



**RIPE NCC**  
RIPE NETWORK COORDINATION CENTRE

# OpenIPmap

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# Reasons

## 1. Increased interest in IP geolocation

- Content providers, researchers
- <https://www.ripe.net/manage-ips-and-asns/db/tools/geolocation-in-the-ripe-database>

## 2. A unified geographical data format is needed

- Across all our tools
- Enabling future geographical investigations
- Accurate information

## 3. IP geolocation is extremely difficult

- Various approaches, some of them not accurate enough to be used singularly
- Academia is working on it! Let's work together

**FOCUS ON  
Infrastructure**

# /locate



<https://openipmap.ripe.net/locate/83.163.50.165/best>

```
{
  "location": {
    "score": 145,
    "countryCodeAlpha3": "NLD",
    "countryCodeAlpha2": "NL",
    "cityPopulation": 147590,
    "stateAnsiCode": "07",
    "pointGeometry": "0101000020E61000005C72DC291D8C12401B81785DBF304A40",
    "cityNameAscii": "Haarlem",
    "stateIsoCode": "NL-07",
    "countryName": "Netherlands",
    "stateName": "North Holland",
    "longitude": 4.63683,
    "geonameId": 2755003,
    "latitude": 52.38084,
    "cityName": "Haarlem",
    "type": "city",
    "id": "HAARLEM-NL-07-U173CX8KTBR196ECJF92"
  },
  "meta": {
    "distribution": {
      "version": "17.9.18.1"
    },
    "service": {
      "version": "0.0.1"
    },
    "request": {
      "params": {
        "ip": "83.163.50.165"
      },
      "query": {}
    }
  }
}
```

\*queries can be bundled with:

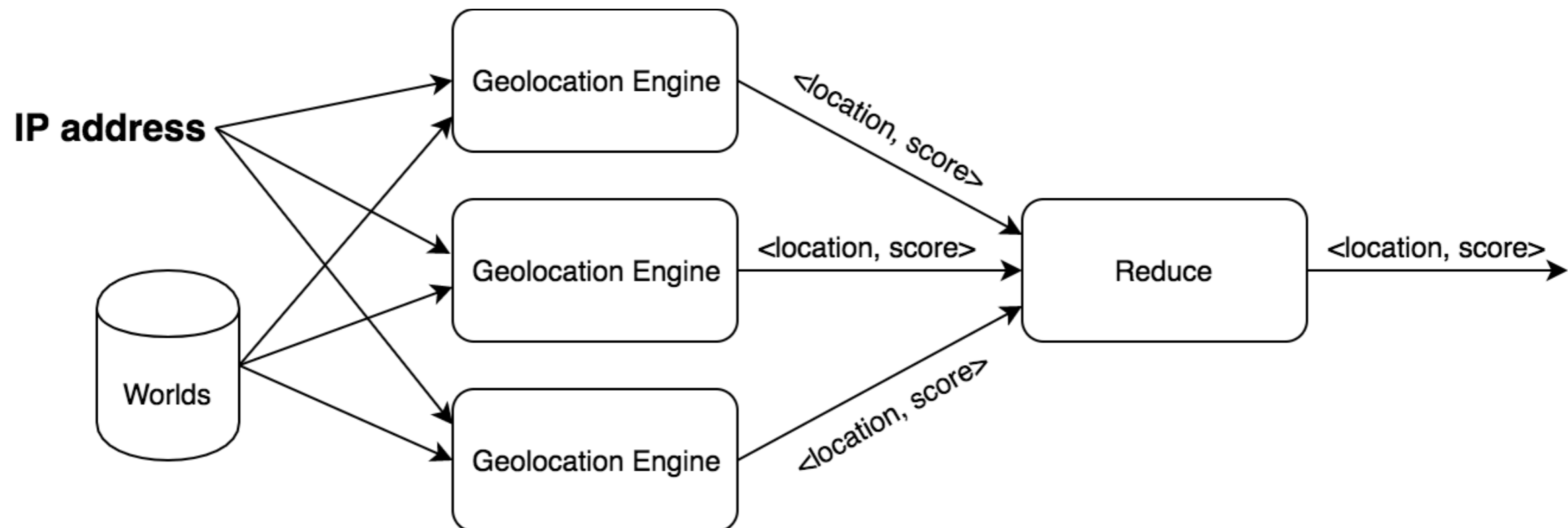
[https://geo.ripe.net/locate/all?  
resources=ip1,ip2,ip3](https://geo.ripe.net/locate/all?resources=ip1,ip2,ip3)



# Multi-Approach Geolocation

Various engines contribute to geolocation

- Each of them is applicable only in some cases
- Some of them are used to remove false positives
- Each of them has a score factor
- Easy integration with third-party work!



# /locate



<https://geo.ripe.net/locate/83.163.50.165/partial>

```
{
  "partials": [
    {
      "engine": "probeslocation",
      "description": "Probes location suggestor - based on user setting",
      "scoreFactor": 10,
      "locations": [...] // 1 item
    },
    {
      "engine": "anycastparistech",
      "description": "Anycast engine - Paristech dataset",
      "scoreFactor": 10,
      "locations": []
    },
    {
      "engine": "crowdsourced",
      "description": "Crowdsourced engine",
      "scoreFactor": 9,
      "locations": []
    },
    {
      "engine": "triangulation",
      "description": "Triangulation engine (if empty try in 3 minutes, triangulation requires time)",
      "scoreFactor": 5,
      "locations": [...] // 20 items
    }
  ],
  "meta": {
    "distribution": {
      "version": "17.9.18.1"
    },
    "service": {
      "version": "0.0.1"
    }
  }
}
```

# /locate - Active geolocation

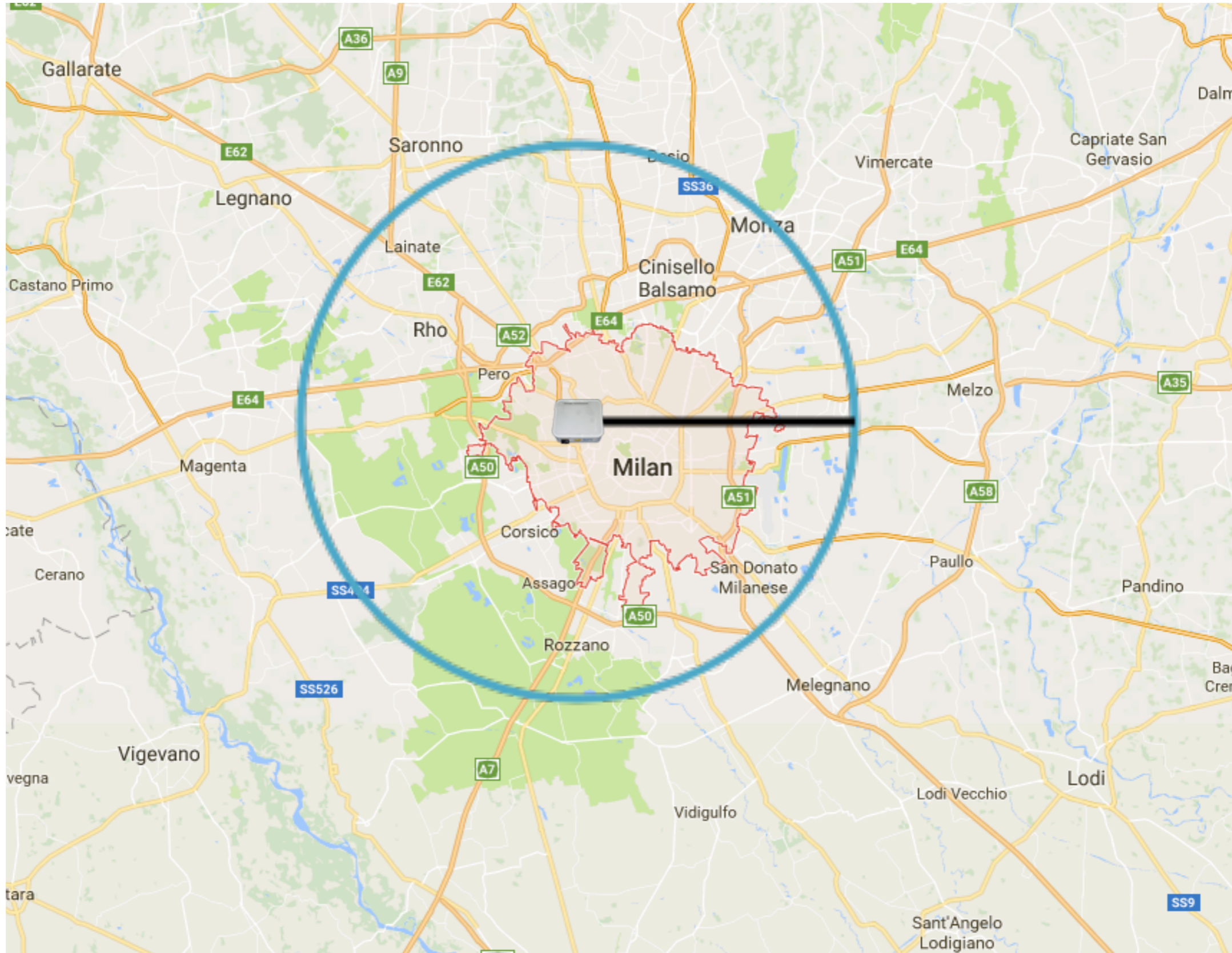


1. If the IP has not been measured yet, a new Ping measurement starts

- Peering DB data and BGP data are used to reduce the locations probed
- Score based on RTT, only RTT <10ms are considered
- PeeringDB facilities and population bust the score
- A list of possible locations is returned
- We are working on it! (Contributions are welcome!)



# /locate - Active geolocation



# OpenIPmap



1. A topological network view is not enough - sometimes you need to see IPs on a map
  - To make sense of RTTs
  - To understand network relationships among countries
  - To verify your geographical optimisation policies
2. Crowdsourcing data by using a map
  - Easier than using the API for occasional use
  - Exposes wrong geolocations
  - Improves accuracy of the crowdsourced data



# OpenIPmap Demo

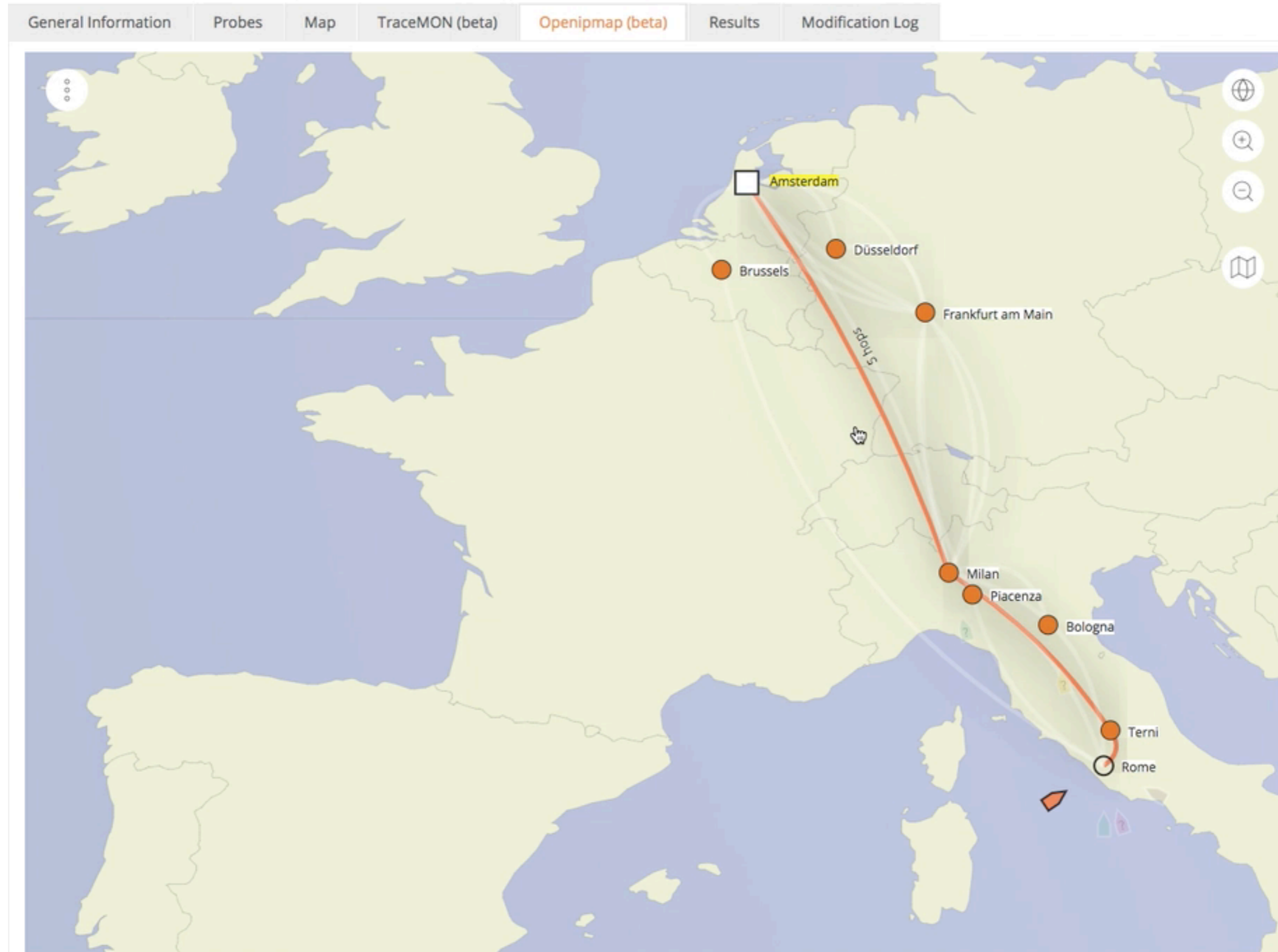


A screenshot of the RIPE NCC website. The top left features the RIPE NCC logo and the text "RIPE NCC RIPE NETWORK COORDINATION CENTRE". To the right, there are two tabs: "RIPE Database (Whois)" and "Website". Below the tabs is a search bar with the text "Search IP Address or ASN" and a magnifying glass icon. A dark blue banner below the search bar contains the text "By searching you explicitly express your agreement with the RIPE Database terms and conditions". Below the search bar is a horizontal navigation menu with the following items: "Manage IPs and ASNs &gt;", "Analyse &gt;", "Participate &gt;", "Get Support &gt;", "Publications &gt;", and "About Us". The main content area below the navigation menu is empty.

# OpenIPmap Demo



⚡ Traceroute measurement to wikipedia.org



# OpenIPmap Demo



## ⚡ Traceroute measurement to wikipedia.org

General Information Probes Map TraceMON (beta) **Openipmap (beta)** Results Modification Log

TRACEROUTES MEASUREMENT 9321881

● ATLAS RESULT 193.206.159.170 → AS137 AS21320 AS1200 AS43...

SUMMARY

AS137	249 (193.206.159.170)	Rome, IT-07	●
	○ 9ms garr.it	Rome, IT-07	●
	○ 2ms garr.net	Terni, IT-18	●
	◇ 20ms (90.147.80.62)	ADD A LOCATION	
AS21320	○ 13ms geant.net	Milan, IT-09	●
	○ 36ms geant.net	Genève, CH-GE	●
	○ 36ms geant.net	Frankfurt am Main, DE-05	●
AS1200	○ 36ms (80.249.210.137)	Amsterdam, NL-07	●
	○ 36ms wikimedia.org	Amsterdam, NL-07	●
AS43821	○ 35ms wikimedia.org	Amsterdam, NL-07	●
AS unknown	▬ wikimedia.org	Amsterdam, NL-07	●

REMOVE FROM MAP

● ATLAS RESULT 79.47.220.106 → AS3269 AS6762 AS1299 AS438...

● ATLAS RESULT 2.231.96.116 → AS12874 AS13030 AS43821

● ATLAS RESULT 193.205.142.127 → AS137 AS21320 AS1200 AS43...

● ATLAS RESULT 79.53.225.203 → AS3269 AS6762 AS1299 AS438...

● ATLAS RESULT 5.95.27.95 → AS30722 AS1273 AS1200 AS43821

● ATLAS RESULT 80.68.206.252 → AS20794 AS1200 AS43821

# Where is OpenIPmap?



<https://atlas.ripe.net>

The screenshot shows the RIPE Atlas website interface. At the top left is the RIPE NCC logo and name. To the right is a search bar for IP addresses or ASNs. Below the header is a navigation menu with options like 'Manage IPs and ASNs', 'Analyse', 'Participate', 'Get Support', 'Publications', and 'About Us'. A breadcrumb trail indicates the current location: 'Home > Analyse > Internet Measurements > RIPE Atlas > Measurements'. On the left side, there is a sidebar menu with 'RIPE Atlas' and 'Measurements, Maps and Tools' highlighted. The 'Measurements' link in the sidebar is circled in red and labeled with a red '1'. The main content area is titled 'Measurements' and features a search bar with a dropdown for 'Search by target' and a search input field. Below the search bar are several filter buttons: 'Any Status', 'IPv4/v6', 'All types', and 'Of all time'. The 'Traceroute' filter button is circled in red and labeled with a red '2'. Below the filters is a table of measurements with columns for ID, Type, Target, Description, Probes, Interval, and Time (UTC). The table contains three rows of data, all of which are Traceroute measurements.

ID	Type	Target	Description	Probes	Interval	Time (UTC)
9855715	Traceroute	185.3.64.1	traceroute_From_NL_POP-Chanrion-Monohome	1	one-off	2017-10-23 15:05 Never
9854358	Traceroute	se-sto-as199150.anchors.atlas.ripe.net	Calibration for anchoring measurement: IPv6 Traceroute for se-sto-as199150.anchors.atlas.ripe.net	4097	one-off	2017-10-23 14:25 2017-10-23 14:35
9854357	Traceroute	se-sto-as199150.anchors.atlas.ripe.net	Calibration for anchoring measurement: IPv4 Traceroute for se-sto-as199150.anchors.atlas.ripe.net	10120	one-off	2017-10-23 14:25 2017-10-23 14:35

# Data & Docs



- <https://ftp.ripe.net/ripe/openipmap/>

## FTP dump

We provide daily full dumps on FTP <https://ftp.ripe.net/ripe/openipmap/> in the following CSV format:

```
IP, geolocation ID, city name, state name, country name, country code ISO2, country code iso3
```

- General docs:
  - <https://openipmap.ripe.net/static/doc/>



# For this hackathon?



- Can you help us crowdsource Lebanese IP addresses?
  
- #TODO Jasper Interface?



# Questions

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