

RIPE Atlas

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Introduction

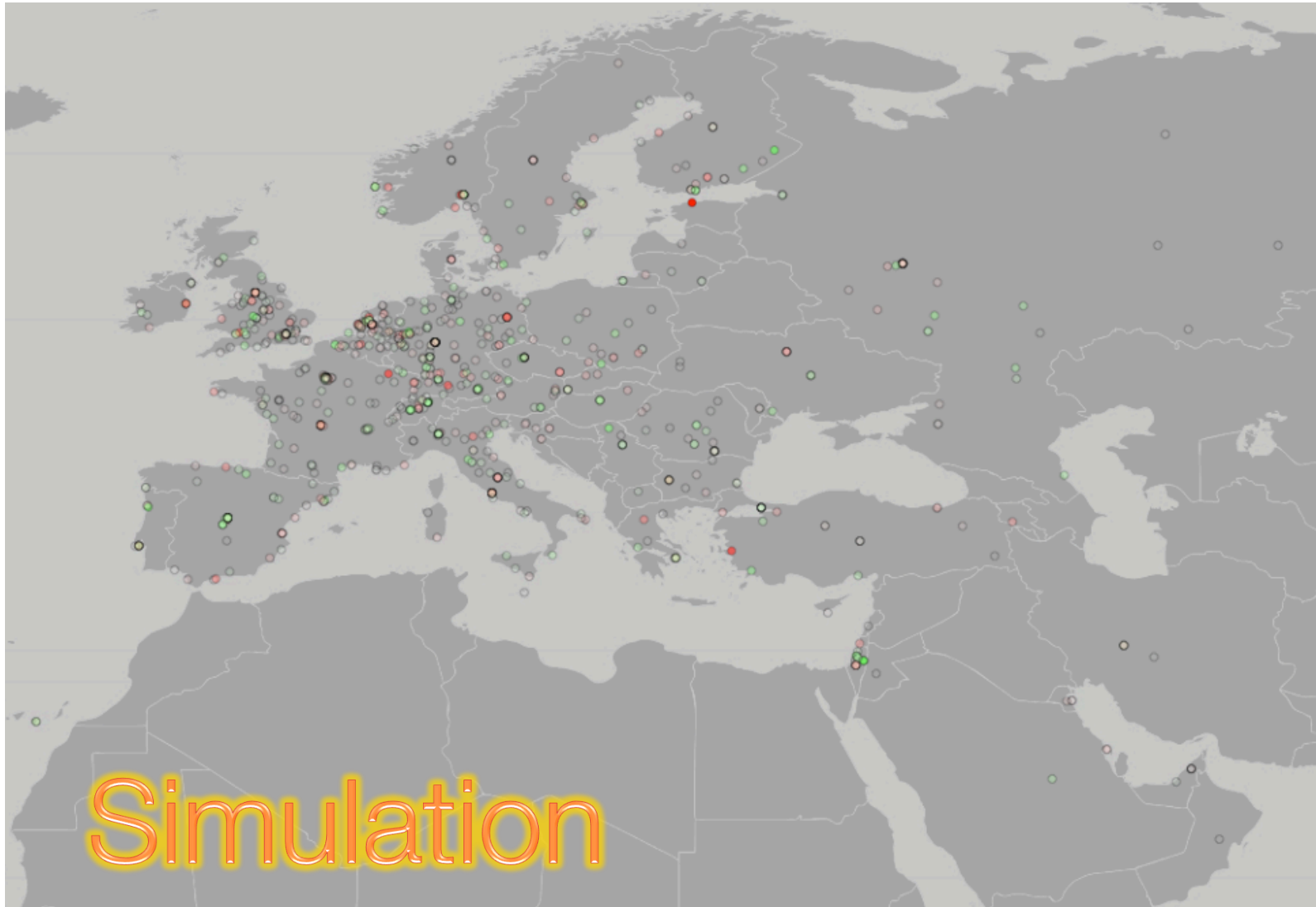
RIPE Atlas:

- There are many Atlases, this is *RIPE Atlas*
- A prototype system for a next generation Internet measurement network
 - To scale to thousands of measurement nodes
 - Potentially “be everywhere” and ready to run different measurements
 - Started last November, we’re still just building it and exploring possibilities

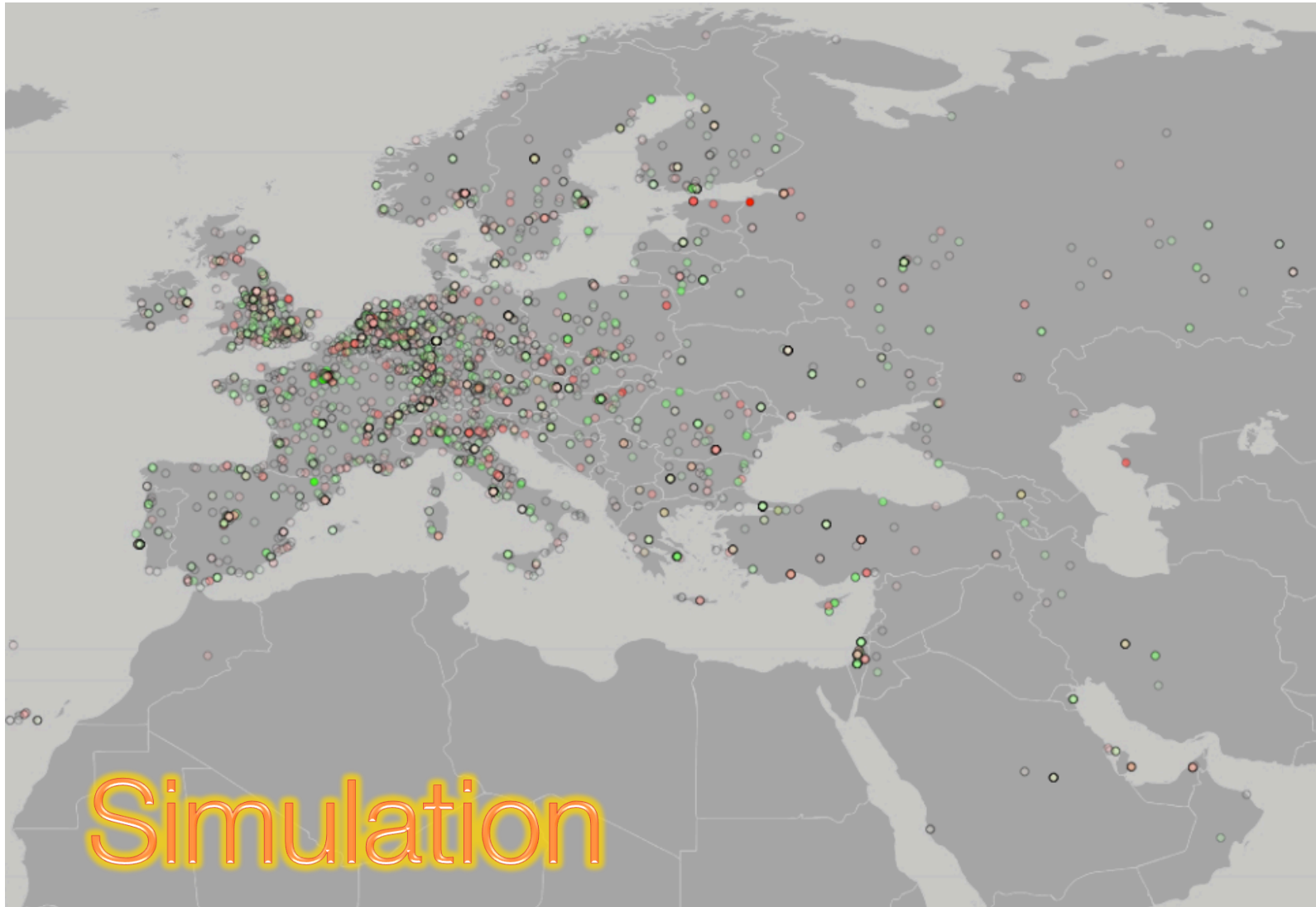
Light Map of Europe



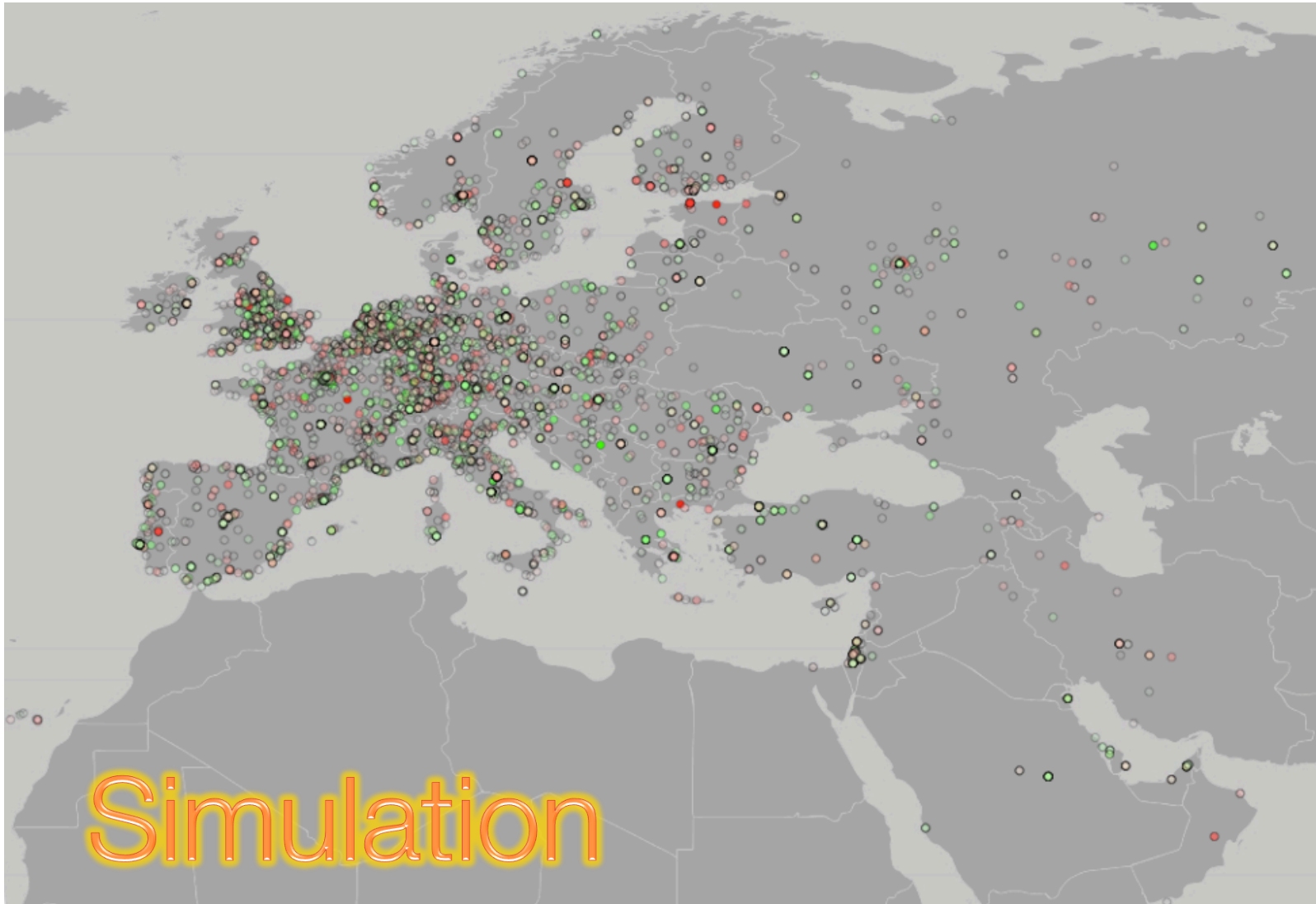
Intuition: 1000 Probes



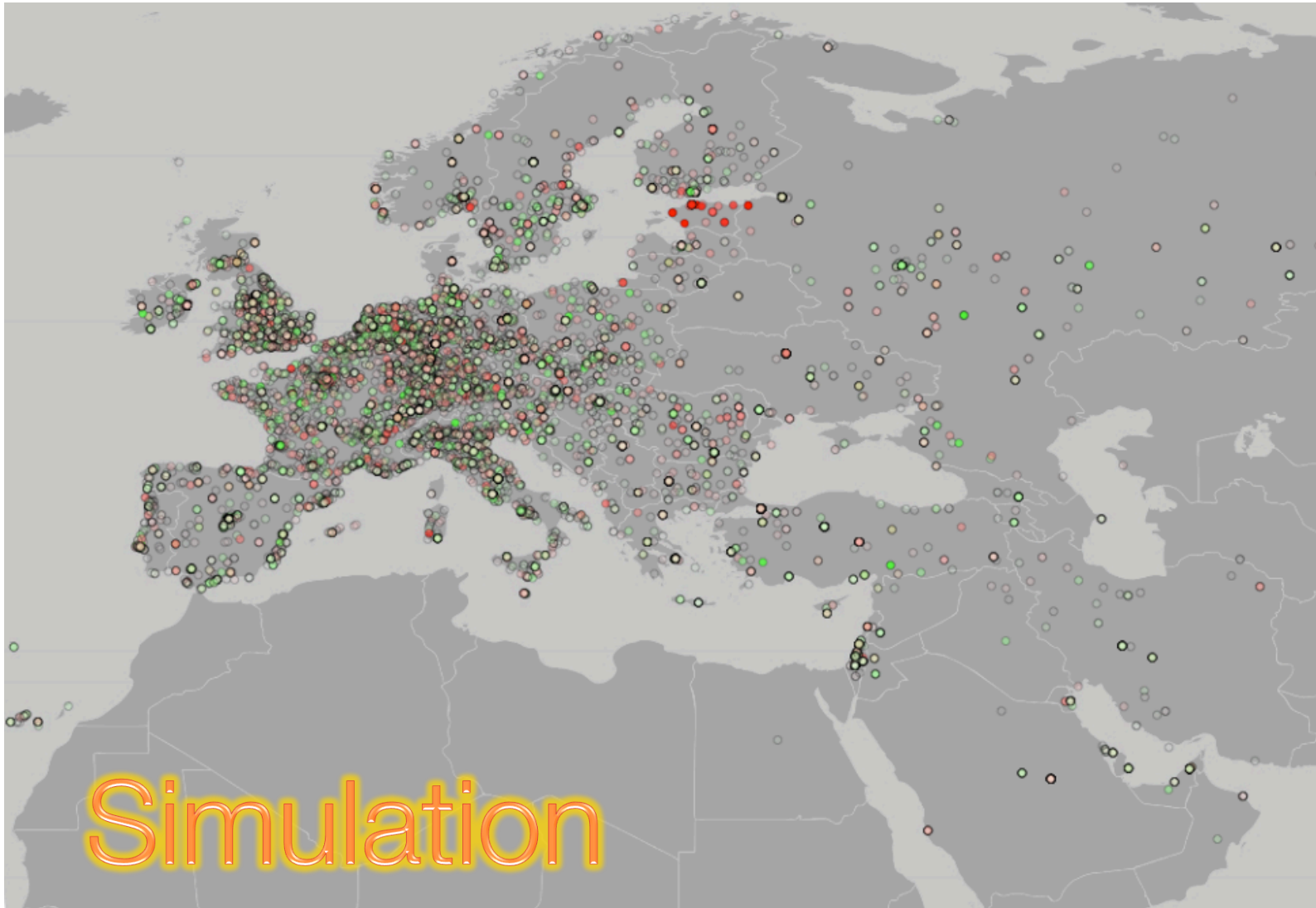
Intuition: 5000 Probes



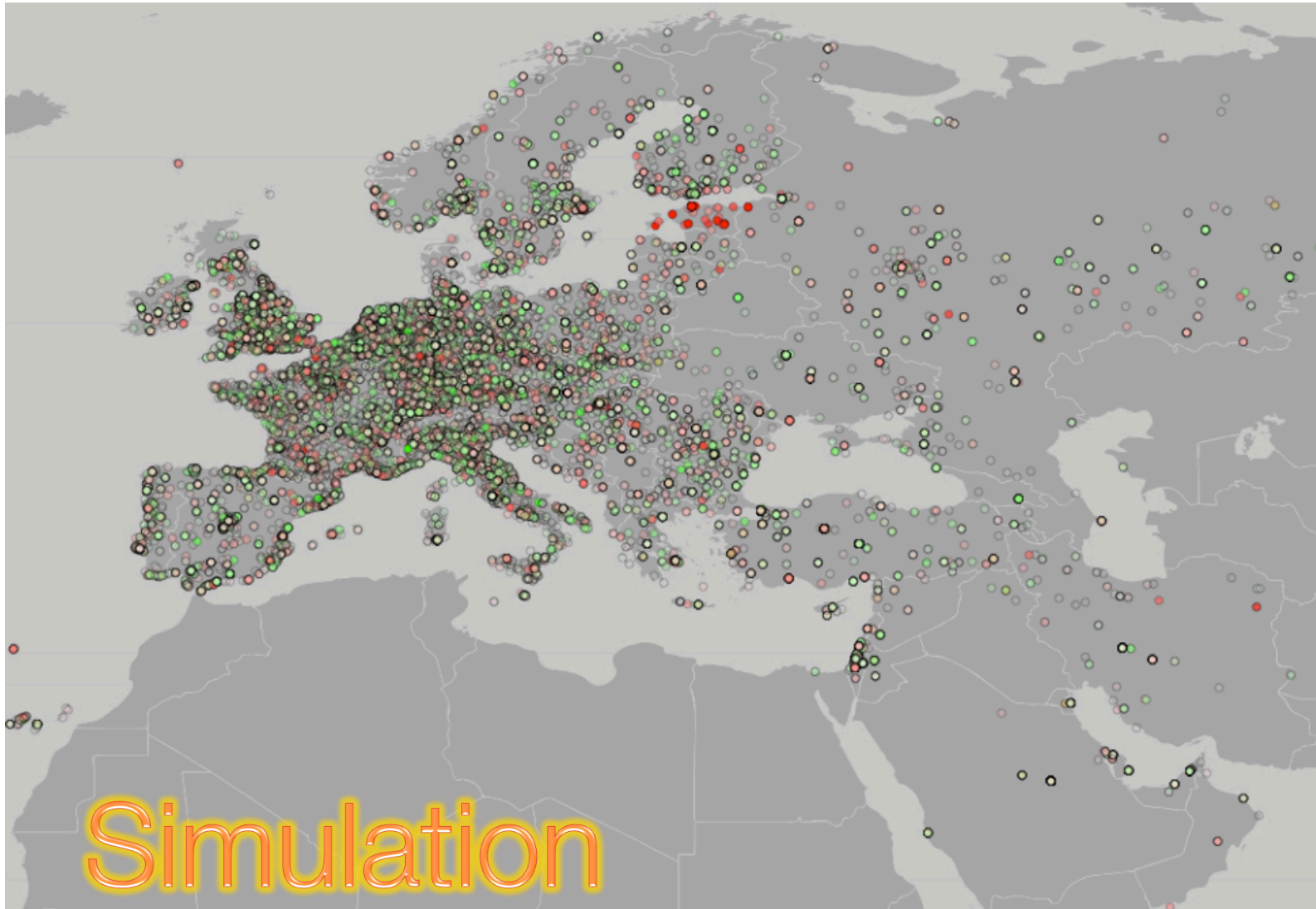
Intuition: 10k Probes



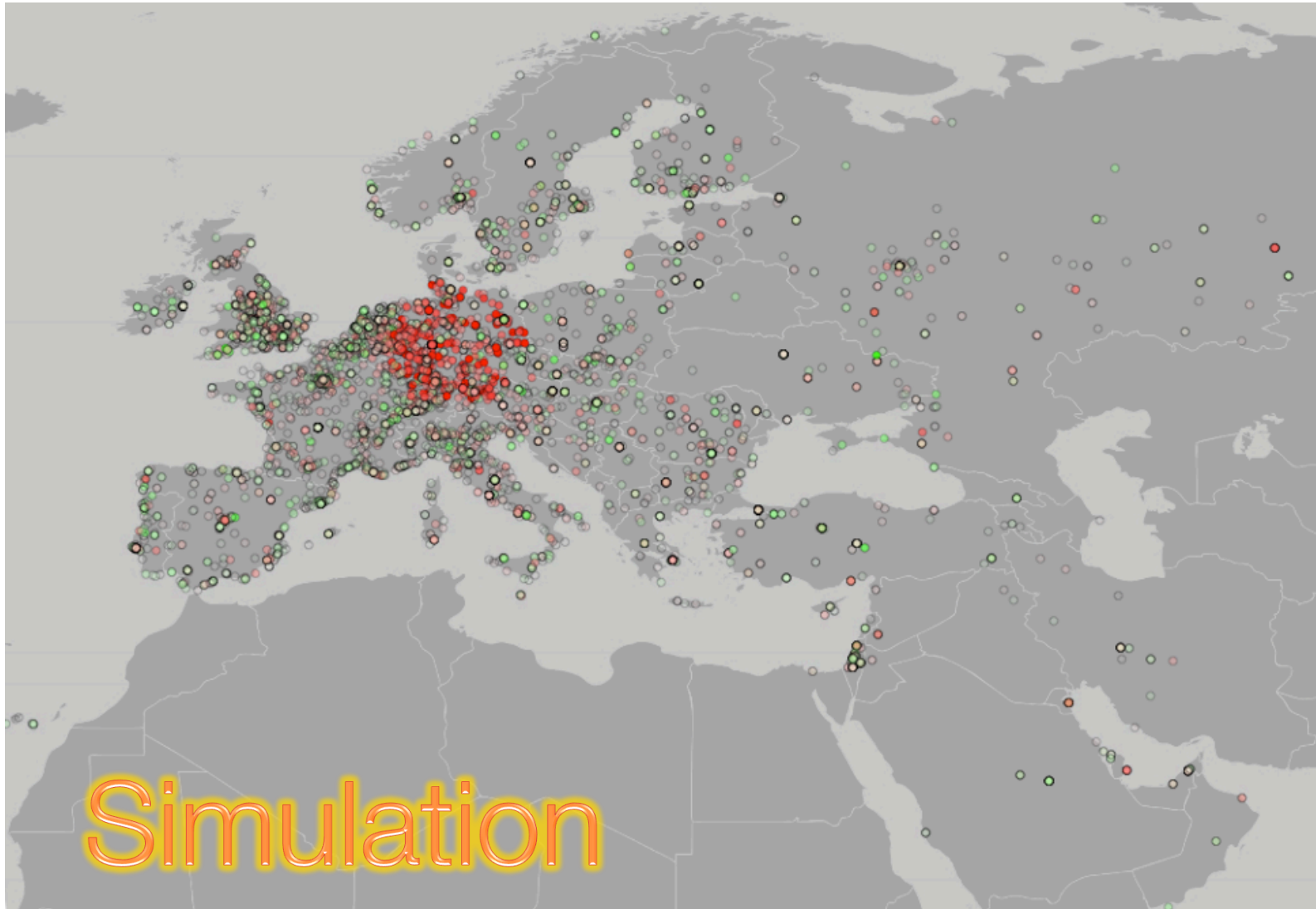
Intuition: 20k Probes



Intuition: 50k Probes



Intuition: 10k Probes & 1 AS



Ambitious Community Effort

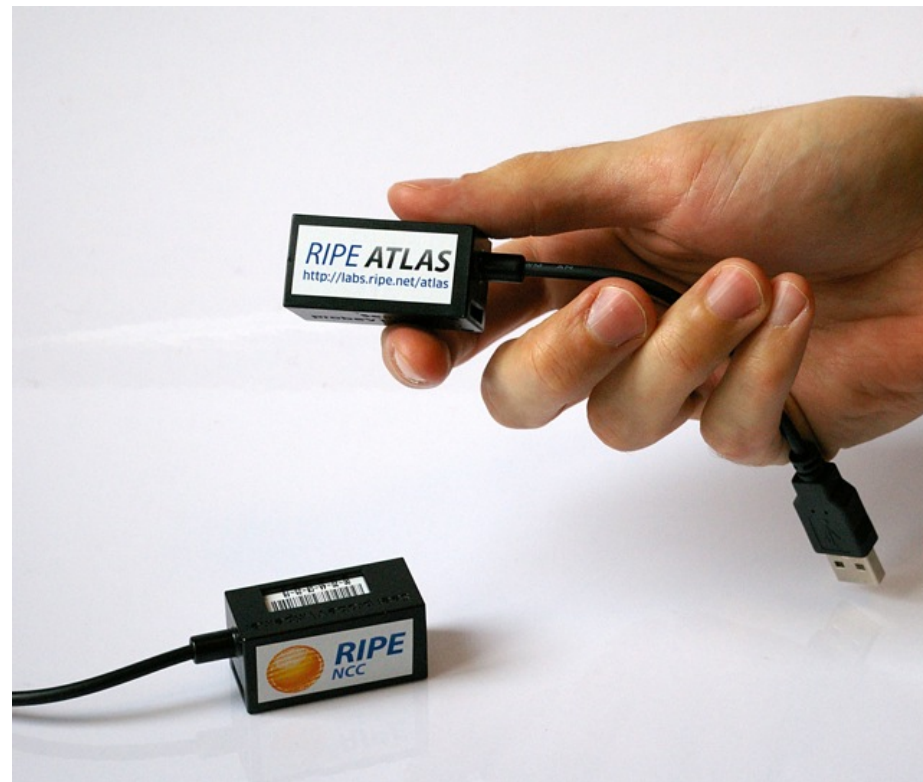
Instead of building small, separate, individual & private infrastructures, build a huge common infrastructure that serves *both* the private goals *and* the community goals.

Ambitious Community Effort

- Individual Benefits
 - Less expensive than rolling your own
 - More vantage points available
 - More data available
- Community Benefits
 - Unprecedented situational awareness
 - Wealth of data, ...

Intuition -> Plan

- For accurate maps we need more probes
- Deploying very many TTM boxes too expensive
- Smaller probes
- Easily deployable
- USB powered
- 24 x 365 capable



Probe Deployments



Versions

- Version 0
 - Ping to fixed targets (IPv4 & IPv6) ✓
 - Traceroute to 1st two upstream hops ✓
- Version 1
 - Ping & Traceroute to variable targets
 - DNS queries to variable targets
- Version 2
 - Your ideas ?
- A non-goal: performance measurements

Network extent



NOT a Simulation



Network extent



NOT a Simulation

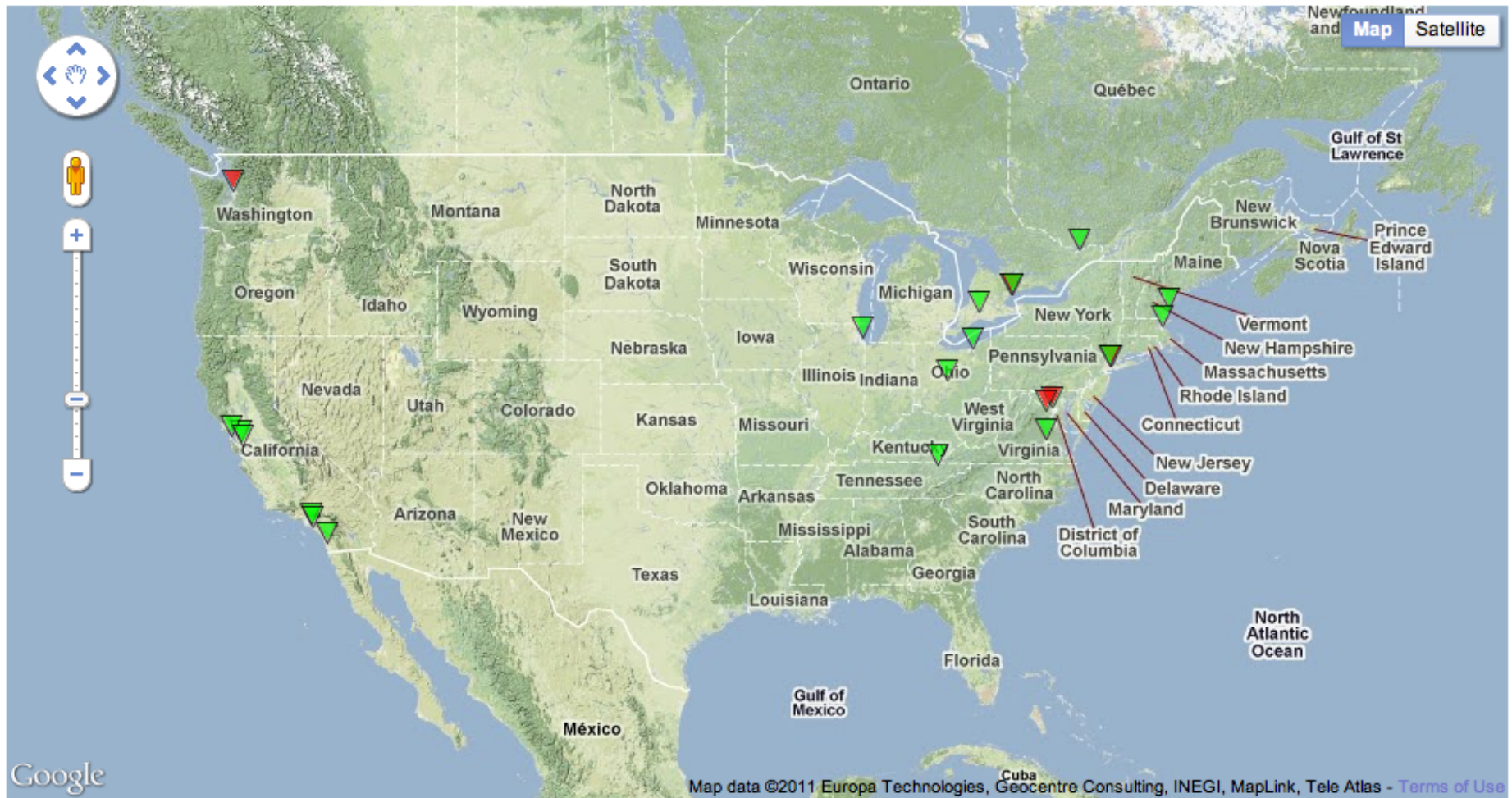
Network extent



NOT a Simulation



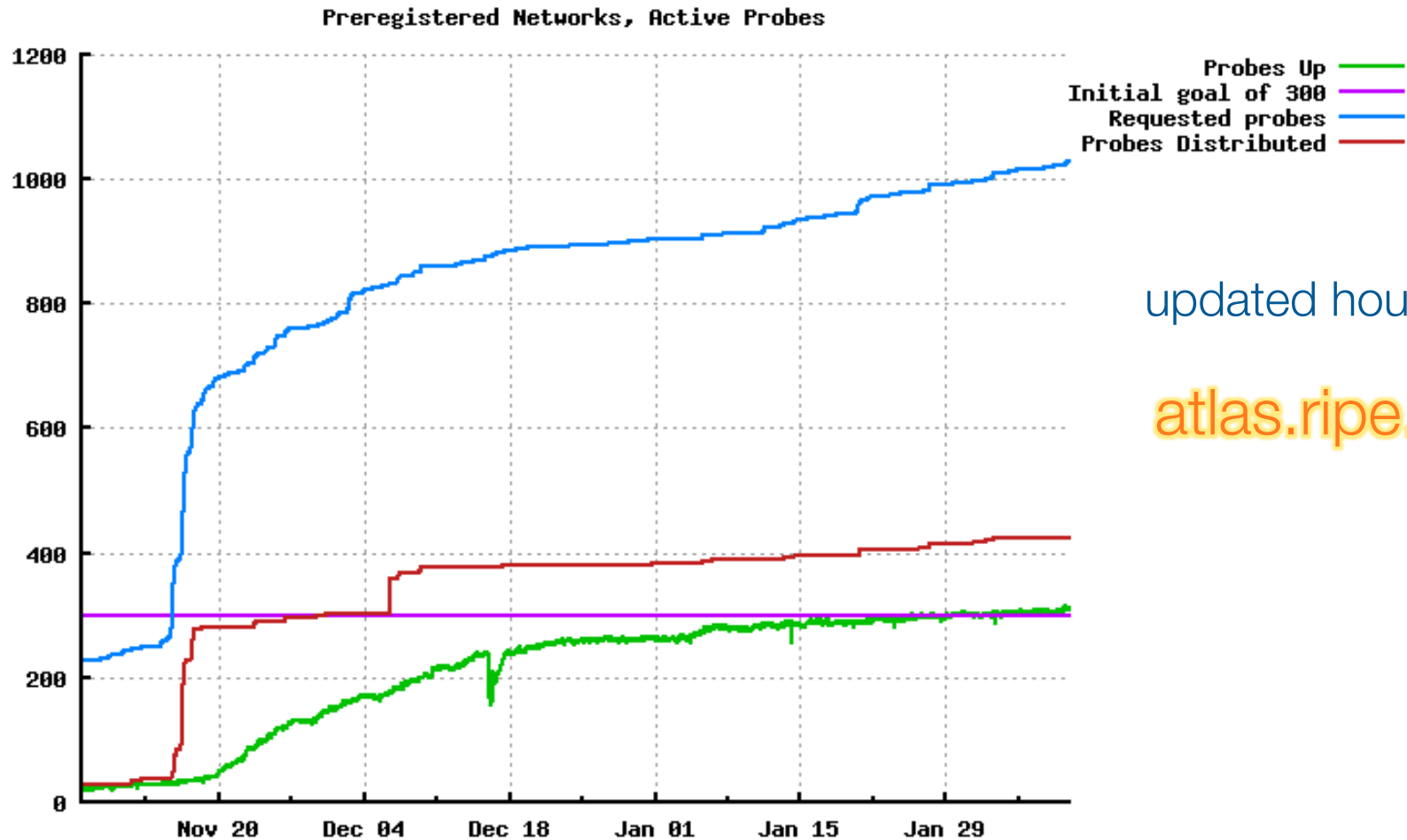
Network extent



NOT a Simulation



Network extent



updated hourly on

atlas.ripe.net

NOT a Simulation

Hosting = Credits = Measurements

- We cannot be everywhere without your help

Become a probe host!

- Donate a fraction of your bandwidth
- Donate a very small amount of electricity

You get:

- Recognition
- Access to fixed measurements from your probe
- Credits = Measurements **from any probe** (Q2/11)

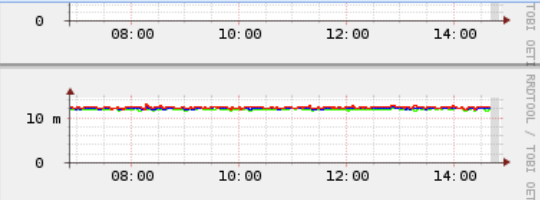
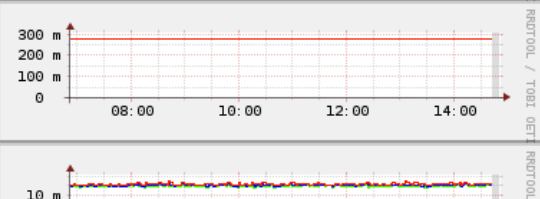

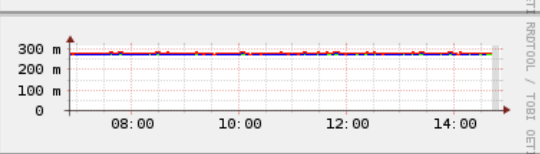

What you see is what you get

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Home | My probes | Logged in: RIPE Atlas | Change password | Log out

My Probes | @dfk xs4all adsl 10/1Mbit/s IPv6

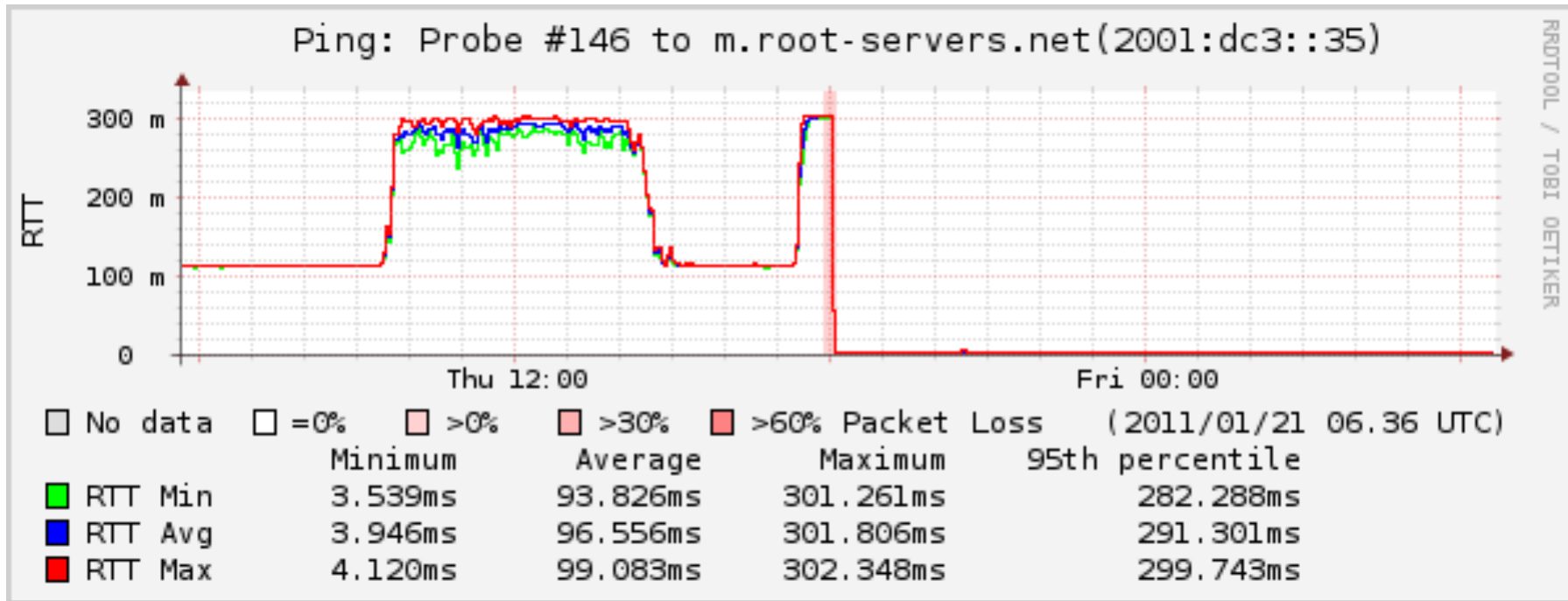
Ping (IPv4)	i.root-servers.net 192.36.148.17	11.579 ms / 11.822 ms / 12.023 ms 2010-11-14 14:45:38 UTC	
Ping (IPv4)	m.root-servers.net 202.12.27.33	275.401 ms / 275.635 ms / 275.854 ms 2010-11-14 14:45:52 UTC	
Ping (IPv4)	labs.ripe.net 193.0.6.153	11.646 ms / 11.807 ms / 11.949 ms 2010-11-14 14:45:59 UTC	
Ping (IPv6)	k.root-servers.net 2001:7fd::1	13.426 ms / 13.433 ms / 13.445 ms 2010-11-14 14:46:21 UTC	
Ping (IPv6)	m.root-servers.net 2001:dc3::35	273.04 ms / 274.874 ms / 278.252 ms 2010-11-14 14:46:10 UTC	

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NOT a Simulation



What you see is what you get



NOT a Simulation

Sponsorship = Credits = Measurements

- 50k probes too expensive for RIPE NCC alone
- Sponsorship Plans:

2K €	↓	8 probes
4K €		16 probes
		...
64K €		256 probes

- Recognition and **many more credits**
- Access to fixed measurements from probes **s** now
- Credits = Measurements **from any probe** (Q2/11)

Sponsorship = Credits = Measurements

- 50k probes too expensive for RIPE NCC alone
- Sponsorship Plans:

that is 2048€	2K €	8 probes
	4K €	16 probes
geek compatible pricing SM		...
	64K €	256 probes

↓

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Sponsorship = Credits = Measurements

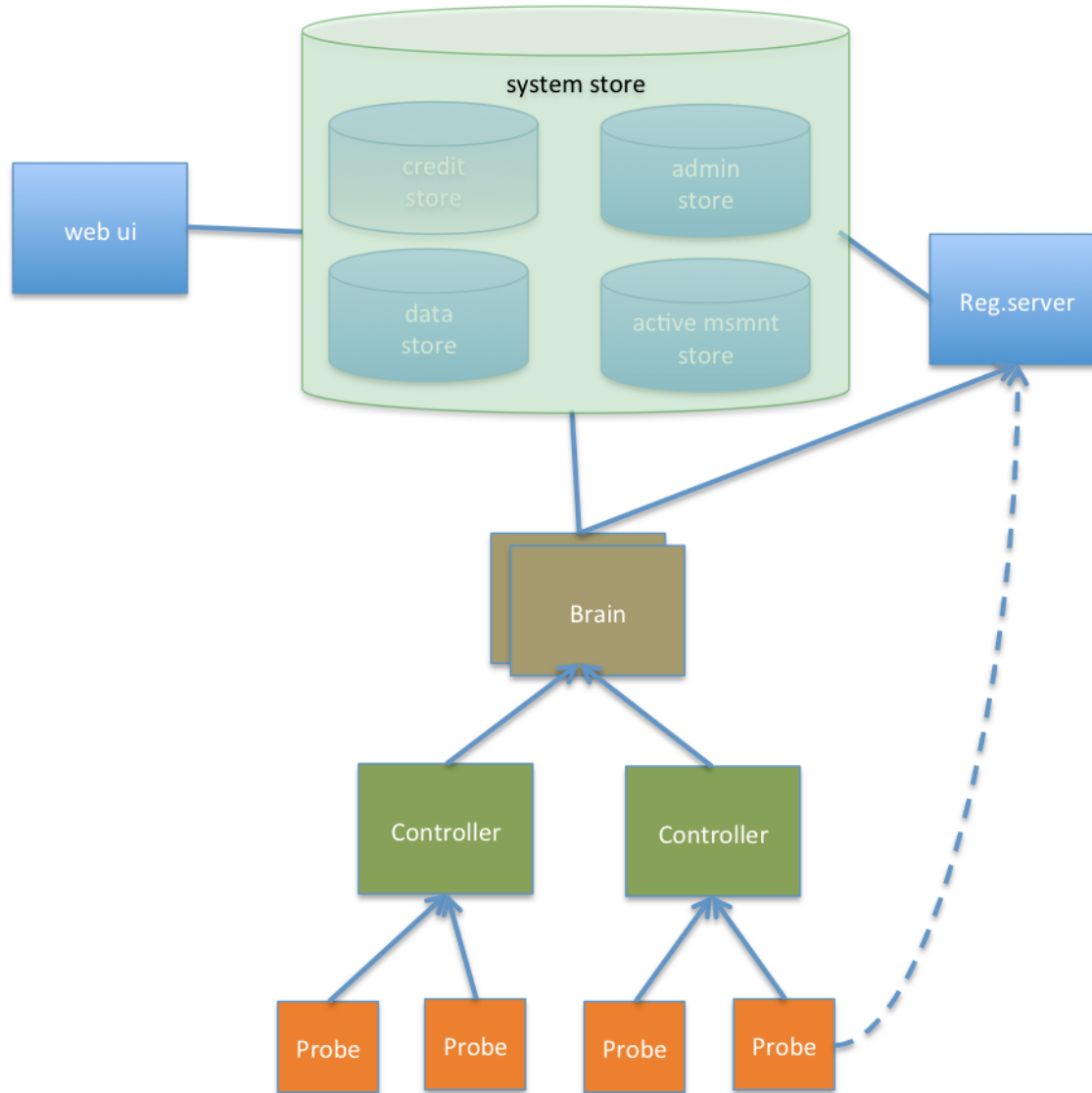
- Most of the early sponsors are more in for the idea than for the potential benefits (for now)
- Many of them are DNS providers of some kind
 - They have multiple locations
 - ... and “renting” measurement functionality is simpler than building a complete measurement network yourself

Measurement nodes – “Probes”

- Probe (v1 / generation 1):
 - Lantronix XPortPro
 - Very low power usage
 - 8MB RAM, 16MB flash
 - Runs uClinux
 - No FPU, no MMU, virtually no UI
 - A reboot costs <15 (<5) seconds
 - An SSH connection costs ~30 seconds
 - We can remotely update the firmware
 - Form factor of the finished probe is “just right”



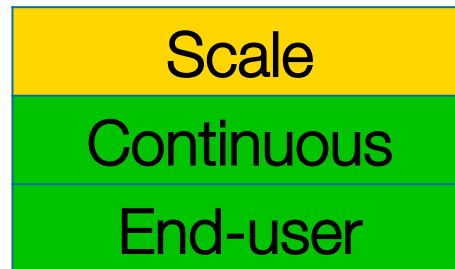
RIPE Atlas - Overall Architecture



RIPE Atlas - Security aspects

- Probes have hardwired trust material (registration server addresses / keys)
- The probes don't have any open ports, they only initiate connections
 - This works fine with NATs too
- Probes don't listen to local traffic, there are no passive measurements running
 - There's no snooping around

RIPE Atlas



Questions?

atlas.ripe.net

