**Response to**

**TRAI**

# Pre- Consultation Paper
# on
# Net Neutrality

**Contributed by**

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1. **What should be regarded as the core principles of net neutrality in the Indian context? What are the key issues that are required to be considered so that the principles of net neutrality are ensured?**

1.1. The stylized model of the Internet envisages it as a two sided market with the Content and Application Provider (CAP) on one end and the users at the other end connected through the broadband platform of the Telecom (and Internet) Service Providers (TSPs). The principle of net neutrality is based on the end to end design principle: that innovation in a network should be determined by decisions at the 'edges', i.e. decisions of the CAP and the end user should govern the growth of the Internet while the intermediary (i.e. TSP) should be a 'dumb pipe' and play no gatekeeping role.

1.2. In the late nineties as the number of web sites as well as and the amount of data on each site mushroomed, new technologies of content delivery emerged that utilized distributed storage of web-based content on the Internet. The practice of 'caching' and "mirroring" implemented, among others, by firms such as Akamai Technologies, allowed websites to place their servers closest to the end users inside a TSP network. This also led to the growth of the Hosting Service Providers (HSPs) that provide content distribution services to websites in partnership with the TSP. The speed of Google search to some extent draws on its partnerships with specific ISPs to place content closer to end users.

1.3. Further, in recent times the CAPs have also become layered with services such as search and social networks becoming important gateways to the Internet. Finally, the advancements in digital advertising, including the omnipresent Google AdWords search algorithms, and the rise of iconic consumer devices like Apple phones have shifted the power hierarchy on the Internet.

1.4. The number of possible commercial arrangements between different entities in the Internet ecosystem has increased multi-fold. These include contracts between CAPs and advertisers, CAPs and HSPs, HSPs and TSPs, CAPs and TSPs, CAPs and end users and TSPs and end users. Web search results today are avowedly non-neutral with the content of the search engine getting priority over organic returns, and paid search dominating the first page.

1.5. There can also be vertical integration between the different entities. For example, the large CAPs such as Amazon, Facebook, and Google started out as pure CAPs but now are HSPs as well. In this situation the old definition of net neutrality that treated the Internet as a simple two sided market does serious injustice to the complexity of the Internet today and overlooks many links of the network that could do serious damage to the spirit of the end to end design principle.

1.6. **One of the main questions that net neutrality advocates must examine today is vertical integration:of CAPs and TSPs, CAPs and HSPs, and HSPs and TSPs.** When HSPs and TSPs are integrated the TSPs could adopt the "zero pricing" rule favoured by net neutrality advocates under which the TSP does not charge a CAP for providing access to end users; however, compensates it with higher charges levied on the CAP in its role as an HSP. This tendency would be exacerbated if the TSP is linked with another CAP which is a competitor to the CAP in question.

1.7. **Hence the Net Neutrality debate is not just about TSPs or CAPs but about regulating competition in the vertically integrated Internet of today where challenges to the end to end design principle could come not merely from TSPs but also search engines, social networks,**

**device manufacturers and HSPs.** The important questions of privacy and security, and challenges to the relative importance of state and non-state actors posed by the Internet also cannot be brushed aside.

1.8. Timothy Wu, the person who coined the definition of net neutrality, studied the rise of the major technologies of communication including the telegraph, radio , TV and the Internet in his 2010 book "The Master Switch". He outlines how a technological innovation starts as a hobby and inevitably ends up as an industry controlled by a few powerful corporations. He advocates the "**Separations Principle**", that creates salutatory distance between each of the many layers of the information economy. On the other hand, the Chicago School advocates no intervention in vertically integrated markets based on the argument that the integration of complementarities must be presumed to outweigh the negative effects on competition in the individual markets.

1.9. While the Internet has indeed come a long way from the research network of the 1960s, we are just at the beginning of a revolution that could end up creating a giant information system of interconnected devices, and objects with human beings merely one of the many entities in the system. **Future facing regulation would recognize the nature of the Internet that is coming into being, and not be tied to formulations that reflect the way things used to be.**

## 2. What are the reasonable traffic management practices that may need to be followed by TSPs while providing Internet access services and in what manner could these be misused? Are there any other current or potential practices in India that may give rise to concerns about net neutrality?

The following Figure illustrates the different traffic management practices and pricing policies that are applicable in this context:

| Priority of bits | Price per bit | |
|---|---|---|
| | *Same* | *Different* |
| Same | Pure NN | Zero rating |
| Different | Improve QoE | Pure Non-NN |

1. If all bits are of same priority and price for each bit is the same (irrespective of application/ content), we term it is pure Net Neutrality (NN). This is an ideal situation and hence should be the **First Choice.**
2. If both priority and price for bits do differ across application/ content it is indicative of explicit discrimination. Hence this should be our **Last Choice,** if at all.
3. If all bits are with the same priority, but they are priced differently is a case that falls in between. While it satisfies NN with respect to priority it does not satisfy with respect to price. Zero rating is an indicative of this where the bits are prices at zero for the consumer that fall under this plan while they are not given either higher/ lower priority compared to others.

However, zero rating is a form of an extreme pricing. If Zero rating is allowed, then for a price of zero, often a downward sloping demand curve will lead to heavy (theoretically infinite) demand for the category of service provided under this scheme.
A TSP acts as a two-sided platform that connects users on one side and OTTs on the other side (**please refer to our response for Q:1 as well**). An OTT can pay fully for the content including bandwidth so that the user is fully subsidized. Hence the marginal cost of providing these bits to end consumers (i.e. data usage charges) is being paid by the OTT firms (and hence subsidized to the end users) in the zero-rating scheme (as discussed in response to Q:1). If due to zero rating, the demand indeed increases to a very large value, the subsidy amount to be given by the associated OTT firms to TSP should also be high. **Hence the argument that only large firms and collusive deals between OTT firms and TSPs will survive.**

This can potentially **crowd out** other services due to constraints on bandwidth and **theoretically block**. However, OTT paying for the bandwidth cost of the user is an indicative of a close cartel being formed between OTTs and TSPs; this collusion has the possibility of crowding out the other OTTs, especially start-ups who cannot subsidize the TSP for bandwidth consumed by the users.

**Hence we propose that all bits should be provided with at least a minimum guaranteed speed as per the NTP. While our recommendation would be to disallow zero rating, at the very least the zero rating apps should be throttled by the TSP so that minimum guaranteed QoS is provided to all bits/ apps/ content accessed by the user. This should prevent zero-rated content from crowding out the other content. In any case access to non-zero-rated apps should not be blocked.**

**Apart from the above minimum speed, we propose that a ceiling price (price/bit consumed at the existing minimum required broadband speed) for data usage charges shall be fixed by TRAI and changed in tune with technology evolution and competition levels (as is being done with Mobile Termination Charges and SMS charges). This is required to prevent crowding out of non-zero rating but essential apps due to differential pricing. We reiterate that the ideal would be to not have zero rating.**

4. The fourth case is when TSP charges the same for each bit; however prioritizes certain OTT content. This case involves TSP implementing technologies such as advanced cache management, Deep Packet Inspection amongst others. From the consumer point of view, it provides better Quality of Experience (QoE) without additional price. Hence can possibly increase consumer surplus. This may also involve close cooperation and agreement between select OTTs and TSPs. This also might decrease the QoE of other OTT services that are not in the scheme.

   **However, such prioritization shall be based on class of service (e.g. synchronized narrowband application such voice/ messaging, synchronized broadband application such video); it shall not vary across source/ app within the same class of service. This of course requires that the regulator define the classes and the allowable management principle.**

**The traffic classes should be minimal and the applicable management minimal and verifiable. The definitions of the classes should not be left to the TSPs.**

**To provide a minimal QoE for essential applications that are not part of this scheme, we propose that TSPs should adhere to providing minimum guaranteed speed as per our National Telecom Policy for every bit that is accessed by the consumers. Hence we propose this minimum speed for all bits (e.g. 512 Kbps and increased later on as mandated) shall be provided as per NTP 2012 (512 Mbps currently; 2 Mbps by 2016; and 100 Mbps thereafter as per clause 1.5 of NTP 2012).**

3. **What should be India's policy and/or regulatory approach in dealing with issues relating to net neutrality? Please comment with justifications.**

India is a telecom market that has the following unique characteristics:

1. Mobile devices and networks are predominant mode for accessing OTT and Internet services; the penetration of wired broadband in India is very poor (one-fourth that of mobile broadband subscriber base); hence the mobile network is the dominant network in India compared to wired network in most of the advanced telecom markets in the world.
2. Access network of mobile operators in dense urban areas are capacity constrained due to limited assignment of spectrum for each operator; spectrum HHI in India: 0.13
3. Competition is intense in the mobile sector with a market share HHI of 0.18. The average number of mobile operators in each service area is 10. Hence cost of multihoming for OTT services is relatively less;
4. There is availability of multi-SIM 3G and even 4G handsets at reasonable prices; the subscriber base is largely pre-paid with completely unbundled handset market;
5. Mobile number portability is in place
6. Due to (3)-(5), the switching cost for subscribers from one TSP/ISP to another is relatively less compared to other world markets.

The issue of net neutrality takes on different hues in the context of different relative maturities of fixed and mobile networks in a market. If a country has a dominant means of access, either fixed line as in Bhutan, or mobile as in India then, and if net neutrality is established as an important principle, **it must be applied to the dominant network**. In case both means of access are well established in a country, then net neutrality can be applied on the high bandwidth fixed network and need not be mandated on the mobile networks as each consumer can be targeted in an undifferentiated manner by all OTTs using the fixed network. In case both fixed and mobile networks have low penetration, net neutrality may again need to be mandated on both networks, as fixed line networks have capacity, and mobiles are likely to be the chosen means of access.

The general principle is that the wired broadband network where capacity is not an issue, the zero charge rule may be in place. but in the capacity constrained mobile network, less stringent rules should apply. We can expect wireless access to be the main medium of access to the internet

for some time to come. This puts pressure on the network, making an adoption of pure net neutrality difficult. In the opposite direction, it also makes it imperative to allow a dynamic innovation environment in the mobile OTT space.

1. **Content prohibition and blocking should not be allowed**. It is the basic right of every citizen to access lawful communication services/ apps/ content/. Hence as is being done internationally blocking of lawful OTT services by the TSPs should not be allowed.
2. **Vertical integration should be carefully monitored and regulated.** Given the extent of competition in mobile services in India and the perfect competition in the OTT services, vertical integration may cause imperfection in the market. Examples of vertical integration and the consequences have been discussed elsewhere in this response. Any threat to competition shall be taken by the Competition Commission of India on a case by case basis using Significant Market Power (SMP) analysis. We also propose increasing competition in Internet Service Provisioning beyond those that are offered by TSPs by allowing unrestricted Internet Telephony for Unified Licensees with Internet Service Provider authorization.

The TSP can recover its investment in the network and manages congestion by charging the OTT or the end user or both.

The TSPs should be allowed to have differential pricing along the following dimensions:

1. Time dependent pricing (all bits priced the same; however varies across time)
2. Location dependent pricing (all bits priced the same; however varies across location)
3. Application dependent pricing (bits of different applications IN DIFFERENT CLASSES OF SERVICE are priced differently). The different classes shall be enumerated by the Regulator or self-declared by the OTTs (e.g. synchronized narrowband application such voice/ messaging, synchronized broadband application such video).

Options (1) and (2) above do not violate Net Neutrality (NN) principles and hence should be allowed.

However (3) depends on another dimension: priority accorded to the bits as well. We illustrate below this special cases of (3), with priority and without differential priority. If in (3), in addition to differential pricing, differential priority of bits is done, then it is a complete violation of NN and hence should NOT be allowed. (please see response to**: Q2**)

4. **What precautions must be taken with respect to the activities of TSPs and content providers to ensure that national security interests are preserved? Please comment with justification.**

5. **What precautions must be taken with respect to the activities of TSPs and content providers to maintain customer privacy? Please comment with justification.**

The OTT firms that provide communication services shall adhere to regulation and law as applicable to them. Similar to call logs to be maintained by the TSPs/ISPs, OTT firms that provide communication services shall be compliant to security, privacy and confidentiality of the user data as applicable for their category of service under the appropriate laws and regulation. Broad regulatory compliance guidelines shall be issued for each category of apps/ content as proposed under Q 5 shall be applicable. These regulatory and compliance guidelines shall be less stringent than that applicable for facility based TSPs/ ISPs due to the following reasons:

1. The OTT services are on an evolutionary path and the future stable equilibrium set of services is unknown at this point; in fact, considering the pace of innovation it is unlikely that there will be an equilibrium for sufficiently long time to allow one to develop complex regulatory mechanisms.
2. The regulation should not be stringent enough to curb innovation and put a full stop to the evolutionary process of OTT services.
3. However the regulation shall be sufficient to bestow certain amount of ownership and responsibility on OTT firms that provide such services.

A related question is what OTT service can be classified as a "communication service". Apart from the obvious pure-play communication OTT services (i.e. WhatsApp, Hike), whether a taxi-hailing app that provides a call-back service to connect to a drive shall be classified as a "communication service" provider?

The answer is left best for the OTT service provider to declare while registering. Self-declaration to a question on the type/ class of service (i.e. communication services, app, video/ audio content) as mentioned in the consultation paper at the time of registering in the App Store as proposed in our response to Q:5 shall bind the OTT service to the appropriate regulation and law applicable.

6. **What further issues should be considered for a comprehensive policy framework for defining the relationship between TSPs and OTT content providers?**

Imbalances do exist in the regulatory environment for licensed telecom operators and OTT firms. This is because OTT firms provide communication services that have similarities with those from existing licensed TSPs. For example, WhatsApp is similar to SMS, but the former allows richer content and has potential to add new features which also accounts for its popularity. Similarly, Skype can provide many more services (screen sharing, quick conference additions, etc.) than can the voice services of the TSPs. Thus while it is tempting to attempt some regulatory parity, the comparisons have to be made more carefully and the repercussions have to be better understood before attempting it in any large scale. Further, new technologies allow provisioning of same service in new ways and hence this should be encouraged and not stifled by regulation.

We a propose a model taxonomy for OTT services. The taxonomy of OTT firms needs to take into account their public positioning, their legal articulation, as well as the perceptions and expectations of their customers.

1. First, there are OTT communication service providers (e.g. Skype WhatsApp) that mimic TSPs and ISPs. The TSPs are regulated by their license conditions. Since these set of OTTs are not licensed they shall be categorized and included through amendments to existing Unified License(as a separate class not requiring UL). Since these are non-facility based, the "must" comply requirements of such communication service providers shall be less stringent but might include issues such as security, certain Quality of Service, privacy of information to name a few. The relevant clauses from IT Act may also be applicable.
2. Second, there are essentially directory services that enable customers to get information about the products or services. Examples include: justdial.com (directory listing), mysmartprice.com (price comparison), zomato.com (restaurants). These firms enable buyers and sellers to get connected and complete the transactions using a communication service much similar to the first category and/or TSPs. However, the main objective of these platforms is to connect entities and not that of providing communication services (as in category one). Though these platform providers do some due diligence to select whom to list and also provide rating services, the onus on successful partnership between buyers and sellers is normally not that of the platform provider. Given the low barriers to entry in such a service, and associated competition in this market, the good and reliable ones survive. Hence any regulation that applies to directory services shall be applicable for these.
3. Third type is an M-commerce platform that connects buyers with a seller that has associated brand and possibly a physical brick-and-mortar business. Examples include: redbus.in (bus tickets), bookmyshow.com (movie tickets), makemytrip.com (airline tickets), travelguru.com (hotels), flipkart.com (merchandise). The platforms do more due diligence in selecting the sellers compared to the second type. They shall be regulated as per the rules the Government devices for e-commerce firms.
4. Fourth is media OTT services that provide streaming or stored audio, or video content either in broadcast form, or peer-to-peer, unicasting or multicasting. Examples include Ghanna.com, Netflix. These shall be governed by appropriate media regulations including copyright issues.

It is also proposed that the Government of India require OTT service providers in India to voluntarily disclose the type of services (e.g. using an example framework given above) that they provide while the apps are registered in the respective App stores (i.e. Google Play Store, Apple iStore). Google Play Store and Apple iStore both require app publishers to "*self-rate*" their apps based on published criteria. Currently, the focus is on age-specific rating, to ensure that users are made aware of the age-appropriateness of the content and functionality of an app. Many countries have defined relevant rating criteria: ESRB - Americas, PEGI - Europe and Middle East, USK - Germany, ACB - Australia, ClassInd - Brazil, as well as the International Age Rating Coalition (IARC). Apps published on the popular app stores need to self-rate themselves against these ratings. **For some countries, this is a condition for the app to be available in that country.** The consultation paper also mentions similar regulations in France and there are news reports about regulation in Europe. These should be carefully studied before any regulation is imposed.

It is suggested that the Government of India works on a similar criteria, and work with the app stores to ensure that OTT apps deployed in India meet the relevant rating levels. Once these self-

declaration are done, then the OTT services are bound by the respective laws and regulation applicable in the country. The self-declaration will also reduce regulatory overhead at the same time making OTT firms own up responsibility and accountability.

If a particular OTT service (e.g., taxi aggregator app service) is licensed and regulated under a government body other than MCIT and TRAI (e.g., radio taxi license by the State Transport Department) , then those policies and regulations shall govern the service.

1. The OTT communication service providers (e.g. Skype, WhatsApp) provide services that may have similarities to that by TSPs. That the TSPs are regulated by their license conditions while these OTTs are not can be thorn on the side of the TSPs. Therefore they should be categorized and included through amendments to existing Unified License (as a separate class not requiring UL).
2. Since these are non-facility based, the "must" comply requirements of such communication service providers shall be less stringent but might include issues such as security, certain Quality of Service, privacy of information to name a few. The relevant clauses from IT Act may also be applicable.
3. Clearly, it is impractical to monitor and control the provisioning of OTT services. Also owing to the speed of innovation in this space and the need for short "idea-to-market" times, it is necessary that OTT services should continue to be **unlicensed** as per the provisions of National Telecom Policy by the Ministry of Communications and IT and TRAI.
4. However, since there is a strong relationship between telecom and OTT services, we advocate regulation of OTT services (**while reiterating that it be in unlicensed form**) as per the regulatory framework applicable. The consultation paper provides some examples of regulations and they should be explored after due analysis.

Since the objectives of regulation must also include universal access to the internet, the ideal would be to have a neutral network in which the TSP does not distinguish between the source of the bits and all bits belong to same class of traffic (i.e. synchronous voice, synchronous video, asynchronous media/ file downloads) are subject to the same traffic management rules independent of the source. A lesser ideal would be take the following approach is be suggested.

1. There should be no distinction made for OTTs transmitting the same kind of data, e.g. VoIP, audio streaming, video streaming, and video download.
2. If there is a conflict of interest, then there should be an attempt to create a level playing field between the service provided by the ISP and the OTT which is in competition with that service. The pricing in this area can be under forbearance by the regulator.
3. A significant portion of the Internet must be reserved as the 'classical internet' where OTTs are not charged at all, and a minimum quality of service is assured in a 'best effort paradigm'.

## Note on CECN

This principle of net neutrality was seriously challenged by the concept of zero rating, whereby a TSP could provide access to a portfolio of content and applications provided by a set of Content and Application Providers (CAPs) free of any bandwidth charge to the end user, while access to other content and applications would be charged differently. Evidently, the TSP's cost of providing services within the free portfolio would be subsidized by the CAPs. The possibility of such differential pricing by the TSP would enable a CAP with deep pockets to get preferential access to the TSP's subscribers, violating the principle of net neutrality.

The CAPs espousing the principle of zero rating invoked the objective of universal access to the Internet to support their case. Though this has been accepted in some countries, the TRAI overruled their proposal in the prohibition of discriminatory tariff notification and disallowed such schemes.

However, in this regulatory notification, while TSPs are prohibited from offering different tariffs based on the content, service, application or other data that a user is accessing or transmitting on the Internet, data transmitted over Closed Electronic Communications Networks (CECN) may be provided without any bandwidth charge. Does this conform to the principle of net neutrality?

Under CECN, a TSP can price the bandwidth for content or application provided exclusively to its subscribers over the CECN differently, even at zero price, as long as this content/ application is not available on the public Internet. We believe that the CECN option will not be used by large CAPs who would avoid being restricted to a single TSP's network. It will be typically opted for by small CAPs in order to get access to the subscribers of a TSP, in an increasingly competitive market. It is not clear from the notification whether any CAP can multi-home in to many TSPs and still not make its content available on the Internet for availing the exclusion. In order to understand the reality of CECN, it is instructive to look at what happened to the Value Added Service (VAS) providers who were associated on an exclusive basis with a single TSP. The VAS provider had little bargaining power over the TSP with the later pocketing almost 70-80 percent of the VAS revenue.

The difference between CECN and zero rating is that zero rating is a way in which CAPs with deep pockets could lock in subscribers with free access, while in CECN, the TSPs can lock in small CAPs with difficult commercial terms.

Will TSPs actively pursue CECN? Probably not, since the app economy is increasingly driven by the mobile phone and is closely connected to the eco system of device manufacturers and operating system platforms. Hence the possibility that a TSP could gain a competitive advantage with its own suite of applications offered through CECN is indeed minimal, especially in a competitive TSP market such as in India.

The issue remains that with increasing amounts of power being wielded by the Internet giants such as Amazon, Google, Facebook, and Apple, the space for Internet startups, certainly in some sectors, is shrinking rapidly. Think of a company attempting to come up with a new mapping software in a world where all Android phones come bundled with Google maps. The issue of reducing barriers to access, the core principle behind net neutrality, remains relevant in an increasingly vertically integrated world. CECN is an unnecessary distraction.

On the other hand, the importance of resiliency and capacity of the Internet infrastructure, especially the last mile access provided by the TSPs, needs more attention. All the Over The Top (OTT) applications provided by the CAPs depend on this infrastructure. WhatsApp that boasts of transmitting over 1,100 calls per second, requires a robust Internet infrastructure for call completions. If the Internet service is to be treated like a utility, then we need to give it "infrastructure" status with all applicable provisions including reducing the regulatory overheads, attractive financial options especially for acquiring radio spectrum, making it easier to obtain Right of Way for cable and towers, so that the "plumbing" of the Internet is adequate to power the Digital India mission. Then the regulator and the policy maker can put in stringent Quality of Service norms for the Telcos to adhere to, failing which severe penalties can be enforced. With a broken Internet pipe as it exists today, the endless debate on Net Neutrality is inconsequential!

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