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December 13, 2010

Chairman Julius Genachowski
Federal Communications Commission
445 Twelfth Street, SW
Washington, DC 20554

Re: ***Ex Parte* Communication**
***Preserving the Open Internet*, GN Docket No. 09-191**
***Broadband Industry Practices*, WC Docket No. 07-52**

Dear Chairman Genachowski:

I write to express my concern regarding your proposal to adopt open Internet rules that accord differential treatment to fixed and mobile networks. As the campaign director of a national, nonprofit, nonpartisan organization dedicated to media reform, I worry that this differential treatment would both harm me in my ability to work effectively as a campaign director for Free Press and harm Free Press's ability to engage in the public education, advocacy, and policy work that is critical to the organization's mission.

How I use fixed and mobile Internet access in my work with Free Press

I depend on both fixed and mobile connections in my work as a campaign director. I am particularly dependent on both forms of access because I live and work in New Jersey, whereas Free Press's policy team is located in Washington, D.C., and its program team is located in Florence, Massachusetts. In the course of my work, I travel regularly to both of those locations, as well as to speaking engagements and meetings with allies throughout the country. In any given month, for example, I am likely to take at least four trips outside New Jersey for work-related purposes.

In general, I use a laptop computer and smartphone in connection with my work. I use them with both fixed and mobile connections. For example, when I am at home, I use my smartphone in connection with my WiFi service. When I am traveling, I use it on a 3G network. Similarly, I use my laptop to connect to the Internet at home via my WiFi service and wired connection, but while I am traveling, I frequently rely on mobile Internet access. I use mobile Internet access both via tethering and through a 3G card that attaches to my laptop. Being able to take advantage of mobile access (whether by tethering or by a separate 3G card) is a critical part of my ability to function effectively as a campaign director. It allows me to work on key Internet applications, including Action Kit, Microsoft Word, Microsoft Excel, Outlook and SlideRocket while I am on the road. Action Kit is our constituent management software — we

use it several times a day to manage our online communications with Free Press's user base of more than 500,000 activists in all 50 states, the District of Columbia, Puerto Rico and the US Virgin Islands. Mobile access is particularly important on my frequent trips from New Jersey to Washington via train, as WiFi access is often slow and unreliable while I am in transit.

How Free Press uses the Internet in its public education, advocacy, and fundraising efforts

As a campaign director, I am responsible for all online outreach efforts. Free Press is one of the nation's leading online organizers sending daily email and social communications to a massive audience of highly engaged activists. Our approach to online organizing is integral to Free Press' advocacy philosophy: using public education and organizing to engage people nationwide in federal policymaking and democracy reform. We typically send 65 to 70 email outreaches per month. We routinely encourage our members to engage in online activism, including sending comments to the Commission via ECFS and sending e-mails to members of Congress or to the White House. We also use our website, social media networks and associated applications to organize the National Conference for Media Reform, which has historically brought together more than 3,000 policymakers, advocates, activists, journalists, educators, and technologists from across the country to discuss advocacy strategies and skills, develop policy proposals, and educate each other on the state of media reform efforts across America.

Free Press increasingly sees smartphones as a new vehicle for citizen engagement in policymaking. For example, in May of 2010, during the Free Press Policy Summit, I conducted a number of live interviews with communications policymakers. I used the video camera on my mobile phone in connection with a mobile application called Ustream Broadcaster that allowed me to stream my interviews live to a website. Thousands of people who couldn't attend the Summit followed it via the Web. If either the application that allows the video recording and upload functionality or the websites that broadcast the streaming were blocked, this effort would have failed. We also intend to use Ustream in order to broadcast interviews and other content from the 2011 National Conference for Media Reform.

Over the last six months, my colleagues and I have devoted considerable time and resources to the development of a mobile activism application. Through this mobile application, we hope to target the hundreds of thousands of people who want to use their phones as advocacy tools for mobile Internet access and freedom issues. The application, which activists will be able to download to their phones, has several different functions. The application will automatically identify a user's mobile provider. Based on that information, the application will provide detailed information in plain language about the terms of service accompanying the user's mobile voice and data plan. That information will be continuously updated and pushed to users based on changes made to such terms. The application will also connect users to activism tools, including a function that allows users to send a letter to the FCC or push a button and call a member of Congress regarding a particular issue. Finally, we would use the application to send action alerts to users when news breaks regarding our critical policy initiatives. We hope that these functions will allow more activists to participate in policymaking with greater ease and flexibility and will allow our constituents to express themselves in real time when critical decisions are being made.

Harms that could result from the Commission's differential treatment of fixed and mobile networks

I am particularly concerned that a rule that allows the blocking of, or discrimination between, Internet content, applications, or services over mobile networks will impair both my ability to work effectively and Free Press's efforts to engage in myriad forms of public outreach and education. I am also concerned that a rule that does not preserve a user's ability to connect lawful devices to a wireless network will have the same deleterious effect.

These harms are not merely speculative. Some mobile carriers have banned tethering entirely on their networks, and others reserve right to impose substantial impediments to tethering access.[1] Others have sought to limit the use of video applications that they don't control. If such bans became the industry standard (which your differential standard seems to contemplate), then I would be hampered in my ability to communicate with my colleagues and access the critical Internet content, applications, and services upon which we depend in our advocacy efforts. For example, a rule that fails to prohibit the blocking or degrading of applications could impede my use of critical applications like Action Kit and Microsoft Word while using a mobile connection. A rule that bans tethering could drastically limit my productivity — it could make it difficult for me to make full use of my computer on my frequent train rides. To put it in tangible terms, every train ride from New Jersey to Washington represents approximately three and a half hours of limited productivity if I cannot access the Internet from my laptop via an open mobile connection.

I am also concerned that mobile carriers will have the ability and incentive to block our mobile web applications as well as to discriminate against or degrade our content as it is transmitted over mobile networks to activists.[2] We use Google Analytics and other usage tracking systems, which show a remarkable growth in the number of activists who access Free Press content via mobile devices, using browsers to review content and to take action signing petitions and sending letters to Washington via their mobile phones. Much of Free Press's advocacy supports increased competition in the markets for communications services such as broadband Internet access. Indeed, Free Press's advocacy has frequently raised the ire of broadband providers.[3] In the past, carriers have not hesitated to suppress mobile content that they have found objectionable.[4] Because the proposed rule opens the door to discrimination or degradation of online content over mobile networks that falls short of outright blocking of

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[1] *See* Comments of Free Press Regarding Further Inquiry, *Preserving the Open Internet*, GN Docket 09-191; *Broadband Industry Practices*, 07-52, Oct. 12, 2010, at 23; Brandon Hill, "AT&T Exec Tries to Justify $20 Tethering Fee in the Face of 2GB Data Caps," *DailyTech*, June 3, 2010; Tim Conneally, "Android tethering is back, just not for those in the United States," *BetaNews*, April 2, 2009.

[2] Our members comprise heterogeneous group of Americans across the country. As noted above, many are extremely technologically savvy and access our website and outreaches through mobile platforms.

[3] *See, e.g.*, Hank Hultquist, *The Danger of Dogma*, AT&T Public Policy Blog, Aug. 13, 2010, http://attpublicpolicy.com/government-policy/the-danger-of-dogma/

[4] *See* Comments of Free Press Regarding Further Inquiry, *Preserving the Open Internet*, GN Docket 09-191; *Broadband Industry Practices*, 07-52, Oct. 12, 2010, at 23-24.

websites, I am particularly worried that carriers will have the ability and the incentive to prioritize certain content at the expense of Free Press, or to suppress any of our content and advocacy that cannot be characterized readily as appearing on a mobile website. Whether carriers prioritize certain commercial content for financial reasons or degrade or block Free Press content for ideological reasons, the result is the same: our content (including our websites, streaming and stored video, and action pages that allow Americans to register public comment with the FCC) will load more slowly on mobile networks, and users may quickly lose interest. A recent study demonstrates that if a webpage takes too long to load, users become frustrated and lose interest.[5] As a provider of online content, we effectively compete with all other Internet content available over mobile networks. If our content is slowed, users will lose interest and our advocacy efforts would be significantly hampered. Similarly, as I understand the rule, nothing would prevent carriers from blocking our new mobile activism application.

In sum, I am concerned that excluding mobile networks from the ambit of meaningful open Internet protections will have the effect of hampering Free Press's speech, education, advocacy, and outreach efforts. And our situation is not unique: non-profit organizations throughout the country depend on the Internet in their organizing and education efforts as well.[6] I urge you to adopt strong open Internet rules that protect both fixed and mobile connections in equal measure.

Very truly yours,

_____/s/_____

Timothy Karr
Campaign Director

cc: Commissioner Michael J. Copps
Commissioner Robert M. McDowell
Commissioner Mignon Clyburn
Commissioner Meredith Attwell Baker

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[5] *See, e.g.*, Pear Analytics, *How Load Time Relates to Visitor Loss*, Aug. 6, 2009, http://www.pearanalytics.com/blog/2009/how-webpage-load-time-related-to-visitor-loss/; Janko Roettgers, *4 Out of 5 Viewers Leave If a Stream Buffers Once*, GigaOm, Dec. 10, 2009. It goes without saying Free Press would not be able to afford to strike deals for prioritized content with each of the mobile providers.

[6] *See, e.g.*, Letter from Holly Ross, Executive Director, NTEN: Nonprofit Technology Network, et al., to Chairman Julius Genachowski, *Framework for Broadband Internet Service*, GN Docket No. 10-127; *Preserving the Open Internet*, GN Docket No. 09-191, June 29, 2010.

Gadgets AT&T Exec Tries to Justify $20 Tethering Fee in the Face of 2GB Data Caps
Brandon Hill (Blog) - June 3, 2010 2:53 PM

AT&T says that customers that tether gobble up more data, yet data restrictions still choke those same users

AT&T's Mark Collins says that those who tether use more bandwidth, yet the data cap still isn't raised

Reaction to AT&T's smartphone data plan adjustments have been rather mixed. On the one hand, smartphone users that have greater access to Wi-Fi hotspots or simply don't use much 3G data stand to save $5 to $15 per month on their monthly bill.

On the other hand, those who have grown attached to their "unlimited" data plans took serious offense to the 2GB caps that AT&T is now imposing for new smartphone contracts starting June 7 (it should be noted that those that wish to keep their $30 unlimited data plans can continue to do so, and even upgrade to new hardware while keeping the unlimited data plan).

Our own "unscientific" poll of tech enthusiasts shows that nearly a quarter of smartphone users consume more than 2GB of data per month.

AT&T has offered a tethering option for smartphones in the past (with the exception of the iPhone), so it's not exactly unheard of to charge for the feature. However, with this new 2GB cap in place, one thing that has seemed quite puzzling to many people is AT&T's $20 tethering charge in the face of these lower caps.

Mark Collins, AT&T's senior VP of data and voice products, mobility and consumer

products, thinks that it's quite simple:

> *That capability is enabling something you can't do today. You can use one device and get multiple connections so it's more useful to you. You're going to use more data so the price is based on the value that will be delivered.*

Tethering a smartphone to a notebook would no doubt result in an increased rate of data consumption. With the old tethering data plan in place, customers could tether up to 5GB which should be enough to cover most heavy downloaders. However, with these new restrictions in place, it doesn't matter if you are using your smartphone for everyday tasks or tethering; you're still limited to same restrictive 2GB of data per month.

It remains to be seen how long these 2GB data caps will stay in place in an increasingly connected world, but boosted limits for tethering can't come any fast enough it seems.

"There's no chance that the iPhone is going to get any significant market share. No chance."
-- Microsoft CEO Steve Ballmer

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Android tethering is back, just not for those in the United States

By Tim Conneally | Published April 2, 2009, 12:55 PM

Applications that allowed Android-based phones to act as 3G modems were pulled from the Android Market earlier this week, only to be returned again to everywhere...except in the U.S. According to a report from a developer of one of the apps that was pulled earlier in the week, Google found that the applications were a violation of T-Mobile's terms of service.

But given the open nature of Android, and the operating system's availability on wireless networks other than T-Mobile, Google today brought back the tethering apps, with the proviso that T-Mobile USA users will not have access to them. Because (unlike with the iPhone) Android applications can be distributed outside of the Market, however, those users who want tethering can likely find the download elsewhere.

AT&T Public Policy Blog | News, perspectives and thoughts on government broadband policies

The Danger of Dogma

Posted by: Hank Hultquist on August 31, 2010 at 11:22 am

One of the central dogmas of the Church of Extreme Net Neutrality (CoENN) is that quality of service on the Internet, or using the preferred nomenclature of the CoENN, "paid prioritization," is the equivalent of a deadly sin.

The CoENN creed against quality of service states that paid prioritization of Internet traffic: (1) has never been contemplated by standards organizations like the Internet Engineering Task Force (IETF); (2) does not exist on the Internet today and, to the extent it exists anywhere, is probably being used nefariously by the pagans; and (3) if it did exist on the Internet, it would be available to and affordable for only a small number of deep-pocketed hegemons.

These iniquities of paid prioritization are spelled out in a recent filing at the FCC in which Free Press preaches the old time religion of the dumb network. But, like so many dogmas, this one turns out to be, well, not exactly true.

Which leads me to the letter we filed yesterday in the FCC's Open Internet proceeding to correct the record with respect to paid prioritization. In a nutshell, we point out that, contrary to the CoENN's claims: (1) the IETF documents clearly contemplate and permit differentiated pricing of Internet traffic based on the use of prioritization; (2) paid prioritization of Internet traffic is widely available to businesses today; and (3) such prioritization is often voluntarily purchased by small and medium-sized enterprises, including minority-owned businesses and community organizations.

I think our letter speaks for itself, and provides the details and facts on these three points in a succinct five pages, but I would like to elaborate briefly on a couple of points. First, the elders of the CoENN seem to have adopted a somewhat self-contradictory creed. At various times, Free Press has expressed the view that any router-based prioritization of Internet traffic is by definition harmful to unprioritized packets. Yet now they seem to have endorsed the use of DiffServ, which is a mechanism for router-based prioritization, as long as it is in the control of "end users."

Free Press apparently does not recognize that content and application providers may also be "end users" of Internet access services. Indeed, to the extent that packets must be marked for prioritization at their origin, content providers may be the "end users" best placed to make use of DiffServ.

One sometimes hears from members of the congregation of the CoENN that the introduction of paid prioritization would enable ISPs to turn best effort Internet transmission into a "dirt road" and force virtually the entire Internet ecosystem to "pay extra" for prioritized transmission. (Query: why would ISPs require such an elaborate scheme to raise rates if they have the market power attributed to them by the CoENN?) Yet now Free Press seems to suggest that ISPs would restrict prioritization to only a few "deep-pocketed Internet giants." While I enjoy the Da Vinci Code conspiracy theories as much as the next blogger, I do expect at least some superficial consistency.

Finally, Free Press has tried heroically to distinguish "router-based" prioritization from "geographic" prioritization (i.e., CDNs), based on unsubstantiated allegations that geographic prioritization does not result in any displacement of unprioritized traffic. For whatever reason, they apparently never subjected this particular doctrine of the faith to any empirical testing. Well, someone else did and found that geographic prioritization can be quite effective in pushing unprioritized packets to the proverbial slow lane.

The FCC must view with healthy skepticism the interpretations and opinions it receives on technical Internet standards, and how they are operationalized by ISPs, from an advocacy group with no demonstrable expertise or experience in such matters. When it comes to data-driven policy making, there is no room for faith-based initiatives, as Chairman Genachowski testified before Congress last year.

TOPICS: Broadband Classification, Broadband Policy, Government Policy

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It's quite scary to think that people like you have any influence over policy decisions aiming to give rise to formalized, egalitarian communication. Your post is a religious jargon filled red herring; if the pagans are those people who made the internet what it is today, and who in the face of impending regulation now hope for a protected free internet (this "dumb" internet made you rich, by the way), then you are one of the street vendors selling them overpriced idols with service & usage agreements. Virtuous character should be a prerequisite of leadership.

Alex August 31, 2010 at 7:20 pm

Surprise, surprise, AT&T is all for destroying the internet's freedom along with Verizon and Google.
What they won't tell you however is that here on the eve of the decades old pay TV model being destroyed by Apple, they are shaking in their boots and scrambling for a plan to continue gouging customers. Gouging us is nothing new to AT&T of course (An extra $20 to tether data from an iPhone? really?).
The shift that is coming is one that people have clamored for and wanted for years, a la carte pricing on TV. Instead, the cable companies make us pay for crap we don't want, leading to much higher bills than anyone wants.
The new model of app based, internet TV will change all of that. Is True Blood the only show you want on app cable? Get the HBO app. Addicted to Hell's Kitchen? Get the Fox app.
As a result, the telco giants are very disturbed and looking for a way to stop their ship from sinking. The answer? RESTRICT THE INTERNET! Once they have the right to control WHAT you access on the internet, they can continue to gouge us.
The simple fact is that bits are FREE!!! They continue to dupe people with this. A perfect example is charging $1500/MB for text messages. Sending a text takes less bandwidth than placing a call, letting it ring once and hanging up.
They are going to try and carry this over to internet access. You don't want to buy TV from our cable division? Fine! You're download limit is capped so low that you have no choice but pay us $100/mo if you want to watch TV over the internet!
The idea that people downloading more costs them more is ridiculous. Once a proper infrastructure is in place (something AT&T is seemingly incapable of doing, but hey, their executives need $100's of millions a year to feed their families!) the bits flow along at no additional cost. I suppose there may be a few dollars a year of electricity, but that's all.
Don't buy their lies. The telcos are doing nothing more than trying to set up the next big price gouging scheme against their monopolies. The fact that there is no competition in broadband and often only one company available to most people will allow them to continue this way, forever raising prices when every other service and product in history usually gets cheaper with time.
STOP AT&T, GOOGLE AND VERIZON! SUPPORT NET NEUTRALITY!!

Shaun September 1, 2010 at 7:49 am

I understand that there is a need to prioritize traffic. Certain protocols need to take priority on the internet so that services sensitive to network utilization/congestion can operate in a way that allows those services to operate within the expected norms. A prime example is VoIP.
The problem/fear comes into the picture when wealthy companies have a way to capitalize on a breadth of traffic, possibly in a way that far exceeds the needs to deliver quality services.
The balance is drawing the line between you, the providers, to deliver a quality service, without overstepping the goal of delivering a quality service and capitalizing on every bit that flows across the wire.
Let's face it, it is the nature of public/commercial entities to capitalize as much as the laws allow. That's just the nature of business. If new markets are artificially

created due to traffic prioritization, market forces will drive the price of goods, which means that the highest bidders will run the show. Laws are intended to protect the rights of people, the environment, competitors, and a lot of other entities whose goal is not capitalization.

Axton Grams September 1, 2010 at 11:30 am

Paid prioritization is not the same as quality of service. You confusing the terms. The quality of service (QOS) fields in the IP header were intended to resolve technical problems, not financial ones. For example, QOS can prevent an email from interfering with an internet phone call. You are trying to use the field in a way that was not intended.

William Garrison September 1, 2010 at 2:34 pm

The main point of contention is actually the record of the data services industry in customer service, reliability, and quality of service (not network QoS, but the actual quality). In other words, the CoENN does not trust AT&T, Verizon, Comcast, et al., and until the data services industry behaves ethically with regard to how it sells and operates its services, the mere suggestion that new routing practices might be acceptable to the CoENN is simply untenable.
You have made the CoENN your advesary by refusing to act reasonably. You bundle services and hide fees, you make labrythine websites that focus almost entirely on propagandizing your services and only include real details as footnotes. You have walked away from selling your services and returned selling the emperor's new clothes (ie, not relying on the merits of your product). Therefore, you can point to as many IETF documents as you please, but it won't change that fundamental fact: the CoENN doesn't believe you are to be trusted with a place as vital for the future of humanity as the Internet.

Adam Dane September 1, 2010 at 5:21 pm

I completely agree with the comments above. If there were companies that I would fear abusing the ability to prioritize traffic to their own gain it would be the cellular companies and cable television companies in the United States. Both bundle services and structure pricing similarly to used car dealerships. I understand there may be cases, such as with denial of service attacks on servers where companies may need to block or slow some traffic. That said, these companies are the last ones I would trust to self regulate and not abuse their customers to try to extract as much money as possible.

Zach Friedman September 2, 2010 at 2:54 pm

I agree with you. Most people don't have a technical engineering level understanding of actually HOW the internet works with BGP, routing, etc and therefore make uninformed opinions. QoS/DiffServ and like it is *ABSOLUTELY* needed in the internet IP core because otherwise we would have problems of VoIP phone calls dropping because of a overloaded circuit and engineering problems with that. Before there was the Internet and packet switching we had circuit switching which was *EXACTLY* what QoS was about differentiating different types of applications based on their engineering/technical need. This is not even related to business but more of smooth running of the network in most cases. The internet changed that with packet switching while more efficient (a single type of protocol for all content), QoS mechanisms need to exist to differentiate traffic based on engineering needs. To Shaun and whoever else above said "The idea that people downloading more costs them more is ridiculous." is wrong. If you actually have engineering background there IS capacity constraints on the internet just like there was on the old POTS (plain old telephone network) or water. While physical infrastructure of copper, fiber, wireless, and DSL-type technologies have

certainly advanced in recent years leading to exponentially more bandwidth capacity, adding capacity to a network still costs money in terms of hardware/software/man hours. Yes the days of laying more copper are long gone replaced by fiber but fiber still has a finite limit limited by the DWDM hardware running it to those nay-sayers that say fiber has infinite bandwidth. Yes fiber has *infinite* theoretical bandwidth but is still limited by the hardware running it (DWDM, etc, etc…)

Will September 2, 2010 at 5:37 pm

You know this guy is on the right side of the argument. The party that spends more time with empty rhetoric and name calling and less time addressing the substantive issue is always on the correct side of the argument. To answer your query ("why would ISPs require such an elaborate scheme to raise rates if they have the market power attributed to them by the CoENN?), you have to ask yourself who has deeper pockets, Joe Sixpack or Google? That's right, Google. And yes, any smart monopolist would aim for those pockets too.

K.C. Garner September 2, 2010 at 6:08 pm

For once, I'm impressed with the content of the comments at the bottom of an article (using the word loosely, here).
I understand that it would probably be counter-productive to post an actual, coherent argument here, Hultqueist, since it's part of an ad campaign. But the "Church of Extreme Net Neutrality" thing comes across as painfully shrill, and there's more sarcastic posturing here than there is defense of your viewpoint. Now, I respect that this is because your viewpoint doesn't really have an ideological defense. That's because it's not rooted in ideology–it's based on dollars. You don't have to believe what you're saying, because you're paid to believe it, and anyone reading knows it (particularly because they probably came here by clicking a paid advertisement). So this whole approach is kind of doomed from the start, isn't it? The fact that you start your blog by alienating everyone with petulant sarcasm is just icing on the cake.

Gareth Sparks September 3, 2010 at 9:56 am

AT&T's position is exactly correct and well stated. People tend to forget that the Internet is a commercial enterprise not a public institution. Companies like AT&T spend money to build and maintain the Internet and they have a right to make a reasonable profit. It is in these companies where the expertise to manage and evolve the Internet lies, not political organizations backed by the likes of George Soros. TOS bits and DiffServ are tools that can be used to improve the quality of service for services that run over networks. Differentiated services allow companies like Boxee, Netflix, and Hulu to compete with the cable companies and offer quality services. I applaud the coming together of the industry and would gladly pay Netflix or my VoIP and extra couple of bucks a month for prioritized service. Let the competition begin.

Mark Milliman September 3, 2010 at 11:50 am

[quote]
The current chair of the IETF, Russ Housley, disagrees with AT&T's assessment. "AT&T's characterization is misleading," Housley said. "IETF prioritization technology is geared toward letting network users indicate how they want network providers to handle their traffic, and there is no implication in the IETF about payment based on any prioritization."
[/quote]
(source: http://www.nationaljournal.com/njonline/tc_20100902_7144.php)
Your position is so logically and factually challenged that one can only wonder

whether you are stupid, or you think we all are. Seems to me it must be one or the other.

M. Hunt September 3, 2010 at 1:08 pm

That digitalsociety URL is a joke, figures it's from one of your paid lobbyists. All George Ou has got are end-user diagnostics he's trying to pass off as scientific observations, when in fact they're anything but.
If there was any validity to his claims, you'd think we'd have heard from AT&T Labs Research by now, and not just some whacko. I remember when AT&T used to innovate and impress the industry with impressive research. It's a real shame you've stooped to this level, and I hope someone in corporate will wake up and give Digital Society the boot.

Mike Hunt September 7, 2010 at 12:58 am

You can call me paranoid, but I think the telephone and cable TV companies don't want to deploy fiber optic cabling and real high-speed internet to the end-users. The surplus of bandwidth would cause the price to plummet – destroying profits, and potentially destroying the companies.
When you have enough bandwidth, traffic prority becomes a non-issue (or at least reverts back to a technical issue).
What we need is a real political movement that will bring the telecoms under government control again, so they can be used to lay fiber optic cabling all over the place. The cost of deployment would be borne, not by the telcos, but by the taxpayers. We absorb that risk, and in return, we finally get real high speed internet.
We need the jobs in this lousy economy.

John K. September 7, 2010 at 3:04 am

As a matter of principle, knowledge and the search for information in an open forum should not be limited or controlled by money. The analogy for paid prioritization is a public library where only the books by publishers who have donated to the library are catalogued and displayed. All books should be displayed. The publishers' donations should be recognized on the donors plaque in the lobby, with the font size determined by donation value. If the publisher own,ed the library, they would own the content and could treat it as they wished. But ISPs are a portal to the Internet; they do not own the Internet's content.

Robert Lewis September 9, 2010 at 5:30 am

Net Neutrality rules to preserve the Open Internet that the FCC must re-establish (and the FCC must reassert its authority by classifying broadband a telecommunications service under Title II) specifically ban ISPs from creating new managed services (that's the moniker telecos use) in which they can degrade, filter, or block any web packets they dislike — but that requires them to look what's inside the packet an invasion of user privacy so there is a privacy issue here for individuals as well.
In some cases prioritization is needed to deal with span, viruses etc and threats to the network but paid prioritization that AT&T wants to implement would result in the creation of two Internet(s) a slow lane (public Internet) and a fast private for profit lane — resulting in an unequal two tiered Internet where websites pay ISPs for faster access.
Any webmasters who cannot afford to pay for priority access will have their websites under this model restricted to a slow lane — without openness future webmasters and future Internet entrepreneurs would need permission to innovate. Keeping the Internet open means preserving the Net as a level playing field where all businesses, old and new, big and small have equal access.

With Net Neutrality AT&T cannot speed up FOX News.com and slowdown HuffingtonPost.com or give priority over Huffington Post.com to have their website load faster.
All websites get to load at the same speed. Furthermore AT&T is trying to mislead the FCC into thinking the Internet Engineering Task Force is against Net Neutrality. The Internet was built on openness, maintaining Net Neutrality is about preserving the Internet in its current form. The Internet Engineering Task Force has rejected AT&T's claims. This is a monopolist telecom company broken up over a decade ago — to create new competition in the wire-line long distance phone market — AT&T should never have been allowed to put Ma Bell back together.
As a condition of its being allowed to re-merge with SBC Communications and Bell South (two Baby Bells) during the Bush Cheney Administration AT&T agreed not to mess with Net Neutrality for at least 2 years, and in that time never tried to mislead the FCC, Congress or the public about it, nor did they try to lobby against it. After the two years ended AT&T made it clear they wanted Internet freedom killed so they can become a corporate gate keeper on the web and censor the free flow of communication and information made possible by an Open Internet.
AT&T are lying thru their teeth — they are a shameless greedy, evil corporation only caring about their bottom line. When broadband was regulated during the Clinton Gore years under Title II there was more jobs created and more investment in the sector.
No corporation should be able to control the Internet. Microsoft tried to monopolize the web browser market in the 1990s when broadband Internet access market was still competitive and regulated to ensure competition the Clinton Administration's DOJ came down hard on Microsoft for antitrust violations and sought to enforce penalties on them. Thanks to Bush's election Microsoft got a sweet deal to settle charges without sufficient punishment and broadband Internet access market became a duopoly of big cable and phone companies.
Under Title II there were more jobs and investment, and more competition resulting in higher consumer choices under deregulation we see fewer jobs and investment but higher revenues for the greedy big cable and telecom companies.
The Internet must remain an open and democratic medium. As a U.S. Citizen I am fed up with corporate control of our media and now our democracy. The Internet represents the future of all media and we the people have to take our media back from corporations like AT&T, Verizon Communications, Clear Channel, Sprint Nextel, Verizon Wireless, CBS, Disney/ABC, Viacom, GE or Rupert Murdoch's News Corp., The future of our media belongs to the entire American public — it belongs to us — all of us responding to AT&T's baseless letter and everyone else nationwide; even Americans serving abroad in the military.
AT&T if your reading this quit trying to mess with the Open Internet. Quit trying to screw us over. We need consumer protections — we need government regulation — deregulation can be just as bad as too much regulation — we have to have some regulation of ISPs and it should extend to mobile broadband — it matters not how we connect to the Internet we should have same open, nondiscriminatory experience on a computer and/or a mobile device.

Maneesh Pangasa September 9, 2010 at 7:26 pm

@Maneesh Pangasa
Oh goodness, foxnews might run faster? Looks like DailyKos even runs faster than foxnews. Someone call the police!
http://www.digitalsociety.org/2010/07/call-the-net-neutrality-police-dailykos-loads-faster-than-foxnews/

George Ou September 13, 2010 at 10:08 am

That's more than ok. Fight harder At&t. In fact go ahead and do just about whatever you want. In the end it won't matter. The more abusive the role you take with a public utility the faster and harder you will fall. It's a proven fact. More than you will ever realize. It's history. Just like all the big companies before you who have done the same. In the mean time you will give up a wonderful opportunity to increase your profits and share holders by taking this path. Others will rise up and innovate where you fail too. That too is a proven fact. It too is history.

America is a huge market place. A few years ago companies like vizio didn't exist or barely had a plan. But they used the global economy and the internet to change their position and lead the way.

Mike Shaw October 5, 2010 at 5:43 pm

Figures. Another day, another corporate cash grab. I personally hope that, despite the spiel about 'reclassification not affecting prioritization' this gets shot down. Just another example of why corporations can't be left to their own devices without a good kick in the pants every so often – they start trying to screw the hand that feeds.

Anthony Gambardella October 5, 2010 at 10:08 pm

"Differentiated services allow companies like Boxee, Netflix, and Hulu to compete with the cable companies[...]"
@Mark If cable companies had their way, Boxee, Netflix, and Hulu traffic would be de-prioritized so badly that it would take two hours for your one-hour episode of Lost to load. And of course, AT&T would be offering a prioritized service for an extra $20 a month for their own on-demand service, or an extra $30 a month for unlimited HTTP downloads. Great deal!
You don't seem to understand that services such as Boxee, Netflix, Hulu, and Wikipedia (yes, even wikipedia) rely upon neutral network carriers in order to function correctly. If network carriers cannot reliably be neutral, then I'm (the entrepeneur) am not going to build a new service that uses the internet. Too risky.
Oh, and about the wikipedia bit: http://arstechnica.com/tech-policy/news/2010/09/wikipedia-now-distributes-its-videos-using-p2p.ars

Ichimonji10 October 5, 2010 at 10:50 pm

In my opinion you are unfit to operate on the public airwaves that have been leased to you. Your draconian and money grubbing anti-neutrality policies will put you out of business within a decade.

Kevin F. Rooney Jr. October 6, 2010 at 12:35 pm

Dear, At&t, I could go on a rant about how wrong and greedy the idea of paid prioritization is, but you are probably already aware of that, and trying to go forward with it despite the fact you know it is ethically wrong. So I will vote with the almighty dollar, and if you try to go ahead with your dastardly plot, I will boycott you completely.
Sincerely,
Charles Deuter.

Charles Deuter October 6, 2010 at 4:24 pm

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about 3 hours ago from web

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12/10/2010 from web

Interesting story from @Pogue about @Corning's "Gorilla Glass", first invented in '60s and used in many smartphones. http://nyti.ms/hxXjCB

12/09/2010 from web

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How Webpage Load Time Is Related to Visitor Loss

August 7th, 2009 by Ryan Kelly in Results-Based Marketing, Search Engine Optimization

21
tweets
retweet

Have you ever been to a website that takes forever to load? What do you do?

We've taken some past research and developed a way to determine how many visitors you could potentially be losing based on how long your website takes to load from 0-30 seconds. This was not easy – only a couple of studies have actually been done, and not only are they "aging", but they have also been controversial and only up to around the first 4 seconds of load time data. Obviously, there are many factors involved in determining how long you are willing to wait for a page to load, but with tabbed browsing, faster connections speeds, and more, maybe this is why a real study has not been done since 2006.

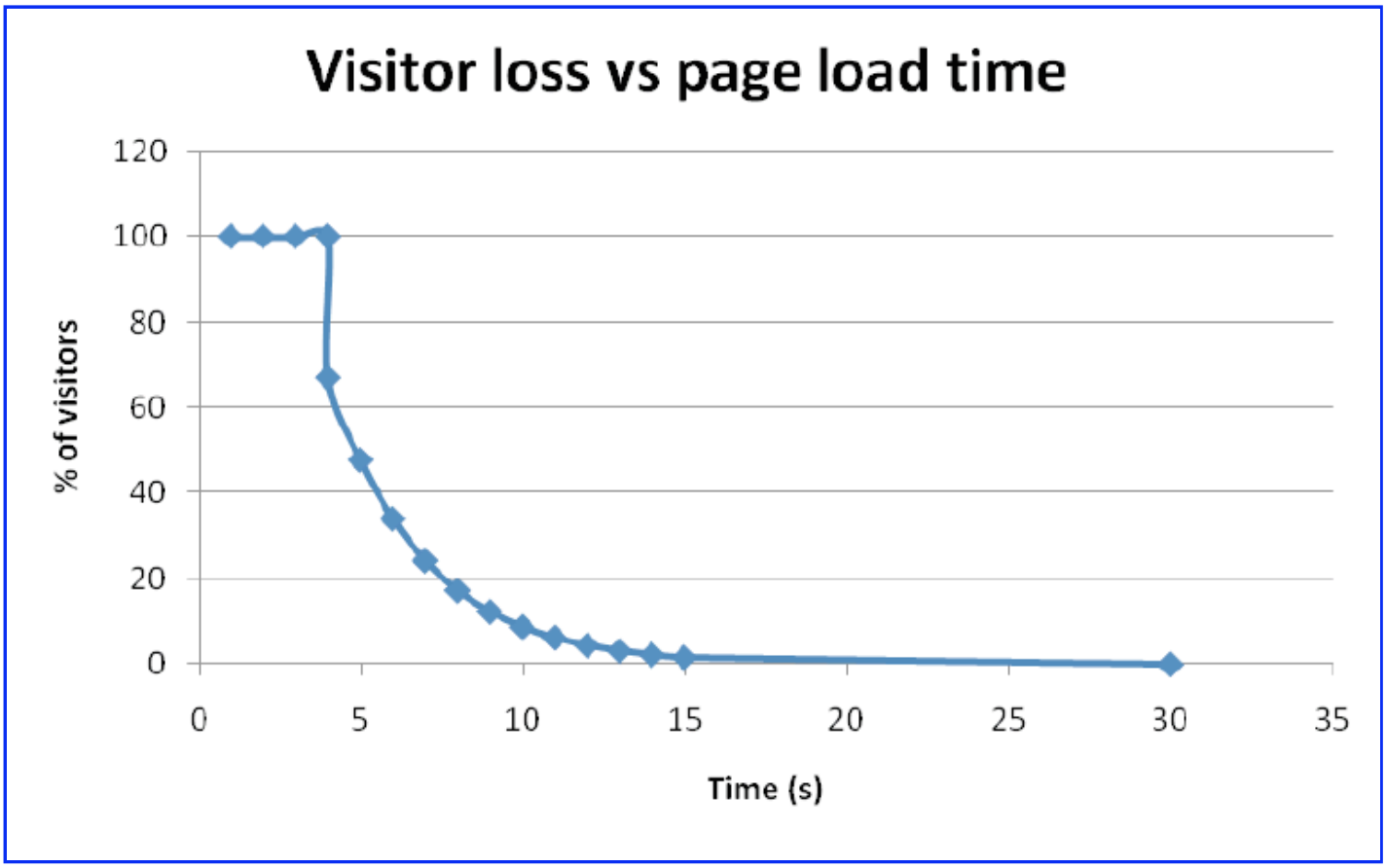
Here are some key takeaway points from the research we were able to come up with:

- Zona research said in 1999 that you could lose up to 33% of your visitors if you page took more than 8 seconds to load.
- Akamai said in 2006 that you could lose up to 33% of your visitors if your page took more than 4 seconds to load on a broadband connection.
- Tests done at Amazon in 2007 revealed that for every 100ms increase in load time, sales would decrease 1%.
- Tests done at Google in 2006 revealed that going from 10 to 30 results per page increased load time by a mere 0.5 seconds, but resulted in a 20% drop in traffic.

Wow. A half of a second? Is that even enough time to take a breath? Yet, when browsing, most people will lose patience and leave your website before they even have time to breathe. How this relates to e-commerce sites is pretty important. If your website is selling a fairly generic item, your site had better load pretty damn fast or you just lost your sale to some other guy. At Christmas, when every parent is looking for this seasons must have toy, better hope your website loads in under 2 seconds. When a husband forgets his anniversary and is quickly looking for a flower delivery

place while the boss isn't looking, your pictures better not be too big and take forever to load.

So how long does your webpage take to load? Check out Pingdom.com/Tools, and then come back here and approximate your potential visitor loss:



If you prefer to "geek out" and read our entire white paper, you can download it here. (I will warn you that it does mention words like "mathematical model", "radioactive first oder decay" and "non-linear regression".)

SHARING IS CARING:

Would you like to try our free website analysis tool and get an instant report on your website in 30 seconds? No signup, no email to give, nothing to install. It's pretty intelligent and can determine if you need more inbound links or even more content for your site.

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- How Webpage Load Times Can Affect Your Google Rankings

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16 Responses

1. -

August 7th, 2009 at 2:55 pm

Interesting and redundant.

I managed to geek out for a while and read your white paper and some of the referenced material. I would like to add some points.

Exponential function (or the radioactive decay function, as you have written) is a very standard function to describe many scientific phenomena. So it's understandable that you assumed it applicable for your case. However, even a Pareto function, which is more widely used in cases of demographic, economic and psychological phenomena, would have served the purpose. Or for that matter, there are numerous other functions that are similar in nature/shape and a simple curve fitting exercise would give out a number of different results.

Moreover, in certain cases (like when buying flight tickets, or books, or apparel) most customers would choose to search and hang around a while longer if they can strike a better deal. So, while a researcher managed to establish that 40% of online shoppers preferred sites which loaded faster, did he actually address the bias that comes with sampling (price range of products purchased, types of products, and some other factors)? In other words, was the sample representative of all the shoppers and products?

Again, tolerable wait time is dependent on a lot of factors, as established in earlier research (for example, feedback on the page load time increases the tolerable wait time to 38 seconds, and I am quoting from one of your sources). There are a lot of flash heavy websites which are amazing to be on and I would love to shop on one of those (have a look at some webby winning websites). Moreover, web traffic might not be a very accurate indicator of the actual sales because there might be a lot of users who were actually "e-window shopping" or who stumbled upon the page.

The point is that it's redundant to model the number of users lost over a 30 second time period. That probably is one reason why much research has not been done in this area after 2006. It's actually fascinating to quantify something as abstract and complicated as human behavior yet in this case it's not very accurate as a case by case approach would be more relevant. What this paper would sum up to is "if you are selling something trivial, better keep your web pages as light as possible".

2. ***Romy Misra***
August 7th, 2009 at 5:02 pm

A lot of research was put into what curve to choose and we did take into consideration the Pareto curve in the preliminary analysis.

The problem with the Pareto curve was that apart from the minimum value of x defined as 4 it had only one parameter. We had 2 other points we knew the curve had to pass through. So this creates a situation of infinite Pareto curves, not passing through all the points we know the curve has to pass.

The radioactive decay on the other hand was found the best approximation with the least error percentage when fit into previous years data. Which made it the best approximation to choose from a predictive model perspective.

3. **-**
August 7th, 2009 at 7:13 pm

Thanks for the clarification on curve selection.

4. ***Men's Citizen Watches***
December 22nd, 2009 at 12:06 pm

Great write up – five stars. I bookmarked this page.

5. ***Meridith Pippenger***
December 22nd, 2009 at 1:11 pm

Hey. I got a 502 gateway error earlier today when I tried to access this page. Anyone else had the problem?

6. ***Coleen Valenzuela***
December 27th, 2009 at 6:37 pm

Went through your post and thought hey, someone was really good in debate classes.

7. ***quel film***
December 30th, 2009 at 12:03 pm

It was a nice post you wrote, keep updating your site, that's nice.

8. ***Randal Lesky***
April 9th, 2010 at 11:21 am

good post, raises valid points

9. ***Jan Amsel***
April 23rd, 2010 at 8:55 am

Normally I do not commence opinion my personal English just isn't up to speed. but yet thanks for this excellent blog post and hoping ahead to more.

10. ***Bham***
September 11th, 2010 at 11:07 am

Nice blog. I bookmarked this page.

11. ***Adolfo***
November 16th, 2010 at 11:01 pm

As someone said, tolerance is related always with the kind of website you are visiting. For example if you were looking information on Wikipedia and the page takes to load more than 10 seconds obviously you will say Next. But if you were looking for a car or something like that, probably wait a little doesn't matter, because you want to be involved on a multimedia experience.

There is another factor, most of people attend to many pages at same time, so when something take more than you expected, you go to read or look into other pages while other page takes to load. So, in this era everybody look to many options to choose the best one. The key is the quality of content, if your content worth to wait then you wait. Simple like that.

Regards from Mexico.

12. ***Vasu Adiga***
November 17th, 2010 at 1:21 am

Twitter should have no visitors left if this were true for all websites. Usefulness comes first, speed next.

13. ***Johan van de Merwe***
November 17th, 2010 at 2:48 am

A nice article, but I have one critical point. Currently you see more and more that commercial websites (like newspapers) include links to content providers of commercials. This is increasing the load of pages intensively, but still the number of commercials are increasing. Sometimes on newspapers it takes about 10 to 20 seconds to load a page and still visitors come back. In the article I didn't find a relation between the content quality and the load time. If I really want to know or have, I will hold my patience a little bit more. And after all, Amazon (not always the fastest) is still the biggest. I think to a certain extend your article is also containing laboratory statistics. Just keep your quality of your content in shape to avoid hasty website zapping.

14. ***Quora***
November 17th, 2010 at 9:44 am

How long will the average user wait for a webpage to load before they abandon?…

* Zona research said in 1999 that you could lose up to 33% of your visitors if you page took more than 8 seconds to load. * Akamai said in 2006 that you could lose up to 33% of your visitors if your page took more than 4 seconds to load on a broadband …

15. ***Ryan Kelly***
November 18th, 2010 at 4:17 pm

That's a good point….people are willing to wait for the fail whale to go away so they can start tweeting their lives away again. I wonder if the same is true for e-commerce sites? I think people will wait for a slow page if they think it's the best deal they can get.

16. ***Ryan Kelly***
November 18th, 2010 at 4:19 pm

Hi Johan,

your comment is similar to Vasu's, and yes, I would agree with that point as well. We just don't have any data relating content quality to load time, or "patience" – but I think it's safe to say that people do wait longer for trusted brands and quality content, lower price, etc. The problem is probably a bigger deal for unknown brands who have a fraction of a second to capture your attention before you move on to the next search result.

Leave a Reply

Note to commenters: please use your name, handle, nickaname - I don't care if it's a fake name - but if you use a "keyword you're trying to rank for" - we will NOT approve your comment.

Name (required)

Mail (will not be published) (required)

Website

Notify me of followup comments via e-mail

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4 Out of 5 Viewers Leave If a Stream Buffers Once

By Janko Roettgers Dec. 10, 2009, 7:00pm PDT 17 Comments

- 0

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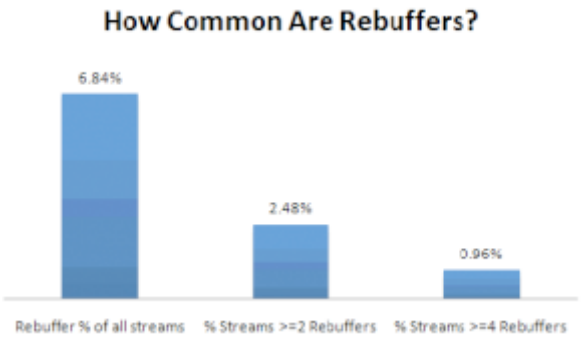
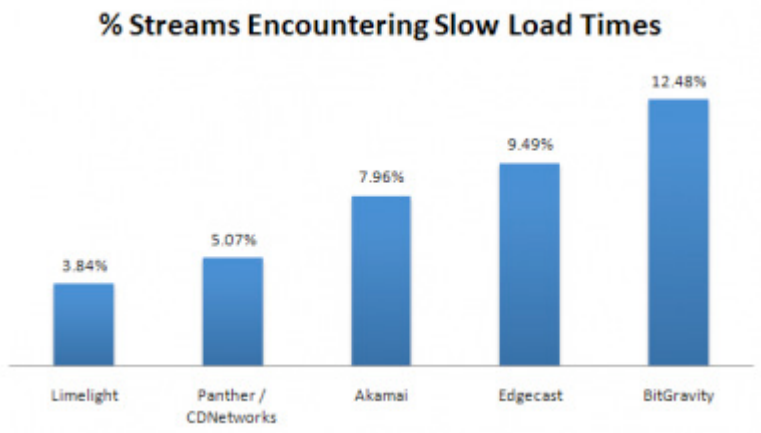


Whatever happened to patience? More than 81 percent of all online video viewers click away if they encounter a clip rebuffering, according to a new study by Tubemogul. The Emeryville-based video distribution and analytics startup took a close look at 192 million video streams over the course of 14 days to figure out how much rebuffers matter. The result: 6.81 percent of all streams rebuffer at some point, and around 2.5 percent rebuffer twice.

Tubemogul also measure how many times rebuffers occur across several popular CDNs. During its tests, Limelight performed the best, while Bitgravity's streams had to reload the most, with Akamai being somewhere in the middle.

Tubemogul's research is based on both short-form content as well as TV shows and other longer streams. The company told me that it wasn't able to give any specifics as to how people interact with buffering in different situations, so we won't know, for example, if users are more forgiving with Hulu streams than with YouTube videos.

However, Tubemogul was able to measure some significant differences between various popular CDNs. Only 3.84 percent of all Limelight streams sampled for the analysis rebuffered, it said. Streams served by Akamai were interrupted roughly twice as often (7.96 percent), while Bitgravity took the dubious honor of being the CDN with the most instances of rebuffering (12.48 percent).



Those numbers are pretty significant, especially now that we know that most viewers don't bother to stick around for a video to start playing again. As Tubemogul's marketing director David Burch noted, "To advertisers, this means many post-rolls are routinely never seen."

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Akamai, BitGravity, CDNs, crowdconf, limelight, Tubemogul

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Comment

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Notify me of follow-up comments via email.

1. Reply
Sonja Tombling Thursday, December 10 2009

I fully agree ! The most important requirement we had when building our bespoke Web TV Player was that it loaded instantly … did we achieve that ?? Yes we did !

In fact its what our viewers love about our player , no loading issues, no buffering, it is on demand in every sense of the word, try it out for yourselves. We have yet to find anything else like it on the web.

2. Reply
Dan Rayburn Thursday, December 10 2009

You sure these numbers are right? On TubeMoguls' website it links to an article that says "192 streams over two weeks", not 192 million streams.

- Reply
Charles Thursday, December 10 2009

I see the same thing 192 videos in the link from their homepage.

- Reply

Janko Roettgers Thursday, December 10 2009

Yeah, looks like Mediapost got this one wrong. Here's what the original Tubemogul paper says: "For a 14-day period, we recorded a sample of 192,268,561 streams from six top video sites and platforms, tracking detailed data on video delivery quality."

192 would have been a somewhat small sample :)

3. Reply
Jack Vlyn Thursday, December 10 2009

So TubeMogul was able to tell us big CDNs perform better than small? Was the sample size and length of content the same at each CDN?

4. Reply
Charles Thursday, December 10 2009

TubeMogul from what I can tell has not published their methodology or any details on how this analysis was performed. As everyone in the video community knows, a huge number of factors can impact any test including:

- Video access
- Time of Day
- Video Encode Type
- End client machine profile
- Last mile connection speed
- Demand on a given network at a specific time

Unless these tests were conducted in parallel or with some control the results are dubious.

- Reply
David Friday, December 11 2009

With the help of an engineer, I wrote this study and am happy to weigh in. A lot of the issues you raise were taken into account when we designed our video delivery metrics technology (InPlay), which tracks these metrics for dozens of top publishers/platforms.

5. Reply
Rob Silver Thursday, December 10 2009

This study is interesting, but I would definitely be curious to see more supporting data, and if viewers were more patient with specific types of video content or platforms. As a new Internet TV network, we are just learning the importance of making our streaming content as functional as possible, especially for viewers with slower broadband connections. To think we could lose 80% of our audience on a single quick buffer seems a bit frightening.

- Reply
  Charles Friday, December 11 2009

  I think you have to consider what type of content as well:

  Hulu buffers for me at least once per show (>10 seconds); yet I still watch because I highly value longform professional content.

  For short form I believe the study is more accurate, myself and many of my friends will immediately leave a YouTube, Break.com or other video player experience if it starts buffering or fails to load.

  -
    Janko Roettgers Friday, December 11 2009

    That was my gut feeling as well. I'd think people are more forgiving with long-form content. You really don't walk away from a 30 minute show if it buffers 25 minutes into the stream.

6. Reply
   John Pecora Friday, December 11 2009

   What we need is to offer faster internet service here in the U.S. We have the fiber cables underground already, but we're not using it.

7. Reply
   Jason Friday, December 11 2009

   Frequently a video will spend more time buffering than the length of the presentation. Two seconds of play then three seconds of buffering. I seldom experience this with Hulu or other large content providers. One problem is that some providers stop the stream at the first reload and the user must start the presentation from the beginning to view it. It frequently takes many attempts to get all the way through it. Since I experienced this I just don't bother waiting any more.

8. Reply
   Michael Kuperman Friday, December 11 2009

   Fiber to the home will not help. The problem is not related to how big your pipe is but more to consistently being able to fill the buffer and not let it run out. *Unless you are doing HD to the desktop but, even than most people on cable today can sustain 1.X Mbps.

   The issue is a combination of network interconnection between various providers and I/O problems on the server typical in long tail content.

The real interesting question is, was this HTTP Progressive (YouTube) or Steaming (Like FMS/WMS) and where were the clients and on what type of connection?
Was the content long tail or short tail (popular vs. not)?
How long was it?
What was the format and bitrate of the content (HD/SD)?

9. Reply
David Brazeal Friday, December 11 2009

I'll bet if you broke this down by category, you'd find the defining issue is not the buffering, but the content quality. I'll put up with buffering in my 30-minute Hulu show. But when that 2-minute YouTube video about a dancing cat buffers, it snaps me out of my trance and makes me re-evaluate whether this is really a good use of my time.

The vast majority of streams (by raw number) are the latter kind of content, so that makes the number of click-aways seem high.

- Reply
David Friday, December 11 2009

You make a great point. Stay tuned for a follow-up bit of research breaking out longer-form video.

10. Reply
ObviousJoe Tuesday, December 15 2009

This is great information as it arms us with more knowledge when looking for a reliable CDN. So the message here is that we should stay away from BitGravity when shopping around for CDN? It looks like their closest competitor in terms of cost is performing more than two – three times better when encountering slow load times.

11. Reply
Ian Macfarlane Thursday, December 17 2009

Thanks for sharing this.

By the way, the link to tubemogul.com is broken – you've used "ww." rather than "www."

21 Trackbacks

1. *80%+ of video users leave if there is a glitch and other stats* December 11, 2009Tracked on

[...] looked at 192 million video streams (source New Tee Vee) across 14 days and found that more than 81% of viewers will leave if it "rebutters." [...]

2. *Better Have a Fat Pipe if you Want to Pimp Videos* December 11, 2009Tracked on

   [...] gonna get into the online video game, you had better be able to deliver fast enough for your users to not have to wait for a rebuffer: Whatever happened to patience? More than 81 percent of all online video viewers click away if they [...]

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4. *Tubemogul: Users have no patience for poor quality » Communications Stats and Figures* December 11, 2009Tracked on

   [...] from: http://newteevee.com/2009/12/10/4-out-of-5-viewers-leave-if-a-stream-buffers-once/ [...]

5. *I do– 4 Out of 5 Viewers Leave If a Stream Buffers Once | techspill blog* December 11, 2009Tracked on

   [...] 4 Out of 5 Viewers Leave If a Stream Buffers Once. This entry was posted in Uncategorized and tagged video. Bookmark the permalink. Post a comment [...]

6. *Are You Losing Visitors With Your Video? « Online Magazine for DIY Entrepreneurs* December 11, 2009Tracked on

   [...] 4 Out of 5 Viewers Leave If a Stream Buffers Once [...]

7. *When Videos Buffer, Viewers Leave ... in Droves [STATS] | DigiSauce.com | Digital Marketing and Social Media Solutions* December 11, 2009Tracked on

   [...] video viewers to be extremely fickle, with four out of five clicking away from a streaming clip if it pauses to buffer (even once), instead of waiting for the video to reload. The study, from Emeryville video analytics startup [...]

8. *Paid Content : paidContent Quick Hits 12.11.09* December 11, 2009Tracked on

   [...] » More than 80 percent of online video viewers will leave a site once a video begins to rebuffer. [NewTeeVee] [...]

9. *When Videos Buffer, Viewers Leave â€¦ in Droves | Edizle* December 11, 2009Tracked on

   [...] video viewers to be extremely fickle, with four out of five clicking away from a streaming clip if it pauses to buffer (even once), instead of waiting for the video to reload. The study, from Emeryville video analytics startup [...]

10. *Flow » Blog Archive » Daily Digest for December 12th - The zeitgeist daily* December 12, 2009Tracked on

    [...] Shared 4 Out of 5 Viewers Leave If a Stream Buffers Once. [...]

11. *No preguntes 'cómo estás' si no quieres escuchar. Everybody's fine. « One Way Or Another* December 12, 2009Tracked on

[...] (y gracias) y que tienes que captar su atención en las primeras líneas, casi palabras. Que dejamos de ver los vídeos si se enganchan al cargar la pantalla. Conversar con algunos jóvenes americanos, sobre todo en las [...]

12. *Bookmarks for December 11th through December 13th | Jesse Bilsten* December 13, 2009Tracked on

    [...] 4 Out of 5 Viewers Leave If a Stream Buffers Once – Usability study about users who will leave a website if the video or multimedia buffers even once. [...]

13. *When Videos Buffer, Viewers Leave ... in Droves [STATS] | The Apple Tech Blog* December 13, 2009Tracked on

    [...] video viewers to be extremely fickle, with four out of five clicking away from a streaming clip if it pauses to buffer (even once), instead of waiting for the video to reload. The study, from Emeryville video analytics startup [...]

14. *Usuarios de internet son poco tolerantes al rebuffer en videos. « Streaming Buzz* December 15, 2009Tracked on

    [...] Fuente: newteevee.com [...]

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    [...] Janko Roettgers reveals some interesting video-related user behaviour… [...]

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    [...] gonna get into the online video game, you had better be able to deliver fast enough for your users to not have to wait for a rebuffer:Whatever happened to patience? More than 81 percent of all online video viewers click away if they [...]

17. *Will America's Speed Deficit Lead To Lost Users? - TechnoBuffalo* December 16, 2009Tracked on

    [...] NewTeeVee recently reported on a study conducted by TubeMogul that found that 81 percent of online video viewers leave a video if it pauses as little as one time for rebuffering. This is a problem since the research found 6.81 percent of all videos rebuffer at some point during their play. [...]

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    [...] if they able to access the intelligence of network engineers at their ISP or the host company, who wants to stop a YouTube video to figure out the issue, when something better is a click [...]

20. *Jesse Bilsten » Blog Archive » What I'm reading: December 2009* March 20, 2010Tracked on

    [...] 4 Out of 5 Viewers Leave If a Stream Buffers Once – Usability study about users who will leave a website if the video or multimedia buffers even once. [...]

21. *4 Out of 5 Viewers Leave If a Stream Buffers Once* April 16, 2010Tracked on

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