



GRAND DUCHY OF LUXEMBOURG  
Ministry of Foreign Affairs

Directorate for Development Cooperation



European Union Africa  
Infrastructure Trust Fund

# RIPE Atlas Project



“It is the obvious which is so difficult to see most of the time. People say 'It's as plain as the nose on your face.' But how much of the nose on your face can you see, unless someone holds a mirror up to you?”

— [Isaac Asimov](#), [I, Robot](#)

# Building a global measurement network

# Atlas Probes

- Probe v3: TP-Link TL-MR3020
  - USB powered
  - Runs open-source firmware
  - **Not** a wireless router!
- RIPE Atlas Anchor: Soekris net6501-70



# Security aspects

- Probes have hardwired trust material (registration server addresses / keys)
- The probes don't have any open ports, they only initiate connections
- Measurements are scheduled by centralised “command servers” via reverse ssh tunnels over TCP:443
- Probes don't listen to local traffic, there are no passive measurements running
- Source code for probe software published

# RIPE Atlas Status:

## February 2014

- 4,700+ probes up and active
- 8,600+ registered users
- Four types of customised measurements: ping, traceroute, DNS, SSL



# Atlas Probes Worldwide





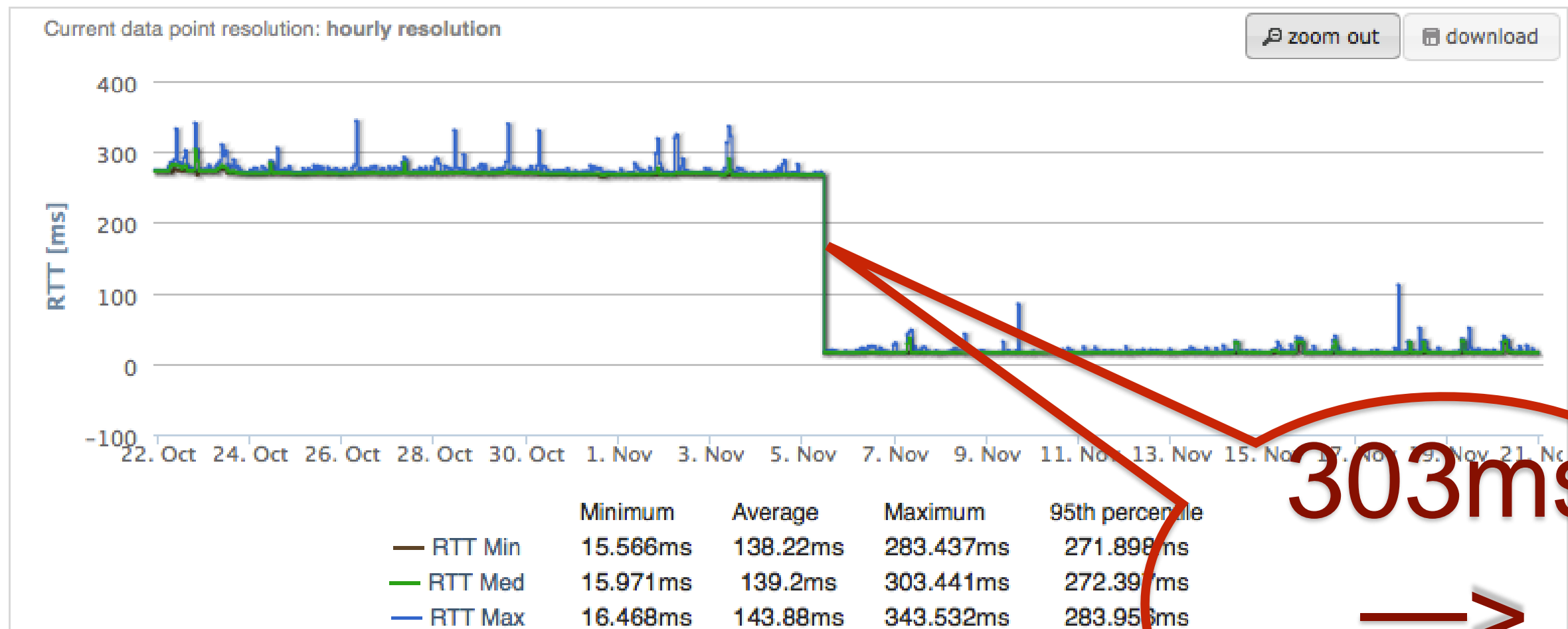
Why measure?

“Measurement  
is the first step that leads to control and  
eventually to improvement. If you  
can't measure something, you can't  
understand it. If you can't understand it,  
you can't control it. If you can't control it, you  
can't improve it”

— H. James Harrington

# Success story: Latency drop from installing a D.root at JINX

Ping (IPv4) to d.root-servers.net (199.7.91.13)



303ms

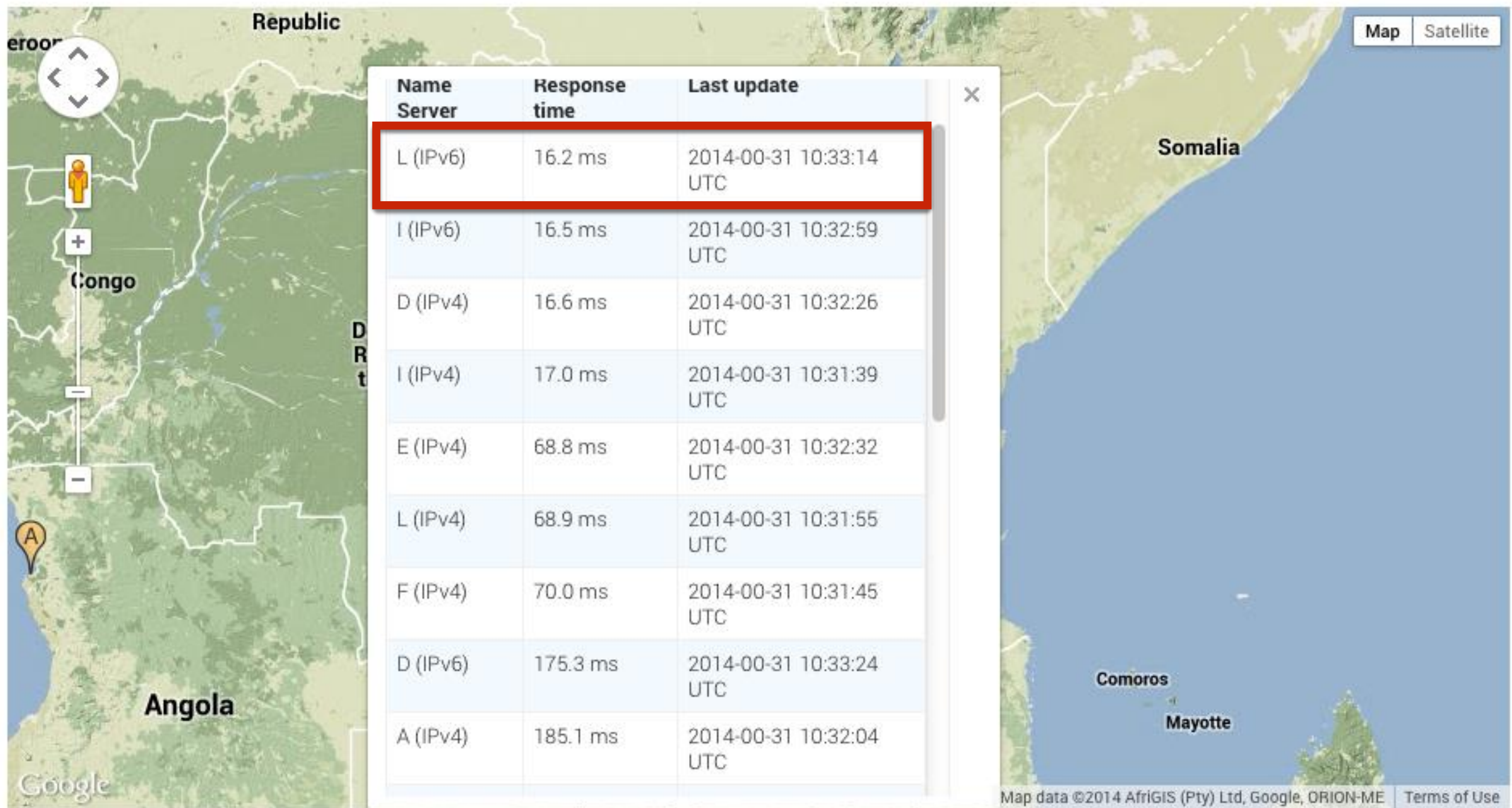


15ms

# Which DNS Roots do you prefer ?



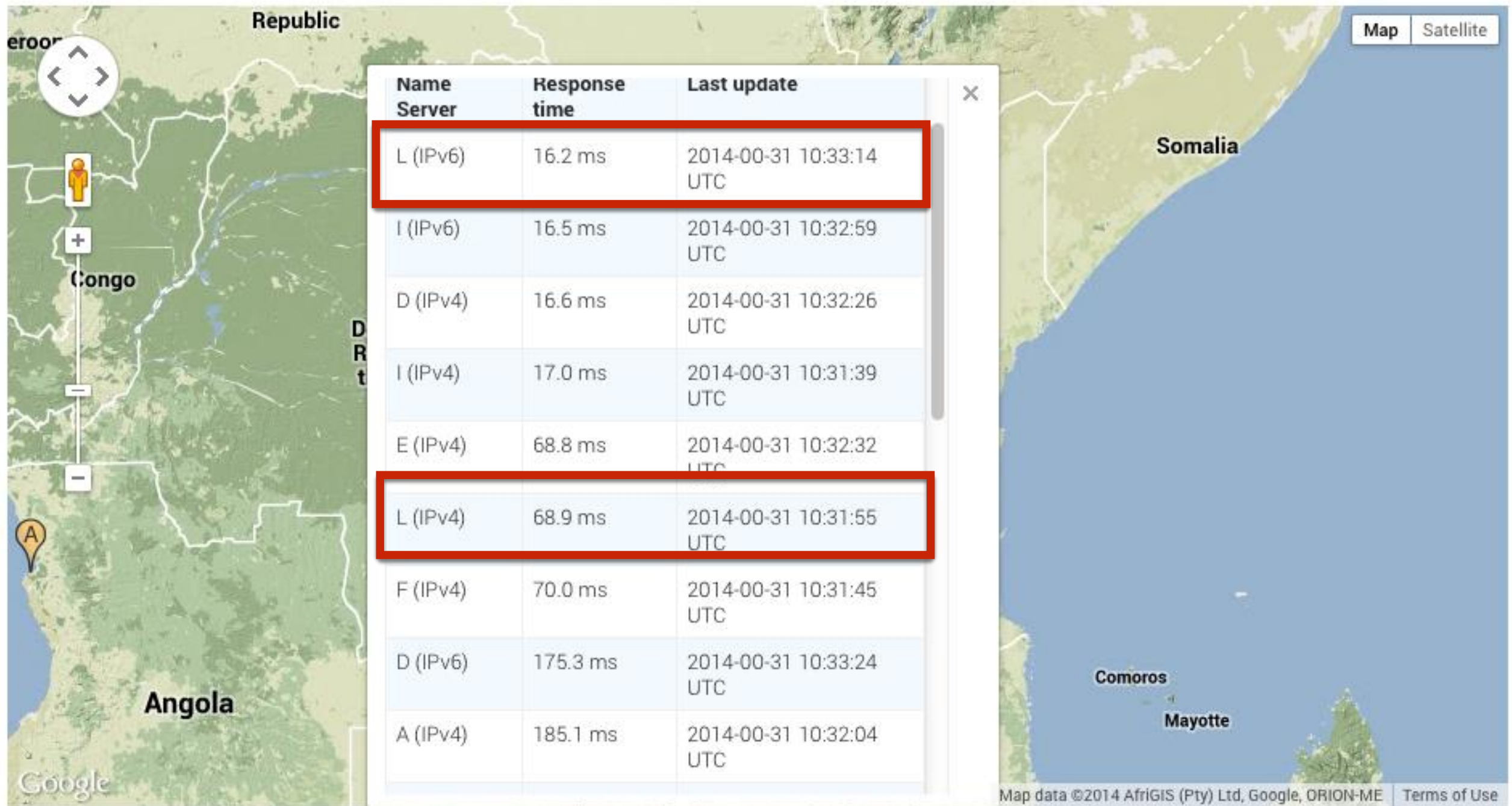
# L-Root Routing Anomaly?



RIPE Atlas DNS RTT Map produced at: 2014-00-31 10:52:42 UTC .  
Measurements taken between 2014-00-31 09:52:42 UTC and 2014-00-31 10:52:42 UTC.



# L-Root Routing Anomaly?



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Get involved!

# Participation & Benefits

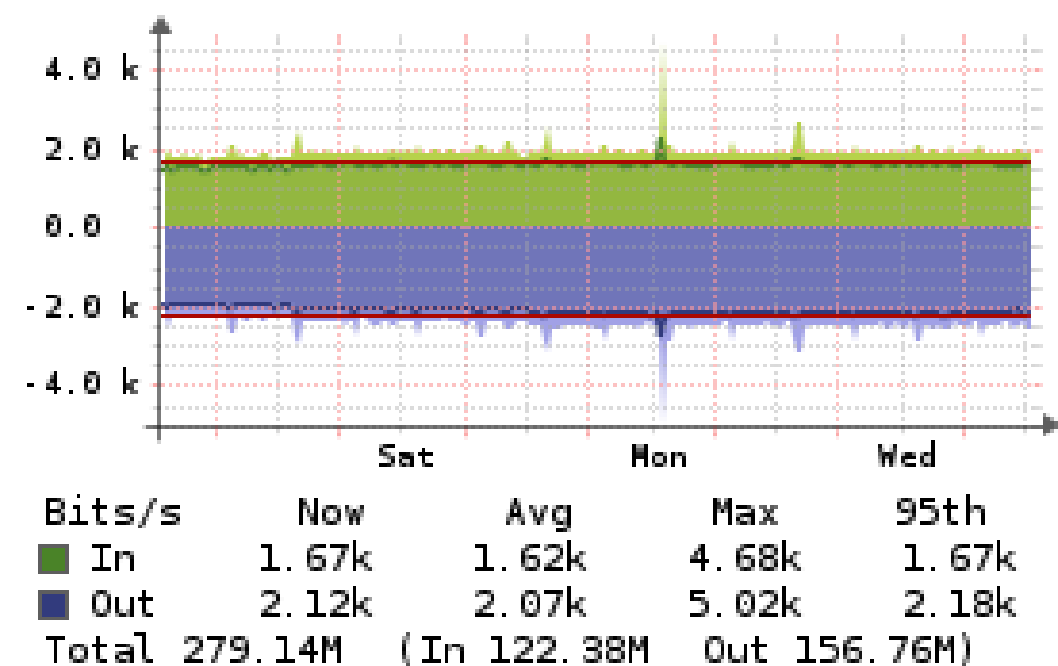
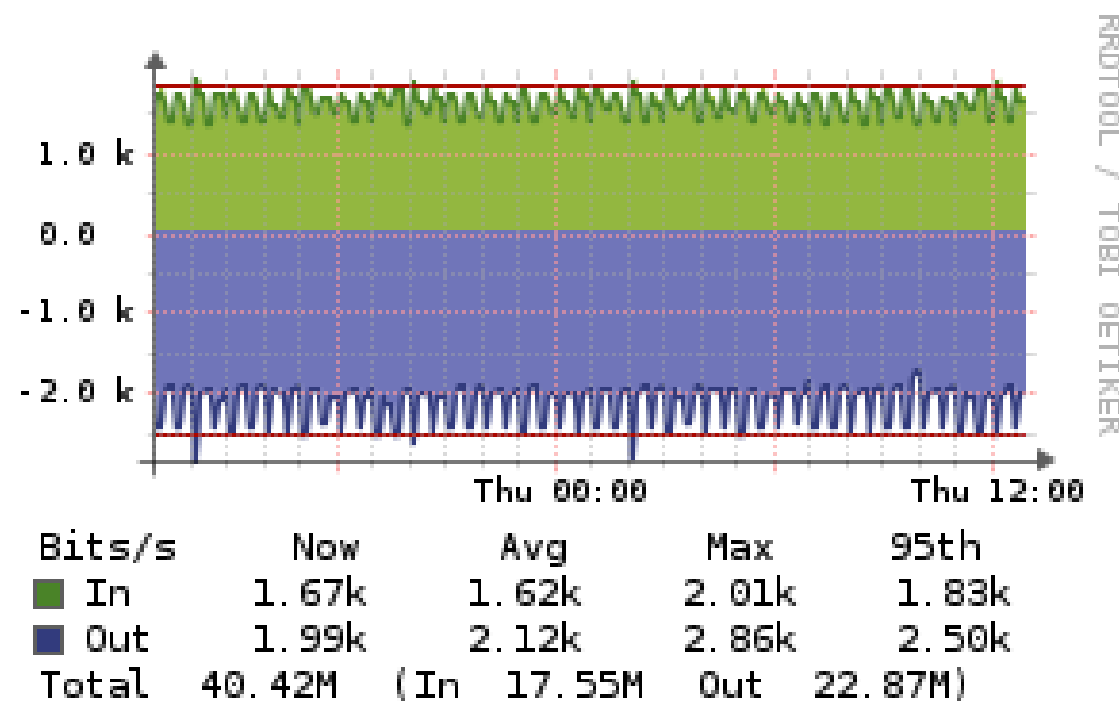
- Major operational benefit: See your network from the outside!
  - Have at your fingertips ~4,500 external vantage points to do customised measurements towards the destination of your choice
- Data of built-in measurements available to everyone
  - \_ Maps, data from public probes, API to download raw data
- Anyone can become an Atlas probe host

# Minimal resource consumption

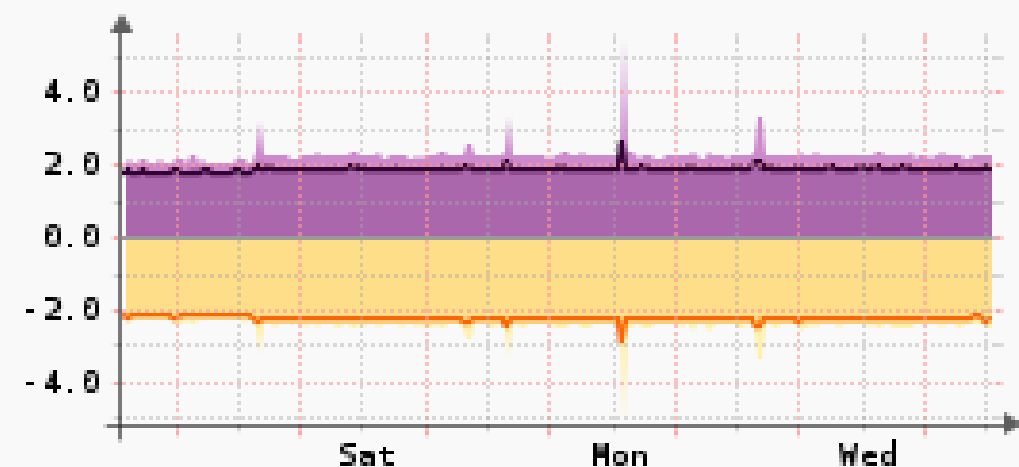
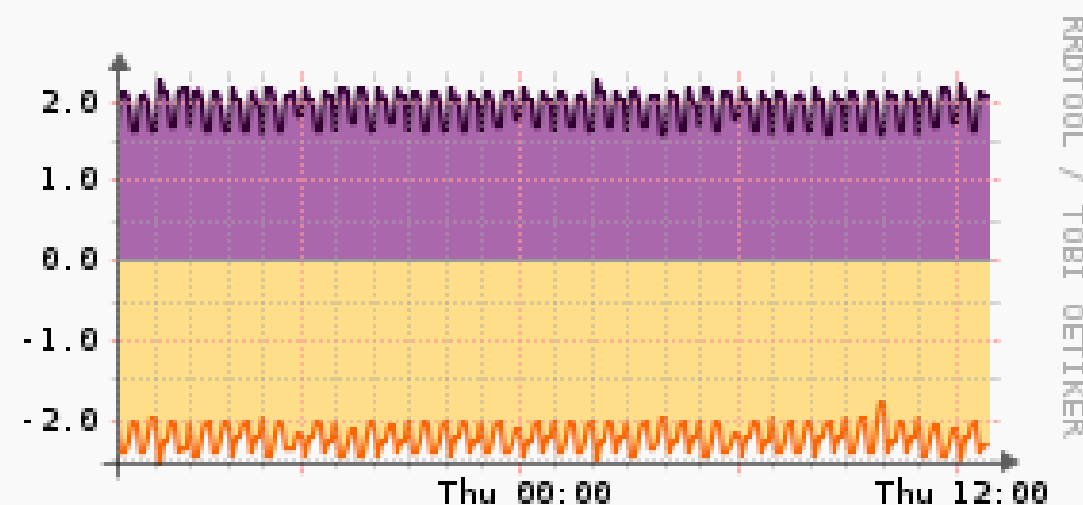
- USB powered (+500mA)
- Fixed RJ45 port
- DHCP configured
- $\pm 2\text{-}4\text{Kb/s}$  (<2 GB per month)
- Must be able to do DNS, HTTPS, ICMP

# Minimal resource consumption

## Traffic



## Unicast Packets



# Signing up is easy

- Simple 3 step process
  - Register online to get a probe
  - Register your probe when you get it
  - Plug it in !

# Community News

- New and more ambassadors
- Active GitHub Community Repository
  - New code and new documents published
- Call to action
  - Upload your photos!
  - Apply to be an ambassador or sponsor





# Atlas Anchors

- Anchors: well-known targets and powerful probes
  - Regional baseline & “future history”
- 36 anchors installed
- Anchoring measurements
- Full-mesh between anchors deployed
- Coming up: each probe will measure 4-5 anchors



# RIPE Atlas Contacts

- Get a probe: <https://atlas.ripe.net/apply>
- Articles & updated on RIPE Labs
  - <https://labs.ripe.net/atlas>
- Twitter: #RIPEAtlas and @RIPE\_Atlas



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**END**

