Net Neutrality: Past, Present, and Future

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1 Introduction

In simple terms, Net Neutrality is the idea that Internet Service Providers (ISPs) will not discriminate against or practice favoritism for certain content providers at the expense of others. The term was coined by Tim Wu in a 2003 article for a law journal, where he laid out a plan for assuring "fair evolutionary competition" on the internet. In the 15 years since then, Net Neutrality has become a partisan issue, with U.S. regulations ebbing and flowing with the shifting of power in Washington. This paper will examine the recent history of Net Neutrality, the current status of Net Neutrality in the United States, and what the future of Net Neutrality might look like. In doing so, the benefits and drawbacks of a neutral Internet will be analyzed. Ultimately, this paper aims to provide a technical understanding of Net Neutrality that will demonstrate that a combination of neutrality and ISP transparency can promote equality for the internet, but also that some features of a deregulated internet have a place in a primarily neutral network.

2 The Present: What is Net Neutrality?

Suppose you have written a letter to your parents and want to send it. After sealing the envelope and contemplating the taste of the glue, you head down to your nearest post box and stuff the envelope into the gaping blue maw. If all goes according to plan, the post office will pick up the letter from the post box and eventually deliver it to the specified address. We trust the post office not to read our mail. We trust the mailman not to copy down the address on the envelope. For the postal service to perform either of those actions would be an outrage. But what if the post office didn't just read your mail, but would treat your letter differently depending on its content. Your letter could be delayed while your neighbor's letter is delivered immediately. Worse, your letter could be thrown in the trash, or copied and sent to some shady government agency. Unburdened by the shackles of net neutrality regulations, ISPs would likely handle data packets in a similar manner. What does that look like on a technical level? Using the post office metaphor, Net Neutrality can be described in terms of the layered architecture model of the internet. In the model, people writing and reading letters represent the Application layer. The contents of the letters are the Presentation Layer. The Session Layer functions like the envelope. The mailman, who represents the Transport Layer, takes the letter to the Post Office, which represents the Network Layer. Finally, the post office reads the address, which represents the Data Link layer, and the letter is prepared for transit (Physical Layer).
In the platonic ideal of a completely neutral internet, these seven layers can all be completely isolated from one another. Just as mailman doesn’t need to know anything about mother dearest to deliver a letter to her address, your phone’s messaging app doesn’t care if your phone is connected to Wi-Fi or the 4G network. And your router doesn’t care if you use Google or Yahoo. A layer does care how lower layers handle the data or what the data looks like at higher layers. Net Neutrality, then, can be described as the principle that at any service or operation at any given layer is performed in isolation from the information on every other layer. This insularity was clearly the intent of the architects of the internet, which means the internet was designed with neutrality in mind. As designed, ISPs should be be able to perform their function using the Network layer alone. If your ISPs looks at the Presentation Layer and reads your email, that is a clear violation of Net Neutrality. And without laws enforcing Net Neutrality, there is nothing stopping ISPs from looking at everything you do. They could collect any data you send over their network for whatever nefarious purpose they so wish. Suppose you’re an undecided voter in the presidential election between Candidate A and Candidate B. You want to do some research on both candidates to inform your decision, but your ISP desperately wants Candidate A to win. When you visit the website for Candidate A, it loads immediately. When you try to visit Candidate B’s website, it takes minutes to load the whole page. This is a blatant ethical violation and should be illegal, but without regulation there is nothing in place to prevent it from happening.

Internet Service Providers have an incredible amount of power: when they receive a packet at layer three, they have access to the data units at every other layer as well. Rather than put faith in faceless corporations, Net Neutrality laws give the ISPs a legal incentive to not invade their customers privacy. Unfortunately, Net Neutrality isn’t what it used to be.

3 The (Recent) Past: Repealing Net Neutrality

In December of 2017, the Federal Communications Commission (FCC) voted to repeal the Net Neutrality rules that had been established by the Obama administration in 2015. As of June 2018, these changes have taken effect. In an editorial for CNET, FCC Chairman Ajit Pai laid out his reasoning for undoing the Obama-era neutrality rules. Pai cited multibillion-dollar decreases in network investment since 2015 as justification the repeal of the Obama-era rules. The most significant change was changing the classification Internet Service from a telecommunications service to an information service. This meant that access to broadband internet would no longer regulated like access to telephone service. Instead, ISPs would be treated to the looser regula-
tions placed on tech companies like Facebook and Google. And while Ajit Pai insists that this
deregulation was a positive step for the future of the internet, his attempts to shift the dialogue
on Net Neutrality failed miserably. According to a poll by Mozilla, 90% of Americans support net
neutrality. Ajit Pai’s attempt to create a viral video and sell deregulation to younger generations
failed miserably—the video quickly became one of the most disliked videos on Youtube, sporting
a like/dislike ratio of around 3%. It’s clear that Pai and the FCC do not believe that their
mandate for regulation comes from the American people. Instead, the FCC has acted on behalf of
Internet Service Providers and big tech companies.

Now, that wouldn’t be terrible if most telecommunications companies weren’t notorious for
their low customer satisfaction. The Mozilla poll found that 63% of Americans do not believe
that ISPs have their best interest in mind. Now while that 63% may just be the percentage
of Americans that have ever been customers of Comcast and Time Warner (cue the rimshot), it
also reflects the distrust of big business that pervades the American consciousness. And truthfully,
there is no reason to trust Ajit Pai and ISPs when they insist that ‘light-touch’ regulation is
preferable to Net Neutrality. Why? Because even when Net Neutrality was the law, there was a
massive loophole—cellular data. Consumers are used to paying a hefty fee for monthly data plans.
Cellular networks created the "zero rating" designation for certain content providers. If a user
visits a website with a zero rating, it does not count toward their monthly data limit. So a user
stopped on the side of the highway could be charged for searching, "how to change a flat tire",
while another user in a passing car could be browsing Facebook for free. If wireless carriers were
more than willing to circumvent Net Neutrality laws, its doubtful that ISPs will put much effort
in to maintaining any semblance of neutrality or equality in broadband networks. This is why
heavy regulation of the internet is necessary. The private sector is motivated by profit, not by
good will for humanity. While that might be a bleak view, big business continues to reinforce that
idea. It falls to the government to maintain the equality of the internet.

4  The Future: Maintaining a Neutral Internet

Proponents of a deregulated internet describe the benefits of a "fast lane", allowing data from
approved content providers to skip past traffic on the crowded 'slow lane'. All your favorite shows
could be streamed to your TV in better quality and with fewer interruptions. It would also reduce
traffic in the slow lane. Moreover, it might shift cost from the end user to the content provider.
Netflix would need to pay their fair share for producing 16% of total global internet traffic?
Understandably, internet "fast lanes" are a compelling idea. But as Joe Walsh, Glenn Frey and Don Henley observed in the late 1970s, life in the fast lane is not all it’s cracked up to be. In 2017, a study showed that users accustomed to receiving content from a 'fast lane' were far less willing to use content providers that were in the slow lane. Effectively, this creates a large barrier to entry for new companies that cannot afford to buy fast lane access. So while repealing Net Neutrality might spur innovation among the ISPs to create better and faster networks, it will curb the growth of internet-based tech startups that are stuck in the slow lane. And this discrimination will grow increasingly problematic as the diversity of internet-enabled devices grows. It’s no secret that 'Internet of Things' (IoT) is the biggest buzzword in tech right now. It describes the explosion of everyday items with ‘smart’ capabilities requiring internet connectivity. So while a decade ago, the average household was accessing the internet exclusively through web browsers, the modern household could have dozens of devices constantly communicating with the outside world. This poses a problem. Should data packets from a hundred different Alexa-enabled toasters get to cut in line in front of an emergency call from a start-up home security system just because Amazon is able to pay for the fast lane? Of course not. And yet that scenario is completely legal under current regulations, and may already be happening. When talking on a cell phone, Jeff Bezos gets the same treatment as the Amazon warehouse staffer working 110 hours a week. Everyone is treated equally on the cellular telephone network with one exception. There is a fast lane: The Wireless Priority System (WPS) enables emergency services personnel to jump to the top of the cellular network queue when necessary. Access to the WPS is controlled by none other than the FCC. Why can’t the internet work like that? One lane for the overwhelming majority of traffic, and a fast lane for the most critical services. A pacemaker detecting a heart attack can send lifesaving information to all relevant parties without being slowed down by millions of people all streaming the newest hit Netflix show. Just like an ambulance, critical packets could turn on their sirens and other data would move out of the way.

5 Conclusion

In conclusion, complete Net Neutrality is something that isn’t realistically achievable, but it can be approached asymptotically, in a sense. The internet has never been and will never be a completely level playing field. It is always possible to be more neutral, but the gains will always be increasingly
marginal. Transparency to ensure that ISPs cannot secretly give priority to some packets over others. And an emergency fast lane that allows a packet to turn on its sirens and have other traffic make way. But while the goal is tractable, it will require a significant effort. It will require significant a political shift to even start the process. The internet was designed with neutrality in mind, but perhaps sacrificing some neutrality for increased utility for emergency situations is a reasonable goal that doesn’t risk a slide into anti-democratic behavior from ISPs. The first step in achieving this goal is electing men and women that believe in the value of Net Neutrality. Most importantly, one of those men or women needs to be in the White House n The best time to legislate a neutral internet was at the beginning. The second best time is now.

6 Works Cited