

Gap between IPv6 User Rate & Traffic Rate

HotRFC Talk, IETF 117

XiPeng Xiao, Huawei Germany & v6ops co-chair

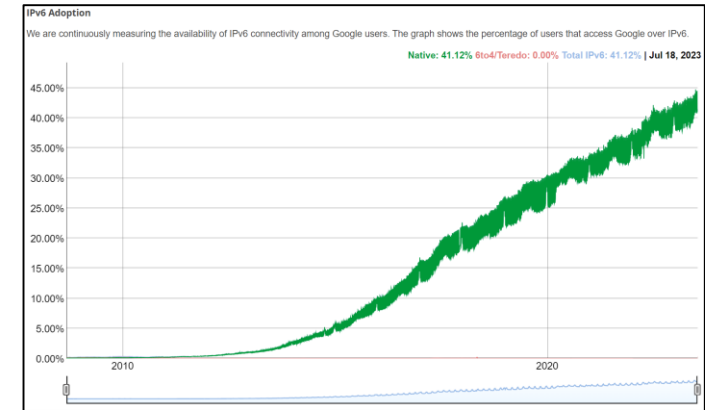
xipengxiao@huawei.com

Problem: Real IPv6 Traffic Rate << IPv6 User Rate Implies

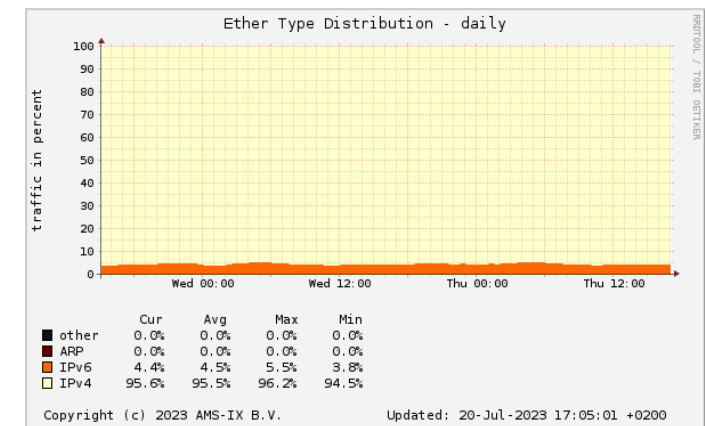
- IPv6 adoption measured by IPv6 user rate looks good
- IPv6 user rate not best KPI, IPv6 traffic rate better
- Implied IPv6 traffic% = IPv6 user% * IPv6 content% * IPv6 connectivity%
- = 41% * 67% * 100% = **27%**
- Real IPv6 traffic stats difficult to get, anecdotal data far below 27%

	Traffic %		Date	Source
AMS-IX	5%		2023 07	https://stats.ams-ix.net/sflow/ether_type.html
Akamai	16.4%	41	2022 06	https://www.akamai.com/blog/trends/10-years-since-world-ipv6-launch
		250	2022 05	https://www.linkedin.com/pulse/oops-we-did-again-akamai-technologies/
Facebook	15.0%		2019 05	https://lemp.io/the-growth-of-ipv6-traffic-on-facebook/

IPv6 user 41% - promising



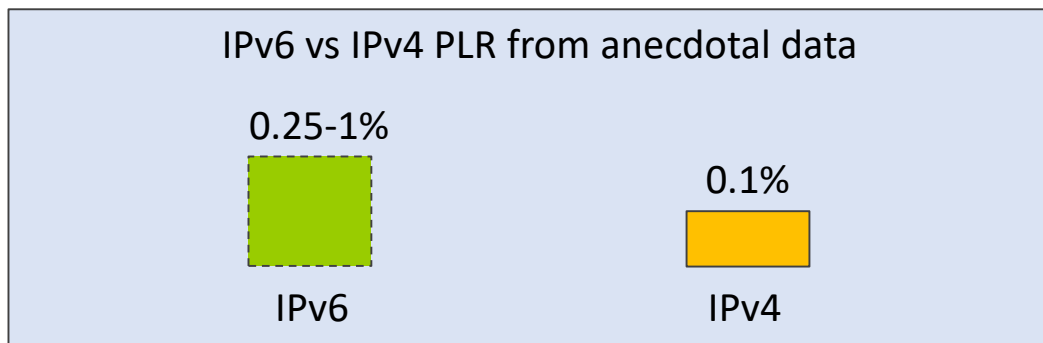
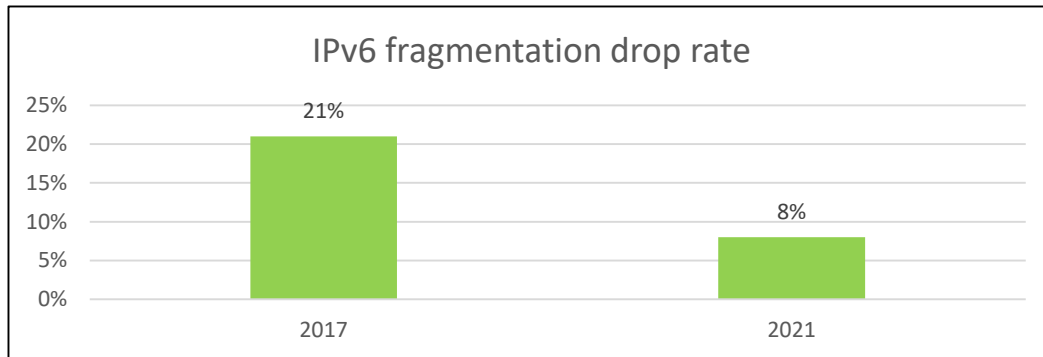
IPv6 traffic 5% - depressing



What cause the big gap?

Theory: Dual-Stack Hides Some IPv6 Issues that Cause DS Users to Use IPv4

RFCs 7872/9098 report high PLR for IPv6 packets with EHs. Anecdotal data shows IPv6 PLR is higher (0.25-1%)



Possible issues that may cause Dual-Stack users not to use IPv6:

- RFC6724 prioritizes IPv4 over IPv6 ULA
- Packet drop may cause Happy Eyeball to select IPv4 for Dual-Stack users
 - Packet drop with EHs,
 - NCE exhaustion causing packet drop
 - Rate limiting to prevent /64 scanning causing NCE exhaustion
 - Long headers causing congestion/drop at mobile backhaul links
 - Fragmentation-related drops
 - Flash renumbering-related drops

Proposal: Collaborate to Identify & Solve Issues

- Provide IPv6 traffic stats if you can
- Feedback whether you agree/disagree with our theory
- Join us to identify & solve Issues

It's time for the community to measure & publish IPv6 traffic stats