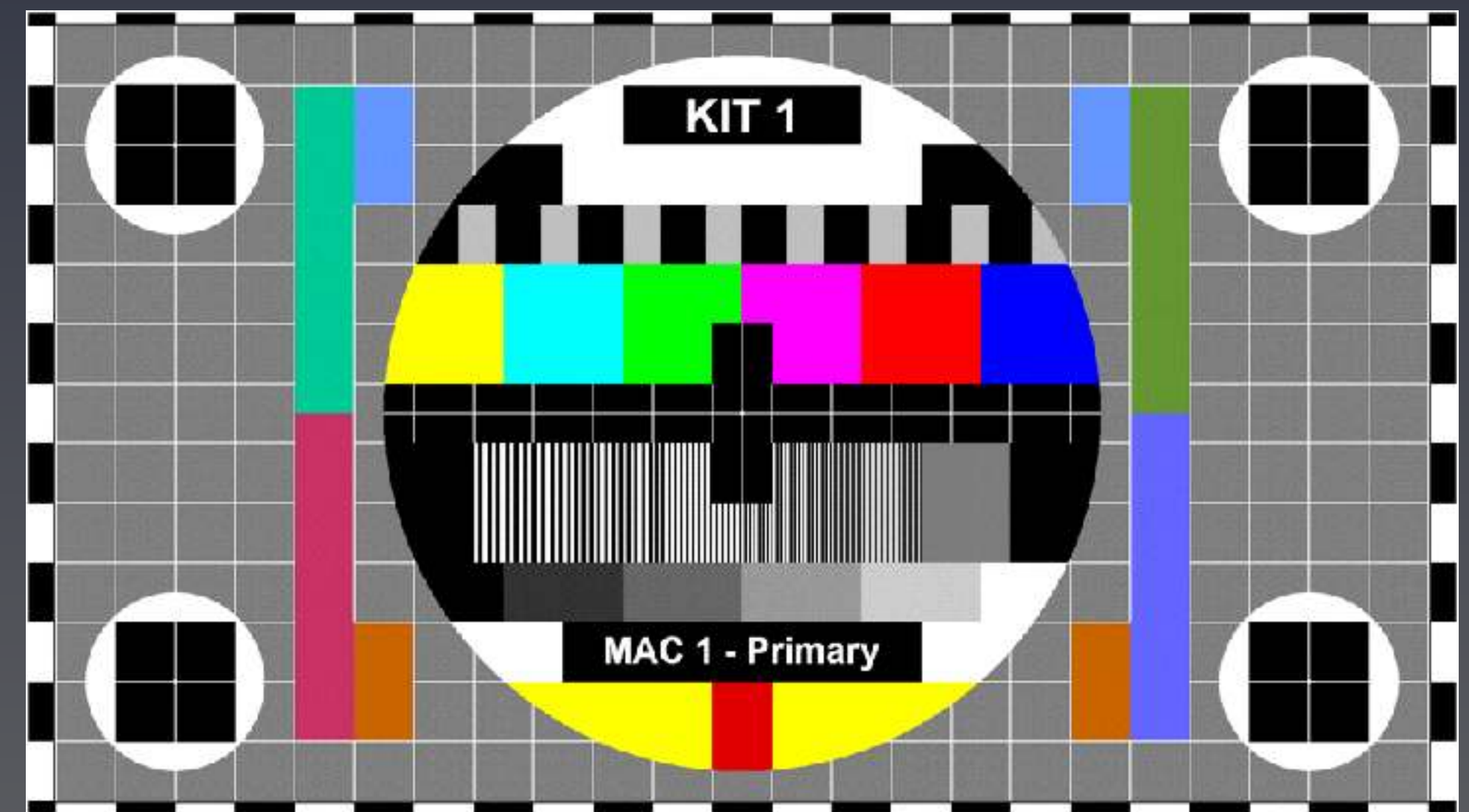
Presentation system wiring



Presentation system innovations



- Reconfigured the scaler in the matrix switcher to produce 1080p in place of 720p output for sharper image
- No more stretched 4:3 test patterns
- First RIPE meeting with a LED screen
 - Not enough room for full stenography text
 - Some flicker issues on video
 - But other than that **looks super cool**



Sometimes things do not work



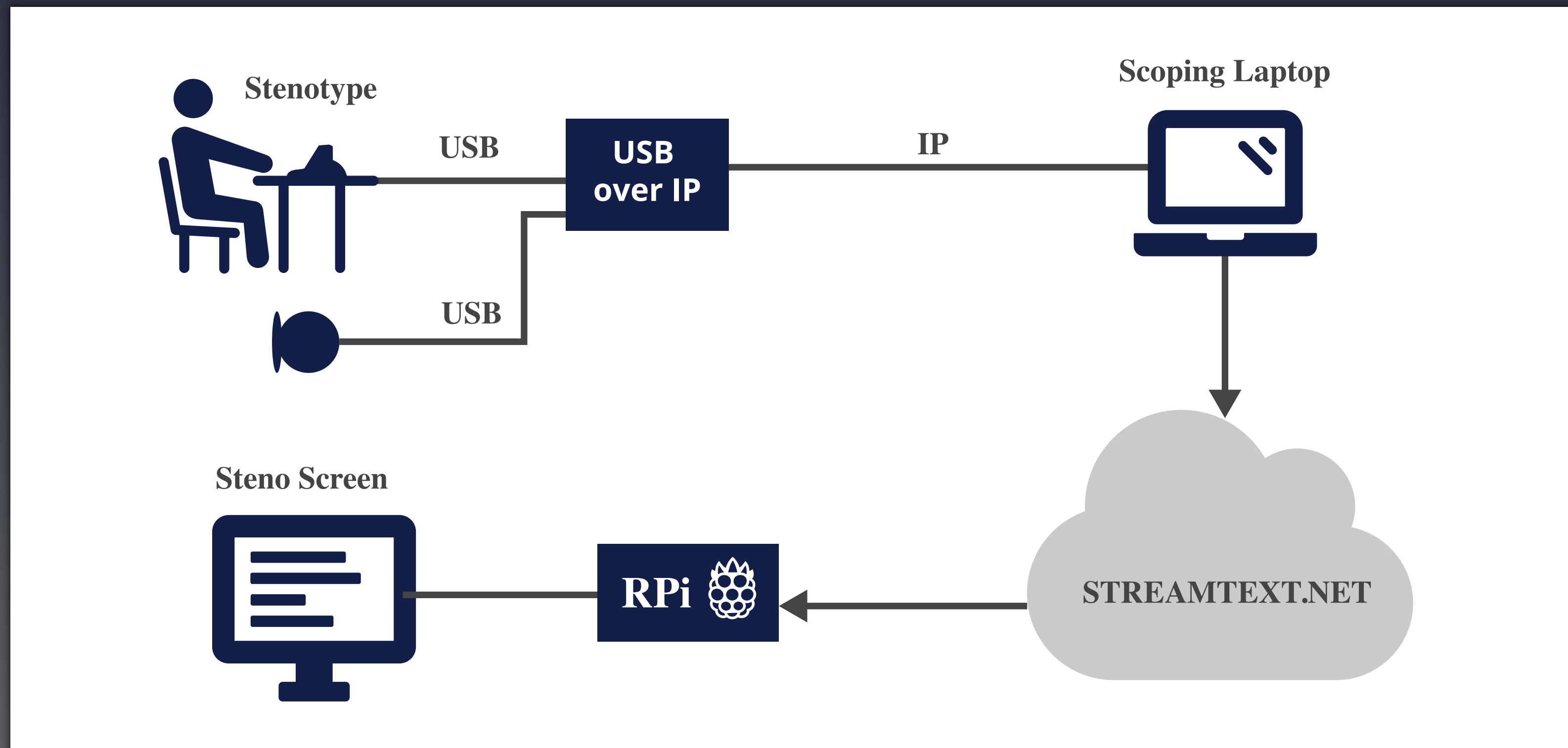


Live Stenography

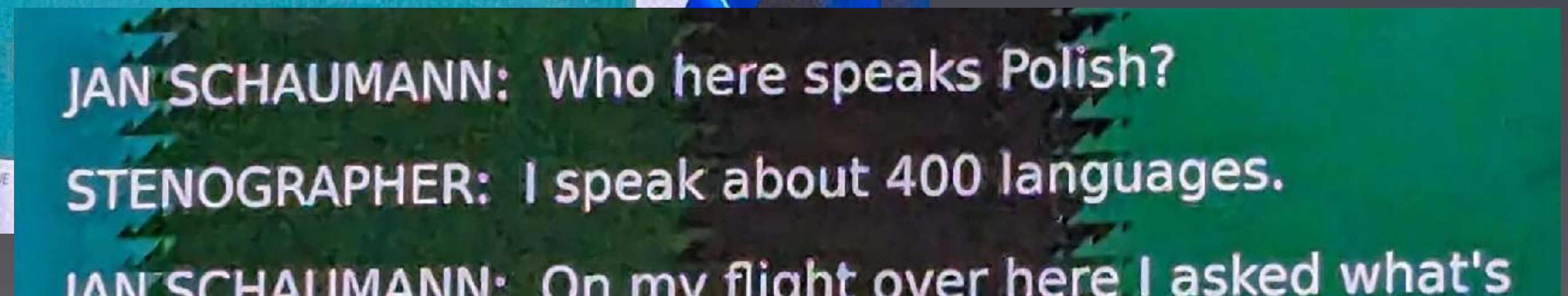
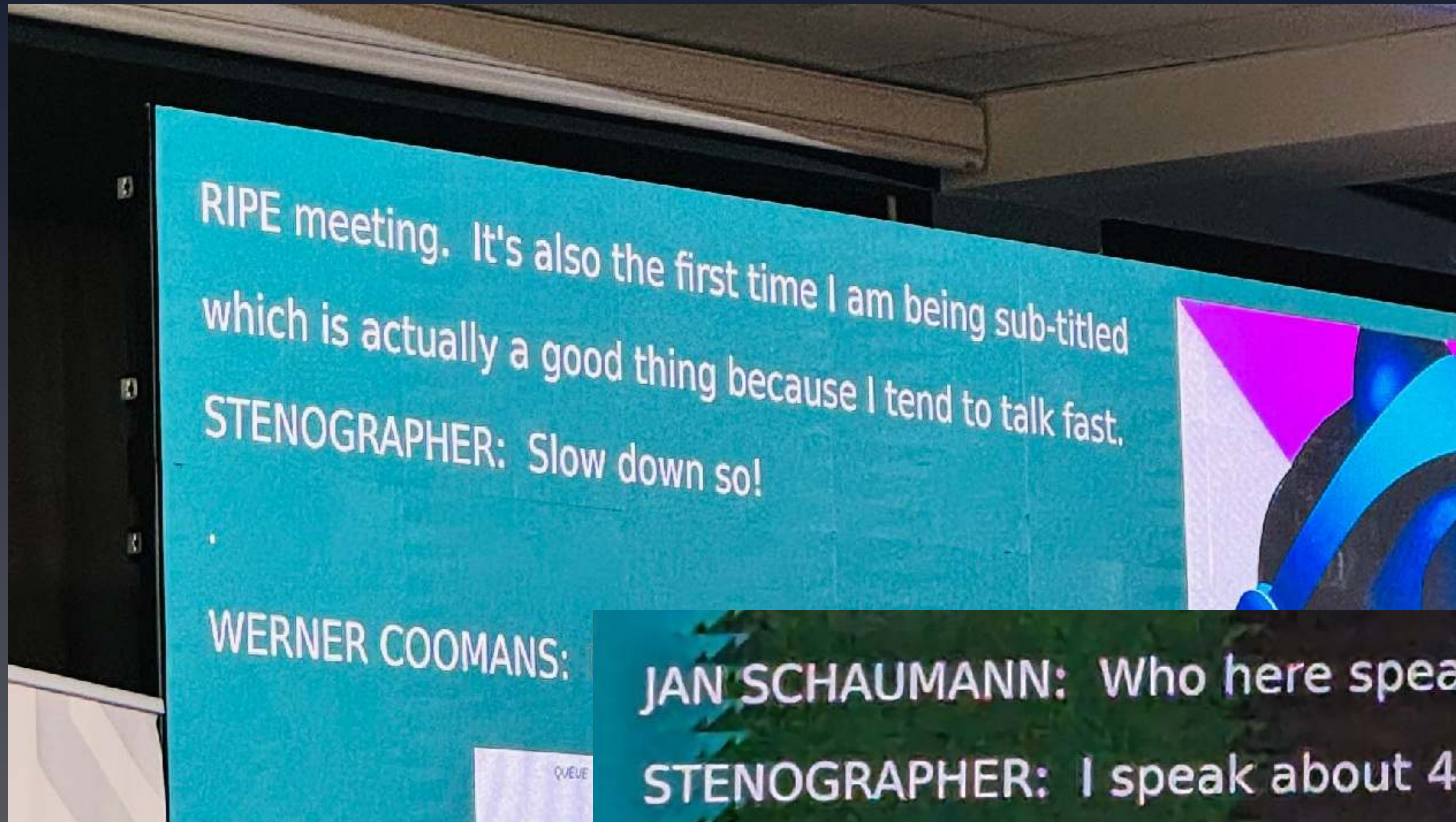
AI-free stenography since 2008



- Helping us understand each other since RIPE 56 in Berlin
- Mary gave a talk about stenography during RIPE 73 in Madrid



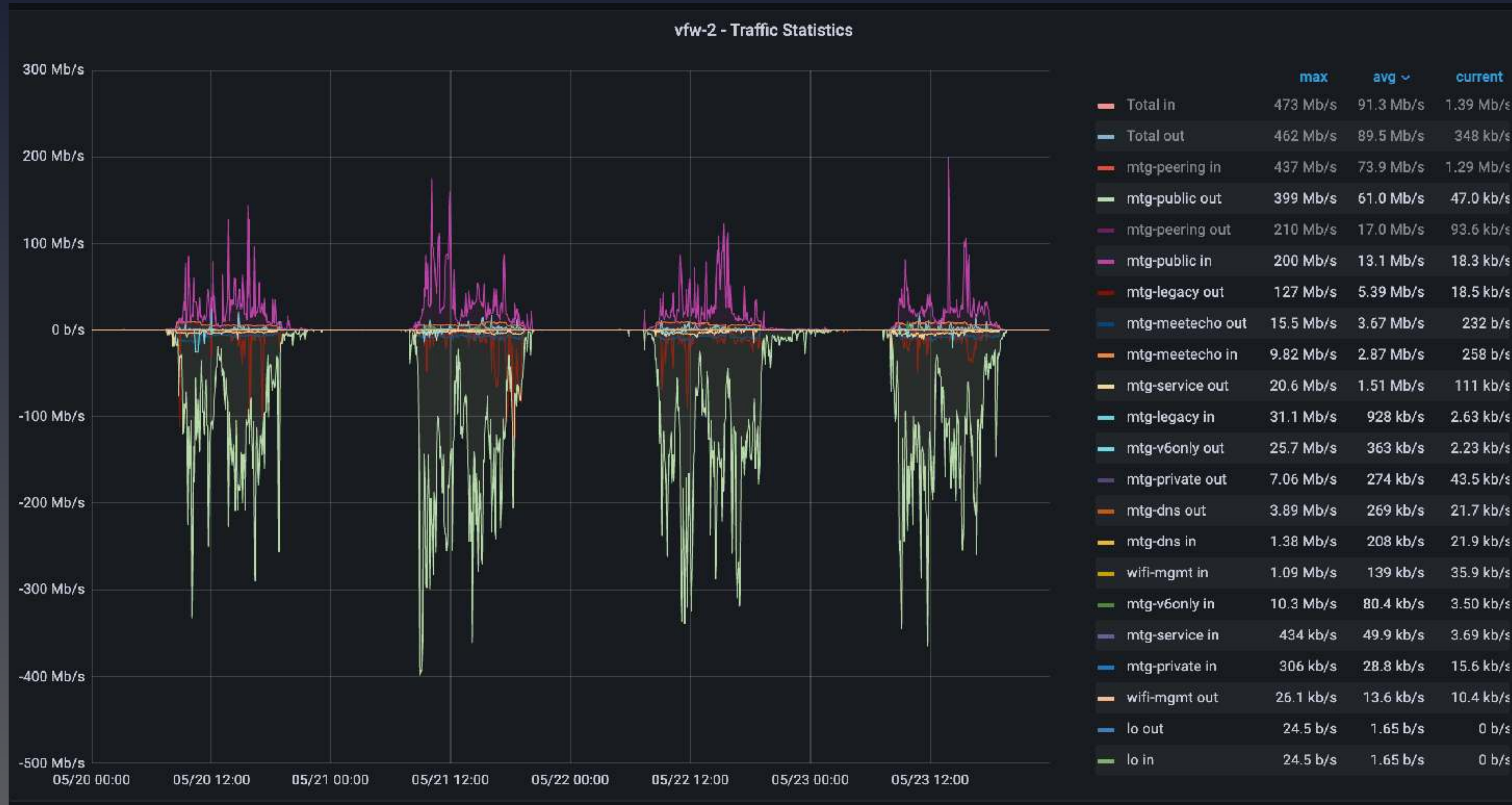
Can Whisper do this?



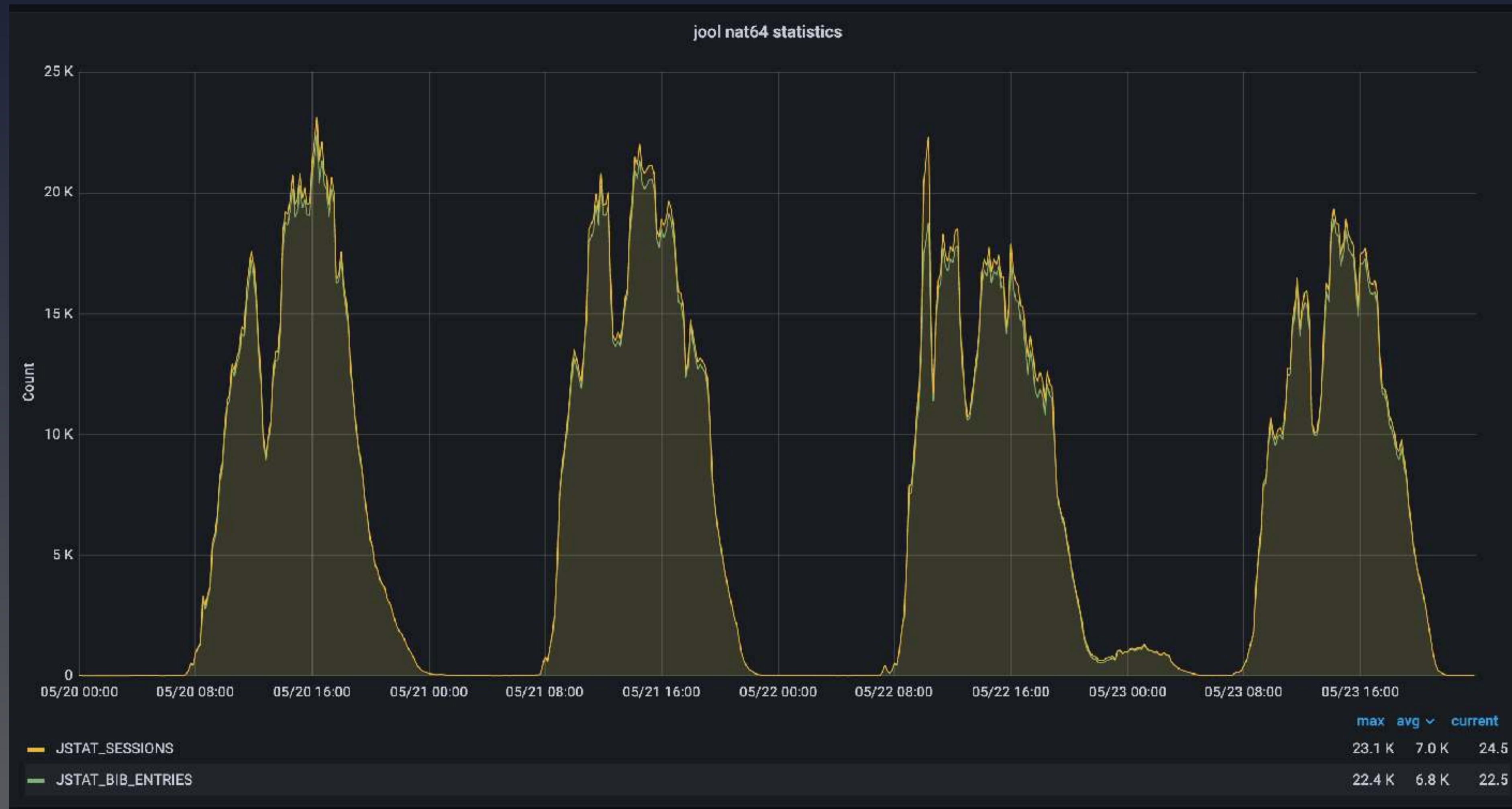


Statistics

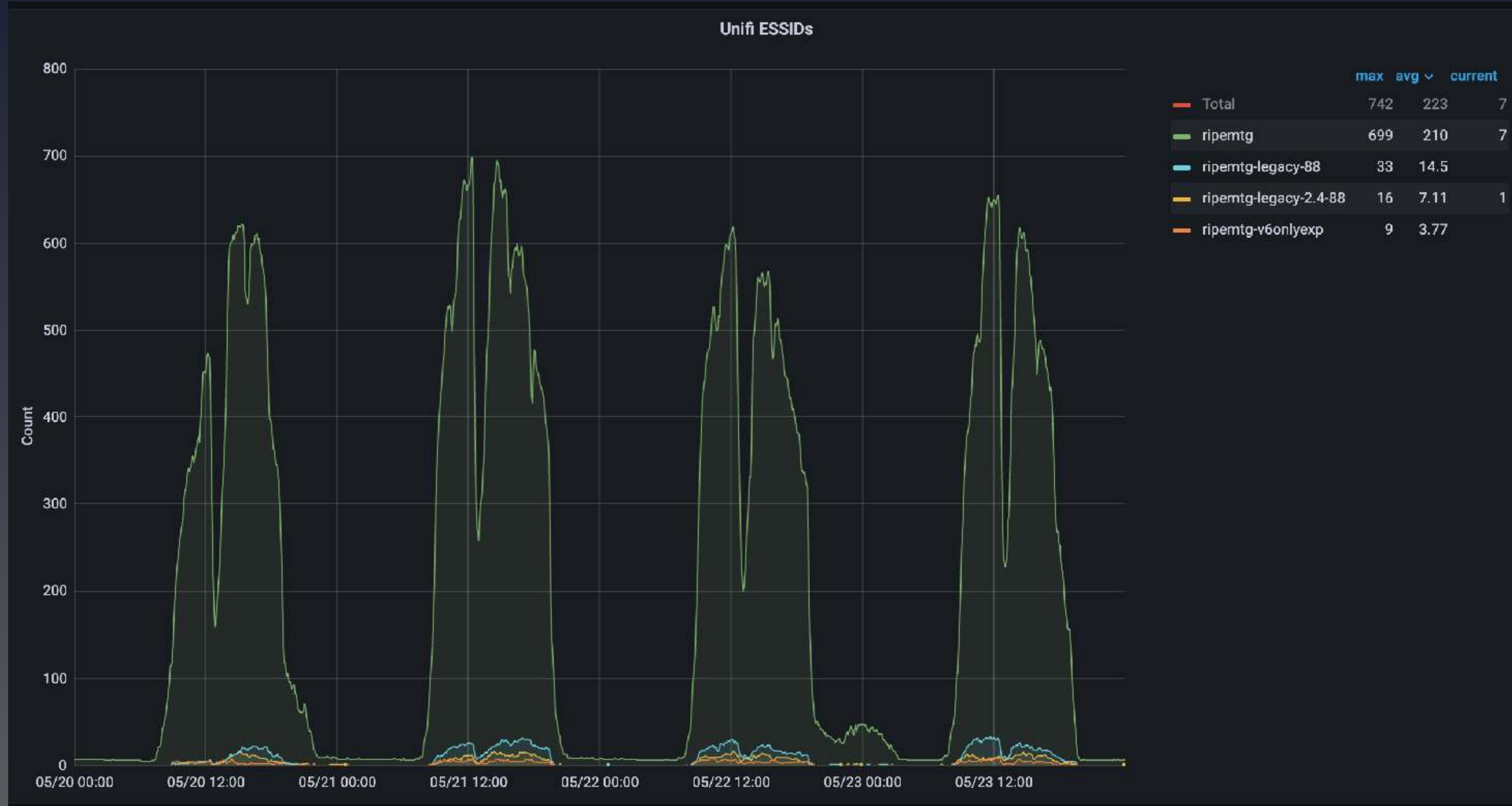
Traffic statistics



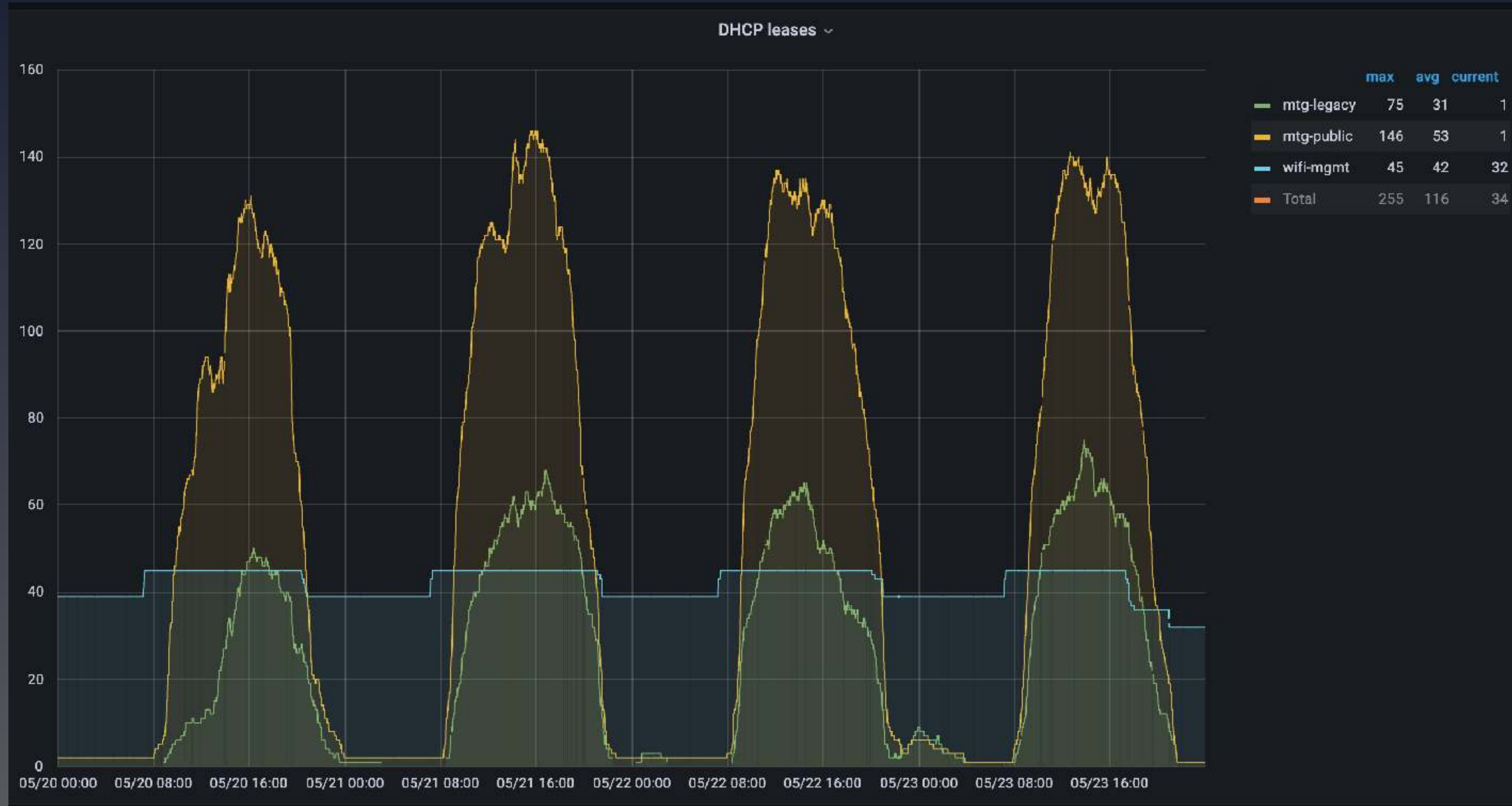
NAT64 sessions



Wi-Fi clients



DHCP leases

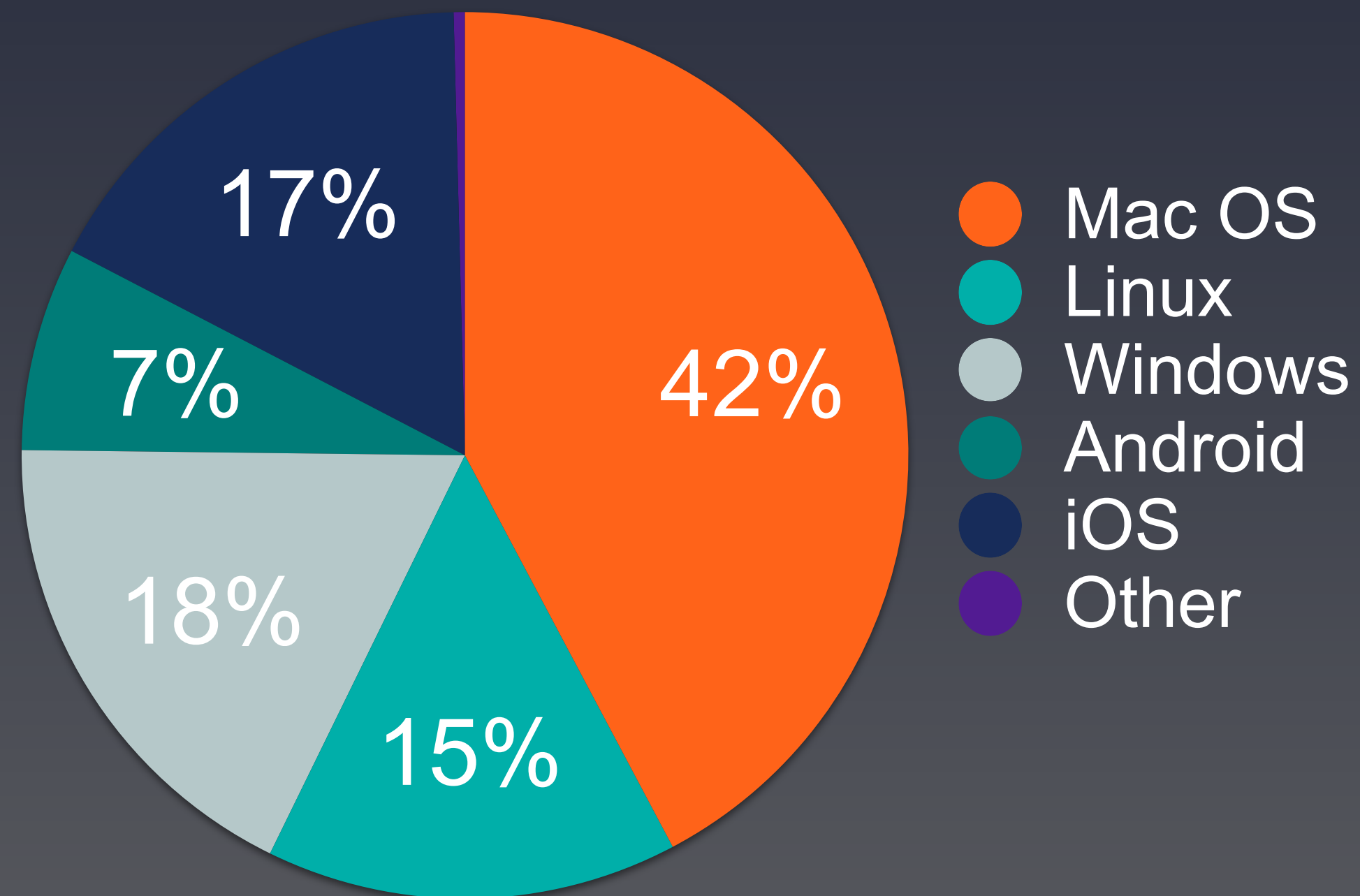


Meetecho statistics

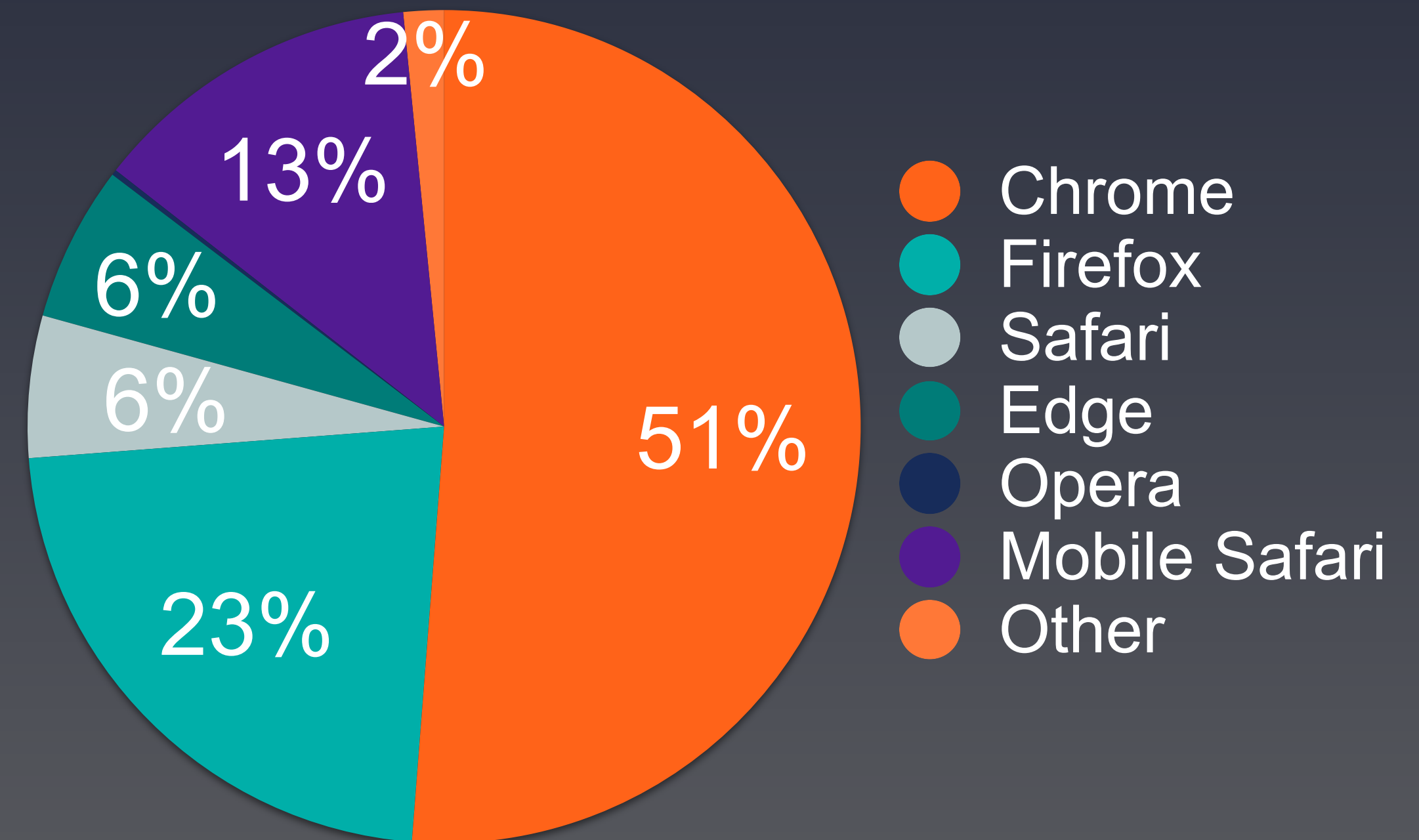


- Percentage joined over IPv6: 57,02 %

OS Usage



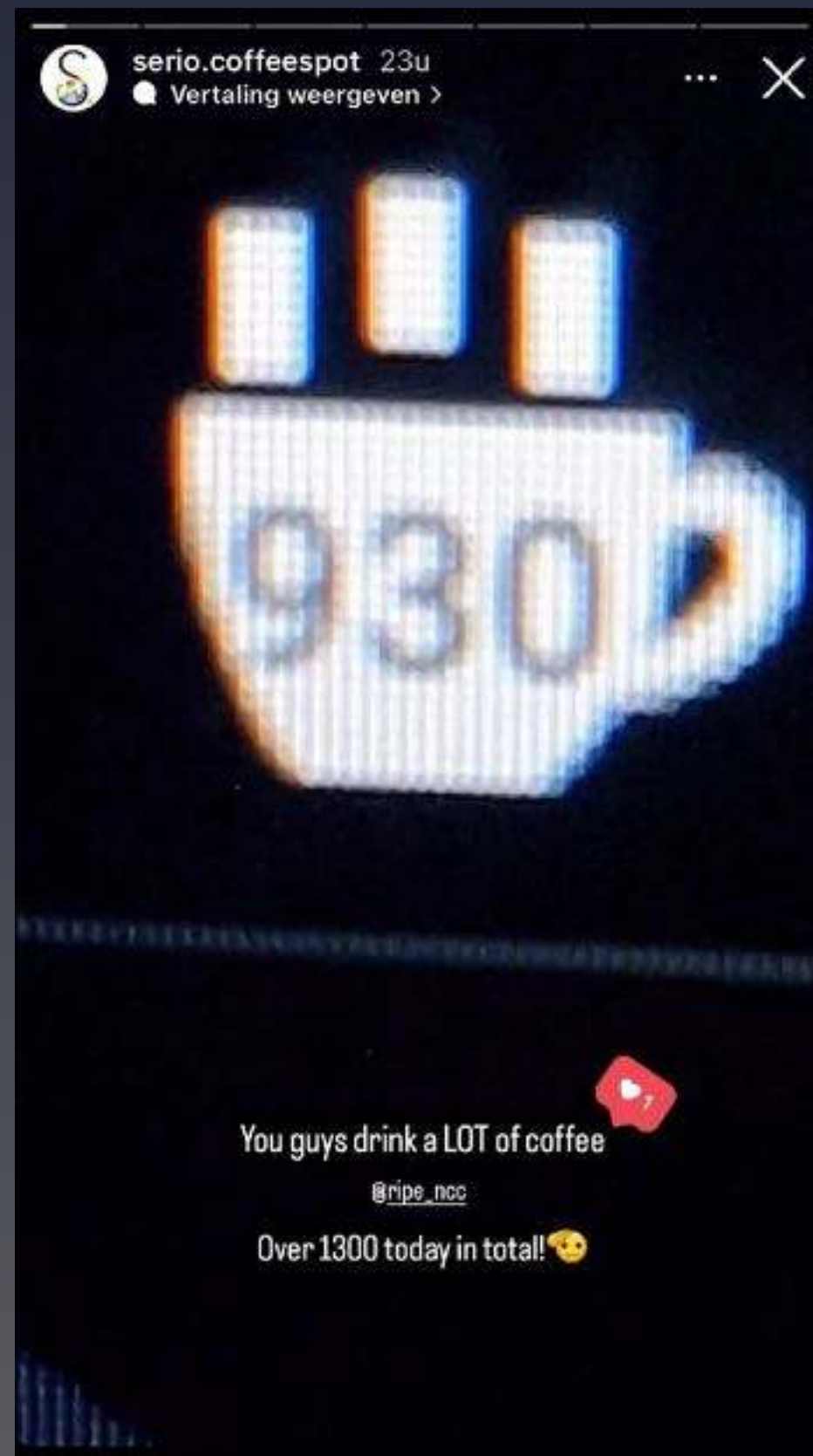
Browser Usage



Barista statistics



- 1300 cups per day





Web Team

- Ihor Marhitych
- Marita Phelan
- František Holop
- Philip Oldham
- Jura Zakarija

Meetecho Team

- Tobia Castaldi
- Alessandro Toppi
- Alessandro Amirante

Comms Team

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- Ulka Athale
- Alun Davies
- Karla Liddle-White
- Adonis Stergiopoulos
- Kjerstin Burdick
- Anastasiya Pak
- Miguel Bastos
- Boris Duval

Coordinators

- Wan-Min Huang
- Sandra Gijzen
- Kajal Ince
- Alexandra Vos

Stenographers

- Mary McKeon
- Tina Kealy
- Anna Murphy
- Aoife Downes



Have a safe trip home



maandag • 12:57

Alert RCB: Warning! Storms, strong wind, heavy rainfall and hail expected today (20.05). During the storm, seek shelter.

Gisteren • 08:17

Alert RCB: Warning! Storms, heavy rainfall and hail expected today (23.05). During the storm, seek shelter.

woensdag • 10:26

Alert RCB: Warning! Storms, heavy rainfall and hail expected today and at night (22/23.05). During the storm, seek shelter.

07:12

Alert RCB: Warning! Storms, heavy rainfall and hail expected today (24.05). During the storm, seek shelter.

07:12 • [Vodafone](#)



Questions



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