Telecom Regulatory Authority of India

Recommendations

on

Traffic Management Practices (TMPs) and Multi-Stakeholder Body for Net Neutrality

New Delhi, India

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ANNEXURES

CHAPTER 1
INTRODUCTION

1.1 Background

In the last few decades, the Internet has emerged as an important resource for innovation and economic growth and as a medium to support information exchange within and across borders. The future growth of the telecom sector and access networks is contingent upon innovation and growth of the Internet infrastructure and many applications, content and services linked to it. However, increasingly, concerns have been raised globally as well as in India relating to the potential for discriminatory treatment of Internet traffic by the entities that control access to the Internet. These concerns regarding non-discriminatory access have become the centre of a global policy debate, often referred to as the debate on network or net neutrality.

TRAI sent its recommendations on "Net Neutrality" to the Government of India on 28th November 2017. DoT accepted most of the recommendations given by TRAI and issued principle directives on Net Neutrality on 31st July 2018. Further DoT amended license conditions for Access Providers and introduced relevant requirements to conform to the principles of Net Neutrality. However, while accepting TRAIs recommendations, DoT made some decisions which were at variance from the recommendations such as:

a) DoT will formulate necessary Traffic Management Practices (TMPs).
b) DoT shall establish a multi-stakeholder body with framework for collaborative mechanism among the stakeholders. The body shall have an advisory role.
c) The Monitoring and Enforcement functions with respect to Net Neutrality will rest with DoT.

1.2 Recommendations sought by the DoT

Vide letter dated 31st July 2018, DoT sought recommendations (refer to

Annexure I) of TRAI on the following issues:

a) *Necessary Traffic Management Practices (TMPs) for consideration of DoT*

b) *Composition, functions, role and responsibilities of the multi-stakeholder body for consideration of DoT.*

1.3 Consultation with stakeholders

Pursuant to a reference received from DoT, TRAI issued a consultation paper on 2nd January 2020 for: identifying and cataloguing list of reasonable Traffic Management Practices (TMPs); a framework for updating the catalogue with technical description and impact of the TMPs; establishing a set-up to monitor and detect violations of Net Neutrality; and creating a Multi Stakeholder Body (MSB) to assist and advise DoT in the matter (refer to **Annexure II** for issues of consultation in detail).

The scope of the consultation paper was restricted only to issues, mentioned in para 1.2 above on which DoT sought the recommendations of TRAI. Last date for submission of the comments was 13th February 2020, and for the submission of counter-comments was 27th February 2020.

Stakeholders submitted their response(s) to the Authority (TRAI) and their comments/counter-comments are available on TRAI's website: www.trai.gov.in. An Open House Discussion (OHD) was held on 24th June 2020 using a video-conferencing platform, where stakeholders participated not only from India but also abroad.

1.4 Structure of this document

Responses of the stakeholders are discussed in detail in Chapter 2, including those raised in the Open House Discussion (OHD). Chapter 3 deliberates on composition, functions, roles, and responsibilities of the Multi-Stakeholder Body (MSB), while, Chapter 4 deliberates upon the framework for compilation of the Traffic Management Practices (TMPs). Chapter 5 summarizes the Authority's recommendations on the subject.

CHAPTER 2

ANALYSIS OF RESPONSES OF THE STAKEHOLDERS

2.1 The responses to the public consultation (Consultation Paper dated 2nd January 2020) are divided into two parts: specific to the questions framed in the paper, and broader issues that came up in their consideration. Subsequent paras provide further details.

A. Issue-wise response of the stakeholders

2.2 Inputs received for the seven issues in the consultation paper are summarised below[1].

2.3 *Can a comprehensive list of reasonable Traffic Management Practices (TMPs) be prepared in advance, or does it need a framework and mechanism to keep it continually updated?*

a) Most stakeholders suggested broad type of traffic management practices for mitigating congestion; prioritisation of latency-sensitive traffic (such as VoIP); Packet core Network Management (Allocation and Retention Priority and QoS based implementation); Network security and integrity (restricting connectivity or blocking of traffic); and Legal requirements, Govt Orders and Emergency situations. Some stakeholders suggested additional practices that included content filtering, deep packet inspection (DPI), and policies adopted with the consent of customers. The responses on the list of reasonable TMPs suggested by stakeholders are discussed in detail in para 4.1 of Chapter 4 of this document. Some stakeholders opposed the deployment of deep packet inspection (DPI) to manage traffic.

b) A few stakeholders were of the opinion that a list of reasonable TMPs can be prepared in advance and periodically reviewed and updated;

[1] Detailed responses are available on TRAI's website: www.trai.gov.in

while others opposed it on grounds that it is infeasible to prepare such a list in advance. Some stakeholders opposed the idea because, according to them, it was not efficient.

c) A few stakeholders suggested a framework to compile the TMPs and to keep the list up to date:

i. Service providers may provide a record of all practices adopted by them for traffic management ("Record of TMPs") and publish it in the public domain. These records in the public domain would be a living document.

ii. To review the declared TMPs, DoT may seek a separate detailed record of their application ("Record of Application") to be submitted to DoT at defined regular intervals. This record must include the time; geographical area; justification of reasonableness, i.e. proportionality and transience; and the nature of TMPs applied. DoT may review such records of service providers and grounds of reasonableness. DoT may take help and advice of Multi-Stakeholder Body (MSB) for reviewing Record of TMPs published by TSPs.

iii. Multi-Stakeholder Body (MSB) may prepare a report based on its analysis of Record of TMPs and Record for Application submitted by TSPs and published in public domain after approval from DoT.

iv. DoT may maintain and publish a refined list of TMPs adopted by all TSPs ("Repository of Necessary TMPs"), having those TMPs that are found reasonable after the process of review.

v. After reviewing the Record of TMPs disclosed by service providers, DoT may directly intimate wrong reporting found in Record of TMPs to TSPs/ISP and issue directions to TSPs/ISPs in case their TMPs

are not aligned with the principles of Net Neutrality, and may also ask them to update the disclosure made by them in public.

vi. To maintain uniformity in Record of TMPs published by TSPs in public domain, a format for disclosure may be prepared by DoT with the advice of Multi-Stakeholder Body (MSB). Under the transparency and disclosure framework, TRAI may also refer to all the disclosures made by DoT, TSPs, and Multi-Stakeholder Body.

d) In respect of the framework suggested by stakeholders above [para 2.3(c)], one stakeholder suggested that MSB should review the record of TMPs submitted by TSPs/ISPs, and prepare a 'Repository of Necessary TMPs' and submit the same to DoT for approval. Upon approval by DoT, MSB should publish this repository. Additionally, MSB should prepare a disclosure format for TSPs/ISPs to publish their TMP in public domain, which should be approved by DoT.

e) Another stakeholder suggested that TSPs should be allowed to make use of TMP which is not included in the list, after intimation to DoT. DoT can include such TMP in the list of reasonable TMPs, by following the prescribed process.

f) A stakeholder proposed that instead of a positive list of reasonable TMPs, consider the utility of a negative list that enumerates prohibited practices to be avoided by access providers.

g) A hybrid approach, combining the explicit whitelisting of acceptable TMPs along with a catch-all provision was also suggested, which would allow DoT with the help of the MSB to issue guidelines, notifications or clarifications on reasonable management practices.

h) A stakeholder proposed the practice followed by the United Kingdom's telecommunications authority, Ofcom, where the TSPs have a policy of

informing the end users of the impact of TMPs on users' Internet access, privacy, etc., and the quality of customer's internet service, and the regulator can seek further information as needed.

i) Finally, one stakeholder also argued that TSPs and ISPs should be exempt from maintaining and/or periodical submission of any Record of Application as this is impractical and will unnecessarily create further operational overheads/cost for TSPs/ISPs. Any matter of issue/concern may be directly discussed by DoT with the relevant TSP/ISP.

2.4 *Short description or detailed technical description regarding impact of TMPs should be part of the documents prepared for list of TMPs and the framework adopted by the Multi-Stakeholder Body to document it*

a) Most of the stakeholders suggested that name and short description is sufficient. For this, a standard format may be specified by the MSB/DoT. The information may be provided in an easy to understand and accessible manner. It should clearly specify the requirements of TMP, whether the practice will affect the users, which applications will be affected, and how, based on network performance.

b) A few stakeholders suggested that detailed description is necessary as the impact of TMPs cannot be interpreted from its name. TSPs/ISPs should be mandated to provide information that clearly demonstrates that TMP solutions being implemented by them are proportional. This can be done through disclosures made in tariff plans and available on that Access Service Provider/ISP's website.

c) Some stakeholders proposed that MSB may maintain and publish detailed elaboration of standard names and their short description (published by TSPs). The detailed description may include details about the list of deployed TMPs, timings when deployed, the nature (whether it is throttling, technical prioritization and/or blocking), the degree, the

grounds, the conditions, and justification of reasonableness. The description may cover guiding principles, i.e., network practice (e.g. congestion management, device attachment rules, etc.), performance characteristics (e.g. service description, performance level, impact of specialized services, etc.), commercial terms (pricing, privacy, etc.), and specify the requirement of TMP. While one stakeholder submitted that BEREC's Net Neutrality Regulatory Assessment Methodology lists out technical specifications that can serve as a framework for the detailed technical description.

d) Few stakeholders submitted that defining a detailed technical description may not be practically feasible. It should only be brought in, if there is evidence that the existing proportionate and transparent traffic management practices are diminishing the consumer experience.

2.5 *Establish a set up to monitor and detect violations of Net Neutrality and avoid false positives and false negatives while collecting samples and interpreting Net Neutrality violations*

a) Some stakeholders suggested that submission of self-compliance certificates, self-governance, and self-audit is sufficient. Authorities may *suo motu* seek information on aspects of the practices or on receipt of any complaint. This proposal was opposed by a few stakeholders.

b) Some stakeholders proposed investigation based on complaints or reports, i.e., an evidence-based approach and probe based approach. Few stakeholders also mentioned a multi-pronged approach which includes monitoring consumer complaints, conducting market surveys, requesting information for service providers, and technical network monitoring. Stakeholders also suggested that cases of TMPs violating the Net Neutrality principles should be reported to the MSB, which the MSB may handle by following steps such as verification of incidents, monitoring consumer complaints and market surveys. Upon admission

of the incident, for further probing, the data should be crowd-sourced from the end users (in the given geographical location, for the given internet service provider) through interactive tools available for download from dedicated websites performing measurements at a specific point in time, or through measurement tools downloaded and installed by the end-user for the purpose of on-going monitoring in the background.

c) Few stakeholders suggested the adoption of mandatory audit of processes. One stakeholder proposed the combination of different types of mechanisms by gauging the case requirement based on frequency of TMPs used by ISP, Geographic location repetitively being selected, and the timeline, and expected number of consumers being targeted by it.

d) A few stakeholders proposed crowd source data or any app-based audit to detect violation of net neutrality, which was opposed by most of the TSPs. Some stakeholders suggested adoption or development of applications, such as Wehe app[2], Open Observatory of Network Interference (OONI)[3] and M-Lab Glasnost projects[4]. It was also suggested that we follow the model of BEREC for creation of a Net Neutrality Measurement Tool[5].

e) Some stakeholders submitted that monitoring may be only done upon reporting of a potential incident rather than continuous monitoring of the quality of the internet. While one stakeholder opposed this proposal.

f) To avoid false positives and false negatives while collecting samples and interpreting Net Neutrality violations, some stakeholders suggested that

[2] https://www.measurementlab.net/tests/wehe/
[3] https://ooni.org/
[4] https://www.measurementlab.net/tests/glasnost/
[5] https://berec.europa.eu/eng/document_register/subject_matter/berec/reports/7296-net-neutrality-measurement-tool-specification

mandatory disclosures by TSPs, collection of information from users through a centralized complaint portal or similar, easy to use mechanism and collection of information from third parties and public domain (research studies, news articles, consumer advocacy reports) may be adopted to reduce statistical errors. While one stakeholder proposed that crowd-sourced measurements may be performed by collecting samples enough in numbers to detect true positives. Selection of samples for measurement need to be diverse enough to detect violations, and samples not attributable to Access Providers actions must be eliminated.

2.6 *Composition, type of membership of the Multi Stakeholder Body*

a) Most of the stakeholders opined that since MSB would have an advisory role, it should be a not-for-profit, industry-led body. It should comprise members representing different categories of TSPs, ISPs, VNOs, Large and small content providers, academics, researchers, civil society organizations, and consumer representatives. Few stakeholders proposed that in addition to above mentioned composition, it may include standards organization, representatives of DoT, MeitY, MHA, MoRTH, MoHUA, Agriculture and Health ministries, and individual consumer representatives. One stakeholder suggested that membership should be open for all the stakeholders likely to be impacted by implementation of TMPs.

b) Another stakeholder proposed that MSB can be formed with representatives from licensed operators, i.e., All TSPs, ISP-A and the representatives chosen by ISP-B and ISP-C ISPs on their behalf. It will not be feasible to include all the content providers or academia in the body, and thus they may nominate their representatives from the respective associations. But this suggestion was opposed by another stakeholder.

c) Few stakeholders suggested a two tiered body, i.e., an advisory council (include TSP, MNO, ISP, and Content Providers) and larger committee (Consumer Forum, Network OEM, Research, Academic and Technical Community), and proposed that the larger committee may formulate its recommendations to the Advisory Council. The advisory council may then share its final advice (based on the committee's inputs) to DoT. One stakeholder proposed that roles and responsibilities of MSB may be divided into three parts: first, TSP centric for handling work related to TMPs; secondly, customer centric for handling the complaints conducting investigations; thirdly, DoT centric to act as an interface between industry and the Government in providing two-way inputs/requirements of the sector in the given domain. One stakeholder opposed this suggestion of segregating functions into industry centric and consumer centric bodies

d) Regarding type of membership, a few stakeholders proposed that there may be different categories of membership. One category as members would have the right to take part in the review and the decision making, and others as associates may only have the right to assess the available information. MSB may also have observer members who do not have any access to the information but may be permitted with some payment. A few stakeholders categorised membership into individual, institutional, and corporate.

2.7 *Functions, roles, and responsibilities of Multi-stakeholder Body*

a) A few stakeholders opposed the establishment of a multi-stakeholder body and some stakeholders agreed with the advisory role of MSB. However, some stakeholders suggested that roles and responsibilities of the multi-stakeholder body (MSB) should be to assist DoT in its monitoring and enforcement functions, formulation of audit systems, and their regular updating, for proposing technical standards and

methodologies, and on matters pertaining to best practices to be adopted for TMPs.

b) Some stakeholders proposed enlarging the functions of MSB to include enhancing the QoS experience, highlighting anti-competitive practices, convening and promoting research on TMPs, enforcing transparency, and collecting, organizing, and disseminating information related to the performance of Service Providers.

2.8 *Policy to be adopted for initial setup of Multi-stakeholder Body*

a) Stakeholders had divergent views on this subject. One stakeholder suggested that industry forums such as COAI can be entrusted with the task of setting-up this body. Another stakeholder submitted that the Government may identify and recognize an existing not for profit industry body and approve its memorandum and by-laws. One stakeholder proposed that DoT may initiate the creation of the MSB through a notification. Given the lack of statutory authority, a government notification will provide legitimacy and legal basis to the MSB. Examples of a similar approach can be found in other jurisdictions.

b) Regarding funding for the MSB, most of the stakeholders opined that arrangement of funds for initial set up including infrastructure and expert consultations may be undertaken by DoT or TRAI or Govt. of India. While one stakeholder suggested that funding of the administrative and monitoring expenditure may be managed by the founding members themselves.

2.9 *Entry fee, recurring fee, etc., for membership and mechanism may be prescribed to determine fee and other contributions from its members*

a) One stakeholder suggested that differential fees may be charged from

different categories of members, and because TSPs/ISPs will be mandatory members of the body, they should not be required to pay any subscription fee. A few stakeholders proposed that entry fee or recurring fee may be uniform, with a lower fee for smaller companies. A cap on membership fee was also suggested for uniformity. Some stakeholders were of the view that decisions on entry fee or recurring fee may be left to the governing body.

b) A few stakeholders suggested that annual subscription due from each member may be calculated on a slab system on the basis of its Gross Sales Turnover during the last financial year.

c) One stakeholder proposed that the membership fees and other contributions can be determined using a mechanism based on the operating costs of the MSB, such that it is divided among the members based on the category to which they belong.

2.10 *Guiding principles and structure of governance of Multi-stakeholder Body and roles and responsibilities of persons at different positions*

a) Some stakeholders suggested that the governance structure may be in line with the governance requirement for a non-profit organization as per the Companies Act, 2013 and Societies Registration Act, 1860. Most of the stakeholders opined that the governance structure may be two or three tiered. They proposed structures of existing organisations such as TSDSI, Broadband Internet Technical Advisory Group, Brazilian Internet Steering Committee and Internet Corporation for Assigned Names and Number (ICANN) to be considered for two or three tier structure.

b) One stakeholder suggested a dual governance structure that includes a governing board, which may be elected body and functions as an apex committee, responsible for administration and management, and an

executive committee, which may be responsible for day to day execution of strategy/guidelines, review of TMPs of TSPs/ISPs, conducting probes, preparation of reports, approving Repository of TMPs, disclosure format, probe reports, etc.

c) One stakeholder proposed that the guiding principles and structure of governance of Multi-stakeholder Body, the roles and responsibilities of persons at different positions may be templated on the lines of TSDSI. Few stakeholders suggested that roles and responsibilities of individuals at different positions may be left to the members to decide.

B. Other broad-level responses of the stakeholders

2.11 In general, some stakeholders opposed establishment of a multi-stakeholder body for monitoring and enforcement of non-discriminatory principles. They also highlighted that the policy on Net Neutrality needs to be reconsidered and aligned with the principles and standards of technologies like 5G. The key responses are as follows:

a) *No need to establish Multi-stakeholder body for monitoring and enforcement of non-discriminatory principles:* Few stakeholders submitted that Net Neutrality principles are now a part of license, which would automatically be monitored by DoT, and the requirement of establishing a multi-stakeholder body to monitor the same does not arise. Having multiple monitoring and enforcement bodies may lead to chaos, additional cost burden for the industry, and inconsistency in the decision-making process. DoT, as the licensor, is fully competent and empowered to monitor and enforce the Net Neutrality Principles.

b) *Policy on Net Neutrality needs to be reconsidered and aligned with the principles and standards of technologies like 5G:* Stakeholders also mentioned that the policy on Net-Neutrality needs to be reconsidered

and aligned with the principles and standards of technologies like 5G. Any policy decision on implementation of Net Neutrality in India should be aligned with telecom market scenario in India, Technological developments like 5G, and shift in control of Internet traffic flow (from networks to other entities such as handsets, operating systems, etc., in the internet ecosystem). The high usage of mobile internet networks in India necessitates the TSPs to optimize their networks and use traffic management practices (TMPs) continuously to maintain integrity of networks while meeting these high usage demands. Unlike the previous generation of technologies which focussed only on P2P communication, 5G is associated with three fulfilment areas enhanced Mobile Broadband (emBB), Ultra Reliable Low Latency Communications (URLLC), and massive Machine Type Communications (mMTC). 5G focuses extensively on various industrial use-case scenarios, such as Machine to Machine (M2M) Communication, automation in industry verticals (such as manufacturing, healthcare, logistics), self-driving cars etc. Therefore, innovative approaches to data delivery will be necessary to take full advantage of 5G capabilities such as network slicing, edge computing and quality-of-service based prioritization. Thus, 'one size fits all' approach has become obsolete in the context of 5G, and the policy on Net Neutrality needs to be reconsidered and aligned with the principles and standards of technologies like 5G. In fact, the investments in newer technologies like 5G will depend on the enabling regulatory provisions which will help in unlocking the full potential/benefits of these technologies.

2.12 These points are analyzed in the following paragraphs.

C. *Why is the establishment of a Multi-stakeholder Body required?*

2.13 As discussed in para 1.1, as per the decision of DoT, the proposed Multi-Stakeholder Body (MSB) with a framework for collaborative mechanism among the stakeholders, would have an advisory role and the monitoring and enforcement functions for net neutrality shall rest with DoT. Accordingly, under this framework, DoT would handle enforcement of principles and would be responsible for ensuring conformance to net neutrality, and for facilitating conflict resolution and consensus formation.

2.14 During the consultation process, stakeholders suggested that Multi-Stakeholder Advisory Body may play a vital role to support DoT to perform its functions. Comments received from the stakeholders in this regard, are as follows:

a) DoT with the help of the Multi-Stakeholder Advisory Body may issue guidelines, notifications, or clarifications on reasonable management practices. The Internet services sector is not limited to TSPs/ISPs alone; it includes content providers, equipment/handset manufacturers, OTT players, entities dealing with smartphone operating systems, browsers, cloud service providers, caching, and content delivery network (CDN) providers, etc. Today, these entities have significant control over internet traffic. As entities other than TSPs/ISPs (such as content providers, device manufacturers, browsers, etc.) also have significant impact on Internet Traffic. Therefore, it should be mandated that the Multi-Stakeholder body should give its advice to DoT on the enforcement of principles of Net Neutrality on these entities to ensure that these remain neutral towards access networks. Also, the body can give its advice to DoT on matters pertaining to best practices to be adopted for TMPs.

b) MSB may also play an active role in assisting DoT in its monitoring and enforcement functions. This will establish a strong working relationship between the Government and the industry, while the Government retains the decision-making control.

c) The problem of inaccuracy and false positives could arise if the monitoring mechanism relied too heavily on user complaints. This problem may be resolved when the MSB comprises all licensed and non-licensed stakeholders.

2.15 As highlighted by stakeholders in their comments, entities other than TSPs/ISPs (such as content providers, device manufacturers, browsers, etc.) also have significant impact on the Internet Traffic. Setting up of a collaborative mechanism would deepen the knowledge of various stakeholders on issues relating to traffic management, implementation of exceptions, implementation of transparency measures, and other relevant aspects. The Multi-stakeholder Advisory body may help DoT in understanding the concerns of consumers and developing consensus among various stakeholders during complaint resolutions and Enforcement.

D. Do Net-Neutrality principles need to be reconsidered and aligned with the future technologies like 5G?

2.16 As per Net Neutrality principle adopted by DoT, a Licensee providing Internet Access Service shall not engage in any discriminatory treatment of content, including those based on the sender or receiver, the protocols being used or the user equipment. Here, "Discriminatory treatment" shall include any form of discrimination, restriction, or interference in the treatment of content, including practices like blocking, degrading, slowing down or granting preferential speeds or treatment to any content. The net neutrality principles are technology-neutral, and there is no prohibition against the new technical aspects that are introduced with the 5G technology.

2.17 The principle of non-discriminatory treatment of content applies specifically to Internet Access Services. Appropriate exclusions and exceptions are part of Net Neutrality principles, to avoid the impact on the

innovation and on the ability of TSPs to manage their networks in a reasonable and efficient manner so as to optimise overall network performance and offer satisfactory quality of services to the users of a diverse variety of content. The provisions of specialised services are kept explicitly excluded from the principle of non-discrimination. Here, "Specialised services" mean services other than Internet Access Services that are optimised for specific content, protocols or user equipment, where the optimisation is necessary in order to meet specific quality of service requirements. CDNs are also not included within the scope of any restrictions on non-discriminatory treatment. Further, any reasonable measures adopted by the Licensee that are proportionate, transient, and transparent in nature, are also permitted under the Net Neutrality principle.

2.18 In the view of above, the net neutrality principles adopted by DoT are technology neutral. Net Neutrality principles will apply without a consequence to 5G technology, in the same way it applies to earlier 2G, 3G and 4G technologies. During the consultation process, no concrete example was given by stakeholders where the implementation of 5G technology would be impeded by the net neutrality principles. Therefore, the Authority concludes that there is no need to reconsider the principles on Net Neutrality for the policies and standards of technologies like 5G.

CHAPTER 3
COMPOSITION, FUNCTIONS, ROLES AND RESPONSIBILITIES OF MULTI-STAKEHOLDER BODY

A. ***Role of Multi-Stakeholder Body***

3.1 As discussed in para 1.1, DoT decided that the proposed MSB should have an advisory role, and the monitoring and enforcement functions for net neutrality shall rest with DoT. Accordingly, under this framework, DoT shall handle the enforcement of net neutrality principles, complaints registered by consumers, and conflicts arise among stakeholders of the internet ecosystem. In performing the above tasks, as an advisory body, the Multi-Stakeholder Body (MSB) may help DoT. MSB may give advice to DoT regarding monitoring and enforcement of net neutrality principles. MSB may also be responsible to provide support to DoT in monitoring and enforcement of net neutrality principles and submit requisite reports to DoT based on monitoring and investigations.

3.2 In view of the above, the Authority is of view that the role of the MSB shall be to provide advice and support to DoT in the monitoring and enforcement of net neutrality principles.

B. ***Composition of the Multi-Stakeholder Body***

3.3 For an industry-led Multi-Stakeholder Body, the role of Internet Access Service Providers and representatives from the research, academic, and technical community may be crucial. The Multi-Stakeholder Body may need to be committed to working with others to find solutions to the challenges related to net neutrality. Also, for the well-being of small and large content providers in the decisions regarding net neutrality, they may be part of the MSB. Civil society organizations may also be the part of MSB as they engage

in advocating the public's rights and wishes of the people, including but not limited to health, environment, and economic rights. They fulfil the important duties of checks and balances in democracies, they are able to influence the government, and hold it accountable. Further, some consumer representatives must be a member of MSB for voicing the concerns of consumers.

3.4 Earlier the Authority recommended that the Multi-Stakeholder Body (not for profit, industry-led) may comprise members representing:

a) The private sector, i.e., different categories of TSPs and ISPs
b) Large and small content providers
c) Representatives from research, academic and technical community
d) Civil society organisations
e) Consumer representatives

3.5 As discussed in para 2.14, the problem of inaccuracy and false positives of net neutrality violation could arise if the monitoring mechanism relied too heavily on user complaints. This problem may be resolved when the MSB formed by consists of all licensed and non-licensed stakeholders.

3.6 As mentioned in para 2.6, most of the stakeholders proposed that since MSB would have an advisory role, it would be not for profit and led by industry. It can comprise members representing different categories of TSPs, ISPs, VNOs, Large and small content providers, academics, researchers, civil society organizations, and consumer representatives. In addition to the above mentioned composition, it may consist of standards organization, representatives of DoT, MeitY, MHA, MoRTH, MoHUA, Agriculture and Health ministries, and individual consumer representatives.

3.7 In the view of above, the Authority is of view that the MSB shall comprise of all TSPs and ISPs (license holders) and other stakeholders such as the content providers; researcher, academic and technical community; civil

society organisations; consumers; and the government.

C. *Initial setup of the multi-stakeholder body*

3.8 **Stakeholders' comments on the formation of Multi-stakeholder Body**

As mentioned in para 2.8, stakeholders had different views on the policy to be adopted for initial setup. From the mentioned policy most of the stakeholders opined that the Multi-Stakeholder body may be set up by the Government. The Government may identify and recognize an existing not for profit industry body and approve its memorandum and by-laws. Another proposal was that DoT may initiate the creation of the MSB through a notification. Given the lack of statutory authority, a government notification will provide legitimacy and legal basis to the MSB. Regarding funding for the MSB, most of the stakeholders opined that arrangement of funds for initial set up including infrastructure and expert consultations may be undertaken by DoT or TRAI or Govt. of India. While one stakeholder suggested that funding of the administrative and monitoring expenditure may be managed by the founding members themselves.

On the issue of governance structure as discussed in para 2.10, some stakeholders suggested that the governance structure may be in line with the governance requirement for a non-profit organization as per Companies Act, 2013, and Societies Registration Act, 1860. Most of the stakeholders opined that the governance structure may be two or three tiered.

3.9 **Approaches adopted in other domains:**

a) There are some industry bodies where Government bodies were involved in initial drafting like TSDSI, EU framework related to Cloud, etc. In Europe, Directorate-General of the European Commission established the Cloud Select Industry Group (C-SIG) with representatives from the major European and multinational companies and organisations with

significant involvement in cloud computing to provide independent validations, and advise on proposals related to cloud computing being considered by the European Commission.

b) Earlier initiatives of the DoT to form an industry-led body: Earlier, DoT has formed Telecommunications Standards Development Society, India, (TSDSI),[6] in reference to standard development space. Before it came into its present form, the Indian Telecom Industry, comprising operators, manufacturers, academia, and R&D organizations, came together to form the Telecommunications Standards Development Society, India (TSDSI), on 7th January 2014. TSDSI is an autonomous, membership-based, standards development organization (SDO) for Telecom/ICT products and services in India. Department of Telecommunications and Ministry of Electronics and Information Technology, and Government of India are jointly supporting TSDSI as India's Telecom/ICT SDO. TSDSI is registered as a not-for-profit society, under the Indian Societies Registration Act XXI of 1860. General Body is the apex decision-making body. The Governing Council steers and governs TSDSI in intervals between General Body meetings. Members of TSDSI form separate Standing Committees for performing its functions. Standing Committees perform their functions through study groups and working groups with members of the body.

3.10 In view of the above, the Authority is of view that the Multi Stakeholder Body (MSB) may be registered under the Societies Registration Act, 1860. As per the license agreements of DoT, various service providers are providing internet services under UL, VNO license, UASL, and CMTS licensees. Formation of the MSB may be initiated by registering all the licensee registering licensed service providers. Meanwhile, DoT may invite

[6] https://tsdsi.in/about/

other stakeholders suggested in para 3.7 to become members of the MSB.

D. ***Responsibilities and functions of the Multi-Stakeholder Body***

3.11 Few responsibilities of a multi-stakeholder body as suggested by some stakeholders are discussed in para 2.7. These may include assisting DoT in its monitoring and enforcement functions, formulation of audit systems and their regular updating, proposing technical standards and methodologies and on matters pertaining to the best practices to be adopted for TMPs. A few stakeholders proposed that responsibilities of MSB may be divided into two or three parts. MSB may have TSP centric sub-body for handling work related to TMPs, customer centric sub-body for handling the complaints conducting investigations and separate DoT centric sub-body to act as an interface between industry and Government in providing two-way inputs/requirements of the sector in the given domain.

3.12 **Approaches adopted in other jurisdictions for monitoring:** Most of the national regulators of the countries in Europe follow the EU regulations and BEREC guidelines. BEREC has proposed two basic measurement approaches[7], first measurement campaigns using measurement systems with dedicated clients and servers in a controlled environment, and second crowd sourced measurement campaigns relying on end user-initiated measurements using end user equipment. Application specific measurements may help in measurement of practices like port blocking, DNS manipulations and other practices that impact QoS of individual applications such as web browsing, video/audio streaming, intermediary proxy deployment, etc. Measurement tool configuration based on IETF document RFC 7594[8] (LMAP framework) may be used for test setup for

[7] BEREC paper on Net Neutrality Regulatory Assessment Methodology dated 5th October 2017, BoR(17)178

[8] RFC 7594, a framework for Large-Scale Measurement of Broadband Performance (LMAP), talks about the overall framework for large-scale measurements of broadband services including description of the logical architecture and standardization of key protocols that coordinate interactions between the components. Subsequently, in

monitoring TMPs[9]. It is observed that crowd-sourced measurement approaches are preferred for collection of data, as setup of a measurement system on a large scale may require special arrangements. However, for in-browser or app-based crowd-sourced measurement tools, it is hard to have full control over all the factors that impact measurement results. For crowd-sourced measurement approaches, more effective steps may be required to be taken since the conditions at the client side cannot be controlled. Generally, it is unknown whether the client environment fulfils the requirements for an accurate measurement. In France, Arcep has made a detection tool called Wehe available to the general public since November 2018. Wehe[10] is an open source testing tool developed by North-eastern University that compares the time it takes for traffic generated by certain services to be relayed. Countries such as Croatia[11] (HAKOMetar and HAKOMetar Plus), Cyprus[12] (cyNettest), Czech Republic[13] (NetMetr) and Slovakia[14] (MobilTest) use applications to detect violations of net neutrality principles. In some of the jurisdictions like Austria, Germany, Norway and Belgian, they conduct surveys to check compliance of ISPs with the TMP Regulations. In the UK, Ofcom uses a multi-pronged approach to measure the availability of high-quality IAS delivered over fixed and mobile networks in the UK[15]. It includes monitoring consumer complaints, conducting market surveys, requesting information from ISPs, and technical network

August 2017, Internet Engineering Task Force (IETF) nalized document RFC 8193 on Information Model for LMAP. The purpose of such an Information model is to provide a protocol and device independent view of the Measurement Agent (MA). Implementation of such information model can be found in RFC 8194 Yang Data Model for LMAP.

[9] BEREC paper on Net neutrality measurement tool specification dated 5th October 2017, BoR(17) 179.

[10] https://dd.meddle.mobi/index.html

[11] https://ec.europa.eu/newsroom/dae/document.cfm?doc_id=68272

[12] https://ec.europa.eu/newsroom/dae/document.cfm?doc_id=68282

[13] https://ec.europa.eu/newsroom/dae/document.cfm?doc_id=68273

[14] https://ec.europa.eu/newsroom/dae/document.cfm?doc_id=68298

[15] Ofcom - Annual Report on Net Neutrality for 2017 and 2018 in compliance with EU regulations and BEREC guidelines

monitoring.

3.13 For monitoring the violation of net neutrality principles by IAS providers, various approaches such as Crowd-sourced Measurements, Field Measurements, and Audit of traffic management practices are being adopted in other jurisdictions. In this regard, various suggestions are made by stakeholders during the consultation process. Responses of the stakeholders are discussed in para 2.5. In view of the above, the Authority is of the view that DoT may consider the following measures for monitoring and detecting the violation of net neutrality:

a) Probe and collect samples in a controlled environment in the field

b) Mandatory audit of processes and networks of Service Providers

c) Investigation based on complaints or reports

d) Crowdsourced measures such as developing applications for end users to test the discriminatory treatment of Content by Service Providers.

3.14 **Responsibilities and Functions of Multi-Stakeholder Body:**

In consideration of the decision of DoT on the framework of monitoring and enforcement, the monitoring and enforcement functions of net neutrality shall rest with DoT. The Multi-Stakeholder Body shall have an advisory role; therefore, functions of this body may be to help DoT in performing monitoring and enforcement with respect to net neutrality and to provide appropriate advice in this regard.

3.15 As discussed in para 2.7 and 3.11 above, during the consultation process, some stakeholders proposed a few responsibilities and functions of MSB. The responsibilities of the MSB includes assisting DoT in its monitoring and enforcement functions, proposing technical standards and methodologies on matters pertaining to best practices to be adopted for TMPs, handling the work related to TMPs, handling the complaints by conducting

investigations. To discharge the above cited responsibilities, MSB may need to perform various functions such as preparing technical standards and defining methodologies in matters pertaining to net neutrality. It may include standards for enhancing the QoS experience, convening and promoting research on TMPs, transparent enforcement measures and collecting, organizing, and disseminating the information related to the performance of Service Providers. Other proposed functions of MSB may be to prepare and submit reports to DoT, perform evidence-based investigation, help DoT in compilation of TMPs, making standard disclosure format for TMPs, recommend standards and procedures for monitoring and enforcement, transparency measures and processes for raising concerns.

3.16 MSB may help DoT in creation of reasonable TMPs (framework for compilation of TMPs adopted by IAS providers in their networks, and the responsibilities of MSB under this framework is discussed in detail in Chapter 4 of this document). Accordingly, for discharging its responsibility regarding creation, maintenance, and publication of the repository of TMPs, MSB may conduct consultation among its members regarding any concerns of TMPs and seek and capture their comments during the consultation process. TMPs submitted by IAS providers may have duplication or more clarification may be required from an end user's perspective, therefore, the body may also perform the tasks of compilation and harmonisation of TMPs for the approval of DoT. With time, the underline technology may get changed or the description of TMP might become insufficient to describe its impact on end users, therefore, the body may conduct periodic reviews of listed TMPs in Repository of TMPs and submit reports to DoT. Any report submitted by IAS providers regarding the framework mentioned in Chapter 4 or any other as sought by DoT related to net neutrality. Such reports may also be reviewed by MSB and submit the outcome to the DoT.

3.17 In view of the above, **the Authority recommends that the DoT may establish a multi-stakeholder body (MSB) to ensure that Internet**

Access Providers adhere to the provisions of net neutrality in their license.

a) **The role of the MSB shall be to provide advice and support to DoT in the monitoring and enforcement of net neutrality principles.**

b) **The MSB shall comprise all TSPs and ISPs (license holders) and other stakeholders such as the content providers; researcher, academic and technical community; civil society organisations; consumers; and the government.**

c) **The MSB may be set up by DoT as a non-profit entity under the Societies Registration Act, 1860. It may start by registering all licensed service providers (UL, VNO license, UASL, and CMTS licensees) as mandatory members, and further invite and/or nominate other stakeholders to become its members (from among groups mentioned in para (b) above).**

d) **The MSB may further modify or define its structure and procedures with the approval of the DoT.**

e) **To fulfil its role, the Multi-Stakeholder body may be required to discharge the following responsibilities:**

   i. **to provide support to DoT in creating and maintaining the Repository of TMPs.**

   ii. **to investigate complaints regarding the violation of net neutrality that it receives from its members or members of the public, or such references that are made to it by the DoT or the TRAI.**

   iii. **to submit reports to DoT, with a copy to TRAI, based on monitoring of internet services, investigations of incidents,**

and review of reports submitted by its members.

iv. **to recommend suitable technical standards and methodologies on matters pertaining to best practices to be adopted for TMPs.**

v. **Any other responsibility assigned by DoT related to monitoring and enforcement of net neutrality.**

f) The Multi-Stakeholder body may perform the following functions:

i. **Seek comments of members on the list of TMP submitted by IAS Providers and compile them;**

ii. **Perform the tasks of compilation and harmonisation of TMPs for the approval of DoT;**

iii. **Maintain and publish the repository of TMPs;**

iv. **Periodically review the TMPs listed in Repository of TMPs;**

v. **Periodically review the reports on the application of TMPs submitted by IAS Providers to itself and to the DoT;**

vi. **Prepare technical standards and define methodologies in matters pertaining to net neutrality;**

vii. **Perform any other tasks assigned by DoT related to Net Neutrality.**

CHAPTER 4
FRAMEWORK FOR COMPILATION OF THE TRAFFIC MANAGEMENT PRACTICES (TMPs)

A. Necessary Traffic Management Practices (TMPs)

4.1 The fundamental feature of the Internet is that it operates on a "best effort" basis. Allowing TSPs to deploy reasonable traffic management practices is necessary for delivering IP traffic on best efforts, which is essential to the design of the Internet. This means that the TSPs do not guarantee either the delivery or the time of delivery of each data packet transmitted over the Internet. There may be circumstances or reasons that can force Service Providers to take special measures regarding traffic management. During the consultation process, most of the stakeholders cited the following broad type of traffic management practices deployed to manage traffic:

a) *Network Management:* Management of congestion; prioritization of network management practices; peak load management; packet scheduling in radio and core network; deep packet inspection; safeguarding the security and integrity of its network through restricting connectivity or blocking of traffic to and from specific endpoints among others.

b) *Fair Usage Policy:* differentiating between voice/data services to prioritize voice over data and manage bandwidth for voice efficiently; deploying content filtering or making available content filtering tools where appropriate for public Wi-Fi access; for IoT/M2M services and applications.

c) *Govt orders or Emergency situations:* Lawful restrictions directed to be imposed by the Government/ Legal court orders/Lawful Enforcement agencies; Prioritization for communications for emergency and disaster

management services.

d) *Policies adopted with consent of customers:* Implementing data caps that have been accepted by the end user as part of their Internet data plan (Tariff Plans); Ensuring elements of a consumer's contract can be applied (e.g. data caps, download limits, heavy user policy); Enterprise access service; Managing Business to Business / Enterprise Services based on specific Service Level Agreements and contracts.

4.2 TMPs are linked with the QoS provided by TSPs, and sometimes it becomes difficult for TSPs to maintain minimum agreed on QoS to customers without applying appropriate TMPs. TMPs may be defined[16] based on impact on applications, end-user experience, techniques used to affect performance of applications, etc. For example, category of practices that affect the connectivity and reachability of individual applications, such as blocking ports using transport protocol (TCP or UDP), blocking IP address, manipulation of specific DNS-requests, etc., or, category of practices that impact QoS of individual applications such as prioritization and/or throttling of specific applications.

4.3 **Challenges of listing necessary Traffic Management Practices**

a) *Determination of Reasonableness:* Principle of non-discriminatory treatment doesn't restrict adoption of traffic management practices by the service providers. However, such traffic management practices are open to question for conformance to the basic requirements of reasonableness, which means the restrictions or interventions by service providers must be proportionate, transient, and transparent. Identification of traffic management practices adopted by TSPs and validation of its reasonableness may be a complex issue, and various technical and measurement challenges may be associated with it. Any

[16] BEREC paper on Net Neutrality Regulatory Assessment Methodology dated 5th October 2017, BoR(17)

traffic management practice must only be applied to handle concerned exceptional circumstances and not for any commercial considerations. It is well known that technologies in telecommunications are changing at a fast pace. So, technical measures of proportionate, temporary or transient nature to deal with such unexpected issues of networks cannot be static, and sometimes may only be known by experience. For similar problems, the reasonable measures may be different in case of different technologies, such as time needed to resolve congestion or throttling of some categories of traffic, which may be different in UMTS (3G) networks as compared to LTE (4G) networks. Therefore, there may be a requirement to continuously observe the measures taken by service providers for traffic management.

b) *Dynamic in nature:* ICT networks remain in a state of flux because network functions have become virtualized, new services are being added, segregated, or discontinued continually, while unknown devices or applications are constantly connecting or disconnecting. The performance of broadband service may also get impacted due to actions of other stakeholders, such as content providers, VPN network providers, and end-user environments. Change in technology may further change the circumstances of adopting any traffic management measure. Any such measures to deal with unexpected issues of networks, which are continuously evolving, cannot be static. It is dynamic and its nature may only be known by experience. Therefore, the compilation of such treatments or practices for traffic management would require review from time to time.

4.4 Currently, there might be several Traffic Management Practices (TMPs), which are developed and deployed in the networks for different requirements. Some of these may be of concern from a Net Neutrality perspective and ought to be deprecated, while some other TMPs may be necessary in specific situations. However, such TMPs must be applied in

a proportionate and transient manner. To monitor and enforce net neutrality principles in an objective and transparent manner, it is required to list out reasonable TMPs and conditions when these may be applied. Keeping in view the continual changes in features and capabilities of networks' services, it might not be feasible to make an exhaustive list containing complete technical details. Technical nature and characteristics of TMP might be implementation specific. To keep pace, there is a need to have a framework to prepare a list of reasonable TMPs. The framework may also be responsible for developing technical documents that should capture enough details so that the interpretation of traffic management practices may be done in an objective manner.

4.5 Keeping in view the continuously evolving features and capabilities of networks and services, it is not feasible to make an exhaustive list of traffic management practices. Therefore, the Authority is of view that DoT may define a process for creation and maintenance of a repository of reasonable TMPs (Traffic Management Practices). This work may be managed with the help of the MSB.

B. Repository for Traffic Management Practices (TMPs)

4.6 As discussed in para 2.3 of chapter 2, stakeholders suggested a framework for compilation of traffic management practices (TMP), and a mechanism to keep the list of TMPs up to date. Accordingly, Service providers may maintain a record of all adopted practices for traffic management in-house. All TMPs adopted by TSPs for their operations will be part of this record, with requisite details. As soon as conditions warranting their use are over, the TMPs would be removed and such record maintained. DoT may ask service providers to submit a detailed record of applications of all TMPs. This record may have time, geographical area and justification of reasonableness for the TMPs mentioned by service providers. This record

may include the evidence of the proportionality and transient application of TMPs. DoT will review such records of service providers and grounds of reasonableness. To maintain uniformity in Record of TMPs published by TSPs in public domain, requisite formats, for compilation of TMPs and maintaining verifiable logs of application of such TMPs, may be prescribed by DoT with the advice of Multi-Stakeholder Body (MSB).

4.7 For compilation of traffic management practices used by TSPs, one approach may be to first identify such practices and then define the extent of proportionality and transience which may be considered reasonable under the principle of non-discriminatory treatment. It may be required to develop a technical document for TMPs after assessment of measures taken by TSPs for traffic management over a period. Frequent update of such technical documents may also be essential, with the change in technologies and services, because outdated meaning of traffic management practices may create confusion for Service Providers, customers and other decision makers. However, identification of such dynamic traffic management practices, and methodology, for checking its reasonableness, proportionality, and transient nature, may require involvement of various stakeholders like representatives from ISPs, content providers, research and academia, etc. So, this may require establishing a system to periodically review and compile the practices, which may be established using different models.

4.8 Transparency regarding traffic management practices adopted by TSPs can be a critical factor in ensuring adherence to the principles of non-discrimination. Transparency by TSPs also enables regulators and other stakeholders in the ecosystem to detect any violations and monitor the QoS available to users. Reviewing the traffic management practices adopted in other jurisdictions reveals disclosure obligations imposed by other regulators. In the UK, Ofcom has imposed obligations on providers to explain their approach in managing internet traffic in customer's

contracts. They must also publish this information. Providers are required to inform their customers about their traffic management policy and its effect on the quality of customers internet service[17]. Broadly, disclosures are of three types - direct disclosure from service providers, precise, and relevant information directly from service providers to its consumers, and disclosure to the public. Such disclosures give transparency to the traffic management practices adopted by internet access service providers.

4.9 As mentioned in para 2.4 of Chapter 2, some stakeholders suggested details which may be considered while preparing the format for compilation of TMPs, as reproduced below:

a) *Description of TMP from the end user's perspective:* name and short description is sufficient. The information may be provided in an easy to understand and accessible manner. It should clearly specify the requirement of TMP, whether the practice will affect the users, which applications will be affected and how, impact based on network performance. A comparable disclosure of different service packages may be considered in description.

b) *Detailed Technical Description of TMP:* For analysing the compliance of Net Neutrality Principles, detailed description is necessary as the impact of TMPs cannot be interpreted from its name. TSPs/ISPs should be mandated to provide information that clearly demonstrates that TMP solutions being implemented by them are proportional. Detailed technical disclosures that can be made available on that Access Service Provider/ISP's website. The detailed description may include details about the list of deployed TMPs, timings when deployed, the nature (whether it is throttling, technical prioritization and/or blocking), the degree, the grounds, the conditions and justification of reasonableness. The description may cover guiding principles, i.e., network practice

[17] https://www.ofcom.org.uk/phones-telecoms-and-internet/advice-for-consumers/advice/net-neutrality

(e.g., congestion management, device attachment rules etc.), performance characteristics (e.g. service description, performance level, impact of specialized services etc.,), commercial terms (pricing, privacy etc.,) and specify the requirement of TMP.

4.10 **Inputs from other jurisdictions:** In Europe, Body of European Regulators for Electronic Communications (BEREC) has released new "*BEREC Guidelines on the Implementation of the Open Internet Regulation*[18] on 11th June 2020. These BEREC Guidelines are drafted in accordance with Article 5(3) of the EU Regulation[19] and designed to provide guidance to the National Regulatory Authorities (NRAs) on the implementation of the obligations of EU's open internet regulation. Regulation imposes responsibility on NRAs to closely monitor and ensure compliance with the rules to safeguard equal and non-discriminatory treatment of traffic in the provision of internet access services and related end-users' rights. New BEREC guidelines suggest a list of details that NRAs can seek and check for assessing whether an ISP complies with the principle of equal treatment. EU regulations also have exemptions for reasonable traffic management measures adopted by TMPs. But, as per regulations, for a traffic management measure to be reasonable, it needs to be transparent, non-discriminatory and proportionate. New BEREC guideline suggests the following details that NRAs may consider during their assessments.

a) When considering whether a traffic management measure is proportionate, NRAs should consider the following:

   i. There has to be a legitimate aim for this measure, namely contributing to an efficient use of network resources and to an optimisation of overall transmission quality;

[18] https://berec.europa.eu/eng/document_register/subject_matter/berec/download/0/9277-berec-guidelines-on-the-implementation-o_0.pdf

[19] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32015R2120

ii. The traffic management measure has to be suitable, necessary to achieve this aim (with a requirement of evidence to show it has that effect, and that it is not manifestly inappropriate);

iii. There is not a less interfering and equally effective alternative way of managing traffic to achieve this aim (e.g. equal treatment without categories of traffic) with the available network resources;

iv. The traffic management measure has to be appropriate, e.g. to balance the competing requirements of different traffic categories or competing interests of different groups.

b) NRAs should require ISPs to provide transparent information about traffic management practices and the impact of these practices. Article 4(1) of the guidelines have transparency measures for ensuring open internet access. NRAs should ensure that ISPs providing Internet Access Services to all end-users (e.g. consumer and business customer end-users) include relevant information.

c) Information in a clear, comprehensible and comprehensive manner in contracts that include IAS, and publish that information, for example on an ISP's website. NRAs should look to ensure that ISPs adhere to the following practices in order to ensure that information is clear and comprehensible:

i. it should be easily accessible and identifiable for what it is;

ii. it should be accurate and up to date;

iii. it should be meaningful to end-users, i.e. relevant, unambiguous and presented in a useful manner;

iv. it should not create an incorrect perception of the service provided to the end-user;

v. it should be comparable at least between different offers, but preferably also between different ISPs, so that the end-users are able to compare the offers (including the contractual terms used by different ISPs) and ISPs in such a way that the comparison can show differences and similarities.

d) NRAs should ensure that ISPs include in the contract and publish a clear and comprehensive explanation of traffic management measures applied, including the following information:

i. how the measures might affect the end-user experience in general and with regard to specific applications (e.g., where specific categories of traffic are treated differently). Practical examples should be used for this purpose. In particular, the following information should be provided by the ISP:

i. the download and upload limits that apply to the IAS selected by the end-user, the traffic management used to manage compliance with download limits, and the circumstances under which these apply.

ii. the circumstances and manner under which traffic management measures possibly having an impact.

iii. how the measures might affect QoS of the IAS, particularly in cases of network congestion and also in relation to other internet access services with different QoS parameters where multiple internet access services with different QoS parameters are offered by the ISP.

iv. any measures applied when managing traffic which uses personal data, the types of personal data used, and how ISPs ensure the privacy of end-users and protect their personal data when

managing traffic.

e) According to Article 5(1) of the guidelines, NRAs shall publish annual reports on their monitoring and findings, and provide those reports to the Commission and to BEREC. BEREC recommends mandatory details such as overall description of the national situation regarding compliance with the Regulation, description of the monitoring activities carried out, results of surveys conducted, etc., to be included in the annual reports. For this, NRAs may request from ISPs information relevant to the obligations set out in the guidelines.

4.11 As per the Net Neutrality principles adopted by DoT, reasonable traffic management practices and certain other legitimate purposes are regarded as exceptions. However, any such exceptions would need to conform with the basic requirements of reasonableness, i.e. the restrictions or interventions must be proportionate, transient and transparent in nature. Reference to inputs mentioned in para 4.10, to assess the reasonableness of the traffic management practices, the framework for compilation of necessary TMPs may include the following provisions:

a) ***Assessment of Transparency:*** IAS providers may provide sufficient information to end users in a clear, comprehensible and comprehensive manner in contracts, and also publish that information, for example on their websites. End users may also be informed about the impacts of applying the TMPs on end users. It may include the following:

i. Impact on the end user experience in general and on users from non-affected area who is trying to reach the user in affected area

ii. Impact on specific services for the users in affected or non-affected areas such as QoS Parameters (Speed, Delay, Delay variation (jitter), Packet loss), availability of internet access

services, services other than internet access services to which consumers subscribe

iii. Impact on type of traffic such as P2P, VOIP, Audio streaming, Video streaming, Instant messaging etc.

b) ***Assessment of Proportionality:*** IAS providers may provide details and justifications for application of any traffic management practice in their networks. In this regard, they may maintain records of:

i. Legitimate aim for this measure (for example: contributing to an efficient use of network resources, contributing to an optimisation of overall transmission quality, etc.)

ii. How the traffic management measure was suitable to achieve this aim (with a requirement of evidence to show it has that effect and that it is not manifestly inappropriate)

iii. Whether the traffic management measure was necessary to achieve this aim? (with a requirement of evidence to show it)

iv. Whether no less interfering and equally effective alternative way of managing traffic exists to achieve this aim (e.g. equal treatment without categories of traffic) with the available network resources. (with a requirement of evidence to show it)

v. The traffic management measure was appropriate, e.g. to balance the competing requirements of different traffic categories or competing interests of different groups.

c) ***Assessment of Transient nature:*** A TMP should be imposed only until the problem persists. The details regarding the duration of circumstances and the duration of measures (TMP) applied to handle such circumstances may provide a reasonable justification that the

particular TMP deployed by IAS providers was transient in nature.

4.12 As discussed in the above paragraphs, the framework to prepare and maintain a list of necessary TMPs may need IAS providers to maintain records of TMPs adopted in their networks and records of application of such TMPs. For the uniformity of records maintained by all IAS providers and information published on public domain for maintaining transparency about their measures, DoT may prescribe some frameworks, in this regard, the following details may be considered while preparing the following formats:

a) Compilation of reasonable TMPs: Title, Reference number, Description from end user perspective, Detailed Technical Description, Circumstances under which the TMP is applicable, Impact on end user experience in general and on user from non-affected area who is trying to reach the user in the affected area, impact on specific services for the users in affected or non-affected areas such as QoS Parameters (Speed, Delay, Delay variation (jitter), Packet loss), availability of internet access services, services other than internet access services to which consumers subscribe, impact on end-user experience with regard to specific applications, impact on type of traffic such as P2P, Gaming, Browsing/emails, VOIP, Audio streaming, Video streaming, Instant messaging, etc., and FAQs for end users to understand its purpose and impact.

b) Records for maintaining verifiable logs regarding application of TMPs: Title, Reference number, Circumstances which compelled the access provider to apply a particular or set of TMPs, Duration of such circumstances (in hrs), Duration of TMP (in hrs), Geographical Area affected, No. of end users affected, Date of publication of this TMP in "Repository of TMP", Details for assessment of proportionality as mentioned in para 4.11, Mode of communication to inform users at the

beginning or immediately after applying it or at the end, etc.

4.13 As per the framework suggested by stakeholders in para 2.3, DoT may maintain and publish a refined list of TMPs adopted by all TSPs having those TMPs that are found reasonable after the process of review. DoT may take the help of MSB for reviewing the records of TMPs. One stakeholder submitted that MSB should review the record TMPs submitted by TSPs or ISPs and prepare a repository of necessary TMPs and submit the same to DoT for its approval. Upon approval by DoT, MSB should publish this repository. It is also suggested by the stakeholder that TSP should be allowed to make use of TMPs which is not included in the approved list of reasonable TMPs, after intimation to DoT. Accordingly, for creation of a repository of necessary and reasonable Traffic Management Practices (TMPs), DoT may prescribe a process where IAS providers will submit the list of TMPs maintained, in house, with definition and description to DoT as discussed in para 4.6 and 4.12 of this document. DoT will set up a repository, where list of TMPs submitted by IAS providers will be recorded in a provisional list and based on the decision of DoT regarding reasonableness, it will be moved to approved or rejected lists. As discussed in Chapter 3, MSB may help DoT in creation, maintenance and publication of Repository of TMPs. For convenience of the end user, the Repository of TMPs may be published by IAS providers, MSB and DoT, and impact of TMPs may also be informed to the affected users through other means e.g., in contracts, as mentioned in para 4.10(c) or through SMS or Apps etc. However, it may have some exemption like TMP is applied for a brief period and very transient in nature or Govt prohibited for publication of information about implementation of any TMP or blocking due to security reasons. For transparency in using TMPs, IAS providers may only be allowed to use TMPs declared by them and recorded in the Repository of TMPs. They may also be required to maintain verifiable logs to application of TMPs and submit a report to DoT. Europe's BEREC guidelines for the

National Regulatory Authorities discussed in para 4.10 (e) suggests annual reporting related to TMPs, similarly, IAS providers may also submit reports on application of TMPs to DoT, on an annual basis.

4.14 In the view of above, **the Authority recommends that the DoT may define the process for creation and maintenance of a repository of reasonable TMPs (Traffic Management Practices). This work shall be managed with the help of the MSB. The process may include following:**

a) The Internet Access Providers shall submit, to both the DoT and the MSB, the TMPs that it employs for managing their networks. This list may be added to the provisional Repository of TMPs, specific to each provider.

b) The definition and descriptions of each TMP submitted by the IAS shall include the following details:

i. Title of TMP and Reference number,

ii. Circumstances and manner in which it would be applied,

iii. Description of how it functions (Detailed Technical Description),

iv. Description and Explanation - how it would impact different services used by users,

v. Impact on the users in affected or non-affected areas

vi. Description and FAQs for end user to understand its purpose and impact,

c) MSB may seek the comments of members on each TMP submitted by IAS, compile the comments, harmonise similar TMPs and their description from the end-user perspective, and submit a compiled

list of TMPs along with the comments to DoT for the approval.

d) Such TMPs that are approved by the DoT may be moved to the List of Approved TMPs and others that are rejected may be moved to the List of Rejected TMPs in the Repository of TMPs

e) IAS providers shall only be permitted to apply, in their networks, the Approved or Provisional TMPs, listed in the Repository of TMPs.

f) The IAS Providers and MSB shall publish the Repository of TMPs on their website. DoT may also publish this Repository, if it so chooses.

4.15 **The Authority also recommends that The DoT may frame a policy for IAS Providers to inform affected users (including those that may have been potentially affected) regarding the impact of applied TMPs.**

a) Such information may be provided before or immediately after applying the TMPs and/or at the end of the period of application.

b) The TMPs applied for very brief periods, as prescribed by the DoT, may be exempted from this requirement.

c) The TMPs applied due to any order of a court or direction issued by the Government and prohibited to publish information, may be exempted from this requirement.

4.16 **The Authority further recommends that The DoT may require the IAS providers to maintain complete and accurate records of instances of application of TMPs for future reference with at least the following details:**

a) The situation and circumstances that compelled the access provider to apply a particular set of TMPs.

b) **Geographical area and start and end timings when the TMPs were in effect, and any further information necessary to justify that the actions were proportional and were operative only for the minimum period of time.**

c) **How the potentially affected users were informed at the beginning or immediately after applying the TMPs and/or at the end of the period of application as per DoT policy mentioned in para 4.15 above.**

4.17 **The Authority recommends that the DoT may require the MSB to collate information provided by the IAS Providers shall submit a report on application of TMPs annually to DoT.**

CHAPTER 5

SUMMARY OF RECOMMENDATIONS

The Authority makes the following recommendations:

5.1 The DoT may establish a multi-stakeholder body (MSB) to ensure that Internet Access Providers adhere to the provisions of net neutrality in their license.

a. The role of the MSB shall be to provide advice and support to DoT in the monitoring and enforcement of net neutrality principles.

b. The MSB shall comprise all TSPs and ISPs (license holders) and other stakeholders such as the content providers; researcher, academic and technical community; civil society organisations; consumers; and the government.

c. The MSB may be set up by DoT as a non-profit entity under the Societies Registration Act, 1860. It may start by registering all licensed service providers (UL, VNO license, UASL, and CMTS licensees) as mandatory members, and further invite and/or nominate other stakeholders to become its members (from among groups mentioned in para (b) above).

d. The MSB may further modify or define its structure and procedures with the approval of the DoT.

e. To fulfil its role, the Multi-Stakeholder body may be required to discharge the following responsibilities:

   i. to provide support to DoT in creating and maintaining the Repository of TMPs.

   ii. to investigate complaints regarding the violation of net neutrality that it receives from its members or members of the public, or such references that are made to it by the DoT or the TRAI.

iii. to submit reports to DoT, with a copy to TRAI, based on monitoring of internet services, investigations of incidents, and review of reports submitted by its members.

iv. to recommend suitable technical standards and methodologies on matters pertaining to best practices to be adopted for TMPs.

v. Any other responsibility assigned by DoT related to monitoring and enforcement of net neutrality.

f. The Multi-Stakeholder body may perform the following functions:

i. Seek comments of members on the list of TMP submitted by IAS Providers and compile them;

ii. Perform the tasks of compilation and harmonisation of TMPs for the approval of DoT;

iii. Maintain and publish the repository of TMPs;

iv. Periodically review the TMPs listed in Repository of TMPs;

v. Periodically review the reports on the application of TMPs submitted by IAS Providers to itself and to the DoT;

vi. Prepare technical standards and define methodologies in matters pertaining to net neutrality;

vii. Perform any other tasks assigned by DoT related to Net Neutrality.

5.2 The DoT may define the process for creation and maintenance of a repository of reasonable TMPs (Traffic Management Practices). This work shall be managed with the help of the MSB. The process may include the following:

a. The Internet Access Providers shall submit, to both the DoT and the MSB, the TMPs that it employs for managing their networks. This list may be added to the provisional Repository of TMPs, specific to each provider.

b. The definition and descriptions of each TMP submitted by the IAS shall include the following details:

   i. Title of TMP and Reference number,

   ii. Circumstances and manner in which it would be applied,

   iii. Description of how it functions (Detailed Technical Description),

   iv. Description and Explanation - how it would impact different services used by users,

   v. Impact on the users in affected or non-affected areas

   vi. Description and FAQs for end user to understand its purpose and impact,

c. MSB may seek the comments of members on each TMP submitted by IAS, compile the comments, harmonise similar TMPs and their description from the end-user perspective, and submit a compiled list of TMPs along with the comments to DoT for the approval.

d. Such TMPs that are approved by the DoT may be moved to the List of Approved TMPs and others that are rejected may be moved to the List of Rejected TMPs in the Repository of TMPs

e. IAS providers shall only be permitted to apply, in their networks, the Approved or Provisional TMPs, listed in the Repository of TMPs.

f. The IAS Providers and MSB shall publish the Repository of TMPs on their website. DoT may also publish this Repository, if it so chooses.

5.3 The DoT may frame a policy for IAS Providers to inform affected users

(including those that may have been potentially affected) regarding the impact of applied TMPs.

a. Such information may be provided before or immediately after applying the TMPs and/or at the end of the period of application.

b. The TMPs applied for very brief periods, as prescribed by the DoT, may be exempted from this requirement.

c. The TMPs applied due to any order of a court or direction issued by the Government and prohibited to publish information, may be exempted from this requirement.

5.4 The DoT may require the IAS providers to maintain complete and accurate records of instances of application of TMPs for future reference with at least the following details:

a. The situation and circumstances that compelled the access provider to apply a particular set of TMPs.

b. Geographical area and start and end timings when the TMPs were in effect, and any further information necessary to justify that the actions were proportional and were operative only for the minimum period of time.

c. How the potentially affected users were informed at the beginning or immediately after applying the TMPs and/or at the end of the period of application as per DoT policy mentioned in para 4.15 above.

5.5 The DoT may require the MSB to collate information provided by the IAS Providers shall submit a report on application of TMPs annually to DoT.

Annexure I (Chapter no. 1/Para no. 1.2)

DoT's Reference to TRAI for Recommendations

Government of India
Ministry of Communications
Department of Telecommunications
Networks & Technologies (NT) Cell
Sanchar Bhawan, 20, Ashoka Road, New Delhi.

No. 12-30/NT/2015/OTT (Pt) Dated: 31 July, 2018

To
The Secretary,
Telecom Regulatory Authority of India,
Mahanagar Doorsanchar Bhawan,
Jawaharlal Nehru Marg,
New Delhi-110 002

Sub: Seeking additional recommendations from TRAI on 'Net Neutrality'

Kind reference is invited towards D.O. letter no. 305-14/2014-QoS dated 28-11-2017 from TRAI vide which its recommendations titled 'Net Neutrality' were conveyed to DoT.

2. In this regard, I have been directed to state that above recommendations have been considered by the Government and it has been decided to seek additional recommendations from TRAI on some of the issues. The details are attached as Annexure-I.

3. TRAI is therefore requested to provide recommendations in accordance with the provisions of Section 11 of TRAI Act 1997, as amended in 2000.

Encl: As above

(Rajiv Sinha) 31/07/18
DDG (NT)

Annexure-I

Additional recommendations sought from TRAI on 'Net Neutrality'

I. *Recommendations on principle of non-discriminatory treatment, application, exclusions and exceptions:*

The recommendation of TRAI in Para 7.1 (iii) (b) (table) regarding Traffic Management Practices (TMPs) is as under:

'Reasonable traffic management practices, as may be further specified by TRAI from time to time'

Decision of DoT:

It has been decided that the necessary Traffic Management Practices (TMPs) will be formulated by DoT. Accordingly, it has been decided to make following amendment in licence agreements regarding TMPs:

'Reasonable traffic management practices, as may be specified from time to time'.

Additional Recommendation sought from TRAI:

It is requested to recommend necessary Traffic Management Practices (TMPs) for consideration of DoT.

II. *Recommendations on monitoring and enforcement:*

The recommendations of TRAI in para 7.5 are as below:

"Authority recommends that for monitoring and enforcement, DoT may establish a multi-stakeholder body with framework for collaborative mechanism among the stakeholders. The multistakeholder body, not for profit, led by industry may comprise members representing different categories of TSPs and ISPs, large and small content providers, representatives from research and academia, civil society organisations and consumer representatives. The terms, conditions and governance structure etc. would be recommended by TRAI once this recommendation is accepted by the Government in principle"

Decision of DoT:

It has been decided that the proposed multi-stakeholder body should have an advisory role. The monitoring and enforcement functions with respect to net neutrality shall rest with DoT.

Additional Recommendation sought from TRAI:

It is requested to recommend the composition, functions, role and responsibilities of the multi stake-holder body for consideration of DoT.

31/07/18

Annexure II (Chapter no. 1/Para no. 1.3)

Issues Raised in the Consultation Paper

Q.1. What are the broad types of practices currently deployed by the Access Providers (APs) to manage traffic? Out of these practices, which ones can be considered as reasonable from the perspective of Net Neutrality? Whether a list of Traffic Management Practices (TMPs) can be prepared in advance or it would be required to update it from time to time? If later is yes, then what framework would be required to be established by the Multi-Stakeholder Body to keep it up to date?

Q.2. Whether impact of TMPs on consumer's experience can be interpreted from its name and short description about it or detailed technical description would be required to interpret it in an objective and unambiguous manner? In the case of detailed technical description, what framework needs to be adopted by the Multi-Stakeholder Body to document it?

Q.3. What set up needs to be established to detect violations of Net Neutrality, whether it should be crowd source based, sample field measurements, probe based, audit of processes carried out by access providers or combination of above? How to avoid false positives and false negatives while collecting samples and interpreting Net Neutrality violations?

Q.4. What should be the composition, functions, roles and responsibilities of a Multi-stakeholder Body considering the decision of DoT that Multi-stakeholder body shall have an advisory role and formulation of TMPs and Monitoring & Enforcement (M&E) rest with DoT?

Q.5. Whether entry fee, recurring fee etc for membership need to be uniform for all members or these may be on the basis of different types or category of membership? What may be these categories? What policy may be adopted for the initial set up of the Multi-stakeholder Body?

Q.6. What mechanism may be prescribed to determine fee and other contributions from its members towards expenditure in a fair and non-discriminatory manner?

Q.7. What should be the guiding principles and structure of governance of a Multi-stakeholder Body? What may be the roles and responsibilities of persons at different positions such as chairing the organisation or working groups, governing the functioning, steering the work etc.?

List of Acronyms

Sl. No.	Acronyms	Full Text
1	BEREC	Body of European Regulators for Electronic Communications
2	CDN	Content Delivery Network
3	COAI	Cellular Operators Association of India
4	DNS	Domain Name System
5	DoT	Department of Telecommunications
6	DPI	Deep Packet Inspection
7	emBB	enhanced Mobile Broadband
8	EU	European Union
9	IAS	Internet Access Service
10	ICANN	Internet Corporation for Assigned Names and Number
11	ICT	Information and communications technology
12	IoT	Internet of Things
13	IP	Internet Protocol
14	ISP	Internet Service Provider
15	LTE	Long-Term Evolution
16	M2M	Machine to Machine
17	MeitY	Ministry of Electronics and Information Technology
18	MHA	Ministry of Home Affairs
19	M-Lab	Measurement Lab
20	mMTC	massive Machine Type Communications
21	MNO	Mobile Network Operator
22	MoHUA	Ministry of Housing and Urban Affairs
23	MoRTH	Ministry of Road Transport and Highways
24	MSB	Multi Stakeholder Body
25	OEM	Original Equipment Manufacturer
26	Ofcom	The Office of Communications
27	OHD	Open House Discussion
28	OONI	Open Observatory of Network Interference
29	OTT	Over The Top
30	QoS	Quality of Service

31	TCP	Transmission Control Protocol
32	TERM	Telecom Enforcement Resource and Monitoring
33	TMP	Traffic Management Practice
34	TRAI	Telecom Regulatory Authority of India
35	TSDSI	Telecommunications Standards Development Society, India
36	TSP	Telecom Service Provider
37	UDP	User Datagram Protocol
38	UMANG	Unified Mobile Application for New-age Governance
39	UMTS	Universal Mobile Telecommunications System
40	UPI	Unified Payments Interface
41	URLLC	Ultra Reliable Low Latency Communications
42	USSD	Unstructured Supplementary Service Data
43	VOIP	Voice Over Internet Protocol
44	VPN	Virtual Private Network