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TrueNet's Response to the Australian Competition & Consumer Commission (ACCC)

Consultation paper on Broadband performance monitoring and reporting in the Australian context

Comments from TrueNet

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Summary

TrueNet has applied its experience and skills in the New Zealand market to provide input we are confident will assist the ACCC to develop a fair, accurate and equitable ISP performance measurement regime in Australia.

The TrueNet programme is totally focussed on providing consumers with transparency about the performance of ISPs in delivering broadband. For ISPs, the programme provides data and commentary that enables them to implement a continuous quality improvement regime. Broadband customers can view the performance of each ISP and give added impetus for ISP investment in improved performance. Competition is enhanced because customer ISPs are provided with full details of their own and their competitors' performance.

TrueNet is testing, monitoring and publishing results of ISP's performance both on a monthly basis and showing trends over time. We have learnt that above all, the monthly report should be independent, fair and relevant. However, the most critical part of the publication of the data is the analysis of the results in plain language. Providing consumers with a rich source of information about the performance of ISPs enables better choices where the tradeoff between quality and price can be made to match the consumers' needs.

It is our view that the company involved in the testing and publication of the data is best placed to add meaningful commentary and complete a rich, reliable and regular monthly report to encourage best practice in ISP performance.

All larger ISPs should be monitored to encourage competition between their technology teams. Smaller ISPs will want to participate, but not necessarily immediately.   It is TrueNet's opinion that Australia should urgently move to regular monthly reporting of performance results to encourage similar improvements to those that New Zealand has experienced.

Response to the ACCC Questions for Consultation

This is TrueNet Australia's commentary on the questions put within the ACCC paper "*Broadband performance monitoring and reporting in the Australian context.*" The basic requirements of the project must include:

- Fairness to all ISPs, openness and transparency;
- A truly independent monitoring and reporting organisation;
- Equitable measurements that ISPs can understand, repeat and use to improve performance;
- Integrity of reporting to encourage belief in the results;
- Regular reporting to enable quick recovery from low rankings;
- Representative consumer and SME measurements;
- File or webpage sites that are independent and dynamic;
- Quotable results, to encourage "winning" ISPs to use the results for commercial advantage;

Comparisons between test-page sites e.g. (at peering exchanges) and lab or ISP based sites are suitable for comparisons, but should not be used for performance monitoring. TrueNet advocates the use of panel testing from public, accessible, TrueNet controlled servers. This works in New Zealand with ISPs using the Network Monitoring Tool provided by TrueNet to improve performance.   The competitive intelligence enabled by the TrueNet data-set drives intense competition for quality.

TrueNet's Network Monitoring Tool

TrueNet developed a Network Monitoring Tool to enable both volunteers as well as participating ISPs to observe the data collected.

The TrueNet Monitoring Tool has two outputs, one for the volunteer and one for the ISP.

Chart 1: Network Monitoring Tool Volunteer Output
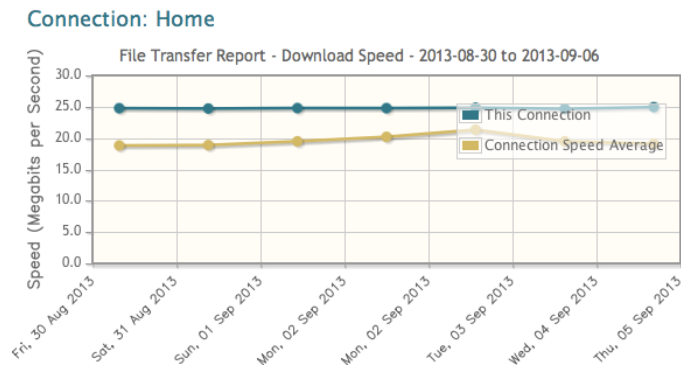
The volunteer is supplied with a secure access to their results, delayed 24 hours to discourage ISPs filling the ranks of volunteers. This tool is displayed above which shows speed averaged over many days and plotted against the average for the volunteer's ISP.

The ISP tool presents live, continuous and competitive data. It is currently showing speed, browsing, DNS and latency results, both by time of day and for defined periods. The chart below shows Speed by Time of day for the major NZ ISPs, averaged over 6 weeks, with the period chosen by the operator.

This tool comes with a wide choice of filters to enable comparisons by location, ISP, technology, speeds sold, urban/rural and cabinet/exchange. The button at the base of the chart is to generate regular reports based on the filter selected.
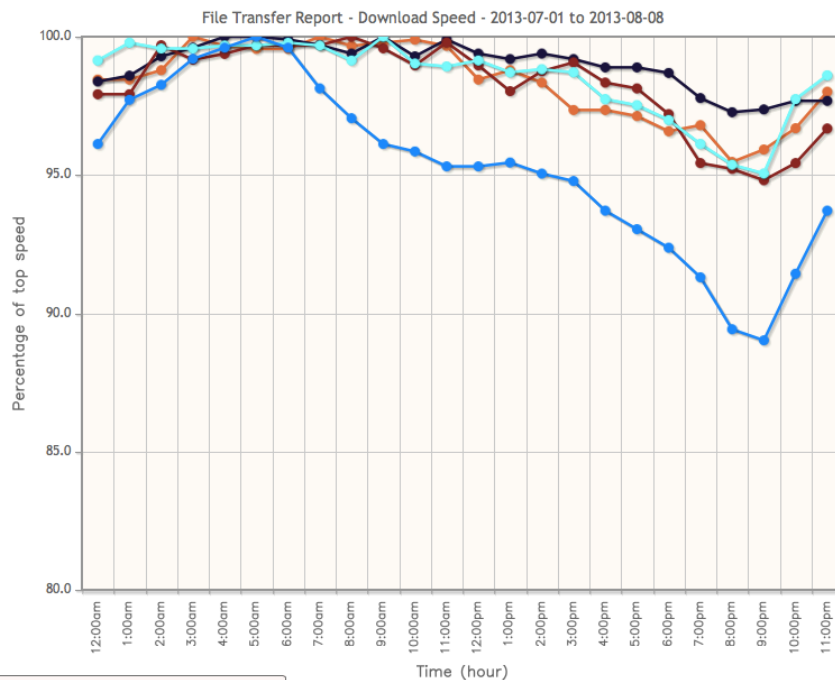
TrueNet experience shows that the key decision-makers within the networks teams of ISPs comprise both the CFOs as well as the Technologists. TrueNet provides regular, accurate data enabling each ISP to view its performance against the other ISPs. This is usually the first time that an ISP can rank itself against its competitors. And, as importantly, the first time the Technologist has had a score for performance. TrueNet testing in New Zealand provides performance scores that are highly motivational for Technologists. The regular reporting of the ISP's data greatly encourages each of them to increase the effort and helps the technologist to justify to the CFO the investment required to become ranked first for performance.

In the two years that reporting has consistently been produced every month, there is a marked improvement across the market as can be seen in Chart 1. TrueNet website viewer numbers continue to increase as more of the public recognise the value of comparing both price and service with performance.

TrueNet regularly publishes a target of better than 95% for the worst hour performance by ISP. Some months only one ISP is now below this target. It took several months of reporting for the first ISP to better the target . TrueNet's measures of Australian ISPs using a small number of probes in Sydney, Brisbane and Melbourne , suggests that such an improvement is needed.

Chart 3 Time of Day improvements over two years of reporting
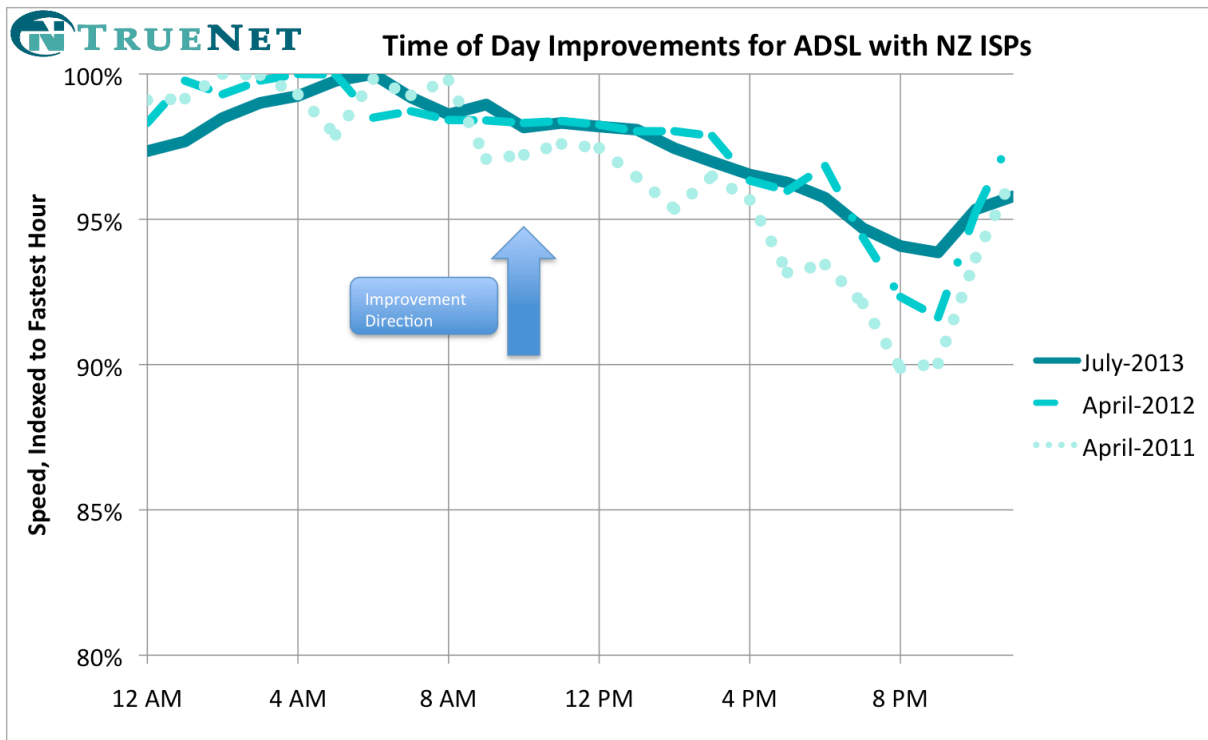
Timeline for Chart 3:
1. April 2011, TrueNet measuring but not reporting
2. April 2012, Commerce Commission contract announced, but TrueNet reporting active for 6 months
3. July 2013, continuous monthly reporting for almost 2 years

TrueNet Responses to ACCC Questions

Testing methodology

TrueNet uses a probe-based measurement technology, with a bridged router located between the modem and the LAN. The probe (HMU or bridged router) firmware is replaced by custom firmware to enable testing tools to be included and security to be arranged. This ensures that the probe is unable to be contacted or altered by the volunteer. The only access for TrueNet is when the probe "Calls home" for a list of tests it will be asked to

conduct. The firmware is also able to be updated at this time.

Tests are able to be updated each hour if necessary, enabling a very quick and reliable turnaround for tests. The probe monitors traffic to identify if it can test and will pause or delay a test if traffic is detected. By asking volunteers to allow a range of data caps for the probe, on many of the probes we are able to complete not just our standard tests, but experimental ones as well.

Probes locations are kept private to TrueNet. No traffic is logged.

TrueNet optimised small file tests to accurately measure speeds using techniques to overcome the issues of ramp-up and ramp-down without stressing the typical New Zealand data cap of 10GB/month at the time of setup. Initially the data cap limited testing to just 400MB/month, but the standard is now 1GB/month and all volunteers are being encouraged to raise their cap to 3GB/month to enable larger file testing, which is required at speeds above ADSL.

TrueNet results are of equal quality to those performed using techniques that swamp a line. TrueNet monitors the speed for each quartile and uses the fastest quartile of a download to record the line speed.

Do you agree that a probe-based testing methodology would be the most reliable and accurate approach for the Australian context?

Probe-based testing is critical to achieve a fair, and consistently reliable result. This is especially true with DSL probes which are distance dependent for maximum speed. The following points are noteworthy:

- Probe-Based testing measures the real experience of consumers and it is easily understood to be fair;
- Fairness - all ISPs have the same chance of location of probes;
- Probe to DSLAM distance can be eliminated as a factor when reporting;
- Sample selection is unable to be manipulated as the distance to DSLAM is random;
- Both SME & Consumers can be easily included;
- The testing device is independent of PC settings, other activity and wifi use;
- Technology can be confirmed by analysing performance results and is likely to stay constant, so updates are infrequent;
- The location can be confirmed by an address verification mailout;
- All technologies are treated equally using Ethernet connected probes for testing;

Lab-based approach:

Cross-talk between probes is maximised in building and jumper cabling, so is very likely to:

- Create a first-turned-on bias for probes, due to DLM;
- Modem restart competition could develop to ensure first-on advantage;
- Manipulation by ISPs is designed into the solution that they install and maintain;

Credibility is limited, as no home LAN is connected in a lab.

Investment in proactive network fault finding under this scenario becomes fruitless.

Client Based approach

- May measure multiple and unknown locations from each PC;
- Prone to impacts from the client activity, e.g. overloaded PC;
- Typically only run when a client has an issue such as poor performance;
- IP Address identification completely flawed and may be in any country/city, any technology;
- Likely to measure mobile traffic as fixed - as is evident from Akamai & Speedtest.net data:

If you consider an alternative approach preferable, what approach do you prefer and why?

Scope

Probe-based testing with results reported monthly by the contractor is the most cost-efficient solution available. The initial cost of lab-based testing equipment is high, and the cost of data is very high.   Probe-based testing is likely to provide sufficient locations to enable comparisons on those factors considered important, e.g. speed by ISP, by technology, by Region, or say "latency by region by technology". Monthly reporting can be completed within the following month by an independent contractor. Real data has real issues, from volunteers upgrading, to volunteers creating interference due to a new practice, to ISPs changing parameters. Many issues like these need to be isolated prior to running a report, so it is difficult, if not impossible, for the regulator to complete such a process within the following month.

Services

3. What services should be included in the ACCC's proposed performance monitoring and reporting program? In particular:

a) Do you agree that the ACCC should monitor ADSL, HFC and NBN-based broadband services?

Monitoring of performance for any technology will result in improvements in that technology. End-users value the quality of their broadband connection slightly more than the technology used to supply it. Comparisons across technologies are fair and reasonable with an objective of improving competitive supply of broadband. Probe-based measurement uses ethernet between the modem and the LAN to locate the tester which means that any technology can be tested using the same tools.

VDSL is treated differently in many countries and is an important alternative that should be tested. TrueNet has needed to develop comparisons of VDSL independent of fibre or ADSL. For many tests VDSL can be treated equally with ADSL, although the probes cannot be mixed as the results are very different.

In the EU, VDSL is treated as fibre access[1] (FTTx) in the USA it is often available, but in New Zealand it is available to over 60% of the country and via most exchanges where DSLAMs in either exchanges or cabinets have both ADSL and VDSL cards.   The Australian market has restricted VDSL mainly to one state and very few suppliers for the present.

b) Do you agree that the ACCC should monitor small business broadband services?

There is no reason business or residential services should be treated differently if the technology is the same.

Small businesses participate in TrueNet's New Zealand panel alongside residential and they are some of our most enthusiastic, altruistic and supportive volunteers. SMEs use the results to inform their own choices. It would be rare for a small business line to be supplied using a different quality from a residential line. Indeed most SME lines would not be obvious - home offices are now ubiquitous.

TrueNet does not distinguish between the two and indeed would need to ask NZ volunteers about their business or residential status.

c) Are there any other services which you consider should be included in the proposed program? In your response, please outline reasons.

Mobile testing is relatively simple using the same techniques as probe-based testing for fixed line, opening up the possibility of fixed-line testing for mobile broadband services. TrueNet has completed a suite of mobile testing measurements and has published results. https://www.truenet.co.nz/articles/truenet-releases-mobile-

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[1] Quality of Broadband Services in the EU, March 2012, page 51

TrueNet is planning and developing fixed, cellular connections in New Zealand for testing in competition with fixed copper or fibre connections.

Regions

4. How should the ACCC determine which regions to monitor as part of any program? In particular:

a) How many Australian cities do you consider should be monitored as part of the proposed program? How could these be determined by the ACCC?

All major cities with a population above a threshold would enable a comparison by city if required.   That threshold needs to be considered in relation to the variation of performance by measured factor, e.g. technology, location and ISP.   Some technologies have consistent performance, whilst others have wild variations so the minimum sample size will vary.

b) Would you consider State or Territory regions which encompass rural and regional areas outside of each major city would be sufficient to provide information to consumers living in these areas on the performance of broadband services?

For example, a Victorian rural/regional delineation which encompasses services outside of metropolitan Melbourne.

TrueNet's experience shows that rural/urban and "Other" comparisons work well, although regions have particular characteristics due to latency, or distance to website servers, which are usually located in main centres.

Internet service providers

5. How should the ACCC determine which ISPs to monitor for ADSL and NBN-based services? For example:

a) Should the ACCC monitor the largest ISPs by total market share in the Australian fixed-line broadband market?

All larger ISPs should be monitored to encourage competition between their technology teams. Smaller ISPs will want to participate, but not necessarily immediately.   Enabling an option for them to participate by providing a process for them to independently fund probes works well. Competitive realities encourage opt-in for any ISP that wants to be seen in the market; monthly reporting enables the best ISPs to underscore their performance, encouraging others to try to compete on quality.

TrueNet NZ has three ISPs who have funded probes, 1 smaller ISP, two for new technologies. To maintain independence, such ISPs are asked to send out a general flyer to all customers of the type they want monitored, suggesting volunteers register on the TrueNet website. TrueNet selects the volunteers based on the funding criteria and arranges all activities from that point, including reporting on the ISP once the threshold of probes is reached.

b) Should the ACCC monitor the largest ISPs by market share for each technology?

For technologies selected for monitoring by the ACCC, all major ISPs should be monitored.   Other technologies/speeds can be funded and monitored when each ISP wishes to start the programme.

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Fibre monitoring is new in New Zealand and is being funded solely by the ISPs wishing to be included in monthly reports. Major ISPs entering the NZ UFB market initially fund probes for each speed and are expanding this funding to specific locations.

c) Should the ACCC monitor the largest ISPs by market share for each region?

Regional monitoring can be treated similarly to technology choices. An ISP that is only present in a single region can fund probes in that region, to be reported only when that region is compared or as a national result with a note to say the probes are limited to that region. Fairness in reporting eliminates these ISPs from cross-regional reporting, e.g. Latency results by region.

Regional monitoring has proven the most valuable information source for ISPs who purchase the data from TrueNet. ISP customers have consistently found unexpected issues with backhaul investment by researching the Network Monitoring Tool.

6. If you consider that another approach to determining which ISPs to monitor is preferable, what is it and why do you prefer that approach?

Choosing the largest ISPs to monitor initially will have the greatest impact, drawing interest from consumers and a competitive response from the ISPs. Adding smaller ISPs at their request keeps the opportunity for them to be included on their timing.

7. Should the ACCC monitor all providers of HFC in Australia, or limit testing to the two major networks operated by Telstra and Optus?

TrueNet doesn't consider initially monitoring all providers necessary. Our experience is that other providers will opt-in to match the competition. A formula for funding of probes could be developed that enables opt-in to get the market started. (e.g. Provide an incentive whereby the ACCC matches the funding of 20 probes).

Speed tiers

8. Do you agree the ACCC should test both ADSL 1 and ADSL2+ services?

Alternative forms of DSL should be ignored for testing so ADSL1, 2 & 2+ should all be treated as ADSL. For most volunteers, including volunteers in Australia, they know they are on ADSL, but not if it is 1 or 2+. If an ISP is offering ADSL1, then that is their choice and this will be reflected in results.

VDSL can be included in many comparisons with ADSL and could compete with NBN as it does in New Zealand. VDSL needs to be compared with Fibre, Cable *and* ADSL.

9. Should the ACCC test specific speed tiers for HFC and NBN-based services or should it test services falling within particular speed ranges? Please explain if and why you prefer a particular approach.

Speed tiers enables direct comparison of specific products by ISP, i.e. the choice most consumers are making when deciding on a purchase. However, many performance comparisons can be compared across tiers, (e.g. Time-of-day performance is not dependent on speed). Performance should always be compared to either advertised speed or implied advertised speed (DSL services running at full speed have an implied advertised speed of the maximum the line will allow).

Comparing absolute speeds between tiers, such as a direct comparison of 100Mb/s with 30Mb/s is of limited value.

Sample size

International testing sizes vary widely from less than 10 to over 300 probes per million population[2].

TrueNet charges setup and support fees per probe. TrueNet's variable price enables the programme to grow with demand or budget and allows smaller ISPs to participate.

10. What is the minimum number of probes which would be required to provide robust results on the broadband performance likely to be experienced by consumers acquiring a particular ISP package or offering in a particular region (i.e. per sample set)?

As mentioned above, the minimum number of probes will depend on results. Some technologies and locations may have highly variable results, while some may be very reliable. As the market grows in New Zealand, TrueNet has developed policy for each technology.

The TrueNet programme is totally focussed on a continuous quality improvement model, so if a particular product is offered where price is lowered because lower quality is offered, then these products should not be compared with premium products (often the case with Unlimited Data cap products). The comparison of like for like is an important criteria for the validity of each data-set.

Increasing the size or reach of the programme can be achieved by individual ISPs' funding probes independently, e.g. when they first offer a new technology or speed tier.

11. Which of the variables (ISP, geographic region, speed tier or size of each 'sample set') is most important and why?

The order of priority is as follows:
1. ISP - measuring ISPs performance is the raison d'être for the methodology and must be considered first
2. Technology - this is the first choice for a consumer or SME
3. Speed tier - this factor is considered by consumers, along with technology, and is often a key part of the decision making
4. Region is unlikely to be a major driver between ISP performance

Note: TrueNet website visits are dominated by the latest monthly report, but coming a close second is the commentary that accompanies the reports, explaining the special nature of technologies and their speed performance. A sample monthly report is included in the Appendix.

Metrics

12. What information regarding download and upload data transfer rates (or 'speeds') would be most useful for ISPs and for consumers? In particular:

a) Do you agree that the ACCC should monitor both peak and off-peak data transfer rates?

Although peak and off-peak is different for each ISP, TrueNet testing returns statistically meaningful results for each hour of the day, enabling a discovery of the peak speed and off-peak speed reduction. This information is invaluable for ISPs.

Comparison of peak to off-peak performance has driven major changes to broadband quality in New Zealand as apparent in Chart 1.

b) What is the daily peak or 'busy' period for demand on broadband bandwidth in Australia?

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[2] Quality of Broadband Services in the EU, March 2012

It is unlikely that there is "one" peak or off-peak period. This is especially significant for those ISPs that focus on business customers.

Regional differences between peak and off-peak times may occur across Australia.

Some traffic differences and hence performance differences may occur as a direct result of the use of peak/ off-peak data caps, which may create congestion in off-peak hours. If so this will show up in hourly testing

c) To what extent are 'burst' speeds available for consumers in Australia and should they be accounted for in the ACCC's proposed testing program?

A range of tests to provide consistent views about the performance of any ISP for their customers' typical usage will highlight and report on any burst speed options provided and any impact that ensues.

TrueNet works with ISPs to improve measurement techniques to identify quality differences where an investment category is intended to improve quality. For example investment in more capacity is evident in peak to off-peak speeds. Investment in burst speed could also be measured to demonstrate the value to consumers.

Additional quality of service metrics

TrueNet monitors many metrics in New Zealand that remain unreported. Funding for analysis and reporting is awaiting the development of more efficient reporting of those metrics already reported. Improved efficiency in reporting will develop over time as changes to the networks and reporting regimes develop. Issues caused by a failure or market change within reports of any ISP during a specific month need to be checked before reporting, and this takes time.

13. What additional quality of service parameters should the ACCC monitor so as to obtain rich and meaningful information regarding the performance of broadband services in Australia? In your response, please state each factor which you consider should be tested and why.

TrueNet NZ's testing includes all of these measures:
- Packet loss
- Latency
- Jitter
- Webpage Browsing time (speed can be calculated, but is confusing with Throughput)
- Domain Name Service (DNS) resolution time elapsed as well as failure rate.

TrueNet also measures Mean Opinion Score (MOS), a measure of voice quality over Ethernet based on internationally accepted voice quality opinion scores.

Consideration of the performance of streaming video testing is likely to be necessary and desirable within the next 2 years as streaming becomes the "normal" TV like experience.

VoIP for suppliers of "over-the-top" software, (such as Skype, Facetime, and Google Hangout), three common home or SME VoIP applications, is a must right now. TrueNet is currently testing the expansion of its services to include the influence of ISP performance on these products in New Zealand.

Reporting

Reporting in New Zealand has been regular and monthly for two years. ISPs now request details of the report timing every month and TrueNet is ALWAYS contacted to hurry up the report release. This points to a strong impact of reporting on the ISPs market positioning.

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14. What do you consider is the best approach to reporting on broadband performance in Australia? In particular:

a) How often should the ACCC report on the results of its broadband performance testing?

Both monthly and annual reporting have a place in driving broadband performance improvements.

TrueNet's experience is that the primary reporting must be on a monthly basis for the following reasons:

- ISPs greatly value their ranking as the monthly reporting gives sufficient time for ISPs to improve their performance prior to the following month's report.
- On the other hand, continuous reporting doesn't ever give ISPs the opportunity to claim the leading position.
- Quarterly reporting or even longer intervals provides the "winner" with an artificial lead for too long in such a fast moving industry;
- Changes in performance will alter on a weekly basis as demand is matched in a continuously moving balance between supply of capacity, updated technology and the demand generated by changing customer numbers and usage.
- Annual reporting up to 2 years after the event is of no value to anyone. Neither the technologists, nor the public are interested in last year's data.

Above all, monthly reporting is fair and equitable, while allowing for continuous quality improvements by the ISPs. Longer interval reporting, such as quarterly, is neither fair nor relevant.

Separate annual reporting by the ACCC is a necessary part of the process, enabling a deeper review at a very detailed level, including the potential to compare by country.

b) Do you agree that the ACCC should provide detailed observations, commentary or analysis on the results of testing?

Above all, the monthly report should be independent, fair and relevant. However, the most critical part of the publication of the data is the analysis of the results in plain language. The company involved in the testing and publication of the data is best placed to add meaningful commentary.

TrueNet tries to avoid commentary on the monthly reports other than to explain the results.   It is up to reporters to fill that gap.

The ACCC may wish to comment in situations where there is a clear conflict with ACCC standards. e.g. a misleading comparison between the actual performance of an ISP and its advertising. Otherwise there is little requirement for the ACCC to comment unless seeking greater publicity of the results to assist with increasing competition between ISPs.

TrueNet would expect to cooperate with the ACCC to develop a comprehensive annual report, published by the ACCC.

15. To what extent would industry (e.g. ISPs) value access to the raw data collected by any testing program and want to have access to it?

TrueNet provides a Network Monitoring Tool that enables ISPs to review results by test, while also enabling comparisons by speed, region, time of day, technology and date. This tool quickly became the main method of access to the data when it was launched early in 2012. Raw data is used by some ISPs, but only to study issues in more detail.

The price of raw data for the ACCC would increase significantly if TrueNet did not retain access and control. Under a model where TrueNet owns and manages the data, the price for raw data access would be the same for ISPs as for the ACCC. The prices for probe setup and support are insignificant compared to the price for

data access, so sharing of these costs with ISPs is critical to the viability of the programme.

The New Zealand experience is that the ISPs not only wish to purchase the raw data, but appreciate the value of TrueNet's Network Monitoring Tool to help to find issues in their network that they themselves are not able to measure.

Typical issues found by ISPs in the NZ network include:
- Bufferbloat from connections outside the ISP network;
- Packetloss between the ISP and its peers; and
- Capacity constraints in remote areas where part of the ISP network is isolated from its core.

TrueNet Background

TrueNet is an independent company dedicated to the accurate measurement and reporting of broadband performance. TrueNet is a joint venture between two experts - Catalyst IT comprises personnel in Australia and New Zealand with open source IT expertise and Jonette Consulting, broadband reporting analysis experts.

TrueNet began in 2010 to fill the gap in the independence, accuracy and depth of monitoring and analysis of broadband services offered to New Zealanders. TrueNet has implemented a user-friendly and effective series of broadband tests. These tests have influenced broadband suppliers to provide a greatly superior service, resulting in the provision to consumers of faster information on demand.

As a consequence of the venture in New Zealand, TrueNet is now offering the same products and service in Australia. TrueNet is driven by its success in markedly improving ISP performance to meet a competitive network challenge. ISPs now compete to offer the best performance to consumers.

TrueNet publishes the test results on a monthly basis on their website, www.truenet.co.nz as well as www.truenet.com.au and promote the reports on Facebook.

The NZ Commerce Commission contracts TrueNet to conduct the monitoring service for DSL and Cable services and to deploy and manage the test probes and provide data and commentary that ensures privacy of the volunteers. The TrueNet Monthly Reports are also funded by The NZ Commerce Commission.

TrueNet data customers include:
- The NZ Commerce Commission
- Slingshot
- Telecom
- Orcon
- Vodafone

In addition some TrueNet customers fund the supply of probes for special purposes, e.g. A monitoring and reporting system for a particular project. These ISPs include:
- Voyager
- Orcon
- Snap

TrueNet's independence is critical as it continues to provide the best and worst results of ISPs, providing them with the means to implement a continuous quality improvement model to deliver a quality broadband service.

TrueNet Personnel

TrueNet is supported by two companies and a number of independent contractors.   Jonette provides operational resources, and CatalystIT provides technical and Australian resources.

Key people for this project include:

- John Butt, Director & Chief Executive
- Andrew Ruthven, Chief Technical Officer
- Annette Begg, Director & Head of Marketing
- Andrew Boag, Australian representative

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APPENDIX, TrueNet July 2013 Monthly Report

Competition Between ISPs Hots Up

In this issue of the TrueNet Broadband Report we measure DNS response for the first time, and Snap takes the honours in the first round. Latency tests are extended to Australia.

Telecom still has some work to do to improve Latency and Webpage Download times to catch up with the rest of the market.

Summary of Performance Measures – All ISPs

ADSL speed performance is very competitive, with only Vodafone lagging below 90%. Webpage download performance is the next most competitive feature, with ADSL performance spread over a wide range from 1.9s to 4.9s.

Fibre performances are consistent, but well below their advertised speeds.

Latency tests across all technologies show Snap as having the best performance for tests within NZ (Wellington), and Orcon to Australia.

DNS is reported for the first time with large differences between ISPs.

Table 1: Summary of all Performance Measures

Technology	ISP	Speed Min/Max	(Mb/s)	Webpage Time (s)	Latency NZ	AU	USA
Capped ADSL	Orcon	98%		2.8	32	48	209
	Snap	98%		2.5	17	48	188
	Slingshot	98%		1.9	37	50	194
	Telecom	97%		4.9	36	60	247
	Maxnet	94%		2.8	34	46	191
	Xnet	94%		2.7	34	50	190
	Vodafone	88%		2.0	37	59	203
Unlimited ADSL	Orcon	89%		2.8	39	53	210
	Slingshot	82%		3.6	35	51	198
VDSL	Snap	89%		1.6	19	44	183
	Voyager	88%		2.3	31	46	192
Fibre 10Mb/30Mb	Orcon	92%	28	1.6	17	31	184
	Snap	91%	27	1.6	14	43	184
Fibre 50Mb/100Mb	Snap	93%	93	1.6	14	43	180
	Orcon	87%	87	1.5	22	36	183

Telecom has nine VDSL probes, but almost all of these started reporting mid to late July, so they will be reported in August.

TrueNet has probes from 9 other ISPs, however there are not enough probes with each of these ISPs to report on them individually, the "Other" category performed reasonably well with a 91% Min/Max Capped ADSL performance. ISPs included in this group are: Actrix (3), Compass, Flip, InSPire(3), Kinect, LinkTel, Woosh, Worldnet, KCInternet.

Speed (File Download Only)

Capped ADSL Speed

Almost no change in order this month for the ratio of peak to off-peak speeds, with four of seven ISPs reporting better than 95% again. Orcon improved 3% to get to the top of the table. Maxnet & Xnet both improved again by 3%, which took them to just below our target performance of 95%. Vodafone have not changed and remain at the bottom after their purchase of TelstraClear.

Chart 1: Capped ADSL Speeds

| ISP	Min/Max
Orcon	98%
Snap	98%
Slingshot	98%
Telecom	97%
Maxnet	94%
Xnet	94%
Vodafone	88%
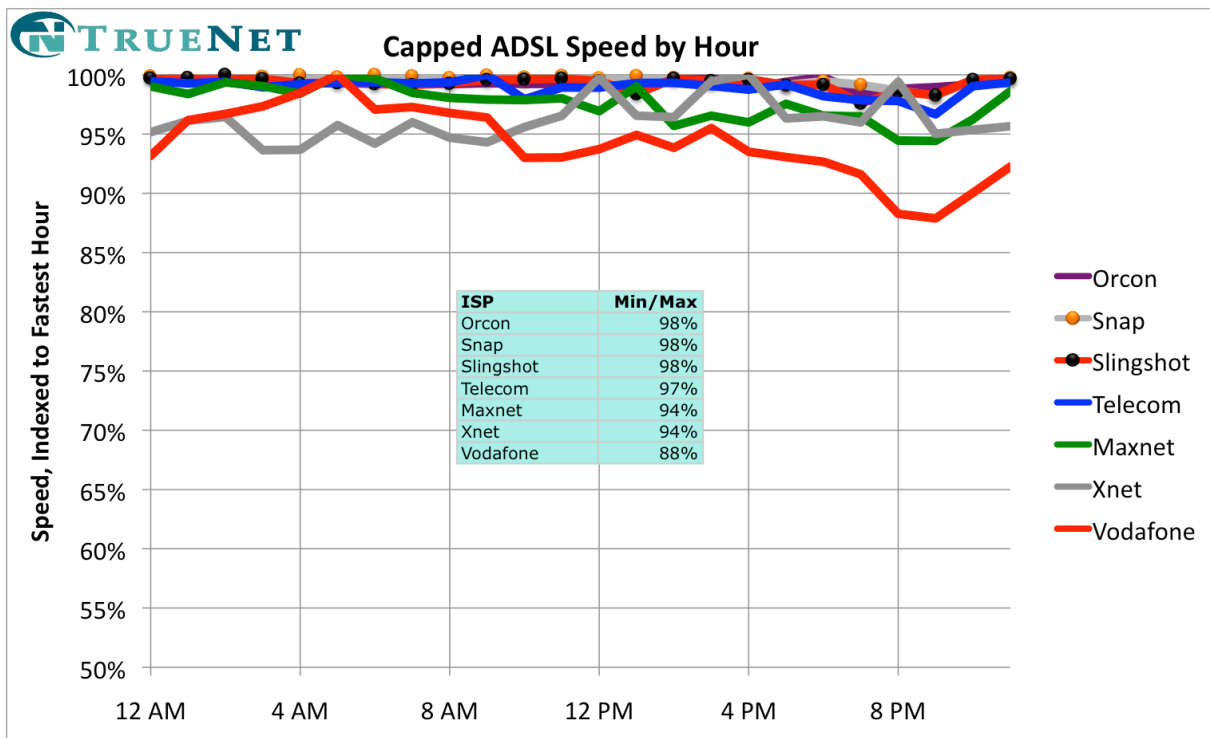
Unlimited ADSL Speed

Unlimited ADSL is sold subject to ISP terms that service may be constrained during peak usage periods, so performance is expected to be less than the premium Capped services.

July shows similar results to June, with both suppliers managing better than 80%, although Slingshot has improved their performance between 10am to 8pm, dropping below 90% at 10pm, an improvement from their highly variable performance of June.

Chart 2: Unlimited ADSL Speed

Unlimited ADSL Speed Comparison

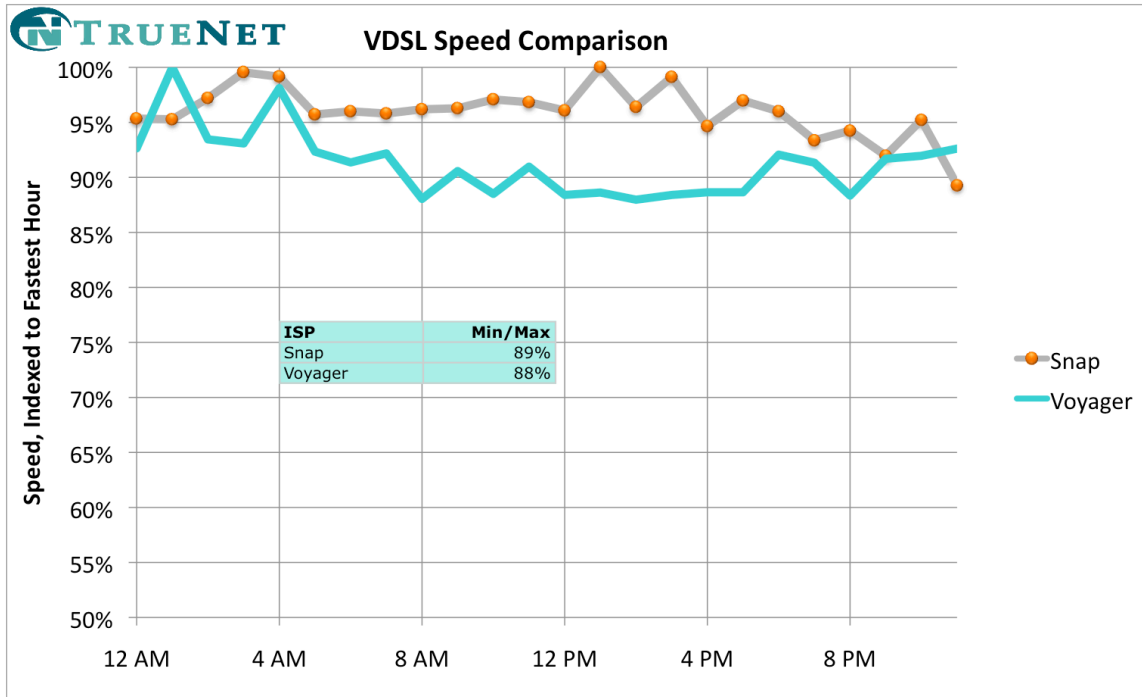| ISP	Min/Max
Orcon	89%
Slingshot	82%
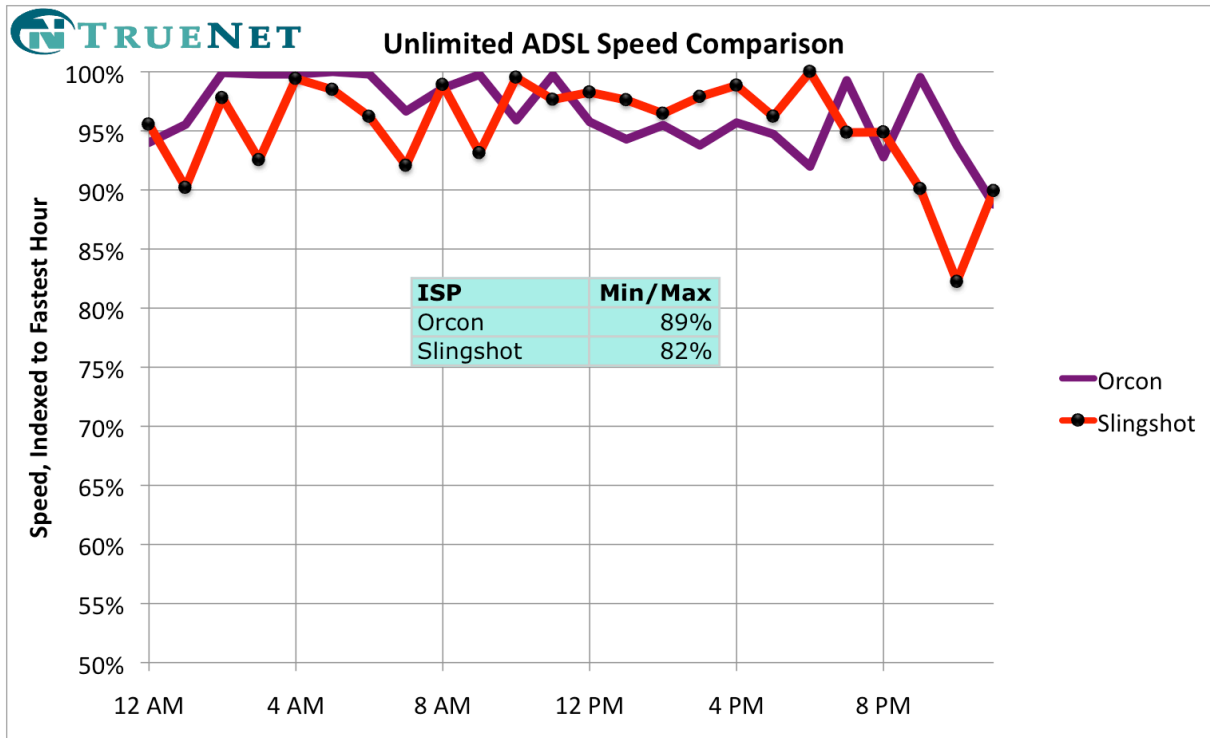
VSDL

Performance reduced considerably in July from better than 95% for both VDSL suppliers to less than 90%.

Next month we expect to be able to report Telecom, nine volunteers switched to VDSL (from ADSL) in July.
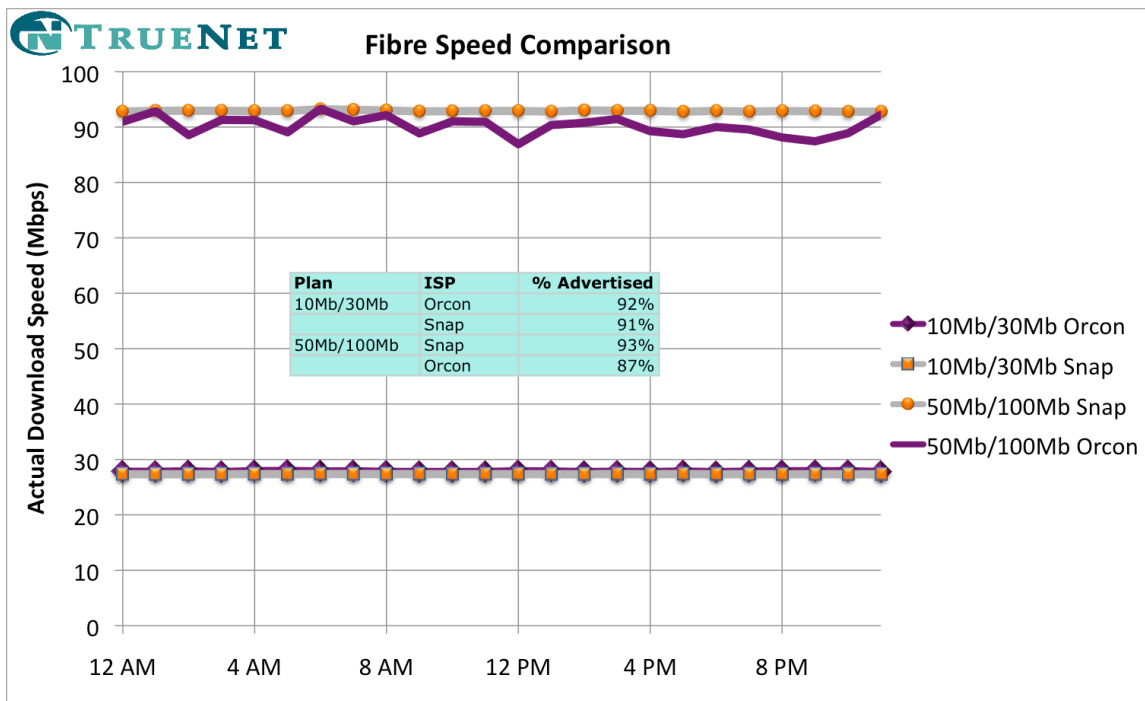
Chart 3: VDSL Speed

VDSL Speed Comparison

ISP	Min/Max
Snap	89%
Voyager	88%

UFB Fibre Speed

Fibre from Snap and Orcon continues to perform at a very consistent level, if not at the advertised speeds.

Chart 4: Actual Fibre Speeds

Fibre Speed Comparison

| Plan	ISP	% Advertised
10Mb/30Mb	Orcon	92%
	Snap	91%
50Mb/100Mb	Snap	93%
	Orcon	87%

Webpage Download Time

Slingshot achieved very large improvements in the sum of the four website downloads from almost 4s in June to under 2.5s in July.

FIbre Webpage Download times are significantly faster than ADSL.

Vodafone Cable results continue to be the best.

Chart 5: Webpage Download Time - All Technologies
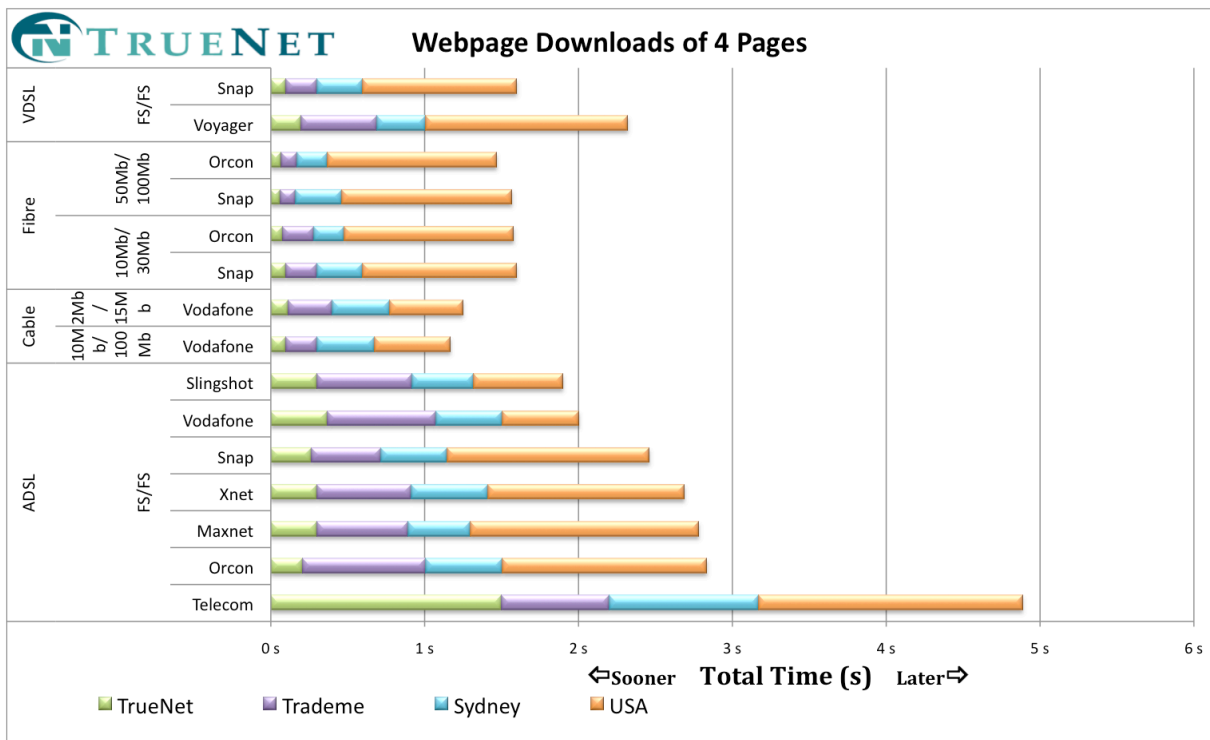
Webpages often have parts from many different servers as well as different countries, so we have presented this with an additive bar chart.

Latency

TrueNet started testing latency from Sydney in July. The latency charts are in parallel to demonstrate the differences between NZ (Wellington), Australia and USA.

Chart 6: Snap consistently has the lowest latency when testing to NZ (Wellington).

Latency tests to Australia show that Orcon is best on all technologies they offer, while Vodafone and Telecom stand out as the worst, exceeding 50ms.

The USA latency measurements are typical for this distance, but the differences between ISPs are problematic for Orcon ADSL, Vodafone ADSL, and especially Telecom.

Telecom as the worst performer clearly has problems with Latency both Nationally and Internationally.

Chart 6: Latency Performance — Latency from NZ, Australia and USA
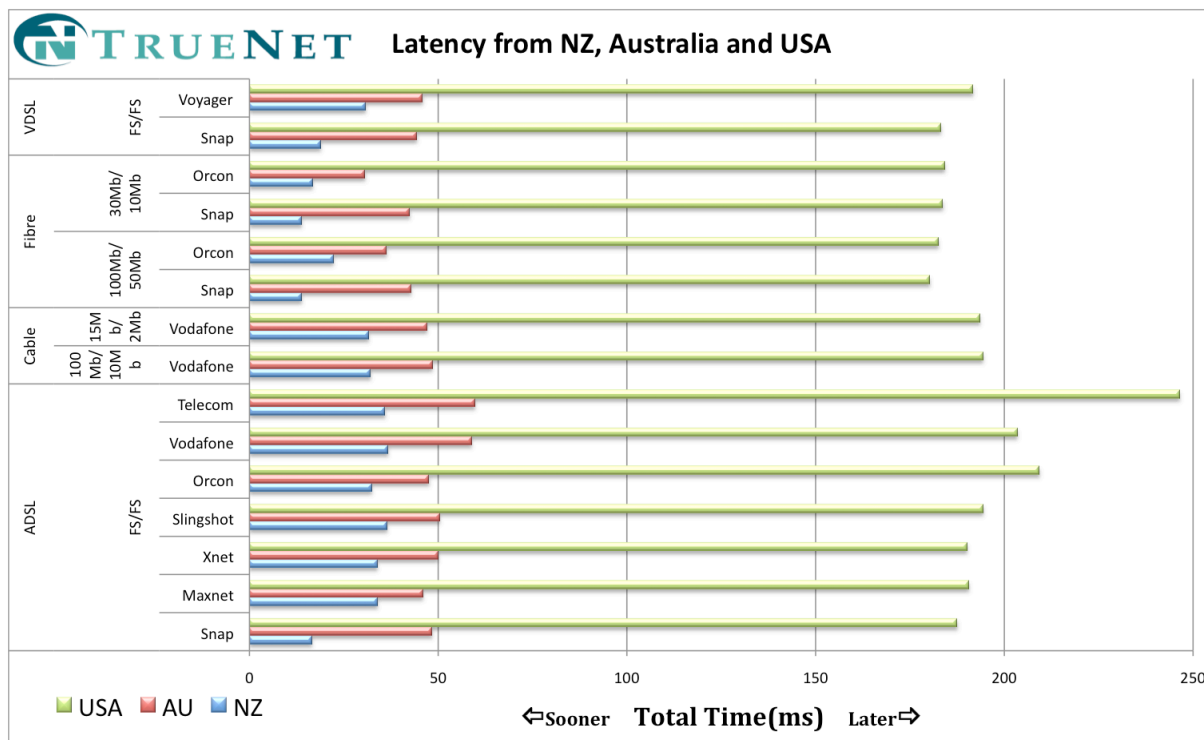
Latency is critical for game players and they need to know the latency from their specific server, so we have presented results in parallel for each location. Next month NZ(Wellington) will be reported separately as Auckland and Wellington.

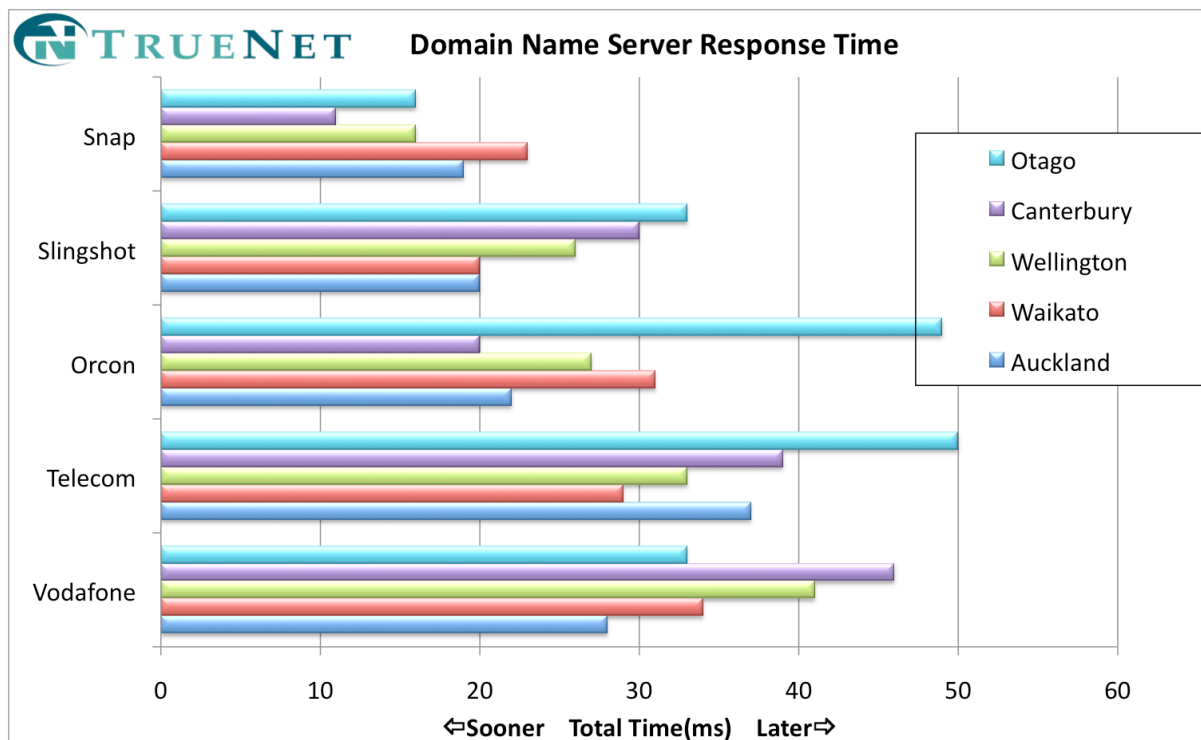## Domain Name Server (DNS) Response Time

The TrueNet Domain Name is www.truenet.co.nz, but for your computer to be able to access a website, your computer needs to find out the website's IP address (in this case 202.78.242.2). Once your computer has this detail it can communicate with the server where the website is held.

This conversion can take time and can slow webpages, although usually not a significant or noticeable amount this can increase if the website has content that comes from multiple servers (eg for advertising content).   TrueNet measures the DNS response time for those experts wanting additional levels of detail.

Snap is significantly faster than all others, with Vodafone significantly slower.

These results are limited to ISPs with probes in all 6 locations. Other locations do not have probes with all 6 ISPs.

Chart 7: DNS server Response Time

Domain Name Server Response Time

Legend: Otago, Canterbury, Wellington, Waikato, Auckland

⇦Sooner   Total Time(ms)   Later⇨

[Help to improve Broadband Speed performance – become a TrueNet Volunteer](#)

Glossary

Details on how we measure are available on our [Technical page](#).

ADSL, VDSL, DSL – the standard broadband service provided over a telephone line, VDSL is a faster version than ADSL. They use similar technology and backhaul, so sometimes DSL is used when referring to both.

Capped Plans – the most common ADSL service, where you have a monthly plan having a GigaByte (GB) limit of usage each month before your speed is slowed or you must pay more.

Unlimited Plans – ADSL service where there is no monthly limit on the amount of data used. Specifications for this service include that it may be "Managed" and have "performance reductions applied during peak demand periods."

Cable – Vodafone (ex TelstraClear) are the only ISP that offers Cable, which is available in a limited number of suburbs of Wellington, Christchurch and Kapiti (Usually suburbs with overhead wires)

DNS – Domain Name Server. As the Internet is based on IP addresses, a DNS service translates domain names into the corresponding IP addresses.

DSLAM – the exchange or cabinet based equipment that your modem is connected to, over the pair of copper wires that are exclusively allocated to your premises.

Ethernet – The wiring used to connect computers to a network, typically an Ethernet cable is coloured (often blue), with small square connectors at each end.

ISPs – TrueNet has probes measuring almost 20 ISPs but only reports on those where there are 5 or more probes working during any particular month.

Latency – The time for a packet of data to be returned by a remote server to the probe when a "Ping" command is issued. TrueNet sets targets for maximum median latency that are known to be achievable.

Median – Median results are used for all measurements. This means that any result represents the "middle" performance measure applicable.   Using median ensures that the result is more representative due to the often skewed nature of measurements.

Speed – Throughput or the median peak connection speed achieved during our standard test downloading an image from our test servers. TrueNet normally reports speed as a comparison at low vs high demand times to show any capacity constraints evident in speed performance, often called the Time of Day analysis.

UFB Fibre - Ultra Fast Broadband connections are the service offered by some ISPs over the Fibre to the Home (FTTH) network being subsidised by the government. Services now being offered include 100Mbps and 30Mbps.

Webpage Download – TrueNet maintains a Standard Test page which is used for measuring the time to download the entire page. This page is visible here, we use a copy located on our test servers for test downloads. The time to download excludes the time for a browser to generate the page on a screen, some are faster than others.