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<u>Comment on the TRAI Consultation Paper on Net Neutrality</u>

Net Neutrality Study Group (Nishant Rajoriya, Dwayne Fernandes, Rajkumar Sahoo, Shailesh Kumar, Anmol Waraich, Jaivir Singh and Nupur Chowdhury)

Centre for the Study of Law and Governance, Jawaharlal Nehru University, New Mehrauli Road, New Delhi: 110067.

Corresponding email address: nupur@jnu.ac.in

I   Basic Understanding of the Internet (What it is and how it works?)

a) The internet is a technology for information exchange. It is unlike any other service or infrastructure good like electricity or telephony. It is in the nature of an essential resource or networking or communication technology and access to it is a pre-requisite for the performance of a whole gamut of human activities – viz. employment, education, innovation, public services, etc.

b) The physical architecture of the internet – as an information highway - does not distinguish or discriminate between information/data packets/content passing through this highway. It allows for equal access or free passage of all content. This fundamental characteristic of the internet is affirmed through the principle of net neutrality. The principle of net neutrality can be defined as the ability of the user to access all content on the internet without facing any discrimination in any manner from the internet service provider. This is inherent to the physical architecture of the internet itself which does not discriminate between types of content. This principle is therefore foundational and should be formally recognised and upheld. Exceptions (regulation of content which is unlawful) may only be allowed for enforcement of legal directive authorized by public authorities.

c) Analogy of a Road Network:

    a. Internet connects various nodes of client and servers just like a road network which connects human habitats. The internet transfers packets containing information just as vehicles operating on the roads facilitate the transport of goods and humans. There are rules defined for vehicles operating on the roads and in a similar manner the internet works on Transmission Control Protocol/Internet Protocol (TCP/IP). Essentially, both internet and road network in

one way or the other facilitates the exchange of information and ideas as well as eases out the access to various aspects of life. Road networks facilitate a wide range of activities such as trade, education, entertainment, networking, communication, etc. Similarly, internet also facilitates almost everything that road network facilitates and beyond, in the contemporary world, except physical movement from one place to another.

b. These activities can cause excess traffic on both the road network and the internet. In economic terms excess traffic is an externality caused by the usage of the network. Such excess traffic can lead to chaotic situations and thus needs to be managed both on roads and on the internet.

c. Regulation of both road network and internet in any form constraints the access and mobility of the user. However, the regulation of the internet is necessary to control certain kind of human behaviour which is percieved as not being good for society (crime or civil wrong) and also for purposes of public safety and maintenance of the network (traffic management). As regards the former matter it is the responsibility of public authorities (as empowered by the law of the land) to address crimes and civil wrongs on the internet. This may also lead to *direct content regulation* – for instance banning of unlawful content. Public authorities may ban unlawful content; the ban is enforced through internet service providers (ISPs) who are then asked to block particular websites or services.

d. Turning to the second matter of regulation of Traffic Management -

    i. Unlike road networks that are owned and controlled by public authorities in various jurisdictions, internet is worldwide and is controlled by corporations and private players which work on the principle of profit making.

    ii. How should traffic be managed and by whom? The obvious answer is the owner of the network – i.e. the internet service provider (ISP) – who has the authority, technical competence and economic incentive to manage the traffic.

    iii. What constitutes Traffic Management Practices (TMPs)? TMPs are multiple measures undertaken by the ISP with the express purpose of ensuring quality of service and for purposes of maintenance of the network. TMPs must not be used to discriminate between different users thereby resulting in privileging access to the internet of one user over another. This would amount to abuse of TMPs and would lead to unequal access to the internet and result in unfair treatment and violation of the principle of net neutrality.

    iv. TMPs are also used in a road network – for instance – creation of various lanes for movement of vehicles at different speeds, pit stops for breakdown and rest, traffic lights, signalling systems, zebra crossings, speed breakers, etc. All these are considered necessary for the purpose of public safety of the road network and are therefore accepted by users of the road network – as it raises the overall utility of the road network for all users. However when traffic is blocked or diverted on roads for allowing accelerated passage for 'important persons' (without any prior notice to the public and which is not legally mandated) by traffic authorities, this   is   a

discrimination against all other users of the road network as it restricts their ability to access the road network. Similarly, blocking or throttling of traffic on the internet by ISPs for providing better access to a particular user by restricting the access of other users' amounts to discrimination. This leads to *indirect content regulation* by ISPs as they allow for faster access to certain content/user. Such kind of *indirect content regulation* is illegal.

    v. TMPs can therefore be potentially used for the following three purposes:

        1. Enforce a legal directive (banning of content that results in crime or civil wrong) and that is authorized by public authorities.

        2. Prevent congestion; ensure safety, security and maintenance of the network.

        3. Indirectly regulate content.

    vi. **TMPs should be legally allowed only for first two purposes and should be expressly prohibited for the third purpose**.

d) Content regulation as mandated and authorized by public authorities is lawful and is therefore legitimate. However when ISPs abuse TMPs for *indirect regulation of content* it is illegitimate and violation of the principle of net neutrality. *Ipso facto* it means, that TMPs should be adopted and applied by ISPs equally to all the users on the network – i.e., they should equally affect all users and should not differentially impact them.

II   Basic Minimum Universal Internet Access

a) Access to the road network is critical in enabling mobility for humans. Similarly access to internet has become critical for ensuring access to employment, economic development, education, innovation, public services, etc. Public investment in the road network is justified in terms of the welfare gains for all citizens. Currently the internet penetration in India is approximately 22% and this reflects a huge digital divide. The existence of this digital divide is in itself discriminatory in the sense that citizens having access to the internet are at a more advantageous position (both in terms of accessing economic opportunities and public services) in comparison to citizens who don't have access to the internet. State must commit therefore to providing basic minimum universal internet access to all citizens as early as possible.

b) Internet Connectivity has been declared as human right or a legal right in various nations such as Sweden, Costa Rica, Finland, France, Greece, Spain, Estonia and Canada. Recently in India, the State government of Kerala has declared access to internet a human right and earmarked a special fund in its budget to provide internet connectivity to 20 lakh families at subsidised rates or free of cost.

c) This commitment to basic minimum universal internet access can be met only through sustained public investment in digital infrastructure (establishing and expanding optical fibres/ creation of wifi hotspots/subsidizing subscription of a basic free data pack for every citizen).

d) Expansion and maintenance of digital infrastructure is also necessary for continued quality of service and to prevent congestion that would negatively impact current users.

e) Sole reliance on private ISPs for expansion of digital infrastructure may be counterproductive for the following reasons:

    a. A broader concern of market distortion is the perverse incentive the existence of TMPs creates for services providers. Given a choice between expanding network capacity and expanding its customer base at the present capacity, ISPs prefer to expand their customer base as opposed to investing in expanding network capacity. TMPs function as a tool that will allow service providers to discriminatorily manage the potentially enlarged base of subscriptions at the cost of investing in the infrastructural aspect of the sector. For ISPs, it is more cost effective to discriminate between users (depending on how much they pay) rather than in expanding digital infrastructure to provide for equal quality service to all users.

    b. Over reliance on ISPs will also create perverse incentives for them to regulate content – i.e. the ability of the users to access specific content on the internet – may be regulated by ISPs in the following manner:

        i. Use of offerings like 'Free Basics' – that only allows access to certain content (as prioritized or selected by the ISPs).

        ii. Abuse of Traffic Management Practices – leading to *indirect content regulation* – which will violate the principle of net neutrality.

III   Traffic Management Practices

a) Traffic Management Practices (TMPs) are required as traffic has to be managed on the network whether it is because of differential data speeds or bandwith requirements for different subscribers or to avoid crashing due to network congestion.

b) However we should in principle distinguish between legitimate and illegitimate TMPs.

c) The traffic on the internet is in the form of packets as the internet is basically a packet switched network. The IP packet contains two parts, IP header and Payload. The routers are advanced enough to read payload or the data which is sent through the network as well as the IP header.

- The IP header contains various information for routing the packet such as the IP version, Internet header length, type of service for prioritizing the packets, total length of packet, identification bits for assembling the fragments, flags for enabling fragmentation, fragment offset, time to live to mark the duration of the packet in the network, protocol for defining protocol used in payload, header checksum, source address and destination address.

- Routers have the ability of manipulating these bits to manage traffic on the network. For example type of service bits are used to determine the priority of the packets and time to live bits which are dynamic and reduce by at least one each time the internet header is processed, are used to determine the time duration for which the packet remains in the network.

- Source and address destinations are also readable which determines the end to end delivery of the packets.

- Thus this header information and the ability of the advance network system controlled by ISPs to process this information could be used as both ways either to improve the quality of service

> or to discriminate between various types of content or discriminate between the users on the basis of source address or destination address.

- Nowadays the routers can also read the payload using the features likes Network Based Application Recognition (NBAR) which is in proper terms called deep packet inspection that recognizes a whole lot of protocols and applications which are web based and use dynamic TCP/UDP port assignments.

- This gives the ISPs complete control in managing the traffic by either prioritizing the various applications which demands the quality of service or throttle and block various peer to peer file shaping applications using this deep packet inspection.

- Therefore, the ISPs have the technical ability to manage the traffic in whatever way they want to manage. They can enhance, throttle, block or regulate the content by doing the deep packet inspection as well as they can prioritize and discriminate between the users on the basis of source and destination addresses by processing the information header.

d) Legitimate TMPs are those that are adopted in pursuance of a legal directive or those that are *necessary* for preventing congestion and ensuring public safety and maintenance of the network. Furthermore such TMPs should be adopted and applied by ISPs equally on all users – i.e., they should equally affect/impact all users – and should not disproportionately burden one group of users over others. These may include for instance TMPs that are implied (and therefore imbibed) to the network such as those to maintain different bandwidth requirements, quality of service provisions, protecting the network from potential security threats and those specifically implied at a particular instance (emergency situations) or during peak times (handle congestion).

e) Illegitimate TMPs are those that block or throttle lawful content by providing preferential treatment for certain kind of applications and thereby differentiates between users in terms of their ability to access content and thus allowing the ISP to *indirectly regulate content,* thereby violating the principle of net neutrality. Use of such TMPs should be legally prohibited.

f) TMPs evolve through constant innovation by ISPs. ISPs have the technical competence and resources to experiment, innovate and evolve different types of TMPs and this puts them at an advantageous position. Any bright line rule that prescribes a list of prohibited TMPs may soon become redundant, as ISPs will evolve new TMPs to regulate traffic in the network. Thus evolving a list of prohibited TMPs is of limited efficacy. This approach is not technically feasible and should be abandoned.

IV   Declaration and Disclosure of TMPs

a) Given the gross asymmetry in technical competence between the ISPs (regulatee), regulator and internet users (both current and potential) - in terms of the ability of the regulatee to innovate, design and apply TMPs and the limited ability of the regulator and users to spot, review and legally challenge the use of such TMPs, it is necessary to provide for mandatory public disclosure for use of TMPs.

b) All ISPs should mandatorily and publicly disclose the use of existing TMPs.

c) Adoption of any new TMPs (i.e. any new measure in addition to those already publicly disclosed) should also need to be notified to TRAI and also publicly disclosed within a certain time period.

Periodic reporting requirements by ISPs giving detailed information on the nature, application and affect of TMPs should be instituted.

d) This will allow for access to information about the use of TMPs by ISPs thereby empowering the regulator and users to monitor, supervise and an opportunity to legally challenge illegitimate TMPs. Wider public scrutiny of TMPs will also disincentivize use of illegitimate TMPs.

V   Standard of Review

a) TMPs that *indirectly regulate content* violate the principle of net neutrality and are therefore illegitimate and should be legally prohibited.

b) The burden of proof should be on ISPs to provide evidence that the TMP adopted and applied (both existing and new) are legitimate TMPs.

c) For establishing legitimacy – ISPs would need to prove the following:
   a. Establishing the fact of congestion on the network – that required the application of TMP.
   b. That the use of the particular TMP was *necessary* for ensuring public safety and maintenance of the network.
   c. TMP had an equal impact on all users on the network.

d) Violations should be heavily penalized by imposing a fine.

e) Investigations on potential violations may be instituted by the regulator – on complaints by users/potential users/interested parties (*locus standi* should be expanded) or *suo moto.*

VI   Why uphold the principle of Net Neutrality and who should regulate it?

a) The choice of rules governing the internet creates the incentive structure within which ISPs choose strategies that maximise their profits. In fact a much stronger statement needs to be made - the choice of rules and the strategies that ISPs choose, affect both existing and future consumers and producers. This is so because ISPs can (if allowed to do so) carve out segments of the internet and make them preferentially available to customers with the ability to pay while cutting or providing lesser access to poorer customers. This would constrain and impinge upon the set of choices available at large not only for present consumption but also to produce innovatively using the net as an abundant resource and thus pre-empt the growth of future consumption. (Such constriction also fetters various rights as noted earlier.) Therefore, the choice of rules impacts the kind of market that will emerge and whether or not incentives to create continuing value will be preserved.

b) In the absence of upholding the principle of Net Neutrality, which ensures non-discrimination between users in terms of access to lawful content, ISPs are faced with perverse incentives that cause them to behave opportunistically, which while privately profitable, will be publically harmful. To elaborate on this -
   a. As discussed earlier, possessing an internet connection implies that one has the freedom to access all lawful content on the internet. In the absence of a regulation that upholds net neutrality, ISPs may potentially divide the internet into 'products' such as a data packet

consisting of various combinations of websites. They may try to induce customers to purchase these 'products' by offering them at lower prices or free of charge. This introduces inefficiency into the market at two levels.

    i. Micro level impact - When the internet is divided into 'products,' it impinges upon a user's freedom to access lawful content according to their preferences. Instead, it allows ISPs to impose their preferences on the users and, in fact, exploits user's demand for her preference of content by making them pay for it. The implications are clear – restricted access chokes the innovative potential of the internet. This is due to the fact that the value of the internet, and therefore, the value it generates for each of its members increase because a Net Neutral internet facilitates greater access and therefore fosters interactions that lead to the generation of yet greater value of the network for all. The internet derives additional value from the fact that new users can come on board and become sources of value generation.

    ii. Macro level impact – As ISPs possess control over the structure and design of the networks through which the internet is supplied and have exclusive control over TMPs, there exists a perverse incentive to perpetually manage congestion at the cost of investing in expanding the technological capabilities of the network itself. This has a deleterious effect on market size and, in effect, on the internet as a sphere of value generation as it disincentivises innovation.

c) Ensuring net neutrality in terms of prohibition on regulation of lawful content by ISPs is of interest as an issue of regulation to various regulators:

    i. Sectoral regulator: TRAI deals with telecommunication industry –including ISPs and are mandated to ensure standard of quality, efficiency of service, secure consumer interests and facilitate competition.

  b. Horizontal regulators:

    i. Competition Commission deals with cases of abuse of dominant position in the market, including cases of creation of monopolies by preventing access to potential competitors.

    ii. National Consumer Disputes Redressal Commission (NCDRC) deals with issues of consumer grievances relating to deficiency in service.

    iii. National Human Rights Commission deals with violation of basic human rights by state and non-state actors.

d) Potentially, therefore, net neutrality is an issue that should be addressed through a cross regulatory commission.

This commentary broadly answers Q1, Q2, Q3, Q4, Q6, Q7, Q8 of the consultation paper on Net Neutrality of Telecom Regulatory Authority of India.