

ATNOG

Tools

AT:NOG 2024/1
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Über Mich:

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Dienstleistungen



Pre-Sales & Consulting
Team
Peering Management



Grundlagen Hierzu

- LIR = Local Internet Registry
- AS oder ASN = Autonomous System Number
- IPv4 oder IPv6 Prefix
- RIR = Regional Internet Registry
- IRR = Internet Routing Registry
ideally: operated by RIRs or others
- Route Objekte, ASN, AS-SET
- RPKI & ROA

Was ist das Problem?

- IP Hijacks
- Leaks

Was ist die „Lösung“

- Sauberes Filter auf IRR und RPKI Basis

Was ist das Problem der „Lösung“

- Die IRR und RPKI Basis

Beispiel #1

Prefixes originated by AS39912

Prefix ▼	RIR ⬆	BGP ⬆	RPKI ⬆	RIPE ⬆	Advice ⬆
77.220.96.0/20	RIPE NCC	39912	39912 ▶/20	39912 ✓	✓ Everything looks good
77.220.105.0/24	RIPE NCC		39912 ▶/24		? RPKI ROA exists, but prefix not seen in DFZ
77.220.111.0/24	RIPE NCC		39912 ▶/24		? RPKI ROA exists, but prefix not seen in DFZ
77.220.112.0/22	RIPE NCC	39912	39912 ▶/22	39912 ✓	✓ Everything looks good
77.220.120.0/21	RIPE NCC	39912	39912 ▶/21	39912 ✓	✓ Everything looks good
78.142.64.0/23	RIPE NCC	39912	39912 ▶/23	39912 ✓	✓ Everything looks good
78.142.68.0/22	RIPE NCC	39912	39912 ▶/22	39912 ✓	✓ Everything looks good
78.142.72.0/21	RIPE NCC	39912	39912 ▶/21	39912 ✓	✓ Everything looks good
78.142.96.0/20	RIPE NCC	39912	39912 ▶/24	39912 ✓	✓ Everything looks good

Beispiel #2

Prefixes originated by AS3549

Prefix ▼	RIR ⬆	BGP ⬆	RPKI ⬆	ALTDB ⬆	APNIC ⬆	ARIN ⬆	LACNIC ⬆	LEVEL3 ⬆	NTTCOM ⬆	RADB ⬆	RIPE ⬆	RIPE-NONAUTH ⬆	Advice ⬆
64.76.0.0/19	ARIN	3549											✖ No route objects match DFZ origin
64.76.9.0/24	ARIN	3549											✖ No route objects match DFZ origin
64.76.62.0/24	ARIN	3549									18678 , 19169 , 23520		✖ No route objects match DFZ origin ① Expected route object in ARIN, but only found in other IRRs ② No (covering) RPKI ROA found for route objects
103.82.131.0/24	APNIC	47582	3549 ▶/24, 134785 ▶/24, 206819 ▶/24		3549 ✓, 47582 ✓				206819 ✓	47582 ✓, 136162 ✓, 206819 ✓			✖ RPKI origin does not match BGP origin ① Multiple route objects exist with different origins, but DFZ only has one

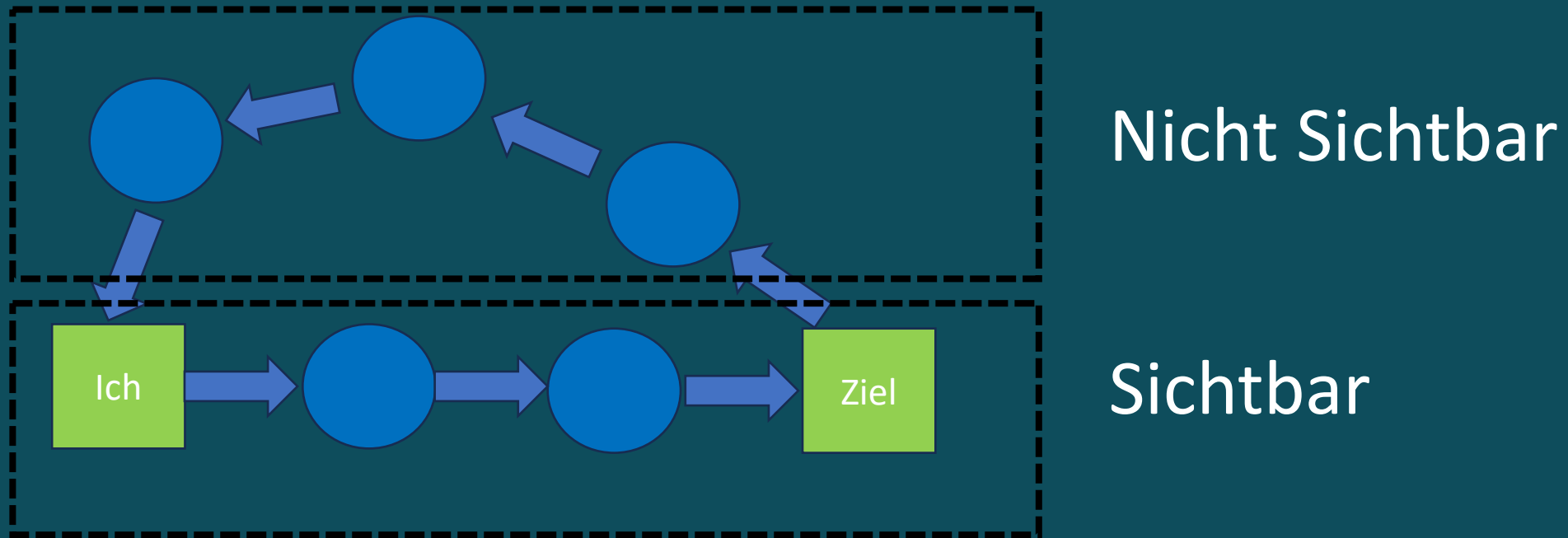
IRExplorer Fazit

- Sehr wichtiges Tool:
- ... zur Kontrolle und Fehlerbeseitigung
- ... um vergessene Einträge zu finden
- ... um Einträge zu finden die Dritte gesetzt haben



Grundlagen Hierzu

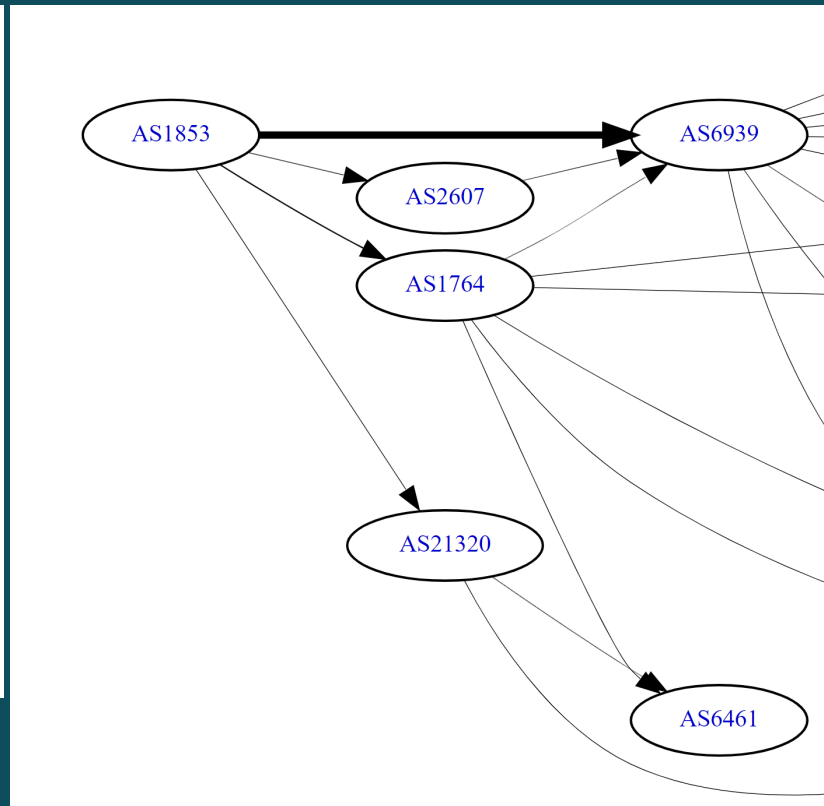
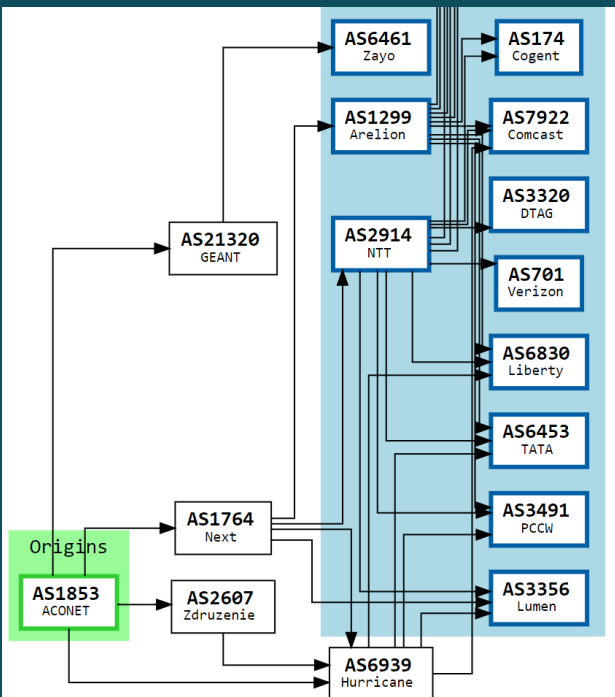
- RTT = Round Trip Time (vs. Latency), Ping, Traceroute



Lösungsidee: wir brauchen eine Traceroutemöglichkeit auf der Gegenseite / Aber auch: „erlaubtes“ Ping Ziel!

Grundlagen Hierzu

- Globaler BGP Tree – wer ist von wem Kunde?



1853 ACONET AConet Backbone, AT

Adjacency: 43 Upstream: 3 Downstream: 40

Upstream Adjacent AS list

[AS20965](#)

GEANT The GEANT IP Service, NL

[AS1764](#)

NEXTLAYER-AS, AT

[AS6939](#)

HURRICANE, US

Downstream Adjacent AS list

[AS34183](#)

BMG BMG Bundesministerium f. Gesundh

[AS1109](#)

UNI-SALZBURG University of Salzburg,

[AS1112](#)

Montanuniversitaet Leoben, AT

[AS1111](#)

University of Klagenfurt, AT

[AS1110](#)

University of Innsbruck, AT

[AS1115](#)

Austrian Academy of Sciences, AT

[AS1114](#)

Universitaet Graz, AT

[AS1117](#)

BOKU Universitaet fuer Bodenkultur W

[AS16314](#)

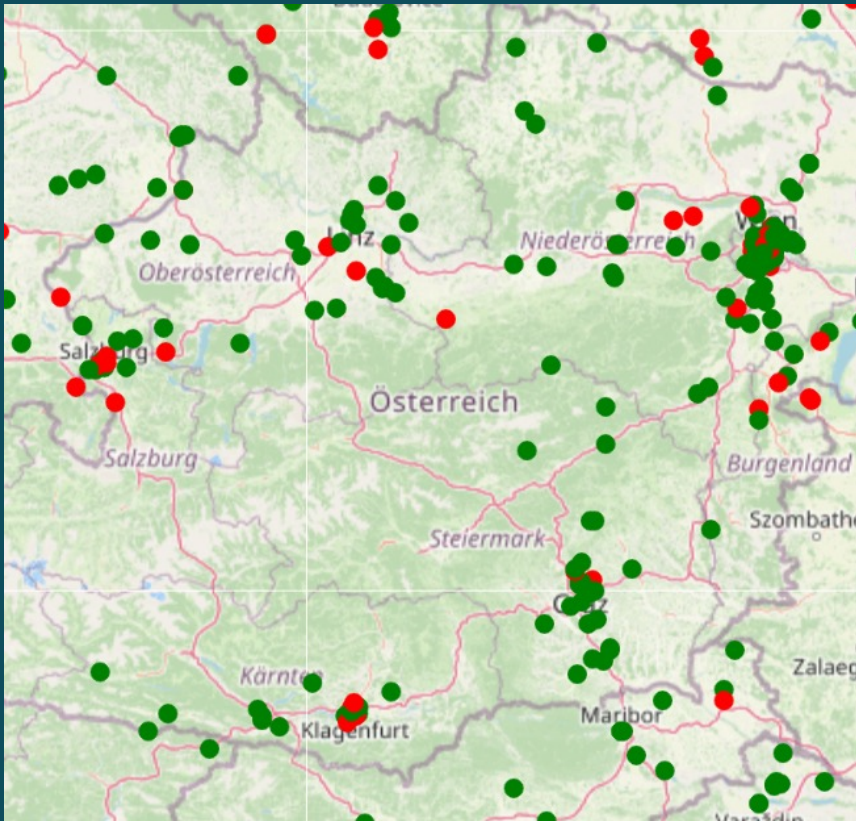
WIENKAV Stadlauer Strasse 54, AT

[AS13042](#)

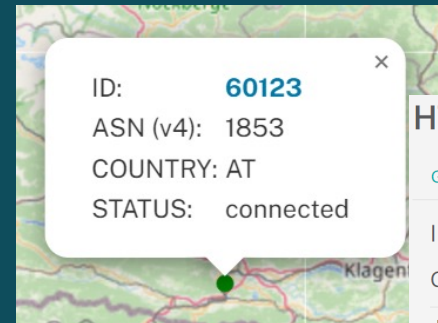
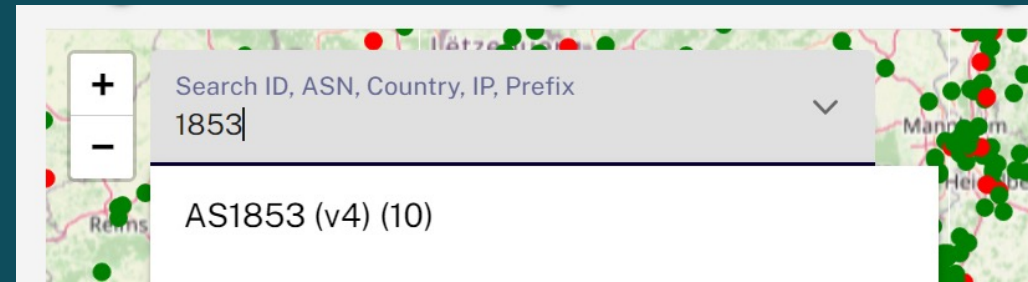
ASN-OENB- AT

- <https://bgp.tools> - <https://bgp.he.net/> - <https://www.cidr-report.org/>

Atlas Probes



- <https://atlas.ripe.net>



HTL Villach	
General	Network
Built-ins	UDMs
Status (beta)	
IPv4	IPv6
Current Configuration	Current Configuration
Internet Address	Automatic
ASN	
Local Address	
Gateway	
Netmask	
DNS Resolvers	

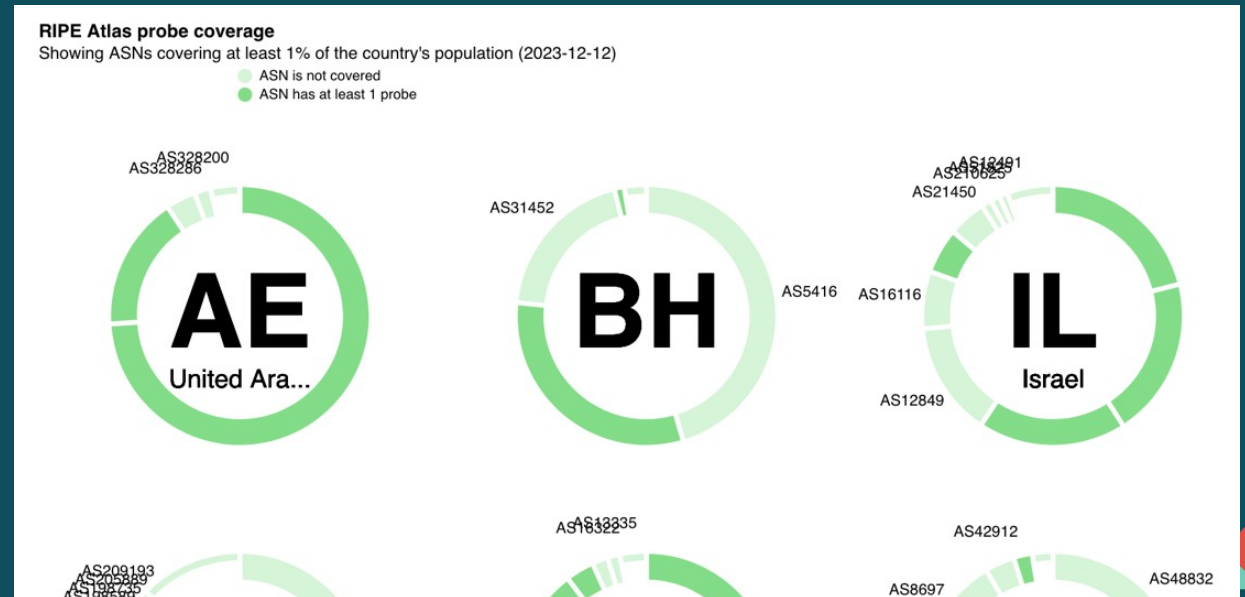
Beispiel – Kärnten Probes zu HTL Villach

Probe	ASN (IPv4)	ASN (IPv6)			Time (UTC)	RTT		Hops
50397	61201	61201	=	⬆️				
52794	61438	61438	=	⬆️				
60123	1853		=	⬆️	2024-02-21 07:41	0.526	█	1
6827	1111		=	⬆️	2024-02-21 07:42	2.244	█	6
7046	61098	61098	=	⬆️	2024-02-21 07:42	7.780	█	11
1004905	39912	39912	=	⬆️	2024-02-21 07:42	12.050	█	8
34181	62373				2024-02-21 07:42 UTC	12.155	█	9
7182	34785				Traceroute to 78.104.195.8 (78.104.195.8), 48 byte packets	12.777	█	8
50074	50226					12.905	█	6
15476	6798				1 193.186.86.2 AS8412 1.323ms 1.048ms 1.044ms	14.122	█	9
53208	8412				2 81.223.21.9 at-car-vill-pe01.as8412.net AS8412 1.713ms 1.645ms 1.631ms	14.835	█	9
6120	42473				3 217.25.122.187 at-vie03c-rc01.as8412.net AS8412 11.521ms 7.961ms 10.951ms	15.090	█	11
15439	6798				4 217.25.123.47 217-25-123-47.static.upcbusiness.at AS8412 7.717ms 7.562ms 7.583ms	15.149	█	9
					5 193.203.0.2 wien21.aco.net 7.157ms 7.149ms 8.714ms			
					6 193.171.18.57 klu2.aco.net AS1853 17.447ms 12.53ms 12.471ms			
					7 193.171.18.58 AS1853 15.272ms 16.427ms 14.171ms			
					8 78.104.195.1 AS1853 17.713ms 14.608ms 14.652ms			
					9 78.104.195.8 AS1853 15.131ms 14.232ms 14.835ms			

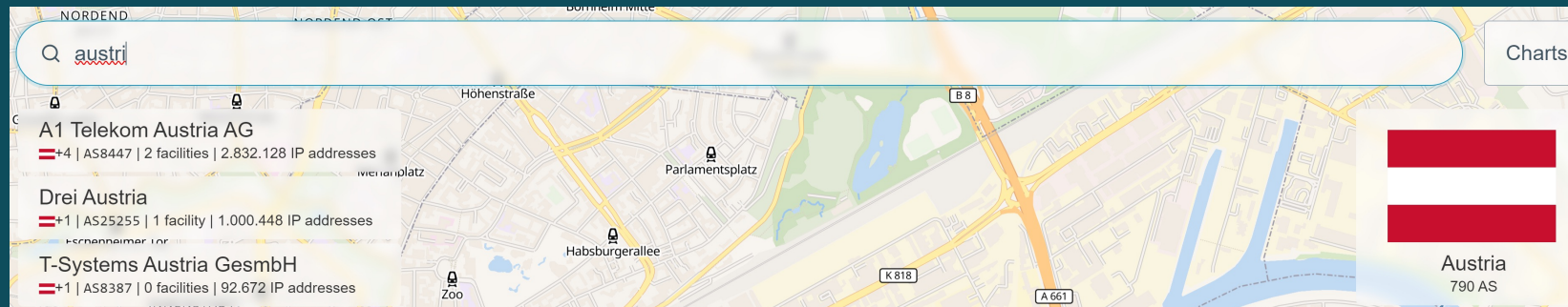
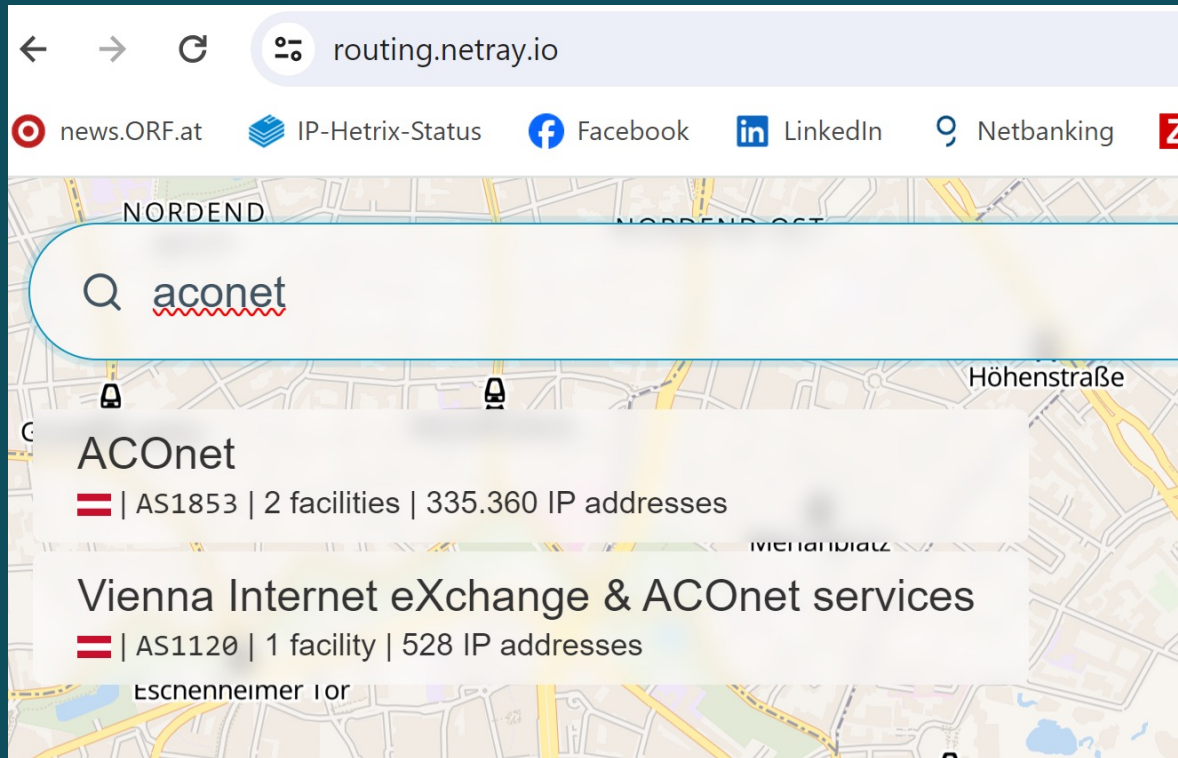
• <https://atlas.mnlg.net>

RIPE Atlas Fazit

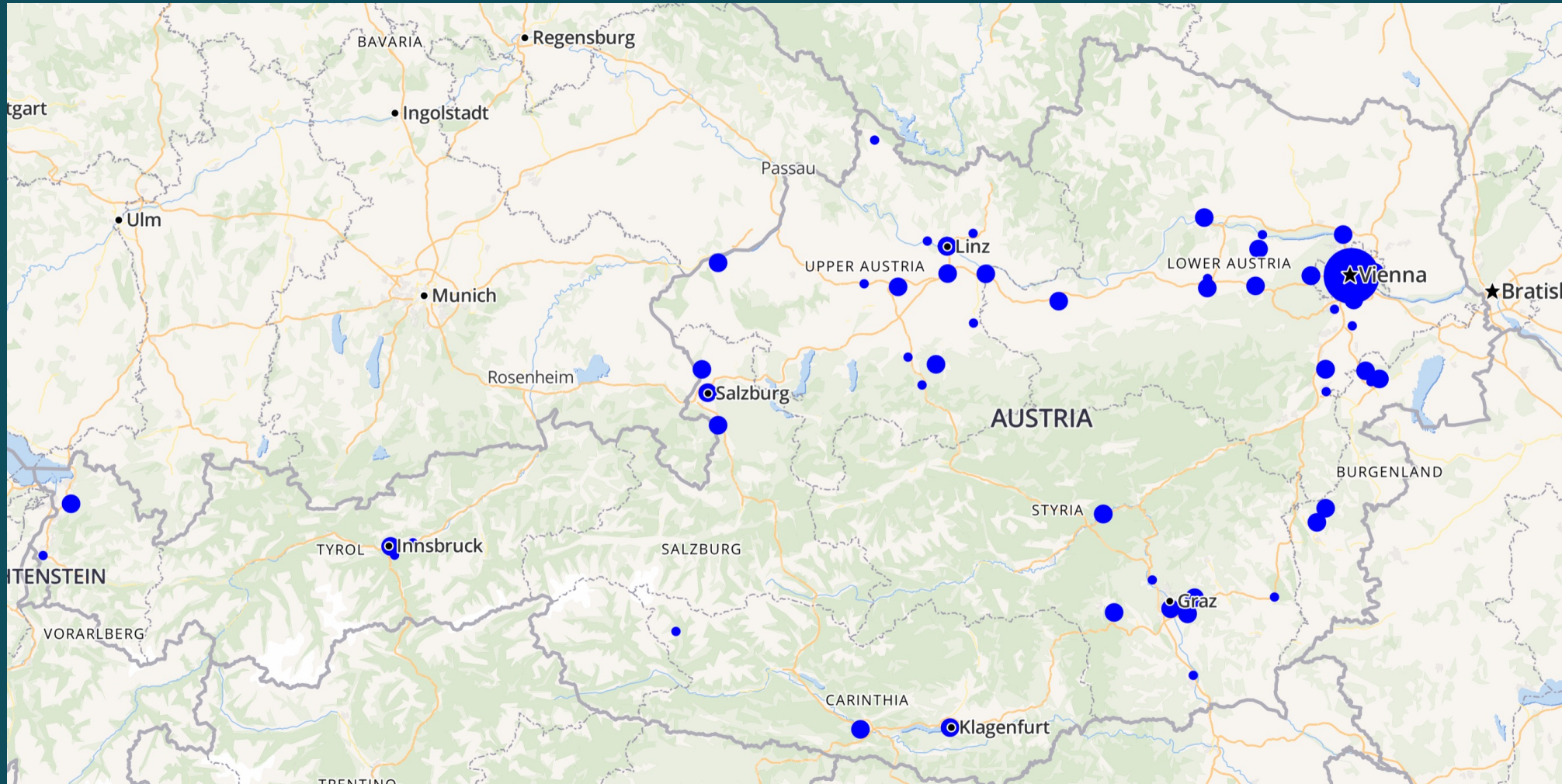
- Sehr wichtiges Tool für Engineers / Community
- Strategische Knoten sollten einen Anchor haben
- Bitte installiert Probes
- RIPE hat Länder die unterversorgt sind – bitte mithilfe



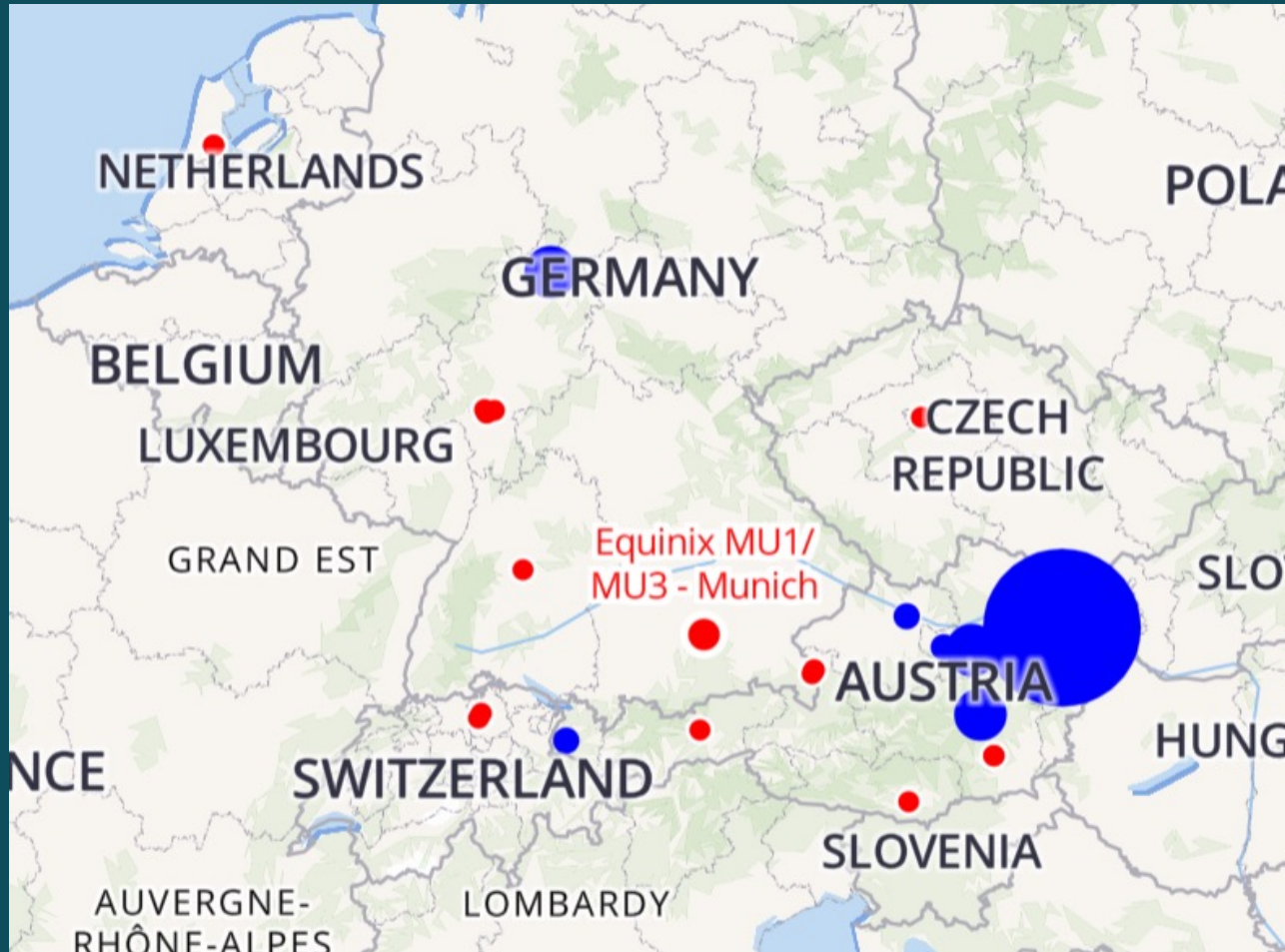
routing.netray.io



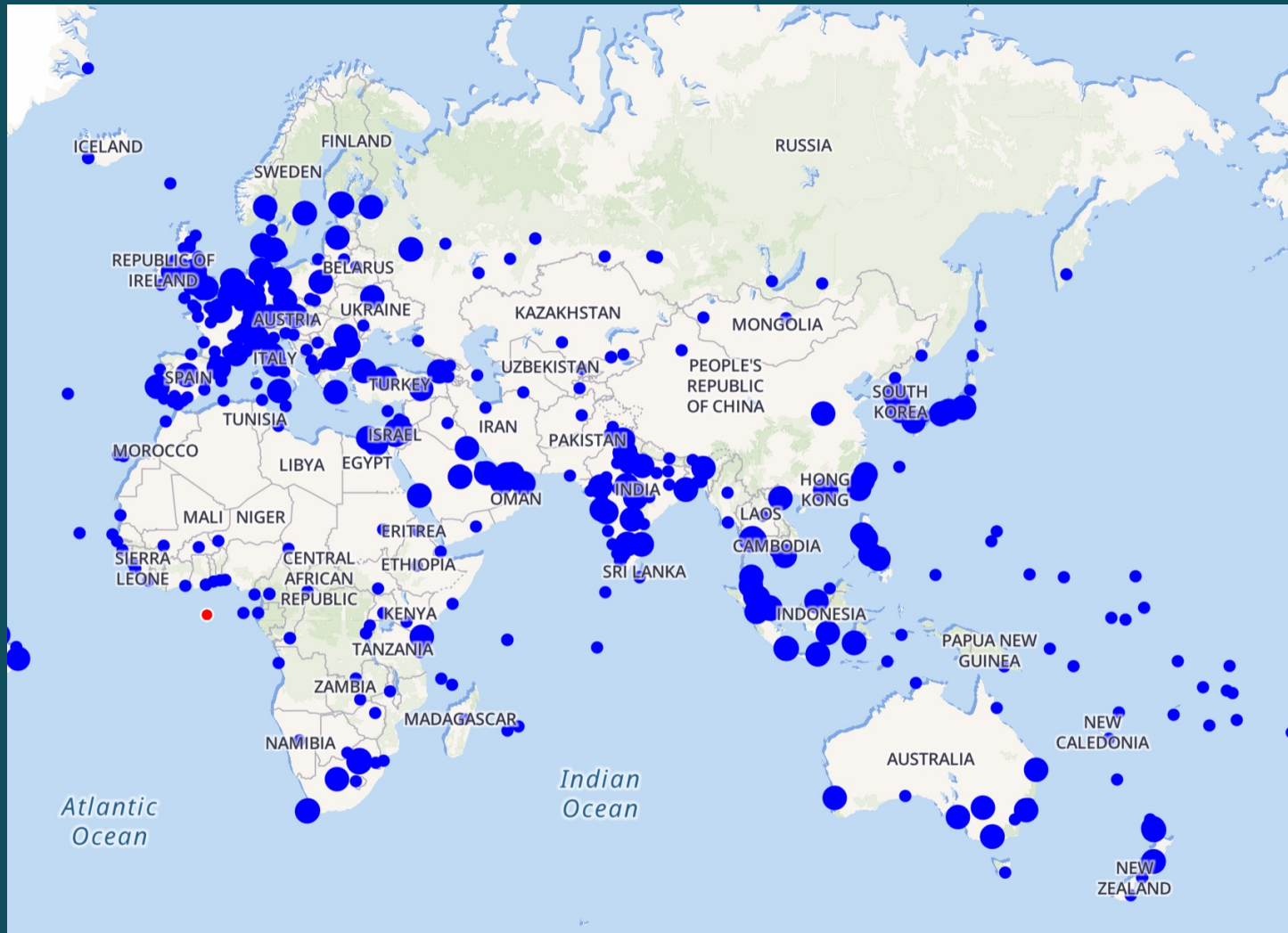
routing.netray.io => Bsp: AS1853



routing.netray.io => Bsp: AS1764



routing.netray.io => Bsp: Akamai




routing.netray.io => Bsp: Austria

 Austria

[AS Table](#) [Charts](#)

[Download table as CSV](#)

ASN	AS name	IPs	IPs in Reg. Country	Reg. Country	Present in Country
AS42	PCH AS42	59.136	67.0 %		 +90
AS174	Cogent Communications, Inc.	28.935.680	79.4 %		 +136
AS209	Lumen AS209	26.204.665	99.9 %		 +23
AS679	Unknown	132.096	100.0 %		
AS701	Verizon	43.023.104	99.8 %		 +41
AS702	Verizon - EMEA	6.037.504	0.2 %		 +24
AS714	Apple Inc.	45.642.496	89.6 %		 +53
AS715	Unknown	84.992	30.1 %		 +108

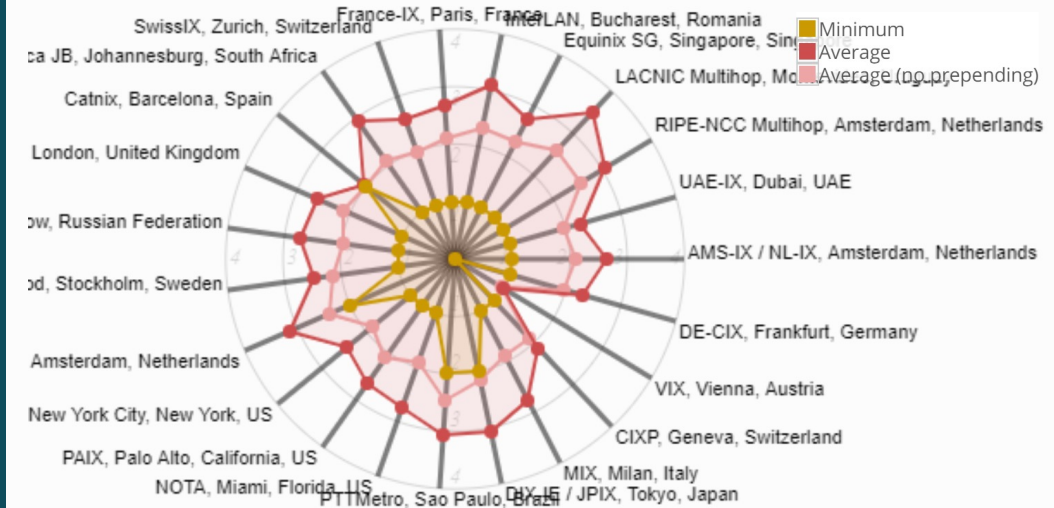
stat.ripe.net

Routing Status (AS1853)



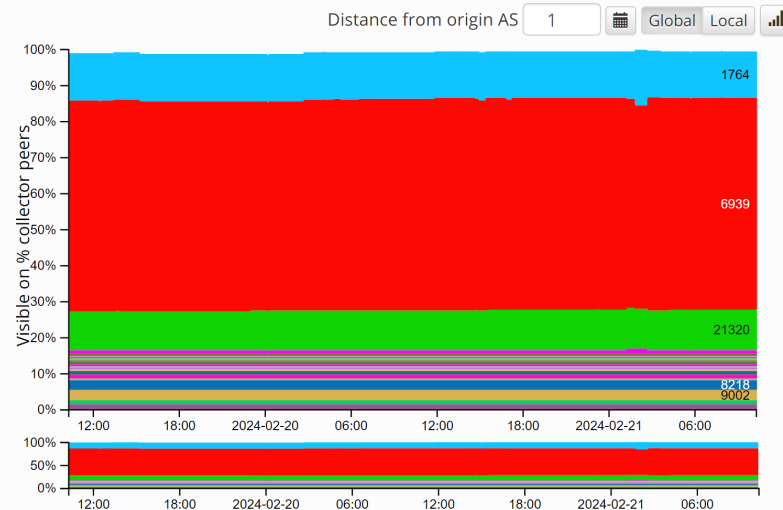
At **2024-02-21 00:00:00 UTC**, **AS1853** was visible to **100%** of 371 **IPv4** and **100%** of 378 **IPv6** RIS full peers.

AS Path Length (AS1853)



Showing results for AS1853 as of 2024-02-21 00:00:00 UTC

Upstream Visibility (78.104.0.0/16)

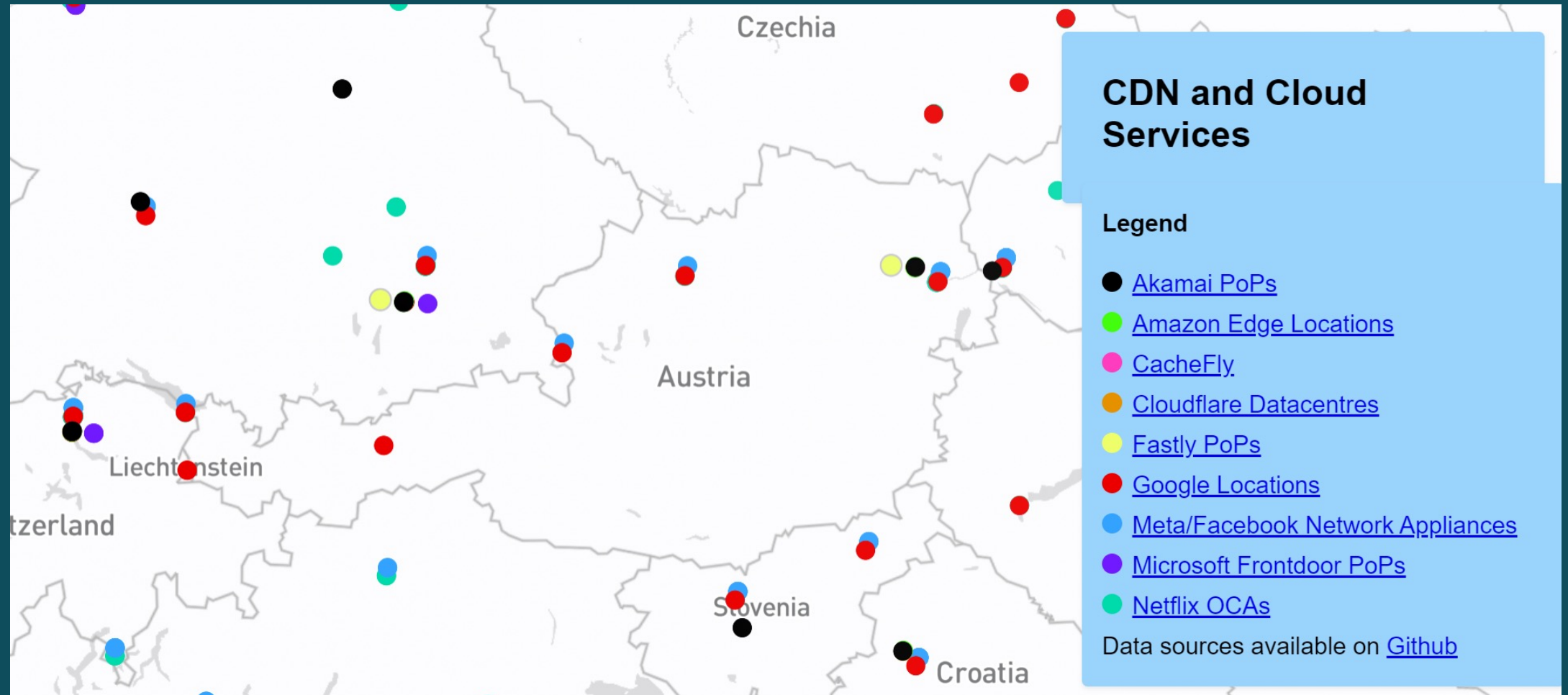


In collaboration with Compunet, Roma Tre

Bitte supported
Route Collectors
Ris.ripe.net
Routeviews
pch...

ATNOG

<https://opentelecomdata.org/cdns/>



Linksammlung

- <https://stat.ripe.net/>
- <https://opentelecomdata.org/cdns/>
- <https://routing.netray.io/>
- <https://atlas.ripe.net/>
- <https://bgp.he.net/>
- <https://www.peeringdb.com/>
- <https://irrexplorer.nlnog.net/>
- <https://bgp.tools/>
- <https://www.manrs.org/>
- <https://radar.qrator.net/>
- <https://radar.cloudflare.com/>
- <https://lg.de-cix.net/>
- <https://www.cidr-report.org/>

Final:

Danke