Regulatory Perspectives on Net Neutrality

Background Paper to CIS Submission for TRAI Consultation on Regulatory Framework for Over-the-top (OTT) Services

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Today, we no longer live in a world of "roti, kapda, makaan", but in the world of "roti, kapda, makaan aur broadband".[2] This is recognized by the National Telecom Policy IV.1.2, which states the need to "recognise telecom, including broadband connectivity as a basic necessity like education and health and work towards 'Right to Broadband'."[3] According to the IAMAI, as of October 2014,

[1]The author would like to specially thank Vishal Misra, Steve Song, Rudolf van der Berg, Helani Galpaya, A.B. Beliappa, Amba Kak, and Sunil Abraham for extended discussions, helpful suggestions and criticisms. However, this paper is not representative of their views, which are varied.

[2]United Nations, "Report of the Special Rapporteur on the Promotion and Protection of the Right to Freedom of Opinion and Expression," May 19, 2011, http://www2.ohchr.org/english/bodies/hrcouncil/docs/17session/A.HRC.17.27_en.pdf.

[3]Government of India, "National Telecom Policy 2012" (n.d.), http://www.trai.gov.in/WriteReadData/userfiles/file/NTP%202012.pdf.

India had 278 million internet users.[4] Of these, the majority access Internet through their mobile phones, and the WEF estimates only 3 in 100 have broadband on their mobiles.[5] Thus, the bulk of our population is without broadband. Telecom regulation and net neutrality has a very important role in enabling this vision of Internet as a basic human need that we should aim to fulfil.

1. Why should we regulate the telecom sector?

All ICT regulation should be aimed at achieving five goals: achieving universal, affordable access;[6] ensuring and sustaining effective competition in an efficient market and avoiding market failures; protecting against consumer harms; ensuring maximum utility of the network by ensuring interconnection; and addressing state needs (taxation, security, etc.). Generally, all these goals go hand in hand, however some tensions may arise. For instance, universal access may not be provided by the market because the costs of doing so in certain rural or remote areas may outweigh the immediate monetary benefits private corporations could receive in terms of profits from those customers. In such cases, to further the goal of universal access, schemes such as universal service obligation funds are put in place, while ensuring that such schemes either do not impact competition or very minimally impact it.

It is clear that to maximise societal benefit, effective regulation of the ICT sector is a requirement, which otherwise, due to the ability of dominant players to abuse network effect to their advantage, is inherently prone towards monopolies. For instance, in the absence of regulation, a dominant player would charge far less for intra-network calls than inter-network calls, making customers shift to the dominant network. This kind of harm to competition should be regulated by the ICT regulator. However, it is equally true that over-regulation is as undesirable as under-regulation, since over-regulation harms innovation — whether in the form of innovative technologies or innovative business models. The huge spurt of growth globally of the telecom sector since the 1980s has resulted not merely from advancements in technology, but in large part from the de-monopolisation and deregulation of the telecom sector.[7] Similarly, the Internet has largely flourished under very limited technology-specific regulation. For instance, while interconnection between different telecom networks is heavily regulated in the domestic telecom sector, interconnection between the different autonomous systems (ASes) that make up the Internet is completely unregulated, thereby allowing for non-transparent pricing and opaque transac-

[4] IAMAI, "India to Cross 300 Million Internet Users by Dec 14," November 19, 2014, http://www.iamai.in/PRelease_detail.aspx?nid=3498&NMonth=11&NYear=2014.

[5] World Economic Forum, "The Global Information Technology Report 2015," 2015, http://www3.weforum.org/docs/WEF_Global_IT_Report_2015.pdf.

[6] http://www.ictregulationtoolkit.org/4.1#s4.1.1

[7] R.U.S. Prasad, "The Impact of Policy and Regulatory Decisions on Telecom Growth in India," July 2008, http://web.stanford.edu/group/siepr/cgi-bin/siepr/?q=system/files/shared/pubs/papers/pdf/SCID361.pdf.

tions. Given this context, we must ensure we do not over-regulate, lest we kill innovation.

2. Why should we regulate Net Neutrality? And whom should we regulate?

We wouldn't need to regulate Net Neutrality if ISPs were not "gatekeepers" for last-mile access. "Gatekeeping" occurs when a single company establishes itself as an exclusive route to reach a large number of people and businesses or, in network terms, nodes. It is not possible for Internet services to reach the customers of the telecom network without passing through the telecom network. The situation is very different in the middle-mile and for backhaul. Even though anti-competitive terms may exist in the middle-mile, especially given the opacity of terms in "transit agreements", a packet is usually able to travel through multiple routes if one route is too expensive (even if that is not the shortest network path, and is thus inefficient in a way). However, this multiplicity of routes is not possible in the last mile.

This leaves last mile telecom operators (ISPs) in a position to unfairly discriminate between different Internet services or destinations or applications, while harming consumer choice. This is why we believe that promoting the five goals mentioned above would require regulation of last-mile telecom operators to prevent unjust discrimination against end-users and content providers.

Thus, **net neutrality** is the principle that we should regulate gatekeepers to ensure they do not use their power to unjustly discriminate between similarly situated persons, content or traffic.

3. How should we regulate Net Neutrality?

3.1. What concerns does Net Neutrality raise? What harms does it entail?

Discriminatory practices at the level of access to the Internet raises the following set of concerns:

1. Freedom of speech and expression, freedom of association, freedom of assembly, and privacy.
2. Harm to effective competition
    a. This includes competition amongst ISPs as well as competition amongst content providers.
    b. Under-regulation here may cause harm to innovation at the content provider level, including through erecting barriers to entry.
    c. Over-regulation here may cause harm to innovation in terms of ISP business models.
3. Harm to consumers

a. Under-regulation here may harm consumer choice and the right to freedom of speech, expression, and communication.
b. Over-regulation on this ground may cause harm to innovation at the level of networking technologies and be detrimental to consumers in the long run.

4. Harm to "openness" and interconnectedness of the Internet, including diversity (of access, of content, etc.)
    a. Exceptions for specialized services should be limited to preserve the open and interconnectedness of the Internet and of the World Wide Web.

It might help to think about Net Neutrality as primarily being about two overlapping sets of regulatory issues: preferential treatment of particular Internet-based services (in essence: content- or source-/destination-based discrimination, i.e., discrimination on basis of 'whose traffic it is'), or discriminatory treatment of applications or protocols (which would include examples like throttling of BitTorrent traffic, high overage fees upon breaching Internet data caps on mobile phones, etc., i.e., discrimination on the basis of 'what kind of traffic it is').

Situations where the negative or positive discrimination happens on the basis of particular content or address should be regulated through the use of competition principles, while negative or positive discrimination at the level of specific class of content, protocols, associated ports, and other such sender-/receiver-agnostic features, should be regulated through regulation of network management techniques. The former deals with instances where the question of "in whose favour is there discrimination" may be asked, while the latter deals with the question "in favour of what is there discrimination".

In order to do this, a regulator like TRAI can use both hard regulation — price ceilings, data cap floors, transparency mandates, preventing specific anti-competitive practices, etc. — as well as soft regulation — incentives and disincentives.

3.1.1. Net Neutrality and human rights

Any discussion on the need for net neutrality impugns the human rights of a number of different stakeholders. Users, subscribers, telecom operators and ISPs all possess distinct and overlapping rights that are to be weighed against each other before the scope, nature and form of regulatory intervention are finalised. The freedom of speech, right to privacy and right to carry on trade raise some of the most pertinent questions in this regard.

For example, to properly consider issues surrounding the practice of paid content-specific zero-rating from a human rights point of view, one must seek to balance the rights of content providers to widely disseminate their 'speech' to the largest audiences against the rights of consumers to have access to a diverse variety of different, conflicting and contrasting ideas.

This commitment to a veritable marketplace or free-market of ideas has formed the touchstone of freedom of speech law in jurisdictions across the world as well as finding mention in pronouncements of the Indian Supreme Court. Particular reference is to be made to the dissent of Mathew, J. in *Bennett Coleman v. Union of India*[8] and of the majority *Sakal Papers v. Union of India*[9] which rejected the approach.

Further, the practice of deep-packet inspection, which is sometimes used in the process of network management, raises privacy concerns as it seeks to go beyond what is "public" information in the header of an IP packet, necessary for routing, to analysing non-public information.[10]

3.2. What conditions and factors may change these concerns and the regulatory model we should adopt?

While the principles relating to Net Neutrality remain the same in all countries (i.e., trying to prevent gatekeepers from unjustly exploiting their position), the severity of the problem varies depending on competition in the market, on the technologies, and on many other factors. One way to measure fair or stable allocation of the surplus created by a network — or a network-of-networks like the Internet — is by treating it as a convex cooperation game and thereupon calculating that game's Shapley value:[11] in the case of the Internet, this would be a game involving content ISPs, transit ISPs, and eyeball (i.e., last-mile) ISPs. The Shapley value changes depending on the number of competitors there are in the market: thus, the fair/stable allocation when there's vibrant competition in the market is different from the fair/stable allocation in a market without such competition. That goes to show that a desirable approach when an ISP tries to unjustly enrich itself by charging other network-participants may well be to increase competition, rather than directly regulating the last-mile ISP. Further, it shows that in a market with vibrant last-mile competition, the capacity of the last-mile ISP to unjustly are far diminished.

In countries which are remote and have little international bandwidth, the need to conserve that bandwidth is high. ISPs can regulate that by either increasing prices of Internet connections for all, or by imposing usage restrictions (such as throttling) on either heavy users or bandwidth-hogging protocols. If the amount of international bandwidth is higher, the need and desire on part of ISPs to indulge in such usage restrictions decreases. Thus, the need to regulate is far higher in the latter case, than in the former case.

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[8] Bennett Coleman v. Union of India, 1973 AIR 106 (1973).

[9] Sakal Papers v. Union of India, 1962 AIR 305 (1962).

[10] Alissa Cooper, "How Deep Must DPI Be to Incur Privacy Risk?" January 25, 2010, http://www.alissacooper.com/2010/01/25/how-deep-must-dpi-be-to-incur-privacy-risk/.

[11] Richard T.B. Ma and Vishal Misra, "The Public Option: A Non-Regulatory Alternative to Network Neutrality," 2011, http://dna-pubs.cs.columbia.edu/citation/paperfile/200/netneutrality.pdf.

The above paragraphs show that both the need for regulation and also the form that the regulation should take depend on a variety of conditions that aren't immediately apparent.

Thus, the framework that the regulator sets out to tackle issues relating to Net Neutrality are most important, whereas the specific rules may need to change depending on changes in conditions. These conditions include:

- **last-mile market**
  - switching costs between equivalent service providers
  - availability of an open-access last-mile
  - availability of a "public option" neutral ISP
  - increase or decrease in the competition, both in wired and mobile ISPs.
- **interconnection market**
  - availability of well-functioning peering exchanges
  - availability of low-cost transit
- **technology and available bandwidth**
  - spectrum efficiency
  - total amount of international bandwidth and local network bandwidth
- **conflicting interests of ISPs**
  - do the ISPs have other business interests other than providing Internet connectivity? (telephony, entertainment, etc.)

3.3. How should we deal with anticompetitive practices?

Anti-competitive practices in the telecom sector can take many forms: Abuse of dominance, exclusion of access to specific services, customer lock-in, predatory pricing, tying of services, cross-subsidization, etc., are a few of them. In some cases the anti-competitive practice targets other telecom providers, while in others it targets content providers. In the both cases, it is important to ensure that ensure that telecom subscribers have a competitive choice between effectively substitutable telecom providers and an ability to seamlessly switch between providers.

3.3.1. Lowering Switching Costs

TRAI has tackled many of these issues head on, especially in the mobile telephony space, while competitive market pressures have helped too:

- **Contractual or transactional lock-in.** The easiest way to prevent shifting from one network to another is by contractually mandating a lock-in period, or by requiring special equipment (interoperability) to connect to one's network. In India, this is not practised in the telecom sector, with the exception of competing technologies like CDMA and GSM. Non-contractual lock-ins, for instance by offering discounts for purchasing longer-term packages, are not inherently anti-competitive unless that results in predatory pricing or constitutes an abuse of market dominance. In India, switching from one mobile provider to another, though initiated 15 years into the telecom

revolution, is in most cases now almost as easy as buying a new SIM card.[12] TRAI may consider proactive regulation against contractual lock-in.

- **Number of competitors.** Even if switching from one network to another is easy, it is not useful unless there are other equivalent options to switch to. In the telecom market, coverage is a very important factor in judging equivalence. Given that last mile connectivity is extremely expensive to provide, the coverage of different networks are very different, and this is even more true when one considers wired connectivity, which is difficult to lay in densely-populated urban and semi-urban areas and unprofitable in sparsely-populated areas. The best way to increase the number of competitors is to make it easier for competitors to exist. Some ways of doing this would be through enabling spectrum-sharing, lowering right-of-way rents, allowing post-auction spectrum trading, and promoting open-access last-mile fibre carriers and to thereby encourage competition on the basis of price and service and not exclusive access to infrastructure.
- **Interconnection and mandatory carriage.** The biggest advantage a dominant telecom player has is exclusive access to its customer base. Since in the telecom market, no telco wants to not connect to customers of another telco, they do not outright ban other networks. However, dominant players can charge high prices from other networks, thereby discriminating against smaller networks. In the early 2000s, Airtel-to-Airtel calls were much cheaper than Airtel-to-Spice calls. However, things have significantly changed since then. TRAI has, since the 2000s, heavily regulated interconnection and imposed price controls on interconnection ("termination") charges.[13] Thus, now, generally, inter-network calls are priced similarly to intra-network calls. And if you want cheaper Airtel-to-Airtel calls, you can buy a special (unbundled) pack that enables an Airtel customer to take advantage of the fact that her friends are also on the same network, and benefits Airtel since they do not in such cases have to pay termination charges. Recently, TRAI has even made the interconnection rates zero in three cases: landline-to-landline, landline-to-cellular, and cellular-to-landline, in a bid to decrease landline call rates, and incentivise them, allowing a very low per call interconnection charges of 14 paise for cellular-to-cellular connections.[14]
  - With regard to Net Neutrality, we must have a rule that **no termination charges or carriage charges may be levied by any ISP upon any Internet service.** No Internet service may be discriminated against with regard to carriage conditions or speeds or any other quality of service metric. In essence **all negative discrimination should be prohibited.** This means that Airtel cannot forcibly charge WhatsApp or

[12]Mobile number portability was launched in India on January 20, 2011 in the Haryana circle.

[13]For a comprehensive list of all TRAI interconnection regulations & subsequent amendments, see http://www.trai.gov.in/Content/Regulation/0_1_REGULATIONS.aspx.

[14]See Telecommunication Interconnection Usage Charges (Eleventh Amendment) Regulations, 2015 (1 of 2015).

any other OTT (which essentially form a different "layer") money for the "privilege" of being able to reach Airtel customers, nor may Airtel slow down WhatsApp traffic and thus try to force WhatsApp to pay. There is a duty on telecom providers to carry any legitimate traffic ("common carriage"), not a privilege. It is important to note that consumer-facing TSPs get paid by other interconnecting Internet networks in the form of **transit charges** (or the TSP's costs are defrayed through peering). There shouldn't be any separate charge on the basis of content (different layer from the carriage) rather than network (same layer as the carriage). This principle is especially important for startups, and which are often at the receiving end of such discriminatory practices.

- **Number Portability.** One other factor that prevents users from shifting between one network and another is the fact that they have to change an important aspect of their identity: their phone number (this doesn't apply to Internet over DSL, cable, etc.). At least in the mobile space, TRAI has for several years tried to mandate seamless mobile number portability. The same is being tried by the European Commission in the EU.[15] While intra-circle mobile number portability exists in India — and TRAI is pushing for inter-circle mobile number portability as well[16] — this is nowhere as seamless as it should be.
- **Multi-SIM phones.** The Indian market is filled with phones that can accommodate multiple SIM cards, enabling customers to shift seamlessly between multiple networks. This is true not just in India, but most developing countries with extremely price-sensitive customers. Theoretically, switching costs would approach zero if in a market with full coverage by n telecom players every subscriber had a phone with n SIM slots with low-cost SIM cards being available.

The situation in the telecom sector with respect to the above provides a stark contrast to the situation in the USA, and to the situation in the DTH market. In the USA, phones get sold at discounts with multi-month or multi-year contracts, and contractual lock-ins are a large problem. Keeping each of the above factors in mind, the Indian mobile telecom space is far more competitive than the US mobile telecom space.

Further, in the Indian DTH market, given that there is transactional lock-in (set-top boxes aren't interoperable in practice, though are mandated to be so by law[17]), there are fewer choices in the market; further, the equivalent of multi-SIM phones don't exist with respect to set-top boxes. Further, while there are must-carry rules with respect to carriage, they can be of three types: 1)

[15]Article 30 of the Universal Service Directive, Directive 2002/22/EC.

[16]See Telecommunication Mobile Number Portability (Sixth Amendment) Regulations, 2015 (3 of 2015).

[17]The Telecommunication (Broadcasting and Cable) Services (Seventh) (The Direct to Home Services) Tariff Order, 2015 (2 of 2015).

must mandatorily provide access to particular channels[18] (positive obligation, usually for government channels); 2) prevented from not providing particular channels (negative obligation, to prevent anti-competitive behaviour and political censorship); and 3) must mandatorily offer access to at least a set number of channels (positive obligation for ensuring market diversity).[19] Currently, only (1) is in force, since despite attempts by TRAI to ensure (3) as well.[20]

If the shifting costs are low and transparency in terms of network practice is reported in a standard manner and well-publicised, then that significantly weakens the **"gatekeeper effect"**, which as we saw earlier, is the reason why we wish to introduce Net Neutrality regulation. This consequently means that **despite the same Net Neutrality principles applying in all markets and countries, the precise form that the Net Neutrality regulations take in a telecom market with low switching costs would be different from the form that such regulations would take in a market with high switching costs.**

3.3.2. Anticompetitive Practices

Some potential anti-competitive practices, which are closely linked, are cross-subsidization, tying (anti-competitive bundling) of multiple services, and vertical price squeeze. All three of these are especial concerns now, with the increased diversification of traditional telecom companies, and with the entry into telecom (like with DTH) of companies that create content. Hence, if Airtel cross-subsidizes the Hike chat application that it recently acquired,[21] or if Reliance Infocomm requires customers to buy a subscription to an offering from Reliance Big Entertainment, or if Reliance Infocomm meters traffic from another Reliance Big Entertainment differently from that from Saavn, all those would be violative of the **principle of non-discrimination by gatekeepers.** This same analysis can be applied to all unpaid deals and non-commercial deals, including schemes such as Internet.org and Wikipedia Zero, which will be covered later in the section on zero-rating.

While we have general rules such as sections 3 and 4 of the Competition Act, **we do not currently have specific rules prohibiting these or other anti-competitive practices, and we need Net Neutrality regulation that clearly prohibit such anti-competitive practices so that the telecom regulator can take action for non-compliance.** We cannot leave these specific policy prescriptions unstated, even if they are provided for in **section 3 of the Competition Act.** These concerns are especial concerns in the telecom sector, and the telecom regulator or arbitrator should have the power to directly

[18] Section 8, Cable Television Networks Act, 1995.

[19] TRAI writes new rules for Cable TV, Channels, Consumers, REAL TIME NEWS, (August 11, 2014).

[20] An initial requirement for all multi system operators to have a minimum capacity of 500 channels was revoked by the TDSAT in 2012.

[21] Aparna Ghosh, Bharti SoftBank Invests $14 million in Hike, LIVE MINT, (April 2, 2014).

deal with these, instead of each case going to the Competition Commission of India. This should not affect the jurisdiction of the CCI to investigate and adjudicate such matters, but should ensure that TRAI both has suo motu powers, and that the mechanism to complain is made simple (unlike the current scenario, where some individual complainants may fall in the cracks between TRAI and TDSAT).

3.3.3. Zerorating

Since a large part of the net neutrality debate in India involves zero-rating practices, we deal with that in some length. Zero-rating is the practice of not counting (aka "zero-rating") certain traffic towards a subscriber's regular Internet usage. The zero-rated traffic could be zero-priced or fixed-price; capped or uncapped; subscriber-paid, Internet service-paid, paid for by both, or unpaid; content- or source/destination-based, or agnostic to content or source/destination; automatically provided by the ISP or chosen by the customer. The motivations for zero-rating may also be varied, as we shall see below. Further, depending on the circumstances, zero-rating could be competitive or anti-competitive. All forms of zero-rating result in some form of discrimination, but not all zero-rating is harmful, nor does all zero-rating need to be prohibited.

While, as explained in the section on interconnection and carriage above, negative discrimination at the network level should be prohibited, that leaves open the question of positive discrimination. It follows from section 3.1 that the right frame of analysis of this question is harm to competition, since the main harm zero-rating is, as we shall see below, about discriminating between different content providers, and not discrimination at the level of protocols, etc.

Whether one should allow for any form of positive discrimination at the network level or not depends on whether positive discrimination of (X) has an automatic and unfair negative impact on all (~X). That, in turn, depends on whether (~X) is being subject to unfair competition. As Wikipedia notes, "unfair competition means that the gains of some participants are conditional on the losses of others, when the gains are made in ways which are illegitimate or unjust." Thus, positive discrimination that has a negative impact on effective competition shall not be permitted, since in such cases it is equivalent to negative discrimination ("zero-sum game"). Positive discrimination that does not have a negative impact on effective competition may be permitted, especially since it results in increased access and increases consumer benefit, as long as the harm to openness and diversity is minimized.

While considering this, one should keep in mind the fact that startups were, 10-15 years ago, at a huge disadvantage with regard to wholesale data purchase. The marketplaces for data centres and for content delivery networks (which speed up delivery of content by being located closer, in network terms, to multiple last-mile ISPs) were nowhere near as mature as they are today, and the prices were high. There was a much higher barrier to startup entry than

there is today, due to the prices and due to larger companies being able to rely on economies of scale to get cheaper rates. Was that unfair? No. There is no evidence of anti-competitive practices, nor of startups complaining about such practices. Therefore, that was fair competition, despite specific input costs that were arguably needed (though not essential) for startups to compete being priced far beyond their capacity to pay.

Today the marketplace is very different, with a variety of offerings. CDNs such as Cloudflare, which were once the preserve of rich companies, even have free offerings, thus substantially lowering barriers for startups that want faster access to customers across the globe.

Is a CDN an essential cost for a startup? No. But in an environment where speed matters and customers use or don't use a service depending on speed; and where the startup's larger competitors are all using CDNs, a startup more or less has to. Thankfully, given the cheap access to CDNs these days, that cost is not too high for a startup to bear. If the CDN market was not competitive enough, would a hypothetical global regulator have been justified in outright banning the use of CDNs to 'level' the playing field? No, because the hypothetical global regulator would have had no jurisdiction over the CDN market.

Motivations for Zero-Rating

Corporate Social Responsibility / Incentivizing Customers to Move Up Value Chain

There exist multiple instances where there is no commercial transaction between the OTT involved and the telecom carrier, in which zero-priced zero-rating of specific Internet content happens. We know that there is no commercial transaction either through written policy (Wikipedia Zero) or through public statements (Internet.org, a bouquet of sites).

In the case of Wikipedia Zero, the goal is purely one of increasing access to knowledge. In the case of Internet.org, while increasing access is also a goal, there is also a clear commercial goal: to entice customers to begin using the Internet so that they may eventually start using other data services. Since in these cases the OTT does not pay the ISP, nor is there any evidence of the ISP charging (~X) more because of (X), it is not a zero-sum game. Thus, there is no harm to competition in such cases.

Passing on ISP Savings / Incentivizing Customers to Lower ISP's Cost

Suppose, for instance, an OTT uses a CDN located, in network distance terms, near an eyeball ISP. In this case, the ISP has to probably pay less than it would have to had the same data been located in a data centre located further away, given that it would have fewer interconnection-related charges.

If an ISP chooses to pass these interconnection-related savings to the customer by zero-rating all traffic through its local IXP, that should be encouraged since

it encourages local hosting of content and reduces the cost of Internet access. In such cases, there is no harm to competition since the deal is not content- or source/destination-specific, but rather agnostic to content and only focused on network distance.

Importantly, this problem is exacerbated in India where web hosting prices are high, transit prices are high, peering levels are low, and Internet Exchange Points (IXPs) are not functioning well.[22] These conditions create network inefficiencies in terms of hosting of content further away from Indian networks in terms of network distance, and thus harms consumers as well as local ISPs.

If an ISP chooses to pass these interconnection-related savings to the customer by zero-rating all traffic through its local IXP, that should be encouraged since it encourages local hosting of content and reduces the cost of Internet access. In such cases, there is no harm to competition since the deal is not content- or source/destination-specific, but rather agnostic to content and only focused on network distance.

Unbundling Internet into Services ("Special Packs")

Since at least early 2014, mobile operators have been marketing special zero-rating "packs". These packs, if purchased by the customer, allow capped or in some instances uncapped, zero-rating of a service such as WhatsApp or Facebook, meaning traffic to/from that service will not be counted against their regular Internet usage.

While these packs are content-specific, they are not based on any commercial deal between the ISP and the OTT. Rather, they are a response to customer demand. Since there is no deal, there is no risk of the ISP providing an unfair advantage to one OTT over another. Rather, the ISP is simply responding to market demand by unbundling its services. This is similar to a cable TV operator offering special bouquets of channels based on customer interest.

Earning Additional Revenues from Content Providers

With offerings like Airtel Zero, we have a situation where OTT companies are offering to pay for wholesale data access used by their customers, and make accessing their specific site or app free for the customer. From the customer's perspective, this is similar to a toll-free number or a pre-paid envelope or free-to-air TV channel being offered on a particular network.

However, from the network perspective, these are very different. A toll-free number is a circuit-switched service where the cost of the call is borne by the recipient. A free-to-air TV channel is a broadcast service where the cost of transmission is borne by the broadcaster. In contrast, the Internet is a packet-switched network where the cost of data transmission is borne by the subscriber. The comparison to free-to-air channels is also instructive, since in 2010 TRAI

[22]Helani Galpaya and Shazna Zuhyle, "South Asian Broadband Service Quality: Diagnosing the Bottlenecks," 2011, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1979928.

made recommendations that consumers should have the choice of accessing free-to-air channels à-la-carte, without being tied up to a bouquet.[23]

If an OTT wishes to engage in paid zero-rating, it should be done in a non-discriminatory and transparent manner, within a regulated marketplace, with specific anticipated anti-competitive practices being clearly prohibited ex-ante. For instance, while richer companies with a strong presence in India may pay to zero-rate traffic for their Indian customers, decentralized technologies such as XMPP and WebRTC, having no central company behind them, would not, leading to customers preferring proprietary networks and solutions to such open technologies, which in turn, thanks to the network effect, leads to a vicious cycle. These harms to openness and diversity have to be weighed against the benefit in terms of increase in access when deciding whether to allow for competitive OTT-paid zero-priced zero-rating, as such competition doesn't exist in a truly level playing field.

Other options for zero-rating

There are other models of zero-priced zero-rating that either minimize the harm is that of ensuring free Internet access for every person. This can take the form of:

- **A mandatorily "leaky" 'walled garden':**
  - The first-degree of all hyperlinks from the zero-rated OTT service are also free.
  - The zero-rated OTT service provider has to mandatorily provide free access to the whole of the World Wide Web to all its customers during specified hours.
  - The zero-rated OTT service provider has to mandatorily provide free access to the whole of the World Wide Web to all its customers based on amount on usage of the OTT service.
- **Zero-rating of all Web traffic**
  - In exchange for viewing of advertisements
  - In exchange for using a particular Web browser
  - At low speeds on 3G, or on 2G.

What kinds of zero-rating are good

The majority of the forms of zero-rating covered in this section are content or source/destination-based zero-rating. Only some of the options covered in the "other options for zero-rating" section cover content-agnostic zero-rating models. Content-agnostic zero-rating models are not harmful, while content-based zero-rating models always harm, though to varying degrees, the openness of the Internet / diversity of OTTs, and to varying degrees increase access to

[23]DTH players told to offer pay channels on la carte basis, HINDU BUSINESS LINE (July 22, 2010).

Internet-based services. Accordingly, here is a hierarchy of desirability of zero-priced zero-rating, from most desirable to most harmful:

1. Content- & source/destination-agnostic zero-priced zero-rating. (Example: free Internet access at low speeds, with data caps.)
2. Content- & source/destination-based non-zero-priced zero-rating, without any commercial deals, chosen freely & paid for by users. (Example: special "packs" for specific services like WhatsApp.)
3. Content- & source/destination-based zero-priced zero-rating, without any commercial deals, with full transparency. (Example: zero-rating of all locally-peered settlement-free traffic.)
4. Content- & source/destination-based zero-priced zero-rating, on the basis of commercial deal with partial zero-priced access to all content, with non-discriminatory access to the same deal by all with full transparency. (Example: "leaky" walled gardens, such as the Jana Loyalty Program that provide limited access to all of the Web alongside access to the zero-rated content.)
5. Content- & source/destination-based zero-priced zero-rating, on the basis of a non-commercial deal, without any benefits monetary or otherwise, flowing directly or indirectly from the provider of the zero-rated content to the ISP, with full transparency. (Example: Wikipedia Zero.)
6. Content- & source-destination-based zero-priced zero-rating, across all telecom networks, with standard pricing, non-discriminatory access, and full transparency.
7. Content- & source-destination-based zero-priced zero-rating, with standard pricing, non-discriminatory access, and full transparency.
8. Content- & source-destination-based zero-priced zero-rating, with non-discriminatory access, and full transparency.
9. Content- & source-destination-based zero-priced zero-rating, with non-discriminatory access, and transparency to the regulator.
10. Content- & source-destination-based zero-priced zero-rating, without any regulatory framework in place.

3.3.4. Cartels and Oligopoly

While cartels and oligopolies may have an impact on Net Neutrality, they are not problems that any set of anti-discrimination rules imposed on gatekeepers can fix. Further, cartels and oligopolies don't directly enhance the ability of gatekeepers to unjustly discriminate if there are firm rules against negative discrimination and price ceilings and floors on data caps are present for data plans. Given this, TRAI should recommend that this issue be investigated and the Competition Commission of India should take this issue up.

4. Reasonable Network Management Principles

Reasonable network management has to be allowed to enable the ISPs to manage performance and costs on their network. However, ISPs may not indulge

in acts that are harmful to consumers in the name of reasonable network management. Below are a set of guidelines for when discrimination against classes of traffic in the name of network management are justified.

- Discrimination between classes of traffic for the sake of network management should only be permissible if:
  - there is an intelligible differentia between the classes which are to be treated differently, and
  - there is a rational nexus between the differential treatment and the aim of such differentiation, and
  - the aim sought to be furthered is legitimate, and is related to the security, stability, or efficient functioning of the network, or is a technical limitation outside the control of the ISP, and
  - the network management practice is the least harmful manner in which to achieve the aim.
- Provision of specialized services (i.e., "fast lanes") is permitted if and only if it is shown that
  - The service is available to the user only upon request, and not without their active choice, and
  - The service cannot be reasonably provided with "best efforts" delivery guarantee that is available over the Internet, and hence requires discriminatory treatment, or
  - The discriminatory treatment does not unduly harm the provision of the rest of the Internet to other customers.

These principles are only applicable at the level of ISPs, and not on access gateways for institutions that may in some cases be run by ISPs (such as a university network, free municipal WiFi, at a work place, etc.), which are not to be regulated as common carriers.

These principles may be applied on a case-by-case basis by a regulator, either *suo motu* or upon complaint by customers.

- Discrimination between classes of traffic for the sake of network management should only be permissible if:
  - there is an intelligible differentia between the classes which are to be treated differently, and
  - there is a rational nexus between the differential treatment and the aim of such differentiation, and
  - the aim sought to be furthered is legitimate, and is related to the security, stability, or efficient functioning of the network, or is a technical limitation outside the control of the ISP[24] , and
  - the network management practice is the least harmful manner in which to achieve the aim.

[24] A CGNAT would be an instance of such a technology that poses network limitations.

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