2019 National Internet Segments Reliability Report

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www.qrator.net
What we do, pt. 1

- Worldwide DDoS mitigation
- Content and application delivery
- Other Anycast services
What we do, pt. 2

- Network and peer engineering at scale
- Anycast network architecture is hard!
- We build models of the Internet to approximate it
What we do, pt. 2

- Network and peer engineering at scale
- Anycast network architecture is hard!
- We build models of the Internet to approximate it
The world’s biggest real-time routing data collector:
more than 600 BGP sessions
with the world’s largest and most distributed peers
Is every red link operational?
A dive into one national Internet

How do we figure out the core of the national network?

• Number of prefixes announced
  • Vulnerable to de-aggregation
• Aggregated size of the announced IP space
  • Irrelevant in IPv6

Defines the customer-provider relation type, according to the Gao-Rexford model
A dive into one national Internet

How do we figure out the core of the national network?

• Number of prefixes announced
  • Vulnerable to de-aggregation
• Aggregated size of the announced IP space
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• Number of customers!
  • Doesn’t work with heavily peering networks
• Number of peers!
  • Works mostly with content providers
A dive into one national Internet

How do we figure out the core of the national network?

- Number of prefixes announced
- Aggregated size of the announced IP space
- Number of customers
- Number of peers

— Every of that! Adjusted for the semantics.
Results!


• https://blog.qrator.net/en/russian-internet-segment-architecture_39/
A surprise #1: UA

#12 -> #4

- UARNET is now the national leader
- Should we see Adam Smith’s invisible hand in this?..
A surprise #2: US

#7 -> #18

- CenturyLink outages
- Market consolidation
Average median reliability 2016 – 2019

- **2016**: 28.75% Median, 40.94% Average
- **2017**: 28.77% Median, 41.10% Average
- **2018**: 24.99% Median, 38.25% Average
- **2019**: 24.99% Median, 37.076% Average
IPv6

- **May 2019**
  DTAG and Verizon establish an IPv6 peering

- Peering wars are less of a thing in IPv4 than in IPv6
IPv6

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IPvX reliability average:
- IPv4: 62.92%
- IPv6: 54.54%
QUESTIONS

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