

RIPE SEE 12 - ATHENS

Finding the Closest CDN Servers

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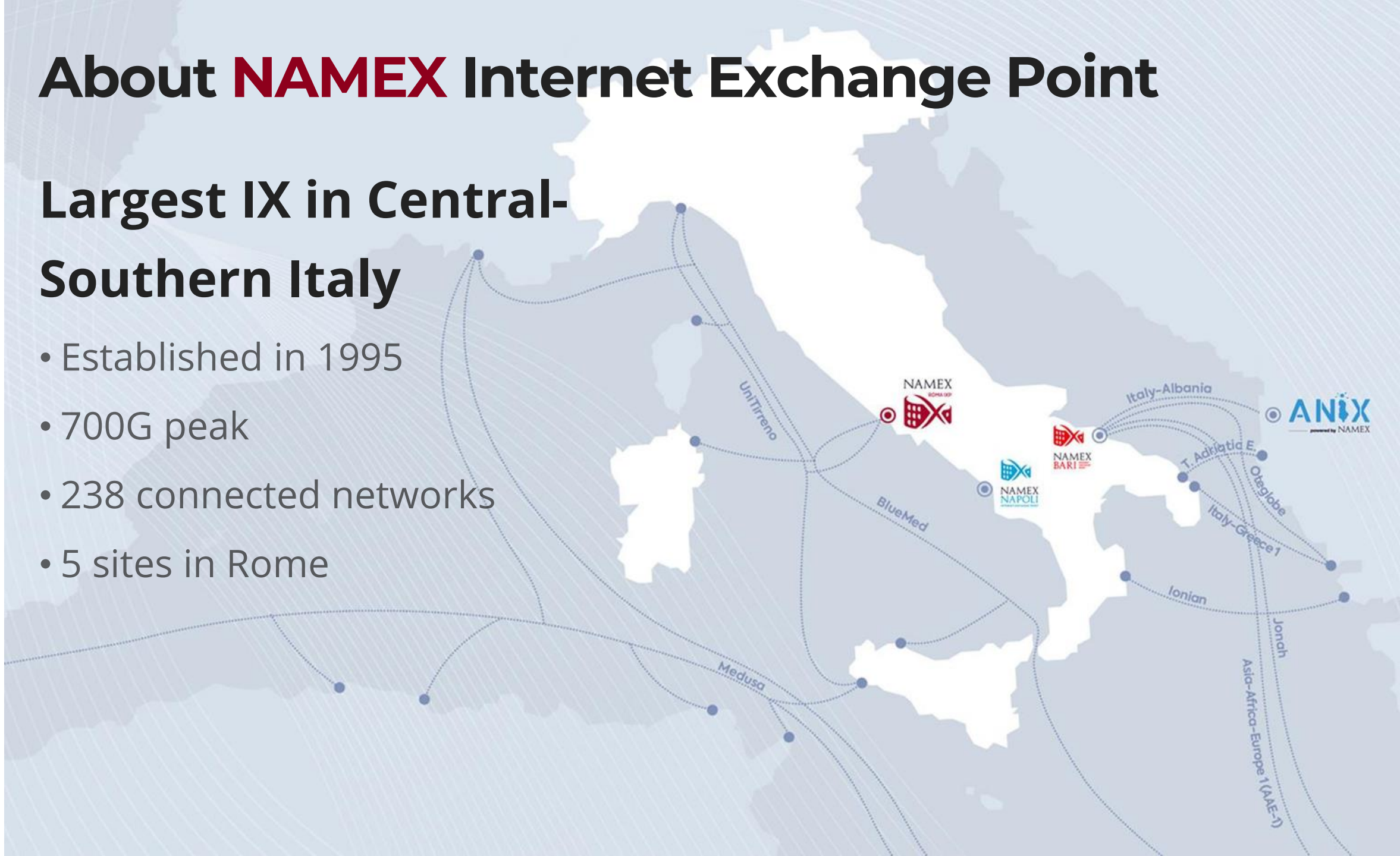
23 April 2024



About **NAMEX** Internet Exchange Point

Largest IX in Central-Southern Italy

- Established in 1995
- 700G peak
- 238 connected networks
- 5 sites in Rome



⚠ This is **Work in Progress**



- Not a scientific research
- Many things are still to be done
- We need your feedback

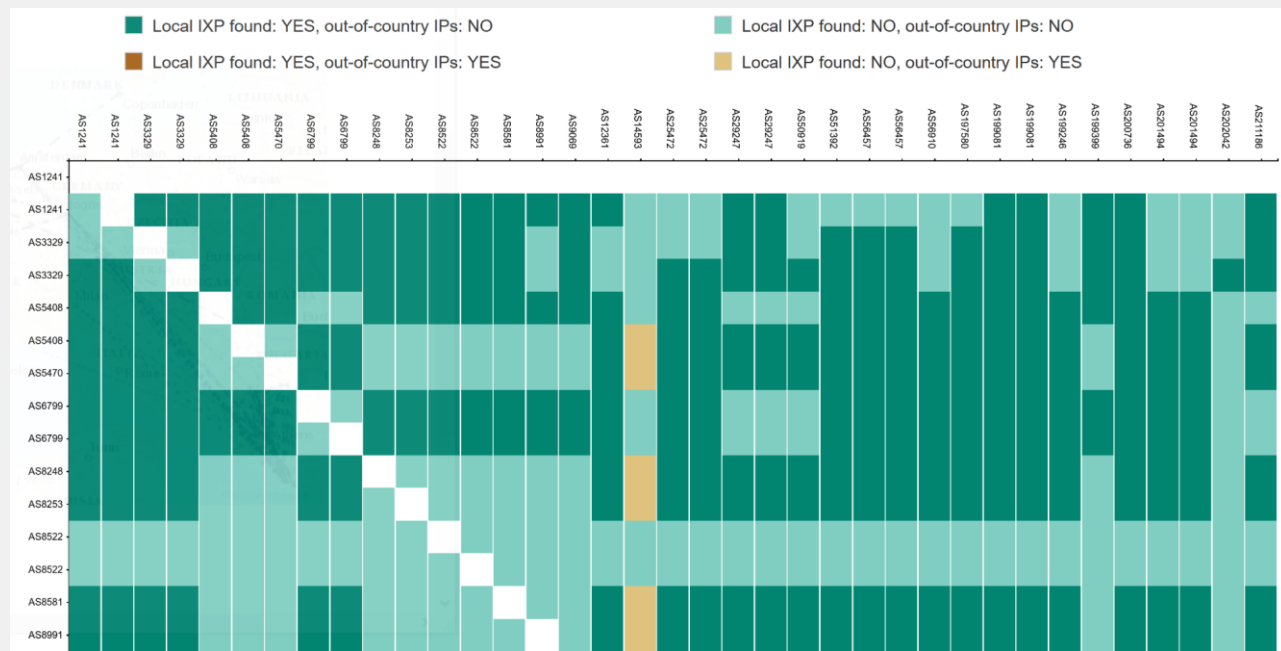
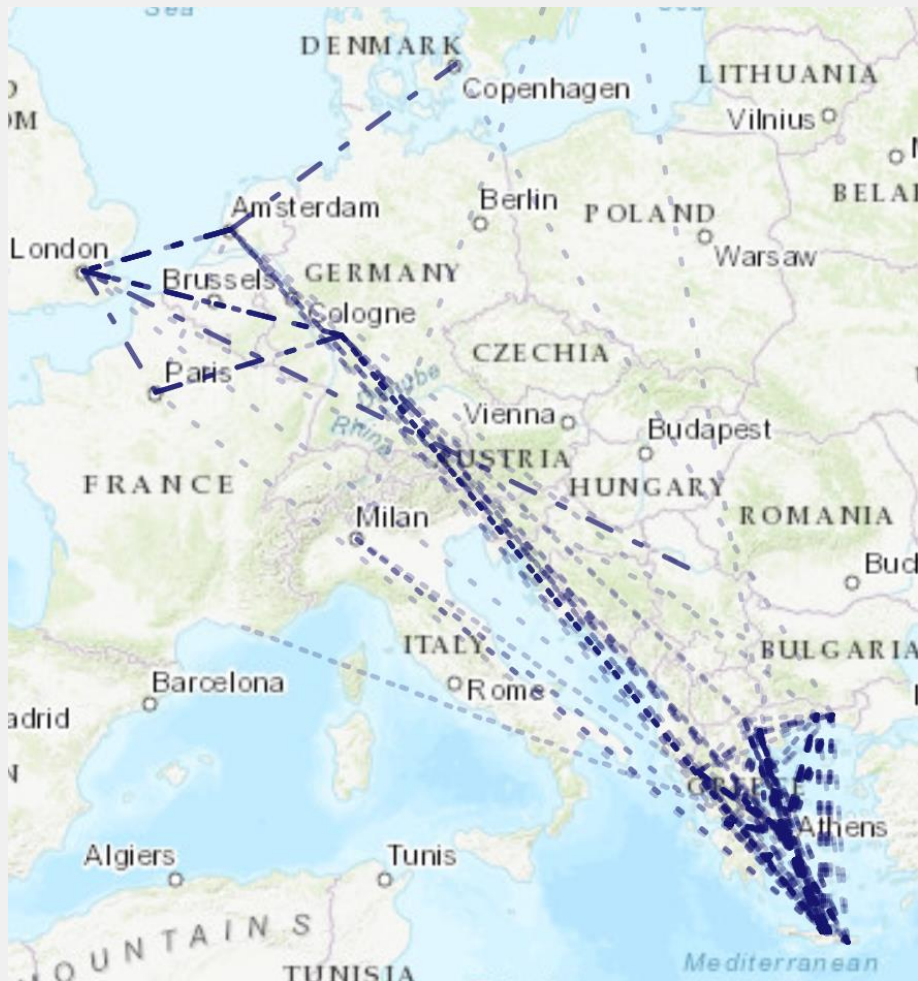
Life at an Internet Exchange

**We love local traffic
and low latencies:
eyeballs close to
content**



IXP Country Jedi: checking the path of local traffic

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OTT/CDN Traffic at ANIX (Tirana)

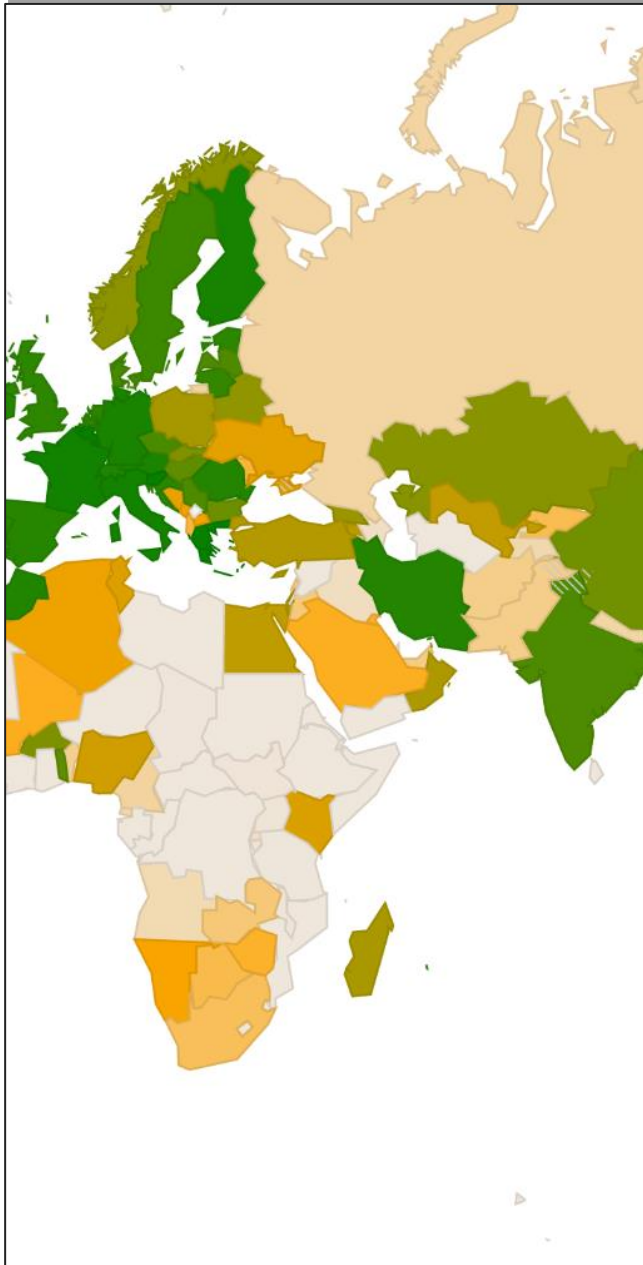
(up to) **90%**

How close is content to the eyeballs?

From what cache/server do I
get my content? And how far is
it?

The CDNs know, of course -
but they don't publish the data

Ideally: we take some probes
and traceroute to the CDNs

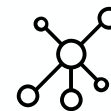


Two Problems



The algorithms

CDNs have dark magic algorithms which find the “best” cache from which to serve my content



The probes

RIPE Atlas probes are great! But they don’t allow HTTP queries and they still lack coverage in some areas

You



Your
IP Address



Proxy Server



Proxy
IP Address



Internet

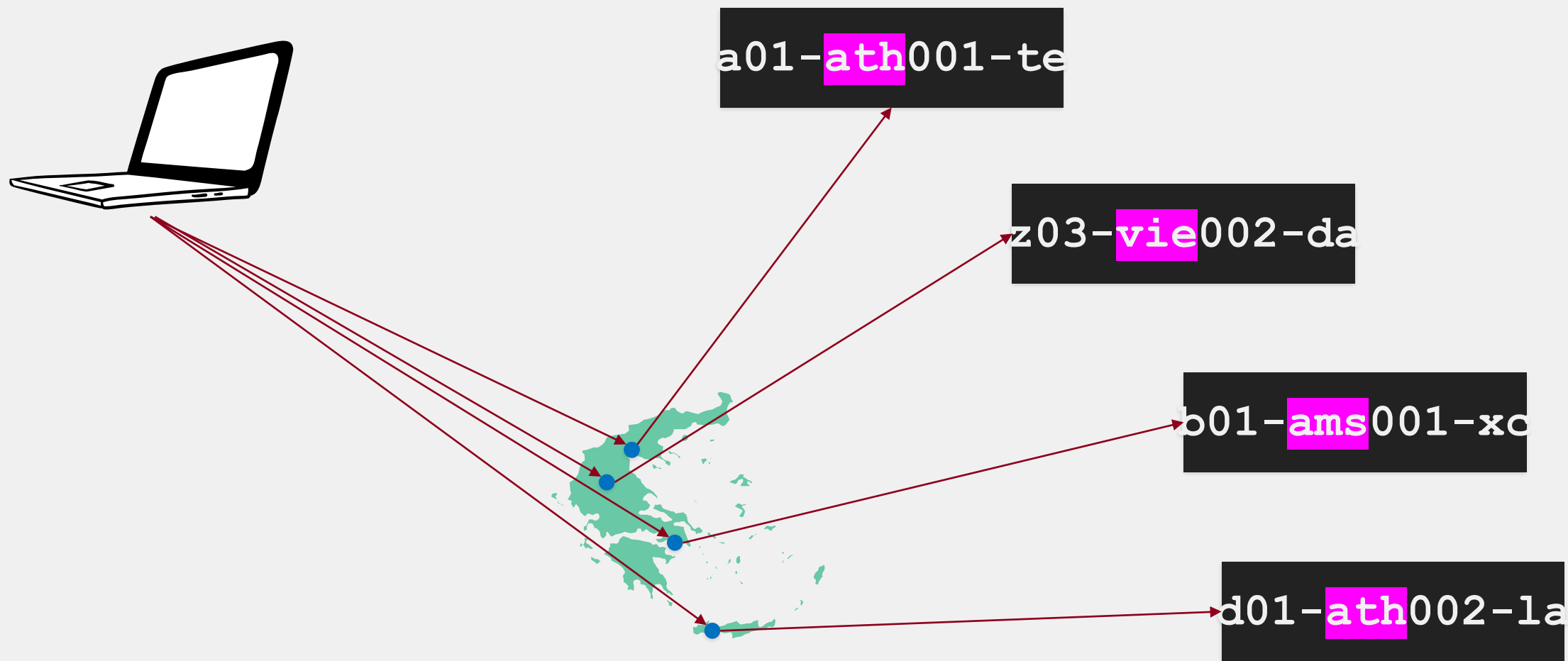


One solution: **proxy services**

Proxy services have hundreds /
thousands of proxies in each
country

Web content served by CDNs often
includes a string identifying the
location of the cache

Obtaining the CDN location through an HTTP query



Our Methodology



Data collection

We downloaded specific webpages with content indicating the location of the CDN servers, from all ASes in different countries (Cloudflare, Google and Netflix)



Analysis

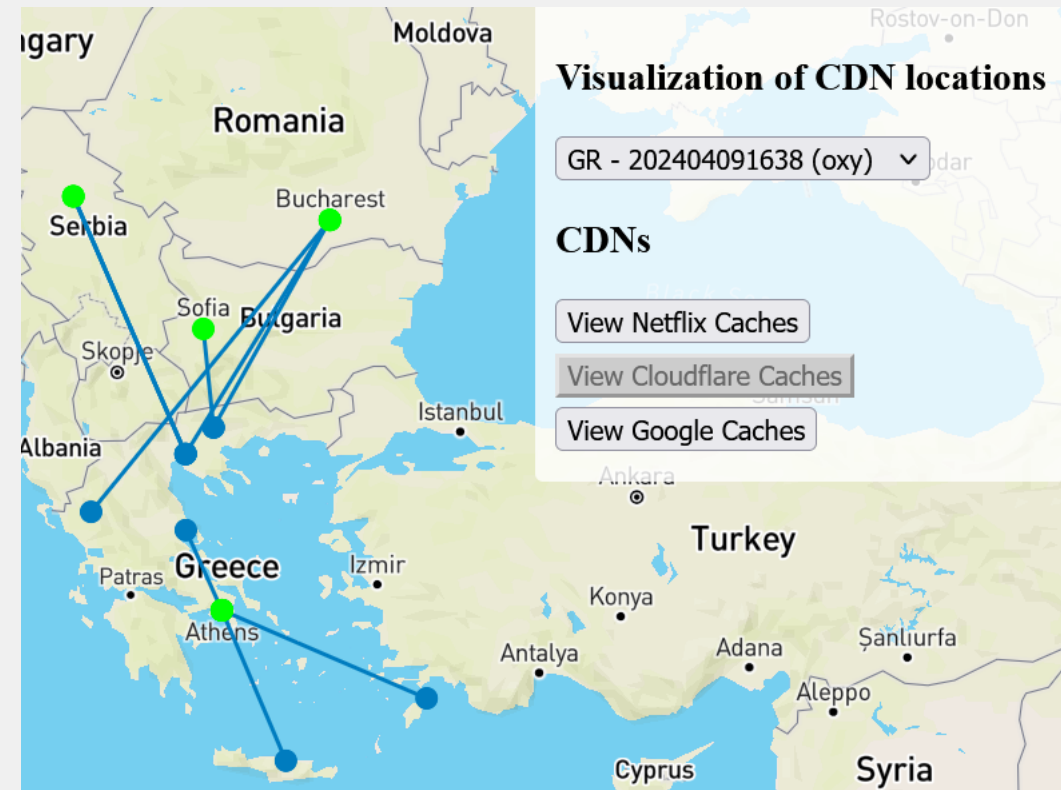
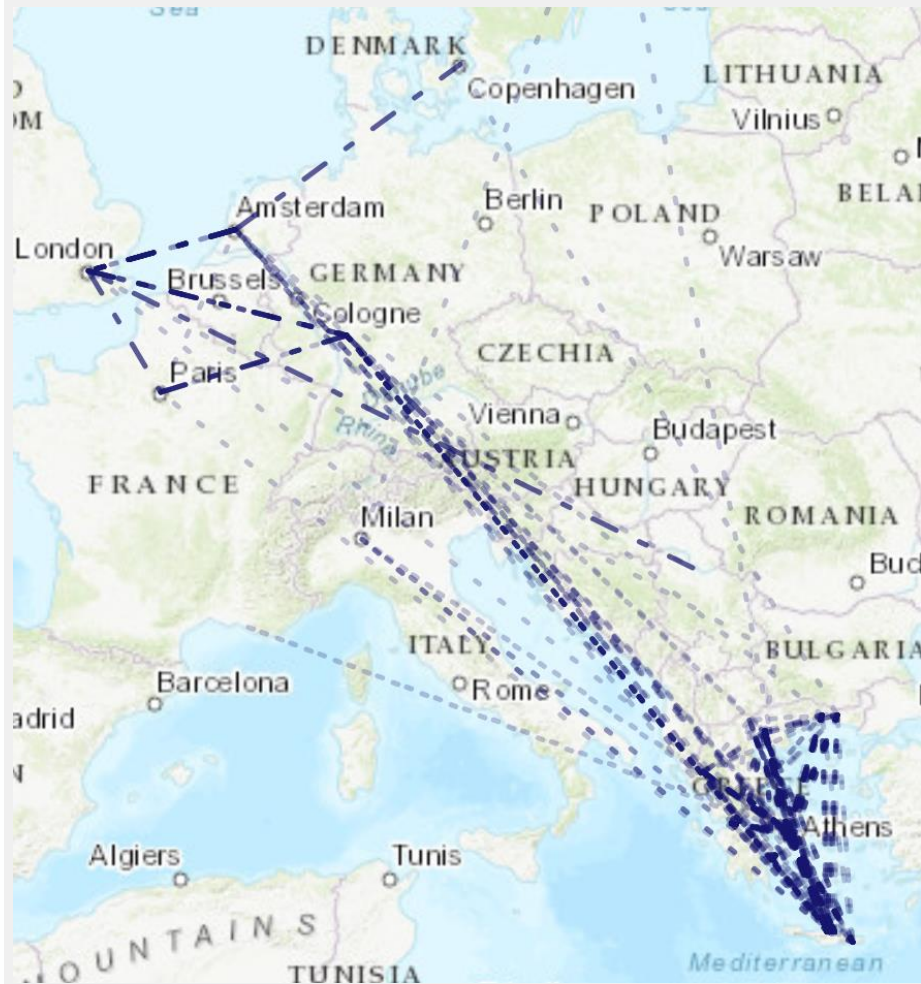
We checked what share of the population in a country is covered by each cache (using APNIC customer population)



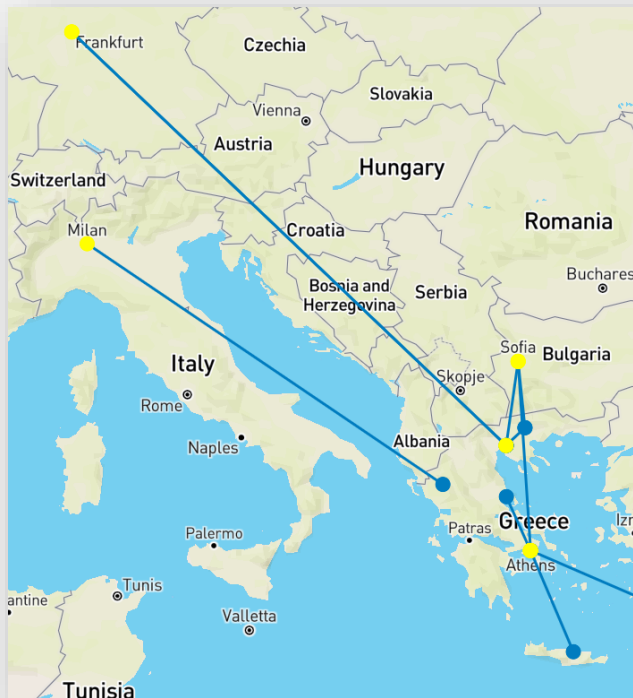
Visualization

We created maps of the links between “proxy probes” and the caches

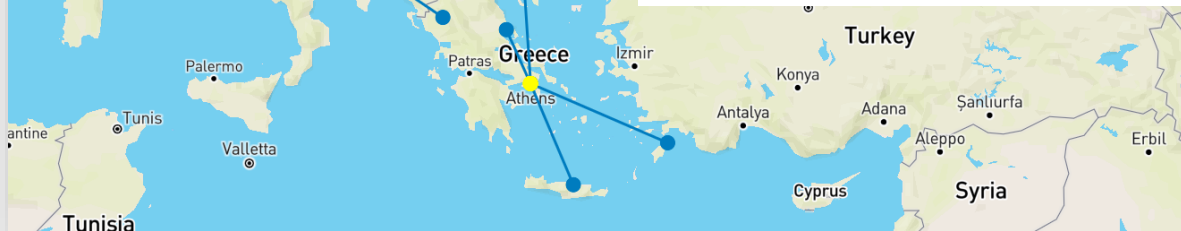
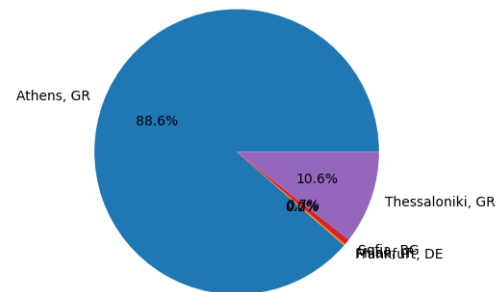




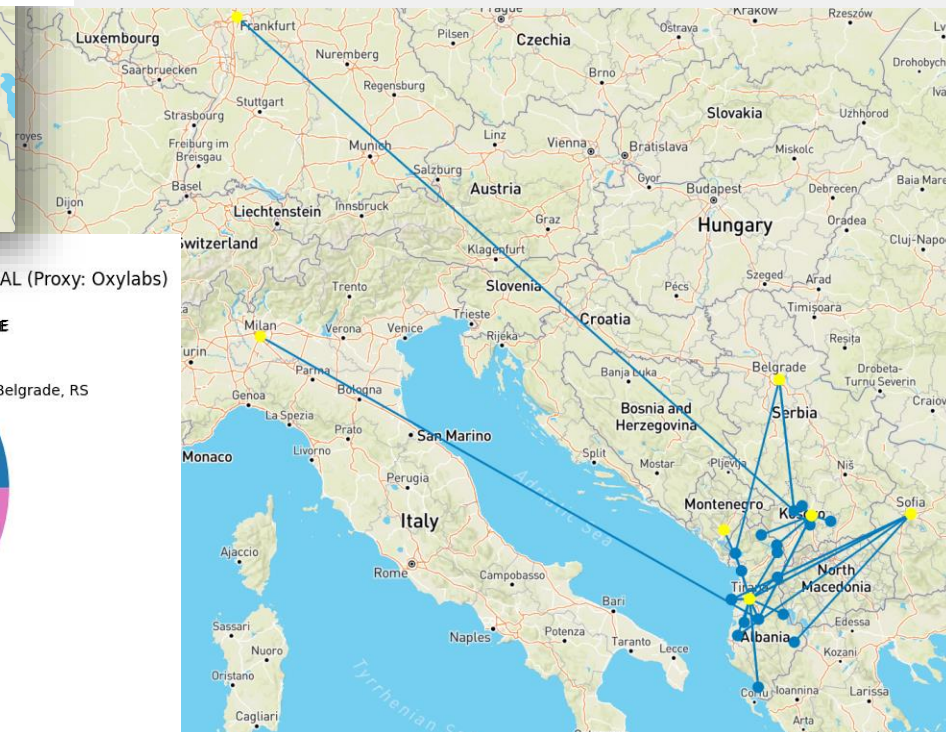
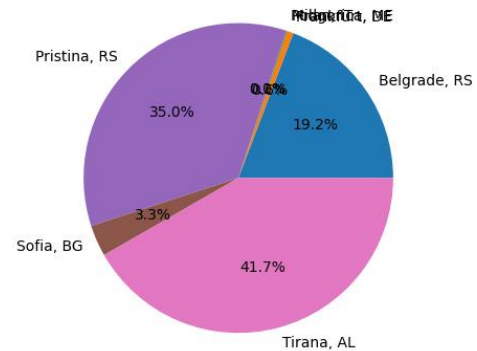
Greece and Albania: Google



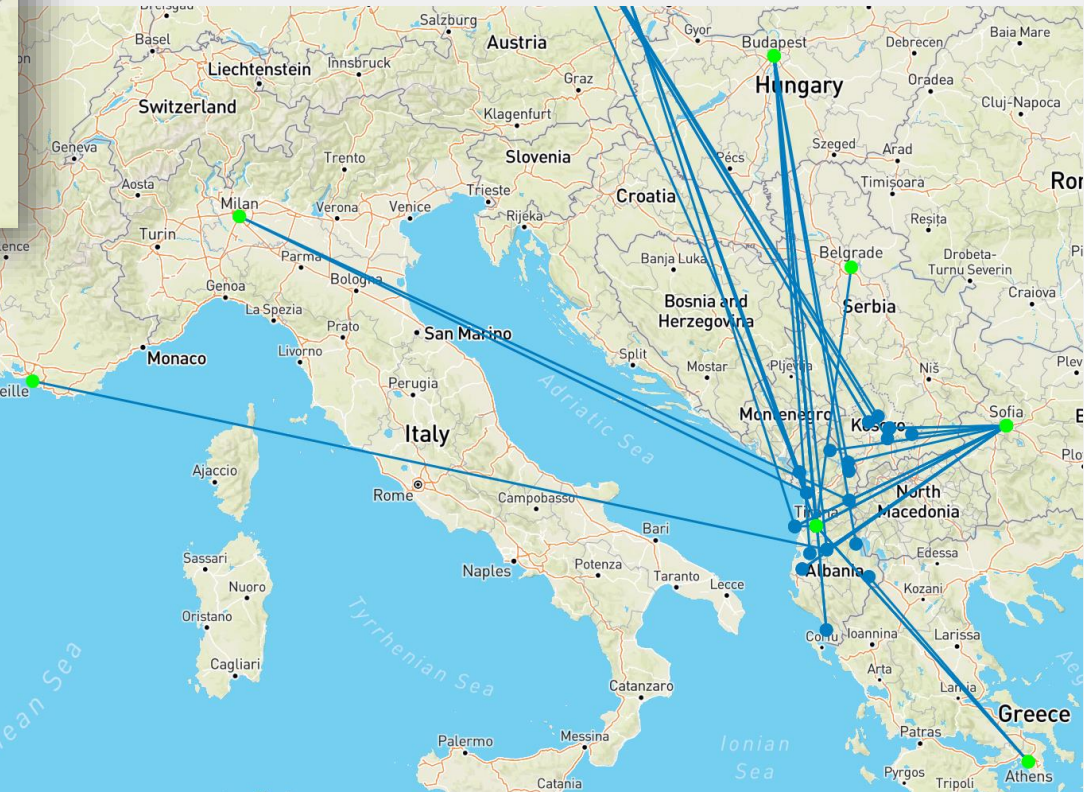
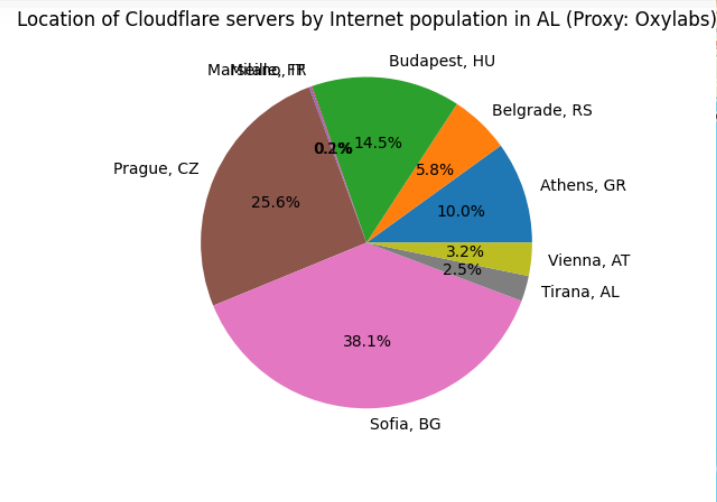
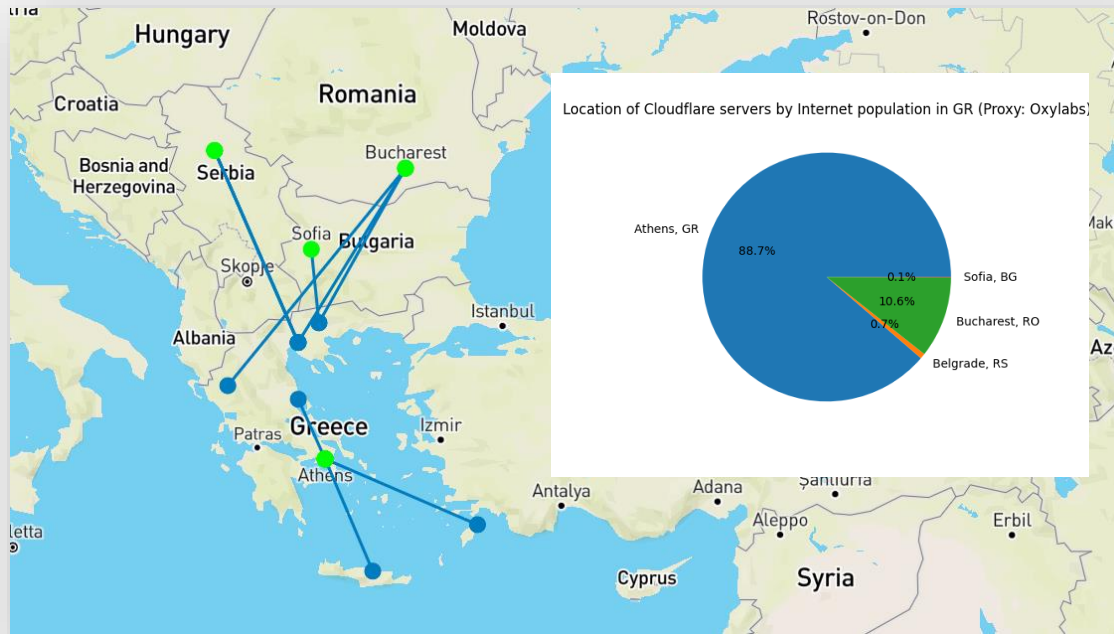
Location of Google servers by Internet population in GR (Proxy: Oxylabs)



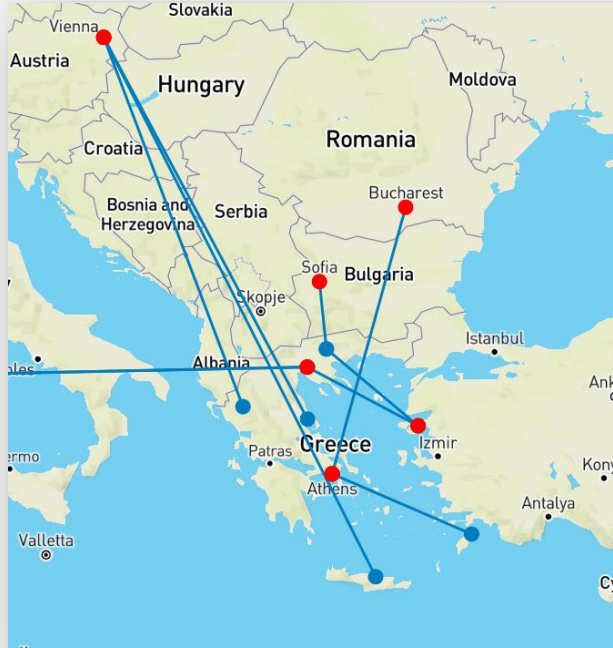
Location of Google servers by Internet population in AL (Proxy: Oxylabs)



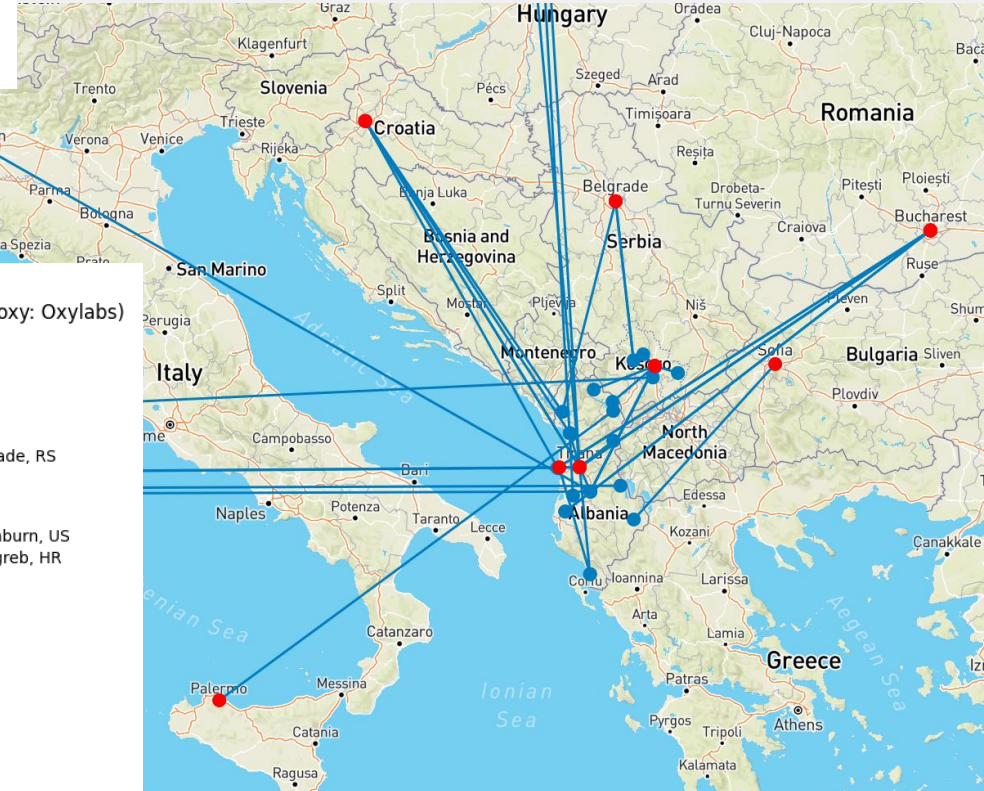
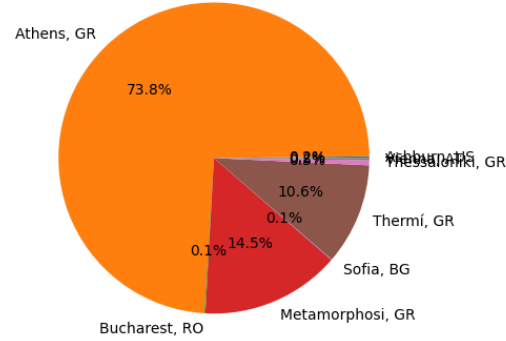
Greece and Albania: Cloudflare



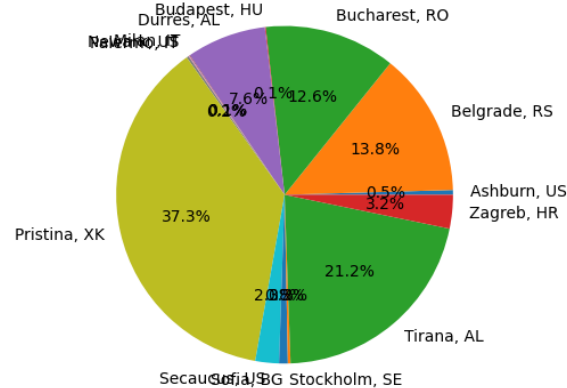
Greece and Albania: Netflix



Location of Netflix caches by Internet population in GR (Proxy: Oxylabs)

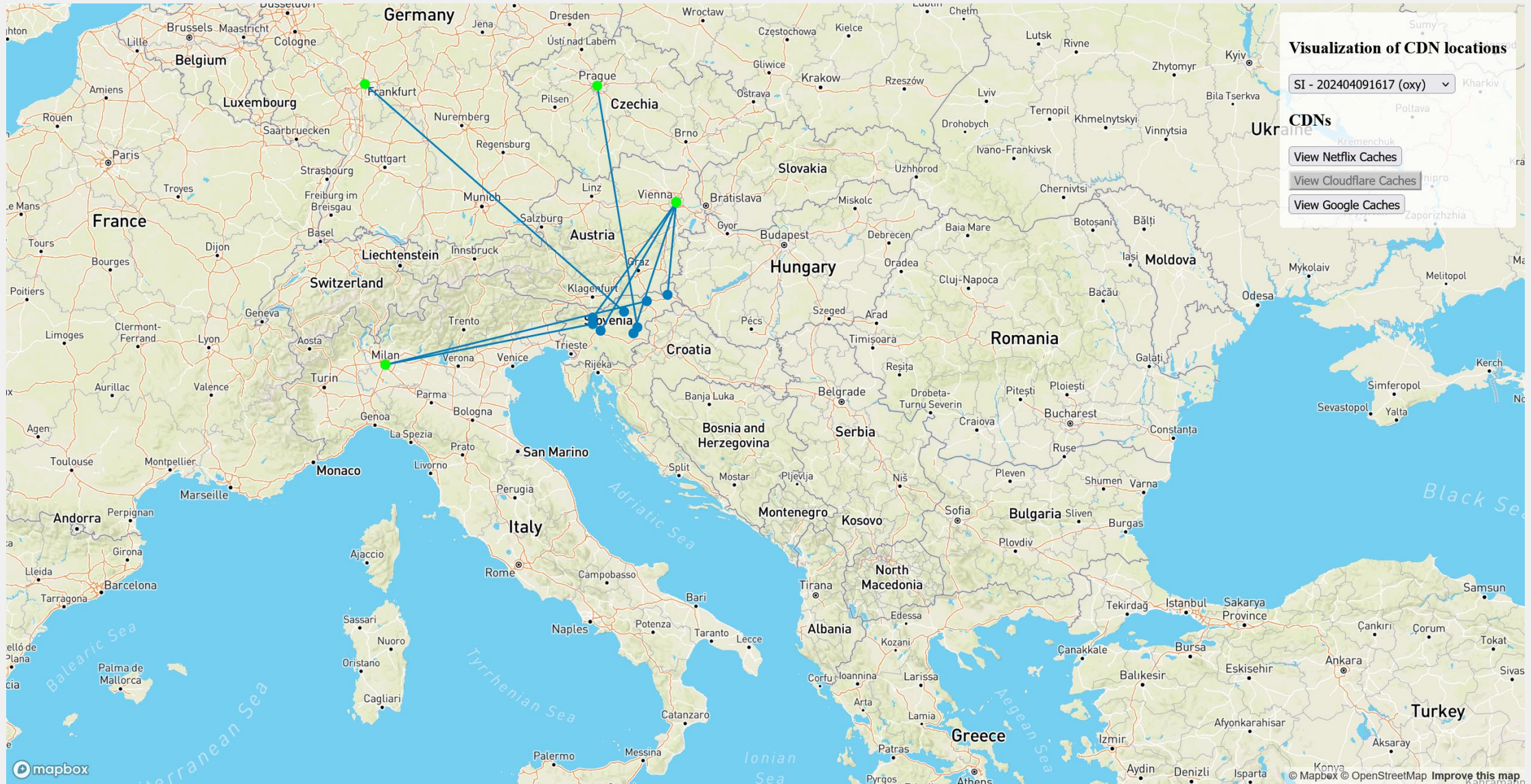


Location of Netflix caches by Internet population in AL (Proxy: Oxylabs)



Ask me for a demo

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A lot more **work** to be done

- Analyze other CDNs/OTTs
- Distinguish between ISP caches and IXP caches
- Filter by city/region (for larger countries)
- Integrate DNS analysis: do results vary if the DNS resolver changes?
- When the server name is not explicit: emulate a browser inspector
- Establish some measure of the distance between the client and the server
 - AS distance
 - Traceroute (e.g. through SOCKS5 where available)

Feedback and suggestions welcome!

Q&A

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