

# Metis: Better Atlas Vantage Point Selection for Everyone

Malte Appel Tashiro, Emile Aben, Romain Fontugne

# Who Am I?

- Researcher at Internet Initiative Japan (IIJ)
- I work a lot with RIPE Atlas

# tl;dr

- What?

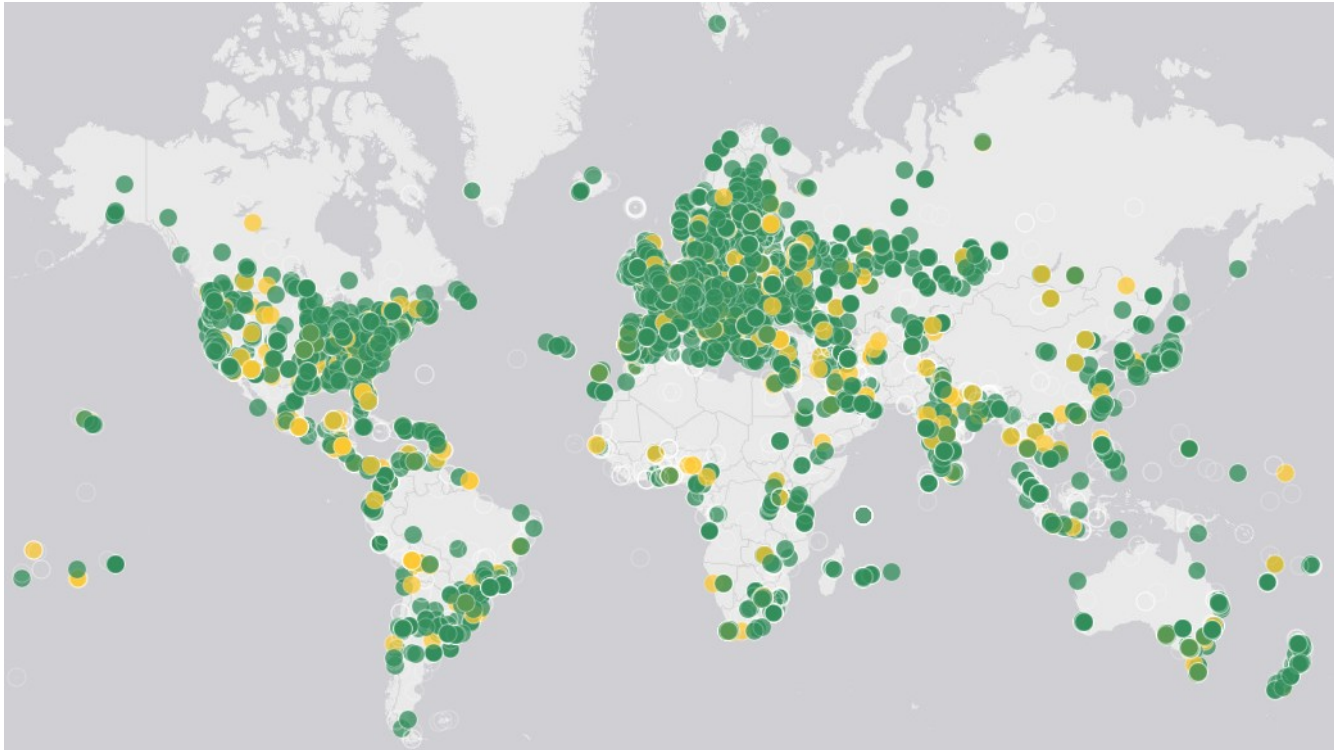
**A tool that provides Atlas probe selections**

→ Alternative to the available Area selection method

- Why?

Distribution of Atlas probes makes Worldwide selection not that worldwide

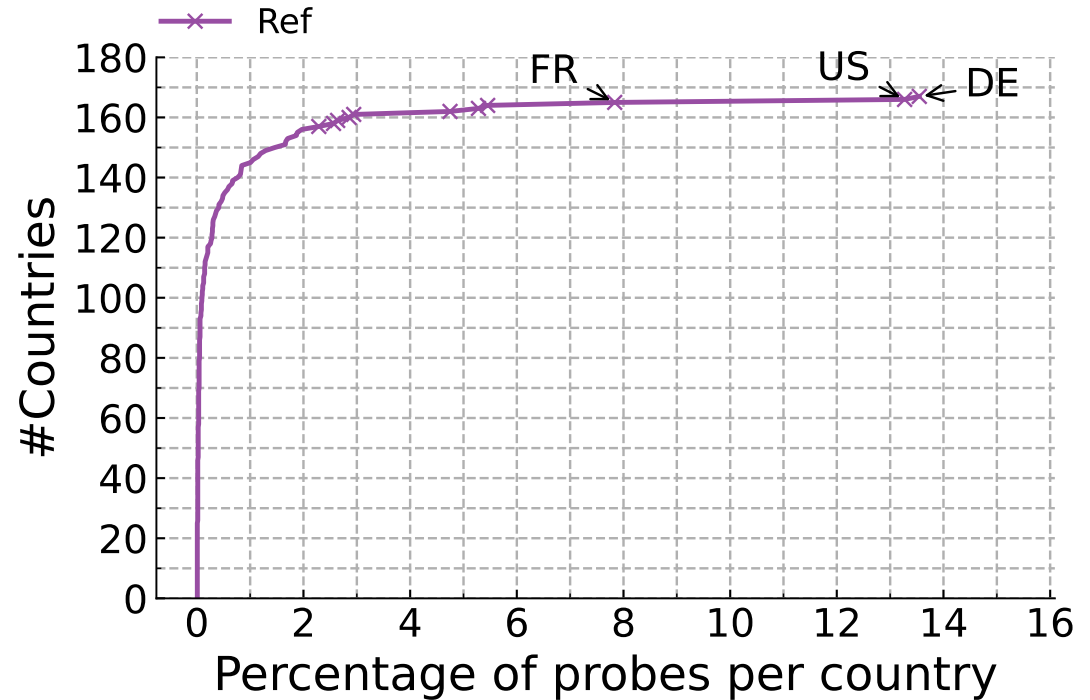
# Probe Distribution - Map



2022-06-08

# Probe Distribution – Plot

- 11,627 (connected) probes
- 168 countries
  - 1,575 (13.5%) probes in Germany
  - 1,543 (13.3%) in the US
- 3,607 ASes
  - 368 probes in AS3320 (DTAG)
  - 3% of all probes
  - 23% of German probes



Data: 2022-02-07

# Probe Distribution – Selection

## Create your selection

In this panel you can manually create a probe selection. If you need more help or you want to visualize where the probes are, please use the wizard selection.

### Type (mandatory)

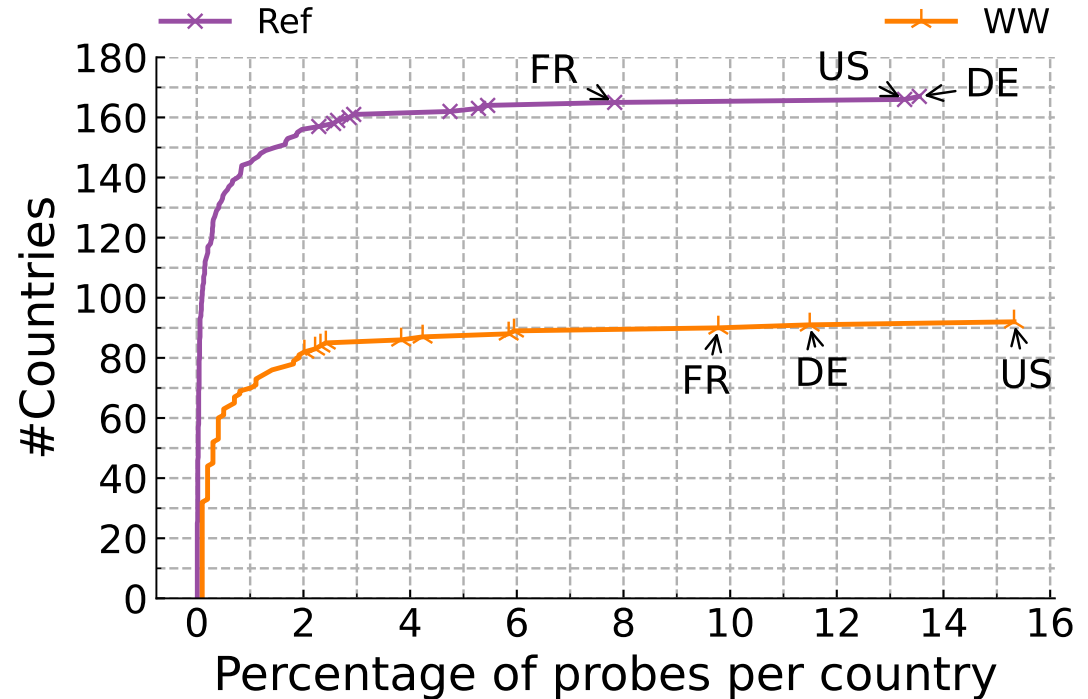
### Area (mandatory)

### Number of probes (mandatory)

### Include tags

### Exclude tags

Select  
1000 probes



Data: 2022-02-07

# Probe Distribution - Selection

## Create your selection

In this panel you can manually create a probe selection. If you need more help or you want to visualize where the probes are, please use the wizard selection.

### Type (mandatory)

area

### Area (mandatory)

WW (Worldwide)

### Number of probes (mandatory)

1000

Include ta

Exclude ta

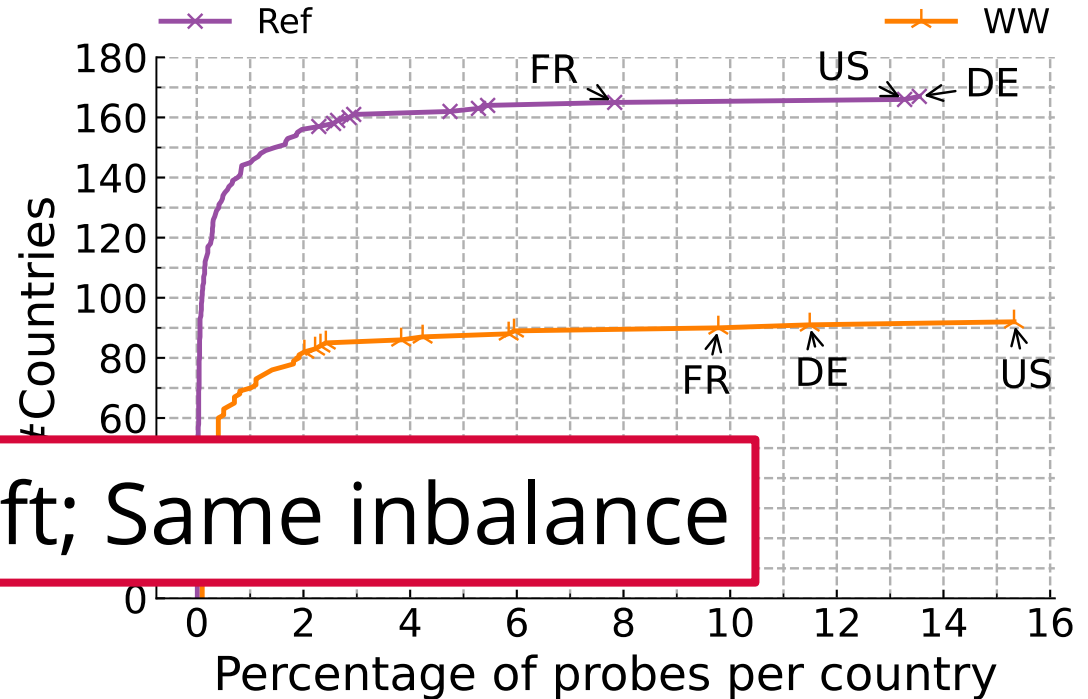
Cancel

Add

Select  
1000 probes

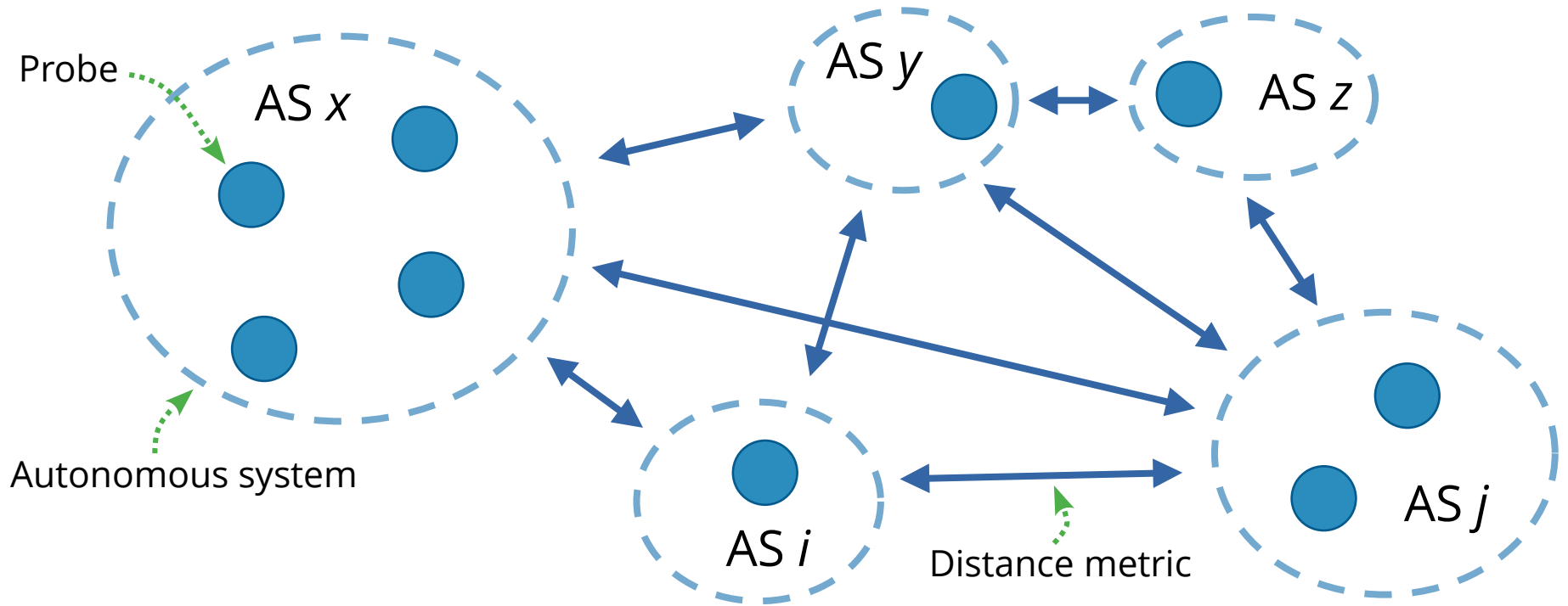


93 countries left; Same inbalance



Data: 2022-02-07

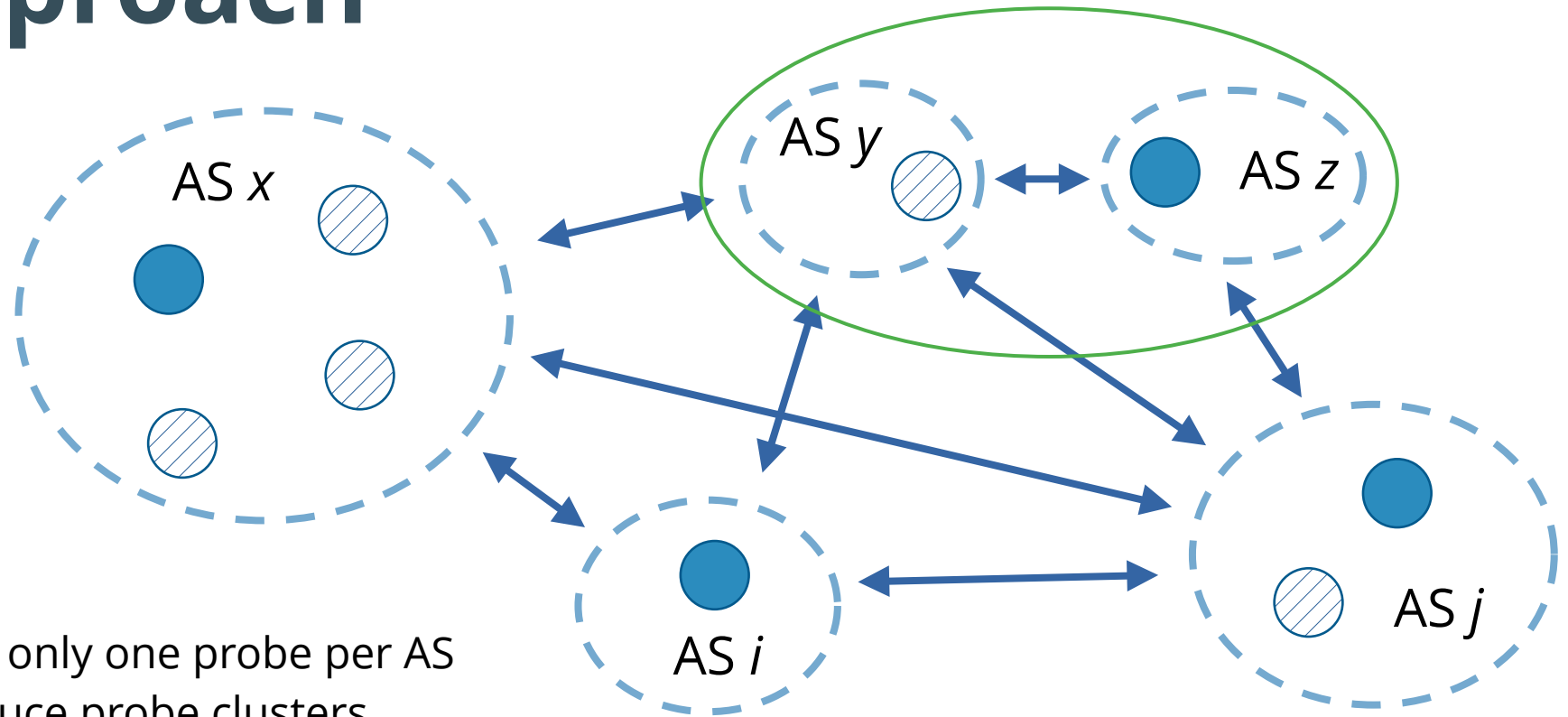
# Approach



Avoid probes that are “close” together → results will be similar



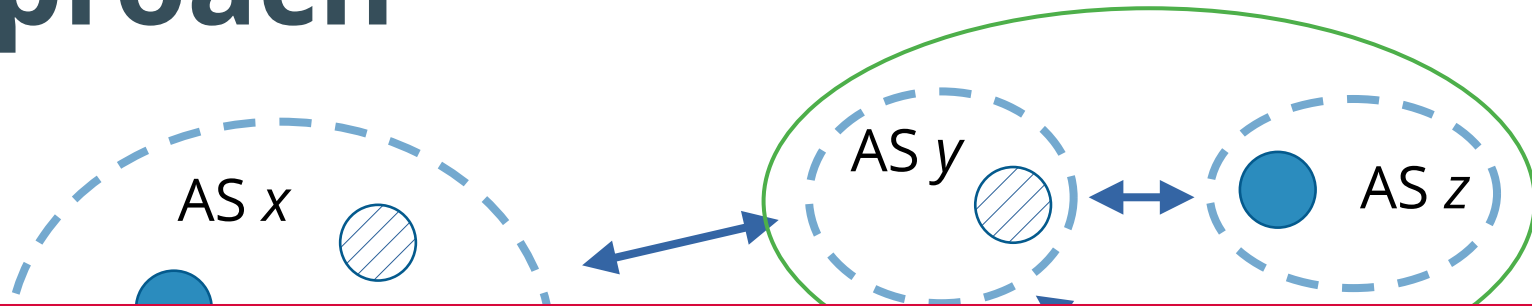
# Approach



Steps:

1. Use only one probe per AS
2. Reduce probe clusters

# Approach

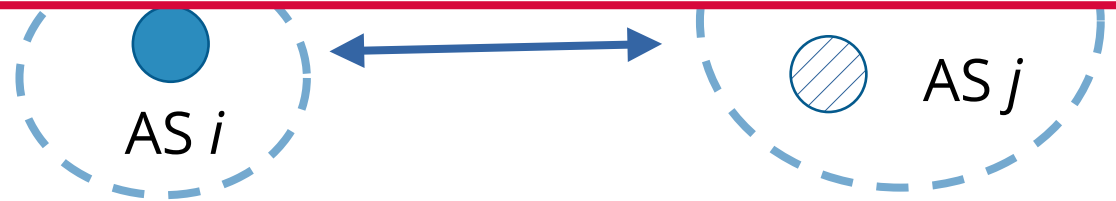


## Short Version

1. Build a distance matrix using Atlas' topology measurements
2. Select subset of probes that are "farthest" from each other

Steps:

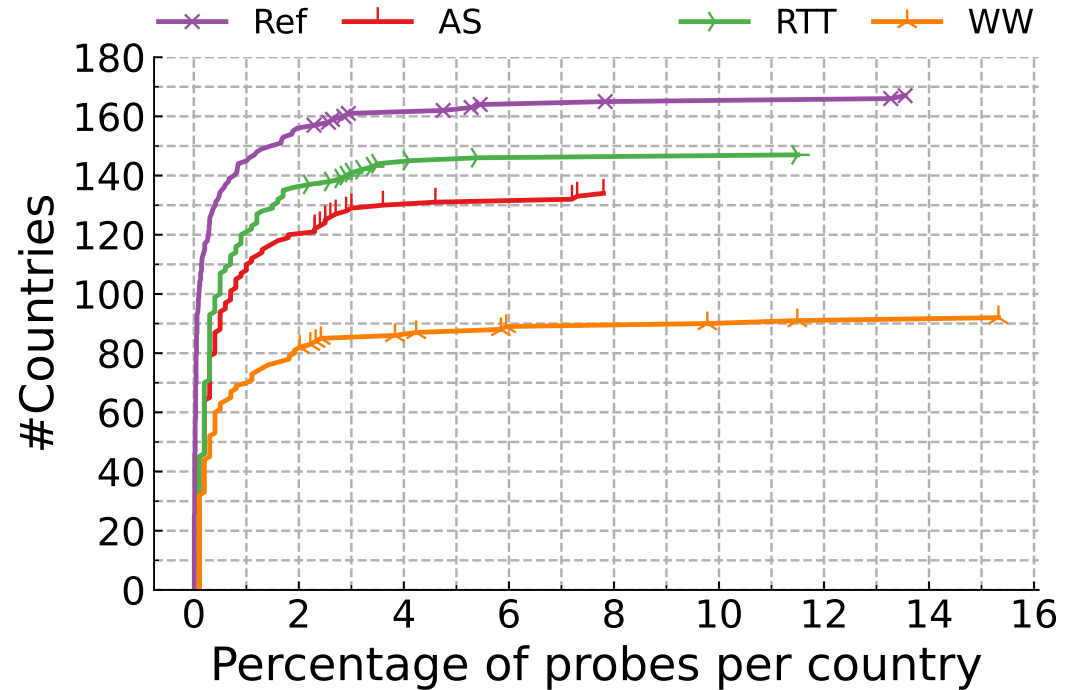
1. Use only one probe per AS
2. Reduce probe clusters



# Metis Probe Set

- Worldwide (Atlas' selection)
  - 93 countries
  - 15.3% probes in the US
- Distance metric: RTT
  - 148 countries
  - 11.5% probes in Russia
- Distance metric: AS-path length
  - 135 countries
  - 7.8% probes in Russia

↑ Geographic diversity



← Even probe distribution

# API/Website

- Create your own probe set!
- Current data available via web form
- Historical data available via API



Metis: Atlas probe selection

On this page, we provide a simple interface to select a probe set based on the latest topology measurement results. The data is updated every Sunday between 01:00 and 03:00 UTC (e.g., 2022-10-02 02:00) and is based on the best low events of measurement data.

We actually provide a list of autonomous systems (ASes) instead of probes. This is because the connected probes are constantly changing. In order to avoid changing the Atlas API each time to parallel, we provide the API specification that can be directly used with the <https://github.com/RIPE-NCC/atlascrawler/blob/master/atlascrawler/atlascrawler.py> repository.

Select a number of Atlas probes, a distance metric, and IP version to generate a list of diverse probe ASes. In addition to the API specification, the results can also be downloaded as CSV file. This corresponds to the IP address list of the selected probe set.

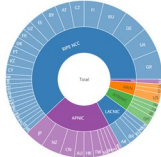
If you are looking for historical data or want to automate the process, check out the <https://github.com/RIPE-NCC/atlascrawler>.

Number of probes: 100  
Distance metric: AS path length  
IP version: IPv4  
00

Selected ASes  [Export to CSV](#)

Rank	ASN	Autonomous System Name	Country
1	8981	ICMOR-AS1 Medicine Center for Marine Research	JP
2	4937	UCWHL University of Cebu	PH
3	20069	NAKASEN1 FODS22 S.R.L.	IT
4	201485	InfraNet Managing IP/SD-WAN leading 5G/4G/LTE/Edge/Network	US
5	100289	ORNL-OR National Infrastructure for Research and Technology S.A.	US
6	42442	ASSET-AS Investment Corporation	US
7	37256	UCSD-AS2	US
8	34997	SAKASHI-TECHNOLOGY-AS SAKASHI TECHNOLOGY INC	JP
9	9039	UNIVIS	DE
10	8233	DUTNET-AS2 Delft University of Technology	NL

Country distribution



<https://ihr.ijlab.net/ihr/en-us/metis/selection>