# RIPE Atlas

## A “Real Big” Measurement Network

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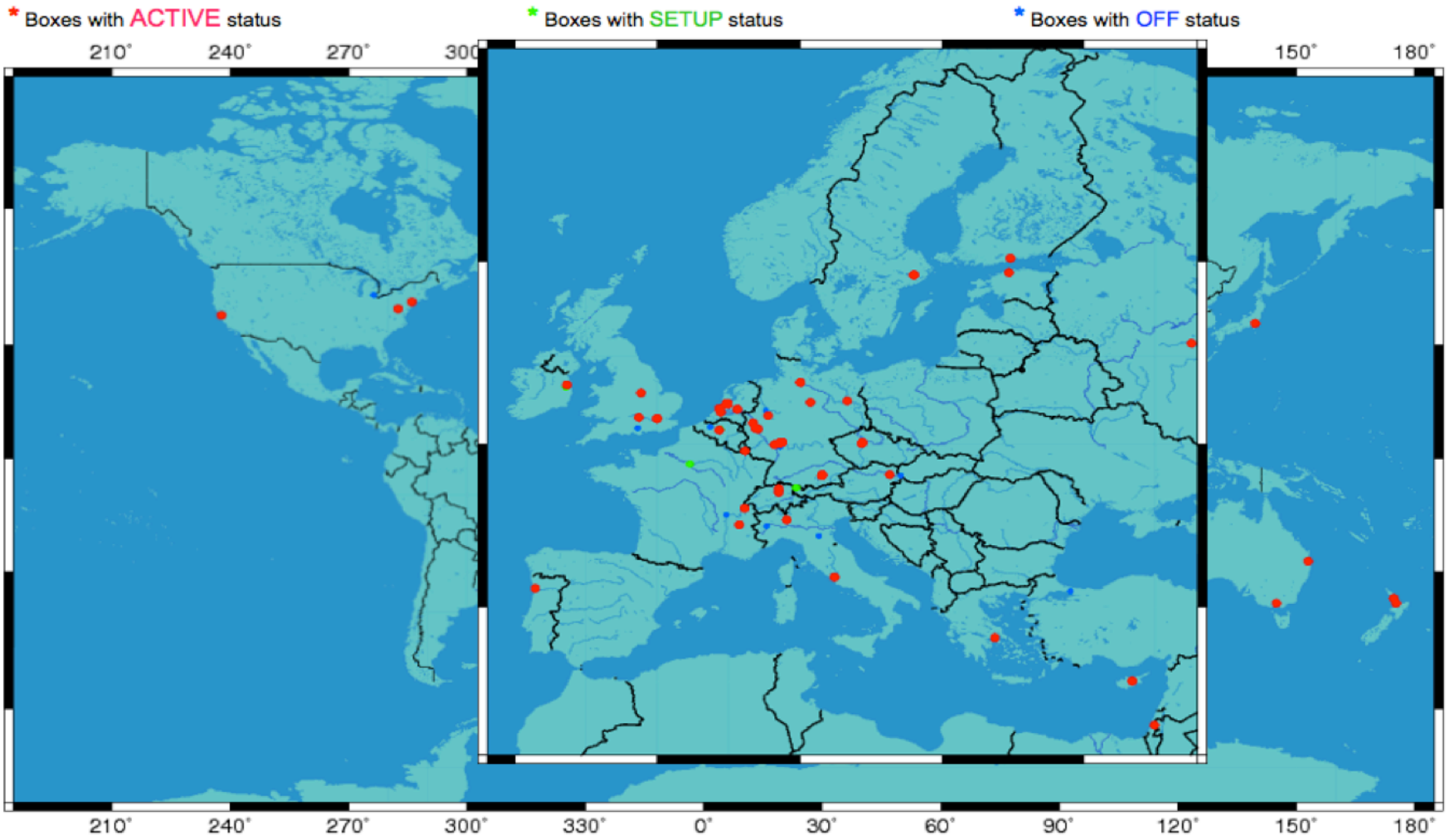
Chief Scientist

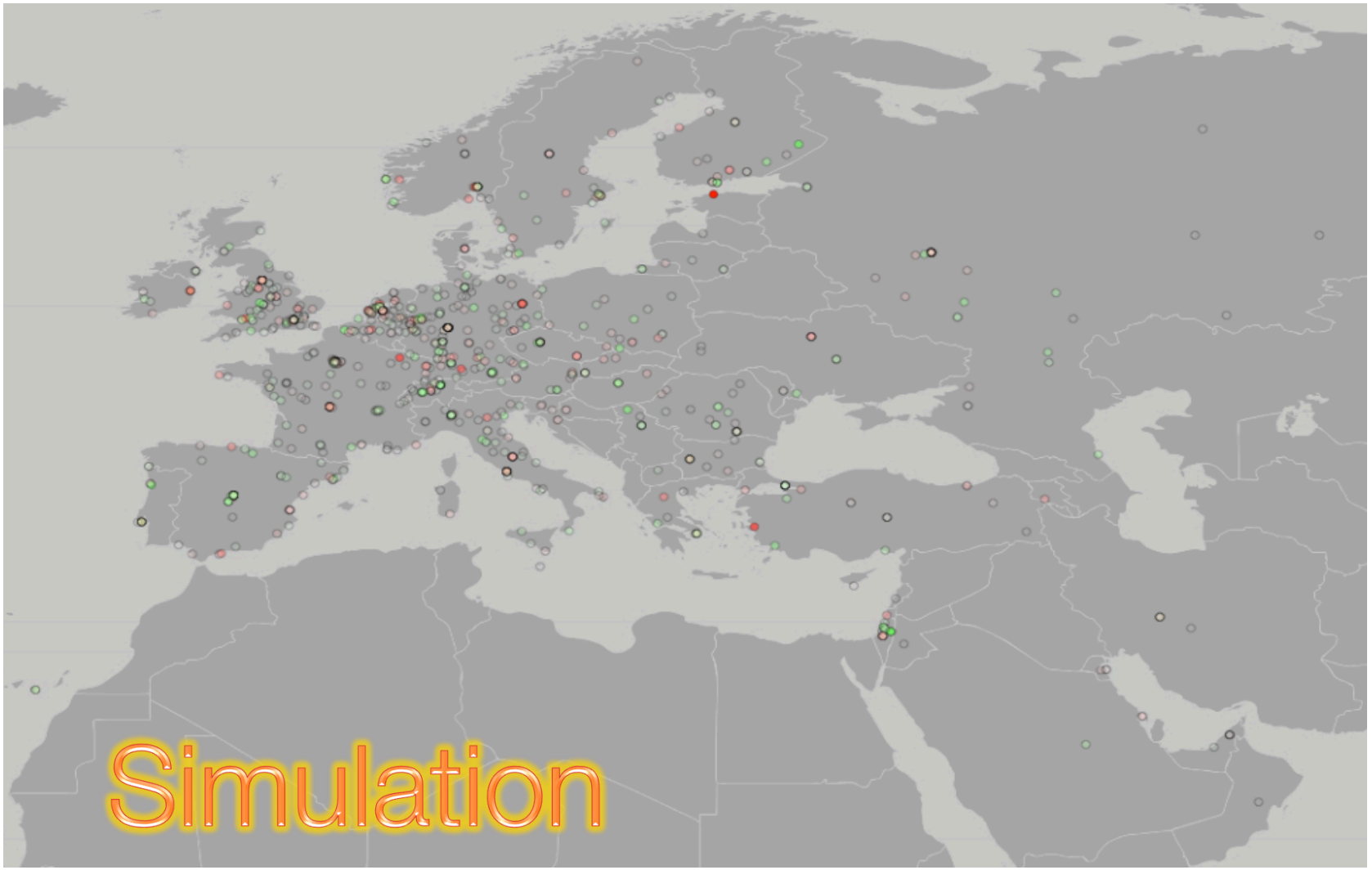
RIPE NCC

# RIPE TTM (used for DNSMON)

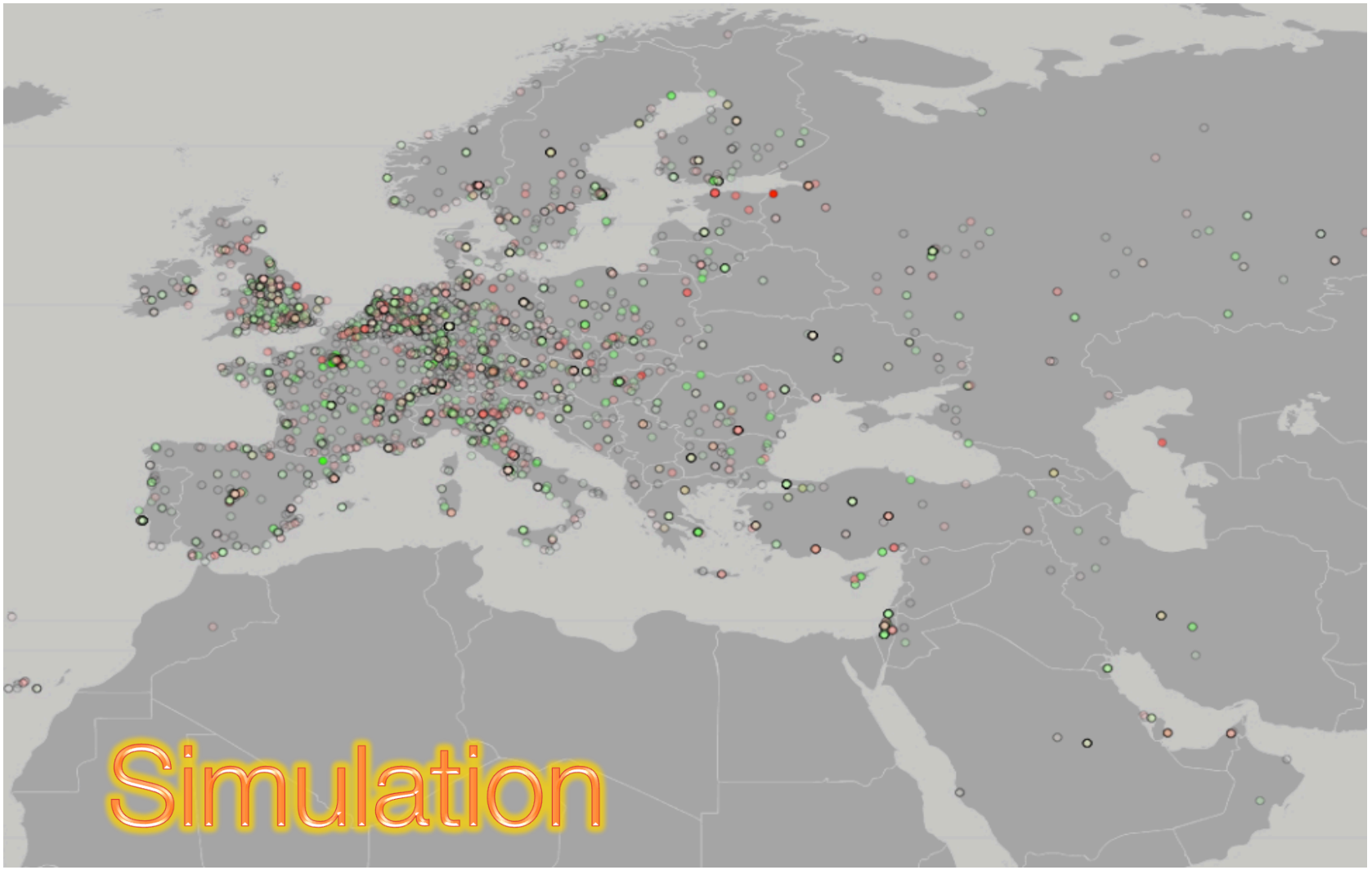


# Light Map

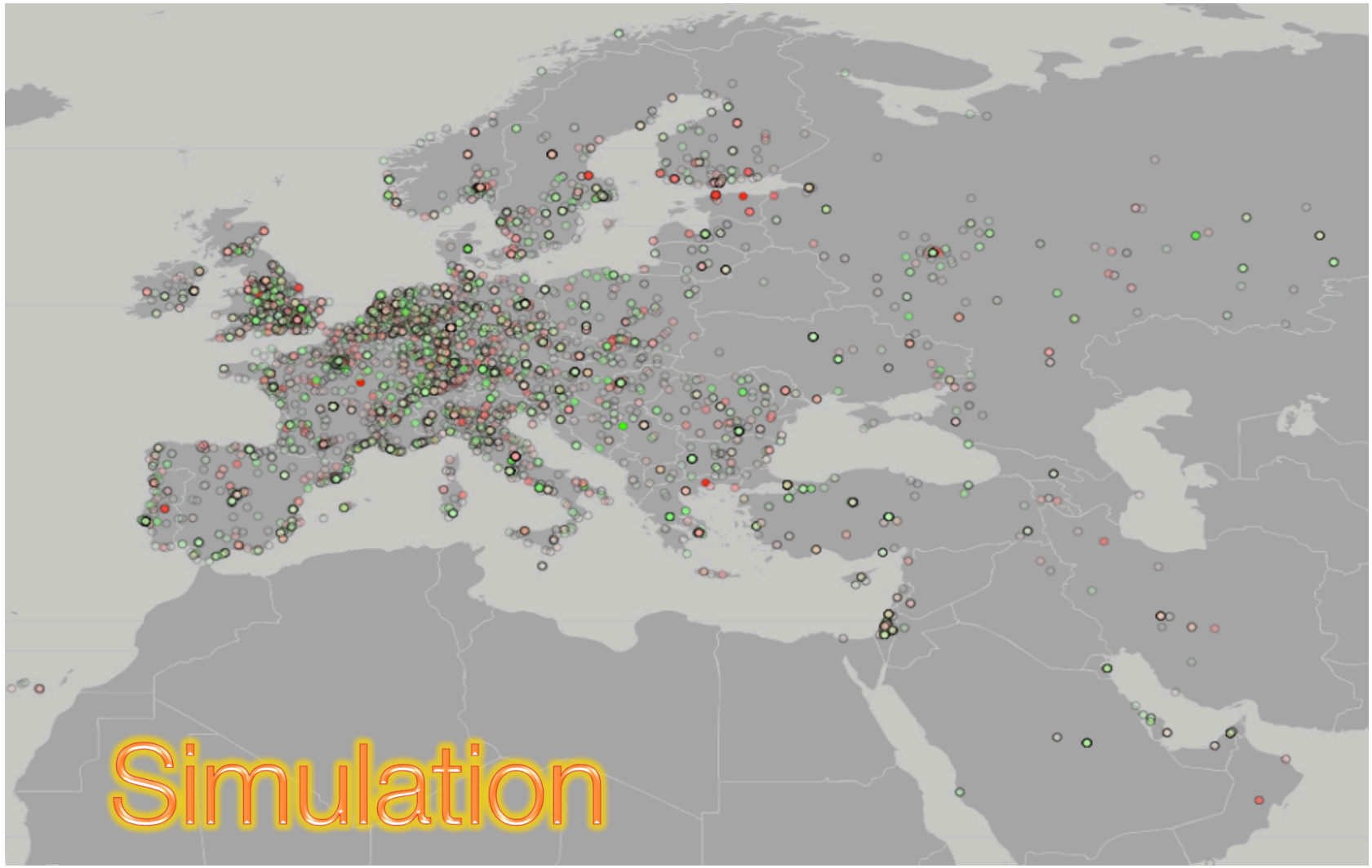
# Intuition: 1000 Probes



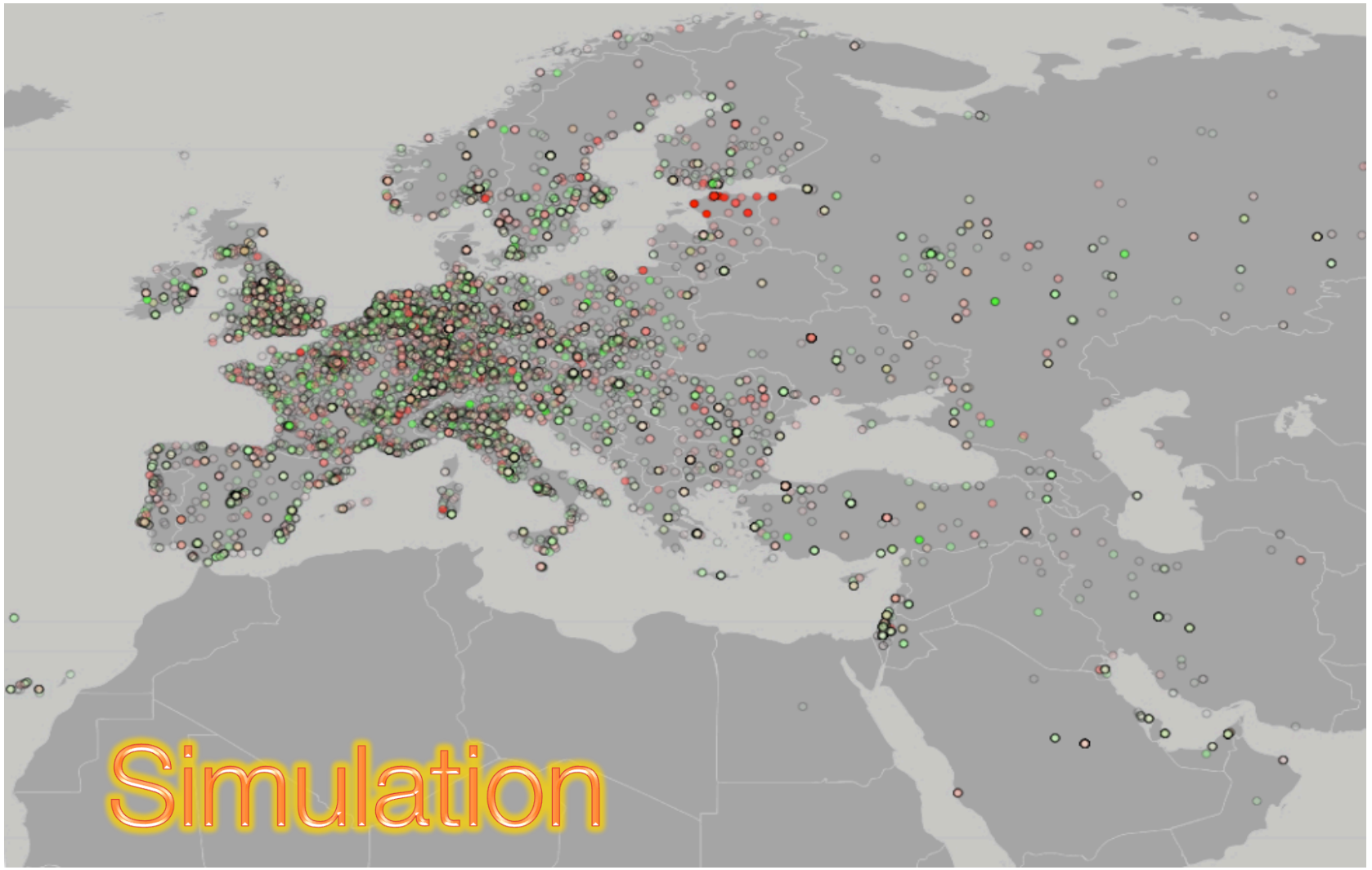
# Intuition: 5000 Probes



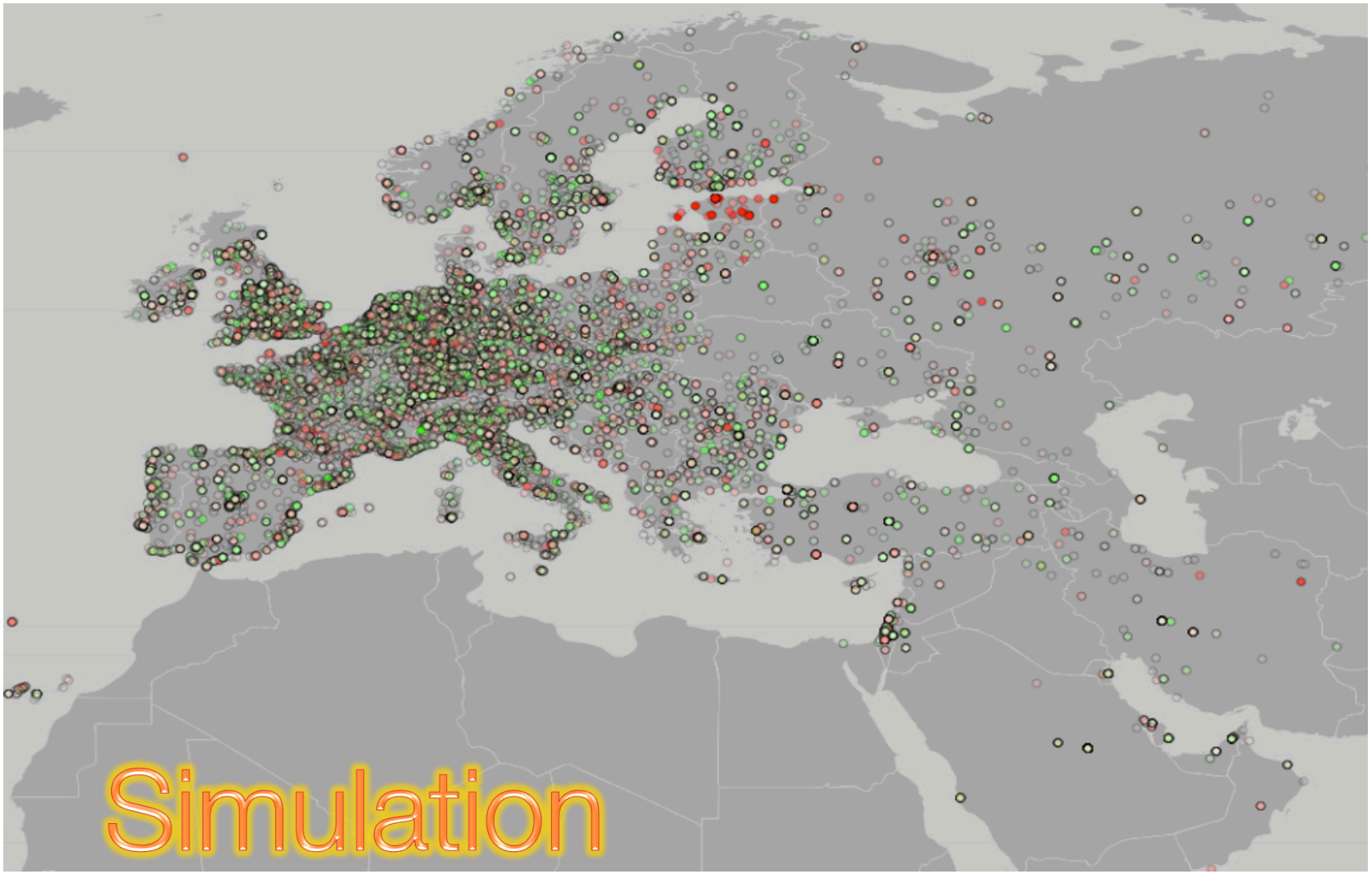
# Intuition: 10k Probes



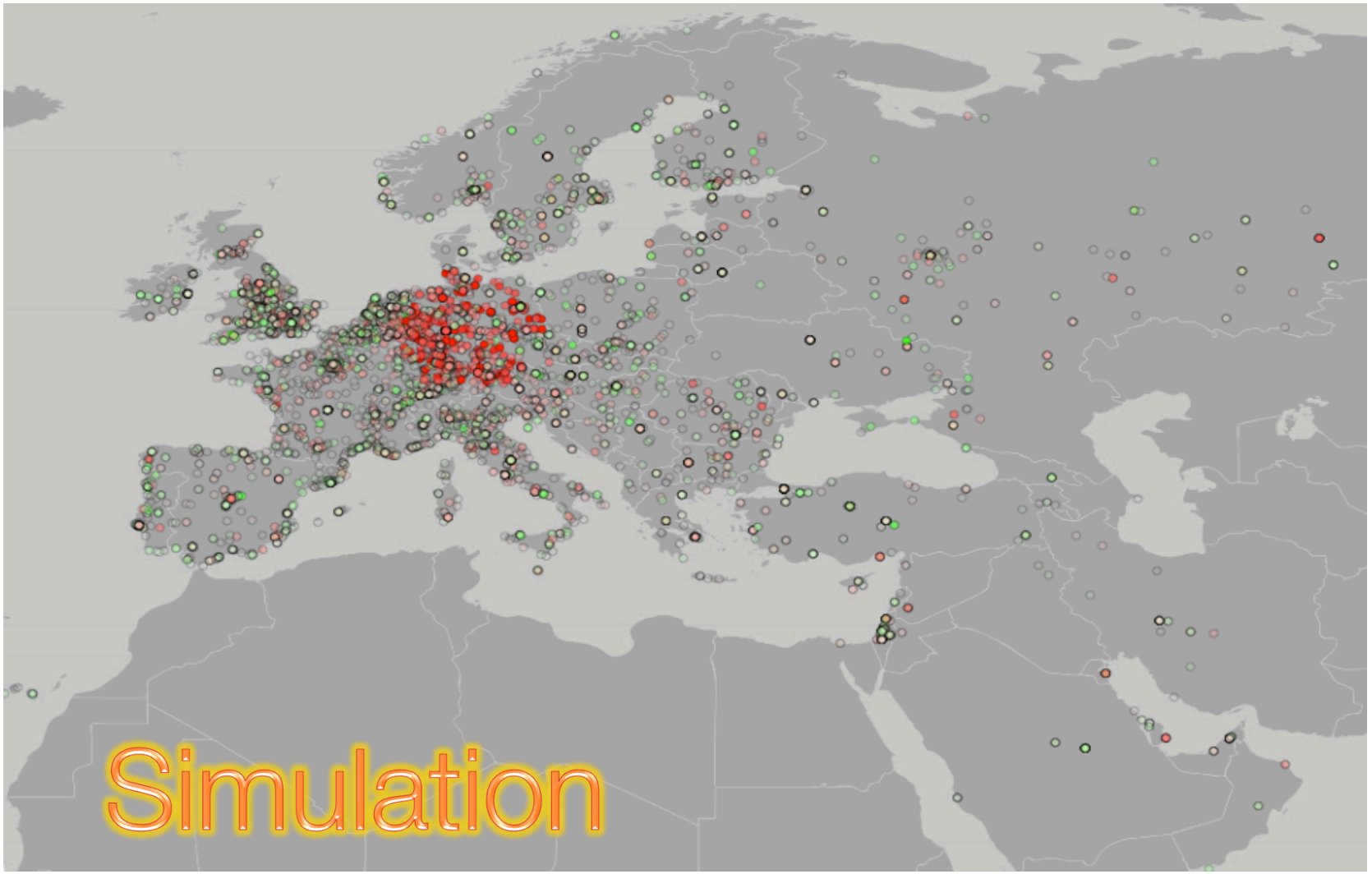
# Intuition: 20k Probes



# Intuition: 50k Probes



# Intuition: 10k Probes & 1 AS



# Ambitious Community Effort

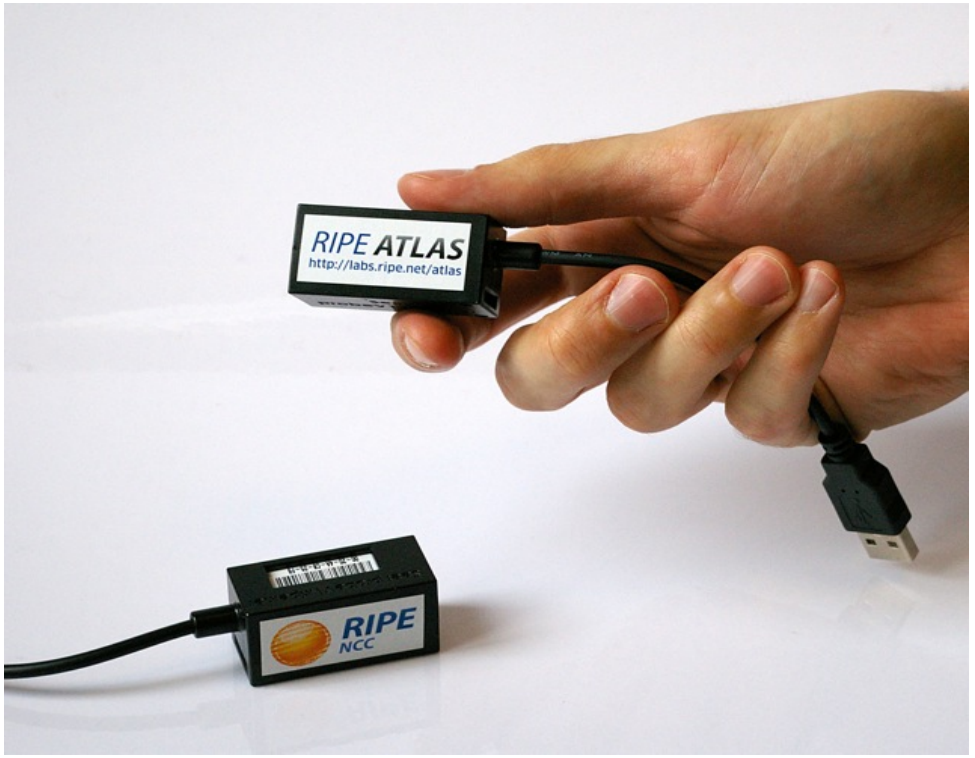
Instead of building *small, separate, individual & private* infrastructures, build *one huge common* infrastructure that serves ***both*** the individual goals ***and*** the community goals.

# Ambitious Community Effort

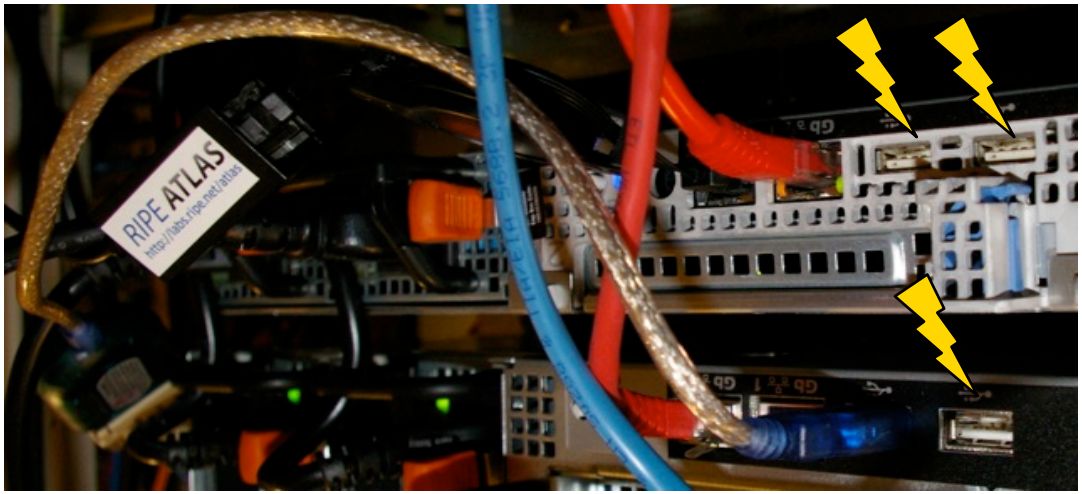
- Individual Benefits
  - Less expensive than rolling your own
  - More vantage points available
  - More data available
- Community Benefits
  - Unprecedented situational awareness
  - Wealth of data, …

# 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


# Probe Deployments


NOT a Simulation

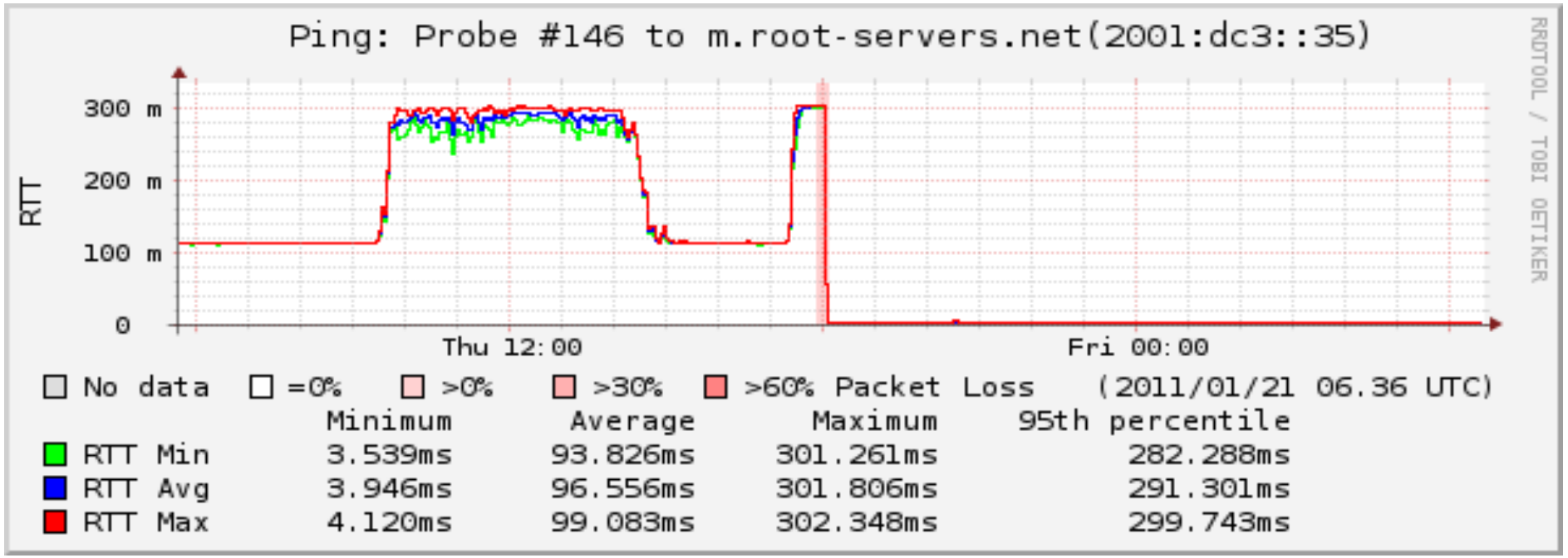
# Probe Deployments


NOT a Simulation

# Probe Capabilities

- 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 ?
- Upgrades are automatic

# What you see is what you get




NOT a Simulation

# Hosting = Credits = Measurements

- We cannot “be” everywhere without your help

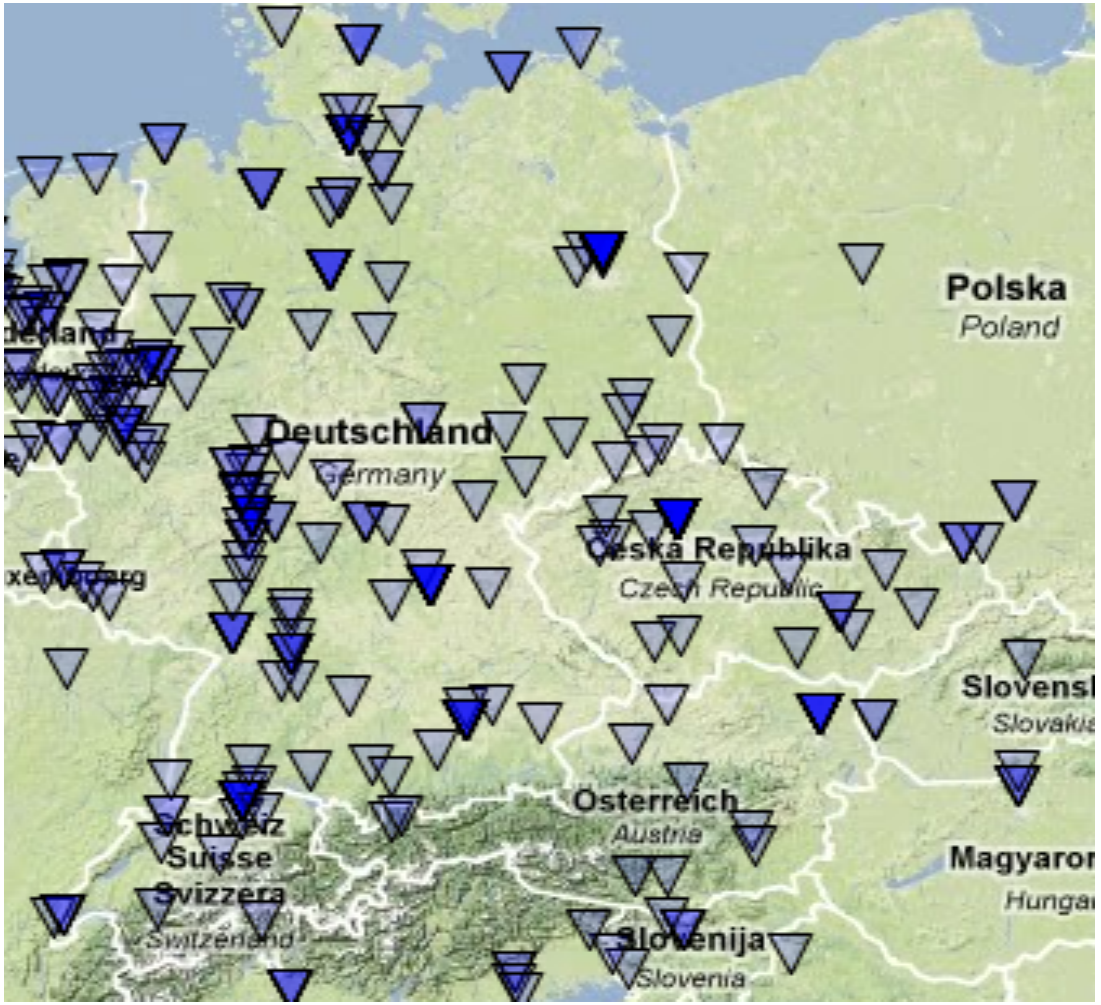
Become a probe host !

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

You get:

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

# Host Applications




atlas.ripe.net

# Hosting = Credits = Measurements

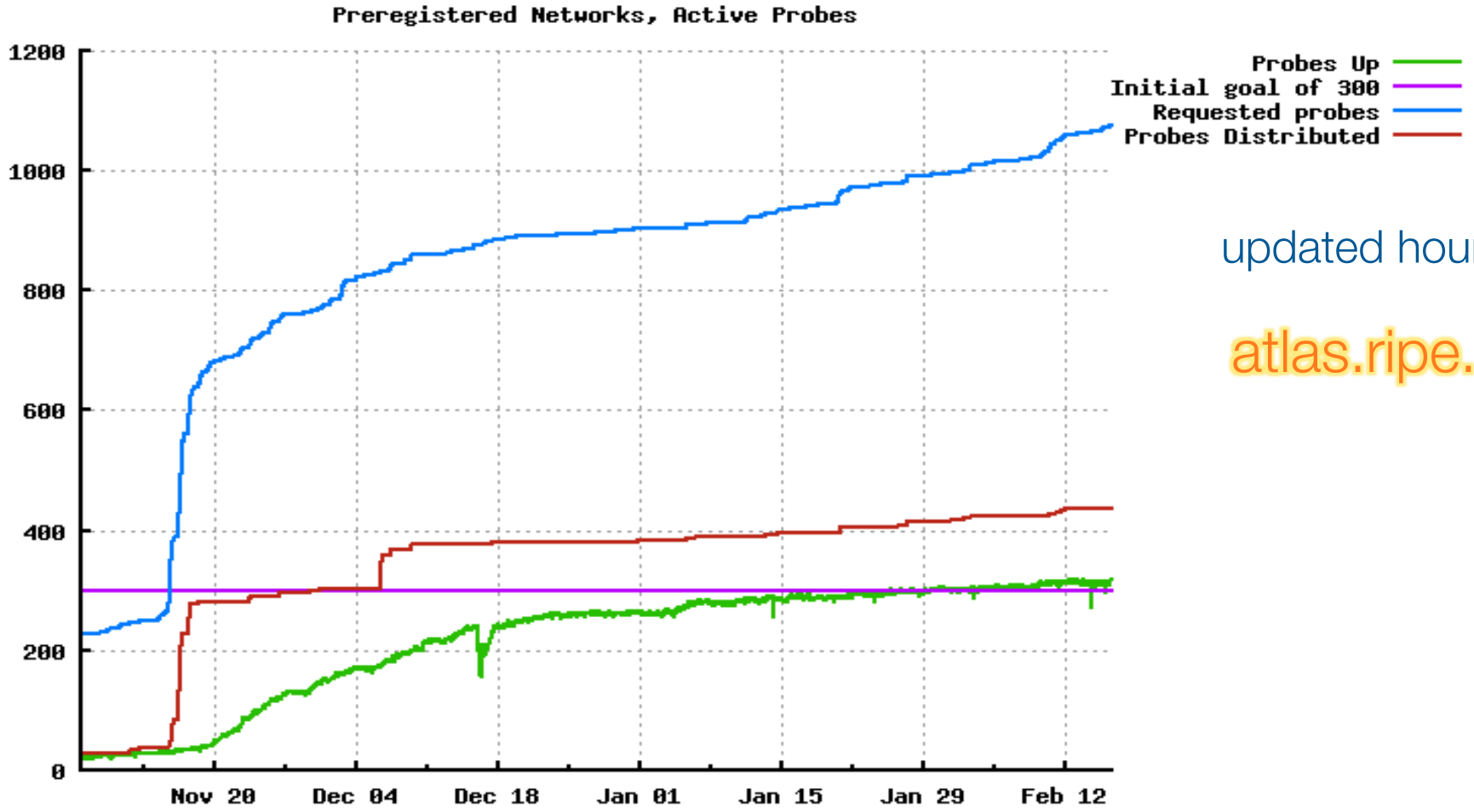
Become a probe host !

First go to atlas.ripe.net and apply !

If your location adds to diversity

we will send the probe.

# Hosting = Credits = Measurements



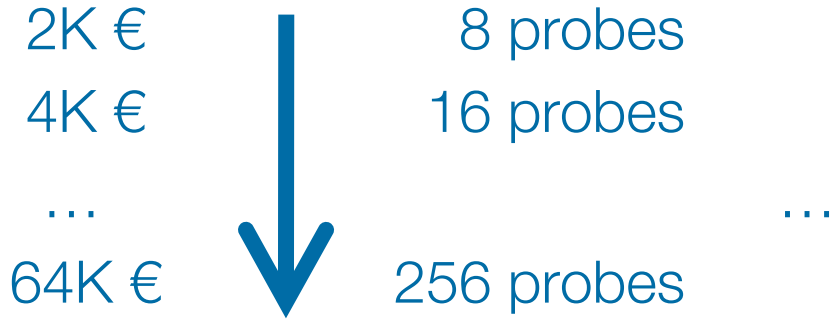

updated hourly on

atlas.ripe.net

NOT a Simulation

# Sponsorship = Credits = Measurements

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




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

# Sponsorship = Credits = Measurements

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

that is 2048€

geek compatible pricing℠

| | |
|---|---|
| 2K € | 8 probes |
| 4K € | 16 probes |
| … | … |
| 64K € | 256 probes |

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

# Sponsorship = Credits = Measurements

For sponsorships see me during the meeting,

or contact me: <daniel.karrenberg@ripe.net>

# Questions?

atlas.ripe.net

RIPE NCC

# Spare Slides

# Why Hardware and not Software Probe ?

- Comparable and Reliable Measurements
  - Known and uniform environment
  - Tamper resistant
- 24 x 365
  - Install and Forget
  - Not dependent on host system, needs little power
- Security
  - Not attractive nor easy target for botnet herders
  - Not introducing potential weakness in host systems

# Is this the RIPE Botnet ?

- No
- Architecture is security conscious -> MAT WG
- Probes do not offer services, no open ports
- Probes are no interesting targets
  - Very special environment
  - Not really powerful either
- Infrastructure is designed with security in mind
- Measurements will be rate limited ….

# Private Measurements ?

- We are not offering this as a service for private and confidential measurements
- All results should benefit the community, also those of individually configured measurements
  - Modalities to be discussed -> MAT WG
  - Embargo periods
  - Aggregation
  - Anonymisation
- If you want to keep it very secret, run your own.

# Relation to Other RIPE NCC Services ?

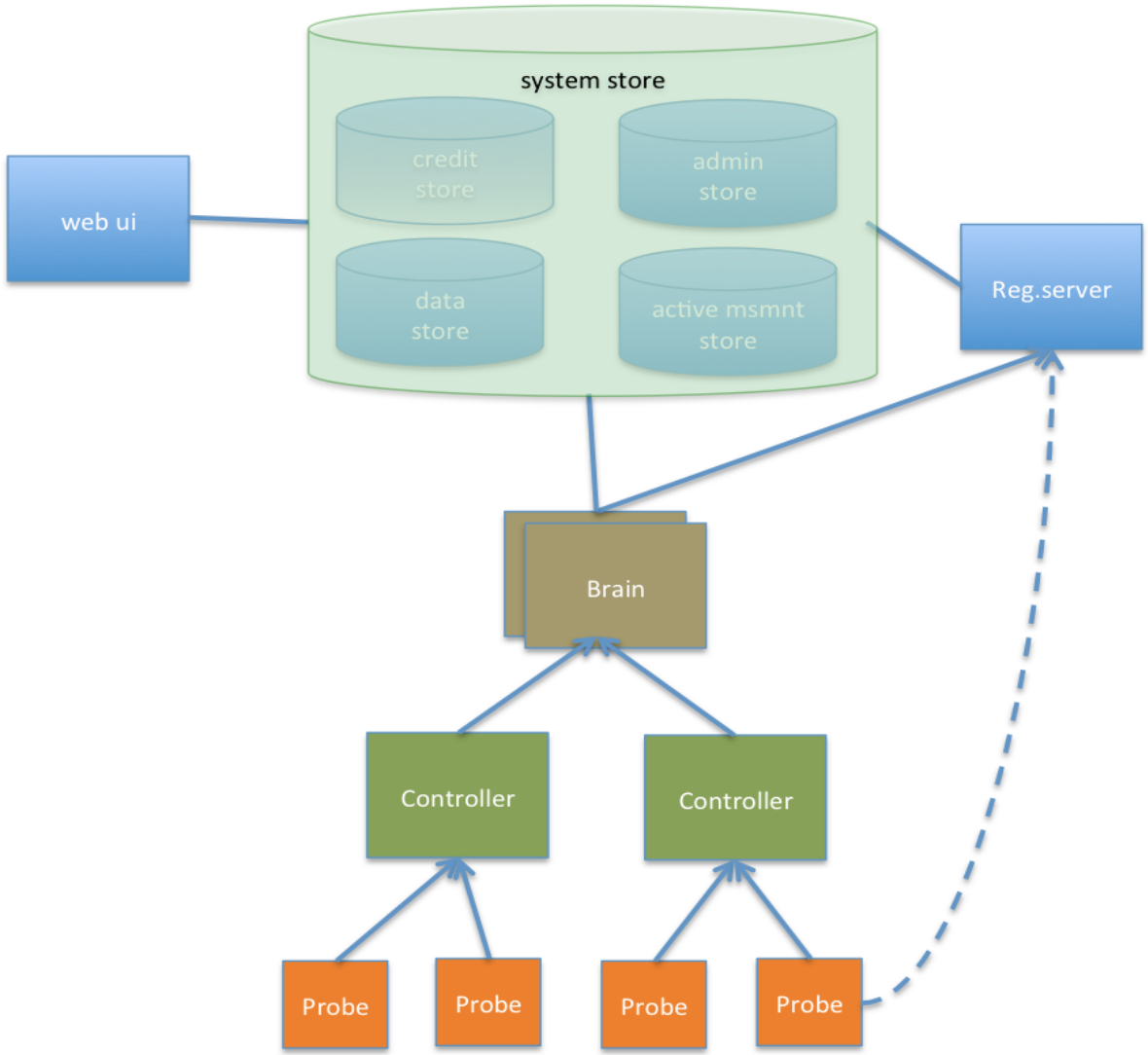
My **personal** vision, to be discussed in MAT WG and with current users:

- TTM will become part of RIPE ATLAS
  - Powerful class of probes
  - “Beacon” probes (some interest already)
  - RIPE Atlas framework of operation and services
- DNSMON will become a class of RIPE Atlas measurements

# 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