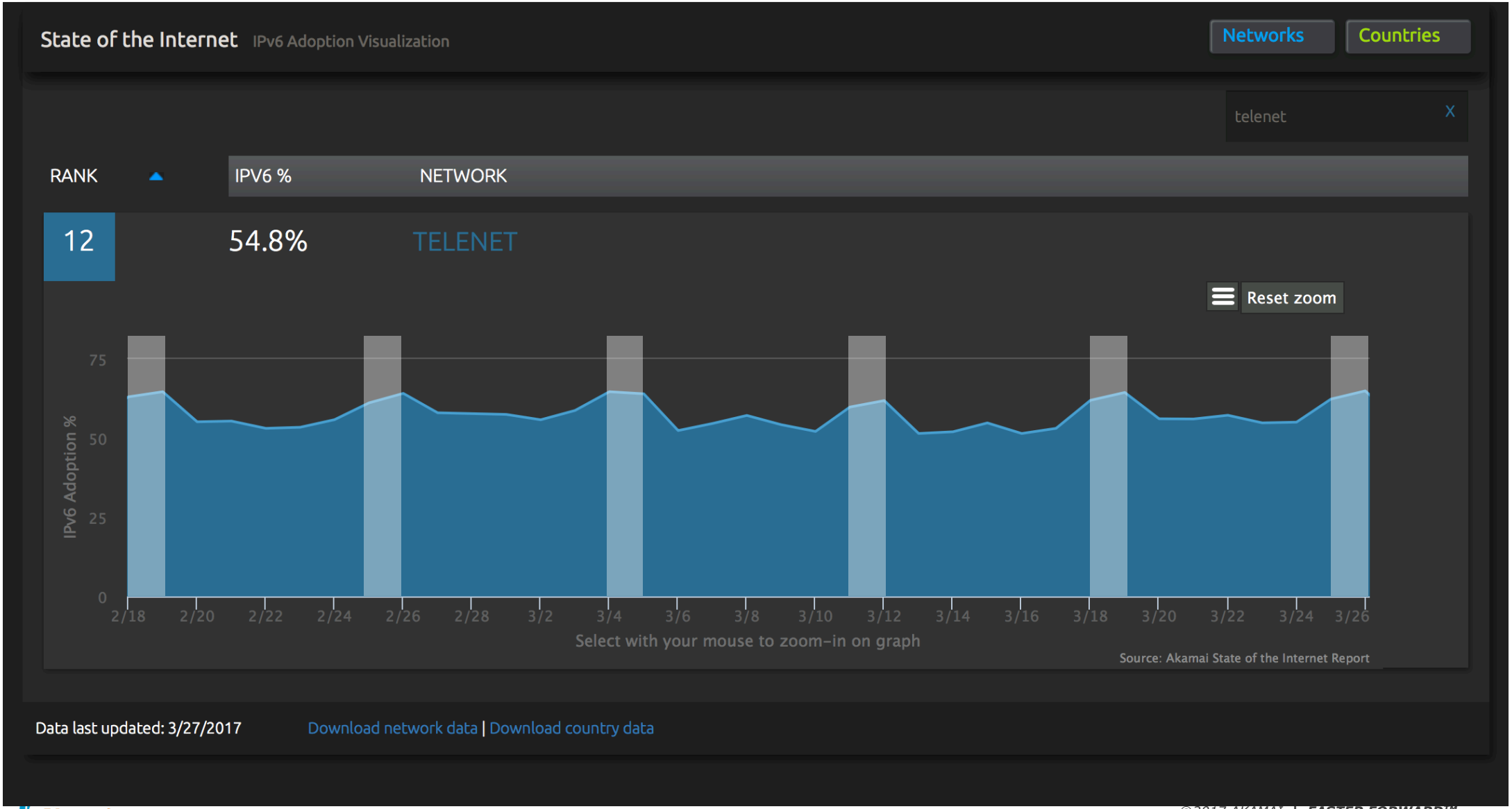
IPv6 Council – (Belgian) Content provider view

Tim Vereecke, Senior Solutions Engineer

IPv6 Trends



6

Peak: 5.8%

Belnet

5

Peak: 39.5%

Brussels

4

Peak: 49.7%

Proximus

3

Peak: 71.5%

Telenet

2

Peak: 73.8%

Voo

1

Peak: 81.5%

KBC

IPv6 Security

IPv6 Performance

A Case for Faster Mobile Web in Cellular IPv6 Networks

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ABSTRACT

The transition to IPv6 cellular networks creates uncertainty for content providers (CPs) and content delivery networks (CDNs) of whether and how to follow suit. Do CPs that update their CDN contracts to allow IPv6 hosting achieve better, or worse performance in mobile networks? Should CDNs continue to host mobile content over IPv4 networks, or persuade to their CP customers the performance benefits of IPv6 content delivery?

In this paper we answer these questions through a comprehensive comparison of IPv4 and IPv6 mobile Web performance in cellular networks in the US from the point of view of Akamai's content delivery infrastructure. Our data show that IPv6 hosting outperforms legacy IPv4 paths in mobile Web. Our analysis leads to clear recommendations for CPs to transition to IPv6-hosted mobile

for cellular networks [51]. We argue that, unlike PlanetLab and Amazon EC2 datacenters [2, 15], Akamai's content delivery servers are so deeply deployed inside several cellular ISPs' networks that the end-to-end communication between mobile devices and Akamai's servers need not, strictly speaking, touch the wired public Internet outside the cellular network. As a result, Akamai's unique content delivery infrastructure enables us to view the end-to-end cellular ecosystem between mobile devices and cellular gateways and evaluate how content is delivered over cellular IPv6 networks from the perspective of content providers (CPs), ISPs, and other content delivery networks (CDNs) [6, 16].

CPs, such as Facebook and others, care about the experience of users with their respective applications. To deliver application content from datacenters to users in a timely manner, CPs make contractual agreements with CDNs to ensure content has high

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http://utkarshgoel.in/docs/Goel_IPv6.pdf

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US data

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Belgian view

One site

IPv6 and IPv4 enabled

Real users

Short timeframe

scalemates

RUM

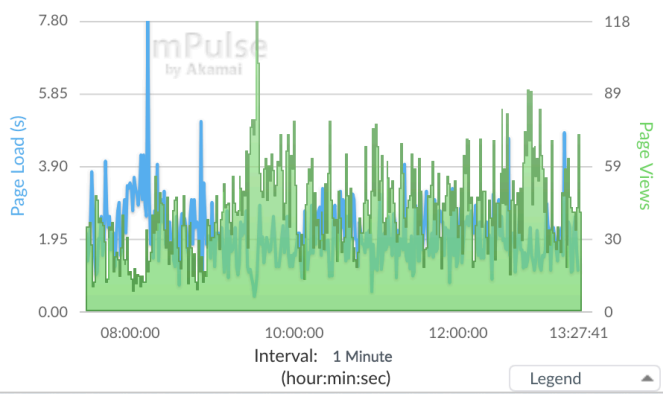
Page Performance

Back-End Time	Front-End Time	Page Load
470ms	1.47s	1.90s

Network Performance

DNS Resolution Time	TCP Connect Time	SSL Handshake Time
126ms	207ms	134ms

Performance vs. Traffic



Traffic

Page Views	Completed Sessions
14.8K	1.8K

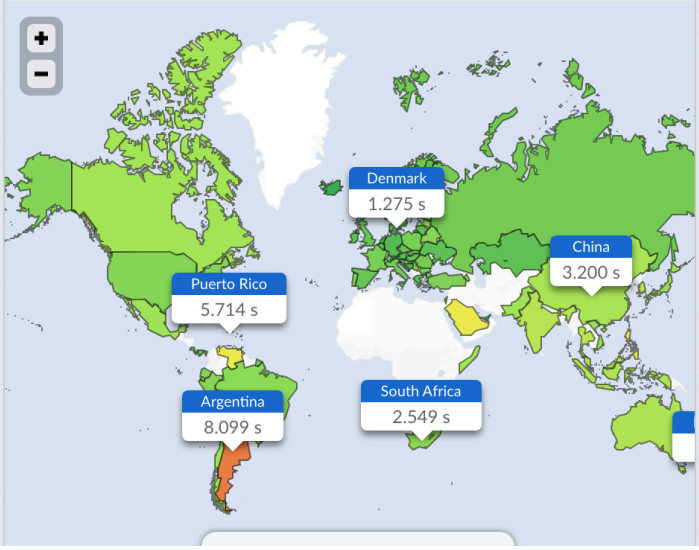
Engagement

Bounce Rate	Average Session Duration	Average Session Length
33%	7:44m:s	5.70Pages

Countries

Row	Country	Load Time	Beacons
1	Germany	1.11 s	2,005
2	United Kingdom	1.55 s	1,692
3	Netherlands	1.13 s	1,313
4	Australia	3.37 s	934
5	United States	2.27 s	833
6	Italy	1.77 s	637
7	Russia	1.88 s	633

Geography



Operating Systems

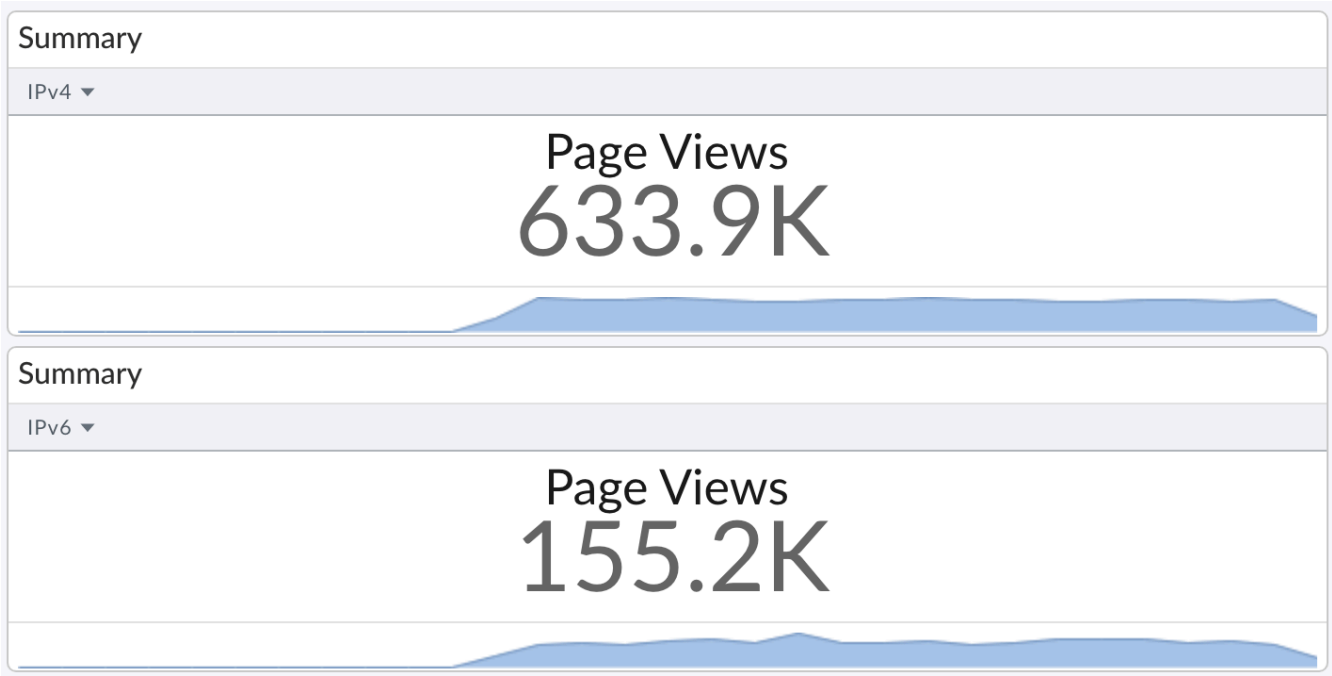
Row	Operating System	Load Time	Beacons
1	Windows	1.70 s	10,149
2	Android OS	2.31 s	2,672
3	iOS	2.37 s	1,132
4	Mac OS X	2.53 s	457
5	Chrome OS	300 ms	241
6	Windows Phone	2.40 s	96
7	Linux	3.08 s	41

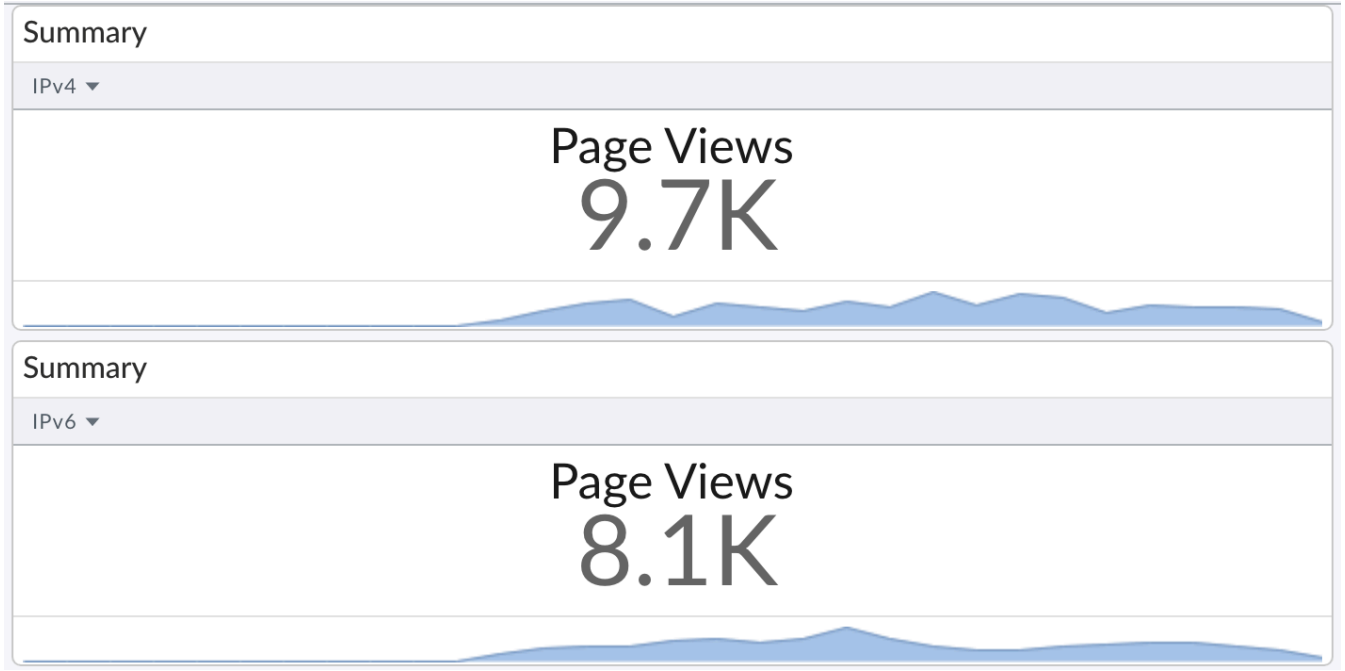
Page Groups

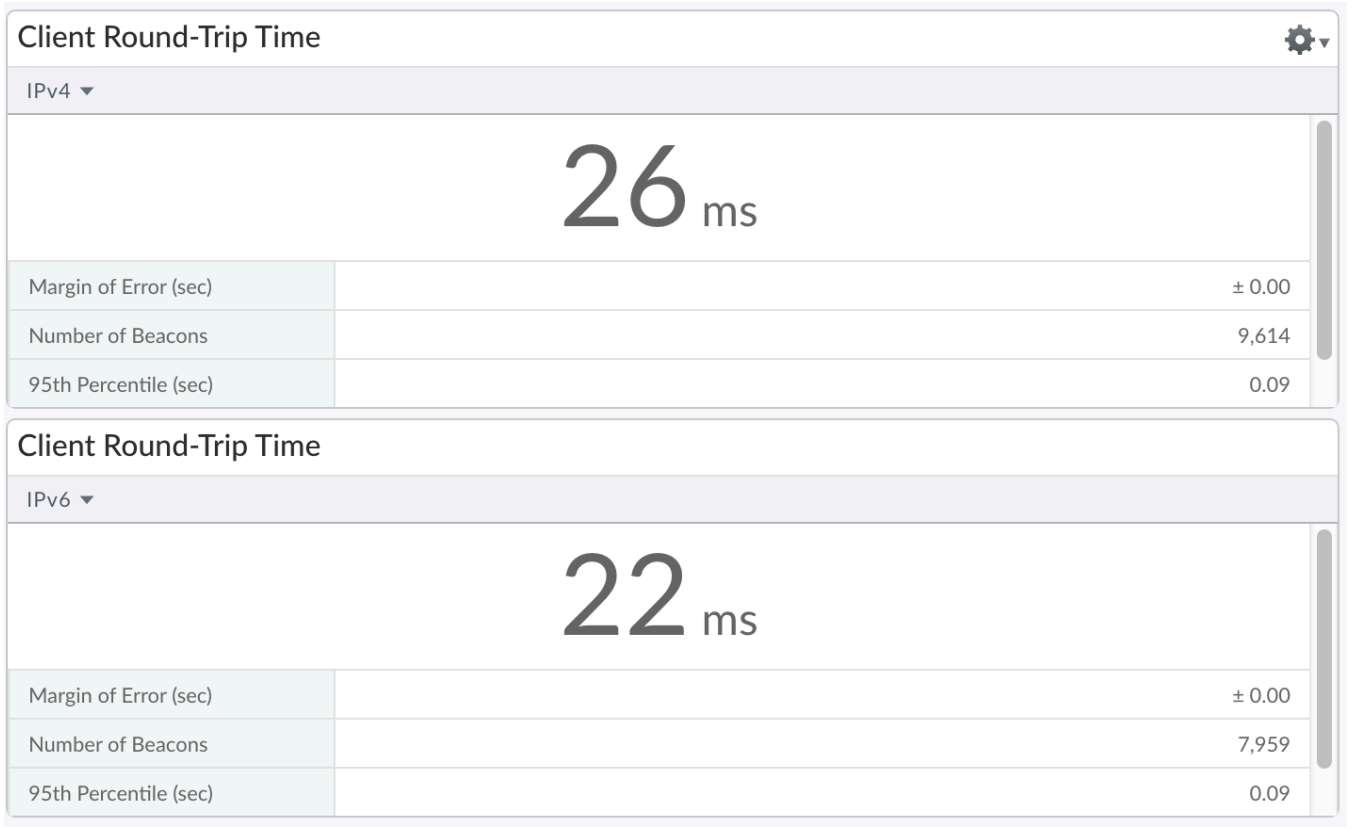
Row	Page Group	Load Time	Beacons
1	Kits	2.63 s	5,208
2	Ajax Autocomplete	310 ms	2,830
3	Search	2.35 s	2,495
4	Ajax Other	250 ms	586

Browsers

Row	Browser	Load Time	Beacons
1	Chrome	1.95 s	5,385
2	Firefox	1.71 s	2,134
3	IE	1.39 s	2,076
4	Chrome Mobile	2.26 s	1,883







Client Round-Trip Time

IPv4

34 ms

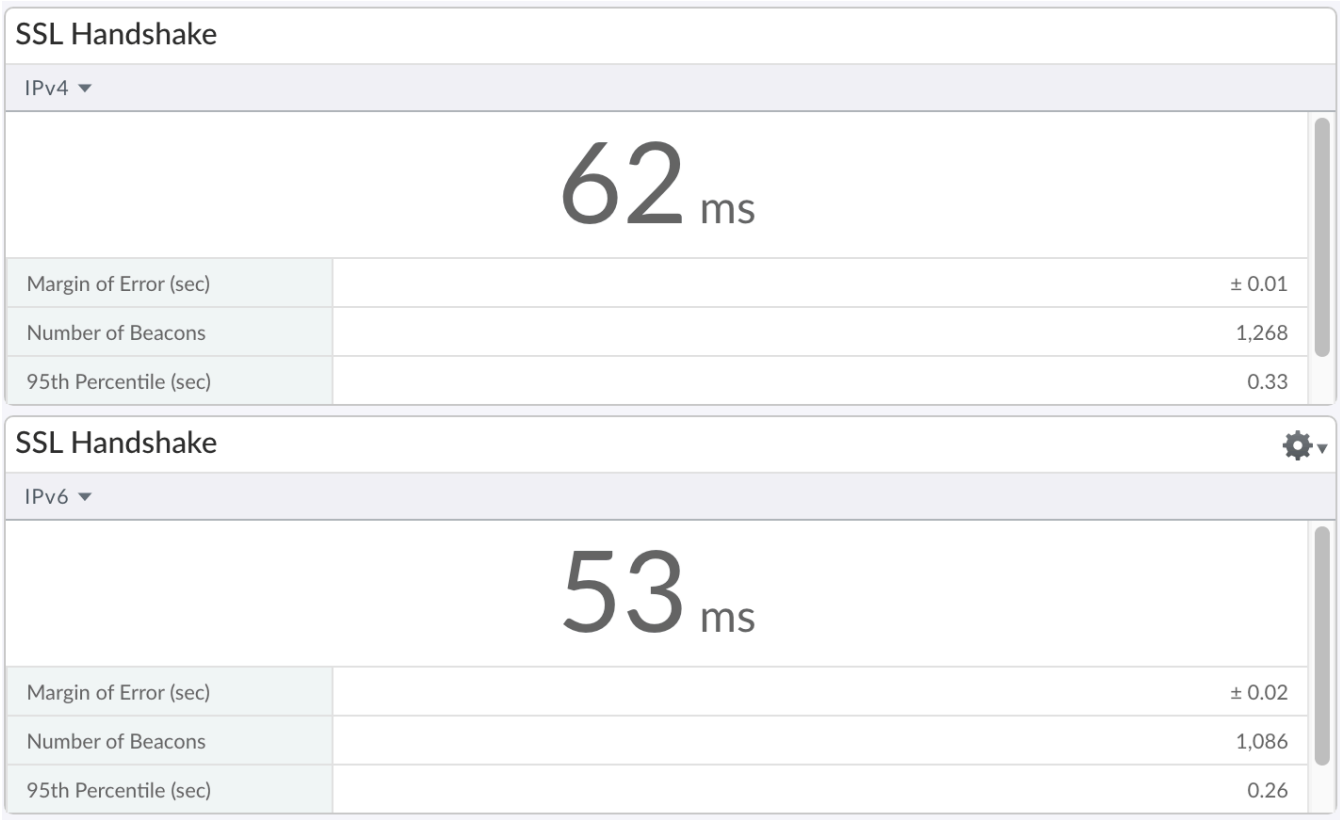
Margin of Error (sec)	± 0.01
Number of Beacons	1,501
95th Percentile (sec)	0.10

Client Round-Trip Time

IPv6

21 ms

Margin of Error (sec)	± 0.01
Number of Beacons	1,145
95th Percentile (sec)	0.09



Back-End Time

IPv4

116 ms

Margin of Error (sec)	± 0.03
Number of Beacons	9,627
95th Percentile (sec)	1.06

Back-End Time

IPv6

127 ms

Margin of Error (sec)	± 0.02
Number of Beacons	7,963
95th Percentile (sec)	0.89

Back-End Time

IPv4

175 ms

Margin of Error (sec)	± 0.08
Number of Beacons	1,522
95th Percentile (sec)	1.23

Back-End Time

IPv6

132 ms

Margin of Error (sec)	± 0.03
Number of Beacons	1,089
95th Percentile (sec)	0.80

IPv6 Privacy

2018-05-25 00:11:04	GA	Mate	2a01:e34:edd9:b6c0:fd33:****|G:1897727379
2018-05-24 23:09:53	GA	Mate	87.213.221.***|G:1375551100
2018-05-24 21:13:02	GA	Mate	2a02:a03f:4a97:7a00:d803:****|G:16093661
2018-05-24 21:12:34	GA	Mate	2a02:a03f:4a97:7a00:d803:****|G:1609366194
2018-05-24 18:52:12	GA	Mate	84.35.203.***|G:1824217792
2018-05-24 18:51:21	GA	Mate	84.35.203.***|G:1824217792
2018-05-24 18:06:16	GA	Mate	2a02:f68:bbb:2::****|G:2037914472
2018-05-24 16:33:44	GA	Mate	217.123.238.***|

What should I mask in IPv6?

Thank you!

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