

Realtime route collector 1 year on

Ben Cartwright-Cox - RIPE86 Rotterdam



Quick overview of bgp.tools



AS206924

Browse the Internet ecosystem

Search by ASN (AS13335), or Prefix (8.8.8.0/24), or DNS (bgp.tools)

Start here...



You are connecting from

- IPv6: 2a0c:2f07:4663:4663:92e2:baff:fe61:c389
- Ben Cartwright-Cox (AS206924)
- 2a0c:2f07:4663::/48
- DNS: 185.230.223.109
- DNS: 2a0c:2f07:4896:666:216:3eff:feff:861f
- DNS: 2a0c:2f07:29:666::5353

Example Pages

- [Cloudflare \(AS13335\)](#)
- [LINX LON1](#)
- [Google DNS Prefix](#)

Recent Updates

- [March 2023 Changelog](#)
- [February 2023 Changelog](#)
- [January 2023 Changelog](#)

Why use BGP.Tools?

We offer for free:

- Near Realtime BGP Data
- User Friendly interfaces
- [Frequently updated external data](#)

We offer for paid users:

- [BGP Network Monitoring](#)
- [IRR Database Monitoring](#)

[Scripting/API](#) [Credits](#) [Pricing](#) [Contact Us](#) [Issue Tracker](#) [Contribute Data](#)

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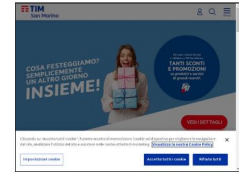
bgp.tools/as/15433

Start here...



Logged in as AS206924

View Edit



Telecom Italia San Marino S.p.A

AS Number 15433

Website <https://www.telecomitalia.sm>

Overview Prefixes Connectivity Whois

IX

Registered on
28 Jun 2000 (22 years old)

Network status
Active, Allocated under RIPE


Network type
Eyeball

Prefixes Announced
75 IPv4, 0 IPv6

Upstreams

57f4e • [AS6762](#) - Telecom Italia Sparkle S.p.A 8978c51

Global Looking Glass (recent)

```
Terminal
File Edit View Search Terminal Help
[10:25:42] ben@eshwill:~$
[10:25:42] ben@eshwill:~$ ssh anything@bgp.tools
Welcome 2a00:23ee:14f0:609f:a435:234f:406d:9a26 This session is supported by:

bgp.tools> show route 1.1.1.0/24 match 1003 short
[AS1003 - andrewnet] MCIv4          ] [1003 12186 174 13335] {[1003
:1300 1003:1302 1003:1306 12186:30000]}
[AS1003 - andrewnet] MCIv4          ] [1003 13335] {[1003:1300 1003
:1301 1003:1314 13335:10125 13335:19000 13335:20050 13335:20500 13335:20530]}
[AS1003 - andrewnet] MCIv4          ] [1003 13335] {[1003:1300 1003
:1301 1003:1315 13335:10094 13335:19000 13335:20050 13335:20500 13335:20530]}
[AS1003 - andrewnet] TORv4          ] [1003 835 13335] {[835:11000
1003:1200 1003:1201 13335:10029 13335:19000 13335:20050 13335:20500 13335:20530
62513:11000]}
bgp.tools>
```



Web UI | Terminal UI

Query all public BGP sessions connected to bgp.tools


Lookup by CIDR, only applies to sessions that have been marked to be exported publicly

Search Filters:

Must Contain ASN:

Query Overview:

322 Sessions Responded
451 Matching Paths Displayed

Supported by: 

185.230.223.0/24 unicast [AS35487 - edge-ng-los01 0000-00-00] * (?/-) [AS206924]

Type: BGP
BGP.as_path: 35487 8849 5511 206924
BGP.community: (56630,3000) (56630,3057) (57695,13000)
unicast [AS1003 - TORv4 0000-00-00] * (?/-) [AS206924]

Type: BGP
BGP.as_path: 1003 835 174 5511 206924
BGP.community: [AS174: Route is learned from EU (Europe) non-customer.] [AS174: United Kingdom] [AS835: Source: Cogent Transit] (1003,1200) (1003,1201) (62513,10000)
BGP.large_community: (206924, 666, 0) (206924, 5511, 0)
unicast [AS34979 - 39D-TEL-02 0000-00-00] * (?/-) [AS206924]

Type: BGP

IXP Info Pages

MIX-IT

 [Go to PeeringDB page](#)



 [Go to IXP-DB page](#)

Data Feeds Available:

RS Feed, Ping, MAC Address

Do you run this IX and want to help with feeds? [Contact Us!](#)

List of members (393 routers over 347 ASNs):

ASN	Description	IPv4	IPv6
 <input checked="" type="checkbox"/> AS16004	MIX S.r.L. - Milan Internet eXchange	217.29.66.1	2001:7f8:b:100:1d1
 <input checked="" type="checkbox"/> AS5392	TELNET S.r.l.	217.29.66.5	2001:7f8:b:100:1d1
 <input checked="" type="checkbox"/> AS12654	RIPE NCC - RIS	217.29.66.6	2001:7f8:b:100:1d1
 <input checked="" type="checkbox"/> AS42692	Overweb Srl	217.29.66.7	2001:7f8:b:100:1d1
 <input checked="" type="checkbox"/> AS25152	RIPE - K-ROOT	217.29.66.8	2001:7f8:b:100:1d1
 <input checked="" type="checkbox"/> AS1267	WIND TRE S.P.A.	217.29.66.9	2001:7f8:b:100:1d1
 <input checked="" type="checkbox"/> AS33891	Core-Backbone GmbH	217.29.66.10	2001:7f8:b:100:1d1

MINAP Milan

 [Go to PeeringDB page](#)

 [Go to IXP-DB page](#)

Route Server ASN: [AS43369](#)
















Data Feeds Available:

RS Feed, Ping, MAC Address

Top Vendors

Vendor	%
 Cisco Systems, Inc	26%
 Juniper Networks	24%
 Routerboard.com	17%
 MIX s.r.l.	6%
 Arista Networks	6%

List of members (93 routers over 82 ASNs):

ASN	Description	IPv4	IPv6	Speed
   AS12637	Seeweb s.r.l.	185.1.114.2	2001:7f8:c5::a501:2637:1	10 gbps
   AS8816	Metrolink S.R.L.	185.1.114.3	2001:7f8:c5::a500:8816:1	10 gbps
   AS5392	TELNET S.r.l.	185.1.114.4	2001:7f8:c5::a500:5392:1	10 gbps
   AS20836	CDLAN SpA	185.1.114.5	2001:7f8:c5::a502:0836:1	10 gbps
   AS20848	TWT S.p.A.	185.1.114.6	2001:7f8:c5::a502:0848:1	20 gbps



bgp.tools

Traceroutes/Looking Glass/Agents

Orange S.A.

AS Number **5511**

BGP

Select BGP Session to query:

London [IPv4] [IPv6]

Input Prefix:

80.80.80.80

Query

```
80.80.80.0/24      unicast [London 0000-00-00] * (?/-) [AS60679]
Type: BGP
BGP.as_path: 5511 3356 30247 60679
BGP.community: [AS5511: United Kingdom] [AS5511: Route received from peering partner]
[AS5511: Route received in Europe from peering] [AS5511: TUNE announce to US peers]
```

You need a [bgp.tools](#) (free) +
RIPE Atlas account for this



RIPE Atlas

There are 392 [RIPE Atlas Probes](#) on this ASN.

Select up to 10 probes at random

Traceroute to:

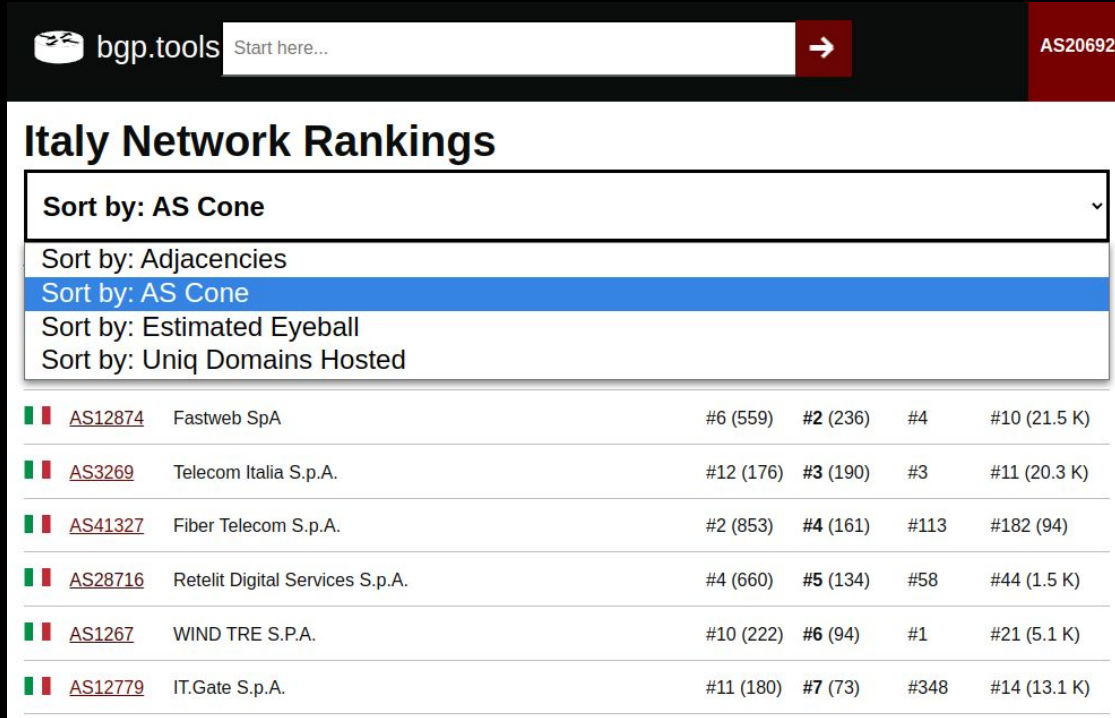
185.230.223.145

Request Traceroute

```
Still waiting on results from RIPE Atlas...
Still waiting on results from RIPE Atlas...
Still waiting on results from RIPE Atlas...
Still waiting on results from RIPE Atlas...
RIPE Atlas Link: https://atlas.ripe.net/measurements/54355868/#general
Start: 2023-05-23T17:26:54Z (Probe: 32064)
HOST: 91.53.213.194
  1. AS0      192.168.179.1      0.0%  1.2
  2. AS3320  p3e9bf082.dip0.t.ionconnect.de..... 0.0%  5.4
  3. AS3320  pac.scs2.l.PAB.FR.NET.DTAG.DE..... 0.0%  24.1
  4. AS5511  193.251.143.83    0.0%  29.0
  5. AS5511  81.52.166.48     0.0%  30.8
  6. AS5511  193.251.143.108  0.0%  31.1
  7. AS0     ???               100.0  0.0
  8. AS0     ???               100.0  0.0
  9. AS206924  beaj0jo.co.uk..... 0.0%  30.9
```

57f4eb6f1d6cd79bae97580e78978c51

Network Ranking



bgp.tools Start here... → AS206924

Italy Network Rankings







Sort by: AS Cone

Sort by: Adjacencies

Sort by: AS Cone

Sort by: Estimated Eyeball

Sort by: Uniq Domains Hosted

 AS12874	Fastweb SpA	#6 (559)	#2 (236)	#4	#10 (21.5 K)
 AS3269	Telecom Italia S.p.A.	#12 (176)	#3 (190)	#3	#11 (20.3 K)
 AS41327	Fiber Telecom S.p.A.	#2 (853)	#4 (161)	#113	#182 (94)
 AS28716	Retelit Digital Services S.p.A.	#4 (660)	#5 (134)	#58	#44 (1.5 K)
 AS1267	WIND TRE S.P.A.	#10 (222)	#6 (94)	#1	#21 (5.1 K)
 AS12779	IT.Gate S.p.A.	#11 (180)	#7 (73)	#348	#14 (13.1 K)

Can be ranked by Global or ASN Country using:

- Peer Count (*)
- AS Cone
- Eyeball Population
- Domain Records

* is improved by feeding bgp.tools BGP data

Possibly interesting recent improvements to the site

- The site now has a place to document BGP community values
- AS-SET decoding has been implemented
- Client side Agent software is available for testing (for traceroutes etc)
- RPKI ASPA support has been added
- Historical Graph data is being recorded for monitoring users
- Table dumps (not MRTs) are being produced for CAIDA
- IX-F feeds are used over PeeringDB where available

Core BGP points

- 940~ BGP sessions established
- Still practically real time BGP data updates on the website

- I feel like I'm reaching some of the limit of networks willing to eBGP peer over the internet
- I also think there is too low visibility of IXP Route Servers
- So bgp.tools is moving into exchanges just like RIPE RIS and RouteViews

Expanding to IXPs

Getting route server data and beyond

Peering LAN first

- RIS/RV collectors live on IXPs
- Kind of a mess of IXP peers just sending their customer cone, not their full table
- Some have hit capacity limits, etc

Name	Physical Location	Type	Scope	Raw Data
RRC00	Amsterdam, NL	multihop	global	data
RRC01	London, GB	IXP	LINX, LONAP	data
RRC03	Amsterdam, NL	IXP	AMS-IX, NL-IX	data
RRC04	Geneva, CH	IXP	CIXP	data
RRC05	Vienna, AT	IXP	VIXP	data
RRC06	Otemachi, JP	IXP	DIX-IE	data
RRC07	Stockholm, SE	IXP	Netnod	data
RRC10	Milan, IT	IXP	MIX	data
RRC11	New York, NY, US	IXP	NYIIX	data
RRC12	Frankfurt, DE	IXP	DE-CIX	data
RRC13	Moscow, RU	IXP	MSK-IX	data
RRC14	Palo Alto, CA, US	IXP	PAIX	data
RRC15	Sao Paulo, BR	IXP	PTTMetro-SP	data
RRC16	Miami, FL, US	IXP	Equinix Miami	data
RRC18	Barcelona, ES	IXP	CATNIX	data
RRC19	Johannesburg, ZA	IXP	NAP Africa JB	data

Rough Comparisons

- RIPE has ~1535 BGP sessions online,
 - 372 / 407 Full IPv4/IPv6 tables
 - (by their own calculations)
 - Some of these sessions have issues about to be mentioned, **some are immensely useful views of the internet though!**

Rough Comparisons

- RIPE has ~1535 BGP sessions online,
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 - Some of these sessions have issues about to be mentioned, **some are immensely useful views of the internet though!**
- bgp.tools is 99% eBGP Multihop only
 - 940~ Sessions online
 - 634 / 927 Full IPv4/IPv6 tables (!!)

Problems with IXP Route Collection

- **Huge** bias to AS6939
 - They are on almost all of the large IXPs, and provide you 180k+ of peered v4 routes that will likely be preferred over transit, hiding possibly interesting transit paths from the collector

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- **Huge** bias to AS6939
 - They are on almost all of the large IXPs, and provide you 180k+ of peered v4 routes that will likely be preferred over transit, hiding possibly interesting transit paths from the collector
- Really expensive if you don't have friends
 - IXP Membership fees + XC fees + colo fees
 - IXP membership alone can be more than the last two
 - <https://peering.exposed>

Solving for XC Fees / Colo

- What is the cheapest, smallest, most insane thing we could ship to a *willing* IXP?

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bgp.tools

<https://blog.benjojo.co.uk/post/smart-sfp-linux-inside>

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Solving for XC Fees / Colo

- What is the cheapest, smallest, most insane thing we could ship to a *willing* IXP?



- No XC, The switch is the power supply, you can hitch backhaul either via someone friendly on the IXP, or relaying via a VPS from a provider that is on the IXP
- Cheap, Around 150 USD all in
- Single core ARMv7, with 512M of RAM running Debian Jessie
- **Completely crazy.** People are a little apprehensive about this device!



bgp.tools

<https://blog.benjojo.co.uk/post/smart-sfp-linux-inside>

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Creative solutions are available



bgp.tools

Creative solutions are available



- Runs a 400Mhz~ 32bit MIPS core, 32MB of RAM
 - The constrained RAM and MIPS CPU μ Arch makes this a challenge to program for
 - Thankfully Zig lang has a mostly working MIPS target!
 - To use as a generic "Linux box" you must perform *some software changes*
 - Vendor has been really keen and helpful with modding these
-
- Similar tech is available via Huawei/Nokia/FS.COM (they share a chipset and design) for 80 USD~ per optic

The actual preference tree

1. Some IXPs have VM infrastructure on the exchange that is easy to use, bgp.tools can run a relay in 128MB of RAM and very low CPU requirements
2. Those magic Linux optics are easy and convenient to ship around
 - But are mildly scary for some, also 1G only, and IXPs are sunseting 1G ports
3. At worst I can ship physical 1U hardware around
 - Ideally want to try and land as many IXPs in a single machine to conserve funds

All sessions lead back to London

- You have have noticed it isn't really possible to store a *modern* full internet table on 32MB of RAM.
- Instead of storing sessions locally, the local collector will "rehost" the BGP session back in London where all of the website infrastructure is.
- This is because with how bgp.tools is designed, all BGP data has to be within 3ms~ of the web server to ensure a enjoyable experience

Current progress

- NL-IX is up, Online in South African INX exchanges (JINX,DINX,CINX), Up on ONIX, More to come!
- Some IXPs are setting up eBGP multihop sessions from their route servers!
 - Route server feeds from MINAP, ERA-IX Amsterdam, GPC Missouri

Setting up feeds is easy

Go to (PeeringDB SSO is supported):

<https://bgp.tools/kb/setup-sessions>

You can **instantly** setup eBGP MultiHop Sessions to bgp.tools. Where you **should** export a full table.

Export to 3rd parties/Looking Glass visibility is entirely optional!



bgp.tools

New BGP Session:

Description for Router/Session: (max 16 chars)

LHR01

Select the ASN you would like us to use for you. We will only accept [AS212232 \(bgp.tools\)](#), AS206924 AS212232, and Private ASN ranges

212232

Select the ASN you are going to use with us. We will only accept AS206924 AS212232 and Private ASN ranges

206924

Select the IP you will be connecting from.

192.0.0.1 / 2001:db8::

You will get the remote (bgp.tools side) IP after you create the session.

Please send **Full tables** rather than just your peering routes/customer routes. bgp.tools may automatically switch your sessions to only import your peering routes to save RAM, but allow us to figure that out for future flexibility!

We support (and encourage) BGP AddPath, and MultiProtocol/MultiFamily BGP

If you absolutely need a MD5 Password on the session, please enter the desired MD5 password

Export this data into publicly available MRT files (also enables the public looking glass)

Also allow commercial products to use those MRT files

Send notifications if session is down for more than 2 hours

Create BGP Session

Questions?

Want to feed bgp.tools?

go to bgp.tools and go to bottom link "Contribute Data"

More complex queries:

IRC: Benjojo-bgptools (terahertz) / benjojo (everything else)

Or email: admin@bgp.tools (I'm here until Friday)



bgp.tools