



IPv6 Metrics Analysis Report #1: Q2 2012

July 2012

[Donald Clark](#) for [NZ IPv6 TaskForce](#)

# IPv6 Metrics Analysis Report #1: Q2 2012

## Overview

### Highlights

- New Zealand's service providers show a strong level of readiness: almost 1/3 of peerings to the rest of the world and each other use IPv6; there is a choice for all sizes of businesses and organisations for their IPv6-capable ISP.
- 4 of the top 5 sites visited by New Zealanders are available over IPv6, with the 5th, *Trade Me*, working towards IPv6 deployment later in 2012
- Government (4%) and ISPs (17%) lead the way in NZ making themselves visible on the IPv6-Internet, but our health, banking and education sectors are lagging.
- NZ's actual levels of IPv6 traffic show middling performance, at c. 0.2% of total traffic. This is ahead of many, on par with economies like Australia, but behind leaders like Japan (1.5%) and France (4.5%).
- Wider purchasing and implementation of IPv6 ISP services and capable CPE (customer premise equipment) are now the largest hurdle to greater IPv6 adoption: the uptake of new UFB-based services provide the opportunity for New Zealand to progress.

### Commentary

The ISP story in NZ is a strong one, that shows good signs of continuing to strengthen. We have a globally high level of v6 peering at an Autonomous System level. There is choice for all sizes of organisations between ISPs offering native IPv6 connectivity, with several ISPs in active trials for the roll-out of IPv6 services later in 2012, or early in 2013.

We have not drawn any conclusions in this report about the share of traffic coming into the .nz name servers, pending further technical investigation on the collection method.

The push made by World IPv6 Launch has really made a difference to service and content availability: 4 of the 5 top sites visited by NZers are now available over IPv6 with the 5th (*TradeMe*) expected to be so later in 2012.



## IPv6 Metrics Analysis Report #1: Q2 2012

July 2012

[Donald Clark](#) for [NZ IPv6 TaskForce](#)

Disappointingly, none of the popular NZ-based sites (mostly media and banks) are available over IPv6 yet and we don't anticipate that changing in the next 12 months (with the exception of *TradeMe*).

New Zealand's ISPs are doing well, with 17% having web services reachable over v6 (reflecting the strong showing of service provider readiness highlighted above). Government is the other sector with a strong showing, with 4% of sites reachable over v6: recent implementations by *NZ Defence Force* and the *Ministry for Primary Industries* bring the first "large Ministry" presence. We expect government presence to grow steadily in the coming 12 months due to a combination of edict and movement to centrally procured (and IPv6-capable) internet and hosting services.

NZ is running at about 0.2% of internet traffic being native IPv6. This is comparable to economies like Australia, but behind leaders like the US and Japan (between 1.0% and 1.5%).

Truly high levels of penetration are strongly associated with the deployment of new infrastructure, eg by Free in France (4.5%) over the past few years, and in developing economies, eg Romania (8.1%).

Given popular content and services are now available, we see the widespread purchase and switch-on of IPv6 services by homes and businesses (along with new CPE) as the last big hurdle to IPv6 traffic growth.

## Service Provider Readiness

The ISP story in NZ is a strong one, that shows good signs of continuing to strengthen. We have a globally high level of v6 peering at an Autonomous System level. There is choice for all sizes of organisations between ISPs offering native IPv6 connectivity, with several ISPs in active trials for IPv6 service roll-out later in 2012, early in 2013.

The roll-out of more IPv6 services (with capable CPE) is probably the most important remaining hurdle to embedding IPv6 capability now that World IPv6 Launch has pushed content availability past tipping point.

We have not drawn any conclusions in this report about the share of traffic coming into the .nz name servers, pending further technical investigation on the collection method.

### Metric 1 - % of NZ ASes announcing v6 prefix

- The level of NZ v6 peering, measured by AS, has been reasonably stable. The last quarter saw small rise from 29% to 31% of NZ ASs having at least 1 v6 peer (actual numbers up from 60 of 206 to 66 of 222): this 6 of 16 (37.5%) new ASs peered at v6.



## IPv6 Metrics Analysis Report #1: Q2 2012

July 2012

[Donald Clark](#) for [NZ IPv6 TaskForce](#)

- NZ continues to overperform in this area. OECD average is 15.3%, China is at 13.4%; Australia at 18.3%. Some economies do outstrip us though, including those like internet leaders The Netherlands at 42.0%.

### Metric 2 - v6-related queries to .nz root servers

- *Due to an bug/error in some of the data collection, we have not had reliable data on this metric since early 2012. This analysis should therefore be interpreted with caution, and by necessity is about early 2012 not Q2 2012.*
- We'd expect to see a steady increase in queries to the .nz name servers coming in over v6 as increasing numbers of ISPs v6-enable their core networks (v6 usually being the preferred protocol).
- We aren't seeing a strong trend yet - whilst there is a steady increase in requests coming in over v6 (including A requests of v6), these are still dwarfed 95% to 5% with requests coming in over v4
- This c. 5% of requests is far higher than the observed levels of v6 traffic (cf Metric 8). This could be due to:
  - the fact that the .nz servers will receive the vast majority of its requests from other DNS servers, and we observe (Metrics 4 & 5) that ISP DNS systems tend to lead the way in v6-enablement.
  - The very different traffic / packet profiles for DNS traffic vs general web / internet traffic.

### Metric 3 - Number and type of ISPs v6 offerings

- There is choice of ISP / transit provider at all levels of the market for business: both SMEs and large enterprises / government. There are a few consumer choices for IPv6, but currently only one national choice (Snap!).
- Speaking to providers revealed that many of them are in trials / pre-production of IPv6 services and we expect an increased number of offerings to be available late 2012 early 2013
- The breakdown by size of ISP (as opposed to market):
  - small ISPs: 1.5 / 3 offering v6 (0.5 being only available under certain connectivity scenarios)
  - medium ISPs: 3/9 offering v6 (at least 2 are currently in pre-production / testing)
  - large ISPs: 2/8 offering v6 (with 1 due to roll-out late in 2012 and 1 doing beta/ pre-production trials)

## Availability of content and services

The push made by World IPv6 Launch has really made a difference to service and content availability: 4 of the 5 top sites visited by NZers are now available over IPv6 with the 5th (*TradeMe*) expected to be so later in 2012.



## IPv6 Metrics Analysis Report #1: Q2 2012

July 2012

[Donald Clark](#) for [NZ IPv6 TaskForce](#)

Disappointingly, none of the popular NZ-based sites (mostly media and banks) are available over IPv6 yet and we don't anticipate that changing in the next 12 months (with the exception of *TradeMe*).

New Zealand's ISPs are doing well, with 17% having web services reachable over v6 (reflecting the strong showing of service provider readiness highlighted above). Government is the other sector with a strong showing, with 4% of sites reachable over v6: recent implementations by *NZ Defence Force* and the *Ministry for Primary Industries* bring the first "large Ministry" presence. We expect government presence to grow steadily in the coming 12 months due to a combination of edict and movement to centrally procured (and IPv6-capable) internet and hosting services.

### Metric 4 - service availability of top NZ domains

- We hoped this metric would provide two things: comparable data for the top sites NZers visit (irrespective of TLD) and an ability to compare across sectors.
  - on sector comparison it is performing reasonably, especially between sectors with a reasonable number of participants.
  - on top sites for NZ it is performing less well: it only tracks sites in the .nz TLD or sites that don't appear in any other country's list. This excludes many of the .com domains that are in NZer's favourites
- Undertaking a manual analysis using the Alexa Top 20 for NZ shows a more realistic, and also more favourable result:

google.co.nz - y  
facebook.com - y  
google.com - y  
youtube.com - y  
trademe.co.nz - n - planned 2012  
(Top 5)

yahoo.com - yes, but nz.yahoo.com isn't - planned  
wikipedia.org - y  
stuff.co.nz - n  
nzherald.co.nz - n  
live.com - n  
(Top 10)

linkedin.com - n  
blogspot.co.nz - y  
westpac.co.nz - n  
twitter.com - n  
amazon.com - n  
nationalbank.co.nz - n  
asbbank.co.nz - n  
kiwibank.co.nz - n  
wordpress.com - n  
tvnz.co.nz - n  
(Top 20)



## IPv6 Metrics Analysis Report #1: Q2 2012

July 2012

[Donald Clark](#) for [NZ IPv6 TaskForce](#)

- This analysis shows:
  - **4 of the top 5** are live in IPv6! The other (Trade Me) has an plan for 2012 go-live
  - **5 of the top 10** are live (yahoo.com supports, nz.yahoo.com seemingly not yet)
  - **6 of the top 20** are live
- It is important for adoption and traffic volumes that so many of the most popular sites for NZers are live in IPv6. The availability of such sites tips the balance in terms of content availability.
- No NZ-native popular sites are IPv6 enabled yet. TradeMe, NZ's most popular site, is very advanced in its plans and should start rolling out live IPv6 services later in 2012.
- Looking across the sectors in terms of IPv6 readiness in NZ (focussing on www service availability):
  - Banks, the health sector and NZ adult sites show 0 live services
  - Education at c. 15% is a poor showing given the 6 years it has had being connected to the IPv6-native REANNZ network
  - Government at c. 4% is a positive start
  - ISPs/Hosting companies at c. 17% are, unsurprisingly, and encouragingly the most advanced
- Metric 4 and Metric 5 show a trend for domains being IPv6-capable on DNS services first: probably due to:
  - the use of other parties to provide their DNS in use, ie there are fewer DNS providers than web service providers, so for every DNS provider that is IPv6 capable it is likely that a number of domains are impacted.
  - the ISPs and registrars, as infrastructure providers, being generally more advanced in IPv6.

### Metric 5 - service availability of .nz ccTLD

- Looking at WWW availability only, the stats for the entire .nz names space show:
  - for .co.nz - a small increase in the quarter to 686 / 419,142
  - for .ac.nz - a small increase in the quarter to 15 / 1940
  - for .geek.nz - holding steady at around 35 / 1172
  - for .net.nz - holding steady at around 165 / 27,322
  - for .org.nz - a slight increase in the quarter to 182 / 126,624
- On a percentage basis these availability stats are much smaller than in Metric 4. However, they are not directly comparable. Metric 4 focuses on popular sites, Metric 5 looks at the entire .nz namespace for which only a sub-set of domains will be associated with unique active websites.
- The trend of DNS service availability preceding web service availability is demonstrated as it was for Metric 4.

### Metric 6 - nz registrars offering v6 glue record services

- Over the quarter, there has been no change in the proportion of registrars for .nz offering IPv6 glue services: it remains at 18%.



## IPv6 Metrics Analysis Report #1: Q2 2012

July 2012

[Donald Clark](#) for [NZ IPv6 TaskForce](#)

- Note: whilst this information is collected monthly for the metrics, DNC Ltd only updates this data every 6 months or so after a survey of registrars.

## Usage and uptake

NZ is running at about 0.2% of internet traffic being native IPv6. This is comparable to economies like Australia, but behind leaders like the US and Japan (between 1.0% and 1.5%).

Truly high levels of penetration are strongly associated with the deployment of new infrastructure, eg by Free in France (4.5%) over the past few years, and in developing economies, eg Romania (8.1%).

Given popular content and services are now available, we see the widespread purchase and switch-on of IPv6 services by homes and businesses (along with new CPE) as the last big hurdle to IPv6 traffic growth.

### Metric 7 - confirmed v6 traffic flows from ISPs

- Data for this metric is not yet available. It should be by late 2012, following the Measurement Lab team's deployment of IPv6 into its main NDT service.

### Metric 8 - % of v6 capable end-users

- Of the three lines to track, the IPv6 Capable line is probably the most important for the TaskForce. It shows how many people **can** connect via IPv6 if they **have** to.
- This metric has historically tracked at a high level for NZ, eg increasing from c. 1.5% to c. 3.0% over the first 6 months of 2012. It has since plummeted to 0.2%.
  - We believe the cause of this dramatic shift is down to the impact of deployment of the APNIC tracker on stuff.co.nz - NZ's #8 website.
  - This led to a huge increase in the number of data points being collected and probably shifts the metric away from a niche set of users / sites towards a level more truly representative of the the actual situation.
- Our supporting evidence for this view is given by Metric 9, below, and by analysing the NZ counter stats (3 month avg) vs other economies:
  - NZ: 37k counts, population 4.3M → 0.0086 counts/person
  - AU: 15k counts, population 21.5M → 0.0007 counts/person
  - US: 90k counts, population 309M → 0.0003 counts / person
  - The NZ data is running at comparative levels of 10 to 30 times other economies.
- Care should be taken in comparing NZ's performance to other economies for this metric.

### Metric 9 - v6 traffic levels



## IPv6 Metrics Analysis Report #1: Q2 2012

July 2012

[Donald Clark](#) for [NZ IPv6 TaskForce](#)

- In lieu of any domestic traffic flow statistics, we are using the Google IPv6 data. This should provide a reasonable proxy given the popularity of Google properties in NZ and the volume of traffic Google sees.
- At time of writing, NZ was showing as 0.24% native IPv6 traffic (correlates with Metric 8), AU as 0.17% and the US as 1.12%.
- Global leaders in this area are
  - France (4.5%) - due to its deployment of IPv6 by new provider Free
  - Japan (1.5%) - due to its technology-leadership culture, eg FTTH
  - Romania (7.6%) - probably due to their being a lack of legacy infrastructure and new deployments “just doing” v6.

## Errors, omissions, arguments

If you wish to comment on this report or correct factual errors, please email [contact@ipv6.org.nz](mailto:contact@ipv6.org.nz)