

IPv6 readiness measurements for NZ

Sebastian Castro - NZRS
AP IPv6 Measurement BoF
APRICOT Auckland 2016



Collection of IPv6 metrics for New Zealand



Potential Metrics

- Measurement

Passive: collect data as is happens

Active: Create an experiment to measure

- Metrics

Packets

Network prefixes

Addresses

Queries

Devices



Data collected by NZRS

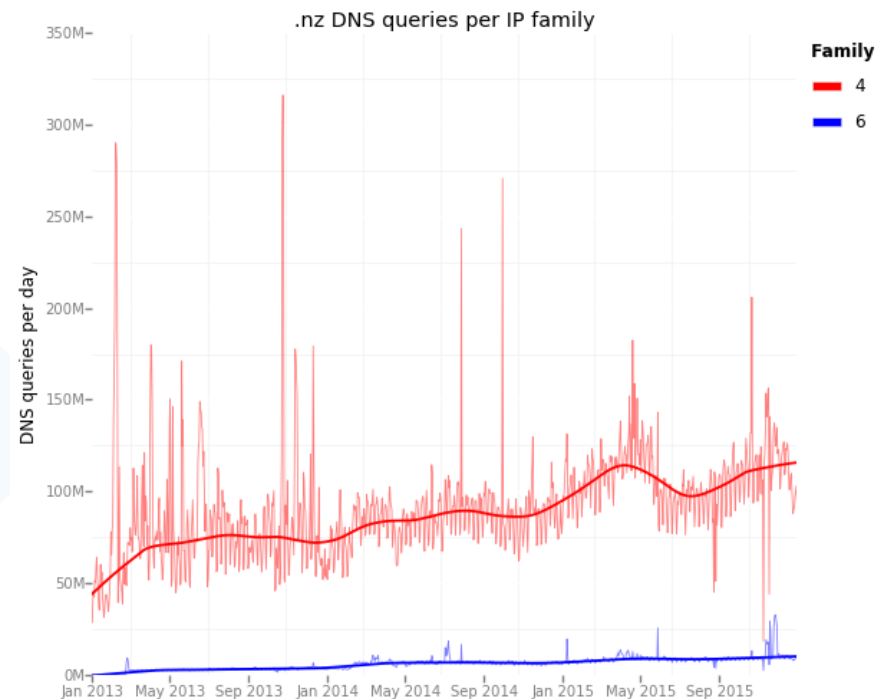
Explore some of our metrics, passive and active

IPv6 .nz DNS Data

- DNS queries for 4/7 nameservers for .nz
 - Large dataset, almost 3 years
 - Includes AAAA queries
 - Signals hosts interested in IPv6 addresses
 - Includes IPv6 sourced queries
 - Signal DNS clients with IPv6 connectivity
- .nz Zone Scans
 - Started in August 2013
 - Number of domains with services publishing IPv6 addresses

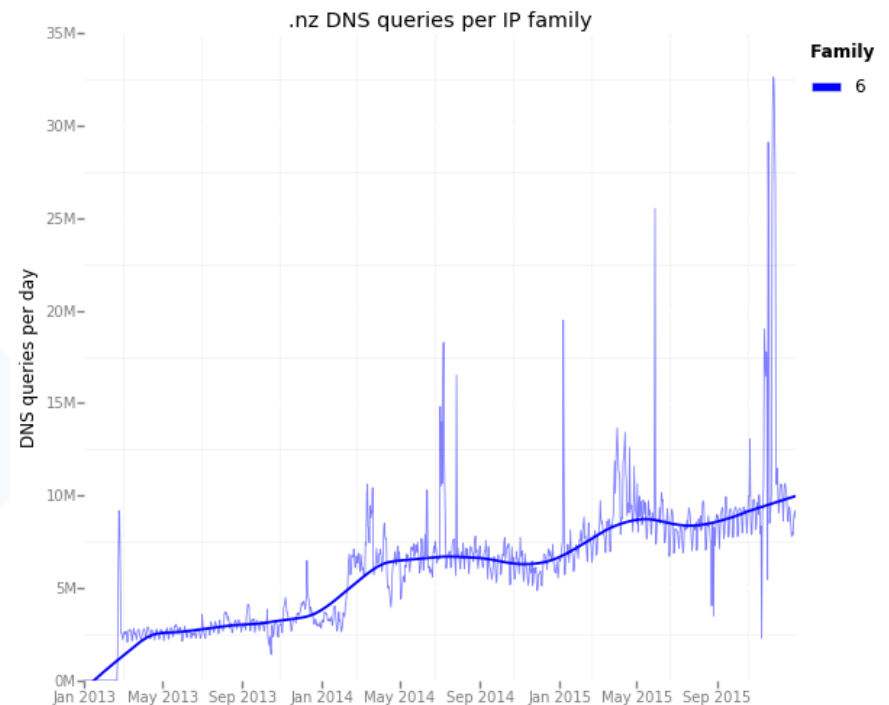
.nz DNS queries

- Traffic for 4 out of 7 nameservers
 - All based in NZ
 - ns1/ns2 with IPv6 addresses
- Smoothed curve
 - Daily patterns
- Spikes due to unusual activity



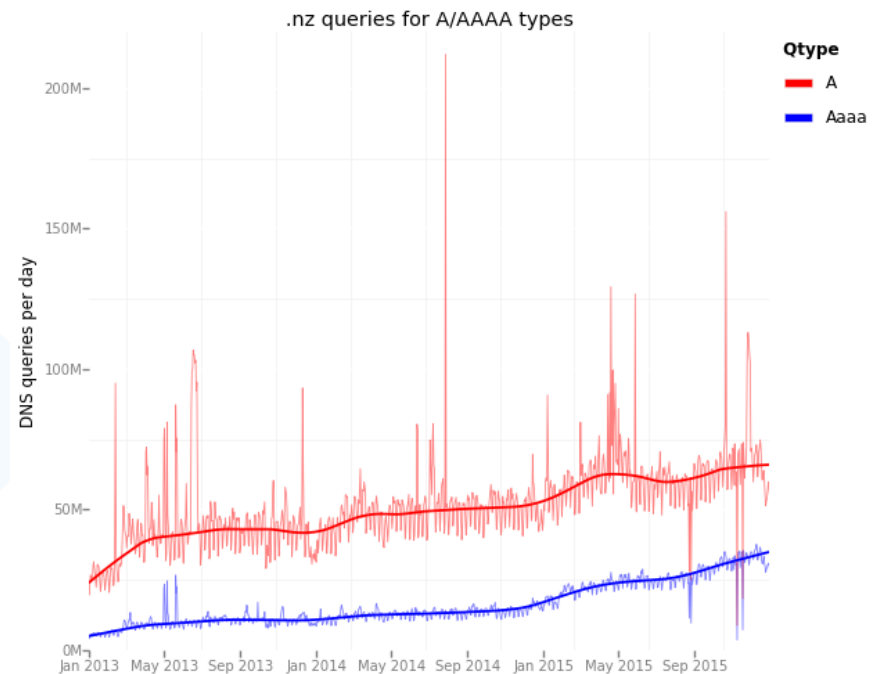
.nz IPv6 DNS Queries

- Closer look of IPv6 traffic
- There is some growth, but slower than IPv4 traffic



Counting per query type

- Compare A queries (IPv4) against AAAA (IPv6)
- The rest of the traffic is not included
- Better growth, closer gap
- OS software updates adding IPv6 support





Data collected by third parties

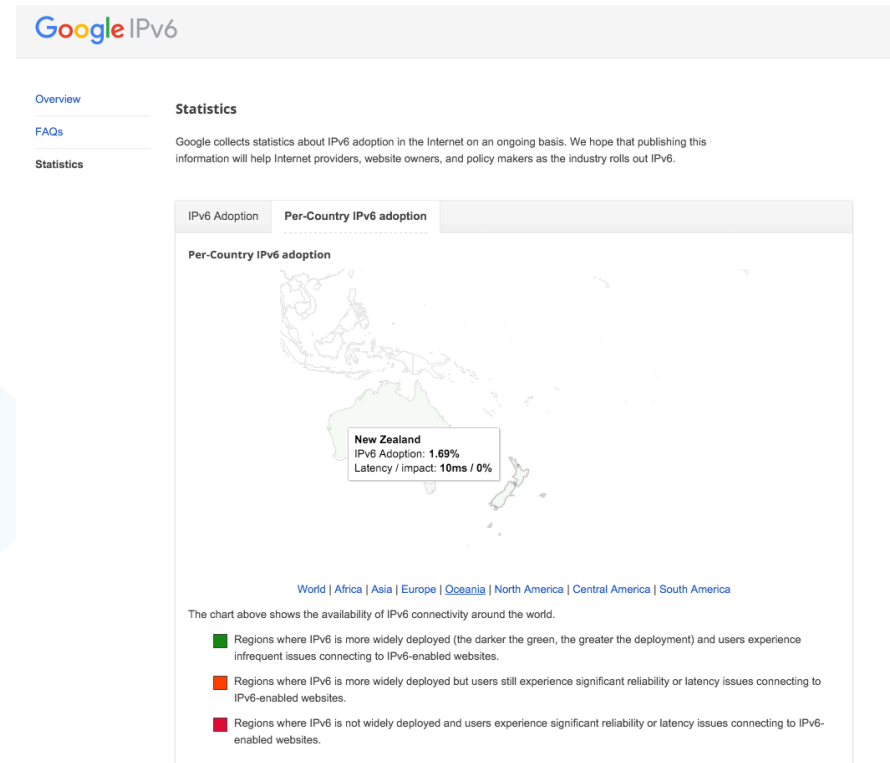
Network visibility, active testing

Third parties datasets

- Google IPv6 stats
Percentage of users visiting www.google.com using IPv6
- Akamai IPv6 Stats
State of the Internet report
Collected from their CDN
- Allocations versus visible prefixes
6labs.cisco.com
RIPE NCC
- APNIC IPv6 measurement
IPv6 Capable Rate

Google IPv6

- Percentage of users accessing Google over IPv6
 - <https://www.google.com/intl/en/ipv6/statistics.html>
- New Zealand: 1.69%
- Australia: 1.77%



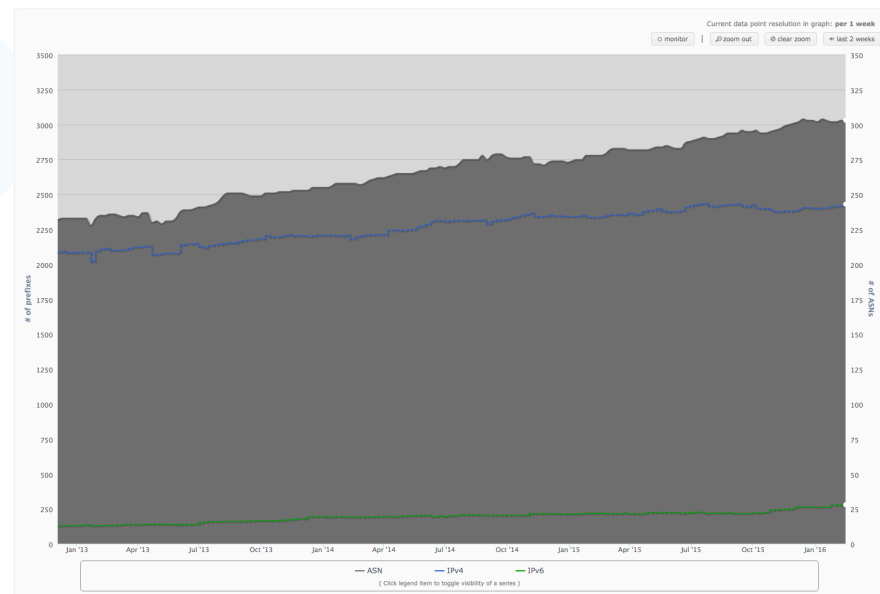
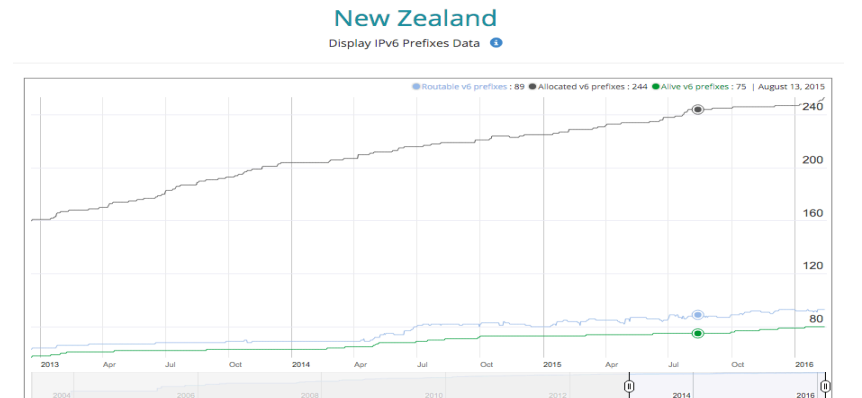
Akamai IPv6

- As observed by Akamai CDN
- State of the Internet report
- # object requests via IPv6 / total # object requests per country
- New Zealand: 0.9%
- Australia: 1.7%



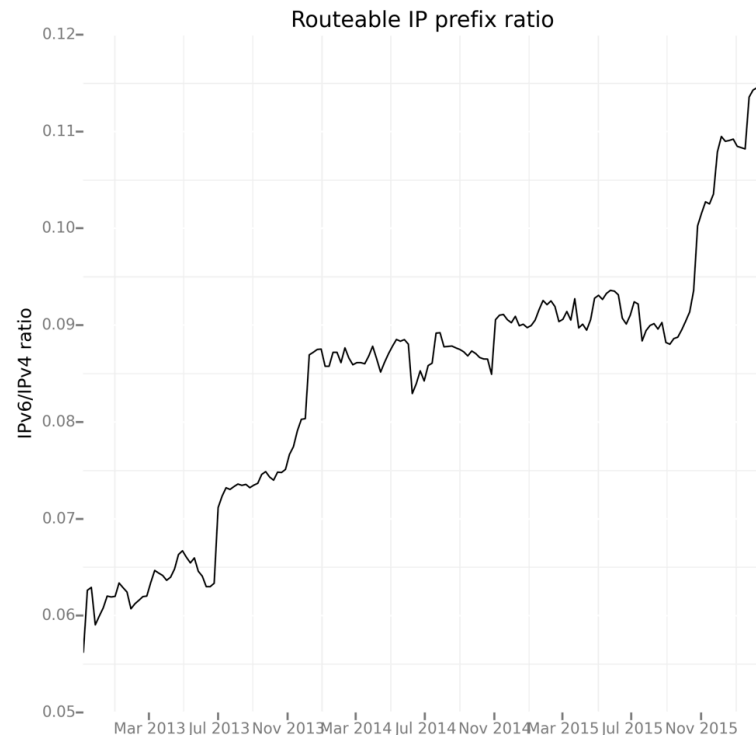
Prefix allocations

- 6labs from Cisco using RIR/Routeviews data
 - Allocated/Routable/Alive
- RIPEstat using the same data
 - <https://stat.ripe.net/NZ#tabId=routing>



Routeable prefixes

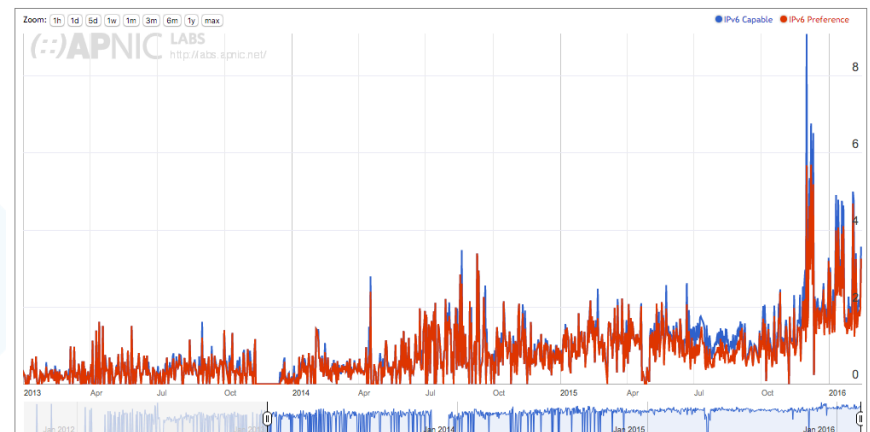
- Using RIPE data
- Ratio of # routeable IPv6 over # routeable IPv4 prefixes
- IPv6 growing faster than IPv4
 - But still quite slow



APNIC IPv6 measurement

- <http://stats.labs.apnic.net/ipv6/NZ>
- New Zealand: 2.49%
- Australia: 3.37%

Use of IPv6 for New Zealand (NZ)



Other measurements

- Eric Vyncke
 - Alexa Top 50 per country
 - IPv6 enabled BitTorrent peers
- Various IXs sFlow stats
 - <https://ams-ix.net/technical/statistics/sflow-stats/ipv6-traffic>

Contact: sebastian@nzrs.net.nz
www.nzrs.net.nz

