



RIPE NCC

RIPE NETWORK COORDINATION CENTRE

Internet Measurements during COVID-19

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RIPE Labs



- Lots of interesting and relevant information

<https://labs.ripe.net/covid19>

- Great operator collaboration
- Virtual Hackathons
- COVID-19 and Network Security
- Organising online events
- and lots more

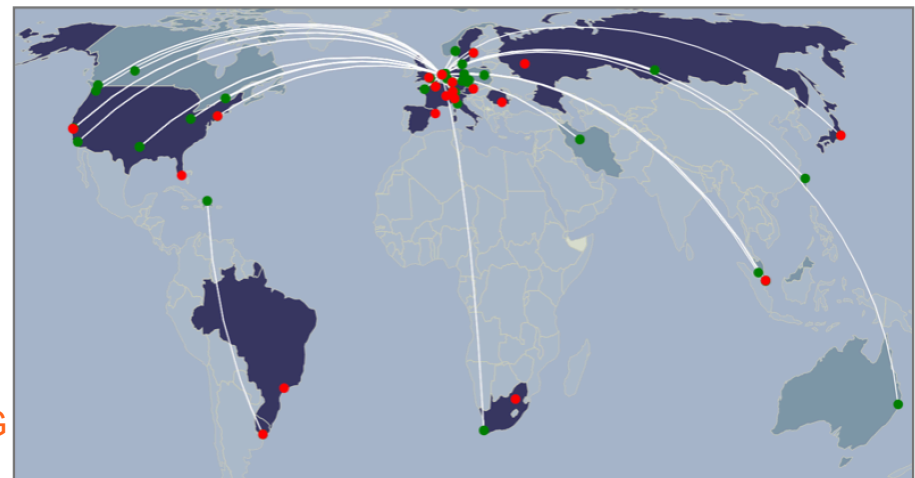


Measuring Network Stability

RIPE Routing Information Service



- RIPE Routing Information Service (RIS)
- RIS collectors collect routing data in BGP
- Shows a history of changes
- RIS makes snapshot every 8 hours
- Differences between show dynamics of the network
 - network maintenance
 - malicious changes and re-routes
- <https://ris.ripe.net>
- <https://stat.ripe.net>

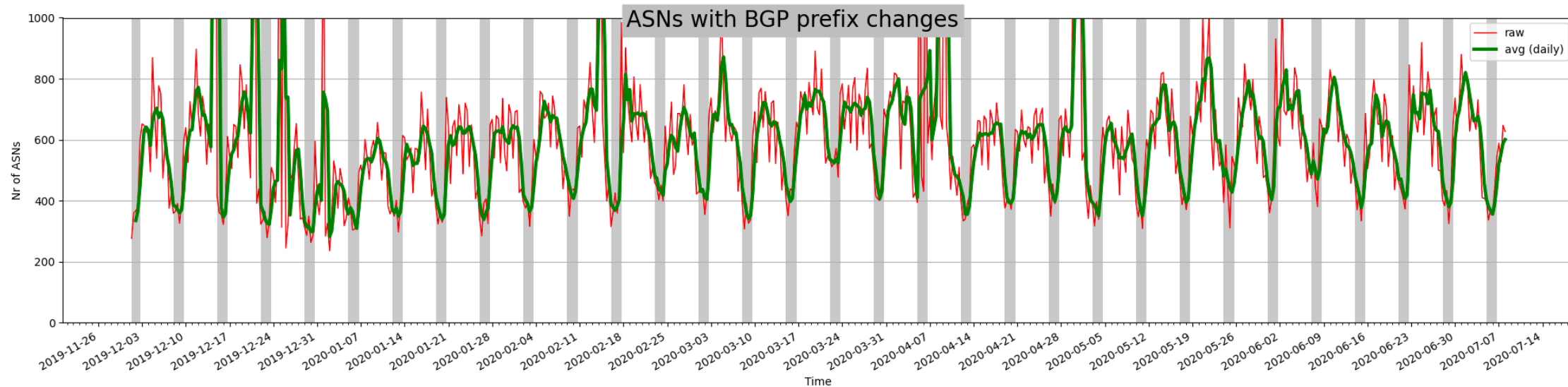


What did we expect?



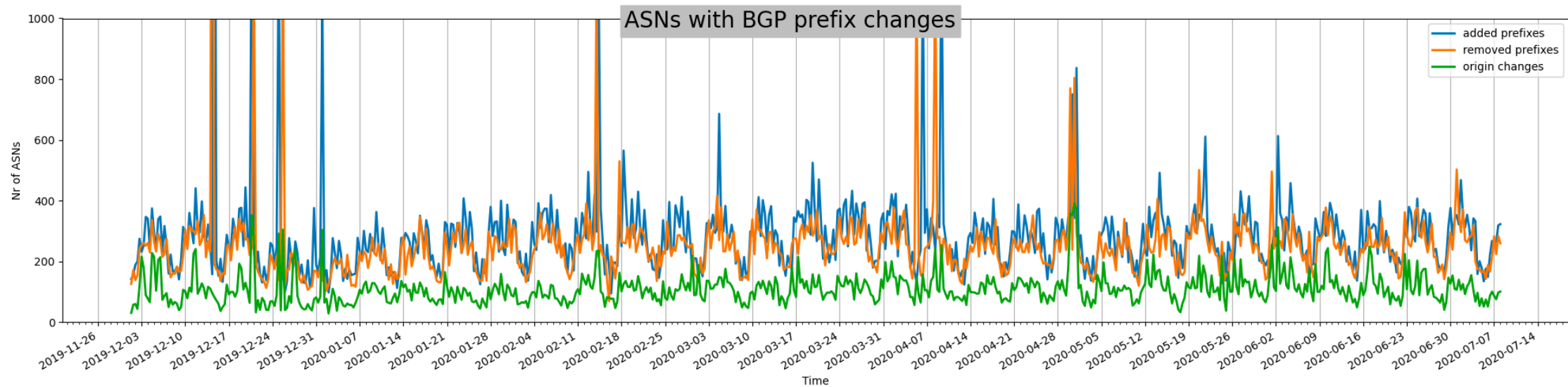
- Less maintenance
- Restricted access to data centers
- And therefore fewer networks involved in changes in BGP
 - We specifically look at origin changes,
 - ie. networks seen with changes in what prefixes they originate

But what did we see?



- Number of ASes with any type of origin change in BGP
 - No visible decrease in the number of changes

Changes in BGP by Type



- **Blue:** Added prefixes
- **Orange:** Removed prefixes
- **Green:** Origin changes

Conclusions



- Normal change pattern
- Periodic dips on Saturday and Sundays
- Stable BGP activity
- Operators take their responsibility and maintain their networks

- More on RIPE Labs:

<https://labs.ripe.net/Members/emileaben/internet-stability-in-times-of-corona>



Measuring Network Delays

Background



- Started during Internet Health Hackathon by Romain Fontugne
- RIPE Atlas <https://atlas.ripe.net>
- Provides and interface to show network delays
- Delays between major eyeball networks and some other networks in a specific country
 - Google
 - AMS-IX
 - DECIX

Measurement Results (Italy)

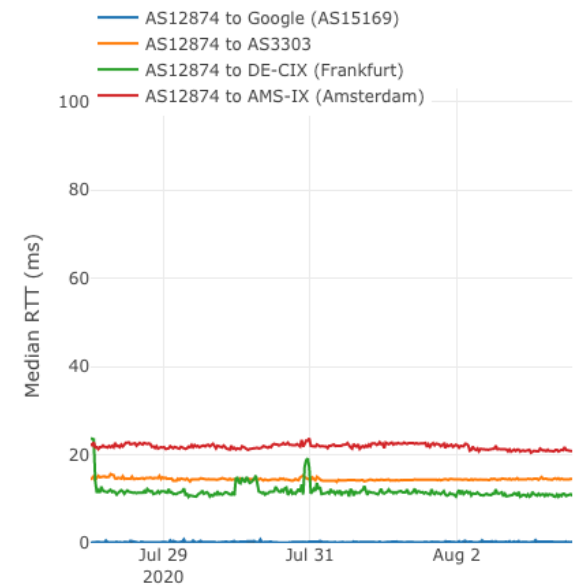
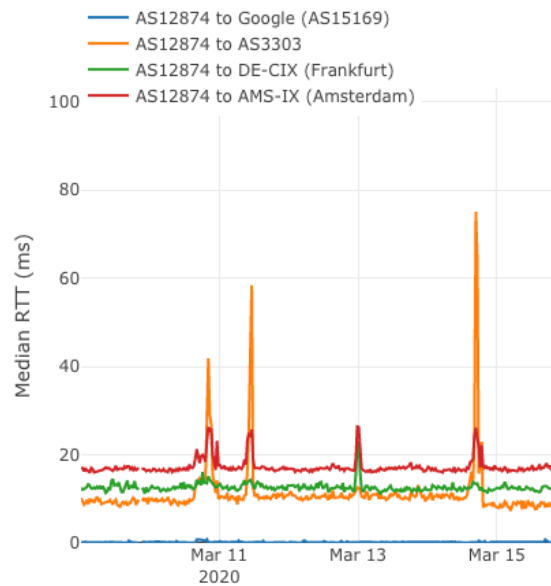
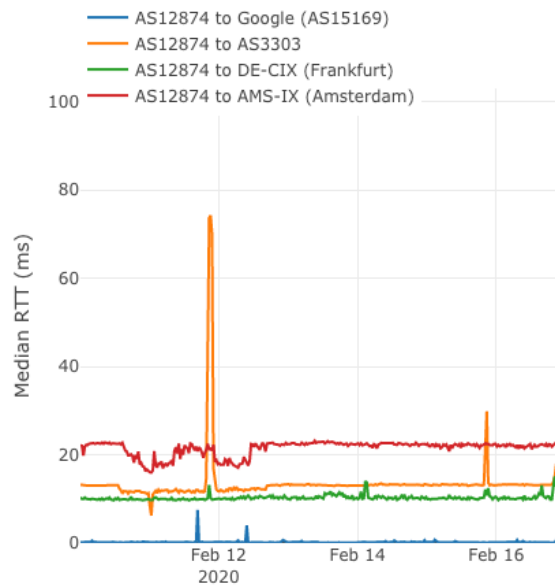


One month before lockdown

Lockdown (9 March)

Latest (August)

FASTWEB Fastweb SpA, IT (AS12874)



Measurement Results (Belgium)

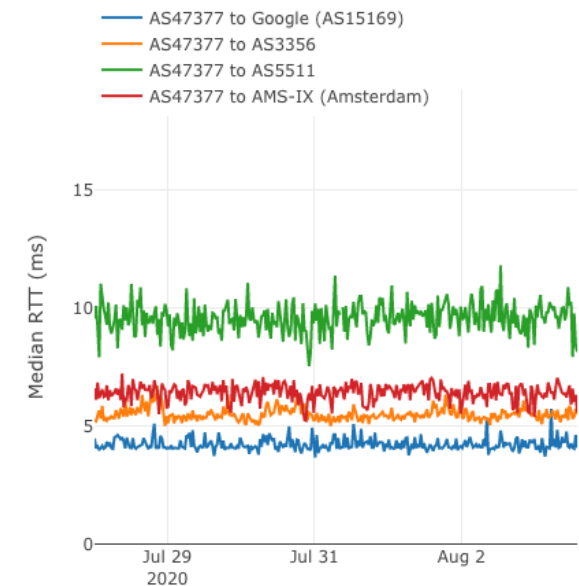
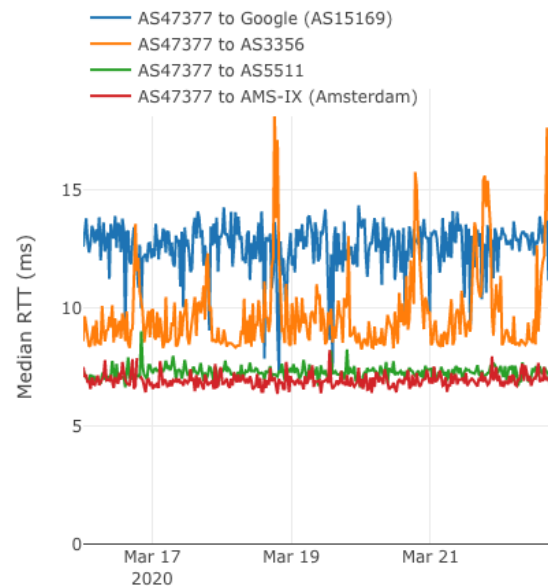
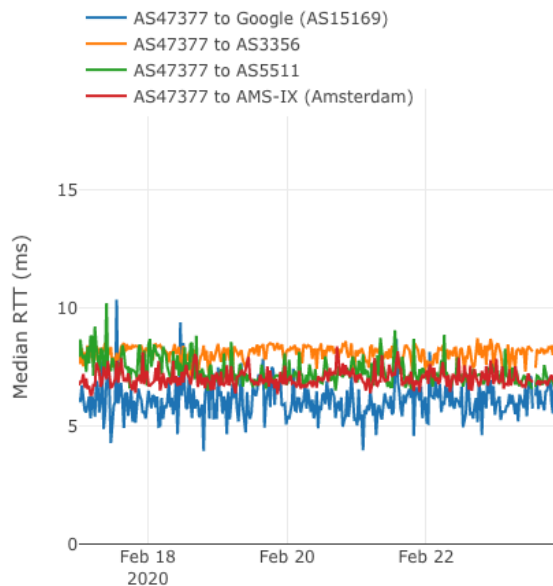


One month before lockdown

Lockdown (18 March)

Latest (April)

MES Orange Belgium SA, BE (AS47377)



Conclusions



- Increased traffic, some congestion
- But overall the Internet is doing well

- Interface:

<https://ihr.ijlab.net/ihr/en-us/covid19>

- Currently only countries that had a clear lockdown start date

- More on RIPE Labs:

https://labs.ripe.net/Members/romain_fontugne/the-internet-health-report

https://labs.ripe.net/Members/romain_fontugne/network-delays-in-times-of-corona

Other Measurements



- Compilation of other Internet Measurements

<https://labs.ripe.net/Members/becha/internet-measurements-in-the-time-of-corona>



Questions



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@meileaben <- no typo!