

### **Robert Kisteleki RIPE NCC**

### **RIPE NCC Tools Update**





### Research

## Articles on RIPE Labs

Some articles from the recent past:

- Route Collection at the RIPE NCC Where are we and where should we go?
- RIPE NCC Internet Country Report: Central Asia
- Looking Inside Outages with RIPE Atlas
- Our First Glance at the Belarus Outages
- IPv6 Adoption Statistics: a Comparison of Different Metrics
- From REX to RIPEstat: a Look at the Past and the Challenges Ahead
- ... and more on <u>RIPE Labs</u>

Robert Kisteleki | RIPE 81 | 28 October 2020







### **RIPE Atlas**

### **RIPE Atlas is 10 Years Old!**

Robert Kisteleki | RIPE 81 | 28 October 2020



### The Vision

- A collaborative, active measurement network
- Should potentially be on "unprecedented" scale, perhaps with vantage points in *every network*
- Community involvement the RIPE NCC shouldn't do this alone
- Focus on the "network level" measurements as much as possible
- Create and nurture an ecosystem of contributors and users
- Provide a long-term, sustainable platform

Robert Kisteleki | RIPE 81 | 27 October 2020



## At 10 Years

- We're at ~11.400 connected probes
  - ~1.350 are v1/v2 (!)
  - ~6.000 are v3
  - ~2.600 are v4
  - ~750 are software
  - ~650 are anchors (about half of these are virtual)
- On average about 25.000 measurements are running
- We cover 177 countries, ~3.700 ASNs
- The "most alive" probe has been up and running for:
  - 9y 318d 16h 28m (and a bit more by now)





## Celebrating 10 Years

- The RIPE Atlas UI will get a significant facelift
  - Expect changes soon after RIPE 81
- We're introducing "birthday presents" for probes
  - Recognising the long-term support from our probe hosts
- We'll be publishing some "tales from the past" and preparing a few other gimmicks
- Organising a <u>RIPE NCC Open House</u> event and a <u>Deployathon</u> Please join the RIPE 81 Atlas community room

Robert Kisteleki | RIPE 81 | 27 October 2020





## After 10 Years

- We plan to make the system more useful to more users
  - Better access to data (simpler, faster, ...)
  - More out-of-the-box support for particular use cases
- Increase value for individual contributors such as probe hosts
- Improve on processes that "help our helpers"
  - E.g. ambassadors and sponsors
- Focus on increased network coverage, if possible
  - Various activities to get probes into more networks

Robert Kisteleki | RIPE 81 | 27 October 2020



## ore useful to more users



### **RIPE Atlas is 10 Years Old!**

### For more details: see the Lightning Talk presentation from Tuesday!







## **RIPE Atlas on BigQuery**

- We're making RIPE Atlas measurement results available via Google BigQuery
- General purpose data warehouse
  - SQL query language on top
  - great for some types of rapid investigation
  - can be used to build complex analyses, or just heavy filtering prior to local analysis
- Information:
  - https://github.com/RIPE-NCC/ripe-atlas-bigguery/
  - https://labs.ripe.net/tools/



				ł	
$\equiv$ Google Cloud Platform <b>*</b>	Serious Resear	ch Project 🔻	<b>Q</b> Search	products and resourc	es 🗸 🔉 ?
BigQuery (i) FEATURES & IN	ifo 📰 Sho	RTCUT			
Query history	Query ed	itor	+ 0	COMPOSE NEW QUERY	HIDE EDITOR
Saved queries		sm_id, count(* pencc-atlas`.s	amples.ping		
Job history	3 group by				
Transfers		_			
Scheduled queries					
Reservations					
BI Engine					
Resources + ADD DATA •	🔮 Valid.				
<b>Q</b> Search for your tables and data sets <b>(?)</b>					A Mara -
serious-research-project	🕞 Run	<ul> <li>Save que</li> </ul>	ery Save view	Schedule query ▼	This query will process 40
✓ ripencc-atlas	Query res	sults	<b>SAVE RESULTS</b>	<b>EXPLORE DATA</b>	
<ul> <li>measurements</li> </ul>					
dns	Query complete		10.6 MB processed) SON Execution deta	ile	
http			Som Execution deta		
ntp	Row msm_id	result_count			
ping	2 101				
sslcert	3 101				
traceroute	4 100	4 40058			
✓ III samples	5 103	40046			
dns	6 100	9 40038			
http	7 101	0 39993			
ntp	8 101	9 39992			
ping	9 100				
sslcert	10 101				
traceroute	11 103		per page: 100 💌	1 - 100 of 9206 Firs	t page IK
					11

## **BigQuery: Project & Datasets**

### https://console.cloud.google.com/bigquery?project=ripencc-atlas

- measurements dataset:
  - public measurement results for DNS, traceroute, ping, HTTP, SSL, and NTP
  - dataset is current: we're continuously adding new results
  - starting from 1 January 2020; we'll increase the date range as we backfill
- samples dataset:
  - 1% of results from 21 October 2020 for each of the above
  - play with it!
- You need a Google account
  - we're covering storage, the cost of your queries is on you





RIP



### RIPEstat

### **RIPEstat - RIR Collaboration**

AIRRS		African Internet Registry and Routing Statistics	
<ul> <li>AIRRS</li> <li>About</li> <li>Query</li> <li>AFRINIC Stats</li> <li>Stats Portal</li> </ul>	~	Internet resources allocation and routing in th This is a prototype, please send us feedback Resource: Prefix, ASN or domain name Your Network: 3333 2001:67c:2e8::/48 2001:67c:2e8:9::c100:14e6	<b>c on</b> service-support@afrinic.net
		Using AIRRS	
		ASN information	Prefix information
		Resource:       AS37708       Query         AS       Routing information (RIS)         AS       Originates prefixes visible         Is not seen in any other route	Resource:       2001:43f8:90::/48       Query         Image: Control of the system       At 2020-03-02 00:00:00 UTC, 2001:43f8:90::/48 was 100% visible (by 268 of 268 RIS full peers).       Image: Control of the system         Image: Control of the system       Signature       Image: Control of the system       Signature         Image: Control of the system       Signature       Image: Control of the system       Signature       Image: Control of the system         Image: Control of the system       Signature       Image: Control of the system       Signature       Image: Control of the system         Image: Control of the system       Signature       Image: Control of the system       Signature       Image: Control of the system         Image: Control of the system       Signature       Image: Control of the system       Signature       Image: Control of the system         Image: Control of the system       Signature       Image: Control of the system       Signature       Image: Control of the system         Image: Control of the system       Signature       Image: Control of the system       Signature       Image: Control of the system         Image: Control of the system       Signature       Image: Control of the system       Signature

- 3rd RIR collaboration with AFRINIC
  - <u>African Internet Registry and Routing Statistics</u>
  - https://airrs.afrinic.net/
- In addition to <u>APNIC NetOX</u> and <u>LACNIC Inforedes</u>



AIRRS	African Internet Registry and Routing Statistics	
AIRRS About Query AFRINIC Stats	Resource:         2001:67c:2e8::/48         Query           Your Network:         3333 2001:67c:2e8::/48 2001:67c:2e8:9::c100:14e6	
Stats Portal	At a Glance Routing DNS Anti Abuse Database Geo Prefix Overview (2001:67c:2e8::/48)	egraphic Activity Suggestions RIR geolocation (2001:67c:2e8::/48)
	Routing information (RIS) Is visible as exact match No more/less-specific prefixes are visible	





### **RIPEstat - UI**



### RIPEstat UI 2020

- Alternative to current RIPEstat UI 2013 \_
- Demo during RIPE81 Thursday 12:00 CET in the main room
- https://beta-ui.stat.ripe.net/



12:10			?
≡ R	IPEstat		
Enter an IP add 193.0.20.2	dress/prefix, ASN, con 230	untry code or .	×
Rel	ative 🕤 Abs	olute 📋	
	Latest	$\bigtriangledown$	
αo	$\heartsuit$		
Prefix	Status	×	(•)
193.0	.20.0/23 is a AS3333(		l by
<b>RIS Vi</b> s	sibility	×	í
193	.0.20.0/23 visibility (		
Geoloc	cation	×	í





### **RIPEstat - UI**

Routing Status (AS3333)		Show all v of 15
Showing results for <b>AS3333</b> as of <b>2020-10-21 00:00:00 UTC</b>	18 08:00:00 UTC.	AS3333 2005 200120022003200420052006
Results exclude routes with very low visibility (less than 10 R	IS full-feed peers seeing).	Showing results for AS3333 from 200 source data

### RIPEstat Widget API

- Shared codebase between collaborating RIRs -
- Enables every partner to create new widgets and use them on their platform



	AS Overvie	ew (AS3333)	20	RIR geolocation (AS3333)
2	(R Originat vi	nformation RIS) tes prefixes sible other route		+
	Name and ho	lder of this ASN:		Show details
		5 - Reseaux		Showing results for AS3333 as of 2020-10-20 00:00:00 UTC
Cod	rdinatior	s Network 1 Centre (F		source data embed code permalink info
	N	CC)		
RIR	Status	Registration	Country	
RIPE NCC	ALLOCATED	1994-05-19	EU	Routing Status (AS3333)
		istry Informatio of 2020-10-21 08:00		At <b>2020-10-21 00:00:00 UTC</b> , <b>AS3333</b> was visible to <b>100%</b> of 324 <b>IPv4</b> and <b>100%</b> of 338 <b>IPv6</b> RIS full peers.
		of 2020-10-21 08:00		<ul> <li>visible to 100% of 324 IPv4 and 100% of 338 IPv6 RIS full peers.</li> <li>First ever seen as origin announcing</li> </ul>
Showing resu	ults for AS3333 as	of 2020-10-21 08:00	permalink info	<ul> <li>visible to 100% of 324 IPv4 and 100% of 338 IPv6 RIS full peers.</li> <li>First ever seen as origin announcing 193.0.0.0/22, on 2000-08-18 08:00:00 UTC.</li> <li>Originated IPv4 prefixes: 6</li> <li>Originated IPv6 prefixes: 1</li> <li>Observed BGP neighbours: 665</li> <li>Address space announced (IPv4): 4608 IPs</li> <li>Address space announced (IPv6): equiv. to 1</li> </ul>
Showing rest	ults for AS3333 as	of 2020-10-21 08:00 embed code	eoo UTC	<ul> <li>visible to 100% of 324 IPv4 and 100% of 338 IPv6 RIS full peers.</li> <li>First ever seen as origin announcing 193.0.0.0/22, on 2000-08-18 08:00:00 UTC.</li> <li>Originated IPv4 prefixes: 6</li> <li>Originated IPv6 prefixes: 1</li> <li>Observed BGP neighbours: 665</li> <li>Address space announced (IPv4): 4608 IPs</li> <li>Address space announced (IPv6): equiv. to 1 /48s</li> </ul>
Showing resu source data	Whois Matc 3333 RIPE-NCC-AS Reseaux IP E	of 2020-10-21 08:00 embed code	eoo UTC permalink info	<ul> <li>visible to 100% of 324 IPv4 and 100% of 338 IPv6 RIS full peers.</li> <li>First ever seen as origin announcing 193.0.0.0/22, on 2000-08-18 08:00:00 UTC.</li> <li>Originated IPv4 prefixes: 6</li> <li>Originated IPv6 prefixes: 1</li> <li>Observed BGP neighbours: 665</li> <li>Address space announced (IPv4): 4608 IPs</li> <li>Address space announced (IPv6): equiv. to 1</li> </ul>
Showing resu source data aut-num as-name	Whois Matc 3333 RIPE-NCC-AS Reseaux IP E	embed code embed code thes (AS3333) Europeens Netw n Centre (RIPE N	eoo UTC permalink info	<ul> <li>visible to 100% of 324 IPv4 and 100% of 338 IPv6 RIS full peers.</li> <li>First ever seen as origin announcing 193.0.0.0/22, on 2000-08-18 08:00:00 UTC.</li> <li>Originated IPv4 prefixes: 6         <ul> <li>Originated IPv6 prefixes: 1</li> <li>Observed BGP neighbours: 665</li> <li>Address space announced (IPv4): 4608 IPs</li> <li>Address space announced (IPv6): equiv. to 1             /48s</li> </ul> </li> <li>Advanced Settings         <ul> <li>Compare to 1 week v earlier  </li> </ul> </li> </ul>
Showing resu source data aut-num as-name descr org status	Whois Matc 3333 RIPE-NCC-AS Reseaux IP E Coordination ORG-RIEN1- ASSIGNED	embed code embed code thes (AS3333) S Europeens Netw n Centre (RIPE N RIPE	eoo UTC permalink info	<ul> <li>visible to 100% of 324 IPv4 and 100% of 338 IPv6 RIS full peers.</li> <li>First ever seen as origin announcing 193.0.0.0/22, on 2000-08-18 08:00:00 UTC.</li> <li>Originated IPv4 prefixes: 6</li> <li>Originated IPv6 prefixes: 1</li> <li>Observed BGP neighbours: 665</li> <li>Address space announced (IPv4): 4608 IPs</li> <li>Address space announced (IPv6): equiv. to 1 /48s</li> </ul>
Showing resu source data aut-num as-name descr org status mnt-by	Whois Matc 3333 RIPE-NCC-AS Reseaux IP E Coordination ORG-RIEN1- ASSIGNED RIPE-NCC-EN	embed code embed code thes (AS3333) thes (AS3333) thes (AS3333) thes (AS3333) thes (AS3333) thes (AS3333) thes (AS3333) thes (AS3333) thes (AS3333)	eoo UTC permalink info	<ul> <li>visible to 100% of 324 IPv4 and 100% of 338 IPv6 RIS full peers.</li> <li>First ever seen as origin announcing 193.0.0.0/22, on 2000-08-18 08:00:00 UTC.</li> <li>Originated IPv4 prefixes: 6</li> <li>Originated IPv6 prefixes: 1</li> <li>Observed BGP neighbours: 665</li> <li>Address space announced (IPv4): 4608 IPs</li> <li>Address space announced (IPv6): equiv. to 1 /48s</li> <li>Advanced Settings</li> <li>Compare to tweek earlier to tweek</li> <li>Exclude low visibility routes</li> </ul>
Showing resu source data aut-num as-name descr org status mnt-by mnt-by	Whois Matc 3333 RIPE-NCC-AS Reseaux IP E Coordination ORG-RIEN1- ASSIGNED RIPE-NCC-EN RIPE-NCC-EM RIPE-NCC-EM	embed code embed code thes (AS3333) thes (AS3333) thes (AS3333) thes (AS3333) thes (AS3333) thes (AS3333) thes (AS3333) thes (AS3333) thes (AS3333)	eoo UTC permalink info	<ul> <li>visible to 100% of 324 IPv4 and 100% of 338 IPv6 RIS full peers.</li> <li>First ever seen as origin announcing 193.0.0.0/22, on 2000-08-18 08:00:00 UTC.</li> <li>Originated IPv4 prefixes: 6         <ul> <li>Originated IPv6 prefixes: 1</li> <li>Observed BGP neighbours: 665</li> <li>Address space announced (IPv4): 4608 IPs</li> <li>Address space announced (IPv6): equiv. to 1             /48s</li> </ul> </li> <li>Advanced Settings         <ul> <li>Compare to 1 week v earlier  </li> </ul> </li> </ul>
Showing resu source data aut-num as-name descr org status mnt-by mnt-by source	Whois Matc 3333 RIPE-NCC-AS Reseaux IP E Coordination ORG-RIEN1- ASSIGNED RIPE-NCC-EN RIPE-NCC-EN RIPE	embed code embed code thes (AS3333) thes (AS3333) thes (AS3333) thes (AS3333) thes (AS3333) thes (AS3333) thes (AS3333) thes (AS3333) thes (AS3333)	eoo UTC permalink info (+) rork ICC)	<ul> <li>visible to 100% of 324 IPv4 and 100% of 338 IPv6 RIS full peers.</li> <li>First ever seen as origin announcing 193.0.0.0/22, on 2000-08-18 08:00:00 UTC.</li> <li>Originated IPv4 prefixes: 6</li> <li>Originated IPv6 prefixes: 1</li> <li>Observed BGP neighbours: 665</li> <li>Address space announced (IPv4): 4608 IPs</li> <li>Address space announced (IPv6): equiv. to 1 /48s</li> <li>Advanced Settings</li> <li>Compare to tweek earlier to tweek</li> <li>Exclude low visibility routes</li> </ul>





### **RIPEstat - Feature Update**

- Looking Glass
  - Close to realtime now most peers are available within 30 seconds
  - Meta data on time recency per peer available
- Maxmind GeoLite2
  - Data is available again but not historically due to changes in the license
  - https://stat.ripe.net/docs/data\_api#maxmind-geo-lite
  - https://stat.ripe.net/docs/data\_api#maxmind-geo-lite-announced-by-as\_
- GeoIP/resource information based on RIRStats (new)
  - https://stat.ripe.net/docs/data\_api#rir-geo

Robert Kisteleki | RIPE 81 | 28 October 2020





### **RIPEstat - Feature Update**

- RPKI History widget (*new*)
  - By AS, trust anchor and country
  - https://stat.ripe.net/widget/rpki-by-(as|trust-anchor|country)
- New widgets developed by APNIC
  - IRR Explorer: <u>https://stat.ripe.net/widget/apnic-irr-explorer</u>
  - Abuse Contact Finder: <u>https://stat.ripe.net/widget/apnic-abuse-contact-finder</u>
  - **Resource Transfer History:** https://stat.ripe.net/widget/(afrinic|apnic|ripe)-transfer-history
- Addition of NPS as means of feedback









# Questions

### <u>robert@ripe.net</u> @kistel



