

Sunday, March 29, 2015

IPv6 Reality Checks

*** Update A revised entry for 2017 can be found [here](#).

Recent statements made on an Australian industry mailing list about how well IPv6 was doing, with some people reporting their traffic is split 50/50 between IPv4 and IPv6, raised my eyebrows, I was not entirely convinced about those figures, so decided to put that 50/50 to the test to see how it applies in my situation.

One of these gentleman told me that my test was flawed, setting it up to fail even, well, I disagree with that, since if 50% of the traffic is favoured as IPv6, it still stands to reason that if I disable IPv4, about 50% of my traffic should still work - albeit slower at times for local sites since I'm limited to a tunnel provided by Hurricane Electric in California, U.S.A, so I expect a bit of lag using local sites, anyway, getting back on point, that should then result in the remaining 50% or so of traffic to actually fail, which is kind of the point if one wants to test the theory of half of the sites working or not via IPv6.

Another gentleman said to me that many IPv6 sites might fail because they still need IPv4 to lookup their AAAA (IPv6) records, I found this true in only one case (noted), however, the fact remains that it should not need an IPv4 address to lookup an IPv6 address, after all, the entire point of this is, IPv6 needs to completely replace IPv4, so why have a reliance upon it? If you are offering up IPv6 addresses, it makes sense to ensure your own DNS servers respond to those queries on IPv6, just as it is now, and has been for decades, with IPv4. (view my test script)

Now, it would be foolish to think that the data usages are all the same, in fact, probably vastly differs greatly between all of us, so we'll assume the results should still be roughly in that 50/50 to 40/60 vicinity, or so one would think.

Update: A small number of people have criticized these tests, nit picking and splitting hairs on data/traffic/sites, lets be realistic, they do go hand on hand, if you want to be a hero and claim actual data, you can claim 100% over IPv6 if you just used youtube and nothing else - but the world doesn't work that way. So consider this an overall test of IPv6 usability/accessibility/reachability/whatever_else_you_want_to_call_it. because unless you have a more sheltered life than me, you do visit more than just one site.

You will soon see that I'm a rather boring individual when it comes to online activities, I'm sure I've been responsible for putting many an NSA operative to sleep on the job. I have decided there is pretty much no risk to my privacy in publishing the sites I frequent, anyone who's read more than one of my posts knows I'm into IT, and most of us use Social Media and online entertainment, but I have withheld listing some sites for privacy reasons as they involve financial transactions, everything else listed is used by tens of thousands plus others and are very common sites, so I don't consider them an invasion of my privacy or able to be used in any nefarious ways against me (sorry Senator Brandis). You will notice I do not list faecesbook facebook, I don't use the pervert stalker infested ID-Theft crime gang privacy invading P.O.S, you'll notice I don't list Skype, I do use it, but neglected to test it - my bad, so I wont count it in either pool.

Time to get started, IPv6 was upped, and IPv4 was downed, DNS tested, works good, I don't include my VPS's in Frankfurt or L.A. since I set them up and know they work, but they were the baseline test, the fact I could ping, trace, and ssh into both of those boxes located on two entirely different networks, confirms my DNS and routing of IPv6 is good to go.

So I started testing the usual sites I go to daily, and to ensure I didn't leave any (or hopefully many) out, I checked my browsers history and even grabbed the ones I only use every once in a while - like buying music which I might do once every month or two, banking/paying bills (the suppressed sites), and hardware sites to check out the latest server and storage stuff, so all kind of irregular stuff as well as the almost required daily rituals.

The results were far far worse than I anticipated, so much so that I had to check that IPv6 didn't drop! Nope, still there, still access my VPS's, still access Google and Youtube, but I could pay no bills, nor buy any music, couldn't buy my lotto entry for Saturdays 21mil or Thursdays 30mil jackpots, I couldn't do much at all...

Blog Export: Noel's Muses, <http://blog.ausics.net/>

As most of the world knows, Australia has the most pathetic TV network programming, it's why we are known as the worlds largest copyright infringer's of TV shows. Australian TV networks treat Australians with utter contempt, we end up waiting months at times for hit shows to appear or return to our little screens, and all TV networks are guilty of this (I do applaud the ABC for same time as UK airing of Doctor Who though!), so of course people don't want to wait 3 or more months after the rest of the world has seen them, the internet is instant - forums, newsgroups and chat rooms fill with discussions of what just aired, so most Australians take matters into their own hands by torrenting to see it at the pretty much the same time as the U.S. and Europe so they don't feel ostracised.

But a small number of people like myself don't go down that road, we opt for either Geoblock bypass add-ons, or VPN's, the latter is my favourite since I have a VPS in the U.S., enabling a VPN on the VPS to watch catchup TV is trouble free, this way I can sit down on a Saturday or Sunday and log into the U.S. networks websites and watch episodes on catchup... but alas, not today, one site, NBC, actually did respond on IPv6, but then to watch the stream, it called an IPv4 only service, so, scrub that out too.

It's no surprise however that Youtube and Google Search worked because everyone knows Google is IPv6 ready, so my morning was not totally lost and it was surprisingly not that much slower than if I had gone direct with IPv4.

A large number of IT and Tech related sites also failed, in fact the only one to respond was Heise - the most popular IT professionals site in Germany, not overly surprised since Germany has an overall IPv6 takeup of around 19% from what I have seen, that's the best in the world, that betters the U.S that sits around 17%, of course most of these are probably end-user IP ranges being enabled, because as the checked list below shows, there aren't too many websites that I view that are IPv6 capable.

In concluding, the results were horrific for IPv6, I have absolutely no idea what these other guys are doing, but 50%? My results here are only 6 sites accessible, with 63 sites unreachable, that's more like a measly few 8 percent of sites accessible via IPv6.

Sites Accessible

google
youtube
www.heise.de
aussiescanners.com
pch.net
en.wikipedia.org

Sites Not Reachable

twitter.com
www.theguardian.com
www.9news.com.au
www.abc.net.au
www.cbs.com
nbc.com (yes, but failed streaming because of - theplayer.platform.com)
abc.com
www.tmr.qld.gov.au
www.foxtel.com.au
bbc.co.uk
cnn.com
www.broadcastify.com
www.yourtv.com.au
bigpondmusic.com.au
www.afl.com.au
www.bom.gov.au
mypolice.qld.gov.au
itnews.com.au
www.webhostingtalk.com
www.datacenterknowledge.com
blogs.crikey.com.au
slashdot.org
exchangewire.com
techdirt.com

www.buzzfeed.com
arstechnica.com
techrepublic.com
gizmodo.com
mashable.com
wired.com
pcmag.com
www.helinews.com
www.airservices.gov.au
flightradar24.com
planefinder.net
flightaware.com
www.msq.qld.gov.au
amsa.gov.au
comlaw.gov.au (This site requires IPv4 to lookup its IPv6 address)
ptwc.weather.gov
ebay.com.au
sourceforge.net
github.com
www.apc.com
www.eaton.com
h10010.www1.hp.com
www.hp.com
www.dell.com
australia.emc.com
www.emc.com
www.netapp.com
irc.undernet.org
www.energex.com.au
tatts.com
www.seek.com.au
eway.com.au
www.lookout.com
www.marriott.com
www.hoyts.com.au

Four sites not listed since they are related to financial/bill transactions.

Perhaps if people had not been crying wolf about running out of IPv4 addresses in two years time, every two years, from around 1992 onwards, and only cried about it when it was really only two years or so off, maybe CSP's might today have a stronger IPv6 uptake.

Either way we have run out of IPv4 now, yet many CSP's have warehouses of spare addresses to dish out still - they weren't all totally asleep at the wheel like some think. Yes, we do need to move to IPv6 now, and yes, Australia is amongst the worst offenders for rolling it out at about 0.01% uptake, but given my tests, it isn't any real surprise that our Service Providers see no urgency.

In the mean time, if you want to play around with IPv6 at home, locate a tunnel broker, there are a few free ones around, and although based in the U.S. I highly recommend Hurricane Electrics free tunnelbroker.net service, the latency isn't that bad at all, and since most international traffic goes via the U.S., you may not even notice the difference.

Posted by NoelB at 22:57

Hi Noel,

Full disclosure, I have been monitoring this on the public list as well.

It is good to see you making the effort in investigation here, but whilst you have uncovered some general data I do not think it is scientifically relevant with regard to what you were trying to prove or disprove.

The data here is relevant only to what would happen if the entire world turned off IPv4 tomorrow, and the comments made on the

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mailing list were not to that effect. I believe this is why people were of the opinion "you were setting it up to fail". I don't think you were setting it up to fail deliberately, but I do feel your proof is entirely different to what was stated on the mailing list.

You point that "it still stands to reason that if I disable IPv4, about 50% of my traffic should still work" is not a sound hypothesis based on the comments of the mailing list which were "some people reporting their traffic is split 50/50 between IPv4 and IPv6". These people were reporting their traffic split with IPv4 enabled, so by completely disabling yours you are in effect testing a case which is completely different.

Further, the users said "traffic is split 50/50", not working sites were split 50/50. So what we would need to check more closely is volume of traffic throughput, not which sites were working or not working.

With Youtube being IPv6 enabled, it would be fair to consider that Youtube alone could account for a considerable volume of traffic throughput for an end user in a normal day to day browsing experience.

I am still on the fence on this one. I do not necessarily agree or disagree with the original 50/50 statement, but like you I could not prove or disprove this. Unfortunately what you have here is a test of something else entirely, which does not prove or disprove the original statement either.

I think the only true way to disprove the original statement would be to allocate funding to:

- Acquire a fully native dual stack IPv4 and IPv6 network with relatively similar latency for traffic via both networks (IE avoid or mitigate the impacts of tunnelling the traffic at any point)
- Perform the testing on your sites with both protocols functional
- Ignore whether a site responds successfully or not
- Monitor the volume of traffic per protocol
- Monitor the volume over a greater period of time to properly capture data through normal use rather than only a simple check of site availability
- Consider re-testing with IPv6 connections attempted before IPv4 connection fallback, which would assist with the "Happy Eyeball" statements.

I would be keen to see you perform further research into this, a lot of people do not go to the effort you have.

- Greg
Anonymous on Mar 31 2015, 10:14

"Further, the users said "traffic is split 50/50", not working sites were split 50/50. So what we would need to check more closely is volume of traffic throughput, not which sites were working or not working."

They do go hand in hand, unless you just visit two sites. I have edited the post to make that point clearer.

Either way, in my testing for my uses as I originally indicated as to how it applies to me, it reflects about the same, the odd youtube video every day or so, still would never come close to 50/50 with ipv4 traffic, ohh sure, if I used lynx to go to all websites and see the cut down text stuff only, nahh, not even then would it come close to 50/50, it would still be around that sub 10% level in how it applies to me, which was the entire point.

Anonymous on Apr 1 2015, 22:21

In the coming weeks, I will be spending another morning on a weekend replicating this test to see who, if any, have pulled their fingers out, since this test was conducted some 8 months ago now, it really is a bit stale, and it's interesting to see the changes, I would like to think that by now, the previous 8% has doubled to at least 16% - or maybe better.

Anonymous on Nov 18 2015, 17:57