



Telecommunications Authority of Trinidad and Tobago

**DISCUSSION PAPER ON
NET NEUTRALITY AND OVER-
THE-TOP (OTT) SERVICES IN
TRINIDAD AND TOBAGO**

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Abbreviations

BEREC	Body of European Regulators for Electronic Communications
CANTO	Caribbean Association of National Telecommunication Organizations
DPI	deep packet inspection
GoRTT	Government of the Republic of Trinidad and Tobago
IoT	Internet of things
IP	Internet Protocol
IPTV	Internet Protocol TV
ISP	Internet service provider
ITU	International Telecommunication Union
OECD	Organisation for Economic Co-operation and Development
OTT	over-the-top service
NGN	next-generation network
P2P	peer-to-peer
PSTN	public switched telephone network
QoS	quality of service
TATT	Telecommunications Authority of Trinidad and Tobago
TV	television
VoIP	voice over Internet Protocol
Wi-Fi	wireless fidelity

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1 Introduction

1.1 Background

In June 2015, the Telecommunications Authority of Trinidad and Tobago (the Authority) issued its consultative document, *Towards the Treatment of Over-the-Top (OTT) Services*. That document explored the concept of OTTs and, in particular, sought to examine the interaction between the markets in which OTT service providers and authorised providers operate in Trinidad and Tobago. In addition to evaluating the impact of OTT voice over Internet Protocol (VoIP) services within the telecommunications industry, the document also aimed to engage the public on issues relating to OTTs.

In reviewing the comments received following the public consultation on that document, the Authority noted that many of the comments were heavily focused on the issue of net neutrality. Generally, this term refers to the idea that all Internet traffic should be treated equally, without regard to its content, destination or source. It was, therefore, evident that the treatment of OTT services could be addressed within a larger overarching framework that includes a discussion on the principle of net neutrality. As such, the Authority took the decision to subsume previous discussions on OTT issues and net neutrality under one document: the *Discussion Paper on Net Neutrality and Over-the-Top (OTT) Services in Trinidad and Tobago*, (the Discussion Paper).

This Discussion Paper provides a discussion on guiding principles and regulatory approaches to net neutrality and the treatment of OTT services. It partitions the discussions on net neutrality principles and OTT regulation, with the former discussion being contained in sections 1–8 and the latter being exclusively addressed in section 9. Following the first round of public consultation, the Authority has amended the document to include feedback received from stakeholders on the discussion points as well as general recommendations on the document.

The inputs from the Discussion Paper shall inform the Authority’s separate policy frameworks on net neutrality and OTT regulation to be issued in the second round of consultation for this

consultation process in accordance with the Procedures for Consultation in the Telecommunications and Broadcasting Sectors of Trinidad and Tobago¹.

1.2 Rationale

The subjects of net neutrality and OTTs have sparked intense debates by politicians, policy makers, service providers and consumers worldwide. Despite its prolific appearance in today's media, net neutrality is hardly a new topic. Some principles of the debate go as far back as the origin of the commercial Internet itself (Downes 2014). In general terms, these principles advocate an open and indiscriminate network, while recognising the need for prudent traffic management practices by network operators.

Trinidad and Tobago is no stranger to these discussions, as the local market has not been spared, nor is it immune to, practices that potentially challenge the principles of net neutrality, particularly as they relate to OTT services.

The issues relating to net neutrality are a matter of national interest. It is thus imperative that policy considerations be given to the concept of net neutrality from a national perspective. As such, decisions taken on the subject should align with policies geared towards the development of the sector and, by extension, the country.

1

https://tatt.org.tt/DesktopModules/Bring2mind/DMX/API/Entries/Download?Command=Core_Download&EntryId=1452&PortalId=0&TabId=222

1.3 Purpose

This Discussion Paper examines both sides of the net neutrality debate within the context of Trinidad and Tobago and proposes guiding principles and recommendations for net neutrality. It also provides a discussion on the applicability of OTT regulation under the current legislative framework and proposes recommendations for their authorisation and regulation.

1.4 Objectives

The objectives of this Discussion Paper are to:

- i. explore the nature of OTT services as they relate to voice, media and messaging.
- ii. present the key principles underlying both sides of the net neutrality debate.
- iii. examine the policy issues relating to net neutrality and OTT services.
- iv. propose guiding principles for net neutrality in Trinidad and Tobago.
- v. make recommendations for the regulation of net neutrality and OTTs in Trinidad and Tobago.

1.5 Legal and Regulatory Framework

The Authority, in its strategic and operational duties, is governed by its legal and regulatory framework, which comprises the following instruments:

- i. The Telecommunications Act, Chap. 47:31 (the Act)
- ii. Concession for the Operation of a Public Telecommunications Network and/or Provision of Public Telecommunications Services and/or Broadcasting Services

The Act provides the regulatory background for net neutrality and OTT services. Section 3 establishes the objects of the Act, which include, inter alia, establishing conditions for:

- “(a) an open market for telecommunications services, including conditions for fair competition, at the national and international levels;
- (b) the facilitation of the orderly development of a telecommunications system that serves to safeguard, enrich and strengthen the national, social, cultural and economic well-being of the society;
- (c) promoting and protecting the interests of the public by—
- (i) promoting access to telecommunications services;
 - (iii) providing for the protection of customers;
 - (iv) promoting the interests of customers, purchasers and other users in respect of the quality and variety of telecommunications services and equipment supplied;
- (d) promoting universal access to telecommunications services for all persons in Trinidad and Tobago, to the extent that is reasonably practicable to provide such access;
- (f) promoting the telecommunications industry in Trinidad and Tobago by encouraging investment in, and the use of, infrastructure to provide telecommunications services...”

Section 18 (1) outlines the functions and powers of the Authority, which include, inter alia:

- “(d) to establish national telecommunications standards; and
- (p) to ensure the orderly and systematic development of telecommunications throughout Trinidad and Tobago”.

Under section 18 (3), the Authority is required to consider the interests of consumers, in particular:

“(a) to the quality and reliability of the service provided at the lowest possible cost;

(b) to fair treatment of consumers and service providers similarly situated;

(c) in respect of consumers similarly placed, to non-discrimination in relation to access, pricing and quality of service”.

Section 21 (1) of the Act mandates that: “No person shall operate a public telecommunications network, provide a public telecommunications service or broadcasting service, without a concession granted by the Minister”.

The concession document also speaks on behaviour relating to anti-competition and market dominance.

Concession condition A21 states: “The concessionaire shall not engage in conduct which has the purpose or effect of preventing or substantially restricting or distorting competition in any telecommunications or broadcasting markets, or interfering with the operation of networks or the provision of services by any of its competitors”.

Concession A22 elaborates: “The concessionaire shall not enter into any agreement, arrangement or understanding which has or is likely to have the purpose or effect of preventing or substantially restricting or distorting competition in any market for the provision or acquisition of any networks, services or equipment”.

1.6 Other Relevant TATT Documents

Other relevant policies, plans and regulations to be read in conjunction with this document include:

- i. *Towards the Treatment of Over-the-Top (OTT) Services, 2015*

- ii. *Authorisation Framework for the Telecommunications and Broadcasting Sectors of Trinidad and Tobago, 2005*
- iii. *Consumer Rights and Obligations Policy, 2014*
- iv. *Draft Telecommunications (Consumer) (Quality of Service) Regulations, 2015*
- v. *Guiding Principles for Regulatory Decision Making, 2015*

1.7 Consultation Process

In accordance with its *Procedures for Consultation in the Telecommunications and Broadcasting Sectors of Trinidad and Tobago*, the Authority sought the views of industry stakeholders on the first draft of this document. Comments arising from the consultation process, inclusive of responses to the Discussion Points, were considered and incorporated, where applicable, within the Discussion Paper. (See Appendix I for the decisions on recommendations (DoRs)). This marks the final publication of the Discussion Paper.

The Authority shall continue with a second round of consultation on the topics of net neutrality and OTT regulation in separate publications, *Net Neutrality Policy Framework and Over-the-Top (OTT) Services Policy Framework*.

2 Over-the-Top (OTT) Services

2.1 Definition of OTT and OTT Services

The terms “OTT” and “OTT services” encompass a broad category of services that are offered over the Internet. The scope of the terms used in this Discussion Paper mirror that of the International Telecommunication Union (ITU) which focusses on “an application accessed and delivered over the public Internet that may be a direct technical/functional substitute for traditional international telecommunication services” that may substitute or supplement traditional telecommunications services (ITU 2019).

In a policy paper presented at the Caribbean Association of National Telecommunications Organizations (CANTO) meeting held in 2014, OTT was described as “a general term used for services that a customer may use which rides on top of a network to which the customer is connected” (CANTO 2017).

The Body of European Regulators for Electronic Communications (BEREC) defines OTT service as “content, a service or an application that is provided to the end user over the public Internet” (BEREC 2016).

The Organisation for Economic Co-operation and Development (OECD) Communications Outlook 2013 has described OTT services as “video, voice and other services provided over the Internet rather than solely over the provider’s own managed network” (OECD 2013).

OTTs are a prime example of a converged technology that exists in today’s telecommunications industry enabled by the Internet Protocol (IP) — a technology that has facilitated the separation of carriage from content, thus allowing OTT providers to use existing networks to deliver content or services to end users without any involvement by network owners in the transaction (ITU 2012).

As seen above, the broad definition of the term “OTT” covers a wide array of services offered over the Internet. For the purposes of the discussion contained in this document, in particular section 9, the scope of the term is limited to those OTT services that take the form of messaging, media or voice services, competing with similar services offered by authorised telecommunications service providers.

2.2 Classification of OTT Services

2.2.1 OTT Voice Services

OTT voice services are a VoIP offering², where voice is transported over the Internet as packet switched traffic (Detecon 2014). Further details on these services can be found within the Authority’s consultative document, *Towards the Treatment of OTT Services*. Examples of OTT voice services include Facetime, Skype, Viber and WhatsApp.

2.2.2 OTT Multi-media Messaging Services

² This is not to be confused with VoIP telephony provided by authorised telecommunications providers who rely on this technology to deliver voice over a public or private Internet Protocol (IP) network.

OTT messaging is similar to OTT voice services, as it relies on Internet Protocol (IP) technology to provide instant messaging services to consumers over the Internet. It is an alternative to the multi-media messaging services (MMS) provided by authorised telecommunications mobile operators. Examples of OTT messaging services include Facebook Messenger and WhatsApp.

2.2.3 OTT Media Services

OTT media is described as delivery of video and/or audio via the Internet, without a cable TV or satellite service operator being involved in the control or distribution of the content itself. It is understood that the content arrives from a third party and is delivered to an end user's device, leaving the Internet service provider (ISP) responsible only for providing the transport medium for the IP packets. It refers to video or audio content being streamed or downloaded over the Internet. Examples of OTT media services include Hulu, Netflix and Spotify.

2.3 The Changing Landscape and OTTs

The OTT services described in this section have revolutionised the communication and entertainment landscape. Consumers have adopted them as a preferred mode of communication and source of entertainment, as they are accessible at little to no cost. Service providers, on the other hand, are faced with competitive pressure from these services that are similar to their traditional services. Moreover, OTTs, and in particular OTT media, have stimulated an insatiable hunger for high Internet speeds which service providers struggle to satisfy.

In the face of this revolution, service providers are faced with the choice of either changing their traditional business models or risk losing market share. The adoption of traffic management strategies is one of the measures they embrace to achieve optimum network performance while

also alleviating any strain on network capacity, so consumers have access to a satisfactory level of quality of service (QoS). This has given rise to the concern that ISPs may manipulate their traffic management strategies for reasons unrelated to network optimisation and integrity. Governments and regulators are, therefore, now being prompted to address these concerns as they relate to the principle of net neutrality.

3 Net Neutrality and Traffic Management

3.1 Definition of Net Neutrality

Professor Tim Wu, one of the earliest proponents of equal treatment of data, has asserted that all content, sites and platforms should be treated equally. He defined net neutrality as “a network design principle. The idea is that a maximally useful public information network aspires to treat all content, sites, and platforms equally. This allows the network to carry every form of information and support every kind of application” (Wu, Net Neutrality FAQ 2006). Within the industry, it has, therefore, been construed that ISPs should treat all Internet traffic equally, independent of type, source or origin.

Wu, and many other academics, also recognised that the term “net neutrality” extends beyond network design. It touches on policy and regulatory strategies aimed at preventing negative spillovers of ISP conduct in other industries, and in the wider economy. Primarily, net neutrality corroborates the decentralised and open architecture of the Internet to ensure competition is preserved, innovation can flourish and consumers have unprecedented access to information (P. D. Luca Belli 2015).

Even in light of concerns for anti-competitive discriminatory conduct by ISPs, it is important to note here that Wu recognised the difficulty presented when forms of discrimination are required in order to “manage bandwidth and prohibit uses of the network that damage the integrity of the network or seriously impinge the rights of other users”. As Wu noted, “such restrictions are necessary if broadband carriage is to be a viable business” (Wu, <http://www.timwu.org> 2002).

3.2 Traffic Management

In the open Internet model described above, data were transmitted primarily on “best effort”, meaning on a “first come, first served” basis. This best effort scenario is based on the inherent end-to-end design of the IP suite, where the network merely acts as a pipe through which packets traverse without any interference by ISPs. In an era of a large volume of Internet users and a variety of bandwidth-intensive applications, some experts have debated that the end-to-end principle is unsustainable. They argue that congestion experienced as a result of the increasing Internet traffic deteriorates the overall performance of the network, forcing ISPs to manage the deluge of traffic, either by overprovisioning network capacity or implementing QoS traffic management policies. The latter has implications for net neutrality when QoS policies extend beyond what is reasonably required to manage the efficiency of a network. The principle of reasonable traffic management is elaborated upon in section 7.

4 Net Neutrality Interferences

It is usually conceded that traffic management mechanisms are required to manage the influx of data-intensive applications and services. (Predictable Network Solutions Limited 2015) As a result, network operators implement traffic management policies that seek to address the problem of congestion and the ensuing degradation of QoS in order to protect the integrity of their networks. This may entail the use of traffic management technologies, such as deep packet inspection (DPI)³. DPI and other similar technologies can be used for innocuous purposes, such as identifying malware, or for extraneous traffic discrimination activities that further the economic interests of authorised network providers.

Section 4.1 – 4.4 provide an overview of the different discriminatory actions that a service provider may employ to manage traffic on its network. The discussion centres on how traffic management practices, along with, in some cases, marketing and pricing strategies, are used by ISPs in dealing with OTT services. These actions may be considered as deviations from the generally accepted principles of net neutrality and, as such, are referred to in this document as “net neutrality interferences”. The adoption of the term mirrors that of a similar study commissioned by the European Commission's Information Society and Media Directorate-General to describe actions of ISPs that qualify as breaches of net neutrality (DLA Piper 2009).

4.1 Blocking

One traffic management practice that has been at the forefront of the net neutrality discussion is the intentional blocking of lawful content. Advanced traffic management methods such as DPI

³ “Deep packet inspection (DPI) is an advanced method of examining and managing network traffic. It is a form of packet filtering that locates, identifies, classifies, reroutes or blocks packets with specific data or code payloads that conventional packet filtering, which examines only packet headers, cannot detect” (Search Networking 2017).

provide network operators with extensive access to information on the data packets that traverse their networks. This form of data profiling assists network operators in the application of traffic management policies that sometimes include the blocking of identified lawful applications, services or websites that are either data intensive or in direct competition with their own service offerings, e.g., OTT voice applications. Blocking of this nature violates the principle of net neutrality and is therefore regarded as a net neutrality interference.

4.2 Throttling

Throttling is the intentional slowing of Internet traffic to reduce bandwidth congestion. In general, it is an intentional lowering of the “speed” that is typically available over an Internet connection (Fisher, <https://www.lifewire.com> 2019).

As with blocking, service providers rely on sophisticated traffic management methods to engage in this practice at certain times of the day when data transfer is at its peak, if the traffic is of a particular type or from a particular website, or all types of data once a certain threshold is reached by the end user (Fisher 2016).

While throttling is often used to reduce network congestion, ISPs may employ the practice for reasons outside this rationale. One study involving over half a million data traffic tests across 161 countries notes the lack of evidence that “any of these policies are only happening during network overload” (Grossman 2018). Throttling, in these cases, may be used by ISPs to drive users towards certain services, typically ones from which the ISP stands to profit. This is an inherent violation of the net neutrality principle.

4.3 Paid Prioritisation

Paid prioritisation is the practice that allows ISPs to offer preferential treatment or prioritised delivery to a content provider's traffic in exchange for monetary compensation. The imposition of fees for prioritised delivery has been a focal point of the net neutrality debate, as it is viewed as an exploitation of traffic management practices by ISPs for financial gain. According to proponents of net neutrality, such behaviour counters the established code of conduct for the treatment of traffic over the Internet. They believe that such a practice interferes with the net neutrality model that has been a catalyst for creativity and innovation.

This perspective is not shared by all, ISPs in particular, who, in some instances, demand flexibility in their traffic management practices and business models because of the challenges they face with the rise of OTT services. Moreover, paid prioritisation may be regarded as product differentiation and not product discrimination. ISPs should therefore be able to offer higher quality services based on the customer's willingness to pay (Gharakheili 2017).

Furthermore, critics of net neutrality rules argue that a "light touch" approach is preferable in order to achieve gains in innovative services such as telemedicine. They argue that an outright ban on paid prioritisation would hinder consumers' ability to benefit from services that need prioritisation, such as latency-sensitive telemedicine services (Pai, Project Goal's Conference on "Aging and Technology: Creating Opportunities to Age Well with Innovation 2017).

4.4 Zero-Rated Pricing

To gain a competitive advantage, ISPs employ various pricing and marketing strategies to differentiate their network's services from those of their competitors. A common pricing strategy is zero rating. This practice allows mobile subscribers to access certain online content (e.g., a website or application) "for free", that is, without having the data counted against their usage (Eisenach 2015). In addition to operator-initiated zero rating, i.e., where ISPs employ the practice

on their own initiative as part of their marketing campaign, there is also sponsored zero rating. This occurs when a third-party content provider enters into a business arrangement with the ISP to zero rate the data associated with the use of their service. The ISP is compensated by the content provider, who agrees to cover the cost of the data charges.

The general concept of net neutrality is that all traffic on the Internet should be given equal treatment by ISPs. It is argued that zero rating violates this principle, as it involves manipulation through economic means to give preferential treatment to some forms of data over others. Some proponents of net neutrality go as far as referring to zero-rated services as having, de facto, the same effect as blocking and/or throttling. As one article states, “At first glance it may appear that all traffic is handled equally in this charging model, but the fact is that once you have used your quota, the traffic that is exempted will be allowed to continue, while all other traffic will be throttled or blocked. This is clearly a case of discrimination between different types of traffic” (Sørensen 2014).

However, others argue that zero rating is a legitimate business development strategy used by ISPs to drive demand for their services, by capitalising on the network effects⁴ gained. Moreover, in light of the growing demand for broadband infrastructure, it is argued that such a pricing strategy may prove beneficial to broadband investment, as it may improve operators’ revenues (Johns 2015). It is also often argued that zero rating helps to broaden access to the Internet by those who would otherwise be excluded from its use, thereby bridging the digital divide. For example, Free Basics, (a rebranding of Internet.org) provides a service that allows users who have never been online to use zero-rated content for free. This brings connectivity to the previously unconnected in multiple countries in Africa and Asia, where research shows that consuming zero-rated content is one of many strategies used by the poor to save money (Galpaya 2017).

⁴ Network effects occur when the customer's perceived value of a product increases with the number of people using that same product or a complementary product.

In Trinidad and Tobago, zero-rating has also been used as a means of increasing consumer access to information and promoting digital inclusion. For example, during the coronavirus disease 2019 (COVID-19) pandemic, the offering of zero-rated education, health and news-related websites allowed for the timely spread of information to the public and the continued access to online learning by lower-income students.

5 Net Neutrality and OTT Services: Key Policy Issues

The principle of net neutrality and, in particular, the extent to which it is observed by service providers in their treatment of OTT services, raises several policy issues. This section focuses on the key issues surrounding the net neutrality and OTT debate, and particularly examines the extent to which the absence of net neutrality rules affects innovation, investment, competition and consumer choice.

5.1 Net Neutrality and Internet Innovation

As discussed in section 3.1, the concept of net neutrality is based on the end-to-end principle of the Internet architecture. Today, this concept is largely understood to comprise a set of principles and rules that require the equal treatment of data regardless of its source and/or destination. The adherence to these principles and rules has been credited to affecting the impetus for the growth and innovation of the Internet. It has enabled innovators who operate at the edge of a telecommunications network⁵ (content providers) to introduce their innovations to large audiences, with great speed and low barriers to entry (Lemley and Lessig 2001). OTT service providers are among the content providers who have benefited from the open platform and have heralded a new age in communication and entertainment with the likes of applications such as Facebook, Skype, Spotify and WhatsApp. In this regard, it has been the view of some experts that lifting net neutrality is a departure from the end-to-end principle that facilitated innovation at the edge of the network without interference from network operators (Economides and Tag 2012). It is in this vein that the principle of net neutrality is defended so that innovation at the edge of the network is protected (Reggiani and Valletti 2016).

⁵ A network located on the periphery of a centralised network. The edge of a telecommunications network typically feeds the central or core network. It is also usually connected to subscribers or consumers, both business and residential.

Similarly, innovative technologies, such as cloud services (e.g., Amazon Web Services, Google Cloud Platform and Microsoft Azure) and the Internet of Things (IoT), have emerged and are burgeoning in the face of an open Internet (Finley 2017). ISP practices that allow for the unregulated control of the Internet, pose a threat to these services, hampering their growth and stifling innovation (Corbin 2017).

On the other hand, it is contended that other innovative services have arisen that should be exempted or given special consideration when implementing net neutrality policies. These services, which are often referred to as specialised services, rely on the use of IP for their delivery to end users over a private and managed network. That is to say, specialised services do not form part of the public Internet and should, therefore, be excluded from net neutrality's ambit. Examples of these services are Internet Protocol TV (IPTV) and e-health services.

While it is generally accepted that these services require delivery that goes beyond best effort to meet QoS requirements, the provision of these services should not compromise the quality of consumers' Internet experience, i.e., the broadband transmission capacity for the public Internet should not be infringed upon such that it severely degrades broadband QoS.

5.2 Net Neutrality and Network Investment

Investment in broadband networks is essential to satisfying the increasing demand for broadband capacity. ISPs are, therefore, advocating for the right to experiment with alternative business

models so they can gain a reasonable return on their investment. They argue that the current model limits their earnings, as content providers use the ISPs' infrastructure to access customers without compensating them for it. ISPs further argue that, not only do OTT voice, messaging and media service providers "free ride" their networks, but the services they offer are in direct competition with traditional services, thereby threatening the ISPs' main sources of revenue. This ultimately impacts the ISPs' ability to reinvest in their networks.

The paid-prioritisation scheme is one such business model ISPs endorse, as it allows them to charge content providers for preferential delivery of certain websites or services in the face of a congested network. It is suggested that paid prioritisation creates positive effects, as revenues generated can be used to invest in network capacity expansion or upgrading network technologies.

However, as previously indicated, some view this practice as a deviation from the open Internet model and consider that congestion is best managed through network expansion. Moreover, advancements in technology (e.g., fibre optics and compression technologies) have enhanced the carrying capacity of wireline networks, thus weakening the capacity limitation argument. With respect to mobile networks, there is a de-loading of traffic off the network when users opt for free Wi-Fi access offered by businesses and hotspots⁶.

In addition to ISP-led investment, it is worth mentioning that content and application providers also invest in the Internet infrastructure. Along with their core business outlay, content and application providers invest in the physical network, facilities and equipment — from data centres to submarine cables and the multitude of servers that store, process and serve content to end users (Analysys Mason 2014). This form of investment results in improved service quality and reduced cost of delivery of Internet services by ISPs.

⁶ For example, in the US, the Nielsen Mobile Performance Panel for August 2016 found that more than three times as much data consumed on Android mobile phones is delivered through Wi-Fi networks as opposed to cellular. In some developing countries, however, there has been a trend towards the use of mobile Internet as either complementary to fixed Internet or as the primary or only form of Internet access (Stork, Calandro, & Gillwald, 2013).

5.3 Net Neutrality and Competition Concerns

As indicated earlier, there are several traffic management and marketing strategies that a service provider can adopt in the provision of its services. Often, these strategies come with the concomitant risk of creating barriers to competition. Specifically, many commentators fear that the absence of net neutrality rules creates opportunities for providers to exercise discrimination that results in anti-competitive practices. This fear is particularly compounded when a provider has, or is suspected of having, a position of dominance. Conversely, where competition within the broadband industry thrives, these fears are alleviated, as the competitive environment places restraints on ISP conducts.

Of concern, is the potential motivation of existing network operators to protect their traditional services, such as voice or cable services, from competition. In this case, discriminatory practices may be directed at providers of OTT services, such as Netflix or Skype, that threaten to place competitive constraints on the network owner's traditional services. The network operator may apply a number of discriminatory strategies to either directly block the competing service or make it unattractive to consumers by influencing its price or degrading its quality of service. These actions, which can result in a reduction of consumer choice of services, may not only be anti-competitive, since the operator uses his position of dominance to foreclose rival services, but it may stifle innovation within the industry, as discussed above.

Arrangements involving paid prioritisation raise additional competition concerns. They potentially create incentives for service providers to give an advantageous edge to some OTT applications or content over others. For example, incentives may exist where a network operator partners or forms an affiliation⁷ with a content provider. In this instance, the network provider, through its affiliate, may offer services within the content market. Thus, there may be an added incentive for the

⁷ This involves a type of inter-company relationship in which one of the companies has ownership of the other or the two companies are subsidiaries of a larger company.

operator to employ a number of strategies that minimise competition downstream because it now has an economic interest within the service provision market. Such strategies may include, amongst others, degrading the quality of the services of the affiliate's competitors and blocking the end user's access to their services. Paid prioritisation may also create a "pay to play" culture, where only businesses that are able and willing to pay operators can readily reach consumers. In this sense, the practice acts as a significant barrier to entry into the content market, as newer providers are less likely to have access to the same financial resources as incumbent firms.

In defence of this practice, however, it has been asserted that paid prioritisation is not unique to telecommunications and is, in fact, a ubiquitous practice adopted throughout economies (Ohlhausen 2017). For example, online advertising companies allow firms willing to pay more to enjoy greater exposure, and supermarkets carry selected brands and give superior placement to the goods of firms that pay the most. It is also purported that paid prioritisation is a vertical commercial arrangement⁸ which generally does not harm the competitive process. In fact, economists agree that vertical restraints often boost efficiency and competition (Slade 2008). They can spur capital investment, coordinate optimal network usage, deter free riding and reduce Cournot competition problems⁹ (Cooper 2005). Thus, it is only in limited circumstances that vertical restraints harm competition.

The issue of competition also extends to the zero-rated pricing strategy adopted by some service providers. However, this concern is viewed by some as unwarranted. Supporters of differential pricing practices, as zero-rated pricing is sometimes called, argue that these practices represent an opportunity for ISPs and content providers to compete in the market by catering to the different needs of consumers. They submit that differential pricing practices give ISPs a way to differentiate themselves in the market, to expand their customer base and, ultimately, to help drive investment and economic growth. For these parties, differential pricing practices are a sign of normal, healthy market activity.

⁸ An arrangement between firms at different levels of the supply chain

⁹ An economic problem occurring in markets with limited players, where the behaviour of the players ultimately leads to the suppression of output and increased prices

On the other hand, it is often argued that the practice of zero rating is anti-competitive and causes market distortions. It is also contended that the practice fundamentally violates the principles of net neutrality, i.e., the provision of zero-rated services gives network operators the ability to discriminate among sources of online content or services. In other words, exempting some content from being counted against the consumer's data usage creates strong incentives for the user to choose the zero-rated services over those that are not. This, as is frequently argued, has the effect of creating a "walled garden" Internet, meaning that the user's view of the Internet will be limited to the zero-rated content. Moreover, it creates a barrier to entry and additional costs for content providers, by requiring them to negotiate separate arrangements with various ISPs. There is also a concern over the presence of anti-competitive conduct, where the zero-rated content or services are owned by the network operator or its affiliate.

Some opponents go as far as referring to zero-rated services as having, de facto, the same effect as blocking and/or throttling (Sørensen 2014). Additionally, it is feared that network operators, in their capacity as "gatekeepers" of the Internet, may attempt to extract exorbitant fees from content providers seeking to have their content zero rated.

Notwithstanding the competition concerns they may present, both paid prioritisation and zero rating may produce beneficial effects that ultimately redound to the consumer. These benefits, which range from improved quality for innovative services and reduced country-level digital divides, are discussed in more detail in section 8.

5.4 Consumer Choice and Access to Information

The debate on net neutrality often centres on whether its absence gives operators the opportunity to exercise discretionary control on the information Internet users are able to access. This is a

matter worth addressing effectively, since continuous access to information is a major driver of innovation, technological advancement and economic progress today.

There is also a concern that, without net neutrality, consumer choices may be curtailed by the fostering of preferential treatment and/or a “pay to play” culture (Fox 2013). When this occurs, consumers are likely to be worse off in the future, as innovation is stifled. When innovation and access to information are reduced, so too is a society’s capacity for increased economic growth and social welfare.

There is also the ethical issue as to whether the absence of net neutrality rules allows for infringements of consumers’ right to use the Internet free of “censorship”. For example, a network owner may choose to limit access to websites hosting views opposing those of the network owner or may block access to a consumer advocacy group’s website that routinely hosts complaints about the services offered by the network operator.

Conversely, as some academics note, there would be reduced concerns about net neutrality in cases where certain practices (such as prioritisation or blocking/filtering of some traffic) are requested by the Internet end user and offered in a manner where the end user retains sufficient direct control over which applications get priority and when. In such an instance, it is important that the measure be explicitly “opt-in” by the consumer (Luca Belli 2016).

6 The Trinidad and Tobago Context: An Analysis of the Net Neutrality Doctrine

In addressing net neutrality issues, many jurisdictions employ a variety of strategies that are designed to reflect the idiosyncrasies of their operating environment. Some of these strategies are outlined in Appendix I. In the case of Trinidad and Tobago, proposed approaches to net neutrality must be made within the context of achieving the country's wider policy objectives, paying specific regard to the development and functioning of the telecommunications sector.

This section examines the role that approaches to net neutrality (as discussed in section 4) may play in the achievement of the country's policy objectives as envisioned by the Act. These objectives include, but are not limited to, promoting investment in, and the use of, infrastructure; establishing conditions for fair competition; promoting and protecting consumer interests; and promoting universal service. Additionally, a key tenet of the net neutrality debate is the role that innovation plays in the socio-economic advancement of a country. This section, therefore, also considers the role of net neutrality in fostering innovation in Trinidad and Tobago, which the GoRTT has highlighted as a strategy for information and communications technology (ICT) sector development.

6.1 The Promotion of Broadband Development and Uptake

One of the strategic thrusts of the ICT Blueprint, the National ICT Plan 2018-2022 (the National ICT Plan), is to improve connectivity. This involves initiatives for enhancing ICT infrastructure, specifically through the ubiquitous deployment of next-generation networks (NGNs)¹⁰. According

¹⁰ A next-generation network (NGN) is a packet -based network which can provide services including Telecommunication Services and is able to make use of multiple broadband, quality of Service -enabled transport technologies and in which service-related functions are independent from underlying transport-related technologies.

to the National ICT Plan, “a key aim of this thrust is to facilitate and incentivise private sector investment and market actors to advance the national ICT infrastructure” (Ministry of Public Administration 2018).

This imperative is supported by one of the objects of the Act, which calls for the promotion of investment and the use of infrastructure. Further to this, in the interest of creating an enabling environment to ensure that opportunities exist for all to be connected in a digital age, actions taken regarding the subject of net neutrality should ensure that the industry remains sustainable, attracts investors and fosters a digitally inclusive environment.

A preliminary assessment of broadband development and uptake in Trinidad and Tobago, using data from the Authority’s statistical repository, reveals the following statistics as at December 2020:

- i. Fixed broadband Internet was provided by 10 operational service providers.
- ii. The fixed Internet penetration per 100 household stood at 88.6.
- iii. Approximately 28 out of every 100 inhabitants subscribed to fixed broadband Internet.
- iv. Active^[1] mobile Internet penetration stood at 56.3% of the population.
- v. 100% and 75% of the population were covered by 3G and LTE/WiMAX mobile network (TATT 2020).

From the data, it is seen that, despite the presence of 12 authorised ISPs operating in Trinidad and Tobago, there are significant pockets of the population that remain unserved and underserved. Policy prescriptions should thus be prompted by the drive for the further rollout of infrastructure and to ensure the presence of conditions apt for increasing consumer take-up. In other words, rules on net neutrality should not be so restrictive as to inhibit investment within the sector.

It enables users’ unfettered access to networks and competing service providers and services of their choice. It supports generalised mobility which will allow consistent and ubiquitous provision of services to users [ITU-T Recommendation Y.2001 (12/2004) - General overview of NGN].

^[1] “Active” refers to having used the Internet within the last three months.

From the data, it is seen that, despite the presence of 11 ISPs operating in Trinidad and Tobago, there are significant pockets of the population that remain unserved and underserved. Policy prescriptions should thus be prompted by the drive for the further rollout of infrastructure and to ensure the presence of conditions apt for increasing consumer take-up. In other words, rules on net neutrality should not be so restrictive as to inhibit investment within the sector.

6.2 Fostering Effective Competition within Trinidad and Tobago

In accordance with section 3 of the Act, another object is to establish conditions for:

“an open market for telecommunications services, including conditions for fair competition, at the national and international levels.”

Any regulatory framework established by the Authority with respect to addressing net neutrality issues should, therefore, work towards the achievement of this objective. This requires a determination of the effects of net neutrality interferences on competition. This would, in turn, indicate if net neutrality rules are required, and the nature and form they should take.

The first step, therefore, is to examine if the market is sufficiently competitive to self-regulate against any potentially adverse effects of practices such as blocking, throttling, paid prioritisation and zero rating. Theories on self-regulation suggest that, where the market is sufficiently competitive, market forces would correct any anti-competitive conduct adopted by providers. Where it is determined that conditions within the local broadband market are sufficiently competitive, corrective policy actions may not be required.

Currently, broadband providers in Trinidad and Tobago operate primarily within a facilities-based competition¹¹ market. Given the capital-intensive nature of network deployment, these markets tend to have a limited number of ISPs, thereby increasing the opportunities for anti-competitive conduct relating to traffic management practices. On the other hand, service-based competition markets usually facilitate competition by encouraging a large number of players in the market, thus limiting opportunities for anti-competitive behaviour.

Additionally, the existence of competition laws within a country can also present a defence against anti-competitive practices. In Trinidad and Tobago, the Authority was established for the purpose of, inter alia, monitoring the telecommunications sector's transformation from a monopoly to a competitive environment and, in particular, to prevent anti-competitive activities. Under section 18 (a) of the Act, the Authority has the function and power to, inter alia, monitor and ensure compliance with the conditions set out within granted concessions and licences. This includes concession conditions A21 - A23 which address issues of anti-competitive conducts and market dominance of authorised service providers. Moreover, section 29 of the Act specifies the circumstances in which the Authority regulates the prices of a telecommunications service, namely, where it detects anti-competitive pricing or acts of unfair competition.

There are, therefore, avenues under the regulatory framework to address deviations from net neutrality principles that amount to anti-competitive conducts. Furthermore, the Authority has proposed amendments to the Act that will grant it wider powers relating to competition issues.

¹¹ In telecommunications, this is competition between providers of the same or similar services, where each provider deploys its own network in order to provide service.

6.3 Promoting and Protecting the Interests of Consumers

As at December 2020, the following statistics were reported:

- i. There were 1,174,200 fixed Internet users^[2] (TATT 2020) and 770,200 mobile Internet users^[3] (TATT 2020).
- ii. The number of active mobile broadband Internet users increased by 16% in 2020 (TATT 2020) while active mobile narrowband Internet subscriptions experienced an increase of 25.5% (TATT 2020).
- iii. The growth in mobile Internet users has narrowed the gap between fixed Internet users and mobile Internet users.

This suggests that consumers are more inclined to use the Internet on the go and are demanding greater speeds. In their use of the Internet, consumers expect an open Internet and high-quality service, which can be compromised by potential net neutrality interferences as identified in section 4.

The Authority has a mandate under section 3 of the Act to protect and promote the interests of customers, purchasers and other users of telecommunications services. Additionally, section 18 (3) requires the Authority, in carrying out its functions, to pay regard to the interests of consumers, as follows:

“In the performance of its functions, the Authority shall have regard to the interests of consumers and in particular—

- (a) to the quality and reliability of the service provided at the lowest possible cost;
- (b) to fair treatment of consumers and service providers similarly situated;

^[2] Fixed Internet users are the number of persons who regularly use fixed Internet services

^[3] Fixed Internet users may also be mobile Internet users.

(c) in respect of consumers similarly placed, to non-discrimination in relation to access, pricing and quality of service”.

There is general concern that net neutrality interferences can hamper the quality of Internet service experienced by consumers. For example, there may be an incentive for ISPs to degrade customers’ Internet speeds for reasons unrelated to network management. It is, therefore, imperative that net neutrality policies safeguard the interests of consumers from ISPs’ unreasonable traffic management practices. Consumers should, therefore, have the requisite information that allows for informed choices, particularly with respect to the traffic management policies and the quality of service offered by their ISPs.

Policies on net neutrality must also weigh the benefits of any net neutrality interferences against the cost. For example, currently in Trinidad and Tobago, ISPs engage in zero-rated pricing. The Authority must, therefore, consider the benefits that such practices may bring, such as facilitating increased access to the Internet by vulnerable consumer groups as well as enhancing competition within the wireless marketplace. On the other hand, a “closed” Internet could mean that customers may only have access to selected content and pay extra for everything else.

6.4 Promoting Local Innovation

One of the strategies presented within the National ICT Plan is the diversification of the economy through ICT sector development. Under this vision, a key initiative is to increase digital content production, by inculcating an “upload” culture that celebrates development and shares the ingenuity and diverse heritage of the people of Trinidad and Tobago (Ministry of Public Administration 2018). This requires a shift in the country’s focus from being at the base of the

value chain, that is, end consumers of foreign content, to creating content of both local and international relevance.

Moreover, fostering local innovation creates opportunities for customised solutions to local issues, resulting in increased social gains. Local content, applications and digital services bring significant benefits to the quality of life experienced by citizens. Furthermore, cultivating such creativity may provide opportunities for economic diversification within the export market. There is, therefore, value in shaping policies that ensure a level playing field for all, especially emerging local content providers.

7 Guiding Principles for Net Neutrality in Trinidad and Tobago

In addressing the topic of net neutrality within the Trinidad and Tobago market, the Authority recognises the need for a policy approach that acknowledges the value of protecting the openness of the Internet, while making allowance for “reasonable”¹² traffic management¹³ practices.

The following five principles, informed by the Authority’s overarching *Guiding Principles for Regulatory Decision Making*, seek to balance these two competing interests and, in particular, promote fair and effective competition, encourage investment within the sector, facilitate market development, and promote and protect the interests of consumers.

Principle 1: Reasonable Traffic Management

The Authority recognises that well-functioning broadband networks require operators to manage their networks reasonably. Thus, traffic management techniques that are reasonable and serve to address specific needs should be allowed. This principle is based on the Authority’s mandate to promote the advancement and development of the sector, as seen in section 3 (b) of the Act.

While “reasonable traffic management” remains quite a subjective term, the research suggests that traffic management is deemed reasonable when there is adherence to specific best practices. For example, traffic management solutions should:

¹² The FCC describes network management practice as reasonable “if it is appropriate and tailored to achieving a legitimate network management purpose, taking into account the particular network architecture and technology of the broadband Internet access service” (FCC 2015).

¹³ The Authority’s definition of “reasonable traffic management” can be found under Principle 1: Reasonable Traffic Management below.

1. be geared towards solving a specific, legitimate and demonstrable technical need.
2. have proportional and reasonable effects in relation to the problem at hand.
3. be auditable¹⁴ and demonstrable in relation to satisfying the above two criteria.

Based on the above and feedback received following the first round of consultation on this Discussion Paper, the Authority proposes the following definition of reasonable traffic management. A set of practices and measures, legitimately implemented, to manage traffic on a telecommunications network, primarily for technical network management purposes. Such practices and measures are legitimate where they are implemented in adherence to the principles of transparency, non-discrimination, proportionality, transiency, and non-commercial considerations.

Principle 2: No Unreasonable Discrimination

The principle of no unreasonable discrimination follows from the Authority's commitment to addressing anti-competitive pricing and acts of unfair competition, pursuant to its legislative mandate included in section 29 of the Act and concession conditions A21 and A22.

Sophisticated technologies have emerged that give network operators unprecedented knowledge of the activities taking place within their networks. Such knowledge can be used to the benefit or detriment of both end users and content providers. Considering this, it is imperative that network operators refrain from exploiting these technologies to engage in unreasonable traffic discrimination.

¹⁴ This means a log should be kept of the traffic management controls that were initiated on the network, for a period of one year after the event. The log should include information as to who initiated the command; the time and date the command was conducted; and the requisite effects of the commands after the traffic management issue has been resolved.

The Authority considers unreasonable discrimination as practices that harm competition (e.g., the degradation of competing VoIP applications or services) and end users (e.g., blocking end users from accessing lawful content of their choice). It also includes acts that impair free expression, such as the deliberate slowing down of lawful traffic due to the nature of the content.

Additionally, service providers who do not own or operate a network but provide a service to consumers from the edge of the network should not be unjustly discriminated against by other service providers (wholesalers) on whom they depend on to get access to the Internet.

The Authority thus proposes net neutrality rules that specifically prohibit network operators from intentionally downgrading and/or blocking lawful content, applications and/or services, rendering them effectively unusable by consumers. Conversely, some discriminatory practices may be allowed for societal issues that are of paramount importance. These include, but are not limited to, bridging the digital divide, public safety, emergency situations, national security issues and child pornography. Discriminatory practices should also allow for the filtering of unlawful content, inclusive of violations of intellectual property rights. (For an application of this with respect to the proliferation of Android boxes in Trinidad and Tobago, see the Authority's *Discussion Paper on Android Boxes in Trinidad and Tobago 2018*).

Principle 3: Encouraging Investment

This principle builds on section 3 (f) of the Act, which posits that one of the objects of the Act is “promoting the telecommunications industry in Trinidad and Tobago by encouraging investment in, and the use of, infrastructure to provide telecommunications services”.

There are conflicting views on the effect of net neutrality regulation on sector investment. Some critics fear that net neutrality regulation will invariably hamper investment incentives, while others discount this notion.

The Authority believes that any policy position taken on net neutrality should ensure that market opportunities and investment prospects are not unduly disrupted by regulation. In fact, policy decisions should seek to ensure that the market environment sends out the correct signals that encourage rather than hamper investment, through regulatory certainty, e.g., through sector stability and the expectation of reasonable rates of return on investment opportunities.

Principle 4: Transparency

Pursuant to section 3 (c) of the Act, one of the objects of the Act is to promote and protect the interests of the public by providing for the protection of subscribers. This involves ensuring consumers are able to make informed choices in their decision-making process. Subscribers must, therefore, have access to accurate information regarding the Internet services they intend to purchase. This, in turn, promotes competition within the industry, as informed consumers are more likely to select service providers offering the best service. Furthermore, greater transparency allows providers of content, applications, services and devices to access the information they need to develop, market and effectively operate within the Internet ecosystem.

This principle calls for network operators to exercise due diligence in disclosing their traffic management policies to subscribers and in a format that is easily comprehended. This entails the disclosure of network practices including traffic management practices and application-specific behaviour¹⁵. In addition, commercial terms and conditions, inclusive of pricing and privacy

¹⁵ This includes disclosure as to whether and why the provider blocks or rate controls specific protocols or protocol ports, modifies protocol fields in ways not prescribed by the protocol standard, or otherwise inhibits or favours certain applications.

policies, must be provided to the subscriber. Moreover, all data privacy policies should be established in accordance with the relevant laws of Trinidad and Tobago.

In addition to the end-user disclosure requirements described above, ISPs will also be required to submit to the Authority information on their traffic management policies and practices, inclusive of details on their traffic management technologies and/or techniques used. This information shall be used by the Authority to ensure compliance with its policies and/or regulations on net neutrality.

Notwithstanding the above, the Authority recognises that the disclosure of traffic management information that is commercially sensitive in nature, or which may compromise the security of a network, should be exempted from the principle of transparency.

Principle 5: Promoting Local Innovation and Entrepreneurship

The basis of this principle can be found in the National ICT Plan, which supports the drive for diversifying the economy through ICT-sector development.

Innovation plays a critical role in the economic development of countries and is, therefore, key to economic diversification. In particular, the development of local digital systems is considered imperative for building digital literacy, serving local needs and boosting competition in

international digital services markets (World Economic Forum 2015). To capitalise on new opportunities, there should, therefore, be a thrust towards cultivating digital innovation within Trinidad and Tobago.

As such, any policy framework on net neutrality should be guided by the principle of local innovation and entrepreneurship, as this would allow for customised solutions to meet the specific needs of Trinidad and Tobago.

8 Recommendations

The above guiding principles strive to strike the delicate balance between protecting the openness of the Internet while preserving and promoting the conditions required for a vibrant and competitive free market.

The Authority thus proposes the adoption of a targeted approach to the net neutrality interferences introduced in section 3 of the Discussion Paper, that is, the adoption of regulations that proscribe practices associated with anti-competitive/detrimental effects within the market, while allowing for flexibility towards commercial practices that may present pro-competitive effects¹⁶.

8.1 Blocking and Throttling

A key component of ensuring the openness of the Internet is the ability of users to send and receive lawful content without fear of being blocked by their ISPs. Notwithstanding the reasonable traffic management practices discussed above, the Authority proposes the implementation of rules which prohibit ISPs from blocking end users from freely accessing lawful information, content, services and applications. Additionally, in the interest of safeguarding the open Internet, ISPs should not be allowed to intentionally restrict, alter, degrade or impair specific lawful content, services or applications¹⁷.

8.2 Conditional Paid Prioritisation and Zero-Rated Pricing

The Authority proposes a more flexible approach to paid prioritisation and zero-rated pricing. The adoption of this approach is based on the argument that paid prioritisation and zero-rating practices

¹⁶ These are effects which constitute offsetting benefits to competition within the industry.

¹⁷ This shall be in accordance with the Authority's Guiding Principles presented in section 7 of the Discussion Paper.

are not universally harmful and may provide opportunities to enhance consumer welfare. Placing a general ban on such practices may, therefore, result in the loss of substantial benefits to society. For example, it has been contended that the practice of zero rating may result in lower prices and increased Internet uptake (Eisenach, Jeffrey A. 2015). Similarly, allowing practices such as paid prioritisation has been linked to advancements in the field of medicine through the use of applications and services like telemedicine (Pai 2017).

However, notwithstanding the pro-competitive effects they may engender, there may be instances of harmful paid prioritisation and zero-rating practices involving anti-competitive behaviour. The Authority's recommended approach, therefore, allows for these service offerings on a case-by-case basis within the stated parameters described below. In more specific terms, this involves the implementation of a notification and consideration process, where the Authority is notified prior to the commercial practices (paid prioritisation and zero-rating services) being conducted.

While the Authority's proposals on these practices reflect a more flexible regulatory approach when compared to blocking and throttling, the Authority is mindful that there must be established safeguards that protect key elements of the open Internet. These safeguards ensure the continued availability and general quality of the open Internet are upheld.

Sections 8.3.1 and 8.3.2 detail the conditions that must first be met before paid prioritisation and zero rating may be offered to the public.

8.2.1 Criteria for Conditional Paid Prioritisation

To ensure that the benefits of this commercial practice are not eroded by resultant anti-competitive effects, the Authority proposes that the following criteria be met prior to its approval.:

1. The ISP provides supporting evidence that its service offering would proffer pro-competitive effects within the market, not cause undue harm to consumers¹⁸, and not constitute anti-competitive practices.
2. The ISP's network capacity is sufficient for delivering the commercial service, in addition to the Internet access service provided.
3. The service is not offered to the detriment of the availability or general quality of the Internet access service for end users.
4. The service is offered to competing content providers on a non-discriminatory basis.

In addition to the above, an ISP cannot mandate the adoption of the service if it is not required by the content provider.

8.2.2 Criteria for Conditional Zero Rating

To ensure that the benefits of this commercial practice are not eroded by resultant anti-competitive effects, the Authority proposes that the following criteria be met prior to its approval.:

¹⁸ This involves an assessment of whether prices have increased, consumer choices and quality of service have decreased, and/or product/service innovation has fallen.

1. The ISP provides supporting evidence that the service offering would proffer pro-competitive effects within the market, not cause undue harm to consumers, and not constitute anti-competitive practices.
2. The service should be offered/available to all content providers within the same or similar category, for example, music streaming applications.
3. The service should be offered to content providers in a transparent, fair and non-discriminatory manner.

9 Regulation of OTT Services

Closely related to the topic of net neutrality is the issue of the regulation of OTT services. OTT providers and their concomitant services now form part of the Internet's ecosystem. The disruptive nature of these technologies has sparked network operators in Trinidad and Tobago to advocate for some form of regulation, to create a more level playing field within the industry. They contend that the current regulatory environment is imbalanced and has thus created an unfair competitive advantage for OTT providers. For example, areas such data protection, quality of service, consumer rights, interconnection and emergency services remain largely unregulated by authorities. According to some experts, these regulatory differences may cause competition distortion and ultimately inhibit investment within the sector (Davies 2016).

On the other hand, supporters of net neutrality, including consumer interest groups within Trinidad and Tobago, have expressed concerns over the regulation of the Internet and its content, including OTT services. They fear the effects of interfering with a model that has worked to the benefit of consumers and businesses alike.

These opposing views highlight the complexity of the subject at hand as well as its regulatory solution.

The issue of OTT regulation was first considered by the Authority in 2015, in its consultative document *Towards the Treatment of Over-the-Top (OTT) Services*. OTT voice was the primary focus of that document and it included the Authority's preliminary assessment of whether OTT voice services could be considered a telecommunications service and, therefore, subject to regulation by the Authority, in accordance with section 21 of the Act. The document concluded that OTT voice may be classified as a public telecommunications service.

Recognising that other types of OTTs are making waves within the telecommunications and broadcasting sectors, it is imperative that the Authority broaden its assessment of the regulation of OTTs to include OTT multi-media messaging and OTT media services. The Discussion Paper thus addresses three types of OTTs: voice, multi-media messaging and media services.

Section 9 of this document explores the case for the regulation of OTT services. It provides the definitions of a telecommunications service and a broadcasting service and examines the extent to which the Authority's regulatory scope covers OTT services. It also touches on the regulatory complexities associated with the inter-jurisdictional nature of OTTs. Finally, the Authority's preliminary recommendations for the regulation of these services are presented.

9.1 Definitions of Telecommunications and Broadcasting Services

9.1.1 Telecommunications Service and Broadcasting Service Definitions

As a starting point, it must be determined whether the scope of the current legislative framework includes OTT communication (voice and messaging) and media services (audio visual content). The definitions of “telecommunications”, “telecommunications service” and “public telecommunications service” are thus examined to ascertain if OTTs fall under the umbrella of telecommunications.

The Act defines “telecommunications”, “telecommunications service” and a “public telecommunications service” as follows:

“Telecommunications’ includes the transmission, emission or reception of signals, writing, pulses, images, sounds or other intelligence of any kind by wire, wireless, optical or electromagnetic spectrum or by way of any other technology.

‘Telecommunications service’ means a service using telecommunications whereby one user can communicate with any other user in real time, regardless of the technology used to provide such a service, and includes a public telecommunications service, a private

telecommunications service, a closed user group service, and a radio communication service.

‘Public telecommunications service’ refers to a telecommunications service, including a public telephone service, offered to members of the general public, whereby one user can communicate with any other user in real time, regardless of the technology used to provide such service.”

These definitions suggest that a service which uses telecommunications (where telecommunications means the transmission, emission or reception of signals, writing, pulses, images, sounds or other intelligence of any kind), to facilitate real-time communication is a telecommunications service. Moreover, provisions were made within the definitions for such services to be provided regardless of the technology employed.

An interpretation of these definitions implies that some OTT (voice) applications fall within the scope of telecommunications service, on the premise that they use telecommunications for their delivery, users can communicate in real or near real time, and providers can employ any technology to provide the service. Further to this, OTTs which have satisfied the interpretation of telecommunications services and are offered to members of the public can be regarded as public telecommunications services.

In the case of regulatory oversight of OTT media services, which are services that resemble broadcasting since it entails the distribution of audio-visual content, the Act’s definition of telecommunications is applicable, given that this definition includes the transmission or reception of images and sound. However, in ascertaining if OTT media services fall within the definition of a broadcasting service within the Act, this definition must be examined.

The Act defines a broadcasting service as “the offering of the transmission of programmes whether or not encrypted, by any means of telecommunications, for reception by the general public, including sound, radio, television and other types of transmissions, such as those on a point to multipoint basis”.

This definition draws on the concept of programmes for public reception (on a one-to-many basis) married with the method of transmission, namely, the use of telecommunications. An interpretation of this definition would suggest the inclusion of OTT media as defined in section 2.2.3.

9.1.2 Parliamentary Intention for the Regulation of Telecommunications Services

The intentions of Parliament play a key role in interpreting the definition and scope of telecommunications services. It was stated in Hansard that the 2004 Telecommunications Bill would take into account “the entire communications sector” and applied to “all types of communications services” and to content services, however delivered¹⁹.

Furthermore, the debate on the 2004 amendment to the legislation showed it was the intention of the legislators that the amended Act would give effect to a policy of technology neutrality, in recognition of emerging technologies in the ICT sector.

The amended Act introduced technology neutrality into the definitions of “public telecommunications service” and “telecommunications service”. The inclusion, in the definitions, of the words “... regardless of the technology used to provide such service;” was, therefore, meant to capture “other technologies providing real-time voice service or telecommunications services”.

¹⁹ Explanatory Note – The Telecommunications (Amendment) Bill, 2004

Additionally, the Explanatory Note – The Telecommunications (Amendment) Bill, 2004 elaborates that amendments to the definitions of “public telephone service” were considered necessary for the following reasons:

“As drafted, there may be an interpretation that this definition applies only to traditional switched telephony. The proposed amendment which will delete the words “the direct transport and switching of voice” and substitute the words “interactive voice communication” will make it abundantly clear that the Authority will regulate the delivery of all public voice services irrespective of the means used to provide the service (e.g., VOIP)”.

There was, therefore, a deliberate attempt to ensure that the subject definitions covered not only the current situation but also covered what would take place in the future. There was recognition of the advancement of technology from public switched telephone networks (PSTNs) to packet switched networks, particularly IP based. From the reading of Hansard and the Explanatory Note, this recognition led to attempts to draft legislative and regulatory frameworks that reinforced a technology-neutral approach²⁰.

9.2 The Nature and Purpose of the Legislative Framework

To resolve any ambiguity over the applicability of the Act’s definitions to OTTs, the Authority has commissioned legal counsel on the issue. Sections 9. to 9.2.3 present a discussion on how the nature and purpose of the Act impact the Authority’s remit to regulate OTTs.

²⁰ Notwithstanding the flexibility given to service providers in selecting their preferred technology, the Authority has been guided by a definition of technology neutrality which acknowledges that neutrality in regulations can include different regulations for different technological solutions, even where similar services are provided, as the technologies used do not essentially have the same features (TATT 2015).

9.2.1 The Act: A Framework Legislation

The Act was crafted as a framework legislation meant to adapt, expand and evolve as and when required. The drafting of the Act was formulated on a principle-based regulatory approach, which has the advantage of being more adaptable to changes in technology and economic conditions, as opposed to a highly prescriptive rules-based approach. The Act was crafted with general obligations and principles in mind, knowing that technical aspects and relevant processes would need to be developed to meet changing circumstances. The statute thus recognised that, while technological advances may proceed apace, fundamental rules and principles would apply futuristically, even to circumstances that the drafters could not envision.

9.2.2 Presumption against Ineffectiveness

Under this presumption, the provisions of the Act should be interpreted in a way that furthers, rather than obstructs, the legislation's dominant purpose. Presumption against ineffectiveness ensures that the Act's manifest purpose is furthered and not hindered. As far as possible, the Act should be construed to work towards the achievement of the objects of the Act; the systematic development of telecommunications; to ensure fair competition; and to protect the interest of the public in Trinidad and Tobago.

Thus, while the Act may not have specifically envisioned OTTs, a fair interpretation of the definitions of telecommunications and broadcasting services embraces them, as the language was deliberately kept broad to encompass the onward march of science and technology.

9.3 The Fit of Traditional Regulations to OTT Services

Taking the discussion one step further, one must also consider the fitness of the current framework for achieving the desired regulatory effects within the OTT landscape.

To ensure the application of appropriate regulation, the Authority must assess whether, and the extent to which, existing regulatory obligations apply to OTT providers. Such an assessment can aid the interpretation of the Act. For instance, legal requirements establishing conditions for the deployment of networks and/or services, quality of service, interconnection to the network or service, and other conditions are mandated by primary and subsidiary legislation but may not necessarily apply to some OTT providers who have limited to no control over these. Moreover, due to the unique zero-priced business model that some OTT providers have adopted, many regulatory instruments, such as pricing, may not be proportionate²¹.

Detailed consideration of the above factors will be given as the document progresses from the discussion phase to a finalised policy framework.

9.4 Future of OTT Regulation

It is clear that OTTs have introduced a level of ambiguity within the legislative framework that has become apparent with the convergence of the market. In response to OTTs some jurisdictions, such as the European Community, are proposing the re-definition of “telecommunications services” to include not only technical but functional aspects as well. The intention is to ensure

²¹ Remuneration may also include advertisements and the monetising of end users’ personal data.

that consumers are effectively and equally protected when using functionally equivalent services (European Commission 2016).

From an analytical point of view, it is not difficult to conclude that OTT communication services are a functional substitute for legacy telecommunications services. Similarly, OTT media services have been replacing traditional subscription-based television broadcasting services over a public telecommunications network. Policy makers and regulators, therefore, cannot ignore the potential impact of OTT services, as their exclusion may lead to a narrow definition of the market and likely regulatory gaps.

Furthermore, it has been suggested that the principle of technology neutrality should be reflected in the way services which are functionally equivalent are regulated. “Technology neutrality means that the same regulatory principles should apply regardless of the technology used. Regulations should not be drafted in ‘technological silos’” (Maxwell and Lovells 2014). This interpretation of technology neutrality allows for the inclusion under the ambit of the regulator of newer and emerging technologies, along with different business models. It is, therefore, argued that emerging Internet platforms, particularly those that offer services with similar functionalities as traditional communications and media services, should be regulated in the same manner.

9.4.1 Functional Equivalence

There have been radical advancements in technology driving the changes in consumer preferences, over the past five years in particular. Consumers are increasingly substituting traditional telephony services (voice and SMS) and broadcasting services with OTTs such as VoIP, multi-media messaging service and online streaming subscriptions. Notably, they are less concerned with the technology used to deliver these services than they are with their function.

This has raised international discussion on the scope of regulation within this current technological era, with a key focus on functionality. For example, the European Union notes: “[i]n order to ensure that end-users and their rights are effectively and equally protected when using functionally equivalent services, a future-oriented definition of electronic communications services should not be purely based on technical parameters but rather build on a functional approach” (The European Parliament and the Council of the European Union 2018).

Functional equivalence occurs where two products or services perform similar functions, even if they do so in a different way (Lichtenberg 2016). The concept is rooted in displacement theory, which measures the extent that consumers of communications and media services are substituting the use of traditional telecommunications services with OTTs (Evens and Donders 2018). Consequently, a new wave of regulation is required, which focuses on the essential functions of services, in addition to how services are delivered to the end user.

The Authority will, therefore, consider adopting, as far as applicable, a “same service, same rules” approach which focuses on the functional equivalence of OTT services. In making a determination on functional equivalence, the Authority may consider the following factors:

- i. Empirical evidence of consumption patterns (substitution/complementary effects)
- ii. Consumer preferences and perception
- iii. Reliability and flexibility of the service
- iv. Types of fee payments (indirect/direct)
- v. Use of national telecommunications resources (e.g., radio frequency spectrum and public telephone numbers)
- vi. Origination/termination on a public telecommunications network

In the development of its policy framework on OTT regulation, the Authority shall give consideration to the adoption of a functional equivalence approach.

9.4.2 Jurisdictional Issues

The Authority recognises the complexities involved in regularising services domiciled outside of Trinidad and Tobago. The reality is that the providers of OTT services often utilise international tax optimisation strategies by basing and registering their principal place of business in the United States or a country with low tax regimes. One report by the ITU recognises the additional challenges this presents, especially with respect to tax collection by some countries, stating: “Imposing an equitable and harmonized taxation regime and other rules on global online service providers is nonetheless a challenge as the toolkit for dealing with large globe-spanning companies is limited. In larger markets such as the China, European Union, India, Indonesia, and United States, governments and regulators have greater bargaining power because online service providers cannot afford to ignore such markets. In smaller jurisdictions, however, governments and regulators have few practical options” (ITU 2018).

The report recommends “an approach of continuing to monitor and putting in place legislative mechanisms and international co-operative forums so regulators have the ability to further regulate online services (even if they currently choose not to)”. This includes strategies such as (i) facilitating the partnering between online service providers and network operators, and (ii) putting in place fair and equitable taxation arrangements.

The Authority will endeavour to implement practical solutions, to ensure a fair and proportionate regulatory environment is established for all players providing public telecommunications and broadcasting services in Trinidad and Tobago.

9.4.3 Classification 1: Functionally Equivalent OTT Services

It has been argued that, since some number-based OTTs²² participate in, and subsequently benefit from, a publicly assured interoperable ecosystem, they should be treated differently from other OTT services (European Commission 2016). More specifically, where, by reason of their characteristics, these OTTs function equivalently to traditional services, for example, using numbering resources to connect to the PSTN, the case for regulation can be made. In other words, such OTT services should be regulated, where relevant, in a similar manner as traditional services (voice and SMS) with certain minimal concession obligations²³.

While some OTT services may fit comfortably within the scope of the regulatory framework, amendments to the framework may be required to ensure efficient sector regulation. OTT service providers under this classification will require service authorisation from the Authority, and where these services use spectrum resources, the provider will be required to apply for an appropriate licence. This will require changes to be reflected in the revised *Authorisation Framework for the Telecommunications and Broadcasting Sectors of Trinidad and Tobago, 2005* (Authorisation Framework).

9.4.4 Classification 2: Other OTT Services

For other categories of OTT services, that is, those which are not functionally equivalent, sector-specific regulation may not be required to the same extent. Such OTTs may not offer their services for remuneration (therefore making pricing regulation irrelevant) or have control over the quality

²² Such as those which connect to the PSTN

²³ The ITU notes that technologies offering similar services do not necessarily have similar features in all aspects. As such, identical regulations may result in the competitive advantage of one technology over another. Consequently, this may call for slightly differing regulations for different technology solutions in the same market segments.

of the service offered, making the application of QoS obligations irrelevant. In this regard, the Authority may consider taking a light-handed regulatory approach to these services. Amendments to the Authorisation Framework will be required to give effect to this.

However, even in the presence of limited oversight on the part of the Authority, these services should not necessarily be precluded from facing regulatory constraints within the wider context of the laws and policy objectives of the country. Some key areas where regulatory control is very much relevant and needed in the digital era include, inter alia, cybersecurity, data protection, child pornography, intellectual property rights, national security and privacy, and other public interest matters. While jurisdictional issues can arise in the implementation of these controls, enforcement can take place, where possible, through local ISPs. This may require extensive collaboration with the relevant agencies which are ultimately responsible for establishing breaches and offences within the confines of the laws and policy objectives of Trinidad and Tobago.

10 Conclusion

This Discussion Paper examines both sides of the net neutrality debate within the context of Trinidad and Tobago. The key aspects of the debate centre around preserving the value of an open and indiscriminate Internet, while weighing the need for prudent and profitable traffic management and commercial practices.

The document provides an overview of the different discriminatory actions that a service provider may employ that are considered deviations from the generally accepted principles of net neutrality (net neutrality interferences). In particular, it examines the extent to which these interferences affect key policy issues such as innovation, investment, competition and consumer choice.

The Authority proposes five guiding principles upon which any policy position on net neutrality should be built. These principles were informed by the Authority's overarching *Guiding Principles in Regulatory Decision Making* that seek to promote fair and effective competition, encourage investment within the sector, facilitate market development and promote and protect the interests of consumers.

The document also presents a discussion on OTT authorisation and strategies for regulating these services in Trinidad and Tobago.

In the first round of consultation, discussion points were presented to stakeholders on the key tenets of the guiding principles presented. The Authority has summarised the comments and recommendations received and has included them in the decisions on recommendations (DoRs) matrix (see Appendix 1). The feedback received on these as well comments related to the rest of the Discussion Paper will further inform the Authority's final policy frameworks on net neutrality and OTT regulation. A summary of these discussion points is presented in Table 1.

Table 1. Summary of discussion points

1. Do you agree with the criteria identified in Principle 1 for determining reasonable traffic management practices? Please explain your response.
2. Which traffic management principles should be upheld by ISPs in the determination of reasonable traffic management measures, e.g., transparency, non-discrimination, proportionality and non-commercial considerations? Please explain your response.
3. To what extent should ISPs be allowed to utilise technologies with traffic monitoring capabilities such as DPI, to identify specific types or content of data traffic, as part of their traffic management practices?
4. Do you agree with the potential effects of each of the net neutrality interferences (blocking, throttling, zero rating and paid prioritisation) on consumers, content providers, service providers and other stakeholders, as discussed in sections 4 and 5? Please explain your response.
5. Should ISPs be permitted to employ marketing strategies (such as zero-rated pricing) through partnerships with content providers? Please explain your response.
6. Should ISPs be permitted to receive financial compensation from content providers, to give preferential treatment (such as paid prioritisation) to certain Internet traffic? Please explain your response.
7. Should ISPs be permitted to charge premium prices to consumers who are willing to pay for preferential treatment of certain Internet traffic? Please explain your response.

8. In addition to those mentioned in questions 5, 6, and 7, what other forms of discrimination would you consider to be reasonable? Please explain why.
9. Can effective competition deter ISPs from engaging in discriminatory practices that negatively impact the market? Please explain your response.
10. What evidence is there to support or refute the argument that net neutrality-based rules stymie investment opportunities? Please explain your response.
11. What role, if any, can a framework for net neutrality play in increasing broadband uptake in Trinidad and Tobago?
12. In addition to commercially sensitive information or network security information, what network practices should not be publicly disclosed? Please provide reasons to support your answer.
13. What role, if any, should the stimulation of local innovation play in sector-wide regulations on issues such as net neutrality? Please explain your response.

11 Next Steps

Following the final publication of the Discussion Paper, the Authority shall issue, for single-round consultations, two policy frameworks: a policy framework on net neutrality and one on OTT regulation. The final policy positions presented therein shall primarily emanate from the discussions and comments received during the consultation process of this document.

References

- Analysys Mason. 2014. *Investment in networks, facilities and equipment by content and application providers*. Analysys Mason.
- BEREC. 2016. *Report on OTT services*. Body of European Regulators for Electronic Communicaitons. Accessed 01 12, 2021. http://berec.europa.eu/eng/netneutrality/specialised_services/.
- Blak, M. 2015. *www.bridtv.com*. July 14. Accessed October 17, 2017. <https://www.brid.tv/tag/ott-revenues/>.
- Buckley, Sean. 2013. "OTT Voice and Messaging: The Future of Telecom." *Fierce Telecom* (Fierce Telecom).
- CANTO. 2014. *OTT Services - Balancing Innovation, Investment and Competition*. Information Paper, CANTO.
- CANTO. 2017. *Public Policy Considerations for OTTs - ITU*. August 19.
- Carlson, J., and W Van Der Weiden. 2015. "Keeping the internet open for innovation: a perspective on the net neutrality debate." *Ericsson Business Review*.
- Cheng, H.K., Bandyopadhyay, S., and H Guo. 2011. "The debate on net neutrality: a policy perspective." *Information Systems Research* 60-82.
- CISCO. 2017. *www.cisco.com*. February 7. Accessed October 26, 2017. <https://www.cisco.com/c/en/us/solutions/collateral/service-provider/visual-networking-index-vni/mobile-white-paper-c11-520862.html>.
- CNET. 2014. *Democrats introduce bill to ban 'paid prioritization' on the Net*. June 17.
- Cooper, James. 2005. "Vertical Antitrust Policy as a Problem of Inference,." *INT'L J. INDUS. ORG.*

- Corbin, K. 2017. *CIO*. 1 18. Accessed 5 31, 2017. <http://www.cio.com/article/3158801/internet/trump-administration-threatens-net-neutrality-cloud-and-iot.html>.
- Davies, Ron. 2016. *Regulating electronic communications A level playing field for telecoms and OTTs?* EPRS | European Parliamentary Research Service.
- Detecon. 2014. *Policy and Regulatory Framework for Governing Internet Applications*. March.
- DLA Piper. 2009. *EU study on the Legal analysis of a Single Market for the Information Society New rules for a new age?* European Commission's Information Society and Media.
- Downes, Larry. 2014. *Forbes.com*. Accessed August 12, 2015. <http://www.forbes.com/sites/larrydownes/2014/09/12/vcdc-when-internet-neutrality-principles-conflict-with-engineering-everyone-loses/>.
- Economides, N., and Joacim Tag. 2012. "Network neutrality on the Internet: A two-sided market analysis." *Information Economics and Policy* 91-104.
- Eisenach, Jeffrey A. 2015. *The Economics of Zero Rating*. National Economic Research Associates.
- Eisenach, Jeffrey A. 2015. *The Economics of Zero Rating*. NERA Economic Consulting.
- European Commission. 2016. *Proposal for a Directive of the European Parliament and of the Council establishing the establishing the European Electronic Communications Code*. Brussels: European Commission.
- Evens, Tom, and Karen Donders. 2018. *Platform Power and Policy in Transforming Television Markets*. Palgrave Global Media Policy and Business.
- FCC. 2015. "FCC." *fcc.org*. 03 12. Accessed 08 10, 2015. https://apps.fcc.gov/edocs_public/attachmatch/FCC-15-24A1.pdf.
- . 2018. *FCC.gov*. Jan 04. Accessed Jan 29, 2018. <https://www.fcc.gov/document/fcc-releases-restoring-internet-freedom-order>.

- FCC. 2015. *REPORT AND ORDER ON REMAND, DECLARATORY RULING, AND ORDER*. Washington D.C.: FCC. Accessed November 11, 2017. https://apps.fcc.gov/edocs_public/attachmatch/FCC-15-24A1_Rcd.pdf.
- . 2017. *www.fcc.org*. Accessed November 13, 2017. <https://www.fcc.gov/restoring-internet-freedom><https://www.fcc.gov/restoring-internet-freedom>.
- . 2015. *www.fcc.org*. February 26. Accessed November 11, 2017. <https://www.fcc.gov/document/fcc-adopts-strong-sustainable-rules-protect-open-internet>.
- Federal Communications Commission. 2010. *Preserving the Open Internet; Broadband Industry Practices*. GN Docket No. 09-191, WC Docket No. 07-52.
- Federal Communications Commission. 2015. *REPORT AND ORDER ON REMAND, DECLARATORY RULING, AND ORDER*. Washington DC: Federal Communications Commission.
- Finley, K. 2017. *Wired*. 1 13. Accessed 5 31, 2017. <https://www.wired.com/2017/01/outgoing-fcc-chairman-tom-wheeler-net-neutralitys-not-dead/>.
- Fisher, Tim. 2019. <https://www.lifewire.com>. October. Accessed December 17, 2019. <https://www.lifewire.com/what-is-bandwidth-throttling-2625808>.
- . 2016. *www.lifewire.com*. December 1. Accessed July 10, 2017. <https://www.lifewire.com/what-is-bandwidth-throttling-2625808>.
- Fox, Jonathan. 2013. *Net Neutrality: What's At Stake & How to Protect it*. CALPIRG Education Fund.
- Galpaya, Helani. 2017. *Zero-rating in Emerging Economies*. Centre for International Governance Innovation and Chatham House.
- Gary Becker, Dennis Carlton, Hal Sider, Gary Becker, Dennis Carlton, Hal Sider. 2010. " Net Neutrality and Consumer Welfare." *Journal of Competition Law and Economics* 497-519.
- Gharakheili, H. 2017. *The role of SDN in broadband networks*. Springer.

- Grossman, David. 2018. <https://www.popularmechanics.com>. September 11. Accessed December 17, 2019. <https://www.popularmechanics.com/technology/infrastructure/a23082434/study-shows-just-how-mobile-providers-throttle-your-internet/>.
- iGovTT. 2012. *smarTT National ICT Plan 2012-2016*. Port-of-Spain, July.
- ITU. 2019. *Collaborative framework for OTTs Recommendation ITU-T D.262*, . ITU. Accessed November 28, 2019. <https://news.itu.int/impact-of-ott-players/>.
- . 2012. "ICT Regulation Toolkit." *ICTregulationtoolkit.org*. Accessed September 13, 2017. <http://www.ictregulationtoolkit.org/toolkit/2.5>.
- ITU. 2018. *Regulatory challenges and opportunities in the new ICT ecosystem*. The International Telecommunication Union (ITU).
- ITU, InfoDev. n.d. "ICT Regulation Toolkit." Accessed November 2014. www.ictregulationtoolkit.org.
- Johns, N. 2015. *Regulating the Digital Economy*. New Dehli: Observer Research Foundation .
- Krim, J. 2005. "Executive wants to charge for web speed." *Washington Post*.
- Lemley, M., and L Lessig. 2001. *The End of End-to-End: Preserving the Architecture of the Internet in the Broadband Era*.
- Lessig, L, and R McChesney. 2006. *www.washingtonpost.com*. June 8. Accessed October 19, 2017. <http://www.washingtonpost.com/wp-dyn/content/article/2006/06/07/AR2006060702108.html>.
- Lichtenberg, Sherry. 2016. *Product Substitution, Functional Equivalency, and the Technology Transition*. National Regulatory Research Institute.
- Luca Belli, Matthijs van Bergen , and Michał Andrzej Woźniak. 2016. "Chapter 8 A Discourse-Principle Approach to Net Neutrality Policymaking: A Model Framework and Its

- Application." In *Net Neutrality Compendium Human Rights, Free Competition and the Future of the Internet*, by Primavera De Filippi Luca Belli, 79-98. Springer.
- Luca Belli, Primavera De Filippi. 2015. *Net Neutrality Compendium: Human Rights, Free*. Springer International Publishing.
- Maxwell, Winston, and Hogan Lovells. 2014. "Technology neutrality means that technical standards designed to limit." *Technology neutrality means that technical standards designed to limit*.
- McSherry, Corynne. 2014. May 1. Accessed August 12, 2015. <http://edition.cnn.com/2014/04/29/opinion/mcsherry-net-neutrality/>.
- Ministry of Public Administration. 2018. " ICT Blueprint, the National Information and Communication Technology (National ICT) Plan 2018-2022."
- Net Craft. 2017. *Net Craft* . Accessed 5 12, 2017. <https://news.netcraft.com/archives/category/web-server-survey/>.
- OECD. 2013. *OECD Communications Outlook 2013*. OECD Publishing.
- . 2013. *oecd.org*. July 11. Accessed October 25, 2017. <http://www.oecd.org/sti/broadband/oecd-communications-outlook-19991460.htm>.
- Ohlhausen, Hon. Maureen K. 2017. "Antitrust Over Net Neutrality." *Colorado Technology Law Journal*.
- Pai, Ajit. 2017. *Conference on Aging and Technology: Creating opportunities to age well with innovation*. Washington DC: FCC.
- Pai, Ajit. 2017. *Project Goal's Conference on "Aging and Technology: Creating Opportunities to Age Well with Innovation*. Washington, DC, November 30.
- Park, Eun-A, and Richard Taylor. 2006. "Barriers to Entry Analysis of Broadband Multiple Platforms:." *Telecommunications Policy Research Conference*. Washington DC.

- Peha, John M. 2006. "The Benefits and Risks of Mandating Network Neutrality, and the Quest for a Balanced Policy." *34th Telecommunications Policy Research Conference*.
- Reggiani, C., and T Valletti. 2016. "Net neutrality and innovation at the core and at the edge." *Internal Journal of Industrial Organization* 16-27.
- Search Networking. 2017. *searchnetworking.techtarget.com*. September 18. Accessed October 23, 2017. <http://searchnetworking.techtarget.com/definition/deep-packet-inspection-DPI>.
- Shimizu, S., Nakashima, N., et al. 2005. "International transmission of uncompressed endoscopic surgery images via superfast broadband Internet connections." *Surgical Endoscopy* PP. 167-170.
- Slade, Lafontaine &. 2008. "Exclusive Contracts and Vertical Restraints: Empirical Evidence and Public Policy,." *HANDBOOK OF ANTITRUST ECON*.
- Sørensen, Frode. 2014. *Net neutrality and charging models*. November 18. Accessed September 10, 2015. <http://eng.nkom.no/topical-issues/news/net-neutrality-and-charging-models>.
- Sydell, Laura. 2006. *www.npr.org*. April 25,. Accessed July 10, 2017. <http://www.npr.org/templates/story/story.php?storyId=5362403>.
- TATT. 2017.
- . 2015. "tatt.org.tt." *tatt.org.tt*. August 18. Accessed April 18, 2018. https://tatt.org.tt/DesktopModules/Bring2mind/DMX/Download.aspx?Command=Core_Download&EntryId=589&PortalId=0&TabId=222.
- TATT. 2020. *Telecommunications and Broadcasting Sectors Annual Market Report 2019*. Market report, Barataria: Telecommunications Authority of Trinidad and Tobago.
- TATT. 2014. *The Draft Revised Authorisation Framework for the Telecommunications and Broadcasting Sectors of Trinidad and Tobago*. Telecommunications Authority of Trinidad and Tobagowrewr.

—. 2015. *www.tatt.org.tt*. 8 18. Accessed 8 21, 2017.
https://tatt.org.tt/DesktopModules/Bring2mind/DMX/Download.aspx?Command=Core_Download&EntryId=584&PortalId=0&TabId=222.

1993. "Telecommunications Act S.C. 1993, c. 38 s.36."

The European Parliament and the Council of the European Union. 2018. *Directive (EU) 2018/1972 of the European Parliament and of the Council of 11 December 2018 establishing the European Electronic Communications Code (Recast)Text with EEA relevance*. Official Journal of the European Union.

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION,. 2018. "Directive (EU) 2018/1972 of the European Parliament and of the Council of 11 December 2018 establishing the European Electronic Communications Code (Recast)Text with EEA relevance."

The Innovation Policy Platform. 2013. <https://www.innovationpolicyplatform.org>. Accessed April 5, 2018. <https://www.innovationpolicyplatform.org/about>.

tnt&t. 2015. *technewstt.com*. July 8. Accessed July 15, 2015. <http://technewstt.com/ttcs-voip/>.

van Schewick, Barbara, and David Farber. 2009. "Network Neutrality Nuance." *Communications of The ACM* 52, no. 2 31-37.

World Economic Forum. 2015. *Expanding Participation and Boosting Growth: The Infrastructure Needs of the Digital Economy*. World Economic Forum.

Wu, Tim. 2002. <http://www.timwu.org>. Accessed January 13, 2021.
<http://www.timwu.org/OriginalNNProposal.pdf>.

—. 2006. *Net Neutrality FAQ*. Accessed July 15, 2015.
http://www.timwu.org/network_neutrality.html.

Wu, Tim. 2003. "Network Neutrality, Broadband Discrimination." *J. On Telecomm. & High Tech.L* 2: 141-176.

Appendix I. Key Trends: Global and Regional Perspectives

Canada

In 2008, the Canadian Radio-television and Telecommunications Commission (CRTC) received an application by the Canadian Association of Internet Providers (CAIP) to order Bell Canada to desist from traffic shaping its Asynchronous Digital Subscriber Line (ADSL) and wholesale Gateway Access Services (GAS). After reviewing the positions of the parties involved, the CRTC denied the CAIP's application based on the following grounds:

1. Bell Canada's traffic-shaping practices did not violate rules as they related to privacy.
2. Bell Canada's traffic-shaping practices involved controlling the speed and not the content.
3. Evidence was not brought forward to demonstrate that Bell Canada's traffic-shaping practices had reduced competition.
4. Bell Canada was not guilty of discriminating or applying preferential treatment in its traffic-shaping practices.

This case brought to light legitimate concerns about traffic management practices deployed by operators. As such, in 2009, the CRTC implemented strong net neutrality rules through the establishment of its framework for Internet traffic management practices. The framework was based on the following four key considerations:

- a. Transparency
- b. Innovation

- c. Clarity
- d. Competitive neutrality

It is through this framework that the CRTC implemented rules to assess and treat with traffic discrimination and the preferential treatment of traffic. In addition to the framework, the CRTC is guided by section 36 of its Act, to prevent blocking, delaying or slowing of traffic. Section 36 of the Act states:

“Except where the Commission approves otherwise, a Canadian carrier shall not control the content or influence the meaning or purpose of telecommunications carried by it for the public” (Telecommunications Act S.C. 1993, c. 38 s.36 1993).

In April 2017, the CTRC expressed its view that differential pricing generally gives either an unfair advantage or a disadvantage to certain content providers and consumers. It published its *Framework for Assessing the Differential Pricing Practices of Internet Service Providers*, which sets out the evaluation criteria it will apply to determine whether an ISP’s specific differential pricing practice is inconsistent with Canada’s legislation.

Caribbean

In 2016, the Eastern Caribbean Telecommunications Authority (ECTEL) issued a determination on net neutrality after consulting with various stakeholders. At the end of the consultation period, ECTEL put forward its position and approach to the subject but has deferred implementing any regulations relating to net neutrality. In its proposed approach, ECTEL has acknowledged that the use of DPI potentially violates the privacy of consumers and has, therefore, urged ISPs to utilise the technology only to detect viruses and to maintain the integrity of the network. Additionally, in recognising that this action might not be sufficient for achieving a free and open Internet, ECTEL

intends to review its QoS regulations, to prescribe minimum Internet broadband speeds for safeguarding against degradation of service. Moreover, ECTEL proposes to strengthen its legislative framework to address situations where DPI may be used for anti-competitive practices.

In July 2016, CANTO issued its *Code of Practice on Safeguarding the Open Internet* (the Code), which seeks to balance consumer rights and responsibilities with the availability of flexible network management tools for operators. The wider objective of the Code is to provide a framework for operators across the Caribbean region to collectively address the issue of net neutrality. The Code states that:

“CANTO and its members support the concept of the open internet and the general principle that legal content, applications and services, should not be blocked.

To give effect to this position Signatories to this code commit that:

1. within the terms, bandwidth limits and quality of service of their individual service plan, customers should have access to their choice of legal Internet content, services and applications;
2. any restrictions on use attached to a particular service plan are effectively communicated to customers;
3. save for objective and transparent reasons traffic management will not selectively target the content or application(s) of specific providers within a class of content, service or application;
4. they will make available a range of service plans that provide customers with viable choices for accessing legal content, applications and services.

The Code also recognises that “Operators must have the flexibility to run their networks, to innovate and to reach appropriate commercial agreements. The Code does not limit an Operator from:

- managing congestion on its network

- safeguarding the security and integrity of its network
- blocking services if required to by law or by a Court
- offering service plans which support the delivery of managed services
- making sure that customer contract terms are honoured”.

Europe

In the European Union (EU), the issue of net neutrality was first addressed within the legislative context in the EU’s 2009/140/EC Directive. This Directive sought to provide amendments to several other Directives. It served as the platform from which the European Commission (EC) noted the importance of preserving an open and neutral Internet and proposed the enshrining of net neutrality as a policy objective. The Directive also recommended that the following regulatory principles be promoted:

“the strengthening of related transparency requirements and the creation of safeguard powers for national regulatory authorities to prevent the degradation of services and the hindering or slowing down of traffic over public networks”.

The revised rules also required regulatory authorities to promote “the ability of end users to access and distribute information or run applications and services of their choice” (Article 8(4)(g) of the Framework Directive). This was supported by rules within the Universal Service Directive, calling for greater transparency in relation to informing consumers about:

- a. conditions limiting access to and/or use of services and applications.
- b. procedures put in place by the provider in order to measure and shape traffic and how these may impact service quality.

The revised regulatory framework also sought to ensure that consumers did not face significant switching barriers, by including rules that regulated the terms and conditions for consumer contract termination. Provision was also made for the setting of minimum QoS requirements by the various

national regulators. Given the state of competition in the European broadband market, due partly to the regulatory infrastructure in place, the above rules were generally considered to be adequate in deterring network operators from engaging in anti-competitive traffic management practices.

In 2011, the EC stressed the importance of transparency as a key part of the net neutrality debate, along with consumers' ability to easily switch services without incurring high switching costs. The Commission emphasised its commitment to an open Internet, relying on the above-mentioned rules to produce pro-competitive outcomes.

The EC stated that further investigations and observations within the market will ultimately determine whether more stringent measures will be required to ensure that competition and consumer choice are not negatively impacted. It also concluded that regulation should not deter investment and innovative business models and should lead to the efficient use of networks and the creation of new business opportunities at different levels of the Internet value chain, while preserving consumer choice.

In 2013, the EC introduced its Telecoms Single Market proposals to the European Parliament, intended to end discriminatory blocking and throttling and deliver effective net neutrality. The proposed rules adopted a middle ground, where the openness of the Internet is preserved but operators are allowed to offer specialised services to meet the specific needs of their customers. In April 2014, the proposals were adopted in the first reading by the Parliament. In June 2015, after months of negotiations, the Parliament, European Council and the Commission reached two agreements, one related to ending roaming charges and the other on the first EU-wide rules on net neutrality.

Specifically, Article 3 of the Regulations provides conditions for safeguarding open Internet access. The Article mandates against ISPs engaging in traffic management measures that go beyond reasonable traffic management practices. In particular, it bans ISPs from blocking, slowing down, altering, restricting and discriminating between specific content, applications or services.

In September 2020, the Court of Justice of the EU (CJEU) issued its first ruling interpreting the 2015 regulation. In the ruling, the CJEU confirmed the illegality of zero-rating agreements that combine a zero-tariff pricing of certain applications with measures blocking or slowing down traffic linked to the use of “non zero-tariff” services and applications. The ruling thus, does not stop operators from offering zero-rated services that are exempted from the customers’ data cap, as long as those services are also blocked/throttled like other applications when the general cap is reached.

This was the first time the Court had been asked to interpret the wording of the EU’s net neutrality law and the interpretation closed what many net neutrality advocates considered to be a loophole which allow operators to prioritise some traffic over other traffic, for commercial rather than technical reasons.

India

In March 2015, Telecom Regulatory Authority of India (TRAI) released a consultation paper on over-the-top services (OTT) and net neutrality for public feedback. Additionally in March 2016, India’s Department of Telecommunications (DoT), sought the recommendations of TRAI on net neutrality and other related aspects, such as economic, security and privacy issues and the regulatory framework for OTT services similar to services provided by telecommunications service providers (TSPs).

On 12 July 2018, TRAI issued its rules on net neutrality which barred any form of data discrimination. The rules made an exception for "critical IoT services" or "specialized services" such as autonomous vehicles and remote surgery operations.

In November 2018, TRAI also issued another public consultation paper on OTT regulation which focussed on OTT services that could be regarded as the same as, or similar to, the services provided by telecommunications service providers. The paper proposed, as a matter for consultation, that “substitutability might be the primary criterion for comparison of regulatory and licensing norms”.

In January 2020, the Economic Times of India reported that a statement from a TRAI official who said “the issue of whether to regulate communication apps, known as over-the-top (OTT) players, isn’t likely to be resolved any time soon given that the matter is far more complicated than earlier thought.”

United States of America

Over the two past decades, there has been contention in the US among network users and ISPs over net neutrality issues. Until 2015, there were no clear legal protections requiring net neutrality. In February 2015, the US regulator, the Federal Communications Commission (FCC), under Chairman Tom Wheeler, approved a new set of net neutrality regulations that focused on maintaining an open Internet. The rules classified broadband Internet service as a public utility, thereby subjecting it to government regulation in the same manner as services like landline telephones. The FCC’s published *Open Internet Order* placed rules on ISPs, prohibiting paid prioritisation, blocking and throttling.

However, in November 2017, the new FCC chairman, Ajit Pai, unveiled plans to repeal the net neutrality policy in the United States. In December 2017, the FCC voted to repeal the Title II net neutrality rules passed in 2015. In the new Order, the FCC reverted to the “light-touch” framework that sought to restore “a favourable climate for network investment”, which they considered key to “closing the digital divide, spurring competition and innovation that benefits consumers” (FCC 2018). Key changes involved: the restoration of the classification of broadband Internet access service as an “information service” under Title I of the Communications Act; the reinstating of the classification of mobile broadband Internet access service as a private mobile service; and the restoration of broadband consumer protection authority to the Federal Trade Commission (FTC).

The Order also requires that ISPs disclose information about their practices to consumers, entrepreneurs and the FTC, including any blocking, throttling, paid prioritisation or affiliated prioritisation.

In May 2018, the United States Senate approved a resolution to nullify the FCC's net neutrality rollback. However, efforts for the House of Representatives to pass similar legislative action were stalled, resulting in the revised FCC Order repealing net neutrality becoming official in June, 2018.