Telecom Regulatory Authority of India

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

2nd January 2020

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Last Date for submission of comments: 30th of January 2020
Last Date for submission of counter comments: 13th of February 2020

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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 telecom sector and of other access networks is contingent upon innovation in and growth of the Internet infrastructure and the 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[1].

1.1.1 TRAI's earlier recommendations on Net Neutrality – TRAI had released its recommendations on net neutrality on 28th of November, 2017. Before these recommendations, on 08th of February 2016, TRAI had issued Prohibition of Discriminatory Tariffs for Data Services Regulations, 2016. The salient features of the recommendations were:

(i) The licensing terms should be amplified to provide explicit restrictions on any sort of discrimination in Internet access based on the content being accessed, the protocols being used or the user equipment being deployed. Content would include all content, applications, services and any other data, including its end-point information, that can be accessed or transmitted over the Internet.

(ii) The discriminatory treatment in the context of treatment of content would 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

[1]TRAI Recommendations on Net Neutrality dated 28th November, 2017

treatment to any content.

(iii) The service providers should be restricted from entering into any arrangement, agreement or contract, by whatever name called, with any person, natural or legal, that has the effect of discriminatory treatment based on content, sender or receiver, protocols or user equipment.

(iv) The scope of the proposed principles on non-discriminatory treatment apply specifically to Internet Access Services, which are generally available to the public.

(v) In order to remove any ambiguity, Internet Access Services have been defined.

(vi) Specialised services, i.e. services other than Internet Access Services, which are optimised for specific content, protocols or user equipment, and where the optimisation is necessary in order to meet specific quality of service requirements shall be exempted from the principles of discriminatory treatment.

(vii) Department of Telecommunications (DoT) may identify specialised services. However, specialised services may be offered by the service provider only if they are not usable (or offered) as a replacement for Internet Access Services; and the provision of such services is not detrimental to the availability and overall quality of Internet Access Services.

(viii) Internet of Things (IoT), as a class of services, are not excluded from the scope of the restrictions on non-discriminatory treatment. However, critical IoT services, which may be identified by DoT, and which satisfy the definition of specialised services, would be automatically excluded.

(ix) Content Delivery Networks (CDNs), which enable a Telecom Service Provider (TSP) to deliver content within its network without going through the public Internet, are exempted from the scope of any restrictions on non-discriminatory treatment.

(x) The Internet Access Service Providers may take reasonable measurements for traffic management, provided the same are proportionate, transient, and transparent. They may also take reasonable measures to preserve integrity and security of network, for provision of Emergency Services, implementation of an order of the court or direction of the Government, or in pursuance of an international treaty.

(xi) TSPs shall be required to declare their Traffic Management Practices (TMP), as and when deployed and the impact it may have had on the users. The disclosure requirements shall also include information about specialised services, direct or indirect arrangements entered into by them.

(xii) For monitoring and investigation of violations, a collaborative mechanism has been recommended to be established in the form of a multi-stakeholder body comprising members representing different categories of TSPs and ISPs, large and small content providers, representatives from research and academia, civil society organisations and consumer representatives. This body, which would be responsible for developing technical standards pertaining to monitoring of TMPs and enforcement of the principles on non-discriminatory treatment and making appropriate recommendations to the Authority. The Government/ Authority shall reserve the right to seek any information from the committee, investigate its conduct to ensure transparency and fair treatment to all its members, and issue appropriate regulations, directions, orders or guidelines, as and when needed.

1.1.2 Acceptance of the TRAI's recommendations by Department of Telecommunications (DoT) – DoT accepted most of the recommendations given by TRAI on the subject, as it is and on 31st of July 2018, issued principle directives on Net Neutrality. Further DoT amended license conditions for Access Providers and introduced relevant requirements to conform to the principles of Net Neutrality. While accepting TRAIs recommendations, DoT made some decisions which were at variance from the recommendations such as:

(i) DoT will formulate necessary Traffic Management Practices (TMPs).

(ii) The Monitoring Enforcement with respect to Net Neutrality will rest with DoT.

1.2 Additional recommendations sought from TRAI

Vide letter dated 31st of July 2018, DoT sought additional recommendations of TRAI on following issues:

(i) Necessary Traffic Management Practices (TMPs) for consideration of DoT

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

1.2.1 Clarification received from DoT – DoTs letter referred to above, did not mention the reasons or additional considerations made by DoT while taking decisions at variance from TRAIs recommendations. Subsequently, DoT clarified its stand vide letter dated June 17, 2019 and informed following:

(i) Traffic Management Practices (TMPs) is a broad concept and does not pertain only to specifying the parameters/benchmarks and other standards governing the quality

of service to be provided by the service providers. Besides, since the necessary Traffic Management Practices (TMPs) shall form part of license agreements to be enforced by DoT, it would be in the fitness of things that they are formulated by DoT. Therefore, it has been decided that necessary Traffic Management Practices (TMPs) will be formulated by DoT. It is pertinent to add here that the issue of laying standards of quality of service to be provided by the service providers shall continue to remain in the domain of TRAI. Accordingly, it is reiterated to recommend necessary Traffic Management Practices (TMPs) for consideration of DoT.

(ii) With reference to multi-stakeholder body, the variance is not with respect to recommendations per se, but their implementation.

1.3 Scope of the consultation

Scope of the consultation is limited to the issues on which additional recommendations have been sought by the DoT. In view of decisions of DoT which are at variance from the TRAI's recommendations (refer section 1.1.2 above), there might be some specific clauses of TRAI's earlier recommendations on Net Neutrality which might need to be relooked. The scope of consultation is limited to only such specific clauses of the recommendations. TRAI has no intention to revisit its principles on Net Neutrality and broad approach recommended earlier.

1.4 Structure of the Consultation Paper

Chapter 2 deliberates on issues related to traffic management practices and its compilation. It will cover establishment of a framework to formulate TMPs and evolve it. Chapter 3 covers composition, function, Governance Structure of multi-stakeholder body and its role and responsibilities. Chapter 4 summarizes the issues of consultation.

Chapter 2

Reasonable Traffic Management Practices (TMPs)

There are various practices adopted by Access Providers to manage traffic in the situations of traffic congestion due to surge in traffic or artificial traffic introduced by external factors such as malicious traffic. Access Providers are expected to expand their capacity to meet the typical traffic demand, however, there might be instances when there may be deficit in capacity due to practical reasons or conditions beyond control of access providers. Pragmatic approach to deal with such situations may require managing traffic by applying some restrictions such as putting cap in terms of maximum throughput, blocking traffic of particular class and nature of applications. Such restrictions should be proportional and transient to the need of managing the situations. TRAI vide its earlier recommendations, suggested provisions for exceptions in some circumstances and called reasonable TMPs. DoT has accepted these recommendations of TRAI and made amendments in license agreements, accordingly.

2.1 Identifying and defining TMPs

Currently, there might be a number of Traffic Management Practices (TMPs), which are developed and deployed in the networks for different requirements. Some of these may be of a concern from Net Neutrality perspective and required not to be applied in general, while some of the other TMPs might be necessary in specific situations. However, such TMPs must be applied in proportionate and transient manner. To monitor and enforce Net Neutrality in an objective and transparent manner, it might be 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 possible to make an exhaustive list and containing complete technical details. Technical nature and characteristics of TMP might be implementation specific. To keep pace, there may be a need to have a framework

to prepare list of reasonable TMPs. The framework may also be responsible to develop technical documents that should capture enough details so that the interpretation of traffic management practices may be done in an objective manner.

2.2 Type of Traffic Management Practices

As discussed in previous recommendations of TRAI [1], the fundamental feature of the Internet is that it operates on a "best effort" basis. This means that the TSPs do not guarantee either the delivery or the time of delivery of each and every data packet transmitted over the Internet. There may be various circumstances or reasons that can force Service Providers to take special measures regarding traffic management. Some of the reasons[2] for which TMPs may be deployed are, such as *Traffic congestion*, which may require them to prioritise/throttle one content stream over the other, *Prioritisation of latency-sensitive traffic*, such as VoIP, which may require certain level of Quality of Service (QoS), *Network security and integrity requirements*, *Legal requirements* and handle *Emergency situations*. Few broad TMPs are shown in figure 2.1. TMPs are linked with the QoS provided by TSPs as sometimes it becomes difficult for TSPs to maintain minimum agreed on QoS to customers without applying appropriate TMPs. TMPs may be defined[3] based on impact on applications, end-user experience, techniques used to affect performance of applications, for example, *category of practices that affects the connectivity and reachability of individual applications* such as Blocking Ports using transport protocol (TCP or UDP), IP address blocking, DNS 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. In UK, Ofcom ask broadband providers to disclose, in public domain, the traffic management practices adopted by them to optimise network utilisation. According to this disclosure[4], providers are required to disclose details w.r.t. three types of TMPs namely blocked, slow down and prioritised. It includes, peak hours when TMP used and traffic type managed during these periods.

[1] https://main.trai.gov.in/release-publication/recommendation

[2] https://main.trai.gov.in/sites/default/files/CP$_{N}etNeutrality2017_{0}1_{0}4.pdf$

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

[4] https://www.vodafone.co.uk/terms-and-conditions/consumer/network-and-coverage/traffic-management/index.htm

2.3 Challenges of listing necessary Traffic Management Practices

2.3.1 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 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 very fast pace. So, technical measures of proportionate, temporary or transient nature to deal with such unexpected issues of networks, can not 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 reasonable time needed to resolve congestion problem in networks, using throttling of some categories of traffic, may be different in UMTS (3G) networks as compare to LTE (4G) networks. The traffic management policies adopted in LTE network are shown in Figure 2.2. Therefore, there may a requirement to continuously observe the measures taken by service providers for traffic management.

2.3.2 Dynamic in nature – Nowadays, technologies, networks are evolving at a rapid rate. ICT networks are in a permanent change of states with known devices connected, unknown things and applications connecting, other disconnecting, with network functions being virtualized, new services being added, services being segregated, services being discontinued, etc[5]. Performance of broadband service providers my also get impacted due to performance of other stakeholders of ICT ecosystem such as content providers, VPN network providers, and end user environment. 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, may not be static. It must be dynamic and sometimes may only be known by experience. Therefore, the compilation of such treatments or practices for traffic management would require review from time to time.

[5]https://www.etsi.org/events/1528-cyber-security-dynamic-nature-of-technology-networks-and-society

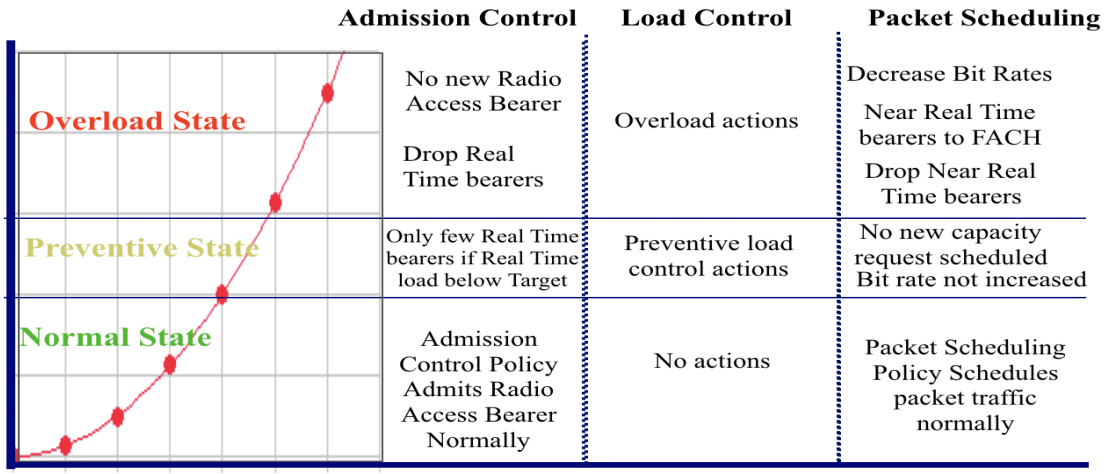

Figure 2.1: Packet core Networks: Allocation & Retention Priority & QoS based implementation

2.4 Framework for compilation of Traffic Management Practices

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 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 of time. Frequent update of such technical document 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 as well as 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 to establish a system that can periodically review traffic management practices adopted by TSPs and perform the compilation of TMPs.

2.4.1 Role of Transparency and Disclosures Transparency regarding traffic management practices adopted by TSPs can be a critical factor in ensuring adherence to the principles of non-discrimination. Public dissemination of information relating to the characteristics of the services being provided and TMPs being adopted contributes to reduce information asymmetries in the market, thereby leading to a competitive market and pro-consumer behaviour.

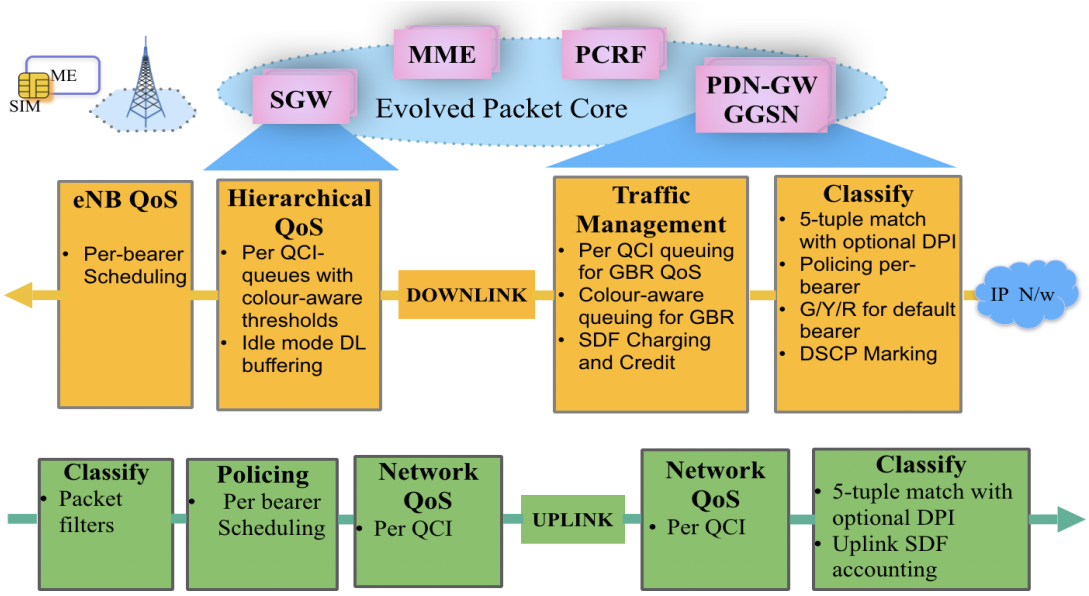

Figure 2.2: Technical details of TMPs in LTE Network

Transparency by TSPs also enables regulators and other stakeholders in the ecosystem to detect any violations and monitor the QoS available to users. After reviewing the traffic management practices adopted in other jurisdictions, it is found that certain disclosure obligations are imposed by majority of regulators for monitoring and enforcement of net neutrality principles and regulations. In UK, Ofcom has imposed obligation on providers to explain its approach to 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 [6]. Broadly, disclosures are of three types - direct disclosure from service providers, precise and relevant information directly from service provides to its consumers and disclosure to general public. Such disclosures give transparency to the traffic management practices adopted by internet access service providers. For example in UK, Broadband stakeholder Group (BSG), a multi-stakeholder body of ofcom (telecom regulator of UK) [7], has developed a framework for transparency and disclosure to the public. There relatively standardised formats for disclosures are being developed and maintained by this industry-led body.

2.4.2 Options for framework – Such system for compilation of traffic management practices may be established by using different models. Some options are discussed below:

(i) **Option 1:** Service providers may submit traffic management information to DoT periodically. Thereafter, with advice of Multi-Stakeholder body (MSB), DoT would

[6]https://www.ofcom.org.uk/phones-telecoms-and-internet/advice-for-consumers/advice/net-neutrality
[7]https://www.ofcom.org.uk/research-and-data/internet-and-on-demand-research/net-neutrality

perform the compilation of TMPs and also handle the maintenance or updating part of such compilation.

(ii) **Option 2:** Service providers may maintain a record of all adopted Practices for traffic management (**"Record of TMPs"**), in house, and publish in public domain. These disclosures in public domain would be a living document, which means any change in use of TMPs must reflect in this Record of TMPs. All TMPs adopted by TSPs for their operations will be part of this record with details and as soon as cause for utilizing certain TMP will get resolved, such TMPs would be removed from the Record of TMPs. To review the declared TMPs applied by services providers in **Record of TMPs**, DoT may ask service providers to maintain a separate detailed record of applications of all TMPs adopted by them (**"Record for Application"**) and submit periodically to DoT. This record may have time, geographical area and justification of reasonableness for the TMPs mentioned by service providers. This record may also have the extent of the proportionality, proof of transient in nature of TMPs applied. The proposed Multi-Stakeholder Body (MSB) or DoT will review of 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. Multi-Stakeholder Body (MSB) may prepare a report based on its analysis of **Record of TMPs** and **Record for Application** submitted by TSPs (**"MSB Report on Necessary TMPs"**) and may be published in public domain after approval from DoT. After analysis and review of submissions made by TSPs and MSB, DoT may maintain a refined list of TMPs adopted by all TSPs (**"Repository of Necessary TMPs"**), which will only have the practices those are found valid and reasonable after reviewing providers **Record of TMPs** (the disclosure in public domain by TSPs). This refined list of necessary TMPs **Repository of Necessary TMPs** may also be maintained by Multi-Stakeholder Body (MSB). DoT may also publish this Repository of TMPs, so that consumers can better understand the various internet service choices when selecting an internet broadband package. Under transparency and disclosure framework, TRAI may also periodically review all the disclosures to end-users made by DoT, TSPs, Multi-Stakeholder Body i.e. **Record of TMPs** (disclosure in public domain by TSPs), **Repository of Necessary TMPs** (disclosure in public domain by DoT) and **MSB Report on Necessary TMPs** (disclosure in public domain by MSB).

(iii) **Option 3:** This option is same as option 2 except that in this option after reviewing of **Record of TMPs** disclosed by service providers, DoT may directly intimate TSPs the mistakes and wrong reporting found in Record of TMPs and ask them to update

the disclosure made by them in public. DoT may take help and advice of Multi-Stakeholder Body (MSB) for reviewing **Record of TMPs** published by TSPs. 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). There may be requirement of reviewing and updating this format of TSP's disclosure from time to time, here Multi-Stakeholder Body (MSB) may help in making consensus among different stakeholders. A similar approach has been adopted by UK's communications regulator (Ofcom) with the help of Broadband Stakeholder Group (BSG) which is the UK governments leading advisory group on broadband. In chapter 3 of this document, Role & responsibilities of BSG in implementation of net neutrality framework are discussed in more detail. Ofcom monitors ISP traffic management measures by reviewing the TMP details published by ISP at their websites. Ofcom is of the view that direct disclosures to consumer can be effective only if they are conveyed in an accessible and comparable format. Accordingly, the regulator has specified disclosure format, with simple keys facts, which seeks to provide accessible and comparable disclosures directly to end-users. Many ISPs provide this information through their Key Factor Indicators (KFIs)[8], which are relatively standardised forms developed by the industry-led Broadband Stakeholder Group (BSG).

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 perspective of Net Neutrality? Whether list of Traffic Management Practises (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 Multi-Stakeholder Body to keep it up to date? Please suggest with justification.

2.5 Monitoring violations of Net Neutrality

As per recent TRAI report[9], India has total 665.31 million internet subscribers, out of this, wired internet subscribers are 21.67 million, and , wireless internet subscribers are 643.64 million . Total mobile internet wireless subscribers are and 643.09 million. If we follow the trend of Internet subscriber base in India, it shows out of total internet subscribers, 96.66%

[8]In accordance with the BSG Open Internet Code 2016, signatory ISPs have published Key Facts Indicators (KFIs) in relation to their traffic management policies: http://www.broadbanduk.org/policies/the-open-internet/open-internet-key-facts-indicators/

[9]TRAI - The Indian Telecom Services Performance Indicator Report April - June, 2019

subscribers are using Mobile device for access of internet service. Performing measurements for monitoring TMPs for such a large subscriber base, which reflect actual experience of consumers, would be a major challenge. The Body conducting such measurement may face several challenges, few listed below:

2.5.1 Impact of end user environment – One of the major challenges of measurement observed in the BEREC report[10] are the potential impact of the end user environment on the measurement results. The end user environment consists of many elements, some of which could limit Internet Access Service (IAS) performance such as, too many simultaneous measurement sessions can cause interference. These limiting factors can be differentiated between fixed and mobile environments[11]. Issues in fixed environments that can affect assessment of measurement results are performance of the modem router, the type of the link, performance of the computer (CPU and RAM load), version of the computer operating system, simultaneous usage of other software like antivirus and firewalls etc. Similarly, the issues related to mobile environments are performance of handset model, the radio connection quality, limitations arising from the subscription, version of the mobile equipment operating system etc. Above mentioned issues may prevent an accurate performance measurement. To ensure that end user environment do not affect the measurement, one option may be that multiple measurements are taken on daily basis and aggregated data for reference.

2.5.2 Lack of awareness to end users – In general, end users are not aware of the potentially negative influence of their own terminal equipment and home network but they assume that all issues are on the access service or content providers side. One solution could be that the end users are made well informed of how to properly set up their terminal equipment to minimize such measurement error due to end user environment. In UK, Ofcom has mentioned a list of other factors which could affect broadband connection, in their website for end-user's information, are as follows:

- the line that provides internet connection to end users home is damaged;
- the device end users are using to access the internet has not been set up correctly;
- the quality of mobile phone signal depends on whether end users are indoors or outdoors;
- there are performance issues with internet router or hub (for example wifi interference); or
- there are faults that relate to specific content providers or their applications.

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

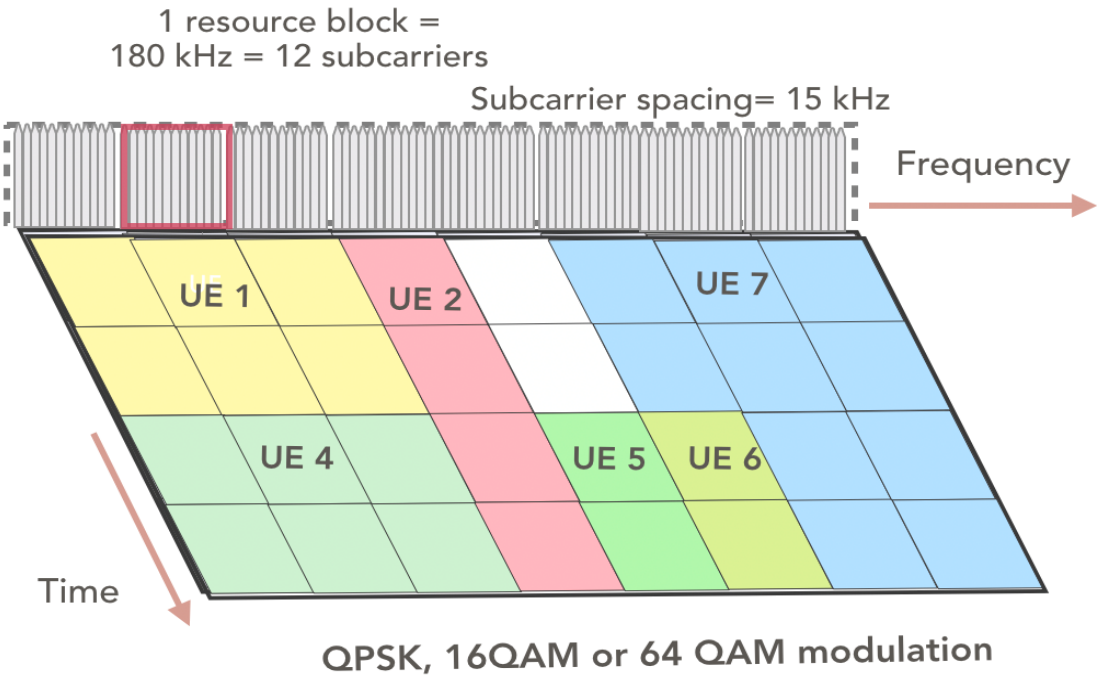

Figure 2.3: Measurement Challenge: Variation due to scheduling

Ofcom has a broadband and mobile checker app which can quickly test the performance and speed of your broadband or mobile connection, and provide tips on how to improve your internet connection.

2.5.3 Other Measurement challenges – Apart from end user environment issue, there may also be other factors which may impact measurement of TMPs and the agency performing such measurements must be cautious about. For example, when initiating a connection, mobile networks need some time to allocate the resources[12]. This delay may impact the measurement results and therefore to avoid such error the measurement results from the first few seconds may need to discard. Scheduling of resources may also impact internet access as shown in figure 2.3.

2.5.4 Challenges of assessment of measurement data – Assessment of the speed (one QoS parameter) measurements (conducted through TRAI My speed crowd-sourcing app) under existing regulations[13] revealed that wide variations in the test results may be observed while performing measurements of KPIs related to wireless communications (Figure 2.4), due to following reasons:

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

[13]TRAI white paper on measurement of wireless Data Speeds at https://main.trai.gov.in/sites/default/files/measurementwirelessdataspeed.pdf

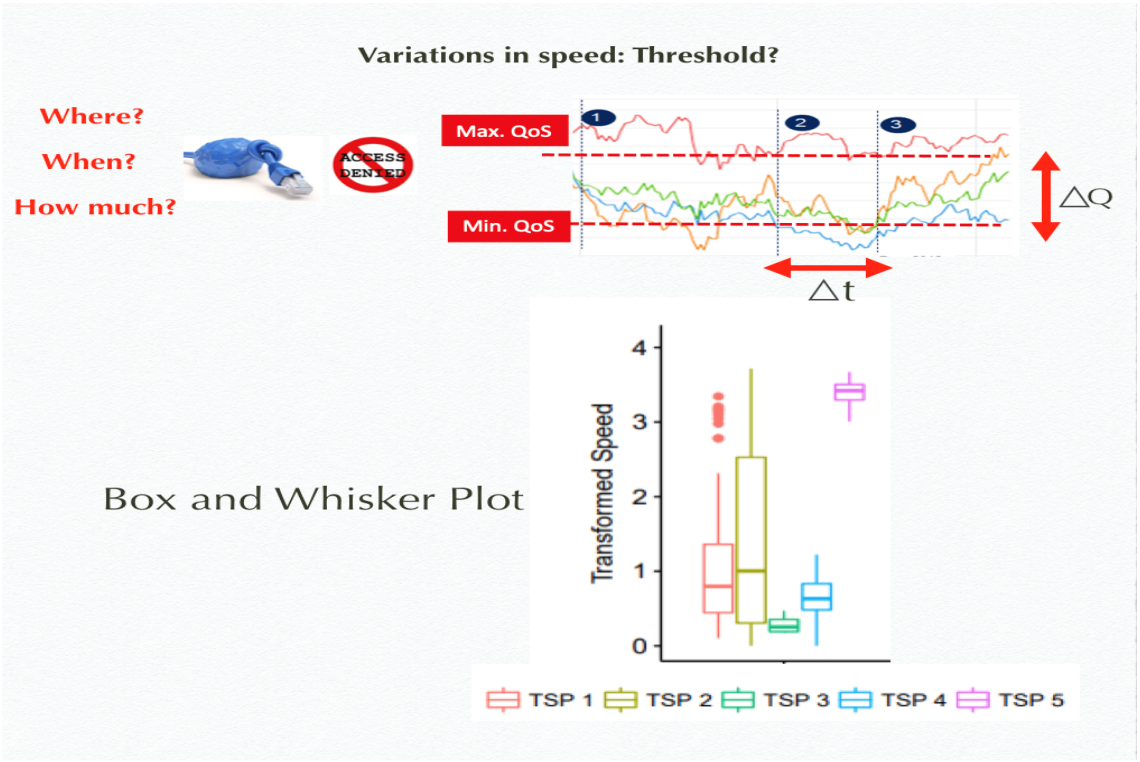

Figure 2.4: Assessment Challenges of Measurement Outcomes

(i) Variations in measurement results may be observed due to different network scenarios such as signal level, variation in resource allocation (Figure 2.5). Specifically, in wireless environment, measurement samples might be reflecting variations that are not as an outcome of non-reasonable TMPs applied by the access provider.

(ii) Test methodology and conditions may also impact the outcome of measurements.

(iii) For meaningful outcomes of measuring one parameter of network's performance, measurement tools are required to have large number of data points. Then imagine, how many data points would be required for simultaneous measurement of different QoS parameters for performance against each app for different operators and which are spatially and temporally distributed. Handling such large scale measurements may require standard protocols among measurement components and controlled environment, so that appropriate and less-erroneous evidence can be gathered against any violation of principles of non-discriminatory principles.

(iv) The issue of false positive[14] and false negative[15] related to statistical analysis may also increase with increase in data points.

[14] An error in data reporting in which a test result that improperly indicates presence of a condition, such as a violation (the result is positive), when in reality it is not present.

[15] An error in which a test result improperly indicates no presence of a violation (the result is negative), when in reality it is present.

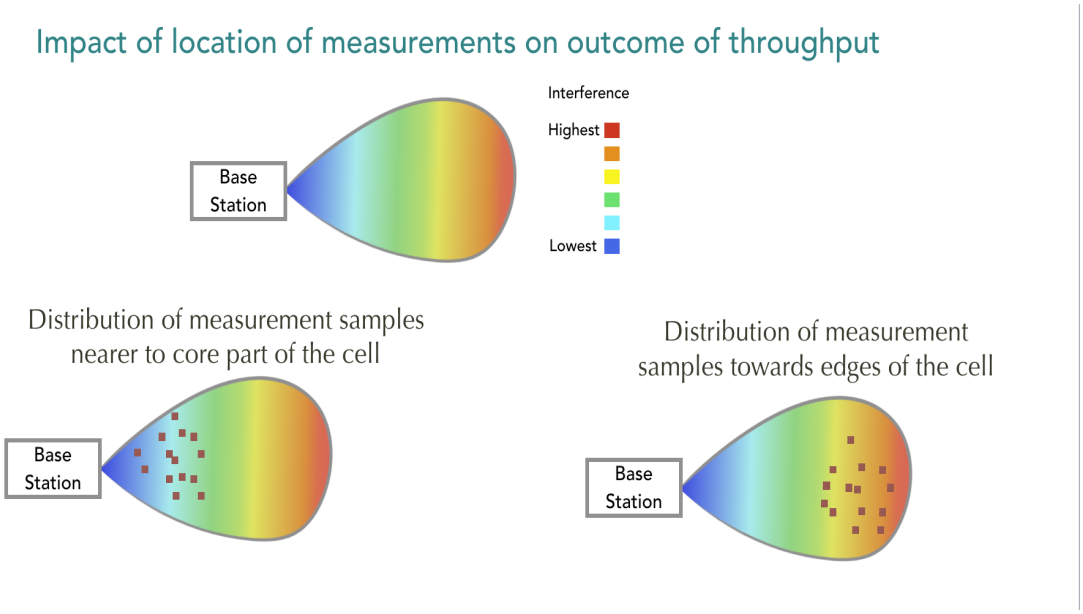

Figure 2.5: Impact of location of measurement on outcomes of throughput

(v) Inferences and interpretations must be done keeping in mind the purpose of tests.

(vi) Assessment of individual test and overall network performance also play a vital role in concluding the outcome of measurements.

(vii) **Single value assessment vs. Multi-tier assessment:** By appropriate consideration of individual tests like filtering, aggregation etc, outcome of measurement of wireless Data Speeds of measurement may be close to the actual performance. But, performing a single value assessment may not give the actual performance of network, even after applying normalization of filtered values to avoid dominance of results by certain users, areas or time windows. Because, users and their usage are not uniformly distributed across geography and time. Therefore, multi-tier assessment (like use of scoring system) may be required instead of simple aggregation of data.

(viii) Geographical area and time may also be important factors that need to be appropriately considered while aggregating results.

(ix) Presentation of outcome of measurement, such as throughput, for an area and for certain period by a single value may not be the best way of showing results. Instead, multiple value presentations like 5 point summary [16] as depicted by box plot may give very good insight about the variability of throughput in a particular region and time of the day.

[16] Ibid

Above discussion show that assessment of measurements of traffic management practices and identification of their reasonableness may also be a challenge. It would also require to define practices like blocking, throttling and preferential treatment, its thresholds and benchmarks (for example, at which measurement point a particular application can be said it has been blocked or throttled or other violations have occurred) and which tests can identify such practices. Without above exercise, it may not be possible to establish any test setup using test tools and make appropriate calibrations. Validation of the collected measurement results may be considered one of the major requirements.

2.5.5 Monitoring Approaches adopted in other jurisdictions – Most of the national regulators of the countries in Europe follow EU regulations and BEREC guidelines. BEREC has proposed two basic measurement approaches[17], 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[18] (LMAP framework) may be used for test setup for monitoring TMPs[19]. It is observed that crowd-sourced measurement approaches are more preferred to collect data, as setup of a measurement system on 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 approach, more effective steps may be required to be taken since the conditions at the client side can not be predetermined. Generally, it is unknown whether the client environment fulfills the requirements for an accurate measurement. In some of the jurisdictions like Austria, Germany, Norway and Belgian, they conduct surveys to check compliance of ISPs with the TMP Regulations. In UK, Ofcom uses a multi-pronged approach approach to measure the availability of high-quality IAS

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

[18]RFC 7594, a framework for Large-Scale Measurement of Broadband Performance (LMAP), talks about 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 August 2017, Internet Engineering Task Force (IETF) finalized 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.

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

delivered over fixed and mobile networks in the UK[20]. It includes monitoring consumer complaints, conducting market surveys, requesting information from ISPs, and technical network monitoring.

2.5.6 Possible Approaches for Monitoring – In view of above discussions, approaches such as Crowd-sourced Measurements, Field Measurements, and Audit of traffic management practices used by Access Providers may be considered for measurement of Net Neutrality violations. Crowd-sourced Measurements may be performed by collecting samples enough in numbers to detect true positive. To avoid the impact of wireless behaviour of networks, selection of samples for measurement need to be diverse enough to detect violations and samples not attributable to Access Providers actions must be eliminated. Under the field Measurements approach, methods such as Probes and conducting measurements and Specialized network setups to detect TMPs which are non-reasonable may be used. Under the approach of Audit of traffic management practice, investigation based on complaints or reports, investigation of logs generated by network elements may be performed.

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 objective and unambiguous manner? In case of detail technical description, what framework need to be adopted by Multi-Stakeholder Body to document it. Please suggest with justification.

Q. 3. What set up need 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 negative while collecting samples and interpreting Net Neutrality violations? Please suggest with justification.

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

Chapter 3

Multi-Stakeholder Body

A critical challenge surrounding the enforcement of net neutrality is the accurate analysis of Practices deployed by TSPs, and the adoption of sound technical tools to detect violations arising from such practices. Regarding TMPs, the dynamic nature of technology can pose certain challenges in accurately analyzing TMPs adopted by TSPs on a real-time basis. Several other jurisdictions have also considered this problem and have arrived at different approaches through which net neutrality violations can be monitored and penalised.

3.1 Roles and Responsibilities

Keeping in view of challenges of monitoring and enforcement of net neutrality principles, Authority recommended that DoT may establish a Multi-Stakeholder Body (MSB) with a framework for collaborative mechanism among the stakeholders. MSB would be not for profit and led by industry. It may comprise of 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 and conditions, governance structure etc. would be recommended by TRAI, once this recommendation is accepted by the Government in principle. However, DoT decided that 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 would handle enforcement of principles and would be responsible for ensuring conformance to adherence to net neutrality and for facilitating conflict resolution, consensus formation and wherever possible striking compromise.

Keeping in mind the above variations in decisions, the Role of Multi-Stakeholder Body may be to give advise to DoT regrading monitoring and enforcement of net neutrality principles. Multi-Stakeholder Body may 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 Composition, Structure and Governance

For an industry-led Multi-Stakeholder Body, the role of Internet Access Service Providers and representatives from research, academic and technical community may be crucial. 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 the well being of consumers.

As per previous recommendations, Authority recommended that the Multi-Stakeholder Body, not for profit, led by industry may comprise of members representing:

- The private sector, i.e., different categories of TSPs and ISPs
- large and small content providers
- representatives from research, academic and technical community
- civil society organisations
- Consumer representatives

In this recommendation, Authority was recommended to adopt self-regulating framework, where Multi-Stakeholder Body, to be established by DoT, may work with collaborative mechanism among the stakeholders. However, in consideration of DoT decision regarding Multi-Stakeholder Body, this body shall have an advisory role. Keeping this in mind, Composition of MSB may have two kind of members, first kind may comprise industries who directly responsible for net neutrality principles and whose services directly get impacted due to its violation namely internet access providers (TSPs and ISPs) and content providers (large and small). Second kind may comprise of other stakeholders of internet ecosystem who are representatives of end users or last mile consumers, such as representative from research, academic and technical community, civil society organisations and consumer representatives. Process for involvement of above two categories of members may be different in decision

making of Multi-Stakeholder Body to give appropriate advice to DoT. Composition of Multi-Stakeholder Body may only be limited to first kind of members one of whom is complainant and other is respondent, and can help Multi-Stakeholder Body in investigation the matter based on technical evidences and report back to DoT with recommendations.

3.2.1 Approaches adopted in other jurisdictions and domains –

(i) **Composition :** The multi-stakeholder approach is one of the solutions for dealing with Internet Governance and related issues. World-wide various multi-stakeholder groups are working in different fields. Having stakeholders involved like civil society, education/technical community, governments and private sector, in problem solving, has its merits and the global community acknowledges it. But to make it effective, proper composition, functions, role and responsibility of Multi-Stakeholder Body has to be recognized. Therefore, in following paragraphs some similar existing groups and international organisations are being discussed along with their own description, as published on their websites.

(a) Brazilian law on net neutrality states that any discrimination or degradation of traffic shall be regulated in accordance with law, upon consultation with the Internet Steering Committee and the National Telecommunications Agency. The Brazilian Internet Steering Committee is comprised of members from the government, the corporate sector, the third sector (that is civil society organizations or NGOs), and the academic community, and as such constitutes a unique Internet governance model for the effective participation of society in decisions involving network implementation, management and use. The Brazilian Internet Steering Committee is composed of 21 members[1], as follows:

i. nine representatives from the Federal Government
ii. Four representatives from the corporate sector
iii. Four representatives from the third sector
iv. Three representatives from the scientific and technological community
v. One Internet expert

(b) In UK, BSG[2] is composed of sponsors and executive members. BSG is partly

[1]https://www.cgi.br/about/

[2]The Broadband Stakeholder Group (BSG) is the UK governments leading advisory group on broadband. It was established in 2001, and since 2006 has focused on next generation broadband issues. The BSGs diverse network includes telecom operators, manufacturers, investors, ISPs, mobile network operators, broadcasters, new media companies, content producers and rights holders, as well as central and local government, devolved administrations, Ofcom and others.The BSG is based in the offices of techUK, the trade body for the ICT, telecommunications and electronics industry.http://www.broadbanduk.org/about/

funded by industry and government (Dept of Culture, media and Sports). Sponsors are the members who fund BSG for its functioning. They are from various industries including network operator such as Vodafone, virgin media, solution providers such as Ericsson, Cisco, and content providers such as BBC. Executive committee is composed of the companies from sponsor members and representatives from Consumer protection Groups and Ofcom.With such co-regulatory setup, market actors and self-regulatory bodies maintain a constant dialogue with regulators and consumers.

(ii) **Governance Structure:** Structure and Governance of any body talks about the decision making structure of the body, formation or constitution of the body and membership of the body. To understand the best practices for governance structure, governance of multi-stakeholder bodies, approaches adopted by some multi-stakeholder bodies in functioning in the field of internet and net neutrality or in other domains, are presented in following subsections along with their own description, as published on their websites:

(a) As we discussed earlier, in UK the multi-stakeholder body, BSG has three components[3]: BSG Chair, BSG Secretariat and BSG Sponsors and Executive. Basically, BSG has two level of hierachy for performing functions of BSG and taking policy decisions. BSG activity is led by an Executive Committee, which include representatives from each sponsor organisation and other members and meets every six weeks. Here, the BSG secretariat provide support to BSG chair and executive committee and its role includes drafting policy proposals, maintaining stakeholder relations and providing administrative support. Signatory ISPs play a vital role in the success[4] of Open Internet Forum in UK, which is a mechanism for facilitating communications between interested parties to ensure that emerging opportunities and risks in relation to the Open Internet are raised within that group for consideration. Ofcom has supported industry self-regulation in this area and to effectively implement it signatory ISPs have come up with practical commitments

[3]http://www.broadbanduk.org/about/

[4]According to Open Internet Code of Practice 2016, in summer 2015, the BSG launched the review of the Traffic Management Transparency and Open Internet Codes of Practice adopted in 2011 and 2012 respectively. The BSG commissioned consultancy WIK to undertake the study as both a form of good practice, to assess the UKs approach in light of the EU Connected Continent Regulation and what improvements can be made to the benefit of consumers and content and service providers. WIK's 2015 report made clear that the Open Internet Forum has delivered substantial benefits to the UK, in helping to foster trust and understanding between ISPs and Content Application Providers (CAPs). It is particularly useful for addressing areas beyond the core provisions of the Regulation and the Code.

with the help of BSG that individual ISP are able to make. They also work with BSG for development of process for raising concerns on breach of BSG codes or Ofcom regulations.

(b) ***To establish practically implementable codes for self-regulation of industry and open internet:*** The BSG has released the Open Internet Code of Practice[5] , a voluntary Code of Practice in support of the Open Internet and the general principle that legal content, applications and services, or categories thereof should not be blocked. These codes could be source or reference for formation of code of conduct (CoC) in our country. BSG's **Open Internet Code of Practice 2016**[6] contains commitments that signatories are agreed to make. The commitments are regarding access to lawful services, and supporting traffic management transparency for internet access services. These are rooted in practical commitments that individual ISPs are able to make. Further, it has explanations of all commitment and which says what these commitments mean in practice. These coding explanations would be helpful for all the stakeholders of internet ecosystem for shaping their policies accordingly. It also provides transparent information to Regulator and consumers about the ISPs commitment for further fixing their expectations and benchmarks. BSG Code also includes good practice principle on transparency, Ofcoms monitoring of provision of transparent traffic management information, process for raising concerns about possible cases of discriminations over the Open Internet, logging an issue with the BSG and its power to handle such issues. BSG conducts review of the Codes in conjunction with the Open Internet Forum which brings together content providers, network operators, Government and Ofcom to discuss issues relating to the Open Internet.

(c) Brazilian Internet Steering Committee is currently composed of an Executive Board, with five directors, four Centers and five Consultants.

(iii) Few examples of structure and governance of the bodies working in other domains, are as follows:

(a) EU has also adopted multi-stakeholder body approach for monitoring cloud service

[5]In 2011, ISPs and Mobile Network Operators (accounting for more than 90 percent of fixed and mobile connections) signed the BSG Traffic Management Transparency Code of Practice aimed at ensuring that Traffic Management policies were transparent and comparable. Building on this Code, BSG published the Open Internet Code of Practice in 2012, in which ISPs committed to not using traffic management practices to degrade the services of a competitor. New Code Open Internet Code of Practice 2016 was published by BSG on 8 June 2016 and is built around 4 Commitments of ISPs regarding open internet.

[6]http://www.broadbanduk.org/wp-content/uploads/2016/06/BSG-Open-Internet-Code-2016.pdf

providers [7]. For this purpose, a voluntary EU Cloud Code of Conduct[8] has been prepared. The Code Governance Bodies , under EU Cloud CoC, are tasked with the implementation and administration of the Code. It has 3 tiers in organisational levels, General Assembly, Steering Board and sub-committee. Secretariate and monitoring body supports steering board to perform its functions and responsibilities. The Code General Assembly is composed of the founding members Alibaba Cloud, Fabasoft, IBM, Oracle, Salesforce and SAP and all other members, whose applications to join have been approved by the General Assembly. he Code Steering Board shall be comprised of a maximum of 13 (thirteen) Members, unless a bigger number of Members is decided by the General Assembly. The Steering Board, directly or through any sub-committees it chooses to create, monitor changes in European Union data protection laws and propose changes to the Code for approval by the General Assembly. Role of internal governance of Code Governance Bodies, under EU Cloud CoC are as follows:

i. The General Assembly shall have the powers to designate the Chairman of the General Assembly and the members of the Steering Board; to approve the Monitoring Body's accounts; to approve annual membership fees, Supporter fees and any other fees as proposed by the Steering Board; to approve new Members; to decide on the suspension or exclusion of any Member; to approve changes to the Code, and to decide on any other matters as requested by the Steering Board.

ii. The Steering Board, directly or through any sub-committees it chooses to create, monitor changes in European Union data protection laws and propose changes to the Code for approval by the General Assembly. The Steering Board develops appropriate policies to assure that interests are disclosed, and conflicts are avoided between Members.

iii. The Secretariat maintain a public register of Cloud Services that are verified adherent and perform other administrative functions.

(b) In India, TSDSI is also a multi-stakeholder body with members from corporate, academia, Research organisations, indian and foreing associations. Although focus of this body totally different, it is india's telecom standard making bodies. It also has a 3-4 layer governance structure, where General Body is the apex decision making body. Governing council steers and governs TSDSI in intervals between General Body meetings. Members of TSDSI form separate Standing committees for performing its functions. A list of Standing Committees for different purposes

[7] https://eucoc.cloud/en/about/about-eu-cloud-coc.html

[8] EUDataProtectionCodeofConductforCloudServiceProvidersversion2.1,November2018

are headed by members of Governing council. Standing committees perform its functions through study groups and working groups with is members. Proposal are prepared by standing committees and decides are taken by higher hierarchy level.

3.2.2 Membership of Multi-Stakeholder Body – In efficient functioning of Multi-Stakeholder Body (MSB), members and organisational structure of Multi-Stakeholder Body play a central role. They may be focused to work on NN principles and to resolve conflicts between stakeholders. Sometimes, a balance in membership may be required for forming fair, reasonable, and non-discriminatory (FRAND) policies for conflict resolutions and consensus formation and carrying out other functions of body. There may be different types of membership like individual or organization memberships. MSB may require representatives from different domains, sometimes may require some expert advise for resolving any issue or conflict and to carry out wide range of functions. Therefore, members representing different domains and categories may require to have minimum level of expertise in their domain and field, such as members representing TSPs or ISPs may have a proven expertise in the area of telecom or ICT technologies, and/or net neutrality and may have strong understanding of TMPs, challenges associated with TMPs and technical requirements. Member organisations may be expertise or operational in the domain of telecom or ICT technologies, and/or net neutrality. Similarly, other categories may also have eligibility requirements for any individual or organisation to become member under the specific category.

3.2.3 Need of functionally independent multiple bodies – As we discussed earlier, ISPs are allowed to take exceptional measures to resolve problems specific to the network or technology. Such measures are of evolving in nature, therefore, there may be a need to specify them from time to time. Preparing a list of such TMPs and updating as and when it changes, would be a full time work and may require a framework which would have agility and would be able to react fast and evolve with the change in time, technology, services and other factors. As monitoring and enforcement functions with respect to net neutrality shall rest with DoT, therefore, there may require to have multiple bodies to handle the challenges associated with TMPs and involvement of representative from industries, academia and consumer groups for keeping a watch on framework for net neutrality and compliance of principles. One option may be to constitute two bodies for reporting to DoT, One would be *TSP centric* and would perform functions of drafting TMPs, review of TMPs disclosed by ISPs, formats for disclosures and submitting periodic reports. Second would be *Customer centric*, which would be established from consumer perspective. The functions of this body would be to handle the complaints or reports submitted by consumers or other queries or

feedback raised by consumers. Both bodies may have different kind of stakeholders as its members. As discussions held by the body which is maintaining TMPs, may be very technical and would mostly focused to the TSP's core responsibilities in compliance with principles of non-discrimination. This TSP centric body may have representatives from TSPs, ISPs, research organisations or academia.

3.2.4 Initial set-up of Multi-Stakeholder Body – As we discussed earlier, MSB has a list of responsibilities for performing its functions and deliverables. Fair and non-discriminatory governing principles, procedures, working methods action plans and guidelines are very important for fair discussions among members. Such framework may encourage stakeholders of internet ecosystem to participate, comply with principles of non-discrimination, build understanding about the challenges of internet and network management, and resolve the conflicting situations keeping in mind the interest of all stakeholders. Members from different stakeholder (TSPs, ISPs, consumers, content providers, technical experts, Academia etc.) may play a vital role in establishment of complete framework for monitoring and enforcement, so that interest of all stakeholder may taken into consideration. However, initial setup of MSB with representative from different stakeholders will be a challenge, as initially, it would not be clear that, who will take responsibility to work on long term visions or mission of MSB, and who will work on short term deliverables to achieve the objective of formation such Multi-Stakeholder Body? Further, for establishment of MSB, it may be essential to define procedures and working methods for interactions between the stakeholders of ecosystem and build consensus among members to reach to a common and single decision of body. But, during initial set up, it may not be clear that how stakeholders of ecosystem would start interacting with each other? Who will take the responsibility to bring representatives of all the stakeholders on same platform and have meetings in fair, transparent and non-discriminatory to frame a constitution of MSB, which may guide concerned body in performing their a set of deliverables? Performing such functions may require a constant guiding and may have an administrative costs.

Initially, there may not be any sponsor member and the framework for collecting funds from membership fee may not work for MSB. One option may be that some founding members collaborate and develop a broad level of code of conduct. With time, founding members involve other members through election process. Initially, founding members would bear the cost of initial set up and function of MSB for successful implementation of principles of non-discrimination. But such arrangement may face dominance of few stakeholders like large enterprises, therefore, special measures may require to avoid monopolies and establish fair and non-discriminatory framework. Other option may be that a temporary setup may introduced by DOT, during establishment of MSB with minimum essential constituent body,

which would have members from all the stakeholders of internet ecosystem. An amount of initial money or grant make available for seeding, setting up and functioning of MSB, till elected office bearers takes over.

3.2.5 Common principles, deliverables and constitution of Body – Study of practices adopted in other jurisdiction shows that major multi-stakeholder bodies are need to identify a set of common principles or codes that all member of the body are committed to comply with. These codes may help in coordinating and integrating contributions of members and may guide in conflict resolutions among members. It may also define the set of deliverables that multi-stakeholder bodies need to perform to fulfil the purpose of its formation. Healthy relations among members may only make this framework for monitoring and enforcement successful. To achieve this, adoption of set of policies or constitution is primary requirement which need to be fair and non-discriminatory towards its members. Therefore, one of the function of MSB may to define procedures and working methods for adoption of a constitution which would be the foundation framework and guiding principles for MSB.

3.2.6 Framework for developing the action plan and its implementation – According to code of conduct and Constitution of Multi-Stakeholder Body, it may be required for Multi-Stakeholder Body to establish processes and working methods for performing its various role and responsibilities and deliverables regarding Monitoring and enforcement. As an advisory to DoT, Multi-Stakeholder Body may require to give appropriate help to DoT in performing their monitoring and enforcement functions. Having a framework for developing action plans, processes, working methods with fair, transparent and proportionate involvement of all the stakeholder and members of the body may help Multi-Stakeholder Body in performing various deliverables.

3.2.7 Policy for budget and resource management – For managing day to day expenses of MSB like administrative, monitoring and enforcement expenditures, a budget may need to be maintained by MSB members. This would ensure independence of body for taking action against violation of principles of non-discrimination. A funding mechanism may be adopted by MSB to meet the day-to-day expenditure. One option could be that cost of administrative, monitoring and enforcement expenditures are covered by fees raised by its Members, may be through membership fee or other contributions. For example, BSG of ofcom (UK regulator) is funded and supported by the Sponsor members. Similar practices are also adopted by multi-stakeholder bodies working in other domains. Like in Europe, a framework has been adopted for ensuring transparency in cloud services. Under this, a voluntary code has been developed and managed by a multi-stakeholder body. In this framework, cost

of Secretariat and Monitoring body are covered by fees raised by its Members and Supporters. All costs of the Secretariat and the Monitoring Body and fees are publicly available[9]. As Supporter, separately and without obtaining voting rights in the General Assembly (body for policy making), any interested individuals or organisations (including user organisations, consumer protection bodies, civil rights groups, industry associations, government bodies or agencies, supervisory authorities, academia, or consultancy organisations) may apply for a membership in the General Assembly. CSPs may not apply for Supporter Status. Membership fee and their rights are also depending on organisations size. Full Membership is open to any Cloud Service Provider no matter of size. However, Non-Voting Membership is also open to either Medium or Small Sized Enterprises. Members with full membership become members of general assembly with voting rights. Non-voting membership fee are different for mid-sized and small sized enterprises.

3.2.8 Management of organisation – Study of practices adopted in other jurisdiction shows that governance structure of multi-stakeholder bodies mostly have two or three layers of hierarchy. Members of body are selected or elected for positions at different levels. Each level has its own role, responsibilities and powers, therefore, members of governing bodies of MSB may require to have adequate experience to held the challenges of their position. As, all the activities of multi-stakeholder body would be performed by members positioned in different layers, therefore, one of the major role & responsibility of MSB is the management of organisations for effectively performing its deliverables. The proposed MSB may also be expected to perform some tasks and deliverables, which may evolve with time. Deliverable may include, give advice to DoT on monitoring and enforcement of net neutrality principles, provide support to DoT for compilation of TMPs, maintain a repository of TMPs and its applications, comply with transparency and disclosure requirements, maintain transparency in its own working etc. Members of Multi-stakeholder body may meet in periodic manner to review body's deliverables and submit proposal before DoT to make it align with Net Neutrality principles and objectives of DoT.

3.2.9 Support for performing deliverables – Perusal of practices adopted in other jurisdiction shows that multi-stakeholder bodies have other components which provide support to executive and steering committees of bodies, like Secretariat which perform the administrative functions of body. Similarly for performing task of monitoring of compliance with codes, one multi-stakeholder body (EU CoC)[10] has established a separate internal independent body for monitoring work. This internal monitoring body is appointed by Steering Board. The actions of the monitoring body are also reviewed by Steering Board. In case

[9]EUDataProtectionCodeofConductforCloudServiceProvidersversion2.1,November2018
[10]EUDataProtectionCodeofConductforCloudServiceProvidersversion2.1,November2018

of factual indication, the monitoring no longer meets the requirements defined in the codes, Steering Board may even withdraw or suspend the appointment of the monitoring body. Above discussion shows that For efficiently performing its deliverables, it may be essential for proposed multi-stakeholder body (MSB) to have a set of defined deliverable and action plans for MSB, and procedures & working methods for administrative or secretariat functions.

3.2.10 IT systems and infrastructure – Adoption of IT systems and infrastructure may make the implementation of framework of monitoring and enforcement much easier, cost effective and trustworthy. IT systems may help in maintaining transparency in its own working and performing other deliverables like transparency and disclosure requirements, conducting meetings and creating awareness and capacity building, where reaching different stakeholders or customers may be challenging and may not be achieved by normal physical or paper works. Having member from different fields, geographical areas and capacity, conducting meetings among members at different hierarchy and different frequencies would be a challenging job. In this regard, MSB may establish IT systems for conduct meetings in a transparent manner such as meeting calendars, mailing system, contact details of secretariat and key office bearers, etc. Involvement of IT systems and infrastructure would improve the credibility of the deliverable of MSB and the functions performed by MSB. It may also help MSB in maintaining the appropriate access to information related to proceedings, meeting and other reports by its own members and even by public in large.

3.3 Functions

3.3.1 Approaches adopted in other jurisdictions and domains – To understand the best practices in other jurisdiction, basic functions performed by some multi-stakeholder bodies in the field of internet and net neutrality or in other domain, are presented in following subsections. In following paragraphs, some similar existing groups and international organisations are being discussed along with their own description of function performed by them, as published on their websites:

(i) The Brazilian Internet Steering Committee has the function of coordinating and integrating all Internet service initiatives in Brazil, as well as promoting technical quality, innovation and the dissemination of the services available. Other functions of committees are:

   (a) proposing policies and procedures regarding the regulation of Internet activities;

   (b) recommending standards for technical and operational procedures for the Internet in Brazil;

(c) establishing strategic directives related to the use and development of the Internet in Brazil;

(d) promoting studies and technical standards for network and service security in the country;

(e) coordinating the allocation and registration of Internet addresses (IPs);

(f) Collecting, organizing and disseminating information on Internet services, including indicators and statistics.

(ii) Broadband Stakeholder Group is the UK government's advisory body on broadband. The BSG secretariats role includes drafting policy proposals, maintaining stakeholder relations and providing administrative support. Broad functions of BSG are:

(a) ***Develop process for raising concerns about possible cases of discrimination over the Open Internet:*** It provides a useful mechanism for various industry players to constructively engage on specific issues and concerns that are emerged. BSG and signatory ISPs keep this process under review in consultation with other stakeholders and make updates publically available.

(b) ***Take measures to make its actions and functions transparent:*** BSG share the log of raised issues with government and Ofcom at regular interval to help build the evidence base of issue of concern and assist Government and Ofcom with any further analysis, action or investigation they may wish to pursue. It also makes updates of process finalized by BSG and signatory ISPs, publically available via its website.

(iii) According to the details specified in their Open Internet Code of Practice 2016 and available on their website, the multi-stakeholder industry body, BSG performs following functions whenever any concern raised by content providers:

(a) In case provider of internet-based content, applications or services believe that a signatory ISP to the Open Internet Code of Practice has failed to meet its Commitments, then they can raise issues directly with such ISPs or get in touch with the BSG with as much evidence and supporting information as possible. BSG dont have any process for consumer complaints and for any complaint or issue in respect of traffic management, only option available with consumer to contact ISPs consumer service and if not resolve file complaint as per general complaint procedure.

(b) ***Resolve issues by calling bilateral discussions between ISPs and providers of internet-based content on breach of CoP or Regulations.*** BSG plays

an important role in discussions between stakeholders on a bilateral basis. The BSG facilitates ongoing discussion between ISPs and content providers through the Open Internet Forum which brings together signatories of the Code, Government, Ofcom, content providers and other interested parties. It facilitates dialogue amongst industry on Open Internet issues and allows concerns and issues to be raised informally.

(c) In case the issue not resolved as a result of bilateral discussions, the provider of internet-based content, applications or services can log this with the BSG. The BSG will not make a judgment of the validity of the claim but will share the log of raised issues with government and Ofcom at regular intervals.

3.3.2 Possible functions of Multi-Stakeholder Body – In consideration of decision of DoT on framework of monitoring and enforcement, the monitoring and enforcement functions to net neutrality shall rest with DoT. 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 give appropriate advises in this regard. In view of above, Multi-Stakeholder Body may need to perform following functions:

(i) Prepare report and submit to DoT after capturing representations from all sections of the members of multi-stakeholder body and performing requisite monitoring and investigation in this regard;

(ii) Perform evidence based investigations with reference to cases forwarded by DoT related to concerns against net neutrality violation and submit report to DoT;

(iii) Take measures to make its actions and functions transparent;

(iv) Help DoT in handling complaints received from consumers;

(v) Help DoT in compilation of reasonable Traffic Management Practices adopted by TSPs with description;

(vi) recommending standards for technical and operational procedures for monitoring and enforcement of net neutrality;

(vii) Consumer awareness regarding net neutrality, transparency measures of TSPs and DoT and process for raising concerns with DoT.

Q. 4. What should be the composition, functions, roles and responsibilities of 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? Please suggest with justification.

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 type or category of membership? What may be these categories? What policy may be adopted for initial set up of Multi-stakeholder Body. Please suggest with justification.

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? Please suggest with justification.

Q. 7. What should be the guiding principles and structure of governance of 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. Please suggest with justification.

Q. 8. Any other issues which is relevant to this subject?

Chapter 4

Issues for Consultation

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 perspective of Net Neutrality? Whether list of Traffic Management Practises (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 Multi-Stakeholder Body to keep it up to date? Please suggest with justification.

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 objective and unambiguous manner? In case of detail technical description, what framework need to be adopted by Multi-Stakeholder Body to document it. Please suggest with justification.

Q.3 What set up need 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 negative while collecting samples and interpreting Net Neutrality violations? Please suggest with justification.

Q.4 What should be the composition, functions, roles and responsibilities of 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? Please suggest with justification.

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 type or category of membership? What may be these categories? What policy may be adopted for initial set up of Multi-stakeholder Body. Please suggest with justification.

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? Please suggest with justification.

Q.7 What should be the guiding principles and structure of governance of 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. Please suggest with justification.

Q.8 Any other issues which is relevant to this subject?

List of Abbreviations

Authority - Telecom Regulatory Authority of India.

BEREC - Body of European Regulators for Electronic Communications.

CMTS - Cellular Mobile Telephone Service.

DoT - Department of Telecommunications.

IAS - Internet Access Services.

ITU - International Telecommunication Union.

M&E - Monitoring and Enforcement.

MSB - Multi-Stakeholder Body.

NRA - National Regulatory Authority.

QoS - Quality of Service.

TMP - Traffic Management Practice.

TRAI - Telecom Regulatory Authority of India.

TSP - Telecom Service Provider.

UASL - Unified Access Service License.

UL - Unified License.

VNO - Virtual Network Operators.