NETFLIX

Shri Asit Kadayan
Advisor (QoS), Telecom Regulatory Authority of India
Mahanagar Doorsanchar Bhawan
Jawaharlal Nehru Marg
New Delhi: 110 002, Republic of India

Dear Sir,

Please find attached, comments from Netflix on the TRAI Consultation Paper on Net Neutrality released on 4 January 2017.
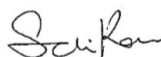
In January 2016, we announced the launch of our service globally, bringing Netflix to over 190 countries, including India. Netflix is the world's leading Internet television network with over 93 million members, enjoying more than 125 million hours of TV shows and movies per day, including original series, documentaries and feature films. Members can watch as much as they want, anytime, anywhere, on nearly any Internet-connected screen or download content for offline viewing. Members can play, pause and resume watching, all without commercials or commitments. Netflix is a pioneer in the business of Internet TV and video, and we continue to innovate as new and exciting technologies emerge.

We are strongly committed to growing our content offerings and partnerships in India. In doing so, we are developing partnerships with local studios, ISPs, content distributors and talent to bring great content and convenience to consumers and industry partners. This year, we are proud to be producing our first Original Series in India based on the critically-acclaimed best-selling novel Sacred Games by Vikram Chandra. In addition, we recently announced strategic partnerships with three major companies in India - Airtel, Videocon d2h and Vodafone - making our platform more easily accessible to consumers across direct-to-home and mobile platforms.

As a company, we rely on telecommunications infrastructure to reach our many customers across the globe. Over the years, we have engaged with governments and other stakeholders on Net Neutrality issues across many countries, including the United States, the EU and Brazil. It is from this perspective that we submit our comments for this consultation, and have limited our submission to those questions that have a direct relevance to our business.

We hope you find this submission useful. Please do not hesitate to contact us if you have any questions or would like to discuss this further. We stand ready to be involved in future consultations, industry dialogues as well as ongoing monitoring and evaluation activities that may be undertaken.

Sincerely,

Sohni Kaur
Public Policy Manager, Asia Pacific
Netflix, Inc.

Summary

Adopting strong net neutrality principles is a cornerstone of promoting the virtuous circle of growth and innovation i.e. content and applications drive demand for faster and more affordable Internet access which then leads to investment in broadband networks. Netflix commends the efforts of the Telecom Regulatory Authority of India (TRAI) to protect the open Internet by **ensuring the equal and nondiscriminatory treatment of content on the Internet - both on fixed line and mobile.**

The demand for entertainment content (social media, video, gaming) is a key driver of Internet adoption, complementing the need for better infrastructure and access[1]. This reaffirms the importance of an open Internet where content producers invest in producing compelling content and where consumers are able to freely consume the content of their choice. An open Internet supports innovation and the growth of content companies such as Netflix.

Globally, Netflix has been an advocate of strong net neutrality protections that promote openness, both on the last mile and at the points of interconnection to the last mile[2]. A pro-consumer Net Neutrality framework is one with clear and strong open Internet protections that prevent blocking, throttling, paid prioritisation, abusive interconnection practices and any other type of unreasonable discrimination at any point of the network. Transparency rules should require ISPs and TSPs to provide meaningful, real-time disclosures of network performance and traffic management practices to keep the public properly informed, as may be determined by TRAI. Relatedly, Netflix provides access to "fast.com" which may be used anywhere in the world to determine current internet download speed across all devices. This provides consumers with a simple, quick and commercial-free way to measure connection speeds.

In considering the use of Content Delivery Networks (CDNs), it is important to recognise that they reduce latency, bring about substantial savings on transit costs for ISPs, and reduce the likelihood of congestion that might impact the user experience. CDNs bring about direct benefits and savings to ISPs, facilitate broadband expansion and should be seen as a valuable contribution that supports the goals of network deployment as laid out by TRAI and the Department of Telecommunications. Therefore, policies should seek to facilitate their use, including ensuring non-discriminatory interconnection between ISPs and CDN providers.

An open Internet promotes competition, free expression, and diversity of content. This boundless choice encourages edge providers like Netflix to continually innovate with our content, technology, and user experience. Net neutrality rules that prohibit harmful conduct but are flexible enough to allow networks to grow and innovate ensures that consumers will continue to reap the benefits of this competitive market.

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[1] [Connectivity, Innovation and Growth: Fostering an Open Internet in Asia](#) - TRPC 2017
[2] Hastings, Reed., (20 March 2014) Internet Tolls and the case for strong Net Neutrality, [Blog Post] Retrieved from https://media.netflix.com/en/company-blog/internet-tolls-and-the-case-for-strong-net-neutrality

Q1. What could be the principles for ensuring nondiscriminatory access to content on the Internet, in the Indian context?

Ensuring non-discriminatory access to the Internet - both on fixed and mobile - is fundamental to ensuring the benefits that an open Internet provides. This is especially so, for supporting the virtuous circle of growth and innovation where content drives user adoption and demand which then leads to increased investment in network infrastructure.

- An open Internet means that **gatekeepers are unable to impede access to lawful information that consumers request and that consumers are able to access information efficiently.** This ability is driven by the cooperative relationship between broadband networks and edge providers.
- The principle of non-discrimination should be upheld across all points of the network. **This necessitates rules against blocking, throttling and paid prioritisation both at the last mile as well as at points of interconnection**. Particular data sources should not be degraded or impeded by ISPs or TSPs.
- Finally, any traffic management practices should be proportional to an ISP's immediate need to manage contention scenarios. These traffic management practices should not discriminate among edge providers of a similar class or category.

With established rules against blocking, throttling and paid prioritisation, TRAI will be able to evaluate complaints or violations on a case-by-case basis against the standard that upholds consumer rights. This balances the principle of non-discrimination with enough flexibility to continue to promote innovation and investment.

Q2. How should "Internet traffic" and providers of "Internet Services" be understood in the NN context?
(b) How should services provided by content delivery networks and direct interconnection arrangements be treated?
Please provide reasons.

The Internet comprises of interconnections between many autonomous networks, all sharing common protocols. A well functioning interconnection regime is key to maintaining an open Internet, and ensuring that investments remain focused on driving consumer use of the Internet thereby avoiding unintended consequences such as higher prices for connectivity or reduced content offerings.

Policies should facilitate non-discriminatory interconnections between ISPs and CDN providers to enable a better and more efficient Internet. It is important that regulation not inhibit the deployment of CDNs.

Content Delivery Networks (CDNs) are a vehicle by which many online content companies connect with and deliver data to Internet access networks for transmission of that data to end-user customers. This localises traffic as close as possible to end-users, shortening network and geographical distances that

data bits have to travel. This benefits consumers, ISPs and Internet users in general. It makes the Internet more efficient and scalable to support requests for content.

Cache servers are the devices that store and serve content with the sole responsibility of delivering content to consumers as fast as possible. They can be installed within Internet exchange points where CDNs interconnect with mutually-present ISPs. Alternatively, they may be deployed directly inside ISP networks. The installation of server appliances in networks enables edge providers such as Netflix to contribute to lessening congestion, reducing latency and bringing about savings on transit costs for local ISPs.

Across Asia, large amounts of content are now stored locally, boosting intra-Asian traffic and thereby allowing carriers to save on long-haul international transit. Hubs such as Singapore, Hong Kong and Tokyo have extremely competitive transit costs as a result. This is especially important as more than 50% of traffic in Asia still originates internationally thereby posing significantly more potential savings[3].

Content Delivery Networks (CDNs) enable content to be delivered more efficiently, bringing about better quality viewing experiences and lower costs for ISPs. The use of CDNs bring about pro-consumer and pro-innovation outcomes while not violating Net Neutrality rules as they do not exempt other sources of content or prioritise certain data over others.

At Netflix, we have invested significant resources into building our own single-purpose content-delivery network, called Open Connect[4]. We provide Open Connect Appliances (OCAs) to ISPs at no charge, including the cost of shipping, when it is efficient for them to be deployed into a network. We will also interconnect with *any* ISP at an Internet exchange point where we are mutually present. In doing so, we do not ask for or require prioritisation, nor do we pay for prioritisation.

Our partners minimize the use of expensive transit bandwidth by placing OCAs within their network, as up to 95% of traffic can be served from these appliances. Given transit bandwidth averages INR 608 /mbps[5], local delivery provides immediate financial savings for local ISPs. Annex 1 provides an example of how deploying an OCA would result in savings for a local ISP.

As a result, consumers in India will have a better quality experience of Netflix, due to a reduction in interconnection points where congestion or a single point of failure may occur. **This does not however, accord any particular "priority status" to content that is delivered via CDNs or through peering. When bits are served through Open Connect Appliances, they are not provided any priority or increased speed.** Rather, they work by simply reducing congestion upstream of the cache. Ensuring that ISPs and TSPs are unable to subvert the protections of net neutrality at the points of interconnection benefits all

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[3] Global Internet Geography, Regional Analysis: Asia, Telegeography (2016) Retrieved from
https://www.telegeography.com/products/global-internet-geography/analysis/regional-analysis/asia/index.html
[4] For more information on our Open Connect program, please visit: https://openconnect.netflix.com
[5] Median Global Transit Prices per Mbps, Telegeography (Q2 2016) Retrieved from
https://www.telegeography.com/products/global-internet-geography/analysis/ip-transit-pricing-trends/index.html

content providers--including those who use proprietary CDNs, third-party CDNs, and those delivered by transit-- as local caching reduces congestion for all content providers that serve Indian consumers.

This Net Neutrality consultation paper is right to point out that traffic management practices can be misused to carry out service blocking, prioritising affiliated content provider services or throttling competitive ones[6]. Indeed, practices like this can also distort competition in the content provider business, thereby discouraging new creation and innovation.

We should also think about interconnection at POPs and caching in this regard. The ability to deny sufficient network capacity at interconnection points unless a content provider is willing to pay for a differentiated service level enables ISPs to act as gatekeepers and discriminate between content providers. Further, this provides a disincentive to organically investing in interconnection capacity, as constraining capacity may compel content providers to pay high fees for interconnection points.

Q8. Which of the following models of transparency would be preferred in the Indian context:
(a) Disclosures provided directly by a TSP to its consumers;
(b) Disclosures to the regulator;
(c) Disclosures to the general public; or
(d) A combination of the above.
Please provide reasons. What would be the mode, trigger and frequency to publish such information.

(C) Transparency rules should require ISPs to provide meaningful, real-time disclosures of network performance and traffic management practices to keep the public properly informed, as may be determined by TRAI. This should be done with due respect to protecting sensitive information that might give their competitors a business advantage.

Q12. Can we consider adopting a collaborative mechanism, with representation from TSPs, content providers, consumer groups and other stakeholders, for managing the operational aspects of any NN framework?
(a) What should be its design and functions?
(b) What role should the Authority play in its functioning?

We believe that involving diverse stakeholders in ongoing monitoring, evaluation and feedback is the best way to ensure that the interests of the consumer are protected and remain the central consideration in any ongoing management of a Net Neutrality framework. In order to have a truly effective and fair monitoring system, it is important that any mechanism be seen to be independent, with transparent reporting and including a representative cross-section of stakeholders from government, content providers, ISPs, edge providers and consumer rights advocates.

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[6] TRAI Consultation Paper on Net Neutrality (4 January 2017) Retrieved from
http://www.trai.gov.in/sites/default/files/CP_NetNeutrality2017_01_04.pdf

While central authority for monitoring and managing a Net Neutrality framework will remain in the hands of the national regulator, we believe that industry has an important role to play in providing feedback as well as observations on the implementation of a net neutrality framework. Netflix would be fully supportive of such a mechanism and stands ready to be part of this process.

Q14. The quality of Internet experienced by a user may also be impacted by factors such as the type of device, browser, operating system being used. How should these aspects be considered in the NN context? Please explain with reasons.

Consumers may choose to use various devices, browsers, operating systems which may have an impact on their experience online.

Net neutrality protects competition and consumer choice by ensuring that consumers can use their Internet connection to access content and services of their choosing without impediment from their ISP. Net neutrality protections should prevent an ISP, which has a unique position as a gatekeeper of the network, from engaging in practices that interfere with a consumer's experience by substituting its preference for that of the consumer. Devices, browsers and other technologies that enable consumers to access content online are distinct from this as they do not hold a monopoly on access. Consumers are able to switch browsers or devices easily based on the experience that they receive, and open competition between these products incentivises innovation that ultimately provides a better quality experience online.

Conclusion

The protection of an open Internet through strong net neutrality principles is central to the development and growth of all developing nations. By adopting a strong framework, India will set an important standard not just for itself, but for other countries that are currently considering similar policies.

We urge TRAI to adopt strong net neutrality rules that protect investments in broadband networks and the content and applications at the edge of those networks. In so doing, India will leverage the tremendous growth opportunities that are realised through an open, fast and affordable Internet.

Annex 1

For illustrative purposes, the following demonstrates an example of savings in transit costs that a local ISP would benefit from with a Netflix Open Connect Appliance;

Let us take the hypothetical example of a medium-sized ISP called "Orchid" with only a national presence in India. "Orchid" receives 4,500 mbps of Netflix traffic a month (assuming this to be at the 95th percentile).

In this example, "Orchid" has the option of either having Netflix traffic delivered from Singapore or locally through an Open Connect Appliance (OCA). Given transit bandwidth averages INR 608 /mbps[7], local delivery provides immediate financial relief.

Therefore, without an OCA, "Orchid" incurs a monthly international transit cost of
4,500 mbps x INR 608 = **INR 27.36 Lakhs**

With the use of an Open Connect Appliance, Orchid would now be able to cache most of the content locally. In this example, let's assume 90% of content watched in India can be cached while 10% will still incur international transit fees. At Netflix, our Open Connect Appliances are programmed in a way that the cache is refilled, during off peak hours, therefore not incurring additional transit fees.

Based on this example, Orchid's traffic and cost per month would now be:

International transit - INR 608 /mbps
Netflix traffic (international) - 450 mbps (10% of original amount)

Therefore, with the deployment of a Netflix Open Connect Appliance, Orchid would now incur a monthly international transit cost of:
450 mbps x INR 608 = INR 2.74 Lakhs resulting in savings of **INR 24.62 Lakhs /mth**

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[7] Based on median transit pricing for Mumbai in 2016 according to Telegeography. Actual cost may vary depending on individual arrangements that each ISP has with transit providers.