RIPE NCC
RIPE NETWORK COORDINATION CENTRE

RIPE Atlas Khipu

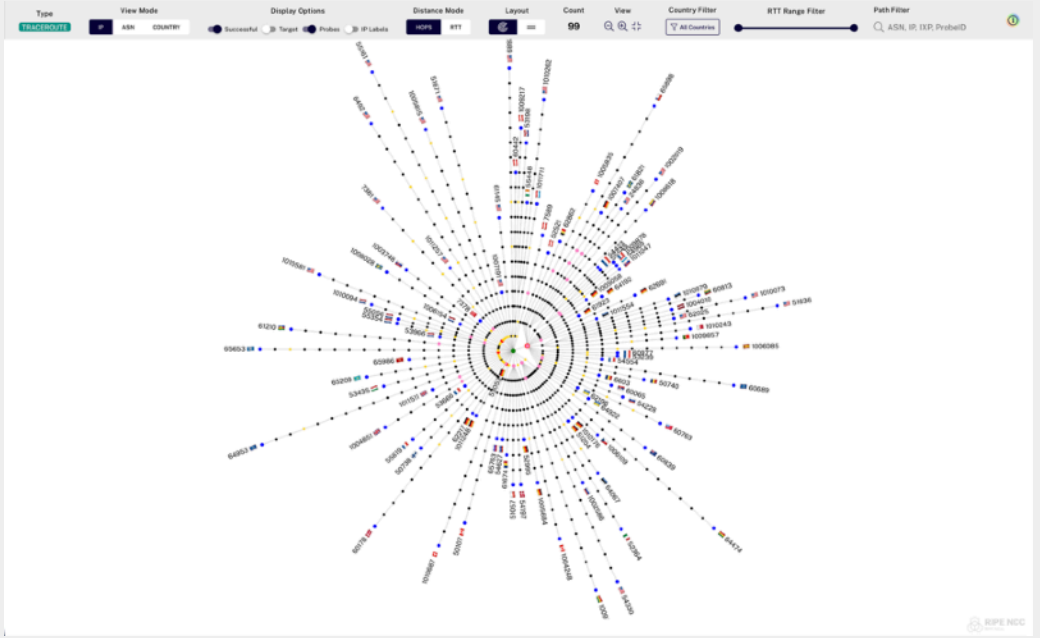
nog.fi

Stephen Suess | nog.fi | November 2025

Khipu Introduction

A new way to look at complex information

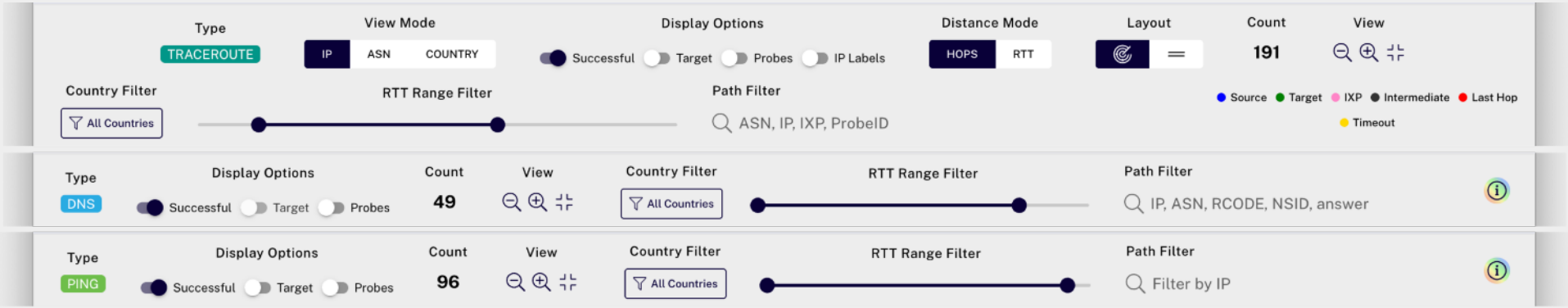
- Addresses the challenge of analysing large-scale traceroute measurements
- Named for its resemblance to Incan recording system using knotted strings
- Use cases include detecting outages, troubleshooting latency, validating routing paths, checking dns resolution/responses, filtering IXPs and more



Khipu Key Features

Measurement Types

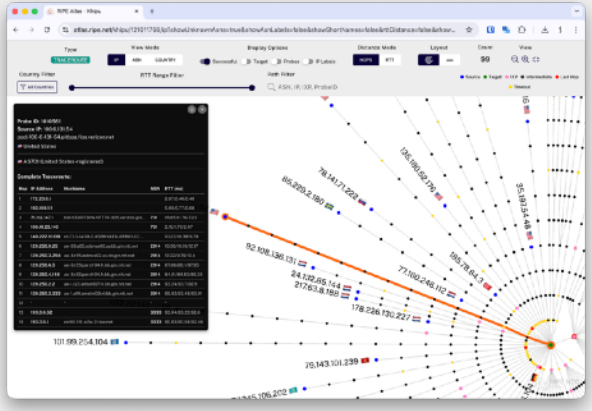
- Traceroute (primary), but also DNS and ping

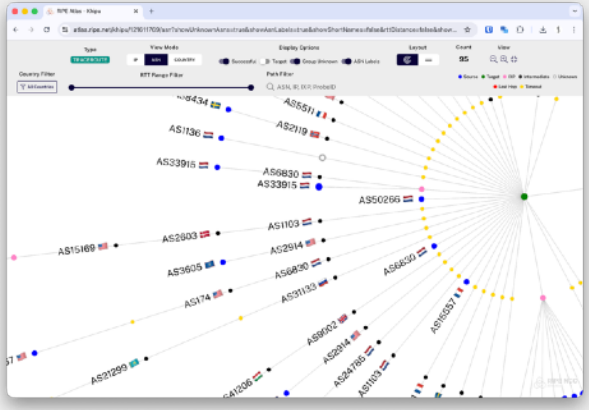


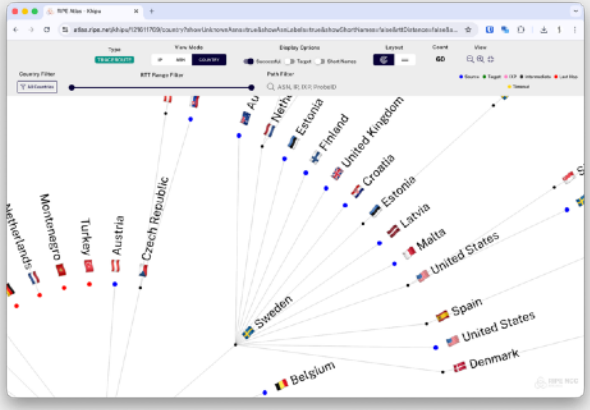
Khipu Key Features

Visualisation Modes

- IP View: Detailed hop-by-hop analysis with individual IP addresses
- ASN View: Network-level topology showing AS paths and IXP interconnections
- Country View: Country paths (currently derived from ASN/IXP/IPLocate cache)



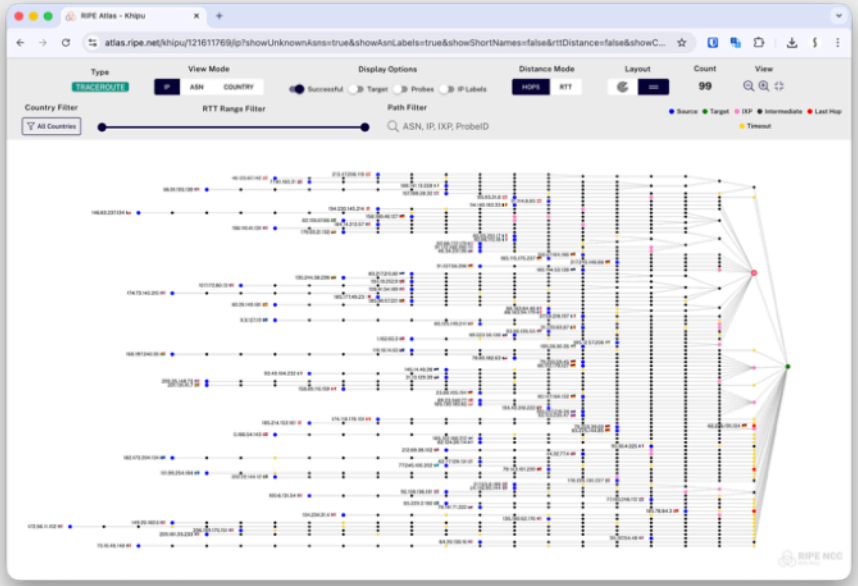


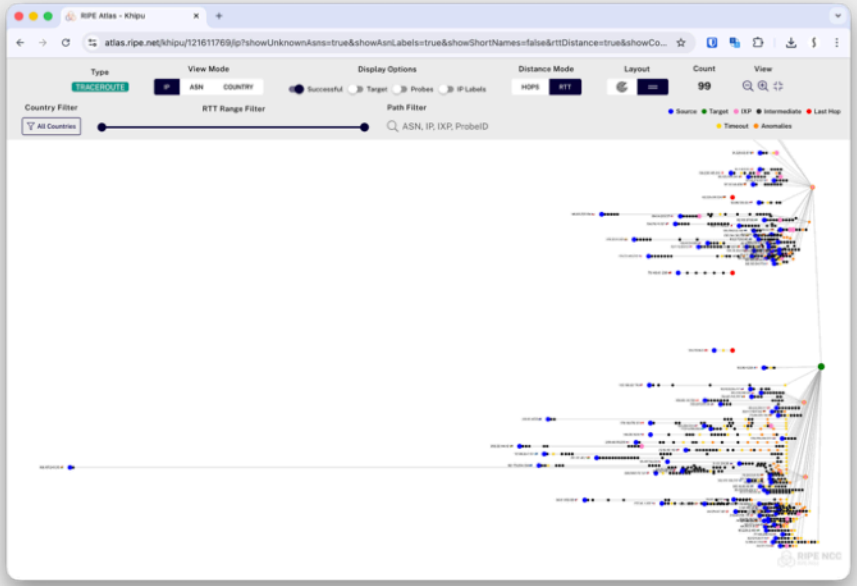


Khipu Key Features

Distance Modes (IP View)

- Hops
- RTT

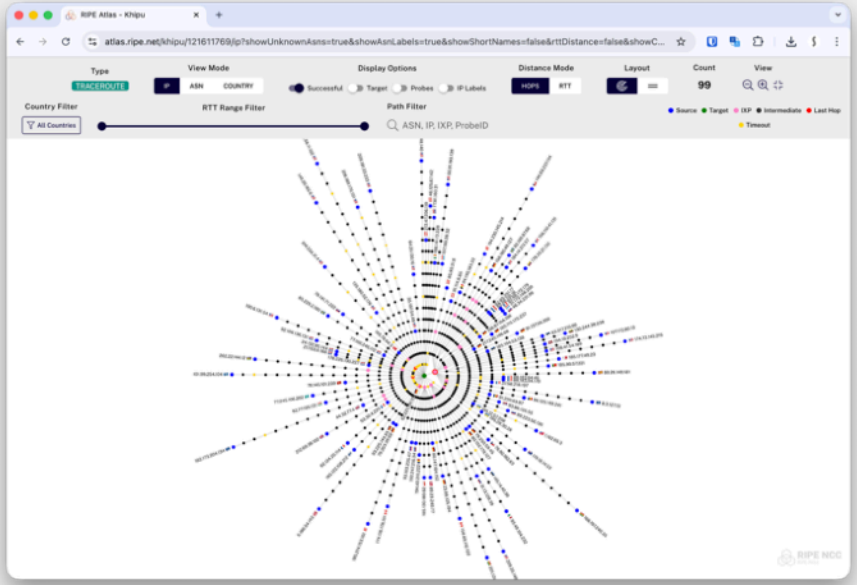


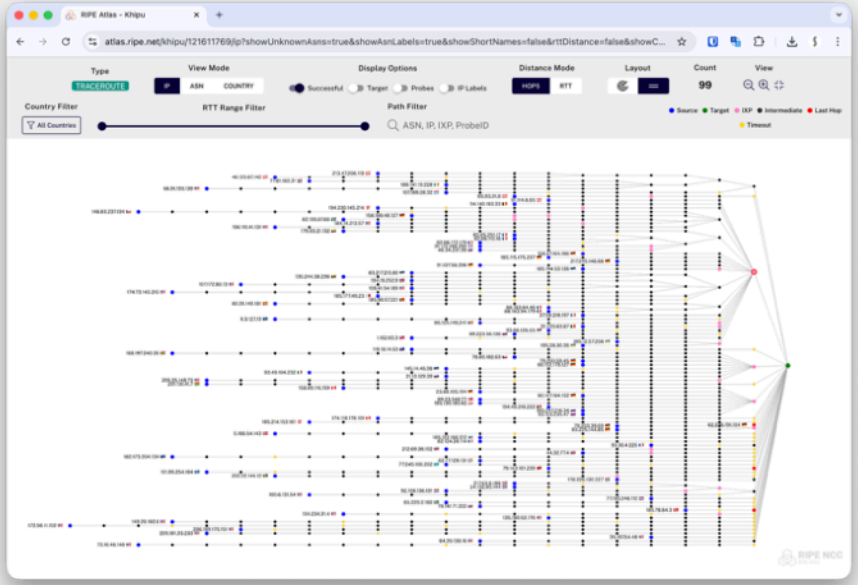


Khipu Key Features

Layout

- Radial (default)
- Horizontal

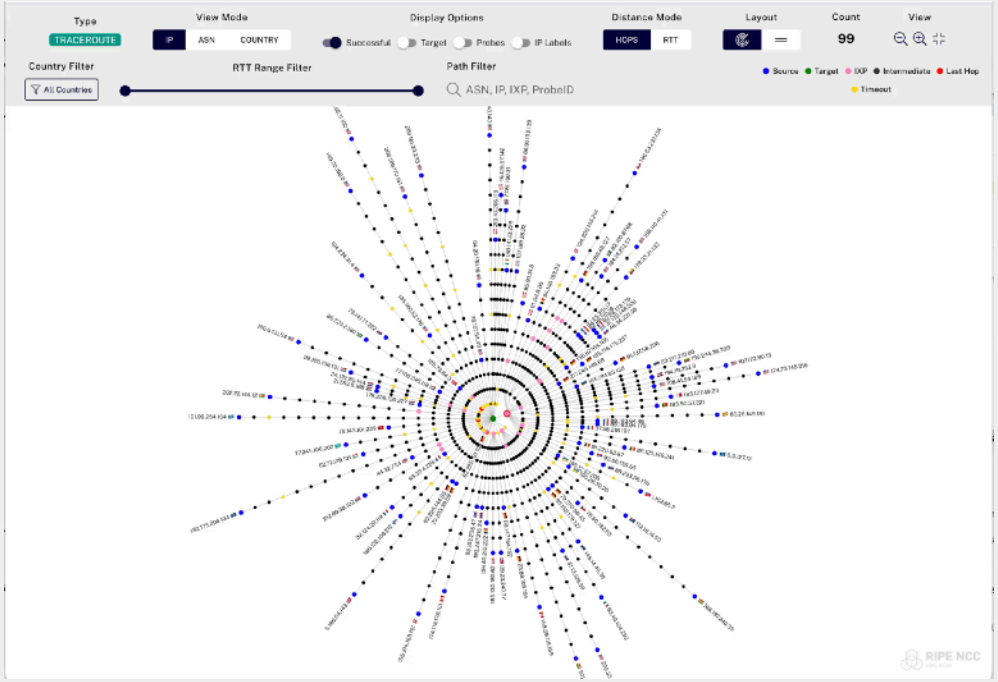




Khipu Key Features

Interactive Capabilities

- Real-time pan, zoom, and node selection
- Toggle successful, target, Probe IP/ ID, labels
- Dynamic filtering by country, RTT ranges, IP, ASN, Probe ID (and more)
- Hover popups with copy, links to probe details and RIPEstat info
- Sharable links



Khipu under the hood

Advanced Analysis Features

- Data enrichment with asn, ixp, country, rDNS lookup, anycast target identification
- Multi-target support (when domain and resolve on probe)

Technical Foundation

- Built with Vue (the same framework as the rest of the Atlas frontend)
- Pre-built data caches for ip2asn (RISWhois), ixp (peeringDB), asn2country (delegated stats), ip2country (IPLocate)
- D3 for data processing and hierarchical layouts
- WebGL for high-performance rendering - enables smooth interaction with thousands of nodes

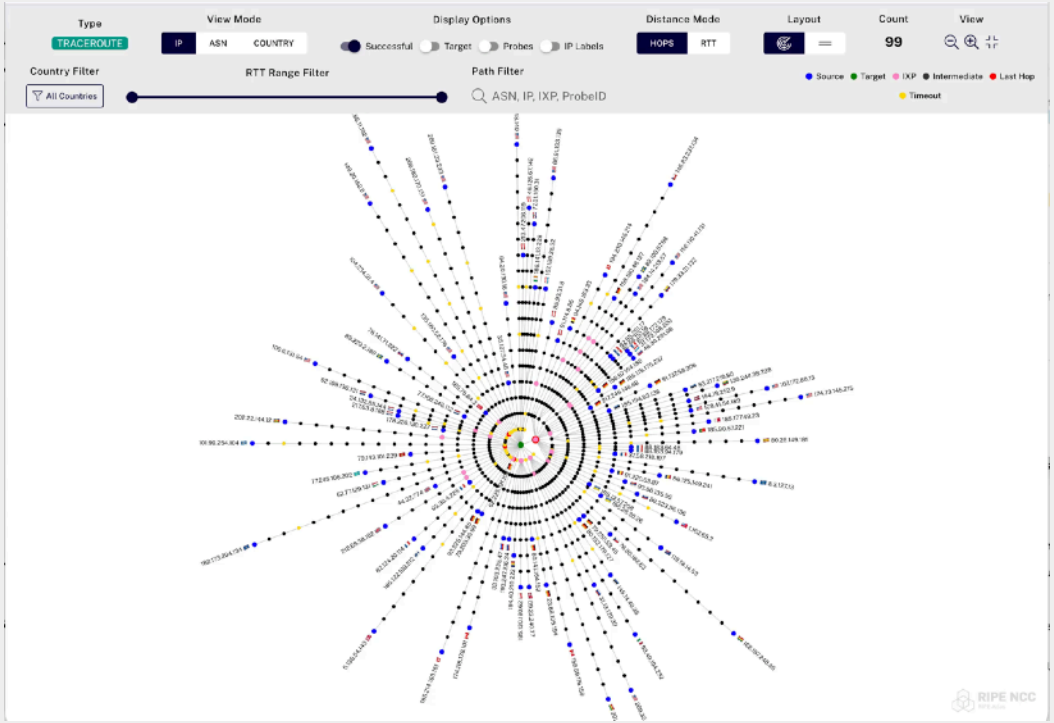
Khipu Resources

Docs: https://atlas.ripe.net/docs/tools-and-code/khipu

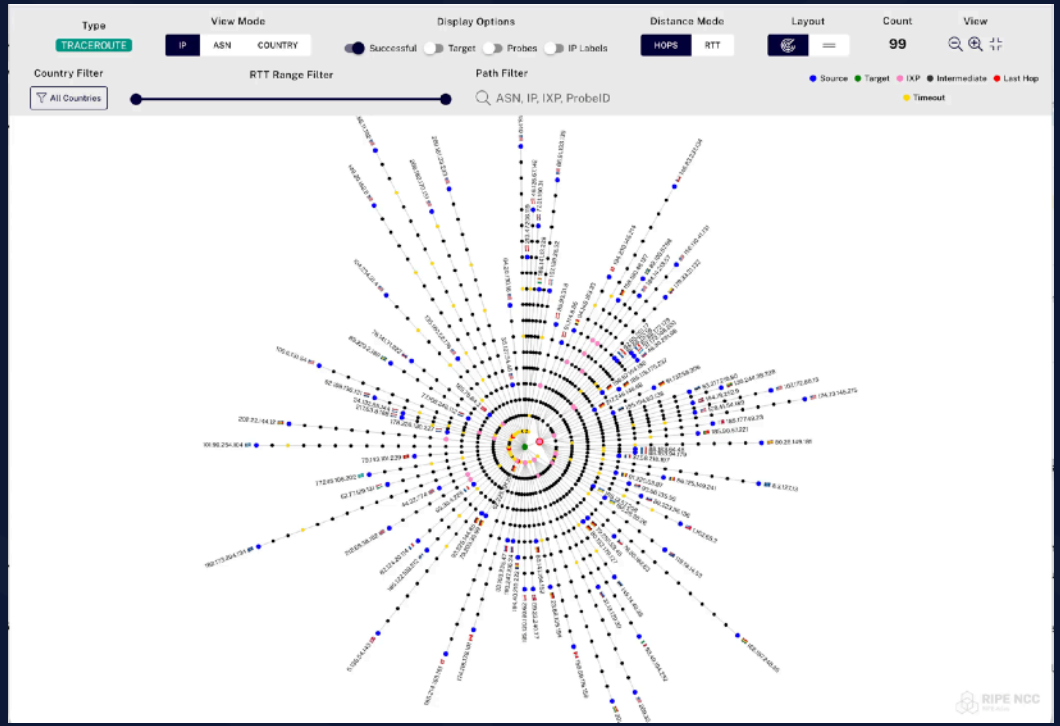
Labs:

https://labs.ripe.net/author/stephen_suess_1/six-ways-to-use-khipu-to-see-and-solve-network-problems/

https://labs.ripe.net/author/stephen_suess_1/khipu-prototype-ripe-atlas-traceroute-visualisation-tool/



Questions & Comments



ssuess@ripe.net