IN THE HIGH COURT OF DELHI AT NEW DELHI

WRIT PETITION (CIVIL) NO. 11173 OF 2019

IN THE MATTER:

WORLD PHONE INTERNET SERVICES PRIVATE LIMITED
...PETITIONER

VERSUS

UNION OF INDIA &ORS
...RESPONDENTS

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Dated:07October 2021

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WORLD PHONE INTERNET SERVICES PRIVATE LIMITED

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...RESPONDENTS

REJOINDER/COUNTER AFFIDAVIT ON BEHALF OF THE PETITIONER AS AGAINST RESPONDENT NO. 4 (WHATSAPP, LLC)

MOST RESPECTFULLY SHOWETH:

I, V Venkat Ramanan, aged about 52 years, s/o Late Sh. N Vishwanathan, working as Sr Vice President in the answering Petitioner Company duly authorised, r/o L-043, 4th Floor, Gulshan Vivante, next to Felix Hospital, Sector 137, Noida, Uttar Pradesh, presently at New Delhi, do hereby solemnly affirm and declare as under:-

I identified the deponent who has signed in my presence.

1) It is submitted that the submissions made by the Respondent No. 4, save that which are a matter of record or that have been expressly admitted herein, are wrong as stated and hence denied.

2) The contents of para 1 - 5 of the counter affidavit filed on behalf of the Respondent No. 4 is a matter

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of record and needs no reply.

3) The contents of para 6 and clauses of the counter affidavit, save that which is a matter of record, is wrong and denied. In 2015 – long before Respondents No. 3 and 4 solidified their current monopoly positions in India, TRAI already recognized Respondents No. 3 and No. 4 were providing the top two mobile phone applications used in India:

2.39 Table 2.4 below shows the comparison of various apps with respect to the data usage.

Table 2.4: Top Apps for sampled users[23]

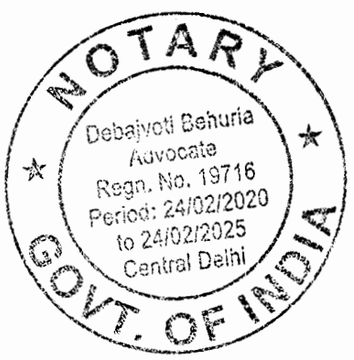
S. No.	Application	Data used (in %age)	Average data usage (MB/month)
1	Facebook	90	9
2	WhatsApp	38	1.2

Consultation Paper on Regulatory Framework for Over-the-top (OTT) services, para 2.39 at page 27 (27 March 2015) (Publicly available at https://trai.gov.in/sites/default/files/OTT-CP-27032015.pdf).

a. The contents of Para 6 a is wrong and denied. It is submitted that private monopolistic entities directly impacting the public interest are always subject to writ petitions. *Zee Telefilms Ltd. &Anr v. Union of India &Ors.*, (2005) 4 SCC 649, para 158 ("**A body**

discharging public functions and exercising monopoly power would also be an authority and, thus, writ may also lie against it.") [emphasis added]. Given the strong public interest implicated by this Petition and Respondent No. 4's exertion of monopoly power, the Petitioner's writ Petition should proceed against all Respondents – including Respondent No. 4. The fact that the functionally equivalent Internet Telephony services of an Internet service provider ("ISP") – an entity required to obtain a Unified License prior to providing such services, are provided by Respondent No. 4 un-hindered and without entering into a Unified License Agreement is well recognized and admitted by all Respondents. Such unlicensed activity is in violation of Section 5 of the Indian Wireless Telegraphy Act, 1933; Sections 4 and 20A of the Indian Telegraph Act, 1885; Section 79 of the Information Technology Act, 2000; and the entire framework of the Telecom Regulatory Authority of India Act, 1997.

b. The contents of para 6.b. is wrong and denied. It is submitted that neither the Telecom Disputes Settlement and Appellate Tribunal ("TDSAT")nor the Supreme Court has previously ruled on any matter subject to this writ Petition given the only matter previously before the Hon'ble TDSATand Hon'ble Supreme Court involved tariffs and license terms solely applicable to Petitioner. Indeed, the Hon'ble TDSAT only exercises jurisdiction over Telecom, Broadcasting, IT and Airport tariff matters under the Telecom Regulatory Authority of India ("TRAI") Act, 1997 (as amended), the Information Technology Act, 2008 and the Airport Economic Regulatory Authority of India Act, 2008**and not** the Indian Telegraph Act, 1885.Given the TDSAT Order was not attached by Respondent No. 4 to its counter affidavit – even though it is extensively cited by Respondent No. 4, a copy of same is marked as **ANNEXURE P/14 filed along with Rejoinder/Counter Affidavit to Respondent No. 3**.



c. The contents of para 6.c. is wrong and denied. It is submitted that all such services provided by Respondents No. 3 and No. 4 in India should be "licensed pursuant to an agreement with the Department of Telecommunications, Government of India ("DoT")"notwithstanding, considering such services "internet-based 'over-the-top' ("OTT") services".

d. The contents of para 6.d is wrong and denied. It is submitted that in providing functionally equivalent Internet Telephony services to that of licensed services, Respondent No. 4 is subject to the same rules applicable to actual licensees. Respondent No. 4's claim there is an "*intelligible differentia*" between its Internet Telephony services and Petitioner's Internet Telephony services is simply not accurate given the identical **functional equivalence** between the two.

e. The contents of para 6.e. is wrong and denied. It is submitted that the TDSAT tariff proceeding documented the license fees paid by Petitioner that are ignored by Respondent No. 4 – showing how Petitioner has been

financially harmed by the uneven application of the law. *See* **ANNEXURE P/14**, para 7 ("Petitioner's challenge to respondent's letter dated 29-6-2012 increasing license fee to 7/8% is also based on lack of proper consultation and that issues related to non-level playing were not considered."). Indeed, by not following the existing regime – one that Petitioner follows, Respondent No. 4 also avoids the "arbitrary restrictions" found within the regime applicable to licensees. *See* AT&T Global Network Services India Pvt. Ltd. Response to TRAI Consultation Paper on Internet Telephony (VoIP) at 6 (5 September 2016) ("Under the terms of ISPs' existing Internet License, ISPs are authorized to offer Internet Telephony services. However, the configuration of the Internet Telephony Services which ISPs are permitted to offer are **subject to arbitrary restrictions which limit delivery options to customers and disadvantage ISPs seeking to offer Internet Telephony Services**. The TRAI should continue to favorably recommend that ISPs be permitted to offer Internet Telephony

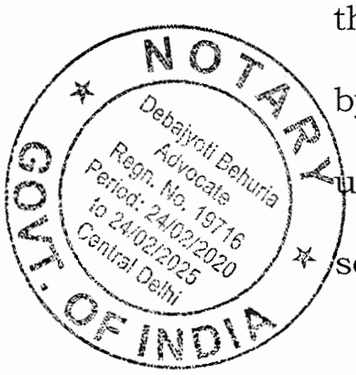
without limitation under the terms of the existing Internet License.") [emphasis added] (Publicly available at https://www.trai.gov.in/sites/default/files/20160906022243101548 9AT%26T%20India.pdf), a copy of which is annexed hereto and marked as **ANNEXURE P/17**.

f. The contents of para 6.f. is wrong and denied. It is submitted that on 25 July 2016, Respondent No. 2 sent a letter to V.D. Moorthy – former Petitioner in a matter before this Hon'ble Court, W.P.(C) 1658/2017, regarding the subject of "Representation against unregulated functioning of Facebook and WhatsApp messengers in India", a copy of which is marked as **ANNEXURE P/13**. In this letter, Respondent No. 2 states that "*to address the issue of the OTT players, TRAI had issued a consultation paper on "Regulatory Framework for Over-the-top (OTT) services" on 27th March, 2015. The views on the framework are under consideration by the Authority. . . .the government is seized of the matter and working towards appropriate decisions and actions for addressing the*

relevant issues." It has now been **five years** since this letter was sent – a period in which Respondent No. 4has grown by far into the largest provider of Internet Telephony services in India. It is submitted herein that the Hon'ble Court is empowered to enforce the law as **it currently exists** and should not be slowed down by the unlikely possibility that currently applicable laws and regulations **might** be enforced or changed in the future.

g. The contents of para 6.g. is wrong and denied. It is pertinent to mention that there is no specific denial of the averments of the Petitioner by Respondent No. 4. Hence the contents of the Petitioner's writ Petition deserves to be allowed. The contents of the writ Petition is reiterated and not repeated for the sake of brevity.

4) That the contents of para 7 - 9 of the counter affidavit, save that which is matter of record, is wrong and denied. It is pertinent to mention that the Respondent No. 4 admits the averments made by the Petitioner that Respondent No. 4 is providing unlicensed services equivalent to the licensed services of the Petitioner. It is furthermore stated



that such services provided by Respondent No. 4 has an impact not only on the public at large but also directly adversely impacts the business of the Petitioner.

5) That the content of para 10 – 12of the counter affidavit is a matter of record and hence requires no response.

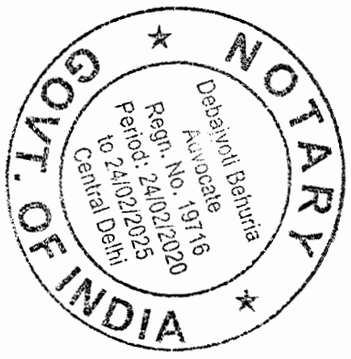
6) That the content of para 13and its clauses A to G of the counter affidavit is wrong and denied. It is submitted that the content herein is repetitive in nature and has already been dealt in para 3of this reply and is not repeated again for the sake of brevity.

A. It is submitted that private monopolistic entities directly impacting the public interest are subject to writ Petitions. *Zee Telefilms Ltd. & Anr v. Union of India &Ors.*, (2005) 4 SCC 649, para 158 ("**A body discharging public functions and exercising monopoly power would also be an authority** and, thus, writ may also lie against it.") [emphasis added].

B. It is submitted that the averments made herein is an attempt to mislead the Hon'ble Court and hence is vehemently denied. It is

denied that Petitioner is "attempting to circumvent the ruling of the TDSAT and the Hon'ble Supreme Court, and re-litigate the same issues before a different forum."It is submitted that the issues raised by this writ Petition were not decided by the Hon'ble TDSAT nor the Hon'ble Supreme Court – which, as stated above, were strictly tasked with addressing tariff issues solely involving the Petitioner.

C. The contents of para 13.C. is wrong and denied. It is submitted that the Respondent No. 3 by its own averments states that it provides unlicensed Internet Telephony Service/VoIP Calls. Such Services are provided by the Petitioner by procuring a license from Respondent No. 2 and are governed by the Indian Wireless Telegraphy Act, 1933; the Indian Telegraph Act, 1885; the Information Technology Act, 2000; and the Telecom Regulatory Authority of India Act, 1997.The contents of para 13.D. is wrong and denied. It is submitted that the contents of the para is already addressed/answered in para 3.d.*supra* and



is incorporated by reference and not repeated for the sake of brevity. It is further submitted that this uneven application has allowed Respondents No. 3 and No. 4 to dominate the market completely and totally – also damaging and putting out of business **other Internet Telephony service providers** who were once viable. This market dominance has not gone unnoticed in the United States where an Amended Complaint was filed on 19 August 2021 by the US Federal Trade Commission, a copy of same is marked as **ANNEXURE P/15**. It is also submitted that Article 19 (1)(g) and14 of the Constitution is being directly implicated herein given an entire regulatory regime has been completely disregarded to Petitioner's detriment and Respondent No. 4's benefit given Respondent No. 4 provides functionally equivalent services to that of Petitioner yet without the appropriate license.

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D. That the contents of para 13.E. is wrong and denied. It is submitted that the uneven playing field set forth in the Petition has caused financial harm to Petitioner **and its**

principals in a manner that is well established and required pursuit of those tariff issues before the Hon'ble TDSAT.

E. The contents of para 13.F. is wrong and denied. It is submitted that the contents of the para has already addressed/answered in para 3.f.*supra* and is repetitive in nature hence isnot repeated for the sake of brevity. It is also submitted that the counter affidavit filed in July 2020on behalf of Respondents No. 1 and No. 2 has further chosen to defer resolution of the important issues set forth in this writ Petition.

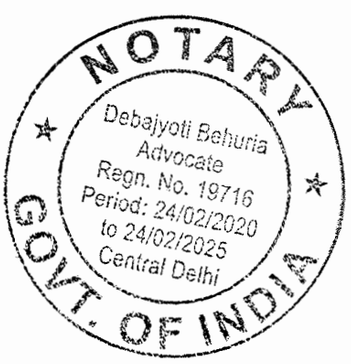
F. That the contents of para 13.G. is wrong and denied. It is submitted that the "robust regulations under the IT Act"cited by Respondent No. 4and its attendant comprehensive rules regarding the interception of encrypted communications has been **publicly opposed by Respondent No. 4**. Indeed, it is not even clear if Respondent No. 4 suggests that it currently adheres to interception of information rules despite its "end-to-end encryption" or whether it merely provides a standard

response to all such Government requests that states it is unable to decrypt the sought-after information. Again, Respondent No. 4 currently **publicly opposes** the enforcement of any such interception rule. *See* "What is traceability and why does WhatsApp oppose it?" (Publicly available at https://faq.whatsapp.com/general/security-and-privacy/what-is-traceability-and-why-does-whatsapp-oppose-it), a copy of which is annexed hereto and marked as **ANNEXURE P/18** ("*Some governments are seeking to force technology companies to find out who sent a particular message on private messaging services. This concept is called "traceability." . . .* ***WhatsApp is committed to doing all we can to protect the privacy of people's personal messages, which is why we join others in opposing traceability.***") [emphasis added]. No matter what Respondent No. 4 does or does not do in this regard, it is submitted that the applicable Rules of interception of communication is dwarfed by the applicable financial commitments and vigorous checks

and balances required under the Unified License Agreement and associated regulations which Respondent No. 4 should adhere to given the Internet Telephony/VoIP services it provides.

7) That the content of para 14 of the counter affidavit is wrong and denied. It is submitted that contents of para 14 with respect to maintainability and tenability of this writ Petition has already be addressed in para 3.a. and 6.A.*supra* and is not repeated for the sake of brevity.

8) That the content of para 15 – 16 of the counter affidavit is wrong and denied. It is denied that this writ Petition cannot proceed against Respondent No. 4 as it is not subject to writ jurisdiction under Article 226 of the Constitution. Respondent No. 4, a purely private company, can still be subject to a writ issued pursuant to Article 226 so long as it is performing a "public function".



"A body is performing a "public function" when it seeks to achieve some collective benefit for the public or a section of the public and is accepted by the public or that section of the public as having authority to do so.

> ***Bodies therefore exercise public functions when they intervene or participate in social or economic affairs in the public interest.****"Binny Ltd. v. V. Sadasivan, (2005) 6 SCC 657, para 11.*

It is further submitted that spurred on by Respondent No. 3's global monopolistic practices – as partially evidenced in **ANNEXURE P/15**, Respondent No. 4– directly and by way of its corporate parent, participates in the "social or economic affairs in the public interest."It is also submitted that Article 226 has been interpreted differently over the years.

> *"This article is couched in comprehensive phraseology and it ex-facie confers a wide power on the High Courts to reach injustice wherever it is found. The Constitution designedly used a wide language in describing the nature of the power, the purpose for which and the person or authority against whom it can be exercised. . . .Any attempt to equate the scope of the power of the High Court under Article*

226 of the Constitution of India with that of the English Courts to issue prerogative writs is to introduce the unnecessary procedural restrictions grown over the years in a comparatively small country like England with the unitary form of Government into a vast country like India functioning under a federal structure. Such a construction defeats the purpose of the article itself. . . ."Dwarkanath vs. Income Tax Officer,(1965) 3 SCR 536, 540-41.

The Hon'ble Supreme Court has recognized that

"it can very well be said that a writ of mandamus can be issued against a private body which is not a State within the meaning of Article 12 of the Constitution and such body is amenable to the jurisdiction under Article 226 of the Constitution and the High Court under Article 226 of the Constitution can exercise judicial review of the action challenged by a party. ***But there must be a public***

law element and it cannot be exercised to enforce purely private contracts entered into between the parties."*Binny Ltd. v. V. Sadasivan, (2005) 6 SCC 657, para 32.*

Unlike in the case submitted by Respondent No. 4 in support of its submission –*Pradeep Kumar Biswas v. Indian Institute of Chemical Biology*, (2012) 5 SCC 111, there is no private contract entered into between Respondent No. 4 and Petitioner that would preclude the issuance of a writ. Moreover, the necessary "public law element" is readily apparent in this Petition given Petitioner is expressly seeking to enforce public laws and regulations.

9) It is submitted that the contents of para 17-22, save that which are a matter of record or that have been expressly admitted herein, are wrong as stated and hence denied. It is submitted that neither TDSAT nor the Supreme Court has previously ruled on any matter subject to this writ Petition. The only matter previously before the Hon'ble TDSAT and the Hon'ble Supreme of Court India involved tariffs and license terms, solely applicable to the Petitioner. Indeed, the Hon'ble

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TDSAT only exercises jurisdiction over Telecom, Broadcasting, IT and Airport tariff matters under the Telecom Regulatory Authority of India ("TRAI") Act, 1997 (as amended), the Information Technology Act, 2008 and the Airport Economic Regulatory Authority of India Act, 2008**and not** the Indian Telegraph Act, 1885.It is denied that the prior TDSAT proceeding resolved issues pertinent to this writ Petition. It is submitted that the Hon'ble Tribunal did not have the authority to issue the writ sought by way of this Petition. It is submitted that out of the eight issues framed before the Hon'ble TDSAT the first four issues which the Respondent herein claims to agitate upon were left open and not decided. It is further submitted that the Respondent herein is misleading the Hon'ble Court as the primary issue of the Petitioner in the TDSAT Petition related to license fees and tariffs and not a challenge of the licensing regime or involved unregulated/unlicensed Internet Telephony Service Providers. The relief sought in through this writ Petition was never prayed before the Hon'ble TDSAT or subsequently in appeal before the Hon'ble Supreme Court of India. The Prayer before the Hon'ble TDSAT reads:

PRAYER

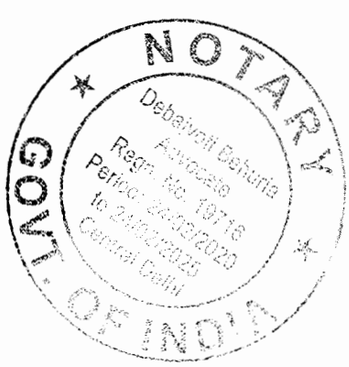
In view of the submissions made above, it is respectfully prayed that this Hon'ble Tribunal may be pleased to:

a) Quash the letters dated 05.08.2014 & 04.09.2014.

b) Restrain the Respondent from encashing the Bank Guarantee being BG No. 6005IBGI5070135 dated 01.10.2007.

c) Restrain the Respondent from cancelling the License being Agreement No. 820-511/2002-LR, dt. 8.4.2002.

d) Restrain the Respondent from taking any action including encashment of Bank Guarantee and Cancellation of the License being Agreement No. 820-511/2002-LR, dt. 8.4.2002 for non-payment of license fees.



e) Set aside and quash the notification dt. 29.6.2012 whereby the Respondent has unilaterally imposed a license fee of 7% from 1.7.2012-31.03.2012 and from 2013-14, 8% of AGR.

f) Pass an ad-interim ex-parte order staying the operation of the impugned notification dt. 29.6.2012;

g) Pass an ad-interim ex-parte order staying the operation of letter dt. 5.8.2014whereby the Petitioner has been asked to submit interest, penalty and interest on penalty on alleged delayed payment for the period from FY 2005-2006 to 2007-08 calculated on a self-assessment basis upto date of payment as well as pay quarterly License Fee for the period FY 2008-09 to FY 2013-14 with interest, penalty and interest on penalty failing which the Petitioner has been threatened with termination of license and encashment of Bank Guarantee provided by it to the Respondent.

h) Pass an ad-interim ex-parte order staying the operation of letter dt. 4.9.2014 whereby the Respondent has threatened to encash the Bank guarantee provided by the Petitioner;

i) Pass an ex-parte ad interim order restraining the Respondent from imposing any license fee whether as a percentage of the AGR or otherwise till the disposal of the present Petition;

j) Pass such further and other orders as this Hon'ble Tribunal may deem fit and proper in the facts and circumstances of the case.

The prayer before the Hon'ble Supreme Court of India in appeal is mentioned below:

PRAYER

In view of the afore-stated facts, circumstances and position of law, it is most humbly prayed that this Hon'ble Court be pleased to:

a) Set aside the Judgment dt. 30.5.2018 passed by the Hon'ble TDSAT in Telecom Petition No. 418 of 2014 to the extent that it does not deal with the issue of imposition of License fee upon the Appellant;

b) Set aside the notification dt. 3.3.2006.

c) *Such other and further reliefs as this Hon'ble Court may be pleased to grant in view of the facts and circumstances of the case.*

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10) It is submitted that the issues raised in this writ Petition concern existing legislation governing the services provided by the Petitioner and the Respondents No. 3 and No. 4. Wherein the

Petitioner is operating through the Unified License Agreeent issued by Respondents No. 1 and No. 2, the Respondents No. 3 and No. 4 are providing the same services but circumventing the existing legislation and are completely unregulated/unlicensed. This injustice can only be ruled upon by a Constitutional Court under Article 226 of the Constitution by the Hon'ble High Court and under Article 32 of the Constitution by the Hon'ble Supreme Court of India and not by the TDSAT. Moreover, Petitioner submits that this Hon'ble Court respectfully should not rely on mere recommendations from TRAI– especially given TRAI and DoT can and do disagree amongst themselves. *See* Clarification related to Recommendations on "Enhancement of Scope of Infrastructure Providers Category - I (IP-I) Registration issued on 13th March 2020", 11 January 2021, para 21, a copy of which is marked as **ANNEXURE P/16** (TRAI submits in its 11 January 2021 letter to DoT that "**thecontention of the DoT**, that the Hon'ble Court in its judgment had held that the Infrastructure Providers cannot be treated as licensees under Section 4 of the Indian Telegraph Act, 1885, **is factually incorrect.**") [emphasis added].DoT also

certainly does not have to accept the recommendations of TRAI. *See* TRAI Consultation Paper on Internet Telephony (VoIP), 22 June 2016, para 3.10 at 20 ("After due consultation process and detailed deliberation, TRAI on 18.08.2008 recommended to the Government that ISPs may be permitted to provide Internet telephony calls to PSTN/PLMN and vice-versa within country and necessary amendments may be made in the license provisions. **However, Government did not accept these recommendations of TRAI.**") (Publicly available at https://www.trai.gov.in/sites/default/files/Consultation_Paper_on_Internet_Telphony.pdf_1.pdf),a copy of which is annexed hereto and marked as **ANNEXURE P/19**.

11) It is submitted that rather than simply ignoring applicable laws, other countries have sought to change their existing licensing regime. For example, by suggesting that India should not be one of those countries having a licensing scheme for Internet Telephony such as "Korea, Singapore, Hong Kong, Philippines, Thailand, Ecuador, and Mexico", Microsoft suggested a different approach: "Microsoft respectfully requests that the TRAI

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propose a regulatory approach wherein PC to PC VoIP requires no license (and is permitted to be transmitted by ISPs over their networks, public or managed, without restriction), and that only two-way PC to PSTN calling (both inside and outside of India) requires a light-touch registration or minimal licensing obligation, accompanied by appropriate regulations deemed necessary to protect consumers or address a market failure." Response To Telecom Regulatory Authority of India Consultation Paper, Microsoft Corporation India Private Limited, page 14 (September 2016) (Publicly available at https://www.trai.gov.in/sites/default/files/20160906021715773412 4Microsoft_Corporation_India_Private_Limited.pdf), a copy of which is annexed hereto and marked as **ANNEXURE P/20**.Reliance JIO, suggested: "The unrestricted Internet Telephony by the ISPs/ OTTs may be allowed only if they migrate to the Unified License with Access services authorization or they offer this service under a commercial arrangement with an existing Access service provider." Comments of Reliance Jio Infocomm Limited on the issues raised in the Consultation Paper on Internet Telephony (VOIP) (Consultation Paper No 13/2016 dated

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22.06.2016), 5 September 2016, at page9 (Publicly available at https://www.trai.gov.in/sites/default/files/20160906023426461017 2RJIO.pdf) a copy of which is annexed hereto and marked as **ANNEXURE P/21**. Further, Reliance JIO suggested that "it should be the responsibility of the Access Service Provider offering Internet telephony **in collaboration with the OTT provider** or otherwise to ensure that the international internet telephony calls are terminated in India through a licensed ILDO." *Id.* at 13 [emphasis added]. Respondent No.3's current business partner, Reliance Jio, realized early on that a special "Facebook exception" was in its best interests. *See* "Stop illegal routing of internet telephony calls: COAI", Economic Times (5 May 2016) ("The Cellular Operators Association of India (COAI) has urged the telecom department (DoT) to stop illegal routing of internet telephony calls, warning that a failure to do so would lead to a breach in telco licence conditions, pose security risks and cause sizeable losses to the national exchequer. **Newcomer Reliance Jio Infocomm is also a COAI member, but the GSM industry body in its letter said Jio held a divergent view on**

the matter.") [emphasis added] (Publicly available at https://economictimes.indiatimes.com/tech/internet/stop-illegal-routing-of-internet-telephony-calls-coai/articleshow/52133359.cms), a copy of which is annexed hereto and marked as **ANNEXURE P/22**.

12) That the content of para 23 – 28 of the counter affidavit is wrong and denied. Respondent No. 4 claims it is a "mere *application* provider" rather than Petitioner who is an "*access* provider". The submitted statement ignores Petitioner is most certainly **both** and to provide its **Internet Telephony/VoIP services** in India, Petitioner has fully complied with the existing applicable licensing regime **for such services**. Respondent No. 4also submits that "the relevant regulatory authorities are seized of the issue and the consultation process is ongoing". The Respondent No. 4is misleading this Hon'ble Court wherein the reality is that the regulators have already spoken, and they will not do anything further to enforce the law **as currently written**. TRAI rather recommends that going forward "Market forces" should dictate a solution. Specifically, TRAI apparently recognizes the

unfairness as regards the selective enforcement of laws and regulations but "recommends that Market forces may be allowed to respond to the situation without prescribing any regulatory intervention. However, developments shall be monitored and intervention as felt necessary shall be done at appropriate time." Recommendations on Regulatory Framework for Over-The-Top (OTT) Communication Services, 14 September 2020, at 2.4(i), **ANNEXURE R4/1**.Contrary to what is submitted by Respondent No. 4, there is no need for the creation of a **new** regime applying to "OTT services" and Petitioner is certainly not requesting the creation of such a new regulatory regime – especially given one is not needed. The Petitioner through this writ Petition is only praying before this Hon'ble Court to enforce the Law/Regulations currently in place.

13) Respectfully, TRAI has long had an agenda to grow the Internet user base in India. In 2010, TRAI recognized that the uptick in Internet users was below what was sought by it. *See* Recommendations on Spectrum Management and Licensing Framework, para 2.105 at page 104 (11 May 2010) ("Despite a token licence fee for ISP, the

number of internet subscribers has grown from 5.14 million in September 2004 to only 15.24 million by the end of December 2009. Of this, the number of broadband subscribers is 7.83 million. These numbers are way below the target of 40 million and 20 million by the end of 2008 for internet and broadband subscribers respectively.") (Publicly available at https://trai.gov.in/sites/default/files/FINALRECOMENDATIONS.pdf),the relevant extract of the public document is annexed hereto and marked as **ANNEXURE P/23**. To increase the number of Internet users in India, sometime after 2015, TRAI began tilting the scales in favor of OTTs and simply disregarded the current licensing regime when making recommendations. These efforts have been very successful as shown by the hundreds of millions of customers Respondents No. 3 and No. 4 have accumulated since 2015.

14) Without referencing the applicable laws and regulations, TRAI recently concluded: "It is not an opportune moment to recommend a comprehensive regulatory framework for various aspects of services referred to as OTT services, **beyond the extant laws and regulations prescribed presently**. It may

be looked into afresh when more clarity emerges in international jurisdictions **particularly the study undertaken by ITU**."TRAI Press Release Regarding Recommendations on "Regulatory Framework for Over-the-top (OTT) communication services" (14 September 2020) [emphasis added](Publicly available at https://trai.gov.in/sites/default/files/PR_No.69of2020.pdf), the relevant extract of the public document is annexed hereto and marked as **ANNEXURE P/24**. *See also* TRAI Recommendations on Regulatory Framework for Over-The-Top (OTT) Communication Services, para 2.4(iii) at page 8 ("Since, ITU deliberations are also at study level, therefore conclusions may not be drawn regarding the regulatory framework of OTT services. However, in future, a framework may emerge regarding cooperation between OTT providers and telecom operators. The Department of Telecommunications (DoT) and Telecom Regulatory Authority of India (TRAI) are also actively participating in the ongoing deliberations in ITU on this issue. **Based on the outcome of ITU deliberations DoT and TRAI may take appropriate consultations in future.**") [emphasis

added] (Publicly available at https://trai.gov.in/sites/default/files/Recommendation_14092020_0.pdf), marked as **ANNEXURE R4/1**. The international ITU body, however, previously made it clear that it is not involving itself in India's internal regulatory matters and is merely a spectator to such activities. *See* ITU Economic Impact of OTTs Technical Report 2017, 5.2 India at 33 ("**India is in the process of reassessing its rules on online services, including OTT services**. . . . As noted in Section 4.2, voice and messaging services are permitted to be offered only by firms that hold a licence. **Internet Protocol (IP) based voice and messaging services can also be offered by licensed network operators as unrestricted Internet Telephony Services; however, these services may not interconnect with traditional switched services. The dichotomy between regulated traditional services and largely unregulated OTT services leads to numerous anomalies**.") [emphasis added] (Publicly available at https://www.itu.int/dms_pub/itu-t/opb/tut/T-TUT-ECOPO-2017-PDF-E.pdf), a copy of which is annexed hereto and marked as **ANNEXURE P/25**.

As for the local ITU branch – the ITU-APT

Foundation of India, that group has already sided with Respondent No. 4's claim there is an "*intelligible differentia*" between its Internet Telephony services and Petitioner's Internet Telephony services. ITU-APT Foundation of India comments on TRAI OTT consultation (7 January 2019) at 3 ("The Consultation Paper ("CP") draws parallels between the communication services offered by OTT service providers and TSPs. However, **we would like to submit that the services offered by them are widely different and cannot be compared**.") [emphasis added] (Publicly available at https://trai.gov.in/sites/default/files/ITUAPT0801 2019.pdf), a copy of which is annexed hereto and marked as **ANNEXURE P/26**.This position is not surprising given that according to the ITU-APT Foundation of India: "Facebook's, [sic] **one of our valued corporate member**[sic] announce a major investment in Reliance Jio that would facilitate the ailing telecom Industry. The two companies said that they will work together on some major initiatives that would open up commerce opportunities for people across India." ITU-APT Weekly News Summary [emphasis added] (Publicly

available at https://itu-apt.org/itu-letter.pdf), a copy of which is annexed hereto and marked as **ANNEXURE P/27**. Rather than rely on ITU, TRAI should have considered more the deliberations of the Confederation of Indian Industry (CII) -- which recognizes that OTT providers are already governed by the present licensing regime. *See* CII Response to TRAI Consultation Paper on Regulatory Framework for Over-The-Top (OTT) Communication Services at 6 (7 January 2019) ("Any new regulations for TSPs and OTTs should be considered taking into account the respective regulations govern the TSPs **and the OTTs** under the Telegraph Act, license, TRAI Act and the Information Technology Act. The Authority should consider new future fit frameworks that lightens the regulatory burden and adopts a progressive approach that allows all entities in the eco-system to proliferate and grow – offering maximum benefits to the consumers.") [emphasis added] (Publicly available at https://trai.gov.in/sites/default/files/ConfederationofIndianIndustry08012019.pdf), a copy of which is annexed hereto and marked as **ANNEXURE P/28**. CII has long been a major force in advocating what

is in the best interest of **Indian businesses**– and does not care about the interests of US-based monopolies: "The journey began in 1895 when 5 engineering firms, all members of the Bengal Chamber of Commerce and Industry, joined hands to form the Engineering and Iron Trades Association (EITA). . . . Since 1992, through rapid expansion and consolidation, CII has grown to be the most visible business association in India." [emphasis added] (Publicly available at https://www.cii.in/about_us_History.aspx?enc=ns9fJzmNKJnsoQCyKqUmaQ==). It is finally submitted that the claim of the answering Respondent No. 4 to be governed by the IT Act and the comprehensive set of rules inactive there under, including interception rules is merely an eye wash. It is submitted that a comprehensive licensing regime is already in place which covers not only the interception rules, penalties, security issues but also governs the license fees and tariffs and mode to operate among others. It is submitted that the stand of Respondent No. 4 in regards to interception rules and end-to- end encryption claimed to be covered under the IT Act and other rules,which it publicly opposes, is just like crumbs

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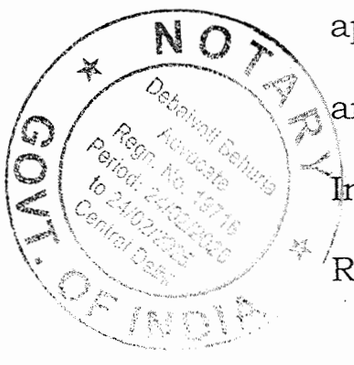
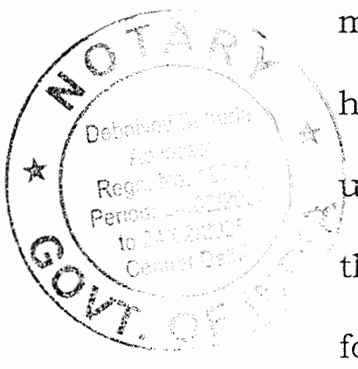
from a pie wherein the Indian Wireless Telegraphy Act, 1933; the Indian Telegraph Act, 1885;the Information Technology Act, 2000; and the Telecom Regulatory Authority of India Act, 1997 provide a complete pie and once it is brought under such laws Respondent No. 4 will have to comply with all the rules and regulations at par with the Petitioner.

15) That the content of para 29 – 37 of the counter affidavit is wrong and denied. Petitioner and Respondent No. 4 are indeed "equals" in that they provide the same Internet Telephony/VoIP service while are treated "unequally" by Respondents No. 1 and No. 2.It is submitted that only the Petitioner is required to comply with the licensing regime applicable for providing such telephony services.

16) That the content of para 38 – 41 of the counter affidavit is wrong and denied. Individual citizens forming a legal entity or juristic person can invoke fundamental rights. It is submitted that the ameliorative relief sought by the Petitioner is issuance of writ by this Hon'ble Court that the applicable laws and regulations are complied with and enforced upon the unregulated/unlicensed Internet Telephony/VoIP Service Provider Respondent No. 4 herein.



17) That the content of para 42 – 52 of the counter affidavit is wrong and denied. It is denied that the issues raised by this Petition are being "considered and decided by DoT and TRAI, the regulatory authorities with the expertise and experience to address such issues." It has been over **five years** since the issue of an uneven level playing field was raised with Respondent No. 2 as regards Respondent No. 4. And, as set forth at 2.4(i), **ANNEXURE R4/1**, TRAI answered "that Market forces may be allowed to respond to the situation without prescribing any regulatory intervention."It is humbly prayed by Petitioner by way of this writ Petition that the Hon'ble Court address Respondent No. 4's unlawful conduct to ensure equal protection under the already existing law. It is denied that the Petitioner is advocating "judicial legislation". Rather, the Petitioner through this Writ Petition is praying that the existing laws and regulations are fairly applied and enforced as to all companies no matter how large and powerful they are.It is humbly submitted that if the unlawful conduct uncovered by this writ Petition is not addressed by this Hon'ble Court, Respondent No. 4 will likely forever be left unchecked to do what it likes in



India.

18) That the content of para 53 – 66 of the counter affidavit is wrong and denied. It is submitted that on 19 November 2019, the Minister of Home Affairs was asked "whether the Government does Tapping of WhatsApp calls and Messages in the country" and responded **without answering the question** but implied it was "tapping of WhatsApp calls and messages" by referencing he same interception rule mentioned by Respondent No. 4 in its submission. *"Government Of India, Ministry Of Home Affairs, Lok Sabha, Unstarred Question No:351"* (Publicly available at http://loksabhaph.nic.in/Questions/QResult15.aspx?qref=6696&lsno=17), a copy of which is annexed hereto and marked as **ANNEXURE P/29**. The Hon'ble Court has no way of knowing if Respondent No. 4 is helping law enforcement, exactly *how* Respondent No. 4 is helping law enforcement, or whether Respondent No. 4 could do more to help. *See* **ANNEXURE R4/3**, Information for Law Enforcement Authorities at 2 ("In the ordinary course of providing our service, WhatsApp does not store messages once they are delivered or transaction logs of such delivered messages.").

Whether or not Respondent No. 4 is consistent with its public pronouncements and does not actually access user accounts is actually of little importance –than that the Respondent No. 4 **admittedly does not comply** with the licensing requirements applicable to providers of Internet Telephony/VoIP services.

19) That the content of para 67 – 71 of the counter affidavit is wrong and denied. It is denied that there is no financial loss to the national exchequer despite the complete failure to obtain **any** entry fee, payment of license fee, or goods and service tax from India's largest operator of Internet Telephony services. A loss of income naturally results when licensing fees are not paid. *See* Cellular Operators Association of India (COAI) Counter Comments TRAI Consultation Paper on Internet Telephony Released, 22 July 2016, at 1 ("Internet Telephony provided by unlicensed entities besides being in violation of license will not only deprive the licensed operators of huge revenue but **will also result in lesser payout to exchequer in the form of reduced license fee on revenues.**") [emphasis added] (Publicly available at https://www.trai.gov.in/sites/default/files/201609

1611510610912 27COAI.pdf), a copy of which is annexed hereto and marked as **ANNEXURE P/30**. It is denied that Respondent No.4's unregulated conduct actually "generates more revenue for the government **by enhancing investments in data networks**, and consequent increases in license fees." [emphasis added]. Even the ITU-APT Foundation of India acknowledges that the infrastructure growth created by OTT providers **happens in the USA and not in India**. *See* ITU-APT Foundation of India comments on TRAI OTT consultation (7 January 2019) at 5 ("It is estimated that OTT investments in infrastructure is fast growing, and the bigger OTT players invested 9% of their 2011-2013 revenues in networks and facilities **in the US**. This trend can be replicated in India with the right regulatory environment which would recognize and incentivize greater investments rather than stifle the industry with arbitrarily applicable licenses.") [emphasis added] (Publicly available at https://trai.gov.in/sites/default/files/ITUAPT0801 2019.pdf), a copy of which is marked as **ANNEXURE P/26**. Both the ITU-APT Foundation of India and Respondent No. 4 are wrong, however,

given that Respondent No. 2's failure to enforce existing laws has already created the "right regulatory environment" for the bigger OTT players. It is also clear neither Respondent No. 3 nor Respondent No. 4 have any intentions of building networks or facilities in India given they have withdrawn their prior physical presence in India and currently **neither even have any office in India**. *See* Emails from Counsel for Respondents No. 3 and No. 4, dated, 6 May 2021, copies of which are annexed hereto and marked as **ANNEXURE P/31**.("For completeness, we also clarify that Facebook, Inc. does not have any office in India.") and ("For completeness, we also clarify that WhatsApp LLC does not have any office in India.").

20) That the content of para 72 – 75 of the counter affidavit is wrong and denied. It is submitted that the question is not whether a licensing regime **should** apply to OTT's when the existing regime already **does** apply, but the real question is whether the existing laws and regulations will be regulated and enforced by Respondents No. 1 and No. 2. It is submitted that the contents of this Petition seeks liberty of the Court to enforce the

laws as written. It is denied that the Petitioner is seeking from the Hon'ble Court to "displace" regulatory authorities but only to enforce existing law and regulations which are applicable to **all** providers of Internet Telephony/VoIP services, even those who claim to ride on the telecommunications rails built and maintained by other companies. It is denied that the Respondent No. 4 was singled out in the writ Petition. Unlike Respondent No. 4,other similar service provider like "Skype" have near zero market share compared to Respondents No. 3 and 4. It is submitted that Skype was once the undisputed dominant provider in India but **after its corporate parent Microsoft was sued in 2014 by Petitioner, Skype removed the ability to call within India from Skype to mobiles and landlines**. In the relevant case, the Hon'ble Court in the United States found that Petitioner was better served filing a writ petition in India rather than in the United States. *TI Investment Services, LLC, World Phone World Phone Internet Service Pvt. Ltd. v. Microsoft Corp.*, 23 F. Supp. 3d 451, 472 (D. N.J. 2014) ("The Courts of India are better positioned to determine whether their own national laws have been violated, and, if so, what the

antitrust consequences, if any, are in their national market. If Plaintiffs wish to renew their suit, they should do so in the jurisdiction where they are alleged to have competed with Defendant, to have complied with regulatory laws, and to have suffered injury, and that is India."). It is further submitted that unlike Microsoft **and even Google**, Respondent No. 4 flagrantly violates existing regulatory prohibitions by, for example, allowing Indian users of its free "WhatsApp Business" utilize their landline phone numbers for messaging with customers. *See* WhatsApp Business App Android Download Page ("You can use WhatsApp Business with a landline (or fixed) phone number and your customers can message you on that number.") (Publicly available at https://play.google.com/store/apps/details?id=com.whatsapp.w4b&hl=en_IN&gl=IN), a copy of which is annexed hereto and marked as **ANNEXURE P/32**. As recognized even by TRAI, such unlicensed services run afoul of the existing licensing regime. *See* Consultation Paper on Regulatory Framework for Over-the-top (OTT) services, para 2.40 at page 28 (27 March 2015) ("Under the current telecom licensing regime, voice and messaging services can

be offered only after obtaining a license. Apart from traditional voice and messaging, IP based voice and messaging services can also be offered by TSPs as unrestricted Internet Telephony Services, which are permitted under the scope of the Unified Access Service (UAS) license in terms of the UAS Guidelines dated 14th December 2005. Similar provisions exist for Cellular Mobile Telephone Service (CMTS) and Basic Service Licences. However, **the scope of the Internet Services Licence was restricted to Internet Telephony Services without connectivity to Public Switch Telephone Network (PSTN)/Public Land Mobile Network (PLMN) in India.**") [emphasis added](Publicly available at https://trai.gov.in/sites/default/files/OTT-CP-27032015.pdf), a copy of the quoted section is annexed hereto and marked as **ANNEXURE P/33**.

21) That the content of para 76 – 78 of the counter affidavit is wrong and denied. It is denied that Respondent No. 4 can freely provide telecommunication services and ignore the Unified License Agreement because it relies on networks built by other companies. It is submitted that

Respondent No. 4 at one pointwas building out its physical presencein India for regulatory reasons. By way of background, on 6 April 2018, the Reserve Bank of India issued its Directive, Storage of Payment System Data, requiring that: "All system providers shall ensure that the entire data relating to payment systems operated by them are stored in a system only in India."Directive on Storage of Payment System Data, 6 April 2018, (Publicly available at https://www.rbi.org.in/scripts/NotificationUser.aspx?Id=11244&Mode=0), a copy of which is annexed hereto and marked as **ANNEXURE P/34**. Soon thereafter Respondent No. 4 announced the appointment of Abhijit Bose as head of "WhatsApp India"– WhatsApp's first full country team outside of California . . . based in Gurgaon."Respondent No. 4's company statement is no longer available on its website butpress accounts of this statement can still be found online. "WhatsApp appoints Abhijit Bose as head of WhatsApp India", The Economic Times of India (21 Nov 2018) (Publicly available at https://economictimes.indiatimes.com/tech/internet/whatsapp-appoints-abhijit-bose-as-head-of-whatsapp-india/articleshow/66735848.cms), a

copy of which is annexed hereto and marked as **ANNEXURE P/35**. According to Mr. Bose's November 2018 statement recounted by the India Times: "WhatsApp can positively impact the lives of hundreds of millions of Indians, allowing them to actively engage and benefit from the new digital economy."*Id.* The India Times also reported in that article: "Apart from the traceability request, the government had had asked WhatsApp to set up a local corporate presence. . . ." *Id.* After finding a way to maneuver around the Reserve Bank of India's 2018 Directive, on 6 November 2020, Respondent No. 4 announced the launch of its payment platform **without having any "local corporate presence"that would store "data related to payments"**. *See* "Send Payments in India with WhatsApp", WhatsApp Blog (6 November 2020)(Publicly available at https://blog.whatsapp.com/send-payments-in-india-with-whatsapp), a copy of which is annexed hereto and marked as **ANNEXURE P/36**.As with Respondent No. 3's massive build out of its physical presence in India, Respondent No. 4's "company statement" regarding the building of "WhatsApp India's"physical presence in India is no

longer found on Respondent No. 4's website. More importantly, as also with Respondent No. 3, Respondent No. 4 now **no longer has any physical presence in India** – despite the country being Respondent No. 4's largest country market. **And, without Respondent No. 4 having any physical presence in the country**, Mr. Bose – still apparently head of "WhatsApp India", announced in July 2020: "Our collective aim over the next two to three years should be to help low-wage workers and the unorganised, informal economy easily accesses three products - insurance, micro-credit and pensions."*See*"Facebook's WhatsApp to partner with more Indian banks in financial inclusion push", Reuters Article, (22 July 2020) (Publicly available at https://www.reuters.com/article/us-whatsapp-india-idUSKCN24N24E), a copy of which is annexed hereto and marked as **ANNEXURE P/37**. It is further submitted that Respondent No. 4 – who already dominants in Internet Telephony, messaging, and mobile paymentsplans on dominating in providing access to "insurance, micro-credit and pensions". It is submitted that this blatant form of digital colonialism should respectfully be rejected by way of this present writ

22) It is submitted that the Respondent No. 4 submits it need not comply with the Unified License Agreement despite providing "telecommunication services"simply because it uses for free the networks built by others. The relevant regulatory authorities have been made aware of the matters set forth in the Petition for over five years without enforcing public laws andtheir own regulations and is why DoT is named as Respondent No. 2 in this matter. *See* **ANNEXURE P/13**. Last year alone, Respondent No. 3 generated revenues of more than US$85 billion and profits of more than US$29 billion. These numbers will grow exponentially as the "free" unlicensed products currently offered to Indians become further monetized by Respondents No. 3 and No. 4. Other than the present writ Petition, there is no available "statutory remedy" that would otherwise cause the enforcement of applicable law. It is respectfully submitted thatthe Hon'ble Court should intercede to ensure equal protection under the law. It is further humbly submitted that if the Hon'ble Court does not intercede to stop the digital colonialism of Respondents No. 3 and No. 4, the same will go

forward unabated. Considering the foregoing facts and circumstances, it is therefore respectfully prayed to this Hon'ble Court to kindly allow the prayer of relief sought by the Petitioner, in the interest of justice, including enjoining Respondent No. 4 from providing Internet Telephony/VoIP services until such time as Respondent No. 4is in full compliance with the applicable requirements for providing such services in the Union of India.

DEPONENT

VERIFICATION:

I, the above named Deponent do hereby solemnly affirm on oath that the contents of the present affidavit are true and correct and nothing material has been concealed therefrom.

Verified on this ___day of October, 2021 at New Delhi

I identified the deponent who has signed in my presence

07 OCT 2021

CERTIFIED THAT THE DEPONENT
Shri/Smt./Km. V. Venkata Ramana
S/o, W/o R/o ..... **DEPONENT**
.....
Identified by Shri/Smt. B. A. Kodiatar
Has solemnly affirmed before me at
Delhi on..... as Sl. No. 118
That the contents of the affidavit which have been read & explained to him/her are true & correct to his/her knowledge

NOTARY

NOTARY
Debajyoti Behuria
Advocate
Regn. No. 19716
Period: 24/02/2020
to 24/02/2025
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07 OCT 2021

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ANNEXURE - P-17
48

AGNSI/TRAI/CP-Internet Telephony/2016-17
September 5, 2016

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New Delhi – 110 001

Sub.: Response to TRAI Consultation Paper [No. 13/2016 dated June 22, 2016] on Internet Telephony (VoIP)

Dear Sir,

AT&T Global Network Services India Private Limited (AGNSI) is pleased to submit its response to TRAI consultation paper No. 13/2016 dated June 22, 2016 on Internet Telephony (VoIP).

We trust that our submission will merit the kind consideration of the Hon'ble Authority.

Thanking you,

Respectfully submitted,
for **AT&T Global Network Services India Private Limited**

Naveen Tandon

Naveen Tandon
Authorised Signatory

Encl.: As above

Comments of AT&T India on the Consultation Paper on Issues related to Internet Telephony (VoIP), Telecom Regulatory Authority of India, Consultation Paper No. 13/2016, June 22, 2016

Part I: Introduction and Summary

AT&T Global Network Services India Private Limited ("AT&T India") respectfully submits these comments on the Consultation Paper on Internet Telephony, dated June 22, 2016 ("Consultation Paper"). AT&T is licensed to provide National Long Distance (NLD), International Long Distance (ILD), Audio Conferencing and Internet Service Provider (ISP) services in India.

AT&T Inc., through its affiliates, is, an integrated communications company providing mobile, video and data solutions. AT&T operates one of the world's most advanced backbone networks carrying more than 117.4 petabytes of data traffic on an average business day to nearly every continent and country. With operations throughout the U.S. and in over 60 other countries, AT&T has extensive experience as an incumbent and a new entrant, as a fixed line operator and a wireless operator, in the dynamic areas of converged technologies and services.

AT&T provides Session Interface Protocol ("SIP") and Internet Protocol ("IP") based business voice solutions across all customer market segments, addressing customers' needs for the entire continuum from Small Medium Businesses in the United States to Large Multinational Enterprises globally. Our solutions help companies adapt to shifting demands and to react to change in near real time. More than 3.5 million businesses from the largest multinational corporations to small businesses turn to AT&T. We serve nearly all of the Fortune 1000 and work in all major industries, including financial services, manufacturing, education, healthcare, retail, hospitality and government.

AT&T India is pleased to comment on the issues listed in the Consultation Paper concerning the need for permitting unrestricted telephony to Internet Service Providers (ISPs) to provide Internet Telephony calling services to the public switched telephone network (PSTN) and the public mobile network (PLMN) in India. TRAI has in August 2008 already recommended removing the current restrictions placed under ISP license on Internet Telephony. Additionally it has also proposed amendments to the existing ISP and NLD licenses to remove the current restrictions.[1] However, the DoT did not accepted these recommendations. The conditions, however, which supported the TRAI's recommendation in 2008 are equally applicable to Internet Telephony as provided in India today. The release of this Consultation underscores the significance and criticality of further liberalizing Internet Telephony in India. Internet Telephony (also referred to

[1] The 18 August 2008 *TRAI Recommendation on Issues Related to Internet Telephony*, including Annexure V and VII proposing amendments under the NLD and Internet License is provided for reference: http://www.trai.gov.in/WriteReadData/Recommendation/Documents/recom18aug08.pdf.

herein as VoIP) provides a viable and cost-effective alternative to circuit switched phone service that not only offers significant benefits in terms of lower costs for both residential and business users but also can contribute in critical ways to the Indian economy if allowed to flourish under open competition. 50

AT&T has had a front row seat observing the transformation of the business voice market. New technologies are providing new ways for end users to communicate and businesses to drive productivity. The technology shift from Time Division Multiplex ("TDM") to IP based solutions continues, with voice services increasingly becoming an application provided over broadband/data connectivity. The primary drivers for the shift away from TDM voice include better pricing for IP-based solutions, wireless substitution, manufacturers discontinuing TDM based premises equipment, and new innovations in IP cloud and mobile solutions providing feature rich Unified Communications and Collaboration (UC&C) services. Customers today are presented with cost effective collaboration and mobile solutions that can help improve workforce productivity (e.g., nomadic worker), business processes, and even entire business models (e.g., retail store front and contact center integrations). Unlike traditional local and long distance services, unified communications platforms and mobile calling solutions typically include unlimited voice capabilities and are available as unregulated over-the-top offerings (OTT), allowing easier entry by new and non-traditional competitors. Several factors influence the customer decision on which one type of solution is preferred, including such things as capital and expense budgets and the degree of in-house technical expertise.

Among the key trends in the business VoIP market are:

- Enterprises and Contact Centers are going through technology refresh and transformation (migration and virtualization) as they utilize IP/SIP capabilities to provide new features (e.g., resiliency features that keep in progress calls from dropping), and reduce the number of traditional voice lines and usage of long distance. Customers purchase converged Voice and Data services to improve overall economics.
- There is a growing trend in today's workforce toward reliance upon mobile devices to perform job functions. The younger generation in particular is entering the workforce with the expectation of a highly mobile environment.
- The market is also evolving to a set of holistic UC&C capabilities that encompass voice, instant messaging & presence, and web/video/audio conferencing capabilities. Contemporary forms of business VoIP can be a seamless UC&C application on their wide area IP networks, featuring integrated voice, instant messaging, email and conferencing capabilities, and that are quickly evolving as full-blown "computer" applications, limited only by the talents of applications developers.
- With the rise of UC&C, voice is much more likely to be assessed as part of a company's IT and end user strategy instead of being compartmentalized solely as part of a telecom plan.

- There is an increasing acceptance of cloud-based, "as-a-service" models, across a variety of capabilities (application software, voice, infrastructure, etc.), particularly as more applications appear that simplify business processes or drive other improvements to justify return on investment. These solutions typically utilize a hosted platform with multi-tenants for better economics.
- There has been a proliferation of OTT voice providers, influencing user expectations on price/value curves. These OTT providers are often able to serve up voice as an application over an IP network (wireline or mobile) which they themselves do not own or operate.

As the examples suggest, in today's environment, VoIP is typically one component of an advanced communications application that can converge voice communications seamlessly with additional data or video applications and devices. The TRAI should encourage service provider innovation and implementation of these advanced applications by regulating VoIP with a light-handed approach. Because VoIP can be offered with far more advanced and different service attributes than traditional voice services, the "technology neutrality" principle does not require application of the same regulations to these very different services.

The National Telecom Policy, 2012 (NTP-2012) has also recognized the need to move towards convergence of voice, data and video to the digital form as below:

> *"6. Telecommunications is no longer limited to voice. The evolution from analog to digital technology has facilitated the conversion of voice, data and video to the digital form. Increasingly, these are now being rendered through single networks bringing about a convergence in networks, services and also devices. Hence, **it is now imperative to move towards convergence between telecom, broadcast and IT services, networks, platforms, technologies and overcome the existing segregation of licensing, registration and regulatory mechanisms in these areas to enhance affordability, increase access, delivery of multiple services and reduce cost. It will be a key enabler of equitable and inclusive growth.**"*
> *(Emphasis Supplied)*

The NTP-2012 has further identified specific strategies in the area of Licensing, Convergence and Value Added Services as below:

> ***3.1. To orient, review and harmonise the legal, regulatory and licensing framework in a time bound manner to enable seamless delivery of converged services in a technology and service neutral environment. Convergence would cover:***
>
> ***3.1.1. Convergence of services i.e. convergence of voice, data, video, Internet telephony (VoIP), value added services and broadcasting services.***

3.1.2. Convergence of networks i.e. convergence of access network, carriage network (NLD/ ILD) and broadcast network.

3.1.3. Convergence of devices i.e. telephone, Personal Computer, Television, Radio, set top boxes and other connected devices.

3.15. To enable and enforce the VOIP facility to enhance consumer affordability. (Emphasis Supplied)

Given the revolutionary ability of these new services to bring different features to end users that are impossible with circuit-switched voice, the TRAI should take action consistent with the recommendations of the 2012 National Telecom Policy, and recognize that IP Telephony and traditional voice services are not the same, and accordingly that the principle of "technological neutrality" must not by default mean that due to certain common "voice" features among traditional telecommunications services and Internet Telephony, that the same precise regulations should apply. AT&T India urges the TRAI to consider the right balance between encouraging the development of Internet Telephony services, and ensuring that customers are properly informed and protected. The TRAI accordingly should recognize the different attributes of these services through application of light-handed regulation that maximizes reliance on market forces.

The need for such light-handed regulation is particularly evident for Internet Telephony services provided to business customers, who raise different economic and safety policy considerations from individual consumers. As described above, the capabilities of these IP-based services can create unprecedented efficiencies for business in India by converging voice, data and video applications to create new services to assist call center operations, remote teleworker applications, and video or IP conferencing. At the same time, Internet Telephony services should not be subject to levels of consumer protection and emergency service access. Provided there is adequate disclosure of the capabilities and limitations of these services, business customers are likely to make informed decisions concerning their purchase and use of Internet Telephony.

AT&T India therefore encourages the TRAI to encourage the deployment of Internet Telephony services to business customers, and the widespread benefits to the Indian economy likely to result from such deployment, by forbearing from the application of traditional public voice regulation to these services with respect to requirements relating to emergency service access and service quality. Thus, in the event that the TRAI adopts mandatory requirements concerning emergency service access and service quality for Internet Telephony services, Internet Telephony services to business customers should be placed in a separate service category and exempted from these requirements. To encourage vibrant competition that will best encourage development of innovative new services for business users, all Internet Telephony providers, including ISPs be eligible to provide services in this category.

In parallel, the TRAI should support the removal of present restrictions on the provision of Internet Telephony Services to (and from) the PSTN and PLMN by ISPs within India.

Currently, only Unified Access Service Providers (UASPs) and Cellular Mobile Service Providers (CMSPs) are permitted to provide these services. Allowing ISPs to offer Internet Telephony Services to (and from) the PSTN and PLMN in parity with UASPs and CMSPs would introduce additional competition that would encourage lower prices and expanded access opportunities and also would allow important new services. The converged voice, data and video capabilities for Internet Telephony, when run efficiently over an IP-enabled platform, can create unprecedented efficiencies especially for call center operations, remote teleworker applications, and video or IP conferencing. This will support the Indian economy by ensuring it remains a competitive location for telecom-dependent industries to operate, and by promoting the manufacture of and investment in Internet Telephony equipment and software. By contrast, the continuation of existing limitations on the provision of Internet Telephony in India will impede both economic growth and consumer benefits. Restrictions to use of Internet Telephony in India is very unusual and complex, and an impediment to conducting business, in comparison to most other countries where the business customer has sites.

To remove the existing barriers, the TRAI not only should remove the restrictions on Internet Telephony included in ISP licenses but also should establish regulations allowing ISPs to provide these services under regulations that promote competition with other voice service providers. In particular, as described below, ISPs require access to both geographic and non-geographic number allocations in standard E.164 format, and the availability of flexible, market-based interconnection arrangements to terminate and receive calls via the PSTN and PLMN.

In Summary:

1. Remove the restriction on ISPs to terminate IP voice calls on the PSTN or PLMN within India.

2. Permit interconnection by ISPs with mobile and fixed line operators. Commercial terms should be settled based on mutual agreement.

3. Apply a sustainable and pro-competitive numbering regime, conforming to general E.164 numbering plans, and any future numbering regime that the national numbering plan may apply.

5. Emergency services not to be mandated and be left to be decided by the ISPs, with the expectation of adequate consumer notification of capabilities and limitations.

6. QoS should not be mandated and should be left for ISPs to use as a means of addressing the market segment needs that they will target.

7. Regulation should not prescribe any end-user or service-provider technology or device-type. This should be left to the determination of users and market forces.

All Internet Telephony providers, including UASPs and CMSPs, should provide Internet Telephony services under competitively neutral regulations relating to interconnection, numbering, emergency service access, and service quality and law enforcement interception.

Q1: What should be the additional entry fee, Performance Bank Guarantee (PBG) and Financial Bank Guarantee (FBG) for Internet Service providers if they are also allowed to provide unrestricted Internet Telephony?

Respectfully, an additional entry fee should not be required for ISPs if they are permitted to provide unrestricted Internet Telephony. Under the terms of ISPs' existing Internet License, ISPs are authorized to offer Internet Telephony services. However, the configuration of the Internet Telephony Services which ISPs are permitted to offer are subject to arbitrary restrictions which limit delivery options to customers and disadvantage ISPs seeking to offer Internet Telephony Services. The TRAI should continue to favorably recommend that ISPs be permitted to offer Internet Telephony without limitation under the terms of the existing Internet License. Further, such permissions should not be conditioned on the payment of an additional entry fee because Internet Telephony Services are permissible service offerings under the existing Internet license. An additional entry fee would create an unreasonable financial barrier and have the effect of discouraging market entry and therefore competition. It also disturbs the viability of existing operations.

It may kindly be noted that in January 2006, when Internet services - including unrestricted Internet Telephony - were introduced under the access license, the access service providers were not required to pay an entry fee or additional entry fee. The Consultation discussion immediately before the TRAI is not about adding new services, but rather, is about providing ISPs the essential flexibility to offer existing services without arbitrary restrictions. In view of the above and from simple comparison perspective, there should not be any entry fee charged for permitting unrestricted Internet Telephony.

Additionally, the existing Internet license has a provision for submitting PBGs and FBGs. PBGs are primarily meant to secure roll out obligation as stated under the license. The current Internet license has a roll out obligation which is not specific across each of the services provided under the scope of the existing Internet license. Therefore there is no case for additional PBG. Similar is the case with the FBG.

Q2: Point of Interconnection for Circuit switched Network for various types of calls is well defined. Should same be continued for Internet Telephony calls or is there a need to change Point of Interconnection for Internet Telephony calls?

In lieu of defining the point of Interconnection, AT&T India notes that network technology is evolving as rapidly as VoIP services themselves. Given the evolution and the topography of network service design and function, the TRAI should avoid interjecting overly rigid concepts of traditional interconnection points and instead provide

service providers the flexibility to enter into market-based interconnection arrangements to terminate and receive calls via the PSTN and PLMN.

Further, AT&T India considers that it is not necessary for the TRAI to promulgate regulatory requirements for interoperability between IP networks and traditional TDM networks. The TRAI should instead rely on voluntary compliance and other relevant standards and protocols. Mandatory interoperability standards may impede continued technological development and innovation in these complex and dynamic services and limit their potential benefits. The TRAI accordingly should monitor industry efforts to ensure interoperability but should resist mandatory standards unless that existing market incentives for voluntary compliance prove inadequate in the future.

Q3 - Q7: – Responses Intentionally Omitted.

Q8: Should an Internet telephonysubscriber be able to initiate or receive calls from outside the SDCA, or service area, or the country through the public Internet thus providing limited or full mobility to such subscriber?

Yes, The TRAI should support the removal of present restrictions on the provision of Internet Telephony Services to (and from) the PSTN and PLMN by ISPs within India. The converged voice, data and video capabilities for Internet Telephony, will support the Indian economy by ensuring it remains a competitive location for telecom-dependent industries to operate, and by promoting the manufacture of and investment in Internet Telephony equipment and software. By contrast, the continuation of existing limitations on the provision of Internet Telephony in India will impede both economic growth and consumer benefits.

Q9: Should the last mile for an Internet telephony subscriber be the public Internet irrespective of where the subscriber is currently located as long as the PSTN leg abides by all the interconnection rules and regulations concerning NLDO and ILDO?

Comments on Q8-Q9:

Respectfully, AT&T India is not confident we understand the intent of Q9. That said, because of the economic and network design efficiency of Internet Telephony, we encourage the flexibility to make or receive Internet calls to or from any number or jurisdiction, irrespective of the interconnection rules and regulations concerning the NDLO and ILDO.

Q10: What should be the framework for allocation of numbering resource for Internet Telephony services?

Q11: Whether Number portability should be allowed for Internet Telephony numbers? If yes, what should be the framework?

Access to E.164 numbering – both geographic and non-geographic – is another critical issue to the growth of Internet Telephony in India. Both types of E.164 numbers should be available for allocation to all Internet Telephony providers, including ISPs, UASPs and CMSPs. By preserving a reasonable ability to obtain geographic numbers, and by also establishing a non-geographic number range reserved to encourage deployment of a numbering resource specifically for this service, the TRAI will best allow Internet Telephony providers a long-term ability to innovate and increase customer demand.

The availability of ggeographic numbers is likely to encourage wider usage of Internet Telephony, which in turn will promote efficient, innovative and affordable services. For end users who are more comfortable with a recognisable number range, a geographic number may be desirable, and excessive restrictions on which operators can obtain such numbers would raise an unnecessary barrier to competitive entry. A number of initiatives should be considered to minimize any adverse impacts on geographic numbering resources. For example, the TRAI could set aside initial number blocks for Internet Telephony services in each geographic area with allocation at possibly 1,000.[2] This approach is competitively and geographically neutral, and is a proportionate response to concerns with number exhaustion. Additional blocks for Internet Telephony would need to be made available to meet demand, even if that triggers code changes in some areas. If demand for new geographic numbers overheats, then at that point the TRAI could consider "conservation" measures, such as allocating numbers for all services in smaller blocks. This would alleviate exhaustion concerns, but might introduce a technical complication for traditional services and should not be introduced until demand for Internet Telephony and impact on the numbering plan is clearer.

New non-geographic number ranges for Internet Telephony services should also be made available, provided that Internet Telephony services are not constrained only to a non-geographic number range. Non-geographic numbers may create efficiencies that improve the ability of new Internet Telephony providers to obtain and use number resources. For Internet Telephony applications that rely significantly on the service for mobility or long distance and international use, a non-geographic number may be desirable given the independence of the number from concepts of distance or fixed location. The TRAI should establish the non-geographic number range for Internet Telephony with low entry barriers for obtaining number blocks, as this will foster Internet Telephony deployment. The TRAI should, however, bear in mind that, as more and more voice services migrate to IP, artificial segregation of Internet Telephony services behind a

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[2] In the United States, allocation of numbers in blocks of 1,000 has been generally implemented. *See, e.g., FCC Releases Telephone Numbering Resource Utilization Report, Over 61 Million Numbers Saved Through Thousand-Block Pooling*, FCC News, (rel. Dec. 11, 2003) (http://www.fcc.gov/Bureaus/Common_Carrier/Reports/FCC-State_Link/IAD/utilizationjun2003.pdf).

non-geographic number range is unlikely to be sustainable in the long term. As such, the TRAI should not segregate IP Telephony numbers from traditional telephony numbers. 57

Q12: Is it possible to provide location information to the police station when the subscriber is making Internet Telephony call to Emergency number? If yes, how?

Q13: In case it is not possible to provide Emergency services through Internet Telephony, whether informing limitation of Internet Telephony calls in advance to the consumers will be sufficient?

Comments on Qs12-13.

AT&T considers that business and residential customers alike should have access to emergency services, where technically feasible. The TRAI should encourage carriers, device manufacturers, software developers, and OEMs to work cooperatively to support the development of standards-based emergency calling number dialing facilities that include voice delivery, call back address capabilities and dispatchable address capabilities.

AT&T also considers that it is vital to avoid customer confusion with respect to the emergency calling capabilities of their VoIP service. In the case of enterprise customers, until such time as the industry has developed this technical capability, AT&T considers that emergency number dialing facilities should not be mandated for Internet Telephony services to business customers, since those customers are unlikely to require traditional levels of emergency service access for these services. Business customers are able to make informed decisions concerning their purchase and use of Internet Telephony, provided there is adequate disclosure of the capabilities and limitations of these services. In particular, where emergency service access is not available – because, for example, a nomadic use capability precludes the transmission of location information – service providers should be required to make users aware of this and business customers should be free to purchase the service. In the event that the TRAI does wish to go further, it should adopt only minimum standards for Internet Telephony services to business customers that are technologically feasible and necessary to ensure access to emergency services, without foreclosing future developments.

Q14: Is there a need to prescribe QoS parameters for Internet telephony at present? If yes, what parameter has to be prescribed? Please give your suggestions with justifications.

Comments on Q14

The TRAI also should avoid any mandated service quality levels for Internet Telephony services. These services are different services from traditional PSTN/PLMN voice services using a fundamentally different technology as well as different service attributes, with different capabilities and limitations and raising different policy considerations. The quality of voice calls over IP networks or the Internet is frequently

different from the quality of traditional voice services for a range of reasons, and even low quality Internet Telephony may offer sufficient cost advantages over traditional voice services for many users to be willing to make this price-quality trade-off. Mandated service quality levels could also limit the development and usage in India of innovative services converging voice with other data applications and devices. A light-handed regulatory approach to Quality of Service will help promote innovation in a competitive market.

AT&T India therefore believes that service quality is an area in which the TRAI should apply the light-handed regulation followed by many regulators with respect to IP telephony services and should avoid imposing strict requirements. Instead, the TRAI should require Internet Telephony providers to notify users that these services may not provide the same voice quality as traditional services and thus allow users to make an informed decision concerning usage. In particular, the TRAI should not apply service quality requirements to Internet Telephony services to business customers, and should at most require operators to provide these customers with adequate notification on this subject.

* * *

AT&T India would be pleased to provide any additional information that would be helpful to the Authority.

Respectfully submitted,

Naveen Tandon

September 5, 2016

Naveen Tandon
Authorised Signatory

ANNEXURE – P-18

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What is traceability and why does WhatsApp oppose it?

Some governments are seeking to force technology companies to find out who sent a particular message on private messaging services. This concept is called "traceability."

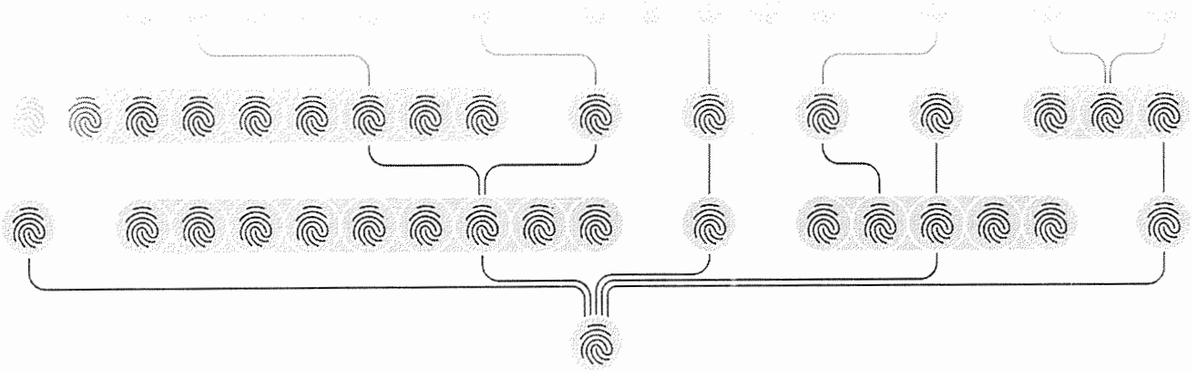
Technology and privacy experts have determined that traceability breaks end-to-end encryption and would severely undermine the privacy of billions of people who communicate digitally. Reasonable and proportionate regulations for an increasingly digital world are important, but eroding privacy for everyone, violating human rights, and putting innocent people at risk is not the solution. WhatsApp is committed to doing all we can to protect the privacy of people's personal messages, which is why we join others in opposing traceability.

How does "traceability" break end-to-end encryption?

WhatsApp deployed end-to-end encryption throughout our app in 2016, so that calls, messages, photos, videos, and voice notes to friends and family are only shared with the intended recipient and no one else (not even us).

"Traceability" is intended to do the opposite by requiring private messaging services like WhatsApp to keep track of who-said-what and who-shared-what for billions of messages sent every day. Traceability requires messaging services to store information that can be used to ascertain the content of people's messages, thereby breaking the very guarantees that end-to-end encryption provides. In order to trace even one message, services would have to trace every message.

That's because there is no way to predict which message a government would want to investigate in the future. In doing so, a government that chooses to mandate traceability is effectively mandating a new form of mass surveillance. To comply, messaging services would have to keep giant databases of every message you send, or add a permanent identity stamp -- like a fingerprint -- to private messages with friends, family, colleagues, doctors, and businesses. Companies would be collecting more information about their users at a time when people want companies to have less information about them.



> "To comply with traceability requirements, platforms may be forced to enable access to the contents of their users' communications, breaking end-to-end encryption and considerably weakening the security and privacy of their product.
>
> Internet Society

How does traceability violate human rights?

Traceability forces private companies to turn over the names of people who shared something even if they did not create it, shared it out of concern, or sent it to check its accuracy. Through such an approach, innocent people could get caught up in investigations, or even go to jail, for sharing content that later becomes problematic in the eyes of a government, even if they did not mean any harm by sharing it in the first place. The threat that anything someone writes can be traced back to them takes

recognized principles of free expression and human rights.

> The provision reverses the burden of proof. The individual must demonstrate that by sharing certain content he or she did not intend to misinform. This gives state and non-state actors a legal tool to criminalize journalists or opponents for political reasons or in order to generate a chilling effect among those who disseminate information that is intended to be concealed.

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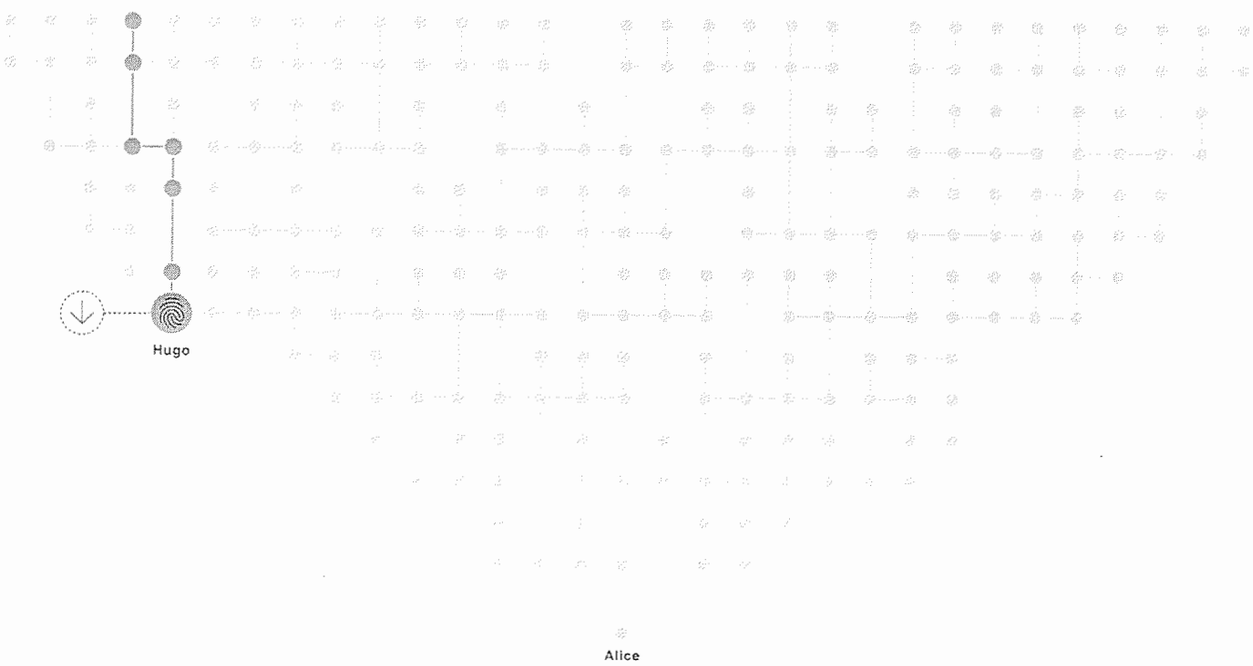
UN Freedom of Expression Special Rapporteurs David Kaye and IACHR Special Rapporteur Edison Lanza wrote in a July 2020 report to the U.N. expressing concern with the traceability provisions in a bill at the Brazilian Senate.

Would traceability work?

No. Tracing messages would be ineffective and highly susceptible to abuse. If you simply downloaded an image and shared it, took a screenshot and resent it, or sent an article on WhatsApp that someone emailed you, you would be determined to be the originator of that content. At another point, someone might copy and paste the same piece of content and send it along to others in an entirely different circumstance. Think of this like a tree with many branches -- looking at just one branch doesn't tell you how many other branches there.



Moreover, traceability inverts the way law enforcement typically investigates crimes. In a typical law enforcement request, a government requests technology companies provide account information about a known individual's account. With traceability, a government would provide a technology company a piece of content and ask who sent it first.

Can WhatsApp work with law enforcement without traceability?

WhatsApp respects the important work law enforcement does to keep people safe. Our dedicated team reviews and responds to valid law enforcement requests. We respond to valid requests by providing the limited categories of information available to us, consistent with applicable law and policy. We also have a team devoted to assisting law enforcement 24/7 with emergencies involving imminent harm or risk of death or serious physical injury. We consistently receive feedback from law enforcement that our responses to requests help solve crimes and bring people to justice.

It's also important to understand that depending upon the nature of their investigations, law enforcement officials have multiple investigative tools, and may obtain information from many sources, including different companies, other governments, or from users' devices. More information about how we work with law enforcement can be found here.

What experts are saying about traceability:

begin to fragment under these rules. Some provisions, such as those enabling traceability of encrypted content and automated filtering, are fundamentally incompatible with end-to-end encryption and will weaken protections that millions of users have come to rely on in their daily lives."

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- Access Now: "The mandates in the new [Indian IT] rules would result in encouraging internet platforms to over-censor content, require dangerous unproven AI-based content regulation tools, retain vast amounts of user data for handing over to the government, and undermine end-to-end encryption crucial for cybersecurity and individual privacy."
- Internet Society: "The Internet Society reiterates its concern, shared by cybersecurity experts, that in order to comply with these traceability requirements, platforms may be forced to undermine end-to-end encryption."
- International coalition of civil society organizations and security researchers: "Undermining security features in order to ensure traceability would affect all users of that platform, not just those that are the subjects of the information request. Protections for privacy, data security, and free expression that are derived from the availability of strong encryption would be weakened or eliminated through the use of this amendment."
- Center for Democracy and Technology: "The guidelines would require WhatsApp to archive what each user shares, robbing them of the absolute privacy provided by end-to-end encryption, one of the app's longtime user benefits. One large country, by adopting and enforcing these rules, could make it so that large messaging platforms either pull out or don't offer encrypted services all over the world."
- Stanford Internet Observatory: "Confidentiality and integrity are core underpinnings of data security. Not even the provider of an end-to-end encrypted service can decrypt encrypted information. That's why end-to-end encryption is incompatible with tracing and filtering content...When intermediaries employ end-to-end encryption, that means stronger security for communities, businesses, government, the military, institutions, and individuals—all of which adds up to the security of the nation. But the new traceability and filtering requirements may put an end to end-to-end encryption in India. The revised intermediary rules put the whole country's security at risk."
- Electronic Frontier Foundation: "Ultimately, any implementation [of traceability] will break users' expectations of privacy and security, and would be hard to implement to match current security and privacy standards. Such changes move companies away from privacy-focused engineering and data minimization principles that should characterize secure private messaging apps."
- Internet Freedom Foundation: "The government will break any type of end-to-end encryption to gain knowledge of who sent what message and also get to know its contents. Also, this specific requirement will break existing protocols for the deployment of end-to-end encryption that has been built through rigorous cybersecurity testing over the years!"

Read more about traceability:

- India's new intermediary liability and digital media regulations will harm the open internet, Mozilla Blog, March 2, 2021
- New intermediary rules should take consumer welfare into account: CUTS, The Economic Times, March 1, 2021
- Centre's IT Rules bring answerability in digital ecosystem. But they also increase political control, The Indian Express, February 26, 2021
- New Indian Social Media Rules Could Threaten Free Expression, Critics Warn, Barron's, February 26, 2021
- Traceability and CyberSecurity, Internet Society, November 27, 2020
- WhatsApp: "PL to track message classifies everyone as suspicious", Tilt, June 23, 2020
- Fact Sheet: Intermediaries and Encryption, Internet Society, June 2, 2020
- FAQ: Why Brazil's Plan to Mandate Traceability in Private Messaging Apps Will Break User's Expectation of Privacy and Security, EFF, August 7, 2020
- Dr Kamakoti's Solution For WhatsApp Traceability Without Breaking Encryption Is Erroneous And Not Feasible, Medianama, August 19, 2019

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ANNEXURE- P-19 62

TRAI

Telecom Regulatory Authority of India

सत्यमेव जयते

Consultation Paper

on

Internet Telephony (VoIP)

New Delhi

22.06.2016

Telecom Regulatory Authority of India
Mahanagar Door Sanchar Bhawan,
Jawahar Lal Nehru Marg,
New Delhi – 110002

Stakeholders are requested to furnish their comments to the Advisor (Broadband & Policy Analysis), TRAI by 21/07/2016 and counter comments by 04/08/2016. Comments and counter comments would be posted on TRAI's website www.trai.gov.in. The comments/counter comments in electronic form may be sent by e-mail to broadbandtrai@gmail.com.

For any clarification/ information, Shri Arvind Kumar, Advisor (Broadband & Policy Analysis) may be contacted at Tel. No. +91-11-23220209 Fax: +91-11-23230056.

CONTENTS

CHAPTER-I

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Introduction

1.1 Since the 1960's when digital voice communication first emerged, the Public Switched Telephone Network (PSTN) has been supported worldwide as the primary means of voice communication. The PSTN is a connection-oriented, circuit-switched network in which a dedicated channel (or *circuit*) is established for the duration of a communication. Originally transmitting only analog signals, the PSTN ultimately switched to digital communication, which offered solutions to the attenuation, noise and interference problems inherent in the analog system. The modern PSTN uses Pulse Code Modulation (PCM) to convert all analog signals into digital transmissions at the originating network and reverses the processes in the receiving network.

1.2 Although highly rated for reliability and Quality of Service (QoS), PSTN Networks have two significant disadvantages:

(a) Expensive bandwidth, which results in high telephone bills for individuals and businesses alike.

(b) Inefficient use of networking channels, which results from dedicating an entire channel for each conversation.

1.3 Packet Switched Networks offer solutions to such problems and are increasingly being used as alternatives to the traditional circuit switched telephone service. IP Telephony provides alternative means of originating, transmitting, and terminating voice and data transmissions that would otherwise be carried by the public switched telephone network (PSTN).

1.4 The use of Internet Protocol (IP)-based networks, including the Internet, continues to grow around the world due to the multitude of applications it supports and particularly due to Voice Over IP (VoIP). IP-based networks are capable of providing real-time services such as voice and video telephony as well as non real-time services such as email and are driven by faster Internet connections, widespread take-up in broadband and the emergence of new technologies.

1.5 The terms "IP Telephony", "VoIP", Internet Telephony and other variants often generates confusion as there are many different definitions used by various organizations. Some use them interchangeably while others give them distinct definitions. Further confusion is caused by using the terms to refer to both the IP-based technologies and the services that are enabled by these technologies.

1.6 Initially, there were two major categories for voice transmission over IP networks based on type of IP network used. When voice is transmitted over public Internet, it is termed as Internet Telephony. Similarly when voice is transmitted over managed IP networks, it is termed as Voice over IP (VoIP). Internet Telephony can be deemed to be a subset of Voice over IP, in the sense that, when voice is carried over a IP network it can be termed as Voice over IP. And if the IP network in this case is the public Internet then it can be called Internet telephony. The primary difference between voice services on managed and unmanaged IP Networks is in quality of speech. However this difference is getting narrower with technological advancement, new coding techniques and availability of higher bandwidth broadband connections.

1.7 The high costs of maintaining legacy networks alongside the requirement to upgrade to intelligent networks with inherent monitoring and adaptive capabilities are the key reason for growing adoption of IP based Network. Consumer VoIP applications can run over a range of

devices, offering flexibility towards seamless communications. For some operators, IP-based transmission is the first step in implementing NGN strategy, although true NGN is a broader concept that involves specific QoS guarantees and generalized mobility not offered by most types of VoIP.

1.8 Still, some existing operators may be reluctant to introduce VoIP, because they already offer voice services over the PSTN/PLMN. Perhaps understandably, they do not wish to cannibalize their higher-margin services offerings. However, the reality is that convergence, in the form of VoIP services, is redefining markets and blurring boundaries between networks and content.

1.9 The ICT sector is developing rapidly. Technological advances are making new services, and new modes of service delivery, possible. In future, Internet will be the primary medium through which converging voice and data services will flow. As a result, market structure, business models, and commercial arrangements for interconnection amongst operators are changing. Internet telephony, or Voice over the Internet Protocol (VoIP) enable users to make real time voice calls, transmitted over the Internet (rather than using traditional circuit switched telephone networks). VoIP enables network operators, service providers, and consumers to make significant savings, by reducing the underlying costs of a telephone call. VoIP uses network resources much more efficiently than conventional telephone service, reducing the costs of providing a call (albeit with the loss of some call quality and service features), and, creating opportunities for regulatory arbitrage that enable TSPs and consumers to reduce or avoid call charges. The volume of VoIP traffic is growing rapidly and the potential exists for packet switched, Internet Protocol networks to become the primary medium for most voice and data services.

1.10 Voice over Internet Protocol (VoIP) is an example of an innovative and disruptive technology. VoIP demonstrates that the basic premise of traditional voice telephony – the network and voice services must be owned and operated by the same firm – is no longer relevant. VoIP is disrupting the pre-existing business plans of traditional telephone service providers and is being introduced by service providers outside the traditional community. For instance, Google launched its Google Voice service in March 2009. Rather than own or operate any part of the underlying network, Google simply offers an application that gives users one phone number for all of their phones, provides free long distance within the United States and low international calling rates.

1.11 Convergence is primarily driven by increasing processing power, high capacity memory storage devices, reduced price, lesser power requirement and miniaturization of the devices. High-speed data transfer is now possible which is necessary for delivering innovative and advanced multimedia applications. Recent trends indicate that Telecom operators are adopting converged platforms to deliver multimedia rich applications containing voice, video and data.

1.12 Presence of unified IP based backbone and the benefits associated with the converged telecom access scenario has enabled the service providers world over to launch more and more converged services such as Internet Telephony, IPTV, Mobile TV etc. The separation of service provisioning and its management from the underlying network infrastructure in packet based networks is further increasing the acceptability of IP based Networks. It is now possible to separate provision of service contents, configuration and modification of service attributes regardless of the network catering such service. There has been enough evidence to suggest that in future IP networks will play much important role and

may ultimately encourage migration of conventional networks towards Next Generation Networks or an All IP Network.

1.13 The acceptability of IP based networks globally has facilitated growth of Broadband. However, this growth is highly dependent on availability of innovative IP based services and their affordability. Telecom service providers across the world are realizing benefits of carrying the TDM traffic over IP based Network in their backbone and access networks. Internet Telephony is considered to be one of the front-runner IP based converged service which is transmission of voice over IP based Network.

1.14 The existing licensing framework has been effective and has contributed to growth of telecom sector. However fast technological development, convergence of networks, services and end-devices is blurring the boundaries of scope of services among different licenses. Rapid changes are taking place worldwide with respect to business models, service delivery platforms and regulatory frameworks to meet the challenges posed by the convergence.

1.15 This Consultation Paper is divided into five chapters. The first chapter introduces the background in which this consultation is being initiated. Chapter - II deals with VoIP technology; Chapter - III presents current Regulatory and Licensing Framework for Internet Telephony; and Chapter - IV deals with Regulatory Issues and their implications. Chapter - V lists the issues for consultation.

CHAPTER II

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VoIP TECHNOLOGY

2.1 The Internet is often characterized as being a packet-switched network. The IP-based network technologies are designed in a way that enables radically different environment for service development, innovation and competition, both when it comes to infrastructure platforms or service development platforms

2.2 The connectionless packet switched nature of the IP-based networks possesses some of the important characteristics enumerated as follows:

- IP technology is based on a distributed network architecture, where routing and intelligence are distributed in the network.
- The service provision is disintegrated from infrastructure operation and the terminals attached at the edges of the network can create and offer services.
- The service development platforms have mainly been open.

These characteristics of the IP technology create good conditions for development and competition.

2.3 Traditional telecommunication operators are now moving beyond the public switched telephone network (PSTN) into IP-based, full-service networks, which are generally known as Next Generation Networks (NGNs). TSP can use these NGNs to deliver a package of voice, data and video offerings, all using the same core network hardware. Following the PSTN/PLMN model, many operators want to control the entire network value chain – in other words, they want to build end-to-end networks, including trunking and access elements. This means that many NGNs are deployed with control and service-layer functions that resemble the

closed systems of PSTN/PLMN operations. These types of networks can be referred to as the closed network model.

2.4 Meanwhile, Telecom Service providers (TSPs) who are not having full fledged networks or not having own large subscriber base may also want to compete head-on with existing TSPs by offering their own packages of voice (often VoIP), video and data. This model however, more closely complements and resembles the open Internet, with the –intelligence and control of the network decentralized and powered by intelligent terminal equipment (i.e. computers, handsets or set-top boxes). This model can be termed as the open network model.

2.5 Currently we are at an evolutionary stage that features both models: The operator-managed, closed network model, which is successor of the legacy, public-switched telephone network (PSTN); and The open network model. For regulators this raises several questions. Can these different types of networks coexist? Can they interconnect? How will they evolve? The answers to these questions are important because of the value that can be unlocked through interconnection and the resulting ubiquity of information and content.

2.6 The **IP Multimedia Subsystem** or **IP Multimedia Core Network Subsystem** (**IMS**) is an architectural framework originally developed by 3GPP to support convergence and new services in the network. To ease the integration with the Internet, IMS uses IETF protocols wherever possible, e.g., SIP (Session Initiation Protocol). According to the 3GPP, it aids the access of multimedia and voice applications from wireless and wire-line terminals, i.e., to create a form of fixed-mobile convergence (FMC). This is done by having a horizontal control layer that isolates the access network from the service layer. From a logical architecture perspective, services need not have their own control functions, as the control layer is a common horizontal layer.

2.7 The consumer can connect to IMS in various ways, most of which use the standard IP. IMS terminals (such as mobile phones and computers) can register directly on IMS, even when they are roaming in another network or country (the visited network). The only requirement is that they can use IP and run SIP user agents. Fixed access (e.g., Digital Subscriber Line (DSL), cable modems, Ethernet), mobile access (e.g. WCDMA, CDMA2000, GSM, GPRS) and wireless access (e.g., WLAN, WiMAX) are all supported. Other phone systems like plain old telephone service (POTS—the old analogue telephones), H.323 and non IMS-compatible systems, are supported through gateways.

2.8 Underlying technology i.e. Voice over IP (VoIP) is a group of technologies used for the delivery of voice and multimedia sessions over IP (Internet Protocol) networks. In VoIP, the signaling that controls the session (e.g. a voice call) is distinct from the audio stream that carries the voice content. Hence, VoIP protocols are classified either as signaling or media protocols.

2.9 Examples of signaling protocols include

(a) Session Initiation Protocol (SIP) – a widely used application layer protocol for creating, modifying and terminating sessions with one or more participants. SIP typically makes use of the Session Description Protocol (SDP) to negotiate media parameters for a call.

(b) H.225.0 – part of the H.323 stack (a family of VoIP protocols standardized by ITU-T); used to establish, control and end a call.

2.10 An example of a media protocol is the Real-time Transport Protocol (RTP), which is used by nearly every VoIP stack today. While RTP is used to transport the actual voice and video data, its sister protocol, the RTP Control Protocol (RTCP), provides feedback on the quality of media distribution in a call.

2.11 Following diagram describes the SIP system architecture, call flows in a VoIP system, and VoIP-to-PSTN bridging.

SIP System Architecture

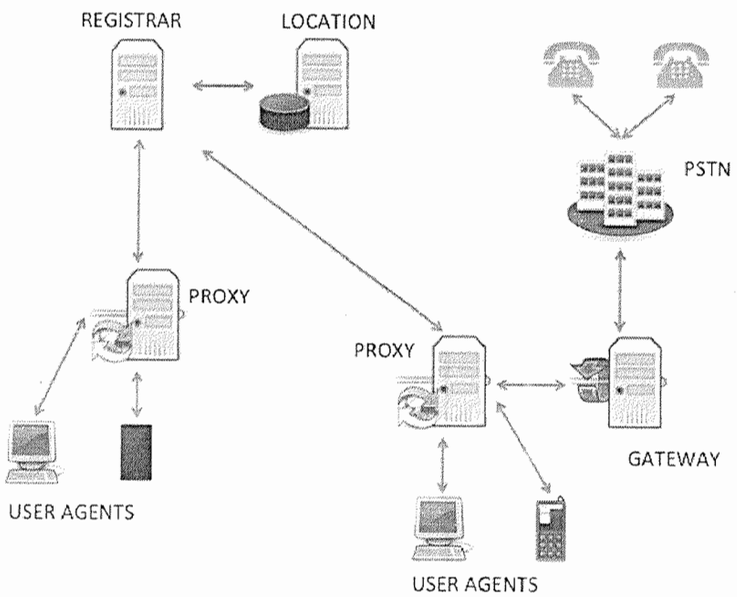

Figure 2.1 SIP System Architecture

2.12 The main elements involved in a SIP system are:

- **User Agents** – A user agent (UA) is an endpoint that originates or receives calls on a SIP network. Examples include a SIP phone, a PC or a smart phone with a SIP app installed, or a SIP-to-PSTN gateway. SIP user agents are usually known as SIP clients.
- **Proxy Servers** – a proxy server routes SIP requests and responses on behalf of user agents. Its job is to ensure that a SIP message is sent to another entity closer to the target user. Proxies can also enforce policies, such as to determine whether a user is allowed to

make a call. In practice, every SIP user agent needs at least one proxy server (also known as a "home proxy") that acts on its behalf. The home proxy is either manually configured in a user agent or discovered through DHCP.

- **Registrars** – A user agent sends a registration request to a SIP registrar when its available to receive calls on a SIP network. A registrar binds one or more IP addresses[1] to the SIP URI[2] of the registering agent and stores this binding in a location server.
- **Location Servers** – A location server stores all the aforementioned bindings. Typically a location server is co-located with a registrar server. Location servers are queried by SIP proxies in order to locate the recipient of a SIP call.
- **SIP Gateways** – SIP gateways allow SIP users to communicate with users on a different voice network (e.g. H.323 or PSTN). They do this by translating SIP messages to that of the other network and vice-versa.

SIP Registration

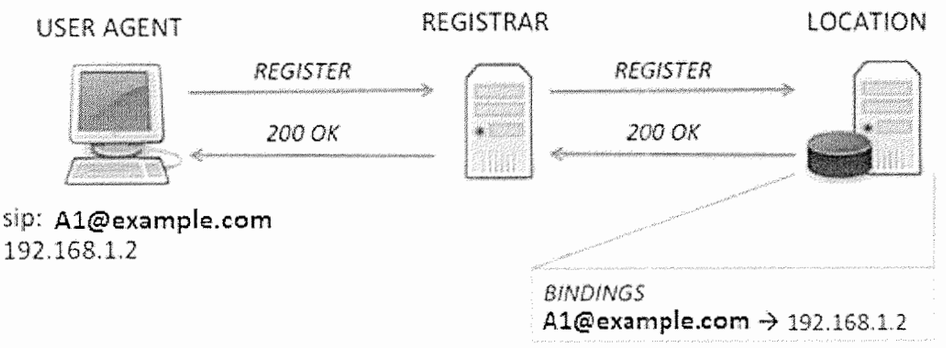

Figure 2.2 SIP Registration

[1] In many instances an IP address is insufficient to reach a SIP user agent (because of network elements like NATs); registrars will bind additional info in these instances.

[2] A SIP URI looks similar to an email address (e.g. `sip:A1@example.com`)

2.13 To register itself, a SIP user agent sends a REGISTER request to the registrar, which binds the user's IP address to the SIP URI, and stores this binding in the location server.

SIP Calls

2.14 In a SIP call, SIP messages are relayed through one or more proxy servers, which make use of location servers to locate the recipient. The media stream bypasses proxy server(s) altogether – wherever possible user agents will directly send media traffic to each other. The most common SIP arrangement is illustrated in the following figure 2.3, and is known as a **SIP trapezoid**.

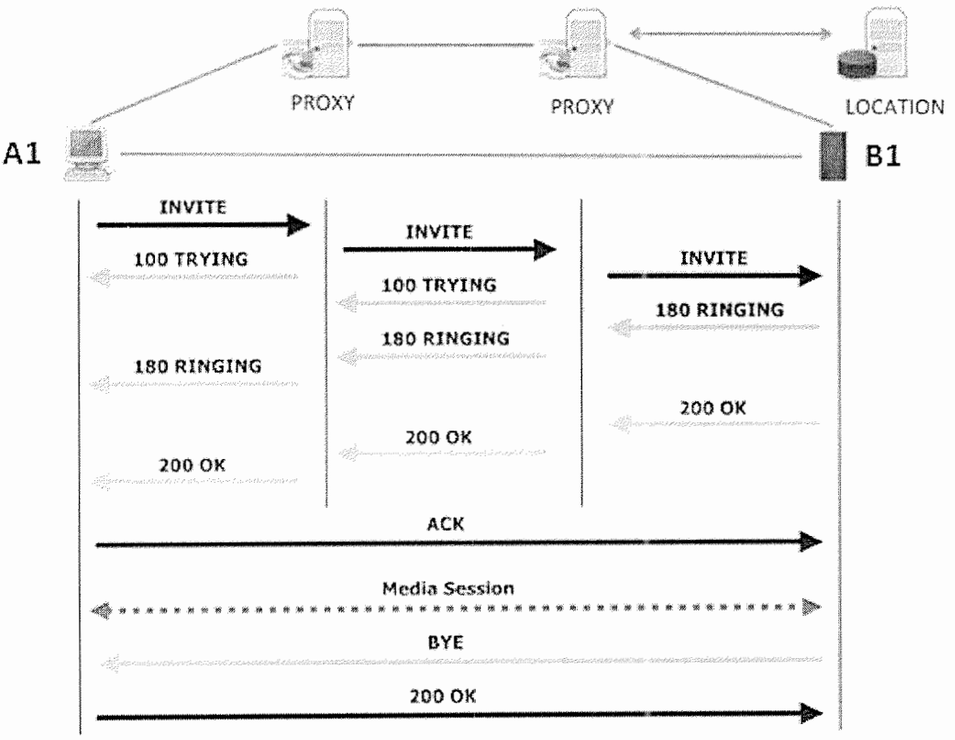

Figure 2.3 SIP Calls

2.15 In this arrangement, A1 (sip:A1@example.com) and B1 (sip:B1@example.net) are two SIP users. A1 initiates a call with B1 using her SIP user agent. Also shown are A1 and B1's home proxies. The sequence of messages sent in a SIP call is as follows:

i. An INVITE goes out from A1's user agent to her proxy server, which responds back with 100 TRYING to indicate that it has received the INVITE and is trying to locate B1.

ii. A1's proxy locates B1's proxy (possibly by performing a particular type of DNS lookup), and forwards it the request.

iii. B1's proxy, on receiving the INVITE, responds back with 100 TRYING. Meanwhile, it looks up B1 in the location server, and forwards the request to its UA.

iv. B1's user agent starts ringing and relays back a 180 RINGING response to A1 as soon as it receives the INVITE.

v. Once B1 picks up the call a 200 OK is sent to A1.

vi. An acknowledgement (ACK) of the 200 OK response is sent by A1's user agent to B1. If the proxy configuration permits it, the ACK might be sent directly to B1's UA, bypassing the proxies.

vii. At this point, the RTP media stream is established between A1 and B1's user agents. This is a peer-to-peer (P2P) stream[3] and the proxies are not involved in its path. Parameters for the RTP are negotiated via SDP messages encapsulated inside the INVITE request and its responses.

viii. As soon as either of B1 hangs up the call a BYE is sent from its UA to A1's UA.

ix. A1's UA responds with a 200 OK to the BYE request and the call ends.

[3] In certain NAT configurations two hosts will not be able to setup a P2P connection, in this case they will need to relay the media stream through a TURN server.

2.16 In the PSTN world, ISDN User Part (ISUP) is used to relay call signaling information between switches, whereas Time-division multiplexing (TDM) channels are used to transmit voice signals.

2.17 Bridging calls from SIP to a PSTN network requires the use of a SIP-to-PSTN gateway. The gateway acts as a SIP user agent and performs two functions:

1. Translates SIP/SDP messages to ISUP messages
2. Translates an RTP media stream to a TDM channel

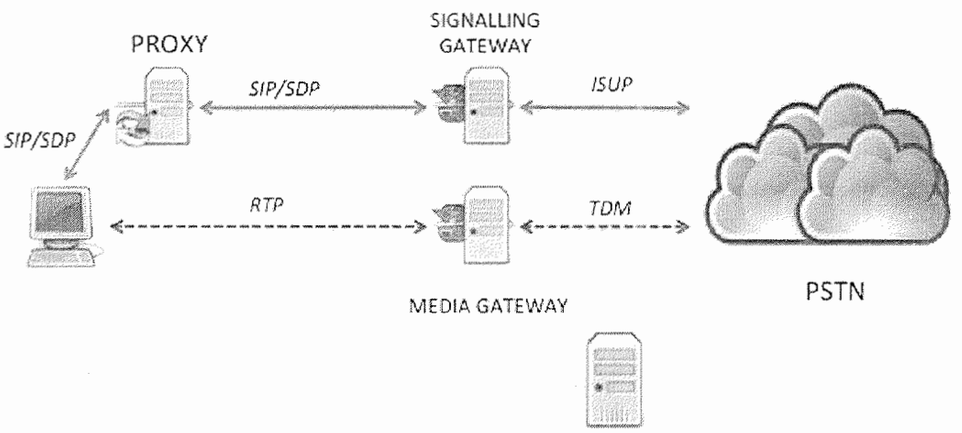

Figure 2.4 SIP to PSTN Bridging

2.18 In order to make calls from a SIP device to a PSTN number, there needs to be a way to translate a SIP URI to a PSTN phone number. Usually this is done by replacing the user part of a SIP URI with the E.164 representation of a phone number (e.g. sip:+91987654321@example.com).

2.19 The call flow for a SIP to PSTN call looks as below:

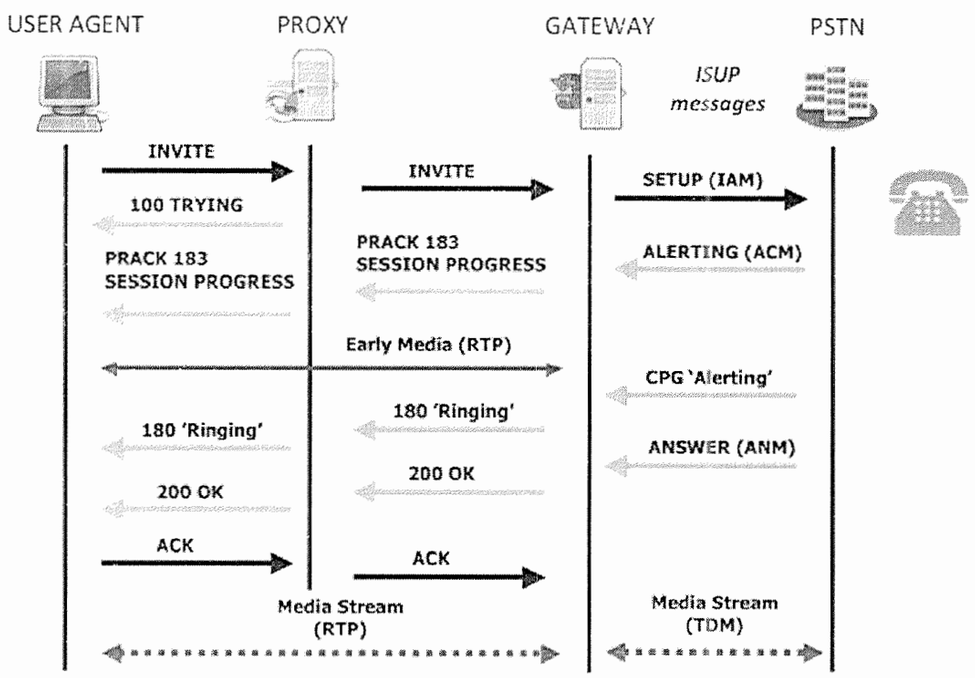

Figure 2.5 SIP to PSTN Call Flow

2.20 To allow the calls in the reverse direction i.e. PSTN to SIP, the service provider allocates a PSTN number for the SIP user. PSTN calls made to this number are routed to the gateway and subsequently to the user's device.

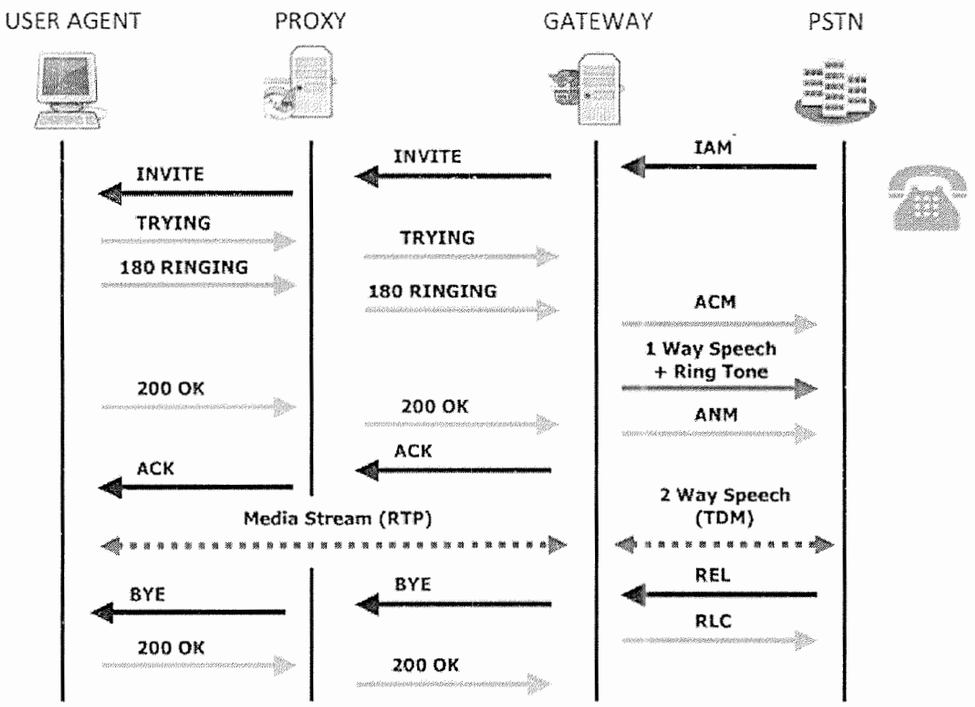

Figure 2.6 PSTN to SIP Call Flow

CHAPTER III

CURRENT REGULATORY AND LICENSING FRAMEWORK

3.1 Internet services in India were first launched in 1995 by erstwhile VSNL then a Government owned PSU. However at that time Internet telephony in any form was not permitted. Later in November 1998, the Government issued new guidelines for Internet services and ISP licenses to private operators. Even at this stage Internet telephony was not envisaged as a service.

3.2 In the New Telecom Policy 1999 (NTP 1999) announced by the Government in March 1999, various steps were taken to support the Internet services however even at this stage Internet telephony was not allowed.

3.3 Later, Department of Telecom announced the guidelines for opening of Internet telephony w.e.f. 1st April 2002 with restricted use of Internet Telephony. Existing ISPs were permitted to offer Internet telephony services only after signing the amended ISP license called Internet Telephony Service Provider (ITSP) license. Internet telephony was permitted only in limited way, as there were restrictions on the type of the technology and devices, which could be used. ITSPs were not permitted to have connectivity with PSTN/PLMN. Initially provisioning of Internet telephony service did not envisage any financial implications (no additional entry fee or license fee). DoT imposed a license fee of 6% of AGR earned from Internet telephony by ITSPs with effect from 1st January 2006.

3.4 In March 2006, Unified Access Service Providers (UASPs) were permitted to provide Internet telephony. In August 2007, all ISPs were permitted to

provide Internet telephony and separate category of Internet Telephony Service Providers (ITSPs) was done away with. License fee of 6% of AGR was imposed on all ISPs except on the revenue earned from provisioning of pure Internet access services.

3.5 The present regulatory framework permits Unified Access Service Licensee (UASL), Cellular Mobile Telecom Service (CMTS) licensees and Unified Licensee to provide voice services within country. They have been permitted to provide unrestricted Internet Telephony. The relevant clauses of UASL and CMTS licenses are reproduced below:

Clause 2.2 (a)(i) of UASL

"... Access Service Provider can also provide Internet Telephony, Internet Services and Broadband Services. If required, access service provider can use the network of NLD/ILD service licensee."

Clause 2.1 (a) of CMTS License

"... The Licensee can also provide Internet Telephony, Internet Services and Broadband Services. If required, the Licensee can use the network of NLD/ILD service licensee ...".

clause 2.1 (a) (i) of UL

".....The Licensee can also provide Internet Telephony, Internet Services including IPTV, Broadband Services and triple play i.e voice, video and data. While providing Internet Telephony service, the Licensee may interconnect Internet Telephony network with PSTN/PLMN/GMPCS network....."

3.6 Internet telephony in the above license has been defined as *""Internet Telephony" Means "Transfer of message(S) including voice signal(S)* ***through public Network".***

3.7 Internet Telephony has been also permitted to Internet Service Providers (ISPs) in restricted manner under ISP licensing conditions issued by Government in October 2007. As per ISPs licensing provisions, there is no restriction on PC-to-PC Internet Telephony calls. PC or adapter can be used to call PSTN/PLMN abroad; however Internet Telephony calls from such devices to PSTN/PLMN in India are not permitted under ISP license. ISPs are also not allowed to have interconnection with PSTN/PLMN networks.

3.8 The scope of services as stated under Clause 2.2(ii) of Part II in ISP License for provision of Internet Services is reproduced below:

"Internet telephony means a service to process and carry voice signals ***offered through Public Internet*** *by the use of Personal Computers (PC) or IP based Customer Premises Equipment (CPE) connecting the following:*

a) *PC to PC; within or outside India*
b) *PC / a device / Adapter conforming to standard of any international agencies like- ITU or IETF etc. in India to PSTN/PLMN abroad.*
c) *Any device / Adapter conforming to standards of International agencies like ITU, IETF etc. connected to ISP node with static IP address to similar device / Adapter; within or outside India.*

Explanation: Internet Telephony is a different service in its scope, nature and kind from real time voice service as offered by other licensed operators like Basic Service Operators (BSO), Cellular Mobile Service Operators (CMSO), Unified Access Service Operators (UASO)."

Addressing under Clause 2.2 (iv):

"Addressing scheme for Internet Telephony shall only conform to IP addressing Scheme of Internet Assigned Numbers Authority (IANA) exclusive of National Numbering Scheme / plan applicable to subscribers of Basic / Cellular Telephone service. Translation of E.164 number / private number to IP address allotted to any device and vice versa, by the licensee to show compliance with IANA numbering scheme is not permitted.

Interconnection under Clause2.2 (v):

"The Licensee is not permitted to have PSTN/PLMN connectivity. Voice communication to and from a telephone connected to PSTN/PLMN and following E.164 numbering is prohibited in India".

3.9 In year 2007/08, when unrestricted Internet Telephony for ISPs were deliberated, the main argument given by TSPs was that they have paid huge entry fee and have made heavy investments to create infrastructure. Opening up of unrestricted Internet telephony to ISPs will impact their business model to a great extent as they apprehend reduction of voice traffic on their network. They argued that as access providers are subjected to higher regulatory levies, huge upfront entry fee and have sunk-in investments on infrastructure development, their overheads will be higher as compared to ISPs. As per them it will disturb level playing field among different licensees. They also argued that infrastructural developments can be impacted due to reduced margins if ISPs start unrestricted Internet telephony. Access providers were of strong opinion that in case ISPs want to offer unrestricted Internet telephony then ISPs should also pay the same entry fees and levies as paid by access service providers.

3.10 After due consultation process and detailed deliberation, TRAI on 18.08.2008 recommended to the Government that ISPs may be

permitted to provide Internet telephony calls to PSTN/PLMN and vice-versa within country and necessary amendments may be made in the license provisions. However, Government did not accept these recommendations of TRAI.

3.11 Since then, there have been significant changes in licensing framework of the country. Now allocation of Spectrum has been delinked with the grant of License. Unified license has been introduced with entry fee of Rs 15 crore for whole country. Therefore any ISP or new service provider who is willing to provide unrestricted Internet Telephony can obtain Unified License with authorization for Access services. Further, some existing access licensee are also planning to start Internet Telephony service. Unrestricted internet telephony to Unified Licensee only with authorization of access services will also ensure that only serious players would provide Internet Telephony. Therefore it is for the consideration of stakeholders that whether there is still need for permitting unrestricted telephony to Internet service providers (ISP) or they may be facilitated to migrate to Unified License with authorization of Access services if they wish to provide unrestricted Internet Telephony.

Question 1:

What should be the additional entry fee, Performance Bank Guarantee (PBG) and Financial Bank Guarantee (FBG) for Internet Service providers if they are also allowed to provide unrestricted Internet Telephony?

CHAPTER IV

REGULATORY ISSUES AND IMPLICATIONS

4.1 With the advancement of technology, Internet Telephony has now become similar to conventional telephony and these providers compete directly with the existing PLMN/PSTN TSPs. Therefore it eventually has to be decided what aspects of conventional telephony regulation should apply to Internet Telephony service. To encourage Internet Telephony services in the country, issues such as allocation of telephone numbers, Interconnection, Interconnection Usage charges and access to Emergency service need to be addressed urgently.

Interconnection

4.2 Interconnection is the most important aspect of the telecom network. Interconnection framework since beginning has been designed to cater for circuit switched networks and regulations are framed to ensure that licensees such as access providers, NLDO and ILDOs interconnect with each other as per National routing plan of the country. Internet is global phenomenon and there is no boundary such as service area or country in internet domain. Therefore applying same rules of conventional telephony for Internet Telephony may not be desirable as it allow a TSP to pass advantage of cost effectiveness of VoIP technology to the consumers.

4.3 Recently BSNL has proposed to introduce Fixed Mobile Telephony (FMT) value added services for its customers. BSNL informed that FMT service will be an extension of their fixed line service using IMS based NGN core switch and IP based access network. Their Subscribers will be assigned a SDCA based number from the number series allocated to BSNL for their fixed line service. Subscriber roaming anywhere in the country or

even abroad can avail this service using an App installed on any device, including its mobile phone, once a subscriber has registered in any SDCA of the country wherein service is being offered by BSNL. FMT service is a voice call using the IP access and NGN switch of BSNL landline for the call routing. Internet access is required to access this service. FMT service essentially needs access to reach BSNL's NGN equipment for registering SIP subscriber for making voice call which means FMT call is not possible without internet.

4.4 A subscriber of such a service will be able to make or receive calls as long as he has access to Internet. Schematic diagram of a call is shown in following diagram:

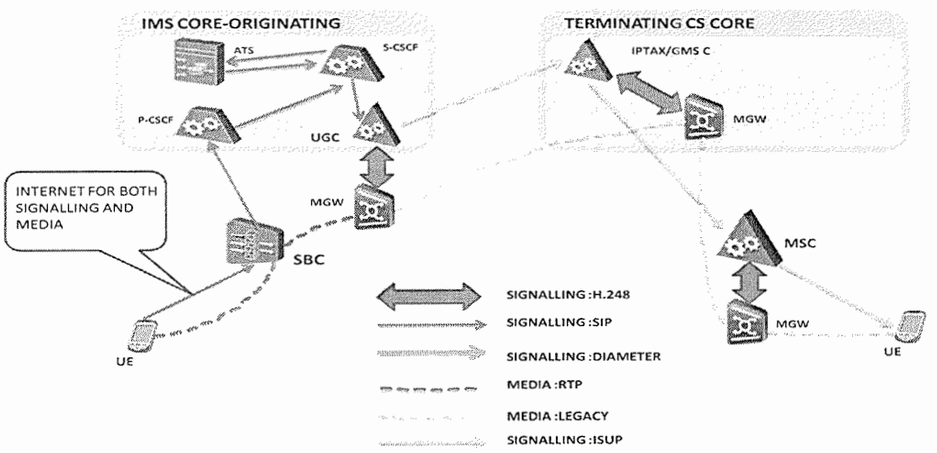

Figure 4.1 Schematic Diagram of Fixed Mobile Telephony Calls

4.5 Other TSPs are also either deploying IMS based network or are planning to migrate to IMS based network. As mentioned earlier, the consumer can connect to IMS in various ways, most of which use the standard IP.

IMS terminals (such as mobile phones and computers) can register directly on IMS, even when they are roaming in another network or country (the visited network). The only requirement is that they can use IP and run SIP user agents. Authentication or routing of call can be done either through application or through SIM in case of Mobile.

4.6 Subscriber may be anywhere in India or even abroad, when he makes the call and the call is routed on public internet upto one of the node of IMS core or to the SIP server as the case may be and finally routed to destination as per national routing plan. Therefore when call is on public internet, it is not being routed through NLD/ILD though it may be traveling through access service areas to reach the node of IMS core or SIP server. In this case inter-service area call is travelling through public internet to reach node of IMS core or SIP server without NLDO.

4.7 In case of Internet Telephony, voice services are simply software applications riding over the internet. Converging technologies and markets make conventional approaches to interconnection charging unsustainable. Many technology forecasters predict that in future voice telephony will migrate completely from circuit-switched telephony to packet switched Technology. Once this happens, Internet interconnection and pricing models may replace the current arrangements. However, in the interim, Internet Telephony network operators will need to interconnect with existing network operators' PSTN/PLMN network.

Transit of Calls

4.8 Unified License also provides that Licensee may also enter into mutual agreements with other Unified Licensee for carrying its intra-Circle Long Distance traffic. Relevant clause is reproduce below:

"2.2 Licensee may carry intra-circle long distance traffic on its network. However, subject to technical feasibility, the subscriber of the intra-circle long distance calls, shall be given choice to use the network of another Licensee in the same service area, wherever possible. The Licensee may also enter into mutual agreements with other UL Licensee (with authorization for access service)/ other Access service licensee/National Long Distance Licensee for carrying its intra-Circle Long Distance traffic."

4.9 Further, Unified License with authorization for NLD services provides that the Licensee may also carry intra-circle switched traffic where such carriage is with mutual agreement with originating access service provider. Relevant clause is reproduce below:

"2.1 (a) The NLD Service Licensee shall have the right to carry inter-circle switched bearer telecommunication traffic over its national long distance network. The Licensee may also carry intra-circle switched traffic where such carriage is with mutual agreement with originating access service provider."

4.10 These clauses provides flexibility to a TSP to transit traffic of other TSP within service area thus avoiding need for large number of interconnection points to start service. A small Internet telephony service provider may connect to only one TSP and this TSP can transit/carry traffic to other TSP as well. Presently, transit charge is in the form of ceiling, ITSP can negotiate transit charge with any TSP who is willing to transit its traffic to other TSPs. As per IUC regulations, transit charge should be less than Re.0.15 (Fifteen paise only) per minute and, can be decided by the concerned service providers through mutual commercial arrangement.

Question 2:

Point of Interconnection for Circuit switched Network for various types of calls is well defined. Should same be continued for Internet

Telephony calls or is there a need to change Point of Interconnection for Internet Telephony calls?

Question 3:

Whether accessing the telecom services of a TSP by the subscriber through public Internet can be construed as extension of fixed line or mobile services of the TSP? Please provide full justification in support of your answer.

Question 4:

Whether present ceiling of transit charge needs to be reviewed? In case it is to be reviewed, please provide cost details and method to calculate transit charge.

Interconnection Usage Charges

4.11 The present framework prescribes Interconnect Usage Charges (IUC) among service providers for various types of calls. This facilitates settlement of the interconnection charges smoothly and curbs the possibility of the disputes. As per the present IUC framework Rs 0.14/- per minute is the termination charge of the domestic calls on wireless network, if calls are originating from domestic wireless network. For rest of domestic calls termination charge has been set to zero. For international calls, termination charges has been prescribed as 53 paisa per minute. IUC regulation has prescribed 35 paisa per minute as ceiling for the carriage charges. The IUC framework has been very effective in the past as it succeeded in overall regulating interconnection charges yet leaving lot of scope to service providers for bringing new tariff packages and effective competition among the service providers. This time tested IUC framework can easily be applied to the Internet

Telephony calls except that additionally termination charges for calls originating/terminating as Internet Telephony calls has to prescribed.

4.12 The most important issue with Internet Telephony calls is that it is very difficult especially by the terminating operator, to identify the originating network (if same number is used for Internet Telephony and PSTN/PLMN) or country of the call. Difference in termination charge between Internet Telephony and PSTN/PLMN will lead to the possibility of arbitrage and the impact on the market can be substantial. Further, even when a PSTN operator is able to detect Internet Telephony traffic, it may not be able to differentiate between domestic and international Internet Telephony calls.

4.13 Internet Telephony providers require access to the PSTN to terminate calls to recipients who do not subscribe to the Internet Telephony provider's service. Such interconnection typically occurs between a Internet Telephony operator's gateway and the PSTN operator's Tandem Switch closest to the call.

4.14 Internet Telephony has significant implications for interconnection charging. To have sustainable charging regime, there may be a need to have uniform charge to avoid regulatory asymmetries that treat similar services differently based on the technology used to provide the services As more services are delivered as packets over digital networks, minutes of use are no longer an important cost driver. Changes in technology in telecommunications network is rapidly changing the cost structures of telecom network and per-minute pricing may become an inefficient cost recovery mechanism.

4.15 Cost Drivers for VoIP Per-minute cost recovery has a number of weaknesses in a VoIP world. Call duration has no meaningful relationship to the costs of a VoIP call. As VoIP traffic increases,

interconnection charges based on bandwidth used would better reflect underlying cost drivers, and would be more consistent with economic efficiency. One way could be that where VoIP operators provide a service that is functionally equivalent to conventional telephony, treating Internet Telephony providers in the same way as conventional service providers will remove arbitrage opportunities. Generally, VoIP operators do not receive any compensation from PSTN operators for terminating calls that originate on the PSTN. As more traffic migrates to VoIP, a new approach to interconnection pricing may be needed. Any new approach to interconnection pricing should: encourage efficient competition and the efficient use of, and investment in, telecommunications networks, treat technologies and competitors neutrally, allow innovation and minimize regulatory intervention and enforcement, consistent with the general trend toward less regulation wherever possible.

4.16 Termination charge issue gets further complicated as there is different termination charges between wire line and wireless network. Basically, at present termination charge is @14 paise per minute for domestic calls between wireless to wireless and for the rest of domestic calls it is zero.

4.17 Internet telephony call may terminate or originate either from wire-line or wireless but basic important difference is that voice call should be accessed through public Internet. The Internet telephony is different when compared to present PSTN/PLMN. It requires minimum threshold speed Internet connection for good speech quality. The incoming calls shall be feasible only when broadband is connected and functioning well. Hence, when call is terminating on Internet Telephony subscriber, subscriber is already paying for data charges and Internet Telephony service provider is simply providing voice service through software. Therefore this cannot be truly called as calling party pay (CPP) regime as

called subscriber is also paying for terminating the call in the form of data charges.

4.18 There are certain challenges that the existing regime imposes on Internet telephony calls. These are described in the following paragraphs

4.19 Mobility: An Internet telephony subscriber as per the license uses the public Internet to make a call from his Internet telephony terminal, which then traverses over the public Internet to the SIP gateway or IMS node of the licensee. Since the call travels over the public Internet, an Internet delivery subscriber may actually make the call from anywhere. Hence a subscriber of say the Mumbai circle, could be sitting in Bangalore and still make and receive Internet telephony calls since the last mile would traverse over the public Internet. National long-distance calls: when an Internet telephony subscriber makes a long-distance call from his Licensed Service Area (LSA) to another LSA, the existing interconnection regime manages this scenario without any issues. For instance if a Mumbai circle subscriber sitting in Mumbai is making a call to a Delhi subscriber, the call will travel between Mumbai and Delhi using an NLDO as is required under the license. However if a Mumbai subscriber were to make a Internet telephony call from Bangalore, to Delhi, the call would travel from Bangalore to Mumbai over the public Internet and then from Mumbai to Delhi via the NLDO

4.20 International calls: when an Internet telephony subscriber makes or receives an international call, the existing interconnection regime manages this scenario without any issues since these calls would travel over an ILDO. However if an Internet telephony subscriber, is located outside the country, for example in the United Kingdom, and chooses to make a call to someone in New Delhi, in this case call could travel from the United Kingdom to Mumbai over the public Internet and only then over the PSTN networks, thus potentially bypassing an ILDO for carrying

inbound traffic. This scenario is not prevented by any Internet telephony providers worldwide and in fact service providers such as Verizon and T-Mobile actually provide a hybrid service allowing their subscribers to use either Wi-Fi or roaming networks to make calls when they are traveling. This is to the benefit of consumers and as such represents advantages derived from using Internet telephony. In view of the above, Stakeholders' views are solicited on the following:

Question 5:

What should be the termination charge when call is terminating into Internet telephony network?

Question 6:

What should be the termination charge for the calls originated from Internet Telephony Network and terminated into the wire-line and wireless Network?

Question 7:

How to ensure that users of International Internet Telephony calls pay applicable International termination charges?

Question 8:

Should an Internet telephony subscriber be able to initiate or receive calls from outside the SDCA, or service area, or the country through the public Internet thus providing limited or full mobility to such subscriber?

Question 9:

Should the last mile for an Internet telephony subscriber be the public Internet irrespective of where the subscriber is currently located as long as the PSTN leg abides by all the interconnection rules and regulations concerning NLDO and ILDO?

Numbering 94

4.21 Numbers always play a central role in telecommunications and their importance is well recognized. A well designed numbering for any service ensures structured growth of any service. UL/UASL/CMTS allow Licensee to provide unrestricted Internet Telephony but it is not clear that whether TSP can use same numbering resource or it will be given separate numbering resource for providing Internet Telephony. Relevant clause of Unified License with regard to numbering of Internet Telephony is as follows:

"2.5 IP Address assigned to a subscriber for Internet Telephony shall conform to IP addressing Scheme of Internet Assigned Numbers Authority (IANA) only. Translation of E.164 number / private number to IP address and vice versa by the licensee for this purpose shall be as per directions/instructions issued by the Licensor. "

4.22 It is worth noting that Internet telephony can be offered without allocation of number resources from E.164 numbering plan. However, it is not possible to call an Internet telephony subscriber from an existing PSTN/PLMN network without allocation of a number, which can be recognized, by the traditional fixed and mobile telecom network. This will greatly restrict the scope and popularity of the Internet telephony services.

4.23 Identification of such Internet telephony numbers from other PSTN/PLMN numbers may be desirable. Considering distinct service features of Internet telephony, a separate series of numbers may be required for Internet telephony services irrespective of the license under which such services are being provided. Since Internet telephony supports CLI, it is desirable that Internet telephony service providers for the benefit of subscribers also provide calling line identification.

4.24 On the other hand, arguably, Internet telephony is merely a technology mechanism and medium. It per se has no impact or relevance on numbering. Convergence may actually be beneficial to consumers. For instance in the United States, no distinction is made between mobile numbers, fixed line numbers or Internet telephony numbers. Even in countries such as United Kingdom, Germany and others Internet telephony is merely a technology and does not have a special numbering block. This has tremendous advantages. For instance one of the biggest applications of this is the Google Fi service, wherein Google provides a single number to a subscriber and based on whether subscriber is at home, in a basement, out on the streets, his cell phone automatically selects the best mobile or wireless network to connect a call. This ensures much higher call quality and ubiquitous service. If Internet delivery numbers were different from fixed line and cellular numbers this type of a service would not be feasible since a mobile handset would not be able to seamlessly transition between networks without having to drop and reinitiate a new call with a new phone number.

4.25 In India, Number blocks are allocated separately for fixed line which is SDCA based and for Mobile which is at country level. One option could be that TSP can use same number resources and have similar restriction for Internet Telephony service with regard to mobility as it for normal voice services. This will also be consumer friendly as he can be reached or can make call with same identity irrespective of whether he is making Internet Telephony calls (if access to internet is available or it is cheaper) or normal call by same number. However, it will be possible when there is same termination charge for Internet Telephony calls.

4.26 Other way could be to allocate separate series for Internet Telephony service and all spare codes which are not being used can be allocated for Internet Telephony calls. At present these numbers cannot be used for

mobile services. If these numbers are allocated to mobile, it will have conflict with local fixed line number. If we add '0' in dialing pattern from Internet Telephony calls to/from other calls (Fixed line/Mobile), it will not have any conflict and this numbering resource which is otherwise idle can be used for Internet Telephony service. In view of the above, stakeholders are requested to comments on following:

Question 10:
What should be the framework for allocation of numbering resource for Internet Telephony services?

Question 11:
Whether Number portability should be allowed for Internet Telephony numbers ? If yes, what should be the framework ?

Access to Emergency Services

4.27 The facility to call nearest authority like police, fire station, hospital, etc has been termed as access to Emergency Service. Accurate identification of geographical location of subscriber is a must for availing emergency services. The concept of emergency number calling has changed with introduction of the mobile services. It is envisaged that accurate location of the caller will also be available to the authority (Hospital, Police, Fire-station) handling emergency situation along with emergency number calls.

4.28 Different telecom networks adopt different technologies to facilitate emergency number calling. In case of usage of Internet telephony services from a fixed location, it is possible to map the position information and route emergency calls to appropriate agency. However, one of the promising features of Internet telephony services is the

nomadic use. In the nomadic use it may be difficult to accurately map position information while originating the emergency call.

4.29 There are various technical options available to make emergency number call even using Internet telephony. One of the simplest options is to route emergency services call to appropriate geographically decentralized emergency service centres and provide them with the appropriate location information. A soft switch in such cases can effectively handle emergency number calls and provide sufficient location information, though such information may not very accurately point to subscriber's geographical location.

4.30 The prevailing International scenario to facilitate emergency number calling is different in different countries. Some of the countries have gone ahead with Internet telephony services without mandating emergency number calling facility. They have emphasized the issue of transparency and desired that Internet Telephony service provider shall inform their subscribers that Internet telephony service will not support emergency numbers calling.

4.31 In India, when subscriber calls from fixed line, the call goes to nearest police/fire station which has been mapped to corresponding location. For mobile, TSPs provide the information of SDCA to BSNL/MTNL along with CLI of calling party and call is routed by BSNL/MTNL to nearest Police station in that very SDCA.

Question 12:

Is it possible to provide location information to the police station when the subscriber is making Internet Telephony call to Emergency number? If yes, how?

Question 13:

In case it is not possible to provide Emergency services through Internet Telephony, whether informing limitation of Internet Telephony calls in advance to the consumers will be sufficient ?

Quality of Service

4.32 Quality of speech in any communication service is an important consideration. Subscribers are accustomed to the PSTN/ PLMN voice quality and expect similar quality from Internet telephony also irrespective of the technology used to provide such services. Ensuring good voice quality will therefore be necessary for ISPs providing Internet telephony. Though Internet telephony standards do not prescribe minimum Internet access speed for good quality of service, it is generally perceived that broadband connection will be required to provide good speech quality. ITU-T Recommendation G.114 (5) defines maximum one-way latency as 150 ms for good speech quality.

4.33 The issue of consideration is whether there is a need to define QoS parameters for Internet telephony or it should be left to service providers. Both the models are prevailing world over. In some countries all Internet service providers have to match QoS parameters as defined for PSTN/ PLMN whereas in some other countries no specific QoS have been defined. Service providers are required to appraise the subscribers

about QoS before they subscribe to such services. Comments of the stakeholders are invited in this regard.

Question 14:

Is there a need to prescribe QoS parameters for Internet telephony at present? If yes, what parameter has to be prescribed? Please give your suggestions with justifications.

CHAPTER- V

Issues for Consultation

Q1: **What should be the additional entry fee, Performance Bank Guarantee (PBG) and Financial Bank Guarantee (FBG) for Internet Service providers if they are also allowed to provide unrestricted Internet Telephony?**

Q2: **Point of Interconnection for Circuit switched Network for various types of calls is well defined. Should same be continued for Internet Telephony calls or is there a need to change Point of Interconnection for Internet Telephony calls?**

Q3: **Whether accessing of telecom services of the TSP by the subscriber through public Internet (internet access of any other TSP) can be construed as extension of fixed line or mobile services of the TSP? Please provide full justification in support of your answer.**

Q4: **Whether present ceiling of transit charge needs to be reviewed or it can be continued at the same level? In case it is to be reviewed, please provide cost details and method to calculate transit charge.**

Q5: **What should be the termination charge when call is terminating into Internet telephony network?**

Q6: **What should be the termination charge for the calls originated from Internet Telephony Network and terminated into the wire-line and wireless Network?**

Q7: **How to ensure that users of International Internet Telephony calls pay applicable International termination charges?**

Q8: **Should an Internet telephony subscriber be able to initiate or receive calls from outside the SDCA, or service area, or the country through the public Internet thus providing limited or full mobility to such subscriber?**

Q9: **Should the last mile for an Internet telephony subscriber be the public Internet irrespective of where the subscriber is currently located as long as the PSTN leg abides by all the interconnection rules and regulations concerning NLDO and ILDO?**

Q10: **What should be the framework for allocation of numbering resource for Internet Telephony services?**

Q11: **Whether Number portability should be allowed for Internet Telephony numbers ? If yes, what should be the framework?**

Q12: **Is it possible to provide location information to the police station when the subscriber is making Internet Telephony call to Emergency number? If yes, how?**

Q13: **In case it is not possible to provide Emergency services through Internet Telephony, whether informing limitation of Internet Telephony calls in advance to the consumers will be sufficient?**

Q14: **Is there a need to prescribe QoS parameters for Internet telephony at present? If yes, what parameter has to be prescribed? Please give your suggestions with justifications.**

Q15: **Any other issue related to the matter of Consultation.**

RESPONSE TO TELECOM REGULATORY AUTHORITY OF INDIA CONSULTATION PAPER

ANNEXURE P-20

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Consultation topic:	**Internet Telephony (VoIP)**
Organisation:	**Microsoft Corporation India Private Limited (MCIPL)**
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EXECUTIVE SUMMARY

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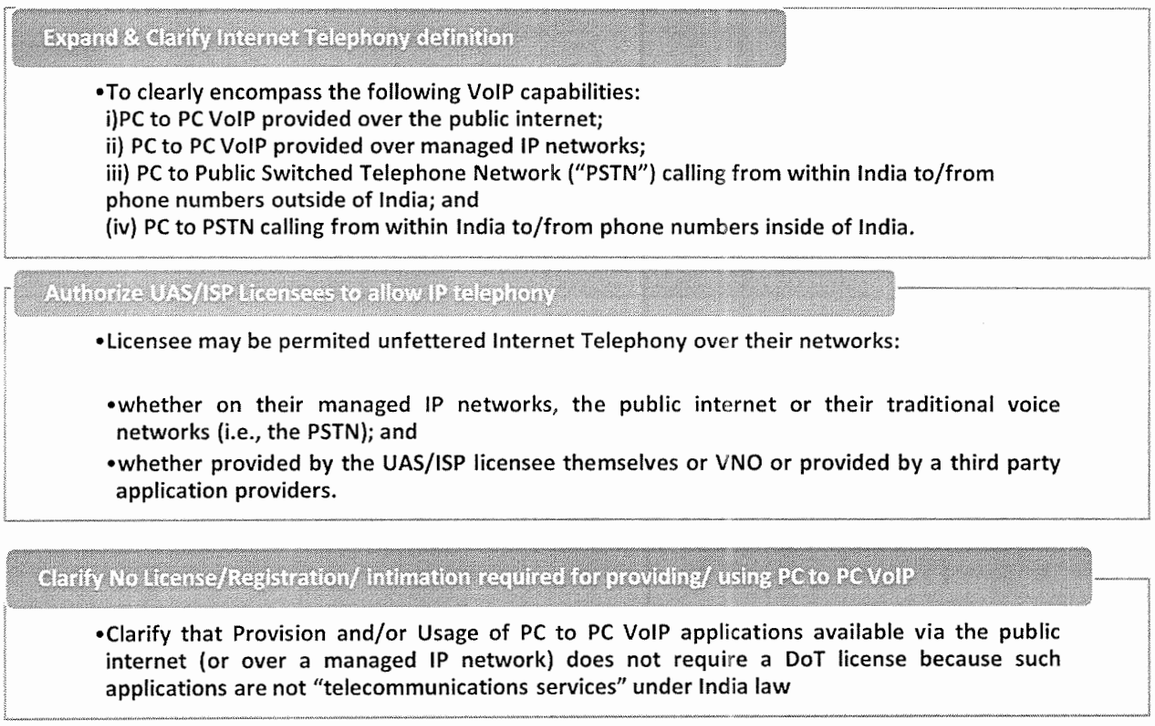
Rapid technological developments are facilitating higher processing power of end devices, reducing memory storage cost and thus enhancing the capability to perform various applications on a common platform. This trend is driving convergence of devices and services, as well as a move to next generation internet protocol (IP)-based networks for the movement of both voice and data traffic (where "voice" is often just another "bit" being moved over data networks). This move to converged platforms and an all-IP network across India and the rest of the world demands a fresh look at the economics and regulatory structure for managing the provision of data and communications services. Microsoft Corporation India Pvt. Ltd. ("Microsoft") applauds the Telecom Regulatory Authority of India ("TRAI") for launching this Consultation to ask important questions regarding the regulatory precincts of one of the more significant services enabled by these IP networks – Voice over Internet Protocol ("VoIP") -- to ensure that Indian businesses and consumers benefit from the innovation created by the internet. TRAI was indeed sagacious and visionary in recommending unfettered internet telephony way back in May 2008, however its recommendations never got translated into reality. Hence we are confident that this time around TRAI's current initiative and renewed efforts will bear fruit.

"VoIP Vs. PSTN" is often wrongly portrayed as a zero sum game. The telecommunication companies play an extremely important role in investing and maintaining infrastructure in India. It's nobody's case that the telecommunication companies should be made to suffer, and there is certainly no reason why infrastructure providers cannot thrive in the internet economy. Enabling VoIP/ internet telephony will be a win-win game for both the telecommunication companies and the application providers. Globally, traditional voice revenues are showing a declining trend while data revenue is dramatically increasing. By providing another reason for consumers and businesses to subscribe to and use broadband data services, VoIP – including VoIP to PSTN calling – will drive data usage in India, and driving data usage will benefit the Indian economy. Protecting older business models in the face of cheaper and better technology does not serve the purpose of public good. For instance, Government of India ("GoI") did not invest in or enact regulations to protect STD/PCO providers after the advent of mobile technology. The better/ cheaper

technology was allowed to prevail in the interest of greater public good. Ensuring that appropriate rules are in place is critical to a future where Indian entrepreneurs, consumers and businesses have ample opportunity to reap the benefits of these new and innovative services, whether through their own entrepreneurial creations or their use of productive and affordable communications tools. Establishing an appropriate, forward-looking regulatory framework will be a key component of India's move into the digital age. 105

Microsoft believes that GoI can accomplish these objectives through three key rule changes/clarifications with respect to VoIP in India:



The current uncertainty about, and restrictions on, the provision of VoIP in India discourages technological advancements, shifts investment to locales outside of India, and has resulted in grey market activities to nonetheless provide some of these VoIP capabilities to common masses throughout India. Hence, there is an urgent need to remove the current roadblocks and uncertainty so companies and entrepreneurs can extend the benefits of VoIP to India businesses and consumers. In doing so, the TRAI should promote regulations that are consistent with the

realities of a 21st Century global internet and the types of services, technologies and business models that it has generated.

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This requires that the GoI take a fresh look at the proper rules of the road rather than simply extending to new technologies and business models the regulatory prescriptions of the past – rules and regulations that were designed for a different marketplace, different types of networks and a different type of technology. Among other things, Microsoft believes that the GoI should look to current VoIP/ internet telephony regulatory frameworks around the world, many of which have been updated to accommodate the dynamic changes taking place in voice communications. While many countries apply *some* regulatory obligations to certain *types* of VoIP, two themes emerge from a review of these other regulatory systems: (i) PC to PC VoIP (whether provided via the public internet or over managed IP networks) is not subject to telecom regulation; and (ii) to the extent some PC to PSTN VoIP capabilities are subject to regulation, governments have not developed VoIP-specific interconnection, intercarrier compensation and/or transit charges for such VoIP services.

On the contrary, PC to PSTN VoIP services are available in markets around the world without the intervention of regulators or application of some VoIP-specific intercarrier payment schemes. The result is not only a growth of voice communications competition, but it also increases the need and demand for data networks to support these services. This "virtuous cycle", as the U.S. Federal Communications Commission ("FCC") calls it, is one in "which innovations at the edges of the network enhance consumer demand, leading to expanded investments in broadband infrastructure that, in turn, spark new innovations at the edge."[1] As a result, if permitted in an unrestricted manner, these VoIP services will drive the need for – and thus investment in – broadband networks, benefitting India's consumers, businesses, network operators and entrepreneurs, large and small. Thus, as described in more detail in response to the Consultation's questions, Microsoft respectfully suggests that there is no need to revisit, refine or apply traditional PSTN interconnection, transit or intercarrier compensation policies to PC to

[1] In the Matter of Protecting and Promoting the Open Internet, *Report and Order on Remand, Declaratory Ruling and Order*, FCC 15-25 (March 12, 2015), at para.7.

PSTN voice services, which to a large extent, take place on networks outside the scope of those traditional concepts. Rather, the government should focus its policy changes on ensuring the existing licensing regime does not prohibit or unnecessarily slow and complicate the availability of VoIP services that are readily available around the globe. 107

INTRODUCTION

Microsoft respectfully submits these comments on the TRAI's Consultation regarding important updates to India's regulation of VoIP – called "Internet Telephony" in the rules of the Department of Telecommunications (DoT). As a company that participates in nearly every facet of the internet ecosystem – not only providing VoIP apps that are accessed via the internet, but also developing operating systems that run both mobile and non-mobile devices connecting to the internet, building and selling devices (from mobile phones to tablets to gaming devices) that connect users to the internet, and partnering with ISPs to enable those devices to connect to the Internet via unlicensed spectrum– Microsoft has a significant interest in the TRAI's Consultation. Moreover, given Microsoft's commitment to the India market– most recently demonstrated by our investment in three data centers across India[2]– we are pleased to offer our insights on the questions raised by the TRAI in the Consultation.

While Microsoft applauds TRAI's proposals to change the way VoIP services are currently treated under India's telecom rules, it is important to note, at the outset, that Microsoft believes the TRAI's present initiative is based on a flawed premise that it must decide which aspects of conventional telephony regulation should apply to "Internet Telephony" services in India. While some obligations from yesterday's communications regulatory frameworks may be appropriate for 21st Century communications delivered via applications and software downloaded from the internet, it should not be assumed that all such rights, obligations and PSTN payment and interconnection structures are necessary or appropriate, or that they should be considered for all types of VoIP capabilities. Hence, some VoIP capabilities may require the application of some regulations, while others do not.

[2] http://timesofindia.indiatimes.com/tech/it-services/Microsoft-to-set-up-three-data-centers-in-India/articleshow/43887336.cms

It will be important for the TRAI to distinguish among VoIP apps that are little more than a software application reached via the global internet, and those VoIP services that are used as substitutes for traditional telecom services, e.g., enabling calls to and from the PSTN. 108

Failure to distinguish among the various types of VoIP, and instead clubbing all VoIP into a single category for regulation, would disadvantage the development of new internet apps, content and services in India, by imposing compliance obligations on them that are ill-fitting, unnecessary and would jeopardize the benefits that VoIP can provide consumers and businesses in India. For example, questions about points of interconnection, termination rates, and intercarrier compensation issues, arise squarely out of yesterday's networks, yesterday's ways of doing business and yesterday's way of regulating traditional telephone networks. Such questions are not appropriate for software applications and communications services, untethered from those interconnected PSTN networks, that are delivered globally via the internet. As we describe below, it would not be appropriate to impose VoIP-specific rules with respect to any of these traditional telecom concepts. Telecom Service Providers ("TSPs") will continue to receive interconnect usage charges ("IUC") on calls terminated on their networks. The fact that an inbound call may have originated as VoIP on the public internet or a managed IP network will not change that. And, as discussed below, there is nothing unique about a VoIP-originated call's use of PSTN networks that requires a VoIP-specific intercarrier compensation regime.

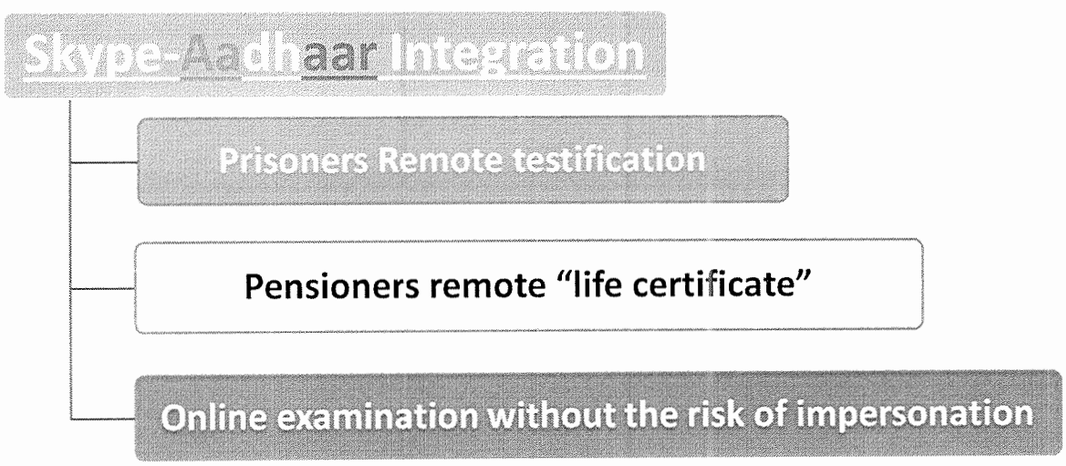
Currently, the global communications industry is witnessing an innovation revolution primarily facilitated due to IP technology. In India, young entrepreneurs and software engineers are at the forefront of this innovation revolution competing globally via the Internet. However, the lack of clarity in communication regulations is driving young Indian entrepreneurs away from India to set up base in countries like Singapore. This is truer of companies operating on the Cloud/ VOIP[3]. It is critical that the GoI enact policies that encourage this development to occur in India – rather than pushing investment to other countries. Such development can result in not only investment in infrastructure in India, but it can also bring innovative new services and capabilities to

[3] http://qz.com/221364/how-india-can-keep-startups-from-moving-to-singapore/

consumers and businesses in India. For example, below are just two examples of how a VOIP app can be used to achieve the Government's vision of Digital India, something that is not possible with PSTN technology. 109

Skype Translator: Microsoft has developed simultaneous real time translation capability on Skype in some of the world's more widely used languages. For instance, a person who knows only English can converse over Skype with a person who knows only Mandarin (Chinese). The software does a real time translation from one language to the other, in 7 languages. And this software is available free of cost.[4] One can very well imagine the benefits of such a software for a multilingual country like India which has 22 official languages. Benefits would include e-education, e-health, national integration, benefits to Small and Medium enterprises etc. But, for this to happen, the regulatory framework has to enccurage Skype and other such companies – large and small - to set up shop in India and invest in this market segment. Without regulatory clarity, major international players will bypass India.

Skype-Aadhaar Integration: Microsoft has already conducted pilot trials integrating Skype Video calling with Aadhaar (India's National Biometric ID system). This allows one to be 100% certain that the person on the other side of the video communication is indeed the person whom he/ she claims to be.



[4] See: https://www.skype.com/en/features/skype-translator/

The potential of this innovation is tremendous in all scenarios where it is mandatory to ascertain the identity of the person on the other end of the video[5]. 110

Together, these two capabilities bring great promise to the realization of a Digital India.

These examples throw up three questions: (i) is such innovation possible where the service or app interacts with the traditional PSTN; (ii) does India want to leverage the benefits of such innovation, and embrace the convergence of traditional technologies and services with those of today and tomorrow, for her national development; and lastly (iii) will major companies invest in India to roll out such innovations if the regulatory framework is restrictive and uncertain, while coupled with an aggressive enforcement environment?

Given this backdrop, TRAI has a tremendous responsibility to ensure that the benefits of modern technology do not bypass India. Microsoft applauds the authority for addressing these important issues.

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[5] See: http://indianexpress.com/article/technology/tech-news-technology/microsoft-satya-nadella-ravi-shankar-prasad-aadhaar-digital-id-2826438/

KEY ISSUES FOR CONSULTATION

(11)

The TRAI in its present Consultation Paper has highlighted the following six issues for consideration.

1. **Interconnection**
2. **Transit of Calls**
3. **Interconnection Usage Charges**
4. **Numbering**
5. **Access to Emergency Services**
6. **Quality of Service**

However, the Consultation does not address core stage-setting issues that Microsoft believes must be clarified prior to establishing new rules of the road for "Internet Telephony" in India. First, the TRAI should clarify the specific features it intends to include in the "Internet Telephony" definition, and it should carefully and precisely explain which proposed regulations are intended to apply to which types of VoIP. As the TRAI notes in the Consultation, there are varying types of VoIP. In Microsoft's view, not all VoIP is the same (neither from a technological standpoint nor a market/business model point of view) and should, therefore, not be subject to the same set of rules. (The same can be said for the broader set of "voice communications" services (i.e., traditional PSTN "voice" communications and Internet Telephony) – not all "voice" is the same and, thus, should not be subject to an identical set of regulations.) Specifically, Microsoft respectfully requests that TRAI clarify the definition of "Internet Telephony" on the lines suggested below. This would encourage further development of VoIP in India (and also thereby discourage the necessity of today's grey market for VoIP in India).

(i) Expand and clarify that the definition clearly encompasses the following VoIP capabilities: (a) PC to PC VoIP provided over the public internet; (ii) PC to PC VoIP provided over managed IP networks; (iii) PC to PSTN calling from within India to/from phone numbers outside of India; and (iv) PC to PSTN calling from within India to/from phone numbers inside of India.

(ii) Clarify that any Unified Access Service ("UAS") or Internet Service Provider ("ISP") licensee may permit Internet Telephony, as defined above, to be provided over their networks – whether on their managed IP networks, the public internet or their traditional voice networks (i.e., the PSTN); and whether provided by the UAS/ISP licensees themselves or provided by a third party over the top of their networks. Then, as described below, apply appropriate regulatory obligations to those PC to PSTN services that are intended as a substitute for traditional voice services provider over the PSTN, i.e., those that enable calls both to and from any telephone number (whether inside or outside of India).

(iii) Clarify that any entity making PC to PC VoIP applications available via the public internet (or over a managed IP network) does not require a DoT license because such applications are not "telecommunications services" under India law.

We are confident these definitional changes and clarifications would enable further development and deployment of innovative services in India because it would align India's regulatory framework to that of many other countries around the globe – countries where consumers and businesses are enjoying the benefits that VoIP (of all varieties) can provide. First, with respect to opening the intra-India VoIP to PSTN market, consumers and businesses will be permitted to finally use innovative services that reduce their costs, improve their efficiency and productivity, and with respect to businesses in particular, quickly and effectively deploy communications systems throughout India. Today, our customers in India – motivated to deploy services and infrastructure that would enable a highly productive and collaborative unified communications experience – are forced to spend weeks (and, more often, months) getting approvals from the TERM cell of the DoT, working with local legal counsel, and coordinating with the local service providers in order to avail such services to ensure they are deployed in a manner that does not run afoul of the restrictions on Internet Telephony under today's rules. These TERM Cell/DoT approvals are required solely as a result of the artificial constraints created by the VoIP restrictions in place in India. And, once completed – having invested time and money – the service often does not even provide the full set of features and economic benefits otherwise

available to users around the globe, which all goes against the present government's initiative of 'ease of doing business' in India. 113

Initially, with respect to PC to PC VoIP -- whether provided via the public internet or over managed IP networks -- the following are just some of the countries that do not impose telecom regulation on such VoIP capabilities: the U.S., Canada, the European Union, Switzerland and other European Economic Area (EEA) countries, other non-EU European countries, Australia, New Zealand, Brazil, Chile, and numerous other countries throughout Latin America.

There are two fundamental reasons such VoIP capabilities are not subject to regulation: First, PC to PC VoIP is really nothing more than a software application that is either inbuilt with the hardware or downloaded to an internet-connected device, thus it is not a "service" at all – much less a "telecommunications service" that should be subject to regulation. In the context of India's telecom laws, it is "content" rather than a "carriage service." Therefore, it will fall under the purview of the Information Technology Act 2000 rather than Telecom. regulations.

The next category of VoIP services that must be considered are those that connect VoIP users to users of traditional telephone services (i.e., landline and mobile telecom services). These VoIP services typically arise in one of two ways: (i) VoIP services that enable communications only to *or* from telephone numbers (i.e., one-way VoIP to PSTN services); and (ii) VoIP services that enable communications both to *and* from telephone numbers (i.e., two-way VoIP services). The former is typically a VoIP capability that enables calls out to phone numbers – a complementary communication capability that consumers use to make calls (often, international calls) that otherwise would not be made due to the very high price associated with traditional international calls made over PSTN networks. The latter service is likely intended to compete directly with – and substitute for – traditional PSTN calling provided by regulated carriers. For that reason, this latter service is subject to regulation around the world.

However, in most countries, regulators have recognized the technological differences between a traditional network-tethered PSTN voice service and a nontraditional untethered VoIP to PSTN

calling service, thus subjecting the latter to slightly different regulation. For example, in the United States, no license is required to provide any sort of VoIP to PSTN calling, even two-way VoIP to PSTN services, which is subject to complying with certain regulatory obligations. These obligations include access to emergency services, lawful intercept of calls to and from the PSTN, and number portability, among others. Providers of two-way VoIP to PSTN calling must also report their annual revenues and pay telecoms-related regulatory fees. But, there is no licensing obligation, and there is no specific VoIP-only interconnection and intercarrier compensation regime. In contrast, although Canada has a minimal registration and license obligation for two-way VoIP to PSTN calling, this is primarily used as a means to ensure that the service complies with regulations similar to those in the U.S. – e.g., calls to emergency services and real-time lawful intercept of calls to and from the PSTN. In Canada, these service providers also must pay an annual regulatory fee (on the order of one-half of one percent), but only if their annual revenues exceed a certain threshold (C$10 million). Smaller companies, with revenues below the threshold, are not required to pay the fee, thus helping to stimulate the market.

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Hence, in addressing whether a license should be required of VoIP to PSTN providers in India, we can draw broad lines based on the frameworks used in a number of other countries, as illustrated below:

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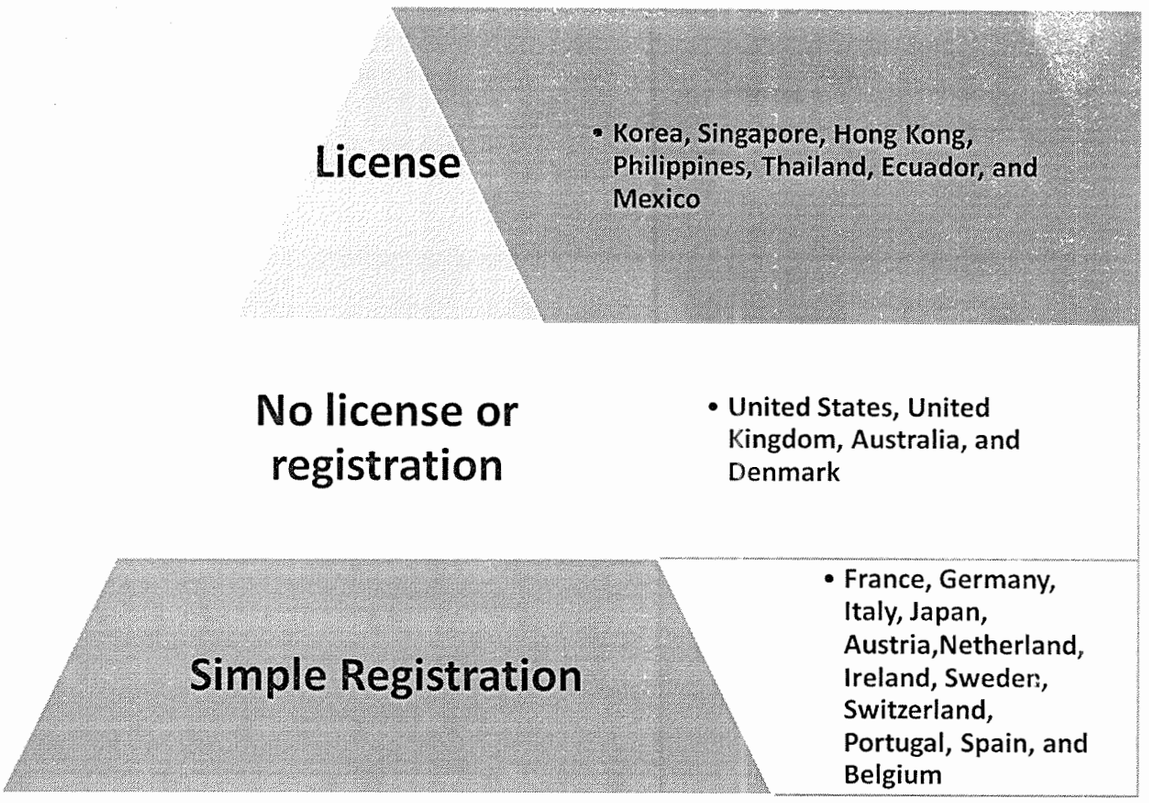

Following the frameworks of many other countries around the world, Microsoft respectfully requests that the TRAI propose a regulatory approach wherein PC to PC VoIP requires no license (and is permitted to be transmitted by ISPs over their networks, public or managed, without restriction), and that only two-way PC to PSTN calling (both inside and outside of India) requires a light-touch registration or minimal licensing obligation, accompanied by appropriate regulations deemed necessary to protect consumers or address a market failure. This would be consistent with other registration regimes in India today in that services – like these VoIP to PSTN calling services – that must rely on an underlying telecom operator for the transmission of the call (either the ISP for transmission of the IP portion of the call or the TSP for the transmission of the PSTN portion of the call), do not require a license. Rather, such services (including OSPs) require only a registration. This approach should stimulate new investment in India as businesses and consumers would be provided more options for their voice communications – options that enable innovative collaboration through voice, video and text – thus also stimulating consumer and business demand for broadband across India.

Key Global data facts on VoIP Regulation Internationally*

Specific VoIP policies or regulations in place, 2015	41%	0% 100%
VoIP subject to general ICT laws/ regulations, 2015	71%	0% 100%
Provision of VoIP legal, 2015	84%	0% 100%
VoIP providers under universal service/access obligation, 2015	52%	0% 100%
Individual users allowed to use VoIP, 2015	89%	0% 100%

ITU ICT-Eye: http://www.itu.int/icteye

(* Strictly speaking, India would not fall under any of these categories due to the ambiguity of the existing policies and regulations)

As discussed further below, questions of intercarrier compensation and interconnection are misplaced in the context of VoIP services – particularly PC to PC VoIP, which is wholly outside the traditional PSTN network framework, but also with respect to PC to PSTN calling. Many PC to PSTN calling services are untethered from the underlying broadband network. Thus, the provider has no "network" for which it has a physical "point" to which another network would need to "interconnect" or exchange traffic. Again, when one looks to other countries, VoIP to PSTN calling is not subject to any particular "intercarrier compensation" regime or special interconnection regime. Rather, as addressed in more detail in the Appendix, the services are available (to the significant benefit of users) without any changes to those pre-existing rules and frameworks. Throughout the world, the stance of the regulator has been to create a competitive, healthy, and dynamic environment focused on subscriber protection and enabling economic growth. Microsoft encourages the TRAI to follow their lead and bring the same benefits to India's consumers and businesses.

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Q1. What should be the additional entry fee, Performance Bank Guarantee (PBG) and Financial Bank Guarantee (FBG) for Internet Service providers if they are also allowed to provide unrestricted Internet Telephony?

Performance and financial bank guarantees are levers used by regulatory authorities to influence market development. As such, they have to be viewed in the context of regulatory objectives: how quickly a market should be opened to innovative and competitive services that will benefit consumers and business, carefully balanced against any need to protect traditional telecom operators who have invested in legacy infrastructure. Certainly, it is important that PBGs and FBGs do not act as a barrier to entry, particular when innovative tools are ready to be made available to enhance India's productivity and economic growth.

FBGs are sometimes considered in order to ensure the reliability and stability of service providers. The FBG provides the government more confidence in the financial health of new market entrants. The existing ISP license is well formulated to allow VoIP/ internet telephony without requiring any additional FBG. It may be noted that even for IPTV services, the licensee is required to have a networth for Rs. 100 crores (Rs. 1 billion); without any requirement of any additional FBG. Accordingly, any additional FBG for internet telephony may not be advisable. With respect to VoIP, however, FBGs are largely unnecessary, particularly in the context of PC-to-PC VoIP, thus further justifying why such capabilities should be wholly outside the scope of telecom regulation.

As noted above, PC-to-PC VoIP is merely a software application that consumers have bundled with their machines or downloaded onto their interconnected-devices. The customer's investment is essentially nothing, and they are not in any way precluded or discouraged from downloading any other software application that may facilitate VoIP communications/ internet telephony. The simplicity of the app, the ability to easily and quickly move from one app to another on one's device, and the low cost of the app (free, except for the cost of the data – paid to the ISP – necessary to download it) make a FBG meaningless. If the app provider goes out of the business, the consumer can simply switch to any number of other apps that enable VoIP communications. For these reasons, PC to PC VoIP communications should remain unregulated,

including with respect to FBGs.

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With respect to PC-to-PSTN calling, particularly a service that encourages traditional TSP service users to switch providers, most countries do impose some telecom regulation. In India, there may be reason to consider an appropriate requirement – particularly if a customer is encouraged to terminate their existing telephone service (e.g., port their phone number) in order to adopt the new VoIP to PSTN calling service. However, as described in more detail in the Appendix, more developed and innovative markets around the world do not impose any such FBG.

Q2: Point of Interconnection for Circuit switched Network for various types of calls is well defined. Should same be continued for Internet Telephony calls or is there a need to change Point of Interconnection for Internet Telephony calls?

Assessing "points of interconnection" of networks in the context of VoIP communications is a prime example of why it is not appropriate to evaluate today's technologies in the context of yesterday's regulations. With respect to applications and services delivered via the internet that enable only PC to PC communications, the provider typically has no network to or from which they must or need to interconnect and never interacts with the PSTN (from which the concept of a "POI" arises). Rather, the underlying ISP – from which the VoIP service provider may be untethered – operates the network that is interconnected to other data networks, thus creating the "network of networks" that is the internet. Thus, a discussion of "points of interconnection" is not a relevant discussion for PC to PC VoIP – again emphasizing why such functionality should be wholly outside the scope of any telecom regulation.

With respect to those non-network based VoIP providers that allow their users to make and/or receive calls to/from phone numbers in other countries, such VoIP providers have successfully depended upon commercial negotiations with PSTN operators to carry their traffic to and from PSTN end points. Such agreements between a network-agnostic VoIP to PSTN provider and the licensed PSTN operator are not "interconnection" agreements, but instead commercial agreements whereby a PSTN network operator (already interconnected – in the traditional sense of "interconnection" – to the PSTN and, thus, to other PSTN networks) has simply agreed to take PSTN-bound traffic from the internet (typically via a SIP trunk) and deliver it to an endpoint on the PSTN (and/or vice versa). These VoIP services that are not tethered to a particular network

resemble the offerings of PC to PC VoIP providers in that they do not necessarily require a physical transmission network for interconnection and, thus, no necessity for interconnection to a particular PSTN POI. In order to realize the benefits that VoIP can bring India's consumers and businesses, it is imperative that the regulatory framework not be restricted by legacy network language or concepts that are ill-fitting and likely to unnecessarily increase cost and reduce innovation. 119

With respect to network-tethered VoIP to PSTN services – i.e., "managed VoIP," or those that are provided by an operator that also operates the underlying physical "last mile" network that must be interconnected to other networks, Microsoft takes no position as to the appropriate manner in which any such issues should be raised or addressed. It is imperative, though, that all network operators generally have the ability to interconnect with other network operators for the exchange and termination of voice traffic, whether such traffic is in the form of TDM or IP voice traffic.

Q3: Whether accessing of telecom services of the TSP by the subscriber through public Internet (internet access of any other TSP) can be construed as extension of fixed line or mobile services of the TSP? Please provide full justification in support of your answer.

Accessing the telecom services of the TSP by a subscriber through the public internet cannot be construed as extension of fixed line or mobile services of the TSP. Moreover, the classification of Internet Telephony as a fixed or mobile service, if accessed through the public internet or a managed IP network, is not justified, whether or not the provider is also a TSP. Hence in our view TSP-provided VoIP should be treated the same as non-TSP provided VoIP. A TSP shouldn't be subject to different rules just because it happens to also provide traditional PSTN services.

Q4: Whether present ceiling of transit charge needs to be reviewed or it can be continued at the same level? In case it is to be reviewed, please provide cost details and method to calculate transit charge.

By "transit" we assume the TRAI is referring to voice traffic that flows from one PSTN network operator to another indirectly rather than directly, *i.e.*, from one end office to another through a tandem switch and tandem transport. There is no need to review or change the current transit

charge regime in India – at least not with respect to VoIP communications. First, with respect to PC to PC VoIP communications, the concept of transit charges has no relevance whatsoever, since transit charges apply only to PSTN traffic, and PC to PC communications do not traverse the PSTN. Nor are transit charges relevant to PC to PSTN VoIP communications. Once a PC to PSTN communication enters the PSTN, that call is the same as any other PSTN call being transmitted and/or terminated on PSTN infrastructure. The fact that a PC to PSTN communication originates on an IP network before it enters the PSTN has no impact on PSTN transit traffic or transit charges. Such traffic will or will not transit intermediary networks and thus will or will not be subject to transit charges the same as any other call that traverses the PSTN from any other origination point. VoIP to PSTN calling creates no distinctions that require a review or a change to the regime. 120

Q5: What should be the termination charge when call is terminating into Internet telephony network?

Intercarrier compensation regimes worldwide are moving more and more toward a system whereby no intercarrier payments are made for the termination of PSTN voice traffic. We understand that wireless domestic calls terminating to a traditional wireless PSTN user in India involve termination charges and that TRAI is considering whether and how to reform that mechanism in a separate proceeding. In the instant proceeding, however, TRAI is considering opening the market to unrestricted Internet Telephony, including VoIP to PSTN calling within India. Typically, providers of Internet Telephony partner with licensed telephone companies to facilitate origination of calls to and termination of calls from the PSTN. And, these partners are likely to be wireline telephone companies who, under the current system, do not receive payments for terminating calls on PSTN networks. We see little rational economic basis for introducing unique charges for terminating calls to the users of their Internet Telephony partners. Not only are such VoIP-specific intercarrier charges economically unjustified, they would introduce significant complexity to an IUC system that already can readily accommodate PSTN-originated calls that are bound for an Internet Telephony subscriber.

Q6: What should be the termination charge for the calls originated from Internet Telephony Network and terminated into the wireline and wireless Network?

See answer above to question 5. For the same reasons explained above, a call from an Internet Telephony user will likely originate on the PSTN as a wireline call via the VoIP provider's underlying partner on whom it relies to connect its VoIP users to the PSTN. Therefore, in India, the terminating access applied to that call would be zero if the call is terminated to another wireline PSTN network. If terminated to a wireless PSTN network, the wireless provider would apply the same terminating access it would charge to anything other inbound call from the wireline PSTN, which under today's IUC framework is zero. 121

Q7: How to ensure that users of International Internet Telephony calls pay applicable International termination charges?

Given the way VoIP works, there is no such thing as an "International Internet Telephony" call – at least not in the context of international termination charges, which apply to traffic carried over PSTN networks. VoIP calls tend to use the internet rather than PSTN networks for traversing international borders, and as the TRAI noted in its August 5th IUC Consultation, the access and terminating charges traditionally applied to this traffic is zero, or "bill and keep." Once VoIP calls are delivered from the internet to the PSTN, then traditional PSTN termination charges apply. Because VoIP calls do not become PSTN calls until they actually reach the PSTN – which often occurs within a country's borders – it would be inappropriate to apply international PSTN termination charges to a call that has traversed only domestic PSTN infrastructure. Should a VoIP call use the PSTN to cross international borders, then it would be appropriate to apply international toll charges to the termination of the call—just as with any other PSTN call that crosses that same international border. But, so long as the use of the PSTN network is limited to domestic usage, domestic PSTN charges (if any) should apply – just as they would apply (or would not apply) to any other call that originates and terminates on the PSTN within India. This is one of the great societal benefits of the internet and VoIP technology, vastly reducing the costs of communicating with friends, family and business colleagues across the globe, and thereby opening up new opportunities for communication that otherwise were previously foreclosed. The long-term economic and societal impacts of these communications capabilities and opportunities cannot be overstated.

Q8: Should an Internet telephony subscriber be able to initiate or receive calls from outside the SDCA, or service area, or the country through the public Internet thus providing limited or full mobility to such subscriber? 122

This question suggests an attempt to apply yesterday's ways of doing things to new technologies, networks and business models. In the traditional PSTN network environment, networks were constructed to deliver and receive traffic at specific and well-defined points for purposes of load-balancing circuit-switched calls. The physical limitations of yesteryear's telecom networks that led to this traditional PSTN structure, however, don't exist with the global internet or with the transition of traditional PSTN networks to next generation IP-based networks. In view of the fact that the internet is an open interconnected set of networks with a comparatively low cost structure, traditional PSTN issues related to pricing and taxation on different types of calls (e.g. local vs. long distance vs. international) become fundamentally different from PSTN circuit-switched networks. In fact, such price differentiation becomes irrelevant, which means that decades-old service area restrictions are misplaced in a world of IP-based network infrastructure. Therefore, there is no technological or economic reason to apply traditional definitions of SDCA, NDCA and even IDCA to VoIP calling. Moreover, with today's technology and customer expectations, local or regional calling areas and distance-based pricing in the domestic market are anachronistic.

Thus, the specific answer to the question above is an emphatic "yes" – particularly with respect to non-tethered VoIP apps and services. By definition, this type of VoIP is a technology that enables communications from anywhere with internet access. Users can place telephone calls to E.164 numbers or communicate with anyone else using the same VoIP app so long as they have internet access – regardless of the provider of the underlying internet access. This flexibility and ubiquity provides additional value and a lower cost option over traditional switched voice services. Consequently, the regulatory authority should adapt its framework to allow modern services such as VoIP to PSTN calling service, as well as modern networks built with more efficient IP-based technology, to flourish for the ultimate benefit of the public. Applying yesterday's rules, such as geographic restrictions, which were developed for a different, older technology and based on a different set of facts, will not benefit India.

Q9: Should the last mile for an Internet telephony subscriber be the public Internet irrespective of where the subscriber is currently located as long as the PSTN leg abides by all the interconnection rules and regulations concerning NLDO and ILDO? 123

Traditionally, the concept of the "last mile" has been premised upon the *network*, not the *user*. The last mile traditionally has been the final leg before call termination or the first leg from call origination on the PSTN network. In the context of Internet-based VoIP services that connect to the PSTN, more than one network is involved in a call and those networks operate differently. We have explained above that only the PSTN component of a call should be considered with respect to PSTN rules. The portion of a VoIP to PSTN call that does not utilize the PSTN but, instead, uses the global internet should not be the focus of, or subject to, PSTN rules. This approach would align with the network focus (rather than user focus) of the "last mile" concept. Accordingly, if the concept of a "last mile" is going to be retained for purposes of an IUC regime, the last mile of an Internet Telephony VoIP to PSTN call thus should be the point where a call begins to use the PSTN or where a call finishes using the PSTN, irrespective of the physical location of the end user. Traditional concepts of geography are no longer required or justified with respect to Internet Telephony.

Q10: What should be the framework for allocation of numbering resource for Internet Telephony services?

Before addressing the issue of numbering resources with respect to "Internet Telephony" services, is it important to first clarify the particular type of VoIP application or service to which these number allocation rules would apply or impact. As noted above, PC to PC VoIP services (whether accessed via the public internet or a managed IP network) are significantly different from PC to PSTN VoIP services because the PC to PC VoIP capabilities do not use a telephone number for routing and terminating a call to a called party. Such services use software applications and IP addresses for routing and connecting users. Therefore, the numbering framework is irrelevant to such apps.

For PC to PSTN Calling services, telephone numbers must be available to all providers – either directly by allowing the VoIP provider to apply for and obtain numbers (even if they are merely a Virtual Network Operator ("VNO") licensee, without an underlying PSTN network in the country)

or indirectly by allowing the provider to use phone numbers that have been allocated to their TSP partner. For example, if a VNO licensee's wholesale partner is an ISP with Internet Telephony 124 authority and that ISP has an inventory of phone numbers, the VNO VoIP provider must be allowed to use the phone numbers of its underlying partner. This concept of sub-allocation of numbering resources is quite common throughout the world and should be used in India to enable a vibrant and innovative communications marketplace.

Moreover, the phone numbers made available to PC to PSTN VoIP providers should be the same phone numbers available to other non-VoIP PSTN providers. There is no need for a separate set of phone numbers for VoIP to PSTN calling, and doing so would only put new entrants at a competitive disadvantage. Limiting PC to PSTN VoIP providers to numbers that are not already in use by customers would discourage entry of competitive alternatives into India, particularly in the business voice market where businesses will not be willing to try a new service provider if it cannot keep its existing phone number. Companies in India, large and small, invest significant resources in promoting their telephone numbers (e.g., on letterhead, business cards, electronic signatures, marketing and advertising) and are reluctant to switch providers if they can't port their existing numbers to a new provider. This is particularly true of longstanding businesses whose numbers are well established in the marketplace. Thus, to port their phone number to a new entrant (which is discussed in more detail below), the new entrant must be permitted to provide services based on the customer's preexisting phone number.

Microsoft believes there is little justification for continuing to attribute geographic significance to telephone numbers. Although customers and businesses may attribute some significance to the geographic locale of a particular phone number, that attribution is not a regulatory or legal distinction; it is merely a marketplace/customer satisfaction distinction that should be left to the customer's preferences. From a regulatory perspective, assigning separate number ranges to VoIP providers has no impact on number availability or administration; on the contrary, it unnecessarily uses more numbering resources than is necessary because VoIP providers are not allowed to port in new customer's existing phone numbers. Call routing, rating, and destination information is handled through signaling and is no longer dependent on telephone numbers. Moreover, the continued existence of any price differentiation between calling geographic and

non-geographic numbers is artificial and, as a matter of economic efficiency, ought to be eliminated (as discussed in more detail above in our answers to questions 5, 6 and 7). In fact, in most countries where a non-geographic number range has been introduced, it has been largely unpopular, unused and, thus, not enforced upon nomadic VoIP providers (e.g., France, Germany, UK, Italy, Belgium, Sweden, Denmark). The genesis of geographic numbers resides largely in the vestiges of yesterday's PSTN networks, their physical limitations, and their attendant intercarrier compensation regimes; as such, there is no justification for bringing these outdated concepts into the VoIP to PSTN calling environment by limiting nomadic VoIP providers to the use of non-geographic numbers.

Q11: Whether Number portability should be allowed for Internet Telephony numbers? If yes, what should be the framework?

Number Portability is critical to ensuring a competitive communications market for consumers and businesses in India, particularly where the VoIP to PSTN service is a two-way calling offering intended as a substitute for traditional PSTN voice calling. Without it, new entrant VoIP to PSTN providers are at a disadvantage because consumers and businesses may not want to release their current phone number and replace it with a new one. Business cards, billboards, marketing materials would have to be thrown away and replaced so they reflect the new phone number. This is not a reasonable outcome in 2016. The introduction of Number Portability in countries around the world was intended to protect new entrants from the competitive advantages of incumbent providers, and has become a standard practice in India for mobile, and will be necessary for wireline as well, if the GoI wants to bring the benefits of voice competition to consumers and businesses in India.

Q12: Is it possible to provide location information to the police station when the subscriber is making Internet Telephony call to Emergency number? If yes, how?

Before answering the specific question posed here, it is important to clarify what specific type of VoIP capability is being referenced when the TRAI says "Internet Telephony." Because the definition currently includes both PC to PC VoIP and PC to PSTN VoIP, each must be addressed separately because the answer is very different for each functionality.

First, with respect to PC to PC VoIP, whether or not location information can be provided to the police station is largely irrelevant today, because PC to PC VoIP cannot connect to the police station all. The police station's emergency services contact number is an E.164 number that requires connectivity to the PSTN. PC to PC VoIP does not connect to the PSTN; therefore, it does not connect to any E.164 phone number, including emergency phone number(s) in any country around the world. Until such time that emergency call centers (including the police station or other appropriate public safety agencies that answer emergency calls) are upgraded to "next generation" calling systems that are connected to the internet, PC to PC VoIP applications and services have no way of connecting to those centers. Therefore, it is premature to ask whether or not location information can be provided with such a communication since it is not possible for the communication itself to be completed pursuant to today's emergency calling architecture. This technological limitation again highlights why PC to PC VoIP should remain outside the scope of telecom regulatory obligations – as it is in other countries around the world.

Second, with respect to VoIP to PSTN calling services, it remains important to first clarify what type of calling capabilities are offered. Is this a one-way VoIP to PSTN service, allowing only calls from the VoIP device to PSTN number? Or, conversely, allowing only calls from the PSTN to the VoIP device? If the VoIP to PSTN calling service is one-way only, it may not be appropriate to impose emergency calling requirements. Certainly, if the feature is only a one-way inbound calling feature, the user can make no calls out to E.164 numbers – including the emergency call center numbers – so it would be inappropriate to impose the obligation on these services. With respect to a VoIP to PSTN outbound-only calling capability, a call to the police station would arrive with no call-back phone number. Thus, if the user contacted emergency services on their VoIP to PSTN outbound-only service and the call disconnects, the emergency call operator has no way of calling back the person in distress because the caller has no phone number to which a call can be made. Thus, rather than imposing an emergency calling obligation on these one-way outbound services, Microsoft believes the public interest is better served by requiring emergency calling of only two-way VoIP to PSTN services: services that are intended as a substitute for traditional PSTN calling services and from which consumers expect to reach emergency services.

Finally, to address the TRAI's specific question about location information, it is important to distinguish between a static piece of location information that may be associated with a user and the "real time" location of the user at the moment he is making the emergency call. The former location information – a static address – can generally be provided if the provider of the service has collected that information and has a way to convey it to the public safety call center. In the U.S., the static location information is referred to as the user's "registered location" and is used for routing calls to the appropriate emergency call center and for dispatching emergency services. The obligation to collect the registered location information and route calls to emergency call centers is imposed only on two-way VoIP to PSTN calling services; it is not imposed on one-way VoIP to PSTN calling or PC to PC calling. 127

Obtaining the real-time location of a network-untethered VoIP to PSTN user is much more challenging today, in circumstances where the user is not calling from his or her registered location. And, even if a real-time location can be ascertained, it is not necessarily possible to convey that information to a public safety call center in a manner that is governed by consistent industry standards. However, at this time, there is no reliable industry-wide practice or standard that enables the real-time location of a VoIP user so that it can be used to route the emergency call and dispatch emergency assistance. Rather, VoIP providers typically rely solely on a static user location – provided when the customer signed up for the service – for routing the call and dispatching emergency services. This approach is usually accompanied by warnings and disclaimers that the emergency calling service has these limitations. By using the static location information and a disclaimer, innovative new technologies are able to enter the marketplace – despite these technological challenges of fitting new internet-based services into a PSTN-bound emergency calling network -- while these location challenges are addressed in industry and standards bodies around the world.

Q13: In case it is not possible to provide Emergency services through Internet Telephony, whether informing limitation of Internet Telephony calls in advance to the consumers will be sufficient?

In markets where VoIP to PSTN calling providers are required to implement calling to emergency services, they typically are required to disclose the above-described limitations to their

customers. These disclaimers ensure that customers are aware of the limitations while also allowing new, innovative and economical communications services to enter the marketplace. This approach provides an appropriate balance of interests – enabling innovation and competition in the market, while also protecting consumers' safety, during this time that the industry transitions to a future when the challenges of location are resolved and more robust emergency calling capabilities are available for VoIP to PSTN calling services. 128

Q14: Is there a need to prescribe QoS parameters for Internet telephony at present? If yes, what parameter has to be prescribed? Please give your suggestions with justifications.

The imposition of QoS parameters is another relic of the traditional PSTN telephone network that should not be extended to the 21st century communications. Imposing QoS on services that were tethered to a particular network, owned and operated by the same provider offering the services, meant that the provider had significant control over the elements of the service and, therefore, the ability to manage the quality of the service. With respect to VoIP to PSTN services that are provided by entities untethered from any particular network, the service provider has no control over the end-user's underlying broadband network, making it difficult to guarantee any particular QoS. The same is true for PC to PC VoIP services that run "over the top" of broadband networks with which the VoIP provider has no relationship.

Q15: Any other issue related to the matter of Consultation.

Yes, see our discussion in the Executive Summary, Introduction and at the beginning of the section entitled Key Issues for Consultation.

APPENDIX A

GLOBAL BEST PRACTICES

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As noted at the outset of this document, we noted that it is important to consider the regulatory frameworks in use around the world. Below we provide responses to each question in the Consultation by explaining how the U.S., U.K., Australia and the European Union address the issues raised in the Consultation.

Q1. What should be the additional entry fee, Performance Bank Guarantee (PBG) and Financial Bank Guarantee (FBG) for Internet Service providers if they are also allowed to provide unrestricted Internet Telephony?

Nowhere, among the numerous countries we analysed, does a VoIP provider (neither a PC to PC VoIP provider nor a PC to PSTN VoIP provider) have to make a PBG or FBG payment. This concept is one that arose out of decades' old telecom regulations and structures, and they are not applicable in today's 21st century global internet based technologies.

United States. In the U.S., where regulation of VoIP services is limited to those that enable calls both to *and* from the PSTN, there is no license required of the provider, and there is no upfront PBG or FBG payment. In the U.S., there are regulations (such as emergency calling) that are applicable to two-way VoIP to PSTN services, but those obligations do not include a license, registration or fee payment.

Australia. In Australia, there is no PBG or FBG payment by VoIP providers of any kind. An entity that enables VoIP to PSTN calling is designated as a 'carriage service provider' by operation of statute. No formal license is required for the supply of such services, but various statutory terms and conditions apply as a consequence of the statutory designation.

Australia only requires telecoms licenses to be held in relation to entities that own or operate certain types of telecommunications *infrastructure*, known as 'carriers'. However, even carriage service providers in Australia are not required to pay an entry fee, PBG or FBG to supply carriage services (whether or not Internet Telephony).

If those entities supply a 'standard telephone service' they are subject to a higher level of regulation (but are still not required to pay an entry fee, PBG or FBG). 130

European Union. Under the EU regulatory framework, Member States may subject the provision of an Electronic Communications Service ("ECS") – including VoIP if it is deemed to qualify as such – only to a general authorization regime (with defined maximum obligations) and not to an individual license. In most Member States (e.g., the Netherlands, Belgium, Italy, Germany) require only a notification or registration duty without the obligation to pay a licensing fee. Thus, there is no concept of a PBG or FBG payment for VoIP services in Europe.

United Kingdom. The UK Communications Act 2003 (implementing the EU electronic communications regulatory framework) introduced a general authorization regime permitting an entity to provide electronic communications networks or services in the UK, without any license, notification or registration. And, there is no PBG or FBG payment required. In the UK there are regulations (such as emergency calling) where VOIP to PSTN (VOIP out services) or 2 way VOIP (VOIP in and out services) are provided but those obligations do not include a license, fee or registration payment.

Q2: Point of Interconnection for Circuit switched Network for various types of calls is well defined. Should same be continued for Internet Telephony calls or is there a need to change Point of Interconnection for Internet Telephony calls?

United States. The U.S. has no VoIP-specific interconnection rules. VoIP services are often untethered from any particular underlying network and, therefore, generally have no "network" to/from which other networks need to interconnect. Rather, the connection of a VoIP provider's cloud to a PSTN provider that is interconnected to the PSTN is managed through commercial negotiations. The point at which the parties connect their clouds and exchange traffic is not regulated. Notably, there has been no need for such regulation as the VoIP-to-PSTN marketplace in the U.S. is relatively vibrant, including network-based VoIP providers (e.g., cable companies that have added VoIP to their line-up of services) and non-network based providers (e.g., network untethered providers such as Vonage).

Australia. Australia does not expressly regulate points of interconnection, rather these are determined as a matter of commercial negotiation between telecommunications operators. /31

European Union. Under the EU regulatory framework, interconnection obligations are imposed by the national law of the EU Member States (transposing the Access and Interconnection Directive 2002/19/EC as amended by 2009/140/EC (in particular Articles 3, 4, 5 thereof)). This results in the following obligation which is directly applicable to all operators of public communications networks: to offer access and interconnection upon request of operators of electronic communications networks and services: (i) for the purposes of providing public electronic communications services, and (ii) in order to ensure interoperability of services.

In addition, the national law of the EU Member States (transposing the same Directive) empowers National Regulatory Authorities to impose obligations:

> (a) to the extent that is necessary to ensure end-to-end connectivity, on undertakings that control access to end-users, including in justified cases the obligation to interconnect their networks where this is not already the case;
>
> (ab) in justified cases and to the extent that is necessary, on undertakings that control access to end users to make their services interoperable;
>
> (c) (omitted here, concerns broadcasting).

Furthermore, in application of the Significant Market Power (SMP) regime, National Regulatory Authorities may impose specific regulatory obligations to ensure access to, and use of, specific facilities (based on Articles 8 and 12 of the Access and Interconnection Directive) of operators that have been found to hold SMP on specific markets.

Because VoIP providers (of all kinds, PC to PC VoIP and PC to PSTN VoIP) do not fit these descriptions, and presumably because VoIP providers typically have no network to/from which they must provide interconnection, no EU Member State imposes any VoIP-specific interconnection obligation.

United Kingdom. Although the U.K. has general interconnection rules and policies in place, there are no VoIP-specific interconnection rules because there is no need or justification for such rules when most VoIP providers are untethered from the networks over which they are accessed by consumers and businesses. In addition, the U.K. has transposed the EU regulatory framework in its national legislation/regulation. 132

Q3: Whether accessing of telecom services of the TSP by the subscriber through public Internet (internet access of any other TSP) can be construed as extension of fixed line or mobile services of the TSP? Please provide full justification in support of your answer.

United States. All that matters in the U.S. is whether a provider is offering an "interconnected VoIP" service, i.e., a service that enables users to make calls to and receive calls from phone numbers. Whether or not this is provided as an extension of the telecom provider's traditional PSTN offering is irrelevant. The service either is "interconnected VoIP" that is subject to FCC regulation or it is not.

Australia. In Australia, it does not matter if the VoIP service is provided by Australia's equivalent of a TSP or not. What matters is whether the service fits the definition of a regulated VoIP service. Thus, whether or not it is an "extension of a fixed line or mobile service" of a TSP is not a relevant analysis in Australia.

European Union. Within this context, BEREC notes that in the context of market power designations in the markets relevant to voice telephony (such as retail markets for fixed telephony, access at fixed location market, wholesale markets for fixed calls origination and fixed and mobile call termination), only one NRA (Norway) found VoIP services with the capability to make calls to the PATS to constitute a substitute for traditional voice services, while only two NRAs (Spain and Portugal) considered that nomadic voice services are also part of the voice market. Most NRAs are of the opinion that there is no clear evidence at the moment that the use of VoIP services may impact the provision of traditional voice, and identify as some of the reasons

for the lack of substitutability that end users perceive VoIP services as having lower quality and security, and the lack of interoperability among OTT voice services.[6] 133

By contrast, Voice over Broadband – generally comprising non-nomadic services, combining the offering of a broadband access line (e.g. via DSL technology or cable modem) with the provision of voice services by a single company – has been interpreted as a substitute for PSTN-based fixed line telephony by various NRAs in the course of their market analyses under the EU framework.

United Kingdom. In the UK, VOIP is treated as any other packet switched data, and VOIP is not currently seen as a 'relevant market' in the UK that requires a review to ensure that it is functioning correctly. Thus, it does not matter if the VoIP app is provided as an extension to a regulated entity's preexisting PSTN voice service or by a company providing only the VoIP capability all that matters is whether it is a 'VOIP out' or a 'VOIP in and out' service. Moreover, it should be noted that Ofcom has stated*: Traditional voice calls are carried over the PSTN network, a circuit switched network that allocates a dedicated circuit to each call. Internet Protocol (IP) data networks, such as the internet, operate in a different way, splitting data into packets which are then sent individually across the network.*

Voice over internet protocol (VoIP) technology allows voice and video calls to be delivered over IP networks, rather than the PSTN network. As VoIP calls are routed over the open internet, VoIP providers are isolated from costs relating to running the IP network over which calls are transmitted (these are incurred by the network operator and passed to the end users as part of their access charges i.e. call origination or call termination charges as appropriate).[7]

Q4: Whether present ceiling of transit charge needs to be reviewed or it can be continued at the same level? In case it is to be reviewed, please provide cost details and method to calculate transit charge.

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[6] BEREC, Report on OTT services, BoR (16) 35, Jan. 2016, p. 18.

[7] See: http://stakeholders.ofcom.org.uk/binaries/research/cmr/cmr15/CMR_UK_2015.pdf - Page 261

(Also see Ofcom Communications Market Report (6 August 2015) as provided at link above in relation to VoIP market generally substitutability).

As discussed above, the concept of transit is not uniquely relevant to VoIP. Thus, VoIP has no bearing on the question of whether or not transit rates in India should be reviewed. 134

United States. In the U.S., "transit" is generally defined as a service provided to two PSTN network operators that allows them to interconnect and exchange traffic indirectly rather than directly. It consists of the rate elements of tandem switching and tandem transport. Even as it determined to bring most other rate elements associated with intercarrier compensation to zero (including tandem switching and transport where it is provided for traffic other than transit traffic, e.g., long distance access traffic), the FCC chose not to regulate rates for the provision of transit services. There are competitive providers of transit services in the U.S., e.g., Intelliquent, which subject transit rates to marketplace discipline.

Australia. The supply of transit services is not regulated in Australia. Thus, no methodology applies for the calculation of levels of transit charges.

European Union. The supply of transit services is substantially deregulated in the EU (only 5 Member States retain some legacy regulation, which is often focused to address those situations where it is difficult to reach locations). The 2014 edition of the European Commission's Recommendation on Relevant Markets Susceptible to Ex-Ante Regulation does not include the fixed transit market. The 2007 edition of the European Commission's Recommendation removed fixed transit from the list of markets that was deemed susceptible to ex-ante regulation in the 2003 edition (ex-Market 10). The relevance of the transit market is declining as the number of PoIs for the PSTN decreases substantially with migration to all-IP NGN architectures. VoIP was never a consideration relating to the transit market in the EU.

United Kingdom. Currently the transit charge does not have a ceiling in the UK - it is a strictly commercial arrangement between two companies. We are aware that sometimes there is no cost as each party bears its own costs. Moreover, there has been no review of transit charges with respect to VoIP services because no such review was necessary.

Q5: What should be the termination charge when call is terminating into Internet telephony network?

United States. In the United States, there is no unique intercarrier charging regime for VoIP services. Moreover, the FCC has adopted a transition of moving all originating and terminating intercarrier compensation to zero (whether for terminating or originating local or long distance calls) – or, as it is commonly called, "bill and keep." Under this approach, carriers recover the costs of the network (specifically, those used for terminating and originating calls) from their subscribers, not from other carriers. In doing so, the FCC explicitly rejected the notion that *only* the calling party benefits from a call and therefore should bear the burden of paying for originating, transporting, and terminating a call. This method of intercarrier compensation has been in place in the U.S. wireless industry for more than 20 years, and it has worked remarkably well, removing uneconomic distortions and encouraging adoption of the most efficient network technologies. More specifically, wireless carriers were required to develop cost-saving network technologies and offer higher quality services to attract customers rather than being able to demand payments from other carriers for access to old networks. The policy has contributed to the deployment of the most technologically advanced mobile wireless networks in the world.

Australia. In Australia, the termination charge for terminating a call to a VoIP user is a matter for commercial negotiation.

European Union. In the EU, VoIP services that terminate calls from the PSTN are subject to the same termination rates that are applicable to any other fixed or mobile PSTN endpoint. Thus, if a VoIP to PSTN provider has obtained its own telephone numbers directly from the regulator/government, that VoIP provider may impose terminating access charges on calls delivered to it from the PSTN. For a VoIP to PSTN provider that uses the phone numbers of an underlying network operator/carrier, it is the underlying network operator/carrier that charges terminating access for calls to it from the PSTN. Notably, however, the EU has not created any VoIP-specific termination charges; rather, calls to/from VoIP providers to/from traditional PSTN endpoints are subject to the very same terminating access framework as any other PSTN call.

United Kingdom. The answer is the same as the European Union, described immediately above.

Q6: What should be the termination charge for the calls originated from Internet Telephony Network and terminated into the wireline and wireless Network?

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United States. See answer to question #5.

Australia. In order for a call to be terminated onto a mobile network as a mobile call, or a fixed network as a PSTN call, the call will need to be delivered to the relevant carrier at its POI in the requisite form. This means that the call will need to be converted from an internet call to a standard call (with CCS#7 signaling, etc.) before it is routed to the POI of the mobile or fixed carrier, unless separate arrangements are negotiated with the mobile or fixed carrier.

Assuming that the call is delivered at the POI with the requisite characteristics, it would be accepted by the mobile or fixed carrier for termination and the standard mobile terminating access (MTAS) charge or fixed terminating access (FTAS) charge would be applied. The MTAS and FTAS charges in Australia are commercially negotiated, but default charges are applied. If a call is not delivered to a carrier at the POI in the requisite format at the POI, but is rather delivered to the carrier as an internet call, then the call termination arrangements will fall outside the scope of the regulated services. In such circumstances, the charges will be determined as a matter of commercial negotiation.

European Union. Please see answer to question #5.

United Kingdom. Please see answer to question #5.

Q7: How to ensure that users of International Internet Telephony calls pay applicable International termination charges?

United States. There are no distinctions in charges for "domestic termination" and "international termination" in the United States (recognizing, perhaps, the reality that there is no empirical economic difference between the two types of termination). Further, as noted above, in the United States there are no carrier-to-carrier termination charges for mobile, and those for wireline telephony, including VoIP, have nearly completed the transition to zero.

Australia. Australia does not differentiate between termination of inbound international calls and inbound domestic calls. A carrier in India, for example, could route a call over the Internet into Australia as an internet call to carrier X, arrange for carrier X to convert the call to a PSTN call, then have the call delivered to the POI of the relevant carrier in Australia for termination in Australia. In this manner, there is a mechanism to avoid international termination charges – something that benefits users of these services by ensuring calling rates are low.

Telstra, the incumbent operator in Australia, has historically sought to eliminate the ability for calls to enter Australia over the internet before being delivered to the PSTN, by seeking for domestic carriers to agree not to supply transit services for inbound international calls. However, such matters are commercially negotiated and would be unlikely to be upheld if subject to regulatory challenge.

European Union. Please see previous comments.

United Kingdom. Please see previous comments.

Q8: Should an Internet telephony subscriber be able to initiate or receive calls from outside the SDCA, or service area, or the country through the public Internet thus providing limited or full mobility to such subscriber?

United States. The U.S. does not impose any geographic restrictions on the provision or use of VoIP services.

Australia. Australia does not impose any geographic restrictions on the provision of VoIP services. Once a call has been routed into the internet, it becomes an internet call so could be terminated literally anywhere that the internet IP address is located at the time.

European Union. Please see previous comments.

United Kingdom. There is no restriction in the UK on whether a VoIP service is nomadic or non-nomadic. The potential portability of VoIP is recognized as a benefit of VoIP over a fixed line PSTN line.

Q9: Should the last mile for an Internet telephony subscriber be the public Internet irrespective of where the subscriber is currently located as long as the PSTN leg abides by all the interconnection rules and regulations concerning NLDO and ILDO? 138

United States. The United States has no licensing obligation for VoIP, and the location of the user is not a relevant regulatory consideration for carrier-to-carrier payments or end user charges. The concept of the "last mile," accordingly, is meaningless for such purposes.

Australia. Because Australia has no licensing obligation for VoIP, and the location of a user is irrelevant for regulatory purposes (other than, perhaps, emergency calling), there is no need to consider the "last mile" of an Internet Telephony call. Rather, VoIP calls – once on the PSTN -- are subject to the same interconnection and routing obligations that are applicable to any other call on the PSTN. The Australian approach is as follows:

- Australia has various industry codes addressing matters such as interconnection. Interconnection agreements in Australia also have commercially negotiated terms specifying technical requirements.
- Where a call is routed over the PSTN to a POI as a standard call, it will need to comply with industry codes and the commercial interconnection agreements. Accordingly, it will need to be delivered to the POI in the requisite format for termination – eg with CCS#7 signalling. An internet call will therefore be converted to a standard call before delivery to the POI under this approach.
- If the call is delivered to a carrier as an internet call for delivery on a PSTN or mobile number of the carrier, then separate arrangements will need to be negotiated with the carrier that involve the conversion of the call by the carrier.
- If the call is delivered to a carrier as an internet call for delivery on an IP address, the call will pass through internet peering and transit links as IP packets and the carrier will have no knowledge that the IP packets constitute a 'call'. *A pure internet call is therefore essentially no different from any other internet service.*

European Union. Please see previous comments.

United Kingdom. This question does not transfer into the UK scenario as licenses are not required for the provision of VoIP services. Moreover, as noted above, VoIP calls are treated just like any other bit when on the internet, and they are treated just like any other PSTN call when they are on the PSTN. There are no restrictions on the mobility of their use, and the location of the user is irrelevant to the application of intercarrier payments that may be applicable. 139

Q10: What should be the framework for allocation of numbering resource for Internet Telephony services?

United States. Telephone numbers in the U.S. are allocated to VoIP services in one of two ways: (i) they are sub-allocated through a commercial relationship between the VoIP provider and a telephone service provider (typically a "Competitive Local Exchange Carrier" or CLEC) which has obtained its telephone numbers directly from the U.S. number administrator; or (ii) the VoIP provider obtains the numbers directly from the numbering administrator because the VoIP provider has, itself, obtained a CLEC certificate or has otherwise been granted FCC authority to directly obtain the numbers. In no case are VoIP providers precluded from obtaining and using any particular type of number – i.e., there are no geographic vs. non-geographic number restrictions in the U.S. And, there are no restrictions on a VoIP provider's assignment of phone numbers to its users. This flexibility in the numbering allocation and assignment rules has enabled VoIP services to flourish and compete in the U.S., bringing significant benefits to consumers and businesses alike.

Australia. Although Australia has historically had a fairly rigid numbering system – strictly dividing geographic numbers from non-geographic numbers – the regulator (ACMA) has recently launched a consultation to consider modernizing the number allocation rules. Specifically, ACMA is looking to put in place a more flexible numbering system in the future. In the future, it is possible that arrangements will be implemented to enable use of standard geographic numbers for nomadic VoIP services, providing greater geographic mobility of phone numbers.

European Union. The EU regulatory framework generally mandates that numbers shall be available for all publicly available electronic communications services, but does not expressly deal

with VoIP in that context or specify on what basis geographic versus non-geographic numbers should be assigned. 140

The European Regulators Group (ERG) takes the position that: [8]

(a) all providers of fixed telephony services should be authorized to permit nomadic use by their subscribers, and geographic numbers should be available for this purpose. The ERG points out that geographical numbers appear to be preferred by many end users for making and receiving phone calls, for various reasons, like end users being used to geographical numbers, having more confidence in calls where the caller's location can be identified, having a preference for calling companies or commercial offers from the same area or fearing unknown rates when calling non-geographical numbers. The ERG considers these reasons to all be valid consumer concerns to be taken into account when allocating numbers to VoIP providers.

(b) Numbering plans should be technologically neutral, based on the service descriptions and the same number ranges should be available within those service descriptions. This means that, geographical numbers for traditional telephony services and geographical numbers for VoIP services should share the same number range, that is, come from a common "number pool".

(c) Nomadism is an essential feature of VoIP services which should not be restricted. Nomadism does not preclude Member States from maintaining the geographical meaning of geographical numbers if desirable; this can be achieved by allocating such a number only to subscribers with a main location (address) in the corresponding geographical zone, as defined in the national numbering plan.

From a study mandated by the European Commission, it appeared that many EU Member States maintain non-geographic number ranges dedicated to VoIP, which are allocated to nomadic operators of VoIP, while geographic numbers are available to non-nomadic providers of VoIP.[9]

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8 ERG Common Position on VoIP, ERG (07) 56rev2, Dec. 2007, p. 15-16.

9 WIK Consult, The Regulation of Voice over IP (VOIP) in Europe, 2008, p. 35.

Geographic numbers are sometimes offered under conditions to nomadic VoIP operators as well, pursuant to which, for example, the use of the geographic numbers is restricted to the same geographical area (France, Italy, Spain), or requiring the VoIP service provider to confirm that the subscriber has his/her home address in the same area (Germany, the Netherlands)). Moreover, there is a growing trend to liberalize and further enable VoIP providers to use geographic numbers in EU countries. Austria, for example, has a draft decision wherein it proposes to expressly allow use of geographic numbers by VoIP providers.[10] And, Portugal just launched a Consultation in which it proposes to liberalize its geographic numbering rules.[11]

United Kingdom. A non-geographic numbering range (056), which is part of the UK National Telephony Numbering Plan (NTNP), was made available by Ofcom for nomadic VOIP services and geographic numbers are available for all PATS including VOIP.

Q11: Whether Number portability should be allowed for Internet Telephony numbers? If yes, what should be the framework?

United States. Not only is number portability "allowed" in the U.S., number portability is a regulatory mandate for VoIP providers that are subject to the FCC's rules – that is, "interconnected VoIP" providers that enable calls both to and from the PSTN. Portability is critical to ensuring a robustly competitive market; therefore, wireless carriers, wireline carriers and providers of interconnected VoIP services must all be prepared to port telephone numbers both to and from other PSTN voice providers.

Australia. Number portability exists in Australia. For example:

- A fixed line geographic number is subject to Local Number Portability arrangements. Hence if a customer was terminating VoIP calls onto a geographic number, they could keep their geographic number if they ported to another provider.

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10 See https://www.rtr.at/de/inf/Konsult6NovKEMV2009/6_Novelle_KEMV2009_kurz_Konsultationsdokument.pdf

11 See http://www.anacom.pt/render.jsp?contentId=1391085#.V5e7cI-cGVB

- A mobile number is subject to Mobile Number Portability arrangements. Hence if a customer was terminating VoIP calls onto a mobile number, they could keep their mobile number if they ported to another provider.
- Special services numbers used for Internet Telephony are not currently the subject of number portability arrangements in Australia, but this is likely to change in the future as Australia updates and modernizes its numbering plan.

European Union. Recognizing that number portability is one of the main enablers of competition, the European regulatory framework mandates that subscribers of publicly available telephone services can retain their numbers independently of the undertaking providing the service (i.e., service provider portability for PATS). The number portability mechanisms (onward routing, all call query, etc.) are regulated independently in each Member State, as portability between countries is not defined.

The ERG has indicated that number portability is viewed as a basic right by consumers in the Member States and that it would be difficult to justify, from a user's point of view, why VoIP would be excluded from portability. The further development of VoIP would also be severely impeded if a user of the traditional public telephone service on the PSTN could not migrate to a VoIP service maintaining the number, even though the VoIP provider is entitled to be allocated numbers in the same number range. The ERG therefore deems it appropriate to impose number portability obligations on VoIP providers, and also allow number portability between traditional telephone services and VoIP services, within the same location. The ERG additionally notes that the imposition of a number portability obligation will only be effective as a facilitator of competition via VoIP if any provider has the ability to request the combination of ceasing of PSTN service and porting of the number to that provider, e.g. to offer a naked DSL service.

United Kingdom. In the UK, number portability is a right of any subscriber to a public electronic communications service with a number from the NTNP. Number portability is seen as a key facilitator of consumer choice and effective competition throughout the EU as without it, the

inconvenience of having to switch phone numbers would have the potential for discouraging subscribers and competition. 143

Q12: Is it possible to provide location information to the police station when the subscriber is making Internet Telephony call to Emergency number? If yes, how?

United States. In the U.S., VoIP providers do not have an obligation to – nor is there currently a technical methodology to enable it – provide the real-time location of a nomadic VoIP user who has dialled the emergency services number, 911. Rather, the FCC has required that the interconnected VoIP providers, i.e., only those that provide a service that enables calls both to and from the PSTN, to collect a "registered location" from each customer. That registered location is then used for purposes of routing the call to the appropriate emergency call center. It is well recognized in the U.S., that the user may not be at that location when he/she calls 911. Therefore, the FCC has also required that interconnected VoIP providers provide their customers a disclaimer that informs them of the limitations of its VoIP 911 calling capabilities.

Australia. In Australia, there is a requirement to provide emergency calling services that applies to the supply of "standard telephone services." The supply of emergency calling services is regulated under an industry code in Australia, known as ACIF C536: Emergency Call Service Requirements. There is no requirement in this code to supply location information, rather the obligation is to disclose the number from which the call was made. Telstra will then use its database to automatically identify an address for any geographic number. If the number is not a geographic number, the emergency call operator will need to ask the location of the person making the call.

European Union. The EU regulatory framework obliges undertakings providing end users with an Electronic Communications Service for placing national calls to numbers in a national numbering plan, to provide access to emergency services (the European emergency number '112' and any designated national emergency numbers) free of charge. The undertakings are also required to provide location data of the party calling emergency numbers to the emergency services.

It is acknowledged that it is more complex for nomadic VoIP to ascertain the real-time location of a caller and route emergency calls to the correct emergency centre as routing for fixed services and networks is based on geographical knowledge of the network termination point through E.164 geographic numbers. In most European countries the location information of calls directed to 112 and originated from non-mobile end users is found by the emergency response centre by looking up the telephone number in a database or requiring such information from the operator that provides the service to the customer ("pull" approach). This database contains, at least, the telephone number and address of all subscribers. Such a database is, in some cases, fed with information by all service providers, who periodically update the data to the emergency response centre. This database is, in some countries, the same as the one used for directory enquiry services.

To cover the case of nomadic use, as a first step, the ERG recommends that providers could inform the emergency centers when a terminal can be used nomadically (a "flag" for possible lack of reliability of the address data). A second step that is often discussed is where the provider enables the user to update his current location (via the web), which could be interrogated by the emergency centre if necessary. This approach could also be used when a geographic number might be used nomadically. The database would contain the caller location information and a warning that the address data might not be reliable in the case of a call to 112. This approach assumes that the caller's number (Caller Line Identification (CLI)) is transmitted with the call. The ERG notes that although a push-type provision of location information is to be preferred, a pull approach is recommended for an interim period. Obviously, both the push and the pull mechanism require relevant Public Safety Answering Points (PASPs) to have data network access to be compatible with VoIP networks and platforms, besides a conventional PSTN connection.[12]

United Kingdom. Free and reliable access to emergency numbers is an essential requirement of many telecommunications licenses globally, including the UK. In the UK PSTN, a network termination point is matched with a callers' location which can be identified from the caller line identification (CLI) present even when CLI is withheld by the caller. Fixed Communications

[12] ERG Common Position on VoIP, ERG (07) 56rev2, Dec. 2007, p. 10-11.

Providers maintain a database that associates the calling line identifier with the address to which the line is connected. This means that the information presented on the screens of Call Handling Agent operators should reflect the premises from which the call is being made. In 2007 Ofcom identified a high level of consumer confusion relating to access to emergency services from a VOIP service[13]: A VoIP service provider is expected to provide accurate and reliable CLI 'to the extent technically feasible' and at no charge to the emergency organizations.

This of course is not viable for those VoIP service providers who do not use or assign an E.164 number (telephone number) as a user identifier. If the VOIP service does not provide access to emergency call numbers, this fact must be made clear at the time of signature of the relevant agreement. If the service is to be used principally at a single, fixed location, the service provider must require the customer to register with it the address of the place where the service will be used, in order to assist emergency services organisations.

Customers must also be advised of any limitations on location information. If access to emergency calls is unreliable (particularly if access is cut off in the event of a power cut or failure, or a failure in the broadband connection over which the service is provided) this must be made clear to the customer, and acknowledged by the customer at the point of signature.

Q13: In case it is not possible to provide Emergency services through Internet Telephony, whether informing limitation of Internet Telephony calls in advance to the consumers will be sufficient?

United States. See previous answer.

Australia. Not applicable – see previous answer.

European Union. See previous answer.

United Kingdom. See previous answer.

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[13] Please See:
http://stakeholders.ofcom.org.uk/binaries/consultations/voip/statement/voipstatement.pdf

Q14: Is there a need to prescribe QoS parameters for Internet telephony at present? If yes, what parameter has to be prescribed? Please give your suggestions with justifications.

United States. The U.S. imposes no QoS obligations on any type of VoIP service, including interconnected VoIP which is subject to other regulatory obligations.

Australia. Australia does not impose any QoS parameters for Internet Telephony calls.

European Union. Under the EU regulatory framework, providers of ECSs may be required to provide information on the quality of their services, using, for example, parameters suggested in the framework.[14] The application of this transparency obligation to VoIP providers varies considerably among Member States. The regulatory framework also allows for the imposition of minimum quality of service requirements in order to prevent the degradation of service and the hindering or slowing down of traffic over networks. Prior to imposing such requirements, NRAs are required to submit them for review to the European Commission who may provide comments and recommendations, in particular to ensure that the envisaged requirements do not adversely affect the functioning of the internal market. We are not aware of any specific requirements having been imposed in respect of VoIP services to date.

United Kingdom. Through the General Conditions of Entitlement Ofcom may require providers to publish specific comparable information for end-users on the quality of their services, such as supply times, fault rates, fault repair times, billing complaints and complaint resolution times. Providers of non-mobile services with net quarterly relevant revenue above £4 million and more than 100 million call minutes per quarter have been strongly encouraged to publish such information. Providers of PATS are required to "take all necessary measures to maintain, to the greatest extent possible":

a. The proper and effective functioning of public communications network at all times.
b. In event of catastrophic network breakdown or in cases of *force majeure* fullest possible availability of public communications network & PATS services provided.

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[14] In Annex III to the Universal Service Directive (Directive 2002/22/EC, as amended by Directive 2009/136/EC).

c. Uninterrupted access to emergency organizations as part of the PATS service offered.

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Ofcom acknowledges in the PATS Guidelines that it is possible that a VOIP provider might not provide all network and service elements which control availability. It lists measures that may be taken in respect of elements of the network or service it does control, for example: engineering the VOIP Service to minimize latency and specifying minimum requirements for use of the service such as bandwidth and contention ratios.

ANNEXURE-P-21
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RJIL/TRAI/2016-17/584
5th September 2016

To,

Shri Arvind Kumar,
Advisor (Broadband & Policy Analysis),
Telecom Regulatory Authority of India,
Mahanagar Doorsanchar Bhawan,
Jawaharlal Nehru Marg,
New Delhi - 110002

Subject: Comments on TRAI's Consultation Paper on 'Internet Telephony (VOIP)' (Consultation Paper No. 13/2016 dated 22.06.2016).

Dear Sir,

Please find attached comments of Reliance Jio Infocomm Limited on the issues raised in the Consultation Paper on 'Internet Telephony (VOIP)' (Consultation Paper No. 13/2016 dated 22.06.2016).

Thanking You,

Yours sincerely,
For **Reliance Jio Infocomm Limited,**

Kapoor Singh Guliani
Authorised Signatory

Reliance Jio Infocomm Limited

Encl.: As above.

RJIL Response to the TRAI Consultation paper on "Internet Telephony (VoIP)"

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General Comments:

1. At the outset, we thank the Authority for issuing this consultation paper on 'Internet Telephony (VoIP)' to deliberate on issues arising out of, and including the licensing, technical and regulatory issues associated with the internet telephony. We appreciate the Authority's recognition of the need to redefine the boundaries of Internet Telephony services when convergence and OTT services are redefining markets and blurring boundaries between networks and content.

2. However, we would like to point out that the unrestricted Internet telephony is already permitted in India to access service providers licensed under the Unified License with Access service Authorization, Unified Access Services License and Cellular Mobile Telecom Service, as also acknowledged by the Authority in the consultation paper para 3.5 and 3.6.

   3.5 The present regulatory framework permits Unified Access Service Licensee (UASL), Cellular Mobile Telecom Service (CMTS) licensees and Unified Licensee to provide voice services within country. They have been permitted to provide unrestricted Internet Telephony. The relevant clauses of UASL and CMTS licenses are reproduced below:

   Clause 2.2 (a) (i) of UASL
   "... Access Service Provider can also provide Internet Telephony, Internet Services and Broadband Services. If required, access service provider can use the network of NLD/ILD service licensee."

   Clause 2.1 (a) of CMTS License
   "... The Licensee can also provide Internet Telephony, Internet Services and Broadband Services. If required, the Licensee can use the network of NLD/ILD service licensee ...".

   Clause 2.1 (a) (i) of UL
   ".....The Licensee can also provide Internet Telephony, Internet Services including IPTV, Broadband Services and triple play i.e. voice, video and data. While providing Internet Telephony service, the Licensee may interconnect Internet Telephony network with PSTN/PLMN/GMPCS network....."

3.6 Internet telephony in the above license has been defined as ""Internet Telephony" Means "Transfer of message(S) including voice signal(S) through public Network"." 150

3. Further, we submit that as the unrestricted Internet telephony is a legitimately permitted voice service under the scope of all the prevalent access services licenses, there is no need to redefine the general provisions like interconnection, allocation of numbering levels etc. for such services offered under the said licenses and the prevailing provisions including IUC charges should be applicable.

4. The only issues that are not covered under the present regulatory framework pertaining to internet telephony are the possibility of permitting unrestricted internet telephony to the Internet service providers (ISP) and OTT providers and the regulatory framework thereof. With respect to allowing unrestricted Internet telephony to ISP, we would like to point out that the Authority has itself addressed this issue in para 3.11 of the consultation paper. The Authority has noted that the issue of permission of unrestricted telephony to ISPs is also already addressed post implementation of Unified License regime, as now there are no prohibitive financial or other restrictions for the ISPs in migrating to Unified License with access services authorization and thereby offering the unrestricted Internet telephony. We are reproducing the relevant para as herein under.

4.11 Since then, there have been significant changes in licensing framework of the country. Now allocation of Spectrum has been delinked with the grant of License. Unified license has been introduced with entry fee of Rs 15 crore for whole country. Therefore any ISP or new service provider who is willing to provide unrestricted Internet Telephony can obtain Unified License with authorization for Access services. Further, some existing access licensee are also planning to start Internet Telephony service. Unrestricted internet telephony to Unified Licensee only with authorization of access services will also ensure that only serious players would provide Internet Telephony. Therefore it is for the consideration of stakeholders that whether there is still need for permitting unrestricted telephony to Internet service providers (ISP) or they may be facilitated to migrate to Unified License with authorization of Access services if they wish to provide unrestricted Internet Telephony.

Thus the ISPs can easily migrate to Access services authorization and in case they wish to provide the unrestricted internet telephony service under the existing license, they may be permitted to do so in commercial arrangement with Access service providers.

5. Further, another area of discussion that remains to be addressed under this consultation paper is how to accommodate the possibility of unrestricted internet telephony offered by the unregulated Over the top (OTT) service providers and how to ensure that the national security issues are not compromised while making these services unrestricted by ensuring legal intercept without putting unnecessary and prohibitive shackles on these services. Another aspect that the Authority may delve into is the quality of service parameters for these services as this may be the only differentiator with the traditional telephony as the Internet telephony will always depend on the public internet which, by its very intrinsic nature is dependent on multiple local factor besides the number of active users at a particular time.

Internet Telephony provided by OTT Players:

(i) The social media, instant messaging and Internet telephony are three most popular OTT applications world over. In fact, with the advent of technology and ever increasing proliferation of broadband, RJIL is firmly of the view that Internet Telephony enabled OTT services can deliver genuinely new and innovative features, and will go way beyond in than delivering communication services rather than traditional telecommunication services. The known new features of Internet Telephony include presence awareness, nomadic usage, collaborative working (e.g. voice + video + file sharing), interactive multiplayer gaming, etc. Therefore, in many senses Internet Telephony is not a replacement of plain old telephony but an enhancement of it and the features of Internet Telephony will not be substitutable by the traditional circuit-switched telephony.

(ii) For India, where the government is looking at increasing the pace of broadband penetration to succeed in enabling programmes like 'Digital India' and 'Smart Cities', etc. Internet Telephony has the potential of being that one clutter breaking application that will connect more Indians to the internet. The value proposition of Internet Telephony lies in the fact that upon being motivated by Internet Telephony, more and more people proactively seek out broadband access. This will also greatly benefit the population which is getting connected for the first time. In fact, one of the major challenges for the growth of the Internet, and particularly that of broadband, is the lack of that one simple, cost-effective application whose value can offset the entry challenges related to the acquisition cost of the broadband access device (e.g. smartphone) and also trumps the challenges of language, literacy & the user not being that IT-savvy. Unrestricted Internet telephony has the potential to assume that role, because of its costing and its capability to survive on any internet access. It can motivate more people to use internet &

broadband and be the harbinger of developmental changes that depend on connectivity and information access. 152

(iii) The advent of smart phones and 3G / 4G technologies has brought a paradigm shift in internet telephony. Many applications were developed which were providing in-app and circuit switch networks connected voice telephony practically for free, the consumer only had to bear the data charges. Many telecom carriers internationally launched their own internet telephony applications to counter this. Consequently, many models of internet telephony have been developed.

(iv) There are primarily the following categories of Internet Telephony products that are being or will be offered:

a. **Shared Controlled Access**- Internet Telephony services are supplied by a Telecom operator using its own servers (thereby complying with Lawful Interception and Monitoring (LIM) requirements) with no exclusive control over the transport layer infrastructure. However, the telecom operator routes all calls through its own core network. This is akin to the internet telephony already permitted under the Unified License and needs no additional regulatory framework.

b. **Access Independent of controls**- In this case the access points are not at all in control of the service provider and in fact the service merely needs internet to function and typically the service providers do not offer any access points. Common examples of this are the OTT communication services. These services however have the limitation of being accessible only to in-app community and the obvious unavailability of LIM. These services will be more useful if they can be terminated on PSTN and that can be facilitated by making suitable provisions where these services tie-up with service providers to offer access.

6. **Regulatory Framework for Internet Telephony- International Perspective:**

a. Internationally, the regulators have taken different approaches in dealing with Internet Telephony. The EU directives impose a minimum set of obligations on all providers of electronic communications services including Internet Telephony, stating that:

"With the specific exception of those operators that are designated as USO providers, the model in the EU framework is that a service provider has the commercial freedom to offer services that qualify him as ECS and hence operate within the rights and obligations that

apply to a provider of electronic communications services; or offer services that qualify him as PATS, and hence operate within the rights and obligations that apply to a provider of publicly available telephone services." 153

b. At national level in Europe the debates were mainly on about whether the providers of VoIP-enabled services will be forced to meet the PATS (publicly available telephone services) obligations, with the majority of the countries agreeing on certain relaxations owing to the intrinsic nature of VOIP in the context of the capabilities of the technology, the cost of deployment and the new market developments.
The major obligations under discussion have been:

- License fees and USO levies
- Access to Emergency Services
- Interoperability
- Interconnection
- Security
- Call records
- Number Portability
- Accessibility

c. There is another aspect of the emerging partnership between the OTT services and telecom service providers in Europe. The Body of European Regulators for Electronic communications (BEREC) in its January 2016 report has noted this emerging partnership the Electronic communication services (ECS) and OTT services and its possible benefits to both OTT and ECS providers stating

"6.5 Conclusions on partnerships
Partnerships between ECS and OTT providers have become more common in recent years and the area will likely continue to evolve in different ways in the near future. As ECS providers continue to look for revenues beyond traditional voice services, partnerships with different OTT providers may become increasingly attractive to help boost data traffic or to get a competitive edge through differentiation and added value to end users. Although differences in how and between whom partnerships materialize are likely to persist, due to competition and local variations in demand, more similarities may also be expected to show as the current experimentation starts to show what works well and what

does not. OTT providers, acting on a generally competitive market, are probably likewise interested in partnerships that enable them to promote their brand and their service by making it easier for users to find and have access to it." 154

d. While FCC has made the general obligations of the TSPs also obligatory on the VOIP providers with some technology based adjustments. The FCC guide on VOIP states that

"How does the FCC regulate VoIP?

911 Services: *Providers of "interconnected" VoIP services – which allow users generally to make calls to and receive calls from the regular telephone network – do have 911 service obligations; however, 911 calls using VoIP are handled differently than 911 calls using your regular telephone service.*
Portability: *The FCC requires interconnected VoIP providers and telephone companies to comply with Local Number Portability (LNP) rules.*
Calling Records: *The FCC limits interconnected VoIP providers' use of customer proprietary network information such as your telephone calling records, and requires interconnected VoIP providers to protect it from disclosure.*
Universal Service: *The FCC requires interconnected VoIP providers to contribute to the Universal Service Fund, which supports communications services in high-cost areas and for income-eligible telephone subscribers.*
Accessibility: *Interconnected VoIP providers must contribute to the Telecommunications Relay Services Fund used to support the provision of telecommunications services to persons with speech or hearing disabilities and offer 711 abbreviated dialing for access to relay services. Providers and equipment manufacturers also must ensure their services are available to and usable by individuals with disabilities, if such access is achievable."*

Thus, the international opinion is in line with Indian regulations treating unrestricted internet telephony at par with traditional Voice telephony and consequently mandate similar obligations barring some specific cases of technological hindrances. On partnership of OTT and Licensed TSP, the regulators are taking a wait and watch approach without mandating any rules as of now.

7. **Regulatory Framework for OTT Internet Telephony in India:**

a. **Licensing:** The Unified License already has a provision for unrestricted Internet Telephony under the access service authorization, therefore the ideal way to implement unrestricted internet telephony by OTT/ISPs is by obtaining access service authorization by these

operators. However, in order to accelerate broadband penetration, unrestricted internet telephony by the OTT/ISP can be promoted by a simpler implementation wherein these providers to enter into commercial arrangements with telecom service providers having Access Service Authorization for terminating their calls on PSTN/PLMN networks.

b. **Interconnection:** The Unified License in its present form covers the aspect of mandatory interconnection in the all type of networks, including unrestricted Internet telephony network. The following clause can be referred

"6.2 It shall be mandatory for the LICENSEE to interconnect to / provide interconnection to all eligible Telecom Service Providers (eligibility shall be determined as per the service provider's License Agreement and TRAI's determinations/orders/regulations issued from time to time) to ensure that the calls are completed to all destinations. *Further, the Licensor may direct the Licensee to implement the process whereby the subscribers could have a free choice to make inter-circle/ international long distance calls through NLD/ ILD Operator."*

"INTERCONNECTION is as defined by the TRAI in its relevant regulations."

"SERVICE means collection, carriage, transmission and delivery of messages over Licensee's network in Service Area as per authorization under this License."

TRAI defines INTERCONNECTION as ""Interconnection" means the commercial and technical arrangements under which service providers connect their equipment, networks and services to enable their customers to have access to the customers, services and networks of other service providers.

From above provisions, it can be clearly seen that all services that are as per the scope of Service defined in the respective License get covered under the existing Interconnection regime. The same shall also be applicable for the unrestricted Internet Telephony offered by the OTT/ISPs in collaboration with access service providers.

c. **Numbering Levels:** As per the prevailing licensing conditions, use of E.164 numbering for Internet Telephony calls has only been permitted for the Unified Licensee having Access Service Authorization. Internet telephony is akin to mobile services. **Thus the use of E.164 mobile Numbering Scheme can also be extended to the internet telephony offered by the OTT/ISP players when in a commercial arrangement with an access service provider.**

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d. **Suggested regulatory obligations:** We suggest the following obligations should be mandatory for the OTT internet telephony service providers in India.

- **Customer on boarding and CAF Audits:** Generally the OTT service providers use the mobile number already available with the subscriber or a virtual number assigned by them and consequently these providers remain outside the purview of CAF requirements, however, in case these service providers are offering unrestricted Internet Telephony in collaboration or under a commercial arrangement with an Access service provider then the responsibility of customer onboarding compliances shall remain with the Access service Provider.

- **Lawful Interception and Monitoring:** The unrestricted Internet telephony service offered by OTT providers under a commercial arrangement with an Access service provider should come under the purview of LIM requirements as applicable for other access service providers and the responsibility of LIM compliances shall remain with the Access service Provider.

- **Call Detail Records and Location:** The unrestricted Internet telephony service providers may be obligated to provide call detail records to the security agencies as per the applicable CDR formats for the Internet Telephony service.

- **Access to Emergency services:** The unrestricted Internet telephony service providers may be obligated to provide access to the Government Emergency services however the limitations in providing location of subscribers may be given due consideration in this case.

  In case the OTT service providers or ISPs wish to provide unrestricted Internet Telephony services independently then they may be asked to acquire/migrate to Unified License with access services authorization.

- Internet Telephony is nothing but a means to provide telephony services, therefore other conditions applicable for protection of interest of subscribers in mobile telephony services like MNP, DND, usage details notifications etc. shall also be applicable for Internet Telephony.

8. **Conclusion:**

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1. **The unrestricted Internet Telephony service is already permitted under the Unified License with Access services authorization/ UASL/CMTS licenses and therefore the relevant terms and conditions of respective licenses are applicable as it is a valid voice service under the scope of License.**
2. **The unrestricted Internet Telephony by the ISPs / OTTs may be allowed only if they migrate to the Unified License with Access services authorization or they offer this service under a commercial arrangement with an existing Access service provider.**
3. **There is a need to promote the innovative services like OTT internet telephony.**
4. **The Authority shall endeavour to provide an enabling regulatory framework to promote unrestricted Internet Telephony offered by OTT players under commercial arrangements with Unified License with Access services authorization/ UASL/CMTS licenses**
5. **There is no need to have provisions on numbering resources, interconnection, IUC etc. separately for unrestricted Internet Telephony offered by OTT or any other players in collaboration with an Access services licensee.**

9. Keeping in light the aforesaid backdrop, the queries raised in the Consultation Paper are answered as follows:

Issue wise Comments:

Q1: What should be the additional entry fee, Performance Bank Guarantee (PBG) and Financial Bank Guarantee (FBG) for Internet Service providers if they are also allowed to provide unrestricted Internet Telephony?

RJIL Response:

1. As mentioned in the General comments, TRAI in its recommendations on 'Issues related to Internet Telephony' dated 18th August 2008 recommended to the Government that ISPs should also be permitted to provide unrestricted Internet Telephony. However, these recommendations of TRAI were not considered by the Government at that point of time.

2. Further, if we compare the access service vis-à-vis ISP licence, there is significant difference in terms of scope, obligations and investment made (or required to be made)

by these licensees. Allowing both these kind of service providers to provide the same service despite one (ISP) not having to invest at the same scale as the other (Access Service Provider) is not equitable. Just prescribing additional entry fee, Performance Bank Guarantee (PBG) and Financial Bank Guarantee (FBG) is not sufficient to remove the advantage to ISPs in this regard. 158

3. It must be noted that unrestricted internet telephony is already permitted under the scope of Access Services authorization in the Unified License and post delinking of license from the spectrum, there is no obstacle or financial hindrance that should prevent the internet service providers from obtaining the Access services authorisation. Further, the prevailing financial requirements for access services authorisation are no way onerous and any ISP interested in offering Internet telephony shall comply with the same.

4. Therefore, in view of the above, ISPs should not be allowed to provide unrestricted Internet Telephony under their existing license and instead all aspiring providers of unrestricted Internet telephony (including existing ISPs) should be mandated to apply for/ migrate to the access services authorization of Unified Licence or offer these services under a commercial arrangement with a Access services licensee.

Q2: Point of Interconnection for Circuit switched Network for various types of calls is well defined. Should same be continued for Internet Telephony calls or is there a need to change Point of Interconnection for Internet Telephony calls?

RJIL Response:

1. As per the prevailing interconnection framework, the existing circuit switched POI were prescribed keeping in view the SDCA based distributed, time consuming and inefficient hierarchy of Fixed network. In the era of Unified Licence and new technologies, wherein even fixed networks are continuously being replaced by IP based networks, such an arrangement is completely redundant at present. There is immediate need to review the prevailing interconnection framework, not only from the perspective of Internet telephony but the POIs should be redefined even for the fixed line and mobile services, as well. However, as we have said earlier also, Internet Telephony is akin to mobile services, therefore, for the purpose of interconnection, it should be treated same as Mobile Networks.
2. In this context, it is also submitted that for the Unified Licensee having PAN India networks, there should not be necessity of LSA based segmentation of the network, and the requirement to route the traffic through NLDO should be done away with. This is in

line with the convergence of networks as envisaged in the NTP'2012. National Telecom Policy -2012 sets out the vision to provide secure, reliable, affordable and high quality converged telecommunication services anytime, anywhere for an accelerated inclusive socio-economic development. Relevant strategies provided in the NTP are as follows:

3.1 To orient, review and harmonise the legal, regulatory and licensing framework in a time bound manner to ***enable seamless delivery of converged services*** *in a technology and service neutral environment. Convergence would cover:*

3.1.1 Convergence of services i.e. convergence of voice, data, video, Internet telephony (VoIP), value added services and broadcasting services.

3.1.2 Convergence of networks i.e. convergence of access network, carriage network (NLD/ ILD) and broadcast network.

3.1.3 Convergence of devices i.e. telephone, Personal Computer, Television, Radio, set top boxes and other connected devices.

3. Interconnection of the Internet telephony network with PSTN/PLMN/GMPCS networks is already permitted under the Unified License having authorization of access services and all voice traffic can be terminated by an Unified Licencee having authorization of access services on the existing Point of Interconnection (POI), irrespective of this being an Internet telephony traffic or otherwise. In order to facilitate convergence, till such time prevailing Interconnection framework gets suitably amended in line with the strategies of NTP'2012, the current POI for various calls should continue to be applicable for the unrestricted internet telephony offered by OTT players in collaboration with Unified Licence having authorization of access services.

4. In case of OTT / ISP service providers are interested in offering unrestricted telephony to its users, they can make commercial arrangements with a licensed service provider as suggested in general comments and offer their services, another option can be by leveraging the transit facility available to Access service providers and National Long Distance service providers to terminate calls to PSTN. The partnering access provider can be made responsible for LIM requirements for all OTT/ISP Internet Telephony calls carried on its network. This will obviate the need of defining new interconnection norms for these service providers as the Access service provider under its current license is anyhow permitted to terminate Internet Telephony calls on its existing POIs with other service providers. Additionally, in case a service provider has existing interconnection with other service providers and wishes to add the unrestricted Internet telephony layer in its network, its current interconnect arrangements should suffice.

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5. It is pertinent to note here that despite Authority's recommendations to explicitly permit IP interconnection having been accepted by the Government by issuing necessary amendment to the Unified License, the resistance to upgrading to new technology persists. Therefore in order to realize the universal IP based interconnection, we request Authority to make it mandatory and the TSPs having TDM network should be mandated to bear the cost of requisite media gateways.

Q3: Whether accessing of telecom services of the TSP by the subscriber through public Internet (internet access of any other TSP) can be construed as extension of fixed line or mobile services of the TSP? Please provide full justification in support of your answer.

RJIL Response:

Internet Telephony is not location specific so it cannot be categorized as fixed line. As already submitted that it should be treated like mobile services.

Q4: Whether present ceiling of transit charge needs to be reviewed or it can be continued at the same level? In case it is to be reviewed, please provide cost details and method to calculate transit charge.

RJIL Response:

1. The provision of transit of telecom traffic is merely an extension of the facilitation to cover gaps in interconnection and maintain continuity of service. It should not be treated as the substitution of the requirement of establishing POIs by a new service provider with all access service providers. However, it should be leveraged to provide access to OTT service providers.
2. The prescribed ceiling of transit charges is on higher side and therefore it may be reviewed from the present prescribed limit of the less than 15 Paise/min. The Authority may consider to review the transit charges along-with the IUC review exercise, for which consultation paper has already floated by the Authority..

Q5: What should be the termination charge when call is terminating into Internet telephony network?

&

Q6: What should be the termination charge for the calls originated from Internet Telephony Network and terminated into the wireline and wireless Network?

RJIL Response:

1. The termination charges of voice calls including the internet telephony calls by the access service providers are very well defined under the prevailing interconnection regulations. As the unrestricted Internet telephony by other providers like OTT and ISP will be provided only in commercial arrangement with Access service providers the termination charges for such calls may be kept same as other calls.

2. However, we reiterate that the best model for termination charges in India remains 'Bill and Keep' (BAK) and the Authority should, be consistent with its earlier position, implement the BAK method.

Q7: How to ensure that users of International Internet Telephony calls pay applicable International termination charges?

RJIL Response:

It should be the responsibility of the Access Service Provider offering Internet telephony in collaboration with the OTT provider or otherwise to ensure that the international internet telephony calls are terminated in India through a licensed ILDO. This is one major area with possibility of arbitrage therefore the Authority may also mandate financial disincentives in case of willful non-compliance and attempts at arbitrage to this case.

Q8: Should an Internet telephony subscriber be able to initiate or receive calls from outside the SDCA, or service area, or the country through the public Internet thus providing limited or full mobility to such subscriber?

RJIL Response:

Yes, the entire purpose of internet telephony is that the subscribers, as long as they have an internet connection, should be able to initiate a call. Unrestricted internet telephony should be truly unrestricted and should not be bound by restrictions like being within the SDCA, etc. However, as indicated in our response to Question 7 above, appropriate measures must be taken for Internet Telephony for incoming international calls.

Q9: Should the last mile for an Internet telephony subscriber be the public Internet irrespective of where the subscriber is currently located as long as the PSTN leg abides by all the interconnection rules and regulations concerning NLDO and ILDO?

RJIL Response:

1. By virtue of the definition of internet telephony, yes, the last mile of the internet telephony subscriber will be public internet. Of course the PSTN leg of the call should comply with all interconnection rules and regulations concerning NLDO and ILDO with minor variances owing to the intrinsic nature of Internet telephony.

2. The voice traffic flow in unrestricted Internet Telephony is not very different from the voice traffic flow in the circuit switched networks. The only difference is that it involves the session border controller (SBC), which is a dedicated hardware device or software application that governs the manner in which phone calls are initiated, conducted and terminated on an Internet Telephony network. All PSTN calls initiated by an unrestricted Internet telephony customer can be handed over at the respective local POIs in the respective service areas post routing through an NLDO. Thus it is in no manner different to the normal offnet inter-circle call for the receiving party.

Q10: What should be the framework for allocation of numbering resource for Internet Telephony services?

RJIL Response:

1. The use of E.164 numbering resource is clearly permitted in the Unified Licence with Access Service authorization. Further, NTP'2012 envisage convergence of services i.e. convergence of voice, data, video, Internet telephony (VoIP), value added services and broadcasting services. Therefore, there is no need to create a separate identification of the internet telephony calls based on the number. The prevailing framework for allocation of numbering resources to Access Service Providers shall be continued for allocation of numbering resources for internet telephony services, as well. This is well defined under the current license conditions wherein only access service providers are allowed this as detailed below:

   a. **<u>Unified License with authorization to provide Access Services:</u>**

   "2.1(a) (i) The Access Service under this authorization covers collection, carriage, transmission and delivery of voice and/or non-voice MESSAGES over Licensee's network in the designated Service Area. ***The Licensee can also provide Internet Telephony,*** *Internet Services including IPTV, Broadband Services and triple play i.e voice, video and data.* ***While providing Internet Telephony service, the Licensee may interconnect Internet Telephony network with PSTN/PLMN/GMPCS network.*** *The Licensee may provide access service,*

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which could be on wireline and / or wireless media with full mobility, limited mobility and fixed wireless access."

Clause 2.5: *IP Address assigned to a subscriber for Internet Telephony shall conform to IP addressing Scheme of Internet Assigned Numbers Authority (IANA) only.* ***Translation of E.164 number / private number to IP address and vice versa by the licensee for this purpose shall be as per directions/instructions issued by the Licensor.***

b. <u>Unified License with authorization to provide Internet Services:</u>

Clause 2.1 (iii): The Internet Telephony, only as described in condition (ii) above, can be provided by the Licensee. ***Voice communication to and from a telephone connected to PSTN/PLMN/GMPCS and use of E.164 numbering is prohibited.***

Clause 2.1 (iv): ***Addressing scheme for Internet Telephony shall conform to IP addressing Scheme of Internet Assigned Numbers Authority (IANA) only and the same shall not use National Numbering Scheme / plan applicable to subscribers of Basic / Cellular Telephone service. Translation of E.164 number / private number to IP address allotted to any device and vice versa, by the licensee to show compliance with IANA numbering scheme is not permitted.***

From the above, it can be seen that use of E.164 Numbering Scheme, which is applicable to the subscribers of Basic/ Cellular Telephone services as per National Numbering Plan is permitted only to the access service providers. Therefore the OTT/ISP providers opting for commercial arrangements with access service providers should be accorded the same facility.

2. Further, the time is now ripe for moving towards an 11-digit numbering system, as most of the TRAI recommendations for effective utilization have been implemented and it appears that there is not much scope to recycle the numbers any more.

3. Furthermore, in the multi-operator, multiple SIM scenario, the artificial conditions of reaching a threshold limit of the attached VLR in order to apply for additional numbering resources need to be removed as with the advent of 4G service these are required to spread the rollout of broadband, as wireless is the only feasible mode to connect the unconnected.

4. Additionally, the advent of Internet of things (IoT) further entails that more and more numbers will be required by the same set of users.

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Q11: Whether Number portability should be allowed for Internet Telephony numbers? If yes, what should be the framework? 164

RJIL Response:

1. The basic premise of number portability is to allow a dissatisfied subscriber to change his service provider without changing his mobile number. As the unrestricted Internet Telephony will be provided under the same access service license conditions, there is no need to change portability obligations. Therefore we do not see any case for not providing the same facility to the internet telephony subscribers.

2. As detailed in the General Comments and in response to Q 10 above, use of E.164 numbering resource for internet telephony is clearly permitted in the Unified Licence with Access Service authorization, therefore we do not see any case for not providing the same facility to the internet telephony subscribers.

Q12: Is it possible to provide location information to the police station when the subscriber is making Internet Telephony call to Emergency number? If yes, how?
&
Q13: In case it is not possible to provide Emergency services through Internet Telephony, whether informing limitation of Internet Telephony calls in advance to the consumers will be sufficient?

RJIL Response:

1. As discussed in the General Comments, the only mode of providing location information will remain the IP address of the last mile internet access and on this basis the access point of the internet access may be located, this may be the closest possible approximation to the location of the subscriber.

2. The security agencies, even at present are able to utilize the IPDRs to great effect, therefore we do not see this as a major hindrance in provisioning of the internet telephony. However, we reiterate that all the internet telephony providers must be required to fully comply with the lawful interception and monitoring requirements. In this regard, we suggest that the following recommendations from the TRAI's recommendations on 'Issues related to Internet Telephony' dated 18th August 2008 shall be reiterated:

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a. All Service Providers providing Internet telephony within country shall ensure installation of suitable LI equipment in time bound manner as prescribed by DoT.
b. Pre-clearance of LI equipment by security agencies shall be required prior to starting of Internet telephony services.

3. The provision of Emergency services has two aspects. Firstly, access to the service area wise emergency number should be mandated as in the case of access services. Secondly, the provisioning the emergency service based on the location information of the subscriber, which may not be possible with a level of accuracy in Internet telephony due to the nomadic use of internet telephony.

4. We believe that the Authority may employ the judicious mix of both the options discussed in the consultation paper. The internet telephony service provider, may be required to transparently communicate that the emergency services may not be available due to in availability of the exact location and simultaneously, the Authority may mandate the routing of emergency services call to appropriate geographically decentralized emergency service centres.

Q14: Is there a need to prescribe QoS parameters for Internet telephony at present? If yes, what parameter has to be prescribed? Please give your suggestions with justifications.

RJIL Response:

1. We believe that for a service which depends upon public internet as last leg, forceful imposition of requirements of the Quality of Service will tend to be onerous. Anyhow the Internet telephony service providers will have to compete with other Access service providers on quality, therefore they will be required to maintain a certain level of quality.

2. Further, the Authority, may advise the internet telephony service providers to self-regulate for now and reiterate its previous recommendations as
   a) QoS on Internet telephony may be left to market forces at present.
   b) The service providers must inform QoS parameters supported by them to their subscribers so that they can take informed decision.
   c) The Authority shall review the decision regarding mandating QoS to Internet telephony service providers at appropriate time.

Q15: Any other issue related to the matter of Consultation.

Nil

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ANNEXURE P-22

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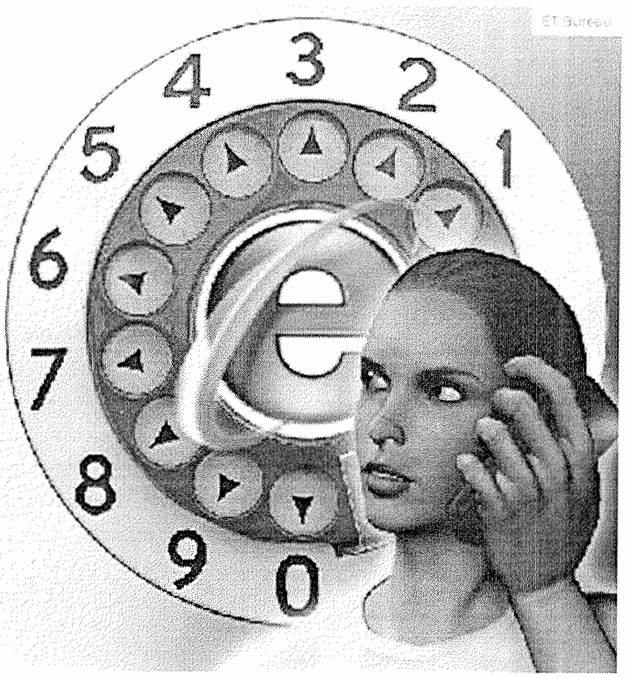
Alert: Manabe, Hasselmann and Parisi win 2021 Nobel Prize in Physics

Stop illegal routing of internet telephony calls: COAI

ET Bureau Last Updated: May 05, 2016, 08:29 PM IST

Synopsis
The COAI's letter has been triggered by state-run Bharat Sanchar Nigam's recent reported plans of launching an app that allows a customer travelling overseas to connect to his local landline back home.



KOLKATA: The Cellular Operators Association of India (COAI) has urged the telecom department (DoT) to stop illegal routing of internet telephony calls, warning that a failure to do so would lead to a breach in telco licence conditions, pose security risks and cause sizeable losses to the national exchequer.

Internet telephony refers to the use of public internet to transmit voice.

"The DoT must direct all licensees not to terminate internet telephony calls by misusing interconnection links meant for terminating calls originating from landline and mobile networks," wrote the COAI in a letter to Telecom Secretary J S Deepak.

telecom: COAI

5G tech safe; concerns around health consequences misplaced: COAI

167 Trai's suggestion to waive RoW charges for 5 years to significantly reduce network rollout cost: COAI

COAI approaches Health Ministry; seeks COVID vaccination for frontline telecom workers

COAI seeks cut in levies, other relief measures; telecom among most heavily taxed sectors

The COAI is the lobby body representing India's biggest GSM carriers such as Bharti Airtel NSE 2.55 %, Vodafone India and Idea Cellular amongst others. Newcomer Reliance Jio Infocomm is also a COAI member, but the GSM industry body in its letter said Jio held a divergent view on the matter.

Jio did not reply to ET's queries at press time.

The COAI's letter has been triggered by state-run Bharat Sanchar Nigam's recent reported plans of launching an app that allows a customer travelling overseas to connect to his local landline back home with his cellphone and make calls without attract ISD charges.

In its letter to Deepak, the COAI has called for a separate numbering series for internet telephony since it is different from landline and mobile services.

It has also suggested that a separate numbering series for internet telephony services be done "through a consultative process", especially since it is yet to be defined under the National Numbering Plan (NNP).

Accordingly, the COAI feels that if an operator uses existing number series assigned to it for terminating landline/mobile calls also for terminating internet telephony calls, "it would be a violation of the NNP".

Such handover of internet telephony calls with caller-line identification (CLIs) designated for fixedline/mobile numbers, it said, would also lead to breach of licence conditions and pose national security risks as it would be a challenge tracing the origin of such calls.

"Terminating operators would have no ways to detect such internet telephony calls, since international calls, which should ideally be routed through international long distance operators (ILDOs), would in this case be illegally routed as local calls, posing a threat to national security," warned the COAI in its letter to the Telecom Secretary.

Illegal routing of internet telephony calls would also cause losses to the national exchequer as the current termination charge for domestic calls is only 14 paise/minute, which is way below the international call termination rate of 53 paise/minute.

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government need to interfere in this matter.

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ANNEXURE – P-23

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Telecom Regulatory Authority of India

Recommendations

on

Spectrum Management and Licensing Framework

11th May, 2010

Mahanagar Doorsanchar Bhawan

Jawahar Lal Nehru Marg,

New Delhi – 110002

2.102 Therefore, the Authority is of the opinion that in view of increasing role of IP-1 in the sector, there are enough reasons to bring them under the ambit of licensing regime. This will also facilitate the following:

- By licensing them, they can also be permitted to provide both passive and active infrastructure, independent of the service providers. This will facilitate faster roll out and reduction in the capital expenditure on the part of the service providers.
- Currently, tower providers are facing restrictions from different local bodies and are being subjected to local regulations which are not uniform. Bringing them under the licensing regime would facilitate a more orderly development.
- The scope for arbitrage will be significantly reduced.

2.103 **In view of the foregoing, the Authority recommends that IP-I category be also brought under the licensing regime with immediate effect.**

Internet Service providers

2.104 To start with, Internet Service providers licence was opened for private sector from November '98 and carried with it no Entry Fee and a licence fee of Re.1 per annum. Restricted internet telephony service was permitted to the ISPs from 1st April, 2002. The licence fee was waived upto 31.10.2003 and a nominal licence fee of Re. 1 became payable from 1.11.2003 to 31.12.2005. With effect from 01.01.2006, the licence fee became 6% of AGR in addition to Re 1 per annum in respect of ISPs with Internet telephony. As per the new guidelines for grant of licence for operating Internet Services issued by DOT in August 2007, all ISPs were permitted to provide

Internet telephony and separate category of Internet Telephony Service Providers (ITSPs) has been done away with. Licence fee of 6% of AGR was imposed on all ISPs except on the revenue earned from provisioning of pure Internet access services.

2.105 Despite a token licence fee for ISP, the number of internet subscribers has grown from 5.14 million in September 2004 to only 15.24 million by the end of December 2009. Of this, the number of broadband subscribers is 7.83 million. These numbers are way below the target of 40 million and 20 million by the end of 2008 for internet and broadband subscribers respectively. Further, out of the existing 165 active ISPs (as against 375 registered), 95.9% subscribers are covered by the top 10 ISPs, with the two PSUs (BSNL & MTNL) having more than 70% of the market share. The annual Revenues from ISPs is estimated to be about Rs 7000- 8000 Crore. Of this, the revenue from the Internet service providers with Internet telephony amounts to about Rs. 1200 crore This amount would be far higher since the deductions allowed from Gross revenue for arriving at the AGR are over 90% of gross revenue.

2.106 The Authority in its recommendations on "Review of Internet services" sent to DoT on 10th May, 2007 observed that there was a need to stop revenue leakage and prescribe uniform formula for imposing licence fee and recommended a uniform annual licence fee equivalent to 6% of AGR on all ISPs including revenues earned from provision of Internet Access, Value Added Services and Broadband in ISP domain. It also recommended a single Internet service provider licence. In the letter dated 31st March, 2009 to the DoT as a follow-upto the recommendations dated 18th August, 2008 on "Issues relating to Internet Telephony", the Authority

once again underlined the possibilities of arbitrage and pointed out that most of the UAS licensees, who can provide internet and broadband including triple play services under UASL, also take separate ISP licence and provide these services (Internet and broadband services) under ISP licence, thereby avoiding the incidence of licence fee.

2.107 The above position has not changed and the Authority feels that the recommendations given earlier should be given consideration. Some stakeholders have represented that levying licence fee on Internet service providers providing pure Internet access would come in the way of the spread of Internet and broadband in the country and jeopardise the growth of telecom sector. The Authority has duly considered this matter. The growth of Internet so far has been low and falls far short of the targets. There is no demonstrable correlation between the absence of licence fee and growth of Internet spread. On the other hand, the lack of licence fee enables scope for arbitrage as brought out by the Authority in the past.

2.108 At the same time, the Authority is keen that the spread of Internet should be much faster than has been so far. In August 2007, pursuant to the recommendations of this Authority, DoT had done away with the Category 'C' license in ISP with the result that today, there is no licence at the sub-State level. The Authority is of the opinion that multiple operators should be allowed including at the local level with low entry fee. Accordingly, the Authority would like to reintroduce the 'C' Category licence with a District-wide jurisdiction. This would enable small operators including the cable operators to offer Internet service along with other services.

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For Immediate Release 174

Telecom Regulatory Authority of India releases Recommendations on "Regulatory Framework for Over-the-top (OTT) communication services"

New Delhi, 14.09.2020, The Telecom Regulatory Authority of India (TRAI) has today released Recommendations on **"Regulatory Framework for Over-the-top (OTT) Communication Services"**, after a multistage consultation process.

2. Earlier, Department of Telecommunications (DoT) vide letter No.12-30/NT/2015/OTT(Pt) dated 3.3.2016 sought the recommendations of TRAI on net neutrality including traffic management and economic, security and privacy aspects of OTT services, apart from other relevant standpoints as covered in the consultation paper dated 27.3.2015.

3. Considering the complexity of issues, referred to in the DoT's letter, and other interrelated issues, the Authority decided to deal with specific issues through distinct consultation processes. The Authority has already issued recommendations or regulations pertaining to 'Prohibition of Discriminatory Tariffs for Data Services', 'Regulatory framework for Internet Telephony', 'Net Neutrality' and 'Privacy, Security and Ownership of Data in the Telecom Sector'.

4. In arriving at these recommendations on the residual issue i.e. 'Regulatory Framework for Over-the-top (OTT) communication services', TRAI issued a Consultation Paper on 12th November 2018 and raised various issues like Similarity and Substitutability of TSP and OTT services, Regulatory Imbalance and Non-Level playing field between TSPs and OTT service providers, Economic aspects, Interoperability, Lawful Interception of OTT services and Access of emergency services from OTT etc. for comments and counter comments from stakeholders. Subsequently, two Open House Discussions (OHD's) were held one at Bangalore on 24th April 2019 and another one at Delhi 20th May 2019, where stakeholders participated and deliberated on the issues.

5. The salient features of the recommendations are:

(i) Market forces may be allowed to respond to the situation without prescribing any regulatory intervention. However, developments shall be monitored and intervention as felt necessary shall be done at appropriate time.

(ii) No regulatory interventions are required in respect of issues related with Privacy and security of OTT services at the moment.

(iii) It is not an opportune moment to recommend a comprehensive regulatory framework for various aspects of services referred to as OTT services, beyond the extant laws and regulations prescribed presently. It may be looked into afresh when more clarity emerges in international jurisdictions particularly the study undertaken by ITU.

6. The full text of the recommendation is available on TRAI website www.trai.gov.in In case of any clarification, Shri Asit Kadayan may be contacted at email advqos@trai.gov.in.

(S.K.Gupta)
Secretary, TRAI
14/9/2020

IN THE HIGH COURT OF DELHI AT NEW DELHI

WRIT PETITION (CIVIL) NO. 11173 OF 2019

IN THE MATTER:

WORLD PHONE INTERNET SERVICES PRIVATE LIMITED
...PETITIONER

VERSUS

UNION OF INDIA &ORS
...RESPONDENTS

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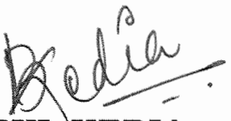

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Dated: 7th October 2021

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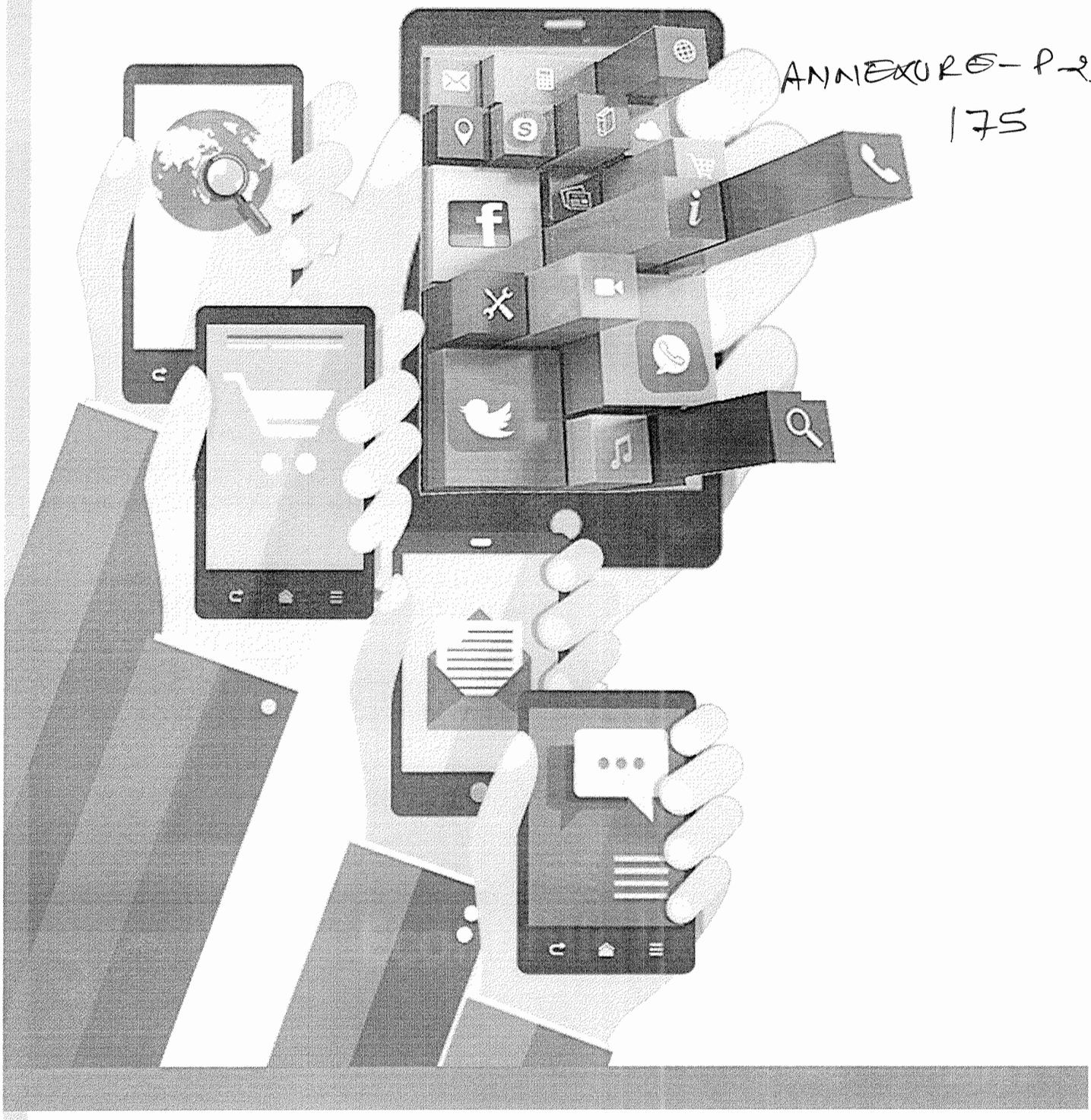

Economic Impact of OTTs

Technical Report

2017

Summary

This technical paper seeks to provide technical and policy background to the international community in both developed and developing countries as to the nature and implications of Over-the-Top (OTT) and related online services.

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Keywords

OTTs, online services, economic impact, policy, infrastructure cost, infrastructure investment, benefits, societal welfare, vertical integration, horizontal integration, policy challenges, policy approaches

Change Log

This document contains the ITU-T Technical Paper "Economic impact of OTTs" approved at the ITU-T Study Group 3 meeting held in Geneva, 5-13 April 2017.

Editor

Mr Ahmed Said (Egypt)

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ITU Study Group 3 (SG-3) has committed to a work item on the economic impact of over-the-top (OTT) services.

This report (which results from that decision) seeks to provide technical and policy background to the international community in both developed and developing countries as to the nature and implications of Over-the-Top (OTT) and related online services.

The report seeks to be *descriptive* rather than *normative*. It seeks to provide clear statements on the current state of play, and to identify suitable *findings* where appropriate; nonetheless, in many cases, it refrains from expressing findings – even in instances where there is little dispute over the relevant facts, there may be multiple conflicting interpretations and narratives based on those facts. In any event, *recommendations* are clearly beyond the scope of this report.

In order to take the study to its current level, it was necessary to resolve a number of interrelated scoping and definitional questions, at least on a tentative basis (but with the recognition that our tentative definitional conclusions for this study are without prejudice to any future regulatory definitions). Among the issues that had to be addressed:

- What is the proper *scope* for the study?
- Given that there is a very wide range of services that might possibly be classified as online services, what services should be viewed as being OTT services for purposes of this study? How do these OTT services differ from other online services?
- How relevant is the economic concept of *substitution* for traditional telecommunications and broadcasting services to this classification?

Network neutrality is a separate topic in its own right. Since it is extensively covered elsewhere, this report treats the topic as being largely out of scope; however, it is addressed where necessary.

Surveillance, whether for purposes of national security or for law enforcement, is treated as being generally out of scope for this report; however, it was necessary to mention it in passing at several points.

Specific aspects that are explored or provided include:

- what OTT services are (and are not) (Chapter 2);
- the benefits and impacts associated with OTT services (Chapter 3);
- a range of challenges to global public policy (Chapter 4);
- examples of interesting approaches that have been attempted or implemented in various parts of the word (Chapter 5); and
- concluding remarks (Chapter 6).

What are OTT services, and how do they differ from other online services?

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Key Findings

For purposes of this report, an over-the-top (OTT) service is an online service that can be regarded as potentially substituting for traditional telecommunications and audiovisual services such as voice telephony, SMS, video on demand and television. (This working definition for purposes of this report is without prejudice to any regulatory definition that might conceivably be adopted in the future.)

With this working definition in hand, it is possible to characterise OTT services based on the traditional services with which they compete. OTT services compete with voice services (typically by offering VoIP services), with SMS (typically by offering chat and messaging services), with voice and video conferencing, and with television and video on demand (typically by offering streaming services such as Netflix and a range of online video content).

Online services that do not substitute to a significant degree for traditional telecommunications or audiovisual services are, for purposes of this report, not OTT services. In practice, however, the distinction sometimes blurs.

This section offers a working definition of OTT services for purposes of this report, and provide examples of what OTT services are (and are not). In order to have a clear scope for this report, it is necessary to establish clear boundaries, as much possible, as to what services should be viewed as being OTT.

If policy or regulatory measures were to be enacted for OTT services, it would presumably be necessary to establish a regulatory definition for OTT services. Consistent with our approach to recommendations in general, this report does not put forward suggested or recommended regulatory definitions. The working definitions that are used in order to establish the scope of this report are thus without prejudice to whatever regulatory definitions, if any, might eventually be formulated by the ITU or any other body.

2.1 Working definitions for purposes of this report

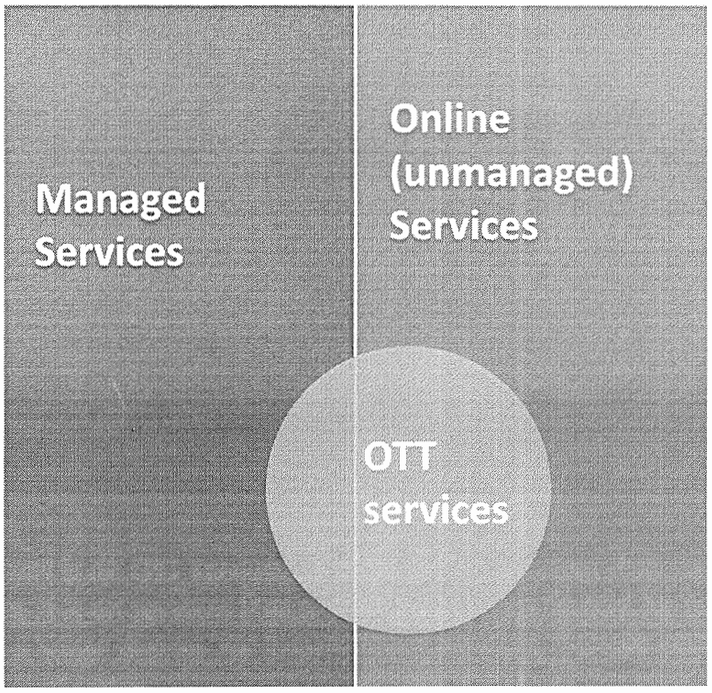
There is no single, universally accepted definition of OTT services or of online services in general. Much of the discussion, however, has tended to focus on establishing a *level playing field*, however defined, between OTT services based on the *Internet Protocol (IP)* and the traditional telecommunications and broadcasting services with which they are presumed to compete. This seems to suggest that competitive neutrality between traditional services and new IP-based OTT services is perceived as an important consideration. With that in mind, the following working definitions will be used for purposes of this report:

- **OTT service:** an over-the-top (OTT) service is an online service that can be regarded as potentially substituting for traditional telecommunications and audiovisual services such as voice telephony, SMS, video on demand and television. [1]

[1] Ilsa Godlovitch, J. Scott Marcus, Bas Kotterink, Pieter Nooren et al. (2015), "Over-the-Top (OTT) players: Market dynamics and policy challenges", study for the IMCO Committee of the European Parliament.

- **Managed service:** a service where the provider offering the service has substantial control over the fixed or mobile access network used for its distribution. The provider may be able to use this control to size its network, or to reserve network capacity to guarantee the quality of the service. [2]
- **Online service:** a service that depends on the public Internet for its delivery, at least in part; consequently, no single network operator can guarantee the quality of the service delivered. [3]

Schematically, the relations among managed services, online services, and OTT services that are assumed for purposes of this report can be viewed as depicted in the Venn diagramme in Figure 1. OTT services are often, but not always, unmanaged.



Source: Marcus

Figure 1. Managed services, online services, and OTT services: a set theoretic view.

Our focus in this report is on OTT services, and on online services that are closely related to them. In other words, it is on services that substitute in some degree for traditional telecommunications and, to a lesser degree, for broadcasting services. [4] Other online services are, as much as possible, out of scope.

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[2] Ibid.

[3] Ibid.

[4] This definition is roughly equivalent in practice to a definition in Shirley Baldry, Markus Steingröver, and Markus A. Hessler (2013), "The rise of OTT players – what is the appropriate regulatory response?" They write: "OTT

2.2 Examples of OTT services for purposes of this report

With these definitions in hand, it is possible to create an organised view of OTT services based on the traditional services with which they compete.[5]

- **Voice services:** Firms include Skype, Viber, the South Korea-based KakaoTalk, and various capabilities that are integrated into social networking and other applications of firms such as Google and Facebook. Some of these services provide voice communications solely or primarily to traditional phones that have phone numbers (e.g. Vonage); some complete calls only to users who have the same application (e.g. KakaoTalk); and many provide both (e.g. Skype). Some offer the ability not only to place calls, but also to receive calls that have been placed to a particular phone number (a service that is sometimes sold separately).
- **SMS services:** A range of chat services are prominent, most notably Whatsapp and Viber.
- **Teleconferencing:** Skype is prominent in this sector, as is Google Hangout. In the traditional telecommunications world, teleconferencing has been primarily a service for large enterprises because it is fairly expensive. OTT services enable inexpensive or free videoconferencing with a range of value-added features, but at a level of transmission quality that can be fairly low.
- **Broadcast (linear) video:** A range of IPTV offerings compete with traditional broadcasting.
- **Video on demand:** Online services can offer a more flexible alternative to traditional video on demand services as well. YouTube is a conspicuous example, but there are many more.

The degree to which these OTT services substitute for the services with which they compete can vary greatly from one service to the next.

- Many would argue (see Figure 2) that chat services have collectively reversed the previous growth trend of SMS, and that it can be presumed to be taking substantial business away from traditional network operators. [6]
- Substitution effects can however be more complex, as appears to be the case with VoIP services such as Skype (see Figure 3). Skype appears to be very successful in taking *international* calling business away from traditional network operators (presumably because it is inexpensive and simple), but it appears to have been less successful in gaining market share among *domestic* calls made (presumably due to factors such as relatively low voice quality). [7]

Communication refers to services whose primary applications lie in communications but use the internet as the transport medium. This is especially relevant to telecom operators since these services operate in a similar space as traditional voice and messaging services."

[5] The taxonomy here is a bit more detailed than that provided by the Indian TRAI, but broadly consistent with it. They note that "Based on the kind of service they provide, there are basically three types of OTT apps: (i) Messaging and voice services, (Communication services); (ii) Application eco-systems (mainly non-real time), linked to social networks, e-commerce; and (iii) Video / audio content." See TRAI (2015), "Consultation Paper on Regulatory Framework for Over-the-top (OTT) services".

[6] Caution is given, here and throughout, that the accuracy of analyst estimates such as these cannot be guaranteed; moreover, forward-looking projections are subject to numerous uncertainties.

[7] As networks gain in speed and capability, this might perhaps reverse. Voice quality of VoIP might well improve over time. Indeed, VoIP is not forced to "clip" high frequency response as is the case with traditional telephony; consequently, it is quite possible in the long term that VoIP will offer audio quality of higher fidelity than that of the traditional voice telecommunications network.

There are often gaps in the ability of OTT services to substitute for a traditional telecommunications or broadcasting service. Often, OTT services function as *imperfect substitutes*. In principle, these apparent substitution effects can be measured and assessed using econometric techniques. In practice, however, data quality may pose challenges, and it is often difficult to establish a clear causal relationship. That usage of a traditional service declined while that of a new IP-based OTT service increased may be *suggestive* of a causal relationship, but the two tendencies may be unrelated to one another, or may both result from some unobserved third phenomenon.

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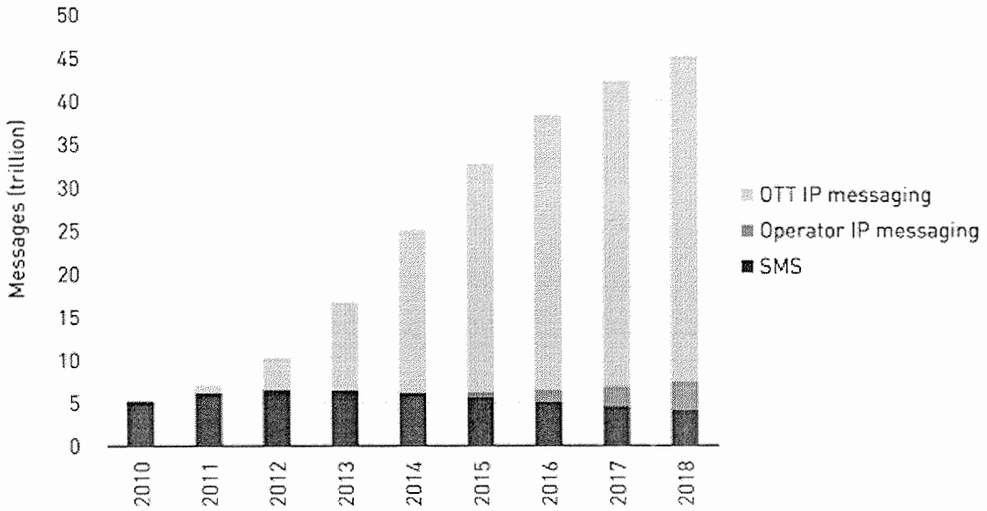
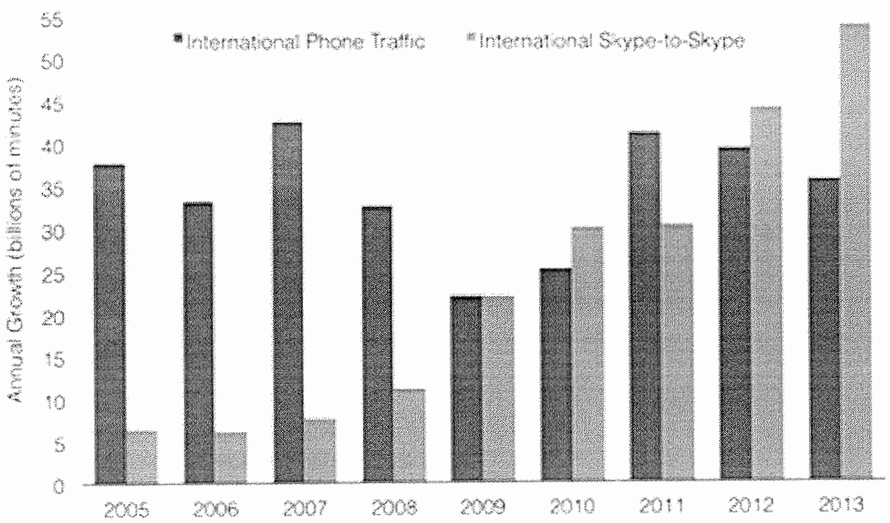


Source: Analysys Mason[8], 2014

Figure 2. Volume of messages from mobile handsets.



Source: Telegeography[9], 2014

Figure 3. Year over year increase in international telephone traffic and Skype traffic (billions of minutes).

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8 See http://www.analysysmason.com/About-Us/News/Insight/OTT-messaging-volumes-Jan2014-RDMV0/.

9 Telegeography (2014), "Skype Traffic Continues to Thrive", 15 January 2014, viewed 26 December 2015, at https://www.telegeography.com/press/marketing-emails/2014/01/15/skype-traffic-continues-to-thrive/.

On the other hand, OTT services often offer capabilities that are either unavailable with traditional services, or else available only at significant cost. Skype, for instance, functions not only as a voice communications substitute (and to some extent as a chat medium), but also offers voice conferencing and videoconferencing, both to and among users of the Skype application and to traditional phones (but only for voice in the latter case). Videoconferencing over the traditional telecommunications is available, but only at a cost that makes it inaccessible to most consumers. 184

In other words, the competition that OTT services offer to traditional services is complex. In some areas, OTT services may fall short in comparison with traditional services with which they compete, while in other aspects, they may greatly exceed what traditional services typically deliver.

2.3 Examples of online services that are not OTT services for purposes of this report

In creating a working definition for purposes of this report, understanding what is *out of scope* is just as important as understanding what is *in scope*.

Some definitions treat *all services delivered over the Internet* as being over-the-top. For instance, the *Board of European Regulators of Electronic Communications (BEREC)*, whose members include the *national regulatory authorities (NRAs)* of all Member States of the European Union, recently defined OTT services in terms of "content, a service or an application that is provided to the end user over the open Internet." [10] For purposes of this report, such a broad definition seems to be unhelpful.

Similarly, according to a recent consultation document on the part of the Indian TRAI, [11]"An OTT provider can be defined as a service provider offering ICT (Information Communication Technology) services, but neither operates a network nor leases network capacity from a network operator." This paper notes that the "... best known examples of OTT are Skype, Viber, WhatsApp, Chat On, Snapchat, Instagram, Kik, Google Talk, Hike, Line, WeChat, Tango, e-commerce sites (Amazon, Flipkart etc.), Ola, Facebook messenger, Black Berry Messenger, iMessage, online video games and movies (Netflix, Pandora)." The consultation document speaks of three kinds of OTT services:

- Messaging and voice services (communication services);
- Application eco-systems (mainly non-real time) linked to social networks, e-commerce; and
- Video / audio content.

A somewhat narrower approach has been used for this report. Messaging and voice services clearly fall within the definition employed in this report, as do visual and audio content; however, application ecosystems would be out of scope, except to the extent that they compete with traditional telecommunications and audiovisual services.

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10 BEREC (2015), "Draft Report on OTT services", BoR (15) 142. They go on to provide a "taxonomy of OTT services that consists of (a) OTT-0 services, which are OTT services that qualify as ECS, (b) OTT-1 services, which are OTT services that do not qualify as [Electronic Communications Services (ECS)] but do potentially compete with ECSs and (c) OTT-2 services, which are the remaining category consisting of OTT services that are not an ECS and do not potentially compete with ECSs." Their OTT-1 and OTT-2 services collectively correspond to OTT services as used in this report, while the three sub-categories together correspond roughly to online services as used in this report.

11 Telecommunications Regulatory Authority of India (2015), "Regulatory Framework for Over-the-top (OTT) services".

Online travel services such as Expedia and Orbitz, together with online ticketing capabilities offered by airlines and railroads, clearly compete with traditional "brick and mortar" travel agencies; however, they do not appear to compete with network or broadcasting services. For purposes of this report, they are considered to be online services, but not OTT services.

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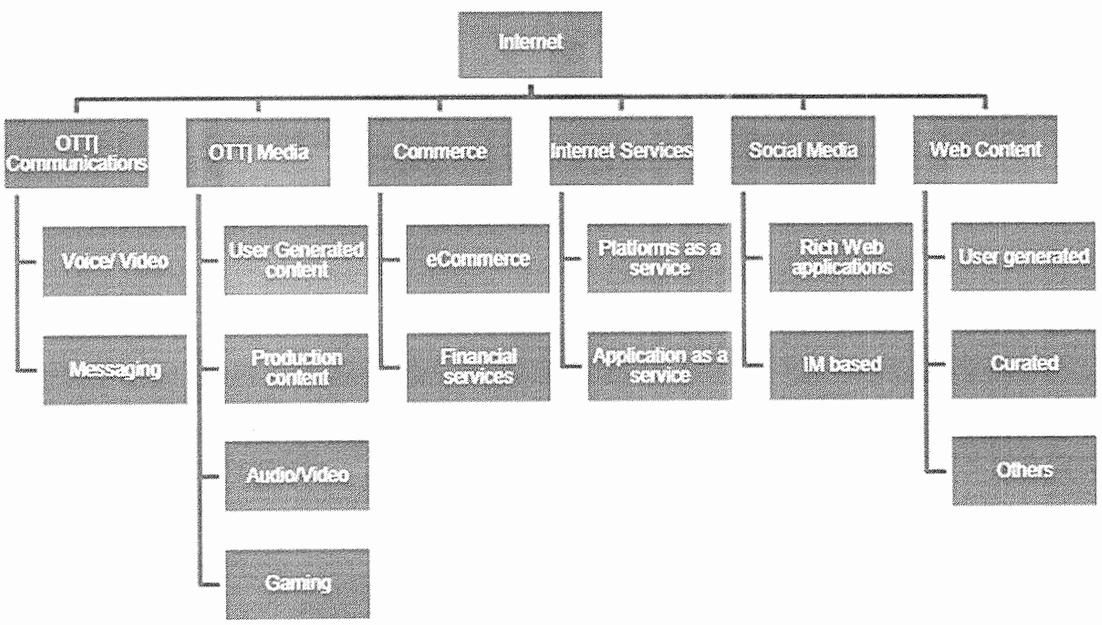
There is a tendency in the press to refer to search engines such as Google, Bing, Yahoo, and Alibaba as OTT services; however, in their role as search engines, they do not obviously compete with any existing telecommunications or broadcasting service. (As explained in Section 3.6, however, it is increasingly common for such services to incorporate complementary capabilities such as messaging or VoIP that clearly constitute OTT services.) For purposes of this report, search engines services are treated as being an online service that is not an OTT service.

Social networking is, for purposes of this report, likewise not an OTT service *per se*; however, this distinction can blur in practice as services become increasingly integrated. Social networking services often offer services that are clearly OTT. Facebook, for instance, acquired the WhatsApp online instant messaging service in 2014, and has had its own offerings for years that provide forms of chat, voice and video calls. Google Hangout offers chat, voice and video services, as well as integration with the Google+ social networking service.

A recent study by Baldry, Steingröver, and Hessler (2013) provides a categorisation of online services. It seems clear that there is a great variety of online services. It is instructive to note that only the first two columns of Figure 4 ("OTT communications" and "OTT media") represent OTT services in the Baldry, Steingröver, and Hessler taxonomy – the rest are online services, but not necessarily OTT services.



Source: Baldry, Steingröver, and Hessler (2013), "The rise of OTT players – what is the appropriate regulatory response?

Figure 4. A categorisation of online services.

Opportunities and impacts associated with OTT services

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Key Findings

Online and OTT services have transformed the economies of both developed and developing countries; moreover, this effect has clearly trickled down to small businesses and to individuals.

Historically, these benefits have tended to be concentrated in developed countries; however, as the process of digitisation accelerates, and as more and more people worldwide are connected to the Internet, these benefits accrue to developed and developing countries alike.

This tendency is closely linked to the growth in the availability and affordability of mobile broadband (and smart phones), which has deepened network coverage and opened it up to the masses, not only in the developed world (where fixed networks were long since fully deployed).

Rigorous proof that OTT services substitute for traditional telecommunications services to a significant degree, but the trends that are visible strongly suggest substitution effects.

Concerns are widespread that OTTs may be impacting the revenues and profits of traditional network operators. This could in turn depress investments that are needed in fibre-based infrastructure, and in new mobile access technologies such as LTE. Different interpretations are possible as to the relevance and severity of this threat.

Online service providers – especially the largest ones – are increasingly vertically integrating networking and content delivery options into their offerings. In most cases, this probably benefits both the online service provider and the network operators that carry their data to end-users.

The best prediction that one can make about the future of OTT and online services, based on previous experience, is that no prediction is safe. Beyond extrapolating the points already made, the following predictions are cautiously made:

- Network traffic associated with audiovisual content will continue to grow, and at a more rapid rate than traffic in general. As a result, the great majority of Internet traffic going forward will be comprised of audiovisual content; nonetheless, linear television is unlikely to disappear for quite some time.
- User-generated content (for instance, YouTube video) can be expected to play an increasingly important role going forward; however, professionally generated content will continue to be important.
- OTT services are likely to be increasingly integrated with related services (for instance, social networking capabilities), and also with real networks that carry the services.

The increasing adoption of OTT services poses various threats to established arrangements, but also entails numerous promising opportunities.

This chapter considers a range of issues, opportunities, and impacts associated with OTT services, and also the drivers of increased deployment, adoption, and use of OTT services; the benefits that

can flow from them; the impacts on traditional providers, and the potential consequences for investment.

The chapter then notes a few likely forward-looking trends, and concludes with a discussion of strengths, weaknesses, opportunities and threats from the perspective of national governments and regulatory authorities.

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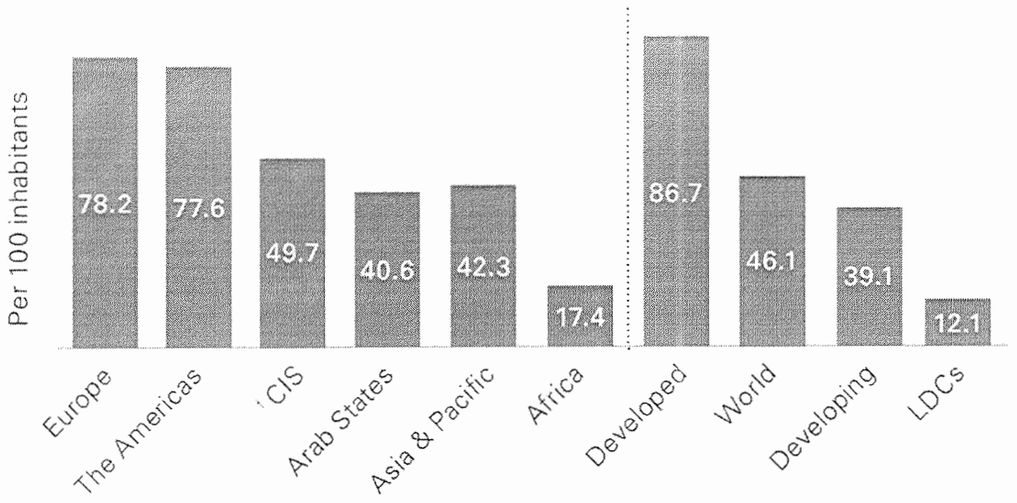
3.1 Improved (mobile) broadband, handsets and tablets as a driver of demand

Chapter 3 spoke of the transformative power of online applications in general, and of OTT services in particular. This tendency appears to be closely linked to the growth in the availability and affordability of *mobile broadband*, which has deepened network coverage and opened it up to the masses, not only in the developed world (where fixed networks were long since fully deployed).[12] ITU has estimated [13] that the coverage of 3G mobile services has expanded from 45% of a global population of 7 billion in 2011, to 69% of a global population of 7.4 billion in 2015, a staggering growth for just four years!

Gaps in coverage remain for now, despite rapid progress. ITU estimates global 3G urban coverage to have reached 89%, but 3G rural coverage to represent a mere 29%. [14] Meanwhile, developed countries can be presumed to benefit from having far more mobile subscriptions per capita than developing countries. The least developed countries (LDCs) have in general the lowest mobile penetration, and thus lowest ability for consumers to access online services in general and OTT services in particular (see Figure 5).



Source: ITU (2015) [15]

Figure 5. Mobile broadband subscriptions (2015).

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12 See also Telecommunications Regulatory Authority of India (2015), "Regulatory Framework for Over-the-top (OTT) services". "The arrival of smartphones with multimedia and advanced communication functions has revolutionized the OTT services market. The greater processing power, easy customisable interface and support of high data rate connectivity make innovation and adoption of OTT apps easier. ... The future of OTT services and their impact will hinge on: a) Growth in penetration of Smartphones (and other smart devices); b) Growth in overall revenues driven by new technologies; c) Growth of IP traffic; and d) Growth of bandwidth consumption."

13 ITU (2015), "ICT Facts & Figures: The world in 2015".

14 Ibid.

15 Ibid.

3.2 Benefits of OTT services

When people speak of the transformative power of the Internet, they often forget that those benefits flow not from the Internet's ubiquitous ability to carry data, but rather from the applications that it enables and the content that it carries. 188

There is little doubt that online and OTT services have transformed the economies of both developed and developing countries; moreover, this effect has clearly trickled down to small businesses and to individuals. Individual craftsmen have access to wider markets, or even to global markets. Economic distortions within countries are reduced, thus raising the economic welfare of all at the same time that it reduces the ability of those "in the know" to exploit individual producers (such as farmers).

Whole economic sectors have been profoundly transformed in complicated ways. A travel industry where travel agents once played a large role is now largely online. Sales of books, music and video content has become a largely online activity. For many, the need to deal face to face with bank personnel is largely a thing of the past. Taxi services are under threat from amateur drivers organised by services such as Uber.

As a related point, the difference between online services versus traditional services may seem less relevant in the years to come, because it will increasingly be the case that all services *are online*.

OTT applications substitute to some degree for traditional telephony and broadcasting, but they also offer many capabilities that go well beyond traditional services. A VoIP service such as Skype, for instance, arguably serves not only as a telephony substitute, but also as a means of enjoying rich videoconferencing. Instant messaging services can provide far richer services than the traditional SMS services that they are to some extent supplanting. OTT video services such as YouTube provide not only access to professionally produced content, but also to user-generated content, thus simplifying and enriching interactions for end-users.

As set out in Section 3.6, integration of OTT networking functions with search functions and with social networking offers additional benefits. The use of search and of social networking enables end-users to locate individuals and companies in ways that never would have been possible with traditional printed telephone directories. [16] This enriches and also simplifies the end user experience.

3.3 Impact on traditional service revenues

Concerns over the impact of OTT services on the revenues of network operators have been noted in both developed and developing countries. The Indian TRAI, for instance, expresses the concern in this way: "[U]nmanaged IP voice services, such as Skype or WeChat or Gmail video chat, can be exploited with lower access speeds. This obviously and adversely impacts the revenue of [network operators]. For example, every Skype call that bypasses the [network operator] is foregone revenue.

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16 One could conceivably argue that social networks and search engines are themselves OTT services to the extent that they compete with printed telephone books, but that seems to be quite a "stretch".

Similarly the use of SMS services, traditionally a lucrative business for mobile operators, is declining. One of the main reasons is the growth of OTT applications like WeChat and WhatsApp. While network quality can be a major constraint to some OTT voice applications, SMS applications are less reliant on network capacity and capability because of their low data usage and higher tolerance for latency. For example, as penetration of smartphones increases, apps like Whatsapp pose a clear challenge to the [network operators] in respect of text messages and even voice messages." [17]

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The usage trends that were previously noted in Figure 2 and Figure 3 are strongly suggestive of substitution that is consistent with the concerns over revenue expressed here.

That seems to be little doubt that revenue is declining for a number of traditional services, especially for SMS. The cause is not proven, but the observed trends are suggestive of substitution effects.

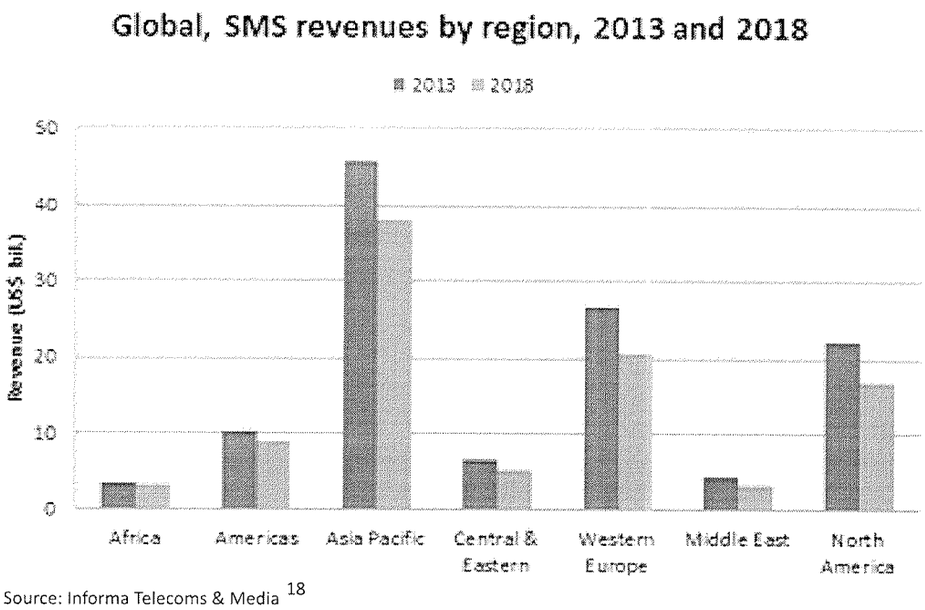

Figure 6. Global SMS revenues by region of the world (2013 and 2018).

Substitution effects are arguably also important for international voice calls. Analyst firm Telegeography notes: "Hundreds of millions of people now use "over-the-top" (OTT) voice, video, and text communications on their computers and mobile devices for a growing share of their calls. Telegeography estimates that the on-net international traffic of Skype, the best-known OTT provider, grew 35 billion minutes in 2014, to 248 billion minutes. While international telephone traffic remains far larger than international Skype traffic, Skype's volumes are enormous. Skype's 2013 international traffic was four times greater than that of the largest telco in the world, and Skype's 2014 traffic growth was nearly 30 percent greater than the volume growth of every carrier in the world, combined.

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[17] Telecommunications Regulatory Authority of India (2015), "Regulatory Framework for Over-the-top (OTT) services".

[18] Informa (2013), "Global annual SMS revenues will be US$23 billion less by 2018", at http://www.informa.com/media/press-releases-news/latest-news/global-annual-sms-revenues-will-be-us23-billion- less-by-2018/#.

Given these immense traffic volumes, it is difficult not to conclude that at least some of Skype's growth is coming at the expense of traditional carriers.

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[emphasis added] If Skype's traffic were added to the volume of international phone calls, international voice traffic would have grown at a compounded annual rate of 13 percent between 2008 and 2013, much closer to historical growth trends. This finding suggests that demand for cross-border communications has not declined, but that an ever-growing number of callers have chosen to take telcos out of the equation." [19]

As in so many aspects of OTT services, these facts are subject to multiple interpretations. One can argue that technological progress inevitably implies the existence, not only of winners, but also of losers. Firms that operated steamship lines did not necessarily benefit from the introduction of steam-based locomotives;[20] firms dependent on horse-drawn transportation did not necessarily benefit from the introduction of automobiles powered by internal combustion engines. The value of this kind of creative destruction is core to the views of the economist Joseph A. Schumpeter. [21] Under this interpretation, the short-term negative impact on network operators is part of a normal long-term business process that ultimately benefits all.

An alternative narrative argues that OTT services are effectively pumping money out of the network operators at the very moment when substantial investments in fibre-based infrastructure are required. This narrative draws on multiple theoretical sources, including Aghion's "inverted U" which argues that investment is maximised when competition is neither too low (implying a lack of competitive incentive to invest) nor too high (implying a lack of funds to invest). [22]

It is also worth noting that the loss in traditional voice and SMS revenues needs to understood in the context of compensating increased revenues for (mobile) data services. The Indian TRAI reports, for instance, that "In India, data usage has increased from 49645 TB in Oct 2013 to 90267 TB in December 2014, showing a cumulative annual growth of 65.2%. The data revenue has nearly doubled, from Rs. 3057.83 Crores in June 2013 to Rs. 5910.28 Crores in September 2014. It is estimated that data revenue as a percentage of overall mobile revenue will reach 32% by 2015 as compared to 14% in 2010." [23] The data consumption of a WhatsApp message does not generate sufficient network operator revenue to offset what an SMS would have generated, but when one factors in the increased number of messages, increased volume of content per message (and for voice, longer duration for voice calls), and all of the other data hungry applications, the effects of online and OTT services on revenues are complex overall (see also Section 3.5).[24]

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19 Telegeography (2013), Telegeography Report, Executive Summary, at https://www.telegeography.com/page_attachments/products/website/research-services/telegeography-report- database/0005/5686/TG_executive_summary.pdf.

20 Occasionally, a visionary leader can make the disruptive leap. Cornelius Vanderbilt managed to build a railroad empire on top of his earlier steamship empire.

21 See especially Chapters VII and VIII of Schumpeter's Capitalism, Socialism and Democracy, Second Edition, 1942.

22 Philippe Aghion et al. (2005), Competition and Innovation: An Inverted U Relationship, Quarterly Journal of Economics, 120(2), S. 701-728.

23 Telecommunications Regulatory Authority of India (2015), "Regulatory Framework for Over-the-top (OTT) services".

24 Telecommunications Regulatory Authority of India (2015), "Regulatory Framework for Over-the-top (OTT) services". "The OTTs are quick to point out that increased data usage augments revenue flows of the TSPs. This is indeed true. However, whether this revenue sufficiently compensates the TSPs needs further examination."

3.4 Impact on infrastructure cost and investment

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Numerous governments and regulatory authorities worry that OTT services are having an impact on the investments of network operators, and that this impact may impact their ability to make investments going forward in new fibre-based technologies (impacting both fixed and mobile deployment), and in new mobile access technologies such as LTE. [25]

Analyst firm Telegeography, for instance, expressed the concern in this way: "While the share of international carrier traffic routed as VoIP grew from 11 percent in 2002 to 38 percent in 2013, many established service providers still rely on their legacy TDM networks. The capital outlay required to transition to new generation IP networks is a small fraction of what most of these companies spent to deploy their TDM networks, but many carriers have been operating their international voice business with a view to maximizing cash flow. Such operators could find it difficult to justify CAPEX in a market segment that is now in decline, ..."[26]

A few years ago, claims were widespread that Internet traffic growth was driving unbounded costs, that flat rate prices prevented network operators from charging to recover their costs, and that regulatory intervention was therefore required to address the claimed market failure. [27] Concerns along these lines are visible both in developed and developing countries. [28]

This is a persuasive narrative, but alternative interpretations are also possible. These alternative views generally are based on claims that growth in traffic does not necessarily equate to an equivalent growth in cost.

Factors in this alternative assessment include:

- Internet traffic growth is indeed healthy, but no longer seems to reflect explosive growth. The percentage growth in both fixed and mobile traffic volumes appears to decline year over year (see Figure 7). This trend is visible in multiple forecasts, and has been visible (for fixed broadband) since the nineties.
- Relevant unit costs also decline year over year (an effect known as Moore's Law), and offset any increase in traffic volume, as is visible in Figure 8. It has been claimed [29] that this decline slightly exceeds the rate of increase in traffic for the fixed network at present. If so, this would suggest that fixed network prices are stable or declining because the corresponding costs are stable or declining.
- Prices for both fixed and mobile broadband services do not appear to be "stuck" at any particular level, but rather appear to respond to normal forces of supply and demand. [30]

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25 See for instance Telecommunications Regulatory Authority of India (2015), "Regulatory Framework for Over-the-top (OTT) services".

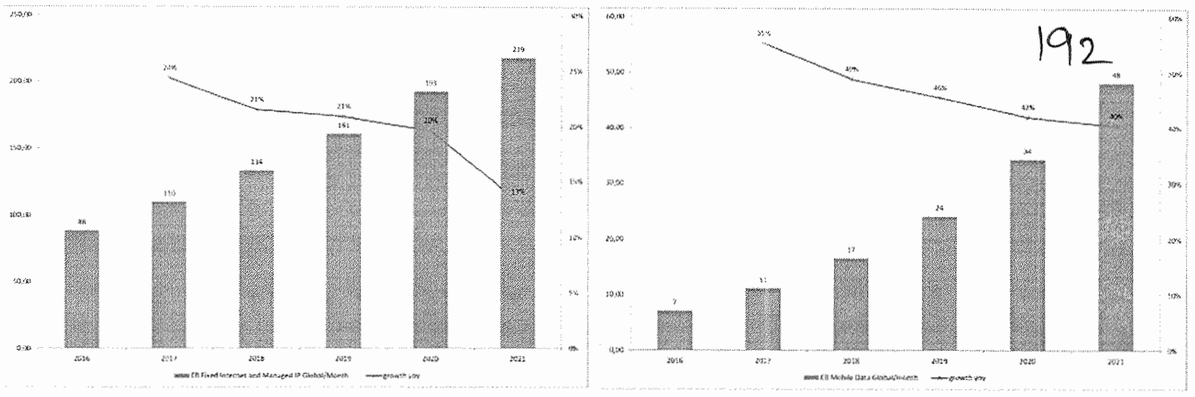
26 Telegeography (2013), Telegeography Report, Executive Summary, at https://www.telegeography.com/page_attachments/products/website/research-services/telegeography-report- database/0005/5686/TG_executive_summary.pdf.

27 See for instance Mark Page, Luca Rossi and Colin Rand (2010): "A Viable Future Model for the Internet", A.T. Kearney, available at: http://www.atkearney.com/index.php/Publications/a-viable-future-model-for-the- internet.html. "Those who have to build and operate the networks required to carry these traffic volumes earn almost no revenue from [content sites] and are often locked into flat rate pricing schemes with [end users] ..."

28 See, for instance, Telecommunications Regulatory Authority of India (2015), "Regulatory Framework for Over-the- top (OTT) services". "The growth of traffic apart, the OTT applications have created an increasing demand for faster broadband speed, which translates into a need for huge investments in network up-gradation by the TSPs. It is thus becoming clear that, in future, the provision of services by OTT players will impact revenues of network operators insofar as their current business models are concerned."

29 J. Scott Marcus (2014), "The economic impact of Internet traffic growth on network operators", available on SSRN at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2531782.

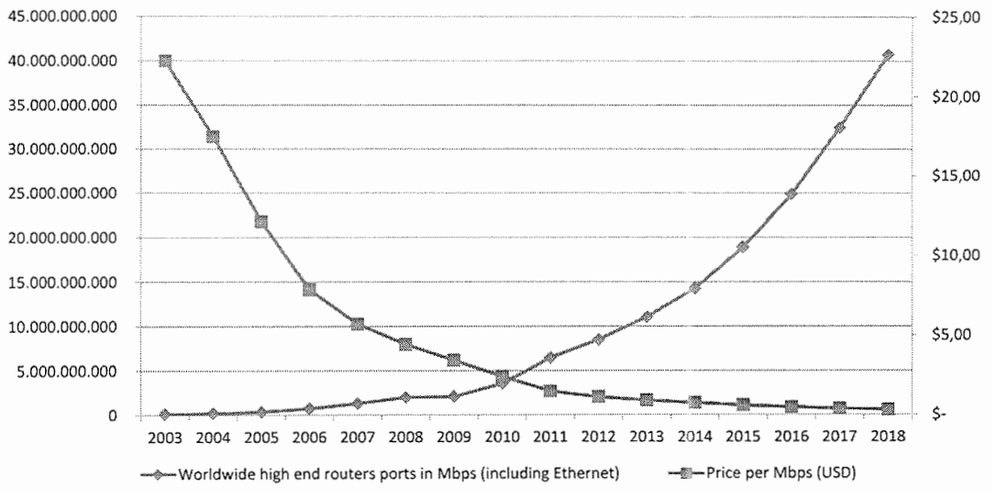
30 Ibid.



Source: Cisco VNI online database (2017), Marcus calculations.[31]

Figure 7. Fixed versus mobile Internet and managed service traffic volume (exabytes, 2014-2018).

The decline in unit costs for key traffic-dependent items of equipment (for instance, large routers and long haul DWDM equipment used by network operators) appear to more than offset the increase in the amount of equipment required to carry fixed network traffic. For the mobile network, the combined effect of increased traffic-dependent equipment volumes and declining unit cost appears to be in line with the increase in the monthly price paid by consumers (ARPU). In neither case are there indications of market failure.



Source: Cisco VNI (2014), WIK / Marcus calculations. [32]

Figure 8. Shipment volumes and unit prices for high end carrier grade routers (2003 - 2018).

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31 J. Scott Marcus (2014), "The economic impact of Internet traffic growth on network operators", available on SSRN at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2531782. See also ITU (2016, forthcoming), OM 5 - Regulatory Aspects of QoS, in the ITU Quality of Service Training Programme.

32 J. Scott Marcus (2014), "The economic impact of Internet traffic growth on network operators", available on SSRN at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2531782. See also ITU (2015, forthcoming), OM 5 - Regulatory Aspects of QoS, in the ITU Quality of Service Training Programme.

3.5 The overall impact of OTT services on societal welfare

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Much of the discussion on OTT services to date (and on online services in general) has been on the negative impact on traditional service providers. That discussion tends to focus on (1) lost revenues to service providers, (2) increased costs to service providers, (3) lost tax revenues to national governments, and (4) transfers of welfare [33] between different countries.

The risks for traditional service providers are real. As the Indian TRAI succinctly notes, "The challenge for businesses in the face of growth of OTT services is, in particular, loss of control over customer relationships, increased competition, the threat of commoditization and the need to engage digitally with suppliers, partners and employees in addition to customers. To deal with this challenge, companies need to adapt to the changing scenario or perish."

Nonetheless, most analyses of the societal welfare impacts of OTT services tend to be incomplete. Societal welfare is the sum of *producer welfare and consumer welfare*. Consumers presumably view OTT services as offering better price/performance than the services for which they substitute (otherwise, they would not be purchased). The OTT service is either less expensive than an equivalent service, or else offers better value overall.

Most analyses of the economic impact of OTT services tend to be incomplete to the extent that

- they consider only costs to producers, ignoring benefits to consumers;
- they often ignore real benefits that flow to producers of the services;
- they may not be clear as to the assumptions that they are making;
- they may not be clear as to the comparison they are making, and in particular as to the counterfactual scenario [34] that they are assuming. Exactly *what* is compared is being compared to *what*?

Online services tend to intensify competition, and thus to reduce the spread between cost and price (i.e. the profit margin). They reduce market inefficiencies caused by imperfectly informed consumers. The increase in market efficiency has two distinct effects on societal welfare.

- First, the reduced retail prices transfer societal welfare from producers to consumers. This transfer is, in a static economic analysis, *neutral in principle to societal welfare*, even though it is harmful to producers. What producers lose, consumers gain.
- Second, the reduced retail prices lead to *increased consumption due to the price elasticity of demand*. More of the product or service is consumed. This effect (formally referred to as a reduction in deadweight loss) represents a real and unambiguous gain in societal efficiency, benefitting both suppliers and consumers.

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33 For a discussion of welfare effects, producer welfare, consumer welfare, welfare transfer, deadweight loss, and Harberger's Triangle, see for instance Chapter 5 of J. Scott Marcus, Ilsa Godlovitch, Pieter Nooren, Bram van den Ende, Jonathan Cave and Werner Neu: "How to Build a Ubiquitous EU Digital Society", November 2013, available at: http://www.europarl.europa.eu/RegData/etudes/etudes/join/2013/518736/IPOL-ITRE_ET(2013)518736_EN.pdf.

34 When one speaks of lost revenues or taxes, what assumptions are being made as to what the world would be like in the absence of OTT services?

For OTT services, the relevant benefits to producers can be assumed to flow primarily from increased overall consumption of network services; and secondarily (but relatedly) from an increased number of subscribers to the network due to the enhanced desirability of the service. OTT services have presumably eroded profit margins for telecommunications market segments that previously had been highly profitable, namely SMS and international voice calls; nonetheless, data revenues are growing substantially, presumably due both to an increase in the number of subscribers and an increase in traffic volume per subscriber, both of which benefit from online services usage in general and OTT service usage in particular. Overall consumer willingness to pay (WTP) presumably also benefits from the use of online services. 194

In some countries, the net effect is an increase in network operator revenues rather than a decrease. Circumstances could however vary greatly from one country to the next.

A detailed analysis of these effects is well beyond the scope of the current analysis, and would in any event depend on far more detailed data in multiple countries than is likely to be available.

3.6 Vertical and horizontal integration of OTT and related online services

As noted in Section 1.3, social networks such as Facebook and Google+ should not considered to be, strictly speaking, OTT services in and of themselves (because they do not directly compete with traditional network operators); however, these are to an increasing extent integrated with OTT services. This tendency is likely to continue, and possibly to accelerate.

Social networks represent a means for end-users to find one another, thus supplanting to a significant degree the role that telephone directories historically played. There is a natural synergy between these directory-like functions and those of OTT voice and messaging services – when one is viewing information about a company or an individual, one may wish to establish contact.

Similarly, there can be synergies between search and content, noting that audiovisual content can be viewed as an OTT service to the extent that it substitutes for traditional video on demand.

These tendencies are already visible in many of the largest content and application providers (many of which are US-based), such as Google, Facebook, and Apple. The offerings of all three incorporate OTT services such as messaging / chat, VoIP voice telephony and video conferencing, and video streaming. Facebook's 2014 acquisition of WhatsApp is an especially prominent example.

One often thinks of integration as a means of gaining *economies of scale* (i.e. gains in cost-effectiveness due to the size of the organization). Integration in this case seeks instead *economies of scope* (i.e. gains in the desirability of the service due to the great breadth of the offering, together with gains in cost-effectiveness due to being able to deliver multiple services that have some commonalities).

A distinct but somewhat related tendency is for online and OTT service providers to vertically

integrate network transmission functions and content delivery capabilities into their respective offerings. [35] Different online service providers make different choices, but the general tendency is to invest more as the online service provider's service traffic, customer base and revenue stream grow. [36] Today, the largest content and application providers often operate international IP-based data networks and Content Delivery Networks (CDNs) that rank among the largest in the world. Typically, however, they serve few if any end-user customers with their own networks – their networks concentrate on international distribution, not on end-user connectivity.

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3.7 Cautious predictions for the future

The best prediction that one can make about the future of OTT and online services, based on previous experience, is that no prediction is safe.

- Before Amazon entered the market, none of the pundits would have predicted that the first online mega-success would be a firm to sell books – the pundits assumed that the migration to electronic publication would happen first.
- The success of Uber as an alternative to taxis may seem obvious in hindsight, but it was not predicted in advance.
- Similarly, the evolution of the sharing economy and the online services that enable it was for the most part not anticipated.

Having said this, one might venture the following predictions:

- The role that online services will play daily life can be expected to progressively grow, both in developed and developing countries; moreover, the impact in the coming years may be especially visible in developing countries, to the extent that they have not yet experienced the full impact of online services.
- The growth of broadband coverage, and progressive gains in the price/performance of broadband (especially mobile broadband), are an important driver.
- General gains in price/performance of all ICTs components (including for example storage and processing power for servers) [37] are another key driver.
- Network traffic associated with audiovisual content will continue to grow, and at a more rapid rate than traffic in general. [38] As a result, the great majority of Internet traffic going forward will be comprised of audiovisual content; nonetheless, linear television is unlikely to disappear for quite some time.
- User-generated content (for instance, YouTube video) can be expected to play an increasingly important role going forward; however, professionally generated content will continue to be important.
- OTT services are likely to be increasingly integrated with related services (for instance, social networking capabilities), and also with real networks that carry the services (see Section 3.6).

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35 This discussion draws on previous work. See J. Scott Marcus (2014), "The economic impact of Internet traffic growth on network operators", available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2531782.

36 This is different in its details from the broadband ladder of investment propounded in a series of papers by Martin Cave (see for instance CAVE (2004)), but it is similar in its effects. As an organisation grows, it is motivated to climb the ladder.

37 Again, this tendency for semiconductor-based price/performance to double roughly every eighteen months is often referred to as *Moore's Law*.

38 See for instance the Cisco VNI (2015).

3.8 Opportunities and challenges for national economies

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Based on the foregoing, it should be clear that growing deployment, adoption and use of OTT services poses both threats and opportunities for national economies; the relative magnitude will, however, tend to vary from country to country. The *SWOT analysis* that appears in Table 1 seeks to identify the most significant overall *strengths, weaknesses , opportunities and threats* that ITU member states confront. The strengths and opportunities are positive, while the weaknesses and threats are negative. The strengths and weaknesses are inputs that relate to the past and present, while the opportunities and threats are forward-looking potential outputs. This SWOT analysis is, in its nature, a somewhat subjective analysis.

	Strengths	Weaknesses
Inputs	• Increasing speed, price- performance, and adoption of broadband services, enhanced price performance (Moore's Law). • Increasing speed and capability of devices and services, enhanced price performance (Moore's Law). • Increased capability of online platforms. • Growing network effects due to increased adoption.	• Remaining limitations in fixed and mobile broadband coverage, adoption, and speed. • Inconsistent global approaches to the scope of regulation, to jurisdiction, to specific regulatory rules, to privacy, to network security, and to taxation. • Limited capacity to create or operate OTT services in many countries.
	Opportunities	**Threats**
Outputs	• Gains in market efficiency. • Consequent gains in GDP and in (skilled) employment. • Economies of scale and scope. • Lower unit costs. • Lower transaction costs. • Overall acceleration of business. • Enhanced innovation.	• Possible negative impact on network operator revenues and profits, with corresponding adverse impact on taxes and on ability to invest. • Increased risk of privacy and security breaches. • Risk of access and service monopolisation. • Risk that the "digital divide" between developed and developing countries worsens.

Source: Marcus [39]

Table 1. Opportunities and threats in the growth of OTT services for national economies.

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39 See also Ilsa Godlovitch, J. Scott Marcus, Bas Kotterink, Pieter Nooren et al. (2015), "Over-the-Top (OTT) players: Market dynamics and policy challenges", study for the IMCO Committee of the European Parliament.

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Key Findings

There are numerous questions that confront policymakers. Different views and different interpretations, even where facts are not in dispute, are possible.

- To the extent that these new OTT services compete with traditional services, what regulatory obligations (if any) are needed?
- Is it appropriate, necessary, or even possible to regulate these services in such a way as to maintain competitive neutrality (i.e. a level playing field) with traditional services with which they compete?

Questions of authorisation and licensing are fundamental. The underlying question is, which online services should be subject to regulation?

Determining which country has jurisdiction is not always straightforward. For online service providers, a country of origin principle is probably best; however, this is not always appropriate or practical.

Competition law and economics faces many new challenges in dealing with online services.

With VoIP, "spoofing" of the Caller Line ID (CLI) for malicious and/or fraudulent purposes represents a serious and growing threat.

Online services pose many new threats to privacy. In some instances, technology also offers solutions.

With the growing importance of online and OTT services, security takes on increasing importance. This has many aspects, including not only the security of the network or service itself, but also access to emergency services. Surveillance clearly must be mentioned, as it also plays a role here; however, it is generally out of scope for this report.

There may be a tendency to focus only on the threat to the established order posed by OTT applications, but it also provides opportunities for societal benefits, not only through creating and providing OTT applications, but also through their use. Measures to enhance creation, provision and use thus also appear to merit consideration in any balanced programme.

This chapter introduces a number of the regulatory debates that have emerged with respect to OTT services.

With the growth of OTT and related online services, numerous challenges to public policy have emerged. Among them:

- To the extent that these new OTT services compete with traditional services, what regulatory obligations (if any) are needed? Is it appropriate, necessary, or even possible to regulate these services in such a way as to maintain competitive neutrality (i.e. a level playing field) with traditional services with which they compete?
- In the specific case of OTT services that compete with conventional network services (for instance, voice over IP (VoIP)), what are the implications for regulation of the Over-the-Top service as distinct from regulation of the underlying network?

- Are traditional approaches to market definition (and to competition policy) suitable in this rapidly evolving and complex markets? Have specific online platforms amassed too much market power, to the detriment of competitors and consumers?

This chapter reflects on (1) issues of competitive neutrality in general (i.e. the "level playing field"); (2) the possible need to authorise or license OTT services; (3) the challenges faced in determining the country of jurisdiction; (4) the implications of OTT services for competition law and economics; (5) threats to network operator revenues and profits; (6) corresponding implications for investment in infrastructure; (7) implications for Quality of Service; (6) implications for consumer privacy; (8) obligations for security and reliability of OTT services; and (9) possible measures to promote the use of OTT services.

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4.1 Competitive neutrality (the level playing field)

There is at present an active debate concerning the level playing field for OTT services. The level playing field is often used, however, to express very different policy dimensions, with significantly different implications. Do online services compete fairly with traditional businesses (such as travel agents, book sellers, or taxi firms) that they may eventually replace? Do OTT services (including messaging services, VoIP services, and streaming video) compete fairly with the SMS, voice telephony, and conventional broadcast services with which they compete? Do the developed countries where most of these services are based benefit unduly at the expense of developing countries?

There are few who would disagree with the general proposition that similar services that are similarly situated, and that compete with one another, should be subject to obligations that are similar (to the extent that doing so is practical). Specifically, one could argue that it is important to maintain competitive neutrality between OTT services and the underlying networks with which they compete. Doing so would serve to maintain competitive neutrality. Philosophically, one can argue that the choice between traditional versus OTT services should be made by the market, with as little interference as possible by regulatory authorities.[40]

This seemingly straightforward principle is difficult to apply in practice. Are the new services really effective substitutes, are they imperfect substitutes, are they economic complements, or are they something else? Is the original rationale for the original regulatory obligation really relevant to the online service that competes with it? How practical and proportionate is it to impose the traditional obligation on a new service – does it impose unreasonably high costs?

The Board of European Regulators of Electronic Communications (BEREC), representing the National Regulatory Authorities (NRAs) of the European Union, expressed the challenge as follows: "A central theme in the discussion about OTT services are the differences in the regulatory treatment of [Electronic Communication Services (ECS), which clearly fall within the scope of the regulatory framework,] and OTT services. BEREC notes that although there is general appreciation of the idea that services of the same type should preferably be subject to broadly the same regulatory treatment there can also be reasons for different regulatory treatment of services.

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40 See Ilsa Goldlovitch, Bas Kotterink, J. Scott Marcus, Pieter Nooren, Jop Esmeijer, Arnold Roosendaal (2015, forthcoming), Over-the-Top (OTT) players: Market dynamics and policy challenges, a study for the IMCO Committee of the European Parliament.

The range of services to which any specific obligation should apply, must be considered in light of the goals of the obligation and the proportionality of that obligation being applied to any specific service or service type. This implies that the social benefits of the obligation and its scope need to be proportionate to the economic costs entailed for each regulated provider, and the static and dynamic competition effects of partial or universal application of the obligations. A preference for a level playing field can be part of the assessment of proportionality, but it is only one of the many elements."[41]

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These concerns over competitive neutrality have been perhaps most visible within the European Union, but they would seem to be just as relevant to developing countries as to developed countries. The Indian TRAI notes the mobile operators have complained that "...the licensed [network operators] in India are subject to many licensing provisions, including but not limited to regulatory fees such as Entry Fee, License Fee and Spectrum Usage Charges. They are also subjected to various statutory regulations such as Quality of Service Regulations, Tariff Regulations and, Consumer Protection Regulations. They also need to ensure emergency services, confidentiality of customer information, privacy of communication, undergo regular audits and ensure proper lawful monitoring and interception. However, 'unlicensed' OTT providers are not bound by any such conditions. This opportunity for arbitrage enables OTT players to offer Internet Telephony either free or at very low tariffs and that too by riding on the TSPs' networks."[42]

The answers to these questions would appear to be crucial; however, the most appropriate answers might well vary from one service to the next, and also from one country to the next. A single, straightforward answer is unlikely to emerge. These questions are likely to be with us for years to come. This might suggest the need for cautious case by case analysis.

4.2 Licensing and authorisation

Licensing and authorisation appear to be linked closely with the competitive neutrality and level playing field aspects addressed in Section 4.1, both as a cause and as an effect.

A key underlying question is, which services should be subject to regulation at all?

Most countries require firms that wish to provide telecommunications services to obtain some kind of licence or permission from the national regulatory authority; however, approaches to licensing can vary substantially from one country to the next. The obligations imposed on licensed entities are considerable in some jurisdictions; by contrast, the Authorisation Directive of the European Union (EU) serves primarily to limit the obligations that national regulatory authorities are permitted to impose.[43]

In many countries, licensed entities fund the regulatory authority itself. In some countries, licensed entities fund the provision of universal service.

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41 BEREC (2015), "Draft Report on OTT services", BoR (15) 142.

42 Telecommunications Regulatory Authority of India (2015), "Regulatory Framework for Over-the-top (OTT) services".

43 In the UK and in Denmark, for instance, firms that wish to become providers of Electronic Communication Services (ECS), and thus subject to EU regulation, are not even obliged to formally notify the national regulatory authority in advance.

The approach to the licensing of OTT services is very diverse at the moment. This is especially visible in regard to VoIP services.

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A few examples:

- **India:** "Under the current telecom licensing regime, voice and messaging services can be offered only after obtaining a license. Apart from traditional voice and messaging, IP based voice and messaging services can also be offered by [licensed network operators] as unrestricted Internet Telephony Services ... However, the scope of the Internet Services Licence was restricted to Internet Telephony Services without connectivity to Public Switch Telephone Network (PSTN) / Public Land Mobile Network (PLMN) in India."[44]
- **European Union (EU):** Practices among EU Member States are not fully harmonised. "[I]n the case of VoIP Telephony services that permit inward and/or outward connections to the PSTN, [...] most NRAs take the view that the VoIP service provider [..] provides an [Electronic Communication Service (ECS)] since it has the contract with the end user, collects payment for the service and negotiates network access to allow the service to be offered, manages directory data base and the servers for call set-up signalling. [...] The VoIP Service Provider is therefore, in these cases, providing the service to the end user, even if some aspects of it are sub-contracted to various agents." An ECS is in principle subject to regulation, including authorisation (licensing) obligations.
- **United States:** In principle, traditional telecommunications services are subject to the licensing obligations of Section 214 of the Communications Act of 1934 as amended, while IP-based information services are not.[45]

4.3 Country of jurisdiction

Many aspects of commerce (including e-commerce) that seem to be fairly clearly defined at national level start to break down when looking at cross-border OTT services. These challenges are, of course, potentially of interest to the ITU, which is among the very few organisations that could potentially deal with them.

A key question, and a starting point for discussion, is: "*Who has jurisdiction?*"

From the perspective of the provider of online or OTT services provider, the ideal answer would that the *country of origin* should have jurisdiction. The service provider then would have to familiarise itself with only a single set of laws and regulations.

A comprehensive approach along these lines at global level, however, would run into any number of challenges. First, it would motivate service providers to establish their operations (on paper, at least) in whichever country had the least restrictive regulations and/or the lowest taxes.

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44 Telecommunications Regulatory Authority of India (2015), "Regulatory Framework for Over-the-top (OTT) services".

45 For licensing purposes, it is important to distinguish among international, interstate, and intrastate communications. The US FCC must affirmatively grant international section 214 authorisation, but it has forborne from the requirements of Section 214 for broadband Internet access service, and has granted blanket domestic 214 authorization for interstate telecommunications services. For intrastate communications, states play a significant role in telecommunications licensure.

This would likely trigger a "race to the bottom" among countries seeking the advantage of being home to these service providers. The second problem is that the diversity of laws among the countries of the world is considerable – one could imagine country of origin among clusters of countries that coordinate their laws closely, but it is hard to imagine comprehensive application of country of origin jurisdiction at global level. 201

The primary alternative would be for the laws or regulations of the *country of destination* or *country of consumption* to govern. This is closer to the situation that pertains today. It of course raises the complexity for online and OTT service providers, since they must be prepared to deal with the divergent laws and regulations of every country in which they operate.

A country of consumption rule inevitably raises questions as well as to which country is the country of consumption, since electronic communications services generally consist of at least two ends, and sometimes more. It also raises the risk that a service provider is obliged to comply with not fully compatible laws in two or more countries.

These challenges show up in many contexts, ranging from taxation to privacy.

Concerns have also been raised relating to the acceptability of content – content that is prohibited on the basis of being inflammatory, societally dangerous, or pornographic in one jurisdiction might be acceptable in another (and perhaps protected under the right of free expression). [46] These issues would however appear to be relevant to online content whether delivered over traditional or OTT services.

4.4 Competition law and economics

In principle, competition law and economics are relevant to online and OTT services, just as they are to traditional services.

In practice, a number of additional factors must be taken into consideration.[47]

First, the potential benefits of these services to society at large, and to consumers in particular, appear to be considerable (see Section 3.2). The benefits are often claimed to be even greater to those who use online tools than to those who produce and provide them.[48]

For this reason, there is an argument to be made that policymakers should be careful to avoid putting needless roadblocks in the way of online and OTT services. This would suggest in turn that dynamic economic effects (i.e. the benefits over time that derive from investment in the creation and use of online tools and OTT services) require serious consideration. Competition policy tends to place greater emphasis today on static economic effects, in part because they are easier to analyse.

These OTT and online services markets could be said to be volatile, and rapidly changing. There have been many examples in recent years where market power that seemed impregnable evaporated rapidly once a new, disruptive player entered the market.

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46 See also Telecommunications Regulatory Authority of India (2015), "Regulatory Framework for Over-the-top (OTT) services".
47 See Ilsa Goldlovitch, Bas Kotterink, J. Scott Marcus, Pieter Nooren et al. (2015, forthcoming), Over-the-Top (OTT) players: Market dynamics and policy challenges, op. cit.; Nicolai VAN GORP and Olga Batura (2015), "Challenges for Competition Policy in a Digitalised Economy"; and Paul DE BIJL, Andrea RENDA, and Massimo MOTTA et al. (2015), "Cross-Competition among Information (Digital) Platforms: Proceedings of the Workshop", all studies for the European Parliament.
48 See for instance Ben Miller and Robert Atkinson (2014), "Raising European Productivity Growth Through ICT".

Barriers to entry appear to be lower than in many traditional telecommunications markets.[49] This suggests, once again, that the threshold of competitive harm that should trigger intervention may perhaps need to be higher than that which has historically been employed.

Finally, many of the online platforms are in reality two-sided (or multi-sided) platforms. The economics of two-sided platforms is still a relatively new discipline. A two-sided platform brings the sides of the market together.
The platform may subsidise one side of the market in order to ensure that there is sufficient participation over – for instance, viewers of over-the-air broadcast television typically pay little or nothing for the service, because advertisers are willing to pay for their presence.
Pricing arrangements to the different sides of the market do not follow the same rules as in conventional markets. Application of conventional competition economics tests can lead to grave errors if applied to two-sided markets.[50]

Overall, this is an area where economic and policy theory continues to rapidly evolve.[51]

All of this suggests that, while competition policy is still highly relevant to online and OTT services, competition authorities may perhaps need to operate with great care and caution in this space.

4.5 Quality of Service standards

In many countries, traditional network operators are subject to explicit Quality of Service (QoS) standards. Providers of OTT services are rarely subject to equivalent obligations. For that matter, if they do not control the networks over which their traffic flows, they may not be in a position to assure QoS.

The question of whether the regulatory authority should impose QoS standards has been a longstanding debate among policymakers. A key question is whether market forces alone sufficient to ensure appropriate QoS.[52] Views on this differ.

The answer to this question obviously has a great deal to do with the degree of competition in the market in question. Largely for this reason, the approach in developed countries is often different from that taken in developing countries where competition is less well established. This section discusses both of the most widely applied approaches.

Historically, in countries where voice telecommunications was a regulated monopoly or government monopoly, both quality and prices for voice services tended to be high. Compensation was typically rate of return based, which meant that the incumbent provider was permitted to charge so as to recover its costs and achieve a percentage profit above them. This creates perverse incentives – the incumbent is motivated to maximise its costs in order to maximise its profits. It can result in "gold plating" of services, i.e. delivery of services in excess of what many consumers strictly require.

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[49] Notably, arguments relating to last mile market power as a barrier to entry would appear to be irrelevant to an OTT market player that has no need for its own network.
[50] See for instance Rochet and Tirole (2004), "Two-Sided Markets : A Progress Report".
[51] See for instance Nicolai van Gorp and Olga Batura (2015), "Challenges for Competition Policy in a Digitalised Economy"; and Paul de Bijl, Andrea Renda, and Massimo Motta et al. (2015), "Cross-Competition among Information (Digital) Platforms: Proceedings of the Workshop", both studies for the European Parliament.
[52] The discussion in this section draws on the ITU's soon-to-be released QoS Training Programme. J. Scott Marcus and Geoff Huston (2015), OM 5 - Regulatory Aspects of QoS, in the ITU Quality of Service Training Programme.

Not all customers require (or are willing to pay for) toll quality voice. The success of mobile telephony makes clear that consumers can tolerate voice quality well below what the fixed network historically delivered.

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"Gold plating" of services can crowd out less expensive, lower quality services that some consumers may desire. Inflated prices result in reduced usage due to the *price elasticity of demand*. The consumption that should have occurred but did not represents a *deadweight loss*, and thus a reduction in societal welfare. One can argue that this has negative impact on the economy as a whole.
In countries where competition is weak or non-existent, this may not be a concern, since there would have been no low price lower quality offerings in any case. Thus, in countries with little or no competition, regulatory imposition of QoS standards and tolerance of high prices may be preferable to low quality and nonetheless high prices.

In countries with competition, however, it is often the incumbent that promotes QoS standards, since they limit the ability of other network operators to compete aggressively on price. In countries with greater competition, or at least with strong prospects of competitive entry, it is often preferable to leave QoS to market forces. One would expect that different levels of quality will emerge in the market in such countries, with correspondingly different prices. Different consumers have different willingness to pay (WTP) for different level of quality, or even different WTP for QoS for different conversations.

Price and quality differentiation benefit the network operators overall, since they can capitalise on these differences and extract more revenue. This is not necessarily to the detriment of consumers. Consumers also benefit from differentiated services that on balance better accord with their preferences.

Aggregate consumption with differentiated quality and pricing tends to be higher, benefitting the broader society.

Based on reasoning along these lines, many developed countries with effective competition do little or nothing to impose QoS standards. Some developed countries (including all of those in the European Union) require network operators to publish statistics on the QoS that they offer and/or the QoS that they achieve. In these countries, persistent failure to achieve the committed levels of QoS might then be actionable, not as a matter of telecommunications regulation, but rather as a matter of truth in advertising.[53]

A key advantage of this "light touch" approach to QoS regulation, in countries where it is feasible, is that it encourages network operators to tailor the QoS of their offerings to meet the requirements, and the corresponding willingness to pay (WTP), of their prospective and actual customers.

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53 Consistent failure to meet QoS standards can also be actionable under a new Regulation of the European Union, Regulation 2015/2120

4.6 "Spoofing" of the caller ID under Voice over IP (VoIP) and other forms of abuse of VoIP

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The core problem of caller ID "spoofing" is the ability of a (possibly malicious) caller to either impersonate someone else, or to anonymise a call in such a way that fraud and abuse can occur. The network operator, the regulator, and law enforcement typically are unable to track and trace the source of the abusive call.

This is essentially a problem of *authentication* of the identity of the caller. Is the caller really who he claims to be?

Under the traditional public switched telephone network (both fixed and mobile), this was less of an issue.

The number of network operators was limited, they had agreed procedures with one another, and the technology was designed to minimise the risk of misrepresentation of the caller ID. Under VoIP, however, the technical ease of misrepresentation is far greater (some argue that there can be legitimate reasons to do so), and the number of network operators is potentially far greater (thus expanding the "circle of trust").

This has been a general concern worldwide, and an intense concern in the United States (see Section 5.7), the UK, and Canada.

Some countries have explicitly introduced regulatory provisions to require providers of VoIP services to accurately report the Caller Line ID (see for instance the discussion of Oman in Section 5.3 and of the United States in Section 5.7).

Although various technical solutions have been discussed, no comprehensive technical solution is generally available today.[54]

Various other forms of abuse capitalising on VoIP, especially mobile VoIP, have raised concerns. In some cases, for instance, an incoming call while roaming is redirected so as to be received, not using the traditional mobile service, but rather using a VoIP service (which may impose high data costs on the unsuspecting user).

4.7 Commercial privacy, transfers of personal data

Three different discussions tend to be conflated in the press and in the public discussion of privacy in connection with OTTs:

- commercial privacy,
- government surveillance for purposes of law enforcement, and
- government surveillance for purposes of national security.

All three are legitimate under suitable preconditions, but all three entail risks – albeit different risks – for consumer privacy.

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54 See J. Scott Marcus and Richard Shockey (2015), «Review of Resource Public Key Infrastructure (RPKI) to verify ownership and authenticity of telephone caller ID over Voice over Internet Protocol», a study for Ofcom, the UK NRA, at: http://stakeholders.ofcom.org.uk/market-data-research/other/technology-research/2015-reports/rpki/.

Our focus in this section is on commercial privacy, since government surveillance is generally out of scope for this report.

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The ability of online service providers to sell or re-purpose information about consumers has become increasingly important commercially, but also increasingly contentious. As regards commercial privacy, there have been, and continue to be, substantial differences in implementation and to a lesser degree in objectives from one country to the next.[55] Some common threads are however visible in many national laws that support commercial privacy. At the risk of over-simplifying, these include:

- Firms that collect personally identifiable data of end users bear a special responsible to maintain the confidentiality of the data, and to protect it both from inadvertent disclosure and from malicious attacks.
- The user should know and provide informed consent to the use of his or her personally identifiable information.[56]
- Personally identifiable data should not be re-purposed (used for purposes other than that which the customer has authorised) without the informed consent of the end user.

The value of personally identifiable data for purposes of targeted advertising over the Internet has grown enormously over the years.
With it, the temptation for online service providers (including not only OTT service providers, but also traditional network operators) to re-purpose personally identifiable data for purposes of targeted advertising are now large.

A substantial challenge has to do with the enforceability of commercial privacy at international level. Whose laws govern (see Section 4.2)? To what extent are relevant laws enforceable in practice?

As previously noted, data surveillance on the part of the government raises its own complex issues regarding the protection of personally identifiable data. In principle, government surveillance is well outside the scope of a study like this one; however, an active discussion in Europe just now makes it necessary to touch on the topic.

Transfers of personally identifiable data from the European Union (EU) to third countries are generally permitted under European law only to the extent that the receiving country provides a roughly comparable level of protection to that afforded by the EU. A recent court case of the European Court of Justice[57] made it clear that these protections must also be adequate against inappropriate use or disclosure of personally identifiable data on the part of the government of the country to which the data was shipped. The court ruled that this is not the case in the United States. As a result, transfers of personally identifiable data between the EU and the United States were at risk of grinding to a halt, with likely negative consequences for businesses (including online and OTT services) in both the EU and the US.

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55 See for instance J. Scott Marcus, Neil Robinson, Joel Reidenberg, Yves Poullet, Adam Peake, Chris Marsden, Florence De Villenfagne, Franck Dumortier, Keisuke Kamimura et al. (2007), "Comparison of Privacy and Trust Policies in the Area of Electronic Communications", a study prepared for the European Commission.

56 If the end user has purchased a service for which the data is obviously required, this condition might be considered to have been fulfilled.

57 Court of Justice of the European Union (2015), Judgment in Case C-362/14, Maximillian Schrems v Data Protection Commissioner. Press release No 117/15, Luxembourg. Available at: http://curia.europa.eu/jcms/upload/docs/application/pdf/2015-10/cp150117en.pdf.

It is not clear how these issues will ultimately be resolved, but most experts agree that a firm and suitable agreement between the US and the EU is needed.[58] The EU and the US subsequently reached an agreement, named *Privacy Shield*;[59] however, Privacy Shield is unlikely to be the last word on the matter. First, as an agreement between the European Commission and the U.S. Department of Commerce, there is no force of U.S. law nor of a ratified treaty to oblige future U.S. governments to comply. Second, *the Article 29 Working Party*,[60] while recognising the very considerable progress that Privacy Shield represents, has expressed serious concerns over the lack of clarity and specificity in Privacy Shield overall. They also have raised specific concerns that (1) the assurances provided by the U.S. do not preclude massive and indiscriminate surveillance; and that (2) the redress procedure offered in the form of an Ombudsman, while representing major step forward, "is not sufficiently independent and is not vested with adequate powers to effectively exercise its duty and does not guarantee a satisfactory remedy in case of disagreement."[61]

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4.8 Security and reliability

This is once again a large and complex area in its own right.

It is clear that the security of all electronic services is important. This is true for electronic communication networks, and not less true for the services (e-commerce, for instance) that run over them.

In many countries (not all), network operators are subject to explicit obligations regarding network security; in most countries, governments or regulators monitor the reliability and security of major networks.

OTT and related online service providers tend to be subject to fewer security obligations. They may however be subject to obligations to report significant security breaches, especially if those breaches exposed significant amounts of personally identifiable end-user data. Surveillance for purposes of law enforcement or for purposes of national surveillance is generally out of scope for this report; however, it is to be noted in passing that some regulatory authorities have expressed concerns over lack of clarity as regards the applicability of these obligations to OTT services.[62]

As OTT services increasingly substitute for network services (at the same time that they depend on the underlying networks), there is a natural but currently unresolved question as to what obligations are required in the longer term, and whether the same obligations are appropriate.

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58 See J. Scott Marcus and Georgios Petropolous (2015), Data transfers under the threat of terrorist attacks, at: http://bruegel.org/2015/12/data-transfers-under-the-threat-of-terrorist-attacks/.

59 European Commission (2016), European Commission - Fact Sheet: EU-U.S. Privacy Shield: Frequently Asked Questions, at

60 The Article 29 Working Party is an independent European advisory body on data protection and privacy, with formal statutory responsibilities identified in various European Directives.

61 ARTICLE 29 DATA PROTECTION WORKING PARTY (2016), Opinion 01/2016 on the EU – U.S. Privacy Shield draft adequacy decision, 16/EN WP 238, at http://ec.europa.eu/justice/data-protection/article-29/documentation/opinion- recommendation/files/2016/wp238_en.pdf. They express concerns that "the representations of the U.S. Office of the Director of National Intelligence (ODNI) do not exclude massive and indiscriminate collection of personal data originating from the EU. The WP29 recalls its long-standing position that massive and indiscriminate surveillance of individuals can never be considered as proportionate and strictly necessary in a democratic society, as is required under the protection offered by the applicable fundamental rights. Additionally, comprehensive oversight of all surveillance programmes is crucial."

62 See for instance Sections 3.20 through 3.27 of Telecommunications Regulatory Authority of India (2015), "Regulatory Framework for Over-the-top (OTT) services".

The issues that appeared in the discussion of competitive neutrality (Section 4.1) are highly relevant here. To what extent are the services in question really equivalent, or substitutes for one another? To what extent are network security obligations at all relevant to a service provider that may not operate a network at all? For a particular obligation that already applies to a traditional network operator, would it be feasible, practical, and cost- effective to apply it to an OTT provider that provides a somewhat equivalent service? 207

4.9 Promoting the creation, operation and use of OTT and related online services

Online services potentially provide enormous benefits to those who use them. Removing any unnecessary impediments to the provision and use of OTT services is therefore a legitimate public policy concern.

Indeed, many have argued that ICT use is far more important than ICT creation and operation.[63] Atkinson claims, for instance, that "the large gains are to be realized not so much from production of ICT ... as in its adoption."

This would appear to suggest a need for continued attention to many of the issues with which policymakers have already concerned themselves, for instance:

- For online services to be optimally useful, consumers should have ubiquitous access to broadband of good quality.
- In the developing world, the mobile network is often more widespread than the fixed.
- This implies in turn that spectrum management must be effective.
- Consumers must be willing and able to use new online services. This likely implies a need for measures in support of digital literacy, and not just during the initial school years.

63 Ben Miller and Robert Atkinson (2014), "Raising European Productivity Growth Through ICT".

Policy approaches attempted or taken in various parts of the world

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Key Findings

Policy approaches as regards OTT services can differ greatly from one country, and among many different dimensions.

To what degree is it appropriate to regulate OTT services at all?

Are there obligations such as access to emergency services, or surveillance for purposes of law enforcement, that are indispensable irrespective of how a service is delivered?

This chapter reviews noteworthy emerging practice on four continents. It is perhaps too early to identify best practice.

Policy approaches taken or proposed vary widely, and among multiple dimensions, from one country to the next, even among countries in the same region. This chapter considers noteworthy approaches taken on multiple continents, representing large countries and small, and including some countries that are developed and others that are arguably still developing.

It is perhaps too early to say what represents best practice as regards regulatory and policy approaches for OTT services.

5.1 Brazil

On 23 April 2014, Brazil enacted the *Marco Civil*, Law Number 12.965, which "establishes the principles, guarantees, rights and obligations for the use of Internet in Brazil". The Marco Civil is an ambitious and far-reaching legislative act; however, large portions have not yet been fully implemented pending decisions by the responsible ministries.

The goals of the Marco Civil are to promote "... the right of all to access the internet; the access to information, to knowledge and participation in the cultural life and in the handling of public affairs; the innovation and the stimulus to the broad diffusion of new technologies and models of use and access; and the adoption of open technology standards that allows communication, accessibility and interoperability between applications and databases."[64]

Topics covered in the Marco Civil[65] include:

- guarantee of freedom of speech, communication and expression of thought, in accordance to the Federal Constitution;
- protection of privacy;
- protection of personal data, pursuant to law;

64 The text here is based on the English translation provided by Public Knowledge at https://www.publicknowledge.org/assets/uploads/documents/APPROVED-MARCO-CIVIL-MAY-2014.pdf

65 ibid.

- preservation and guarantee of network neutrality;
- preservation of stability, security and functionality of the network, via technical measures consistent with international standards and by encouraging the use of best practices;
- the liability of the agents according their activities, pursuant to the law;
- preservation of the participative nature of the network; and
- freedom of business models promoted on the internet, provided they do not conflict with the other principles set out in this Law.

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The Marco Civil establishes strong consumer privacy rights, including the inviolability and secrecy of the user's communications whether over the Internet or stored, except where a court order holds otherwise. The user's data may not be provided to third parties without the user's express, free and informed consent. Use of personal data is restricted to legitimate and lawful purposes.

Network neutrality is expressed in broad and sweeping terms, but with limited detail. "The party responsible for the transmission, switching or routing has the duty to process, on an isonomic basis, any data packages, regardless of content, origin and destination, service, terminal or application." The exact meaning of "isonomic"[66] here is not altogether clear. At a meeting sponsored by CGI.br and consumer advocate Proteste in Sao Paolo in February 2015, for instance, a ministry spokesperson opined that different treatment for the traffic of different applications that have different requirements was not necessarily incompatible with isonomic treatment.

The Marco Civil also deals extensively with surveillance for purposes of law enforcement, and seeks to limit surveillance based in third countries. This is noted in passing, as regard surveillance as being generally out of scope for this report.

Finally, the Marco Civil exempts a provider of Internet access from liability for the content that it is posted, except in instances where the Internet access provider is notified by court order of the specific infringing content and fails to remove it within the time frame specified in the court order.

5.2 India

India is in the process of reassessing its rules on online services, including OTT services.

A public consultation was published on 27 March 2015, with responses due by 24 April 2015.

A final ruling has not yet been issued.

As noted in Section 4.2, voice and messaging services are permitted to be offered only by firms that hold a licence. Internet Protocol (IP) based voice and messaging services can also be offered by licensed network operators as unrestricted Internet Telephony Services; however, these services may not interconnect with traditional switched services. The dichotomy between regulated traditional services and largely unregulated OTT services leads to numerous anomalies.

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66 In the Portuguese text, *isonômica*.

In terms of concrete proposals, the consultation document appears to implicitly propose:

- that OTT services either be explicitly licensed as are traditional communication services, either as Communication Service Providers (CSPs) or else under a separate category as application Service Providers (ASPs);
- alternatively, TSPs could treat firms that offer OTT services as Bulk Users of Telecom Services (BuTS);
- enactment of explicit network neutrality rules; and
- whether OTT service providers are treated as CSPs, ASPs, or BuTS, the consultation considers what level of payments between content providers and network operators might be appropriate.

The consultation document appears to provide only limited indications as to how regulatory differences between regulated voice and SMS services versus unregulated OTT VoIP or messaging services might be addressed. If OTT services were treated as CSPs, they would be subject to all of the same obligations, which however would raise numerous issues and therefore "needs careful deliberation". If classified as ASPs, the national regulatory authority would be empowered to impose obligations in regard to emergency services or lawful interception, but the consultation document does not specify what those obligations would specifically entail, or to which OTT applications they might apply. If classified as BuTS but not as CSPs or ASPs, the consultation document does not indicate how regulatory asymmetries might be addressed (if at all).

This process is still ongoing. The TRAI issued an order a second consultation late in 2015, and issued a ruling prohibiting discriminatory tariffs early in 2016.[67]

5.3 Oman

In 2012, the Telecommunications Regulatory Authority (TRA) of Oman implemented "Decision No (34/2012): On Issuing the Regulation on the Provision of Public Voice Telecommunications Service via Voice over Internet Protocol (VOIP)".[68]

The text is concise and clear. The Regulation:

- Provides a working definition of VoIP;
- Establishes that licensees of "public voice telecommunications service Licensees are permitted to provide VOIP voice telecommunications service in accordance with the Telecom Act and the licenses awarded to them."
- Reserves for the TRA the prerogative to "exempt specific VOIP applications via computers or similar devices if they are for personal purposes only." This could, for instance, be used to exempt online games from various obligations.[69]
- Providers must verify the identity of the subscriber and record relevant information.
- Providers of VoIP as a Basic voice service are obliged to observe the quality of service requirements issued by the TRA.

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67 TRAI India (2016), "Prohibition of Discriminatory Tariffs for Data Services Regulations, 2016", 8 February 2016. 68 An unofficial English language translation is available at https://www.tra.gov.om/pdf/551decisionno34-2012.pdf.
69 The Omani TRA informs us that no explicit exemptions have been granted to date.

- Providers of VoIP as a value added service must notify subscribers that they are not subject to the same quality of service requirements that are applied to the Public Basic Voice Service, and that the service will not necessarily be available if power fails.
- Licensee must also:
  - provide access to emergency services;
  - send the Calling Line Identification (CLI) number for all calls (note the Caller ID spoofing has been an issue in Oman, as in many countries, as explained in Section 4.6);
  - consider confidentiality and protection of beneficiary's data and calls; and
  - maintain and store the beneficiary's personal data within Oman's geographical boundaries.

5.4 The United Arab Emirates

In the United Arab Emirates, Voice over IP services such as Skype, Viber and appear to be effectively blocked, although it is not altogether clear whether they are being blocked by the network operator or by the government.[70]

VoIP services are not included in the licence terms of the two fixed network operators, Etisalat and Du. According to a statement of the national regulatory authority issued in September of 2014, "We have recently seen local newspapers and social networks publishing news with regards to the Viber service being blocked in the UAE. We would like to clarify that the service was never licensed in the UAE. Moreover, the VoIP regulatory policy has only licensed Etisalat and Du, The Licensees, to provide telecommunication services in the UAE, including VoIP services. This policy still exists and has not been amended."[71]

5.5 South Korea

In South Korea, Internet access service providers must obtain a service license from the Ministry of Science, ICT and Future Planning (MSIP) and are subject to the Telecommunications Business Act.

As in many parts of the world, the basic legislation relating to telecommunications regulation was created for the switched telephony network. The Telecommunications Business Act was subsequently amended, however, to include providers of Internet access services within the definition of common carriers. Today, a common carrier that provides Internet access service is subject to the same duties as those that apply to traditional providers of telephony services.

South Korea has been subject to various disputes as regards OTT services, notably in the context of blocking, throttling, or charging for OTT VoIP services such as Voice Talk, Line, Skype and Viber. The Citizens' Coalition for Economic Justice and Korean Progressive Network Jinbonet reported telecommunications carriers to the KCC on November 23, 2011 for allegedly charging users more for VoIP applications or blocking their use entirely.[72]

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70 See for instance Joey Bui (2015), "Skype ban tightens in the UAE", in The Gazelle, 7 February 2015, at http://www.thegazelle.org/issue/55/news/skype/.

71 As quoted in Joey Bui (2015), "Skype ban Tightens in the UAE", op. cit.

72 See Borami Kim and Byoungil Oh (2014), "Network Neutrality in S. Korea", at http://act.jinbo.net/drupal/node/8351.

There have also been allegations that Korea Telecom (KT) blocked its high-speed Internet service subscribers from using Smart TV starting on 10 February 2012 so as to identify and discard data that was being sent to a Samsung Smart TV server. Thanks to the arbitration of KCC, KT withdrew the restriction on 14 February 2012.

Partly as a result of concerns such as these, the Korea Communications Commission (KCC) issued a guideline on network neutrality and Internet traffic management in December 2011. The guideline established the user's right to access to lawful content, applications and services of his or her choice, using devices which are not harmful to network, and the user's right to be informed of traffic management practices.

It also mandated transparency of traffic management, no blocking, and no unreasonable discrimination.[73]

Building on the KCC's earlier work, the MSIP subsequently issued revised "Guidelines on the Net Neutrality and Internet Traffic Management" on 5 December 2013.[74]

Network operators in South Korea are not prohibited from charging their customers extra fees to use VoIP, or blocking the use of VoIP altogether. Network operators are permitted to charge VoIP providers a "traffic usage based cost share".[75]

5.6 Europe

It is important to recall that relevant regulation within the European Union (EU) takes place within a common Regulatory Framework for Electronic Communications (RFEC). In areas that are not rigorously specified, there are differences among the 28 Member States,[76] but they can be viewed as representing variations on a common theme.

The question of how to deal with Over-the-Top services has emerged as a new concern for EU regulatory policy in recent years; however, the underlying concern with the de-coupling of the service from the network is by no means new. These same issues were visible from the time that it was first recognised that packet-switched protocols in general, and the Internet Protocol (IP) in particular, de-coupled electronic communication services (ECSs) from the underlying electronic communications network (ECN).

The European RFEC that was enacted in 2002 already attempted to address these challenges (1) by distinguishing between the ECS and the ECN, and (2) by embracing an over-arching principle of *technological neutrality*. Technological neutrality did not fully resolve the underlying challenges. Notably, the boundary between voice telephony services and e-mail as electronic communication services (ECSs which in general fall within the regulatory framework),[77]

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73 Ibid. These provisions are similar to those of the US FCC's Open Internet Order of 2010. The article includes a brief and informal translation of the guidelines.

74 An informal translation into English appears in Kim and Oh (2014), op. cit.

75 Telecommunications Regulatory Authority of India (2015), "Regulatory Framework for Over-the-top (OTT) services".

76 The RFEC also applies for the most part to three countries that are member of the European Economic Area (EEA) but not of the EU, and also to some extent to Switzerland (pursuant in the latter case to bilateral agreements).

77 As defined in Article 2(c) of the Framework Directive of 2002, as amended in 2009, an "... 'electronic communications service' means a service normally provided for remuneration which consists wholly or mainly in the conveyance of signals on electronic communications networks, including telecommunications services and transmission services in networks used for broadcasting, but exclude services providing, or exercising editorial control over, content transmitted using electronic communications networks and services; it does not include information society services, as defined in Article 1 of Directive 98/34/EC, which do not consist wholly or mainly in the conveyance of signals on electronic communications networks ..."

and *information society services* (which are explicitly excluded under Article 2(c) of the Framework Directive)[78] has always been challenging. Per Recital 11 of the Framework Directive, the "... definition of 'information society service' ... spans a wide range of economic activities which take place online. Most of these activities are not covered by the scope of this Directive because they do not consist wholly or mainly in the conveyance of signals on electronic communications networks. 213

Voice telephony and electronic mail conveyance services are covered by this Directive. The same undertaking, for example an Internet service provider, can offer both an electronic communications service, such as access to the Internet, and services not covered under this Directive, such as the provision of web-based content."

These issues could be said to have first risen to prominence with the emergence of *Voice over IP (VoIP)* services. Some forms of VoIP function as a classic over-the-top service that competes directly with traditional voice services, thus challenging the business model of traditional providers of ECS while being largely outside of their control.

The European Commission drafted a position paper and conducted a public consultation on VoIP in 2004.[79] The consultation document explored a number of regulatory issues, including authorisation, universal service, and means to deal with market power. In each of these areas, application of the core elements of the regulatory framework seemed to be reasonably straightforward and unproblematic, which is to say that efforts to craft the regulatory framework in a technologically neutral way appear to have been fairly effective. More complex challenges were identified having to do with access to emergency services; the ability to use geographic or non-geographic numbers (and to exercise number portability); integrity and availability of the network; privacy; and lawful intercept. IP interconnection was identified as posing complex challenges that extended well beyond VoIP.

The findings in subsequent analyses by the European Regulators' Group (ERG)[80] in 2005, 2006, and 2007,[81] and also in a subsequent study on behalf of the European Commission,[82] were largely similar. The problems that were identified had little to do with the core elements of the regulatory framework; rather, they dealt with aspects that were more or less peripheral, including telephone numbering and number portability; network integrity and security; access to emergency services (including the ability to locate the user when emergency services are needed); and lawful intercept. Progress has been made in most of these areas, and some continue to be somewhat problematic to this day. Most recently, EU regulators studied these issues through their joint organisation BEREC.[83]
Notably, BEREC felt that the definition of an Electronic Communications Service (ECS), i.e. a service subject to the RFEC, was not sufficiently crisp. This risked anomalous treatment among the Member States, and had already led to different interpretations.

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78 See also recital 5 of the same Directive, which notes that the regulatory framework "...does not ... cover the content of services delivered over electronic communications networks using electronic communications services, such as broadcasting content, financial services and certain information society services, and is therefore without prejudice to measures taken at Community or national level in respect of such services, in compliance with Community law, in order to promote cultural and linguistic diversity and to ensure the defence of media pluralism."
79 European Commission (2004), "The Treatment of Voice over IP (VoIP) under the EU Regulatory Framework", 14 June 2004, at: http://ec.europa.eu/information_society/newsroom/cf/dae/document.cfm?doc_id=3980. The author of this report served as an expert adviser to that project.
80 The ERG was the predecessor organisation to BEREC.
81 ERG (2005), ERG Common Statement for VoIP Regulatory Approaches, ERG (05)12; ERG (2006): Report on "VoIP and Consumer Issues", ERG (06) 39; and ERG (2007): Common Position on VoIP (Draft) of the ERG – High Level Policy Task Force on VoIP, ERG (07) 56 Rev1.
82 Dieter Elixmann, J. Scott Marcus, and Christian Wernick, with the support of Cullen International (2008), "The Regulation of Voice over IP (VoIP) in Europe", at: http://ec.europa.eu/information_society/policy/ecomm/doc/library/ext_studies/voip_f_f_master_19mar08_fin_vers. pdf.
83 BEREC (2016), "Report on OTT services", BoR (16) 35.

"The general interpretation of NRAs is that some of OTT services qualify as ECS, for example OTT voice services that have the possibility to make outgoing and/or incoming calls to the PATS." 914

BEREC explicitly asked that the information gathering powers of EU NRAs be strengthened, including the ability to demand information from firms that are not themselves (currently) subject to the RFEC.

As noted in Section 4.1, BEREC noted the appeal of the "level playing field", but argued that "... there can also be reasons for different regulatory treatment of services. The range of services to which any specific obligation should apply, must be considered in light of the goals of the obligation and the proportionality of that obligation being applied to any specific service or service type.

This implies that the social benefits of the obligation and its scope need to be proportionate to the economic costs entailed for each regulated provider, and the static and dynamic competition effects of partial or universal application of the obligations.
A preference for a level playing field can be part of the assessment of proportionality, but it is only one of the many elements."[84]

These questions are still active, and have been the subject of several recent public consultations issued by the European Commission.

5.7 The United States

In the United States, the Communications Act of 1934 as amended imposes scarcely any obligations on *information services*. Providers of *telecommunications services*, by contrast, are subject to a range of regulatory obligations; however, the FCC can forebear[85] from applying most obligations where certain criteria are met.

The *Federal Communications Commission* (or FCC, the US national regulatory authority) has an open proceeding seeking comment on the appropriate regulatory classification of all IP-based services, including interconnected VoIP, and has declined to explicitly classify interconnected VoIP. Meanwhile, the FCC has found that because customers largely viewed interconnected VoIP service as a substitute for traditional telephone service, certain obligations that applied to telephone service providers should appropriately be applied to interconnected VoIP service (i.e. VoIP that places or receives calls to telephones on the *Public Switched Telephone Network (PSTN)*)[86] as well, including contributions to the Universal Service Fund, emergency calling obligations (to the emergency number 911), notices of discontinuance of service, compliance with CALEA, and telephone number portability. Most FCC rules that have been extended to VoIP apply specifically to interconnected VoIP.

Online or OTT services may be subject to other obligations as well. Interconnected VoIP, non-interconnected VoIP, and certain online video services are subject to certain FCC regulatory obligations. Most or all online services are subject to privacy obligations.

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84 BEREC (2016), "Report on OTT services", BoR (16) 35.
85 Under the authority of Section 10 of the Communications Act.
86 In the FCC'S rules at 47 CFR 9.3, interconnected VoIP is defined as "a service that (1) Enables real-time, two-way voice communications; (2) Requires a broadband connection from the user's location; (3) Requires Internet protocol- compatible customer premises equipment (CPE); and (4) Permits users generally to receive calls that originate on the public switched telephone network and to terminate calls to the public switched telephone network."

Some services, such as online banking and health services, are subject to sector-specific regulation. The history of network neutrality rules in the United States is complex. The US FCC put the current network neutrality (Open Internet) rules in place in 2015.[87] The FCC's Open Internet Order of 2015 served to re-classify broadband Internet access services; to impose network neutrality rules on providers of broadband Internet access services (BIAS);[88] but also to exempt BIAS providers from numerous other obligations using the previously mentioned authority to forebear.[89]

In Section 4.6, the Caller ID "spoofing" issue was discussed. The U.S. Congress passed the *Truth in Caller ID Act* in 2011 to prohibit spoofing in the U.S. The FCC adopted rules implementing this act. Since then, several bills to expand the TCIDA have been proposed in the Congress.

Relative to taxation, the United States has long had a Congressional moratorium on taxes on Internet access and on Internet-specific taxes (and on the imposition of multiple taxes on e-commerce), but not specifically on services provided over the Internet, under the *Internet Tax Freedom Act of 1998.*[90] In principle, purchases made over the Internet are subject to state sales tax whether the purchaser lives in the same U.S. state as the e-commerce provider or not; however, collection of sales tax tends to be unenforceable unless the merchant has a physical presence in the state that seeks to impose the sales tax. A substantial fraction of the sales tax that is nominally due is not in fact collected.[91] The *de facto* moratorium on state sales tax on interstate sales arguably represents a financial benefit to online merchants in comparison to conventional "brick and mortar" merchants (but an advantage that is offset to some extent by shipping costs).[92] The long-standing moratorium was recently made permanent as part of the Trade Facilitation and Trade Enforcement Act of 2015.

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87 US FCC (2015), "Protecting and Promoting the Open Internet", Report and Order on Remand, Declaratory Ruling, and Order, GN Docket No. 14-28, FCC 15-24.

88 The obligations were not imposed on providers of OTT or VoIP services.

89 J. Scott Marcus (2014), «Network Neutrality Revisited: Challenges and Responses in the EU and in the US», a study on behalf of the European Parliament's IMCO Committee, IP/A/IMCO/2014-02. PE 518.751, available at: http://www.europarl.europa.eu/RegData/etudes/STUD/2014/518751/IPOL_STU%282014%29518751_EN.pdf.

90 The Internet Tax Freedom Act of 1998 is not a separate law; rather, it is Title XI (Moratorium on Certain Taxes) of Public Law 105–277. See: http://www.gpo.gov/fdsys/pkg/PLAW-105publ277/pdf/PLAW-105publ277.pdf.

91 See US Congressional Budget Office (2003), "Economic Issues in Taxing Internet and Mail-Order Sales", at: http://www.cbo.gov/sites/default/files/10-20-internettax.pdf.

92 Ilsa Godlovitch, J. Scott Marcus, Bas Kotterink, Pieter Nooren et al. (2015), "Over-the-Top (OTT) players: Market dynamics and policy challenges", study for the IMCO Committee of the European Parliament, at http://www.europarl.europa.eu/RegData/etudes/STUD/2015/569979/IPOL_STU(2015)569979_EN.pdf.

Six Concluding remarks

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This report has sought to explain the opportunities, the threats, and the various regulatory and policy measures that have been taken in order to address these challenges in various regions and countries and around the world that appear to be among the first to confront them.

Online and OTT services have transformed the economies of both developed and developing countries; moreover, this effect has clearly trickled down to small businesses and to individuals. Historically, these benefits have tended to be concentrated in developed countries; however, as the process of digitisation accelerates, and as more and more people worldwide are connected to the Internet, these benefits accrue to developed and developing countries alike.

OTT services are thus associated with significant opportunities for all; however, they are also associated with a number of new threats. Existing regulatory provisions that were developed for the switched telephone network tend to be ill-equipped to deal with today's challenges; moreover, in many cases, a global consensus as to what constitutes best practice has not yet emerged.

Among the challenges to National Regulatory Authorities (NRAs) are:

- Determining which services should be licensed and/or subject to regulation going forward. Assessing the degree to which it is appropriate to impose the same obligations on new IP-based services as on traditional services.
- Determining which country has jurisdiction (with respect to each potential obligation) for a given international or global online service.
- Determining whether Quality of Service (QoS) should be monitored or regulated.
- Addressing risks of fraud, such as falsification of the identity of the calling party.
- Coping with a range of other risks to privacy and security that are associated with these new services.

Many claim that OTTs are impacting the revenues and profits of traditional network operators, with negative impact on investments that are needed in fibre-based infrastructure and in new mobile access technologies such as LTE. Different interpretations are possible as to the relevance and severity of this threat, but there is good reason to believe that substitution effects are present.

Any direct impact of OTT services on the profits and revenues network operators needs to be understood, moreover, in its broader context. Many things are happening at once. Substitution results in lower effective prices to consumers, which not only transfers gain to consumers, but also motivates them to consume more service – thus benefitting not only the consumers, but also generating new revenue for network operators. Globally, the number of networks users continues to increase, due in part to improving price/performance, thus also driving new revenues. At the same time, the steady improvement in the price/performance of network and computing equipment lowers unit costs for network operators. The interactions among these factors are complex, and the relative magnitudes different from case to case.

Network operators have to seriously re-think their businesses in order to capitalise on these factors, but it is by no means the case that the news is all bad for them. For consumers, and

thus for society as a whole, the potential gains from online and OTT services are substantial. Any ultimate consideration as to what constitutes best practice will need to consider the full range of effects of OTT services.

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January 7, 2019

ANNEXURE - P-26
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To,

Shri. Asit Kadayan,
Advisor (QoS),
Telecom Regulatory Authority of India (TRAI),
Mahanagar Door Sanchar Bhawan,
J.L. Nehru Marg, (Old Minto Road)
New Delhi - 110002, India

Email: advqos@trai.gov.in

Subject: **ITU-APT Foundation of India comments on TRAI OTT consultation**

Dear Sir,

ITU-APT Foundation of India (IAFI) is a non-profit, non-political registered society, non partisan Industry foundation registered as a society under the Societies Registration Act, 1960.

IAFI is working for last 15 years with the prime objective of encouraging involvement of professionals, corporate, public/private sector industries, R&D organizations, academic institutions, and such other agencies engaged in development of Indian Telecom sector in the activities of the International Telecommunication Union (ITU) and the Asia Pacific Telecommunity (APT).

The Foundation has been recognized as a international/regional Telecommunications organization by the International Telecommunications Union (ITU). IAFI is also having close working relations with similar organizations in many other countries including, Japan, Indonesia and USA.

ITU-APT Foundation of India (ITU-APT) is sector Member of the ITU Development Bureau (ITU-D) and ITU Telecommunication Standardization Bureau (ITU-T) which manifests its usefulness of the Indian Telecom industry The Foundation members are entitled to participate in the activities of ITU-D and ITU-T

Our members include many stalwarts of the telecom sector including many previous secretaries, members, advisors and DDGs of the DOT and Telecom Commission. We also have many corporate members from India and other countries including operators, vendors. 219

The foundation has been responding to TRAI on many issues of interest and I am pleased to enclose herewith our views and comments on TRAI's OTT consultation at Annex 1

For any further information or clarifications, please contact Ms. Aarush , General Manager of the Foundation at +91 999 979 7700/ +91 997-134-9028 or info@itu-apt.org) or the undersigned.

With warm regards,

Bharat Bhatia (BB)
President
Mobile:-+91-9810173737

Annex

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IAFI views and comments on TRAI OTT consultation

Q. 1. Which service(s) when provided by the OTT service provider(s) should be regarded as the same or similar to service(s) being provided by the TSPs. Please list all such OTT services with descriptions comparing it with services being provided by TSPs.

The Consultation Paper ("CP") draws parallels between the communication services offered by OTT service providers and TSPs. However, we would like to submit that the services offered by them are widely different and cannot be compared.

Other jurisdictions including UK (through their telecom regulator, Ofcom) have concluded that the use of OTT applications is unlikely to be a sufficiently close substitute for calls to a mobile number. [1] The differences between these services are technical (they operate on different layers – application layer and network layer) well as qualitative. TSPs control the underlying broadband access infrastructure, and are the gatekeepers to broadband internet access and therefore, OTTs themselves.

OTT services can have aspects of communication services, such as messaging. However, most OTT services offer a wide range of functionalities in addition to the communication feature. Due to the variety of services and apps, it is not always easy to distinguish between the primary and ancillary features of an OTT service. As a result, the categories of 'communication services' and 'non-communication services' are not identifiable categories, and seek to create an artificial distinction. For example, gaming apps (like Call of Duty), payment apps (like PayTM) and social media apps (like Hike) use messaging or calling merely to augment unrelated services and improve the consumer experience. Conceiving "communication services" as a sub-category of OTT applications serves no purpose other than to create an impractical distinction between communication functionalities and non-communication functionalities among OTT applications.

The OTT services depend on the physical infrastructure created by TSPs and generate demand for data – this relationship has been seen as likely to be a virtuous cycle across the digital value chain.[2] While TSPs can provide their own OTT applications, OTT service providers cannot exercise exclusive right to resources, such as spectrum, right of way to set up infrastructure, access to numbering resources, etc.

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[1] p. 29, CP. In reference to the Mobile Call Termination Market Review 2018-2021, available at https://www.ofcom.org.uk/__data/assets/pdf_file/0022/111397/draft-statement-mobile-call-termination.pdf.

[2] WIK-Consult, "Applications and Networks: the chicken or the egg. The role of digital applications in supporting investment and the European economy", p. 45. Available at https://www.wik.org/fileadmin/Studien/2015/Microsoft_Cloud_framework.pdf.

OTT services also offer many non-traditional and unique features – such as sharing content like GIFs, sharing documents, video calling, geo-tagging images etc. They also contribute more to the economy than basic telecommunication services, and created consumer surplus of Rs. 6.3 lakh crore in India in 2017[3].

We call the TEAI's attention in particular to the European Union's acknowledgment in the revised European Electronic Communications Code of the fundamental differences between "number-based interpersonal communications services" ("NB-ICS"), such as those interconnected with the public telephone network, and "number-independent interpersonal communications services" ("NI-ICS"), which includes non-interconnected OTT communications apps.[4] The EU created separate regulatory regimes for NB-ICS and NI-ICS, subjecting NI-ICS to lighter touch regulation (e.g. transparency requirements).

Q. 2. Should substitutability be treated as the primary criterion for comparison of regulatory or licensing norms applicable to TSPs and OTT service providers? Please suggest factors or aspects, with justification, which should be considered to identify and discover the extent of substitutability.

We are of the firm opinion that this should not be used as a criterion. Substitutability in itself is a complex criteria: it comprises many considerations and factors and shouldn't be simply reduced to one factor. Besides functional similarity, several considerations are important for determining substitutability in the context of regulation. For example, the players must:

(i) compete in the same layer (e.g., network layer, application layer, etc.) with comparable rights to resources;
(ii) offer services that are functionally the same;
(iii) have the same target group of customers;
(iv) have the same area of operation
(v) offer services on similar devices.

It is clear that based on a holistic assessment of all of the above criteria, there is no question of considering the two services to be substitutable.

Even if functional similarity were to be treated as the only criteria, consumers do not view OTT communications applications as substitutes for traditional telecom services. Further, mandating regulatory and licensing obligations on a new and growing economy will ignore critical differences between the stage of growth they are at, and hinder the innovation that drives the OTT economy. This economy is expected to grow exponentially and contribute significantly to allied digital sectors such as digital advertising[5]. OTT services are expanding into newer areas each day, providing

[3] WIK-BIF, "The Economic and Societal Value of Rich Interaction Applications (RIAs) in India", p. 13. Available at https://www.wik.org/fileadmin/Studien/2017/WIK-BIF_Report_-_The_Economic_and_Societal_Impact_of_RIAs_in_India.pdf.
[4] European Parliament and the Council of the European Union, *Directive establishing the European Electronic Communications Code*, Article 2 ¶ 6 (July 11, 2018).
[5] EY, "Digital Opportunity: Indian Media and Entertainment 2017", p. 18. Available at https://www.ey.com/Publication/vwLUAssets/EY-digital-opportunity/$FILE/EY-digital-opportunity.pdf.

customers with the complete Internet experience; whereby the digital technologies of the future like as artificial intelligence, cloud computing etc. will be accessible to them.

In light of the above, we can see that using substitutability as a measure of comparison will ignore other relevant factors such as nature of telecom and OTT economies, level of competition, maturity of businesses, etc.

Moreover, from our response to question 1, it is clear that OTT services are not substitutes to telecom services. Based on these two factors, we may conclude that extending the existing framework to an environment that it was not designed to address would be harmful, and instead, innovation should continue to guide the OTT economy.

Q. 3. Whether regulatory or licensing imbalance is impacting infusion of investments in the telecom networks especially required from time to time for network capacity expansions and technology upgradations? If yes, how OTT service providers may participate in infusing investment in the telecom networks? Please justify your answer with reasons.

There is no licensing or regulatory imbalance that impacts investment of infrastructure in the telecom networks. In fact, there is no evidence that licensing a subset of OTT services arbitrarily classified as "communications services" would have a beneficial impact on investments. It is much more likely to have a counterproductive impact on the already massive investments that are made by OTT service providers in infusing investments in telecom networks.

Some examples of these are provided below:

(i) In India, Google and Indian Railways have collaborated to provide WiFi hotspots for users in railways.
(ii) Amazon operates at least 30 data centres in its global network, of which 2 are in India, and several others are upcoming.
(iii) Facebook and Microsoft invest heavily in submarine cables.
(iv) Google and Facebook have collaborated to lay the Pacific Light Cable Network.
(v) The Telecom Infra Project ("TIP") which is a collaborative telecom community has co operations between various telecommunications infrastructure players, network operators as well as OTT players, and it encourages the development of better backhaul capacity which is the need of the hour.[6]
(vi) Several OTT service providers that invest in data centres also lease the same for the use of other players in the market including governments in some cases.

In light of the above, it would be incorrect to state that OTT service providers do not participate in investment of infrastructure, or to characterize them as "free riders" on the backs of investment made by TSPs. It is estimated that OTT investments in infrastructure is fast growing, and the bigger OTT players invested 9% of their 2011-2013 revenues in networks and facilities in the US.[7] This trend can be replicated in India with the right regulatory environment which would recognize and incentivize greater investments rather than stifle the industry with arbitrarily applicable licenses.

[6] TIP website, available at https://telecominfraproject.com/project-groups/#backhaul.
[7] "Investment in Networks, Facilities, and Equipment by Content and Application Providers", September 2014, Published by Analysis Mason, Commissioned by Google.

It should also be borne in view that all mobile data is estimated to increase by eight times between 2016 to 2022, which is a CAGR of 40 per cent, due in large measure to the proliferation of new and advanced OTT services. Total fixed data traffic is also forecast to increase by 20 per cent per annum over the same period.[8] This is only possible due to the innovation in OTT services – such growth opportunities would not exist if the telecommunications sector in any country was still restricted to voice and SMS services alone.

Therefore, OTT services should be seen as drivers of investments and revenue in the telecommunications sector – and not as competitors suffering from a regulatory "imbalance."

As regards the issue of TSPs, the issue of low margins, cutthroat prices, outdated regulatory regimes etc. need to be addressed separately and the regulatory regime needs to be made more flexible in order to allow for pricing / technology innovations and collaborative approaches by TSPs.

Q. 4. Would inter-operability among OTT services and also inter-operability of their services with TSPs services promote competition and benefit the users? What measures may be taken, if any, to promote such competition? Please justify your answer with reasons.

Interoperability is a subject matter of competition and should be regulated by the Competition Commission of India, with applicability of anti-trust laws, if and when the need arises.

It should also be noted that interoperability among TSPs is justified on the ground that they connect most of the population and the lack of interoperability will handicap communication. However, OTT service providers do not provide essential services or operate critical infrastructure. Hence, there is no corresponding public policy argument to justify interoperability among OTT services.

In addition to the above, we believe that the OTT economy is highly competitive and as such, no measures are required to increase competition. Consumers switch very easily between different applications due to their low cost and minimal switching costs. Further, one device is easily able to operate multiple services of similar variety (called 'multi-homing'), due to which consumers can access multiple applications without any difficulty[9]. Hence, there are no competition concerns arising in this regard, in the same way they do for telecommunications services.

Any regulation aimed at the imposition of uniform standards on OTT services for achieving interoperability, would work to the detriment of such services, as the service providers may not be able to make their services more unique and useful for their users. Standardisation of this kind may keep out innovation. It is important to note that innovation in relation to communications has

[8] Ericsson, "Mobility Report on the Pulse of the Networked Society", November 2016. Available at https://www.abc.es/gestordocumental/uploads/internacional/EMR_June_2016_D5%201.pdf

[9] *In re* Vinod Kumar Gupta and Whatsapp Inc. Case no. 99 of 2016, available at https://www.cci.gov.in/sites/default/files/26%282%29%20Order%20in%20Case%20No.%2099%20of%202016.pdf

created value for network providers as well as consumers,[10] and thus, it should continue to guide developments in this area.

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In fact, the OTT economy can be argued to be more competitive than TSP services which means that concerns regarding mandating interoperability may be misplaced. There is a stream of new entrants in the online space because the barriers to entry for online services are low. A new mobile app requires minimal staff, capital investment and infrastructure. The rise of cloud-computing platforms has dramatically decreased the time and capital necessary to start and scale an online service. Therefore, the regulatory concerns for making apps interoperable on ground of competition concerns may be misplaced at this stage.

Q. 5. Are there issues related to lawful interception of OTT communication that are required to be resolved in the interest of national security or any other safeguards that need to be instituted? Should the responsibilities of OTT service providers and TSPs be separated? Please provide suggestions with justifications.

No, there should not be provisions pertaining to lawful interception of OTT communication in addition to the provisions for interception that are already present. In this context, it is important to highlight that the Code of Criminal Procedure, 1973 ("CrPC") and Information Technology Act, 200 ("IT Act") both contain relevant provisions allowing for law enforcement access to records that are held by OTT service providers.

Some of these provisions are highlighted below:

- CrPC
  - Section 91 – summons to produce documents
- IT Act
  - Section 69 - Power to monitor or decrypt any computer resource;
  - Section 69A – takedown obligations
  - Section 69B – Monitor and collect traffic data or information through any computer resource
  - Various rules and regulations issued under the IT Act.

It is clear that there are sufficient safeguards in a number of laws which are likely to ensure that to the extent that law enforcement requires any kind of access to be facilitated; such access may be enabled by OTT service providers.

If the existing mechanisms are deemed to be insufficient, then it is also possible to consider reforms to make these provisions better enforceable through undertaking consultations with relevant stakeholders.

However, it would not serve "national interest" to focus on weakening existing security measures in order to make interception easier. This would have several undesirable outcomes which would end up hurting national interest, as follows:

[10] Brian Williamson, "Next generation communications & the level playing field – what should be done?", June 2016, p. 14. Available at http://www.ccianet.org/wp-content/uploads/2016/06/Next-Gen-Comm-Level-Playing-Field.pdf

- By design, security features built into OTT communications systems and other service systems ensure customer interest by safeguarding their data and encouraging them to repose trust in the OTT service providers.
- Any weakening of the security features, including encryption policies, would potentially give rise to concerns about violation of the right to privacy of users.
- Cybercrimes may proliferate if security features are weakened.
- Lawful interception may give rise to questions of surveillance which need to be balanced against the legitimate expectations of privacy and freedom of speech of internet users, as well as commercial freedom of internet application providers.

While the TRAI has identified several concerns with the manner in which OTT services are being used to "spread rumour" by miscreants, we believe that it may be counterproductive to weaken security features and strengthen interception mechanisms as a response to the same. Instead, the applications themselves should be left to respond to this need by modifying their features in a way that makes it difficult for persons to misuse their services. This is a technical and policy decision that needs to be left to each service provider based on its specific purpose and deployment of technology.

In this regard, steps have already been taken by various OTT service providers. Currently, certain messaging apps are trying out features in beta version for Android, which will help users identify suspicious links, spam and fake news. Auto detection features based on link content – that is, whether the link that a user receives is fake or spam – are also being tested out. These steps should be further encouraged.

We do not observe any concern raised by TRAI that can be addressed by even more intrusive interception regimes. We believe that the solutions to these problems lie elsewhere and are already being explored. It would be advisable not to compromise the privacy of users and security of systems without addressing a corresponding harm.

In this regard, it is appropriate for TSP and OTT players to have differential responsibility given that they invest in different parts of the digital economy and the technical aspects also vary. Therefore, there should be no importing of additional regulatory constraints from one regime to another.

Q. 6. Should there be provisions for emergency services to be made accessible via OTT platforms at par with the requirements prescribed for telecom service providers? Please provide suggestions with justification.

Emergency services are part of the essential services that are provided by TSPs as they connect large populations across the country. However, OTT services do not enjoy this kind of access or criticality.

Further, there is a need to consider the technological differences between TSPs and OTT service providers. Emergency services require location information, which is based on GPS and tower location. TSPs have access to both, and are thus able to identify the location of the users.

On the contrary, OTT services can have locational information only if the users have allowed GPS data to be collected, and also updated it. Additionally, most public-safety answering points (PSAP) are currently not equipped to handle incoming emergency communications from OTT services that are

not interconnected with the Public Switched Telephone Network (PSTN). In order to receive emergency communication, they will have to upgrade their IT systems and invest in new technologies.

Further, at this stage, most public-safety answering points (PSAP) are currently not equipped to handle incoming emergency communications from OTTs that are not interconnected with the PSTN. Therefore, mandating emergency calling services from OTT service providers may prove to be an exercise in futility. In fact, what would be more fruitful would be for OTT service providers to clearly inform users on their websites that emergency services are not available on their platform.

We would like to reiterate TRAI's own recommendation in its Consultation on Regulatory Framework for Internet Telephony, in which it recognised the limitations of Internet Based Services and recommended the following *"In view of the above, the Authority recommends that the access service providers providing Internet Telephony service may be encouraged to facilitate access to emergency number calls using location services; however they may not be mandated to provide such services at present. The subscribers may be informed about the limitations of providing access to emergency services to Internet Telephony subscribers in unambiguous terms."*

Q. 7. Is there an issue of non-level playing field between OTT providers and TSPs providing same or similar services? In case the answer is yes, should any regulatory or licensing norms be made applicable to OTT service providers to make it a level playing field? List all such regulation(s) and license(s), with justifications.

There exists no such concern of "non-level playing field" between OTT service providers and TSPs since the playing field is different for them. As explained in responses 1 and 7, they are not competitors, do not provide the same services, and operate in different network layers. One is an enabling service for the other.

While the regulations and licenses that are applicable to TSPs may be accompanied by a set of obligations, they are equally a matter of accessing certain rights and privileges as elaborated upon in the response to Q.1. This regulatory approach is informed by an assumption that telecommunications connectivity is a critical infrastructure whose access needs to be ensured at the same universal level as other facilities like roads and waterways. Much in the same way all critical utilities are treated under a different regulatory regime, the provision of telecommunications too is heavily regulated.

To the extent that the present regulatory regime no longer serves the interests of the sector, they may be revised. TRAI may reconsider burdensome license clauses that restrict operations of TSPs and prevent them from exercising flexibility in terms of their pricing and technology.

However, such a regulation should not be informed by a desire to "level the playing field" between two different varieties of market players. This could lead to overlapping regulatory regimes and a host of separate laws governing different types of OTT players. The regulation of TSPs should continue to

be informed by its separate status as a critical utility which acts as the underlying enabling service for OTT services.

Licensing requirements would be particularly harmful in this regard. Licensing requirements or other regulatory obligations, especially those tied to local presence, could create barriers to entry and expansion for app providers, particularly start-ups that lack the resources to obtain a license or incorporate local entities in all countries of operation. This could result in Indian consumers not being able to access the full benefit of global online applications, depriving the Indian public of innovative and useful technology. It may result in subverting the promise of the open internet and leave India out of the global surge of innovation.

Q. 8. In case, any regulation or licensing condition is suggested to made applicable to OTT service providers in response to Q.7 then whether such regulations or licensing conditions are required to be reviewed or redefined in context of OTT services or these may be applicable in the present form itself? If review or redefinition is suggested then propose or suggest the changes needed with justifications.

No, as we have not suggested any regulation in Q. 7.

Q. 9. Are there any other issues that you would like to bring to the attention of the Authority?

There are no other issues.

ITU-APT
Foundation of India

ANNEXURE – P-27

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THE WEEKLY NEWS SUMMARY

Highlightsof the Week

ITU-APT Foundation of India has started working on WTSA-20 Preparatory meetings on virtual format with the help of Members comments on different WTSA Resolutions The platform is open to all members to give their valuable inputs, Related documents and list of resolutions and other recent documents are available on our websit

Invitations have been sent to members for the APT 2nd Preparatory meeting to be held as an e-meeting on . Request for nominations for registration of delegates for WTSA-20/2 have been invited. These will be sent to DOT

ITU-R WP4A/4B/4C will be organised by ITU -R as e-meetings from 28 to 29 May 2020. Proposals are welcome for this meeting. For more details, please contact the secretariat

TOP STORIES :

- The Telecom Regulatory Authority of India (India) has issued a Consultation Paper on Framework for Technical Compliance of Conditional Access System (CAS) and Subscriber Management Systems (SMS) for Broadcasting & Cable Services seeking comments of all stakeholders, Full text of consultation paper is available on TRAI's website at www.trai.gov.in.

- ITU took the great initiative to organise a session on Pandemic to exposure of girls in ICT. International Girls in ICT Day Celebrated on 23rd April 2020 on a virtual format by Ms.Doreen Bogdan-Martin, Director (BDT) ITU, The program is addressed by former President of Costa Rican Ms. Laura Chincilla who said, Young Women and girls are called to lead future and in doing so, we must make technology their best ally. People took participate on worldwide bases in the inspiring global discussion where all panellist shared their experience, challenges and leadership with young girls and women. Aarush from ITU-APT secretariat attended the meeting

- Facebook's, one of our valued corporate member announce a major investment in Reliance Jio that would facilitate the ailing telecom Industry. The two companies said that they will work together on some major initiatives that would open up commerce opportunities for people across India.

THE WEEKLY NEWS SUMMARY

- The telecom industry is in discussions with district and local authorities across states for opening up prepaid recharge centres following the recent orders by the Home Ministry, and hopes that these outlets will start opening in a day or so. The Cellular Operators' Association of India (COAI) has also written to various states, urging them to issue "requisite instructions in the state/UT to enable 'mobile recharging retailers' to open their outlets for offering telecom services to the public",

- The government's decision to monitor foreign direct investment (FDI) deals from China is likely to impact 5G investments in the country.

- Indian internet traffic showed a 30% jump during the COVID-19 lockdown With the world's second most populous country cooped up indoors during the lockdown, Indian telecom traffic has witnessed at least a 30% jump over last two weeks. According to a report by data measurement firm Nielsen, the amount of internet data used in India has grown by 19% in week four of covid-19 disruption as compared to the pre-covid period. The growth is driven by an older age group with the consumption of the 35-plus category having risen by 35%. Video streaming platforms have been a beneficiary too, with a 12% increase in the time spent per user per week.

Confederation of Indian Industry

ANNEXURE-P-28
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CII Response to TRAI Consultation Paper on Regulatory Framework for Over-The-Top (OTT) communication Services

7 January 2019

Preamble

The National Digital Communications Policy 2018 is a watershed document as it clearly indicates the commitment of the Government to

- Promote and protect fair competition
- Attract long term high quality and sustainable investments
- Pursue regulatory reforms to ensure that the regulatory structures remain relevant, transparent, accountable and forward looking
- Remove regulatory barriers and reduce regulatory burden that hampers investments, innovation and consumer interest
- Strengthen the sector's institutional mechanism & legislative framework
- Secure India's digital sovereignty encompassing data privacy choice & security of its citizens

The Policy states its intent to ensure a holistic and harmonised approach for harnessing Emerging Technologies, under which one key element/strategy is to promote innovation in the creation of Communication services and network infrastructure by developing a policy framework for 'Over The Top' services.

The policy also states its intent to enable Infrastructure Convergence of IT, telecom and broadcasting, including restructuring of legal, licensing and regulatory frameworks for reaping the benefits of convergence.

Given the onset of convergence and the increase envisaged in the number of providers offering communication applications and services, the traditional licensing and regulatory regime may need to be reconsidered. The Authority could consider opportunities to deregulate the communications sector where possible.

A light, simple, transparent regulatory framework for the communications sector addressing actual consumer or competitive harm could be adopted. The Authority needs to evaluate each regulatory obligation on its relevance, requirement, practicability and desirability whilst formulating this future fit framework. Global practices and considerations may also be taken into account and the regulation should

provide predictability and legal certainty with clear frameworks that are enforced in a transparent manner.

To the extent possible, the government should consider horizontal regulations that are applicable across sectors at the national level.
The concept of sector specific taxes should also be reviewed. A recent report of the GSMA has also opined that sector-specific taxes on mobile economy hinder connectivity and development of the mobile industry.

The government could look at subsuming the license fee into the GST regime in order to ensure growth of the communications industry.

The discussions on a national data protection and privacy law are already underway. The specific provisions under license pertaining to privacy and data protection may be reviewed and be replaced with a cross reference to the data protection law, as and when announced.

Q.1
Which service(s) when provided by the OTT service provider(s) should be regarded as the same or similar to service(s) being provided by the TSPs. Please list all such OTT services with descriptions comparing it with services being provided by TSPs.

- The Authority has, in its Consultation Paper given the definition of OTT adopted in various jurisdictions.

- In this context, EU has proposed expanding the definition of electronic communication services: -

  "EU proposes to expand the definition of electronic communication services to inter alia include 'interpersonal communication services' meaning a service that allows direct interactive interpersonal exchange of information via an electronic communications network between a finite number of people, where the persons initiating/participating in the interaction determine its recipients.".

- We propose that the above definition of electronic communication services may be adopted in the Indian context as well.

- We further call the Authority's attention to the European Union's revised European Electronic Communications Code which has expanded the scope of "electronic communications services" (ECS) to include "number-based interpersonal communications services" ("NB-ICS"), such as those interconnected with the public telephone network, and "number-independent interpersonal communications

services" ("NI-ICS"), which includes non-interconnected OTT communications apps. The EECC places higher regulatory obligations on NB-ICS than NI-ICS.

- Simultaneously under Regulatory fitness and simplification [REFIT agenda] it has sought to simplify and reduce the administrative burden on communication services in order to avoid overregulation.

Q.2

Should substitutability be treated as the primary criterion for comparison of regulatory or licensing norms applicable to TSPs and OTT service providers? Please suggest factors or aspects, with justification, which should be considered to identify and discover the extent of substitutability.

- Substitutability is one of the many criteria that should be considered by the Authority in determining what regulations should be applied. Other parameters such as switching costs, level of competition, cost of service etc should also be considered.

- Substitutability may be assessed from both from the point of view of the consumer and considering the characteristics of the application or service.

- Comparison of regulatory or licensing norms or trying to assess the extent of substitutability to determine which rules should be applied/be applicable may be a narrow approach if carried out within the confines of the existing framework.

- The legacy rules that are applied need review to ensure that the TSPs are not burdened by outdated or inappropriate regulation.

- A light touch regulatory approach can be adopted and applied across the entire digital communications eco-system.

- Authority should opt to deregulate traditional communications framework wherever possible and refrain from over-regulating or regulating in a manner that disproportionately burdens companies or prevents innovation and investment.

- Authority should look to redefine and reconsider the licensing and regulatory framework for TSPs. This would mean testing each rule under the telecom license and questioning its relevance in the new digital eco-system.

Q.3

Whether regulatory or licensing imbalance is impacting infusion of investments in the telecom networks especially required from time to time for network capacity expansions and technology upgradations? If yes, how OTT service

providers may participate in infusing investment in the telecom networks? Please justify your answer with reasons. 283

- There is no doubt that the growth of OTT applications and services increases the need for infusion of investments in the network to maintain and upgrade capacity on an ongoing basis.

- The relationship between TSPs and OTTs is symbiotic – OTTs drive user demand for data, which in turn requires the TSPs to invest in expanding network capacity and coverage. The increased use of OTT services has resulted in higher network utilization and is contributing towards the increased revenues, which in turn would lead to higher investments in the TSPs' networks.

- Reducing the regulatory burden on TSPs may be a desirable step to increase the investible funds in the hands of the TSPs to cater to the growing requirements for network capacity expansions and technology upgradations.

- OTTs participation in infusing investments may be achieved by allowing TSPs to offer OTT packs to their consumers.

Q.4

Would inter-operability among OTT services and also inter-operability of their services with TSPs services promote competition and benefit the users? What measures may be taken, if any, to promote such competition? Please justify your answer with reasons.

- Interconnection is mandated only in respect of network interconnection, i.e. for communication between two networks.

- In case of OTTs, mandating inter-operability amongst OTTs and between OTT and TSPs may not be practical and could be left to mutual agreement between the parties.

Q.5

Are there issues related to lawful interception of OTT communication that are required to be resolved in the interest of national security or any other safeguards that need to be instituted? Should the responsibilities of OTT service providers and TSPs be separated? Please provide suggestions with justifications.

- Lawful Interception and customer data privacy is of paramount importance for electronic communication services.

- Authority has recommended a National Encryption Policy in its recommendations on "Privacy, Security, and Ownership of the Data in Telecom Sector" which we support to be implemented by way of a horizontal regulation. 234

Q.6

Should there be provisions for emergency services to be made accessible via OTT platforms at par with the requirements prescribed for telecom service providers? Please provide suggestions with justification.

- Under the existing licensing framework, TSPs are mandated to provide Emergency services to their subscribers.

- In the Authority's Internet telephony recommendations, which have been accepted by the Government], it is provided that

  "The Licensees providing Internet Telephony service may facilitate access to emergency number calls using location services; however, it is not mandated to provide such services at present. The subscribers may be informed about the limitation of providing access to emergency services to internet Telephony subscribers in unambiguous terms"

- A similar approach may be adopted in the case of OTTs to provide provision of emergency services by OTT players not be mandated at this stage.

- There should be complete transparency to the consumer with regard to emergency number calling.

Q.7

Is there an issue of non-level playing field between OTT providers and TSPs providing same or similar services? In case the answer is yes, should any regulatory or licensing norms be made applicable to OTT service providers to make it a level playing field? List all such regulation(s) and license(s), with justifications.

- The communications eco system has widened and grown to cover services being offered through various technologies/platforms, communication applications and services.

- The legacy rules that are applied to TSPs are in urgent need of a review to ensure that the TSPs are not burdened by outdated or inappropriate regulation

- The key areas that should be reconsidered include:

- Financial Conditions – the license fee, spectrum and other charges payable to the Government

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- Security Conditions

- Commercial Conditions – Tariffs

- The TRAI too, in its NDCP consultation, has noted that there is a growing convergence of the digital ecosystem which is transforming the way electronic communication and digital services can be offered,

- Any new regulations for TSPs and OTTs should be considered taking into account the respective regulations govern the TSPs and the OTTs under the Telegraph Act, license, TRAI Act and the Information Technology Act. The Authority should consider new future fit frameworks that lightens the regulatory burden and adopts a progressive approach that allows all entities in the eco-system to proliferate and grow – offering maximum benefits to the consumers.

- The new future fit framework should recognize this growing convergence of networks, services, technologies and should consider the emerging digital ecosystem and ensure growth for all players.

Given the onset of convergence and the increase envisaged in the number of players offering communication applications and services, reconsideration of the traditional licensing and regulatory regime may be advisable.

To the extent possible, the government should consider horizontal regulations that are applicable across sectors at a national level.

The direct tax levy of license fee, spectrum charges etc creates a huge financial burden to TSPs. The concept of sector specific taxes should also be reviewed. Apart from the impracticality of enforcing a traditional license fee regime across all players offering communications applications and services, a recent report of the GSMA has also stated that sector-specific taxes on mobile economy hinder connectivity and development of the mobile industry.

The discussions on national data protection and privacy law are already underway and the provisions under that law would apply to both OTT players as well as TSPs. The specific provisions under license pertaining to privacy and data protection may be reviewed and be replaced with a cross reference to the data protection law, as and when announced.

Q.8

In case, any regulation or licensing condition is suggested to made applicable to OTT service providers in response to Q.7 then whether such regulations or licensing conditions are required to be reviewed or redefined in context of OTT services or these may be applicable in the present form itself? If review or redefinition is suggested then propose or suggest the changes needed with justifications.

- Applying legacy rules to all providers of communications may be neither desirable nor practical. The Authority should consider opportunities for deregulation and new frameworks that are progressive and inclusive, that consider the entire emerging digital ecosystem and the specific characteristics of each service and also allow all entities in the eco-system to proliferate and grow, offering maximum benefits to the consumers.

- As suggested that in the new framework, there should be no sector specific taxes, the license fee and spectrum charges should be subsumed into GST.

Q.9

Are there any other issues that you would like to bring to the attention of the Authority?

- No comments

GOVERNMENT OF INDIA
MINISTRY OF HOME AFFAIRS
LOK SABHA

ANNEXURE-P-29

UNSTARRED QUESTION NO: 351
ANSWERED ON: 19.11.2019

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WhatsApp Tapping

Dayanidhi Maran

Will the Minister of HOME AFFAIRS be pleased to state:-

(a) whether the Government does Tapping of WhatsApp calls and Messages in the country;

(b) if so, the details thereof;

(c) the protocol being followed in getting permissions before tapping WhatsApp calls and messages;

(d) whether it is similar to that of mobile phones/telephones;

(e) whether the Government uses Pegasus software of Israel for this purpose;

(f) if so, the details thereof; and

(g) whether the Government does tapping of calls and messages of other platforms like Facebook Messenger, Viber, Google and similar platforms and if so, the details thereof?

ANSWER

MINISTER OF STATE IN THE MINISTRY OF HOME AFFAIRS
(SHRI G. KISHAN REDDY)

(a) to (g) : Section 69 of the Information Technology Act, 2000 empowers the Central Government or a State Government to intercept, monitor or decrypt or cause to be intercepted or monitored or decrypted, any information generated, transmitted, received or stored in any computer resource in the interest of the sovereignty or integrity of India, security of the State, friendly relations with foreign States or public order or for preventing incitement to the commission of any cognizable offence relating to above or for investigation of any offence.

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Similarly, Section 5 of the Indian Telegraph Act, 1885 empowers lawful interception of messages on occurrence of public emergency or in the interest of public safety.

This power of interception is to be exercised as per provisions of law, rules and Standard Operating Procedure (SOP). Each such case is approved by the Union Home Secretary, in case of Central Government; and by Home Secretary of the Stateconcerned, in case of a State Government.The competent authority in the Central Government has authorized following 10 agencies for this purpose:

i) Intelligence Bureau;
ii) Narcotics Control Bureau;
iii) Enforcement Directorate;
iv) Central Board of Direct Taxes;
v) Directorate of Revenue Intelligence;
vi) Central Bureau of Investigation;
vii) National Investigation Agency;
viii) Cabinet Secretariat (RAW);
ix) Directorate of Signal Intelligence (For service areas of Jammu & Kashmir, North East and Assam only)

-3/...

x) Commissioner of Police, Delhi

Any interception or monitoring or decryption of any information from any computer resource can be done only by these authorized agencies as per due process of law, and subject to safeguards as provided in the rules and SOP.

The safeguards and review mechanism have been prescribed in Rule 419A of the Indian Telegraph

Decryption of Information) Rules, 2009 and Standard Operating Procedure issued for the purpose. There is no blanket permission to any agency for interception or monitoring or decryption and permission from competent authority is required, as per due process of law and rules, in each case. Each case is also reviewed by a Committee Chaired by the Cabinet Secretary in case of Central Government and Chief Secretary of the State concerned in case of a State Government.
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COAI

ANNEXURE-P-30

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Counter Comments
TRAI Consultation Paper on
Internet Telephony
Released on July 22, 2016

At the outset, we would like to highlight key submissions made in our response to the Consultation paper in order to provide clear perspective on the issues involved:

1. Only Unified Licensee with Access Authorization can be allowed to provide Internet Telephony on their networks.

2. Internet Telephony requires Access Network (Last Mile) of UL/CMTS/UASL under Licensing Framework.

3. The Access Network to Subscriber of UASL/CMTS/UL (Access Authorization) has to be given by that UASL/CMTS/UL (Access Authorization) only. Even a licensee which is not giving such access network to its subscriber (last mile), cannot provide /internet telephony.

4. Any such attempt to provide connectivity through other service provider's internet connection is equal to any OTT Communication Service and not Internet Telephony Service as envisaged under the current licensing regime.

5. An OTT Communication Service (even when provided by a licensee where that licensee does not have an access network) cannot use any numbering or addressing resource to show such OTT Communication Service as Internet Telephony.

6. The fundamental issue of OTT Communication Services and corresponding issue of 'SAME SERVICE SAME RULES' needs to be decided first before initiating this Consultation.

7. Internet Telephony provided by unlicensed entities besides being in violation of license will not only deprive the licensed operators of huge revenue but will also result in lesser payout to exchequer in the form of reduced license fee on revenues.

We would like to make following submissions on the comments received from various stakeholders:

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1. **Internet Telephony as a Fixed line or Mobile service:** Some of the stakeholders in their response to the Consultation paper have submitted that Internet Telephony should be construed as the fixed line service; others have stated that it is 'akin' to a mobile service. In this regard, we would like to make following submissions:

   a. We would like to submit that Internet telephony cannot be construed as an extension of fixed or mobile services. Public Internet is a separate delivery channel. License too clearly states that Internet telephony is different from the fixed and mobile services offered by access licensees.

   b. Importantly, we would like to submit that such remote access of telecom services of an ISP/TSP by its subscriber through internet access of any other ISP/TSP is illegal and not allowed under the current licensing regime. It is also not a public internet which is created by the subscriber using the internet access of another ISP/TSP.

   c. Public internet is 'Internet Cloud' which is behind the gateway of ISP/TSP and not the "Internet access of any other TSP". TRAI itself has mentioned Public Internet as 'Internet Cloud' in 2008 Consultation paper on the same subject and it cannot now change the definition. Hence, internet telephony, with so called public internet being at last mile level, is not envisaged in the license agreement. **Any routing of call, in this manner will be in serious breach of numbering plan, re-selling conditions, CLI tampering and illegal call routing.**

2. **Interconnection/Termination Charges:** Some of the stakeholders have submitted that Point of Interconnection for circuit switched network for various types of calls cannot be made applicable for Point of Interconnection for IP Telephony calls and hence the IUC that currently exists cannot be implemented in case of voice traffic if they follow the IP domain. Some have contended that the fixed line termination should be followed; others that it should be the termination applicable to mobile services. However irrespective of whether these services are classified as 'content' or as fixed line or even as mobile, these stakeholders want that Bill and Keep (BAK) should be implemented for termination charges. In this regard, notwithstanding to our comments w.r.t to the initiation of this consultation paper even before deciding on the issue of OTT Communication Services and corresponding issue of 'SAME SERVICE SAME RULES' by the Licensor, we would like to make following submissions:

   a. COAI has always held the view that Interconnect charges should be determined **on cost based and work done principle**. Interconnection usage charges should be arrived at by using a robust cost based model, which includes all costs and justifies investment for expansion of service.

b. Networks have to be built and costs have to be recovered and unless the TRAI is proposing a move back to a Receiving party pays regime, a cost based IUC has to be prescribed.

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c. The TRAI has itself stated in 2015 that the Bill & Keep approach is not desirable in cases there are asymmetries in traffic flows, where operators are at different stages of development, that bill & keep has never been mandated by Regulation but is mostly voluntarily agreed between operators, that no country has adopted bill and keep in a CPP regime, even the most mature telecom regimes have not opted for bill and keep. Hence, we are of the view that the Bill & Keep approach cannot be prescribed in such environment.

d. Further, prescribing Bill & Keep will disincentivize the operators from investing in telecom & network infrastructure, since the operators will not be adequately compensated for the resources utilized in its network, but at the same time is required to install and expand its network to meet the growing terminating traffic.

e. The so called internet telephony being mooted in the consultation appears to be focused on app based telephony that will ride on networks created by other TSPs/ISPs with no incentive for any TSP to invest in the said underlying infrastructure.

3. **Entry fee for ISP:** Some of the stakeholders have submitted that no additional entry fees should be charged from the ISPs to allow them to offer unrestricted internet telephony services. In this regard, we would like to make following submission:

a. In case ISP Licensee intends to provide Internet Telephony as permitted under UL (AS) along with interconnection to PSTN then there is no basis to submit that ISP does not need to migrate to UL (Access Authorisation) with applicable terms and conditions, entry fee, Performance Bank Guarantee and Financial Bank Guarantee and set-up independent network to provide such services.

b. It is a fact that the ISP license /authorization does not allow them to offer unrestricted Internet Telephony; thus if an ISP provider is desirous of offering unrestricted Internet telephony, it must take /migrate to the appropriate license, i.e. the Access service license/authorization.

c. Hence, it is imperative that only entities that obtain a UL with authorization for access services be allowed to offer unrestricted internet telephony and pay additional amounts as prescribed under that license to be able to offer Internet Telephony services.

d. Also, ISP should be allowed to offer internet telephony only on the access network built by them and should ensure that they meet all licensing requirements like Security, numbering, routing etc.

4. **Emergency call:** Some of the stakeholders are of the view that providing the location information to the police station when the subscriber is making Internet Telephony call to Emergency number under VOIP is not possible and hence the same should not be mandated.

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a. The 'Emergency number calling' is a critical facility which cannot be overlooked. It is mandatory for all UL/UASL – whether existing or new – to provide this service. An access licensee providing telecom services (including Internet Telephony) is bound to provide Emergency services access to its customers over its own network or through commercial tie-ups.

b. Further, we believe that DoT has mandated the handset suppliers to manufacture GPS enabled handsets w.e.f 1st Jan, 2018. Since majority of the Internet Telephony calls will be based on mobile devices with broadband Internet connectivity having GPS facility, the location information can be provided by the Internet Telephony service provider, while originating the call to emergency numbers.

5. **OTT Internet Telephony (VOIP) :** Some stakeholders have given their comments with respect to the Internet Telephony to be provided by the OTT players or the non-licensees. In this regard, we would like to make following submissions:

a. **Re contention that VOIP services do not Bypass the existing Licensing Regime:** we would like to submit that despite the fact that TSPs are the ones who are required to (a) invest heavily in creating the access infrastructure for the internet, (b) acquire the customers through proper verification processes, (c) be held accountable for ensuring the Quality of Services for the desired user experience, and (d) pay huge levies in the form of license fee, spectrum charges, and capital expenditure to maintain networks, the TSPs role is now being envisaged to be 'Passive'. In contrast, unlicensed entity/OTT player are merely riding on the networks of TSPs in India. In addition, the licensed TSPs are subject to various security conditions, various licensing conditions and TRAI's customer centric regulations; these entities (currently with respect to restricted Telephony) do not comply with. **Thus, a severe Regulatory imbalance exists between OTT communication players and the Telcos, which needs to be addressed at the earliest.**

b. **Re contention that the telecom infrastructure that delivers VoIP is already under Surveillance and Blocking Regulations – No further security provisions required:** In this regard, we would like to submit that:

i. At present, there is a widely differing treatment accorded between telcos and OTT players as regards security compliance requirements on similar services. It should be noted that extensive and stringent security conditions are laid down and required to be met by the licensed telcos. These include:

- Taking permission/approval of the licensor for any new service
- Setting up Lawful Interception and Monitoring (LIM) systems 243
- Restriction on switching of domestic calls/messaging from outside the country
- Restriction on sending user information abroad
- Gives the Licensor the right to inspect the sites/network used for extending the service
- Providing necessary facilities for continuous monitoring of the system, not employing any bulk encryption equipment; taking prior evaluation and approval of Licensor for any encryption equipment for specific requirements
- Switching/Routing of voice/messages in P2P scenario
- Responsibility for ensuring protection of privacy of communication and confidentiality of subscriber information
- Quality of Service, Unsolicited Commercial communications, Complaint Redressal Mechanism, etc.

ii. There is undoubtedly a need to ensure that these inequities are addressed and there is level playing field between the TSPs and the OTT communication service providers. This may be done by ensuring that the regulatory framework applicable to OTT communications services is the same as that applicable to the communications services provided by TSPs.

c. **Re contention that VOIP is not cannibalizing the TSPs Revenue:** In this regard, we would like to submit that the growth of OTT communication services is impacting the traditional revenue streams of the TSPs. The growth in data revenues is insufficient to address this erosion. Going forward, with the increasing penetration of Smartphones, this trend will only accelerate, thus further adversely impacting the financial viability and business sustainability of the TSPs. The implication of the revenue will be largely due to substitution of voice and messaging service:

i. **Messaging substitution:** Instant messaging services and other social networking tools are affecting SMS revenues, and SMS is becoming less important for many consumers. As mobile Internet is steadily growing as a key revenue generator, SMS is slowly declining as a significant revenue opportunity. According to research firm Ovum, the Indian telecom operators may lose USD 3.1 billion in SMS revenues by the end of 2016.

ii. **Voice Substitution:** Voice revenues are expected to suffer because of VoIP-based OTT offerings. In India, around 75% of revenues are generated by voice. Several OTT players have already had an impact on mobile VoIP growth and on the total voice market.

iii. **Data revenues do not compensate for fall in revenues from OTT services**: According to an industry research, the number of mobile operators generating revenues from OTT services by charging for data is falling year-on-year. TRAI has itself highlighted in its Consultation Paper on Regulatory Framework for Over-the-top (OTT) services released on March 27, 2015, the fact increased data usage fails to

compensate for loss of revenues to TSPs arising due to OTT services. Further, these services also put strain on the network, thus requiring further investments. २५५

d. **Re contention that PC to PC VoIP (whether provided via the public internet or over managed IP networks) is not subject to telecom regulation;**

i. We would like to state that the comment from certain stakeholders that PC to PC VoIP is not subject to telecom regulation is incorrect. The PC to PC calling has been explicitly mentioned in the Unified License under the Internet Service. The relevant extracts from the Unified License are mentioned as below:

"(ii) The Licensee may provide Internet Telephony through Public Internet by the use of Personal Computers (PC) or IP based Customer Premises Equipment (CPE) connecting only the following:

a) PC to PC; within or outside India

b) PC / a device / Adapter conforming to TEC or International Standard in India to PSTN/PLMN abroad.

c) Any device / Adapter conforming to TEC or International Standard connected to ISP node with static IP address to similar device / Adapter; within or outside India"

e. Re contention that TSPs never used this opportunity to develop their own VOIP services:

i. We would like to submit that views expressed by some stakeholders regarding the VOIP services not being provided by TSPs in context of wireless networks do not take into account various technical facts about 2G networks.

ii. The constraints related to narrow channel bandwidth in GSM networks, Jitter in IP, latency made it unsuitable to provision VoIP over narrow bandwidth 2G Networks.

iii. The constraints mentioned in the above point would have led to QoS issues on VoIP over 2G wireless Networks.

iv. Moreover, in absence of suitable IP header compression technology integrated in 2G technologies, the VoIP packets would have consumed significantly higher spectrum resource on wireless networks as compared to circuit switched technology.

v. The above facts were taken into consideration by standard making bodies like ETSI/3GPP etc. and therefore, circuit switched technology was used to provide voice

over the 2G wireless networks which was suitable at that time world over not just in India.

Our Request w.r.t OTT Communication:

a. We wish to submit that while we acknowledge the role of OTT communication players, however, it is pertinent to note that some of the services that are offered by the OTT Communication players such as messaging/instant messaging and VOIP telephony are perfect substitutes of the services that are being offered by the TSPs under UASL/UL.

b. There is thus a need to address the various regulatory imbalances and ensure Regulatory Neutrality, between TSPs and OTT players. For this, the Authority should **apply the principle of, "Same services, Same rules".** Only under such an environment, the TSPs will get a fair chance to compete with OTTs on similar pricing and terms.

c. We request TRAI to also consider our response to TRAI Consultation Paper No.2 /2015 on Regulatory Framework for Over-the-top (OTT) Services dated 24th April 2015 and come up with its recommendation on the issue at the earliest. We would like to hereby highlight some key points that need the consideration of the Authority:

- Regulatory Framework for OTT players need to be prescribed.
- Promulgation of similar regulatory mechanism for all providers, including OTT players regarding National Security, public order, decency and morality, protection of privacy, data protection, public safety and disaster management.
- Analyzing the impact of growth in OTT on the traditional revenue stream of TSPs
- Discuss whether OTT players offering communication services (voice, messaging and video call services) through applications (resident either in the country or outside) be brought under the licensing regime
- Discussion on Commercial Negotiations: Similar to the mutual commercial agreements between the DTH infrastructure providers and content providers, TSPs too should have the freedom of commercial negotiation with OTTs communication players who are utilizing the TSPs' network and bandwidth for delivery of its services.
- Pricing model and options, i.e. bandwidth / time / website access based, to be adopted for the commercial agreement between the TSP and the OTT service provider and the same should be left to the mutual arrangement between them.
- Security Issues: Security concerns, maintaining data records, logs etc. and ensuring security, safety and privacy of the consumer data as well as their compliance by OTT Communication players needs to be addressed.

****

ANNEXURE-P-31

246

From: **Pathak, Varun** <varun.pathak@amsshardul.com>
Date: Thu, May 6, 2021, 16:50
Subject: World Phone Internet Services Pvt. Ltd. Vs UOI & Ors., WP (C) No. 11173/2019
To: anupam@kiaa.co.in <anupam@kiaa.co.in>
Cc: bipul.kedia@gmail.com <bipul.kedia@gmail.com>, laxman@kanthcorp.com <laxman@kanthcorp.com>, Mirza, Gauhar <gauhar.mirza@amsshardul.com>, @SAM WA.litigation <wa.litigation@amsshardul.com>, @SAM FB Litigation <fb.litigation@amsshardul.com>

Dear Mr. Prakash,

We write on behalf of our client, Facebook, Inc., arrayed as Respondent No. 3 in the matter titled World Phone Internet Services Private Limited v. Union of India & Ors., WP (C) 11173/2019 (the "**Petition**"), before the Hon'ble High Court of Delhi.

At the outset, we note that the April 19, 2021 hearing in the Petition should have been adjourned per the Hon'ble Court's office order dated April 18, 2021 (attached), which directed all cases from the year 2019 to be adjourned. Thus, it is unclear why the April 19, 2021 hearing in the Petition proceeded.

At the April 19, 2021 hearing in the Petition (order attached), the Hon'ble Court granted liberty to serve Facebook, Inc. "*at [its] Indian office and also through [its] US office*." This direction appears to have been passed in error. As Facebook, Inc. has already entered appearance in the Petition on November 19, 2020 (order attached), no further steps are required for service pursuant to the order dated April 19, 2021.

For completeness, we also clarify that Facebook, Inc. does not have any office in India. Moreover, the address provided in CM Application No. 8994 of 2021 at paragraph 7 is not the correct address for service on Facebook, Inc. Any service of documents on Facebook, Inc. must be completed at its registered address: 1601 Willow Road, Menlo Park, California 94025, United States of America.

Please direct any further correspondence regarding the Petition to us. Facebook, Inc. reserves all its rights.

Yours sincerely,

Varun Pathak (D/460/2007)

For Shardul Amarchand Mangaldas & Co

(Advocate for Respondent No. 3)

Varun Pathak
Counsel

247

Shardul Amarchand Mangaldas & Co
Advocates & Solicitors

Amarchand Towers, 216 Okhla Industrial Estate, Phase III, New Delhi - 110 020, India

T +91 11 41590700, 40606060 Ext. F: +91 11 2692 4900

M +918527883939

E **varun.pathak@AMSShardul.com**

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India Business Law Journal Law Firm of the Year 2020
Law Firm
of the year

From: **Mirza, Gauhar** <gauhar.mirza@amsshardul.com>
Date: Thu, May 6, 2021, 17:50
Subject: World Phone Internet Services Pvt. Ltd. Vs UOI & Ors., WP (C) No. 11173/2019
To: anupam@kiaa.co.in <anupam@kiaa.co.in>, bipul.kedia@gmail.com <bipul.kedia@gmail.com>
Cc: laxman@kanthcorp.com <laxman@kanthcorp.com>, Pathak, Varun <varun.pathak@amsshardul.com>, @SAM WA.litigation <wa.litigation@amsshardul.com>, @SAM FB Litigation <fb.litigation@amsshardul.com>

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Dear Mr. Prakash,

We write on behalf of our client, WhatsApp LLC (formerly known as WhatsApp Inc.), arrayed as Respondent No. 4 in the matter titled World Phone Internet Services Private Limited v. Union of India & Ors., WP (C) 11173/2019 (the "**Petition**"), before the Hon'ble High Court of Delhi.

At the outset, we note that the April 19, 2021 hearing in the Petition should have been adjourned per the Hon'ble Court's office order dated April 18, 2021 (attached), which directed all cases from the year 2019 to be adjourned. Thus, it is unclear why the April 19, 2021 hearing in the Petition proceeded.

At the April 19, 2021 hearing in the Petition (order attached), the Hon'ble Court granted liberty to serve WhatsApp LLC "at [its] Indian office and also through [its] US office." This direction appears to have been passed in error. As WhatsApp LLC has already entered appearance in the Petition on November 19, 2020 (order attached), no further steps are required for service pursuant to the order dated April 19, 2021.

For completeness, we also clarify that WhatsApp LLC does not have any office in India. Moreover, the address provided in CM Application No. 8994 of 2021 at paragraph 9 is not the correct address for service on WhatsApp LLC. Any service of documents on WhatsApp LLC must be completed at its registered address: 1601 Willow Road, Menlo Park, California 94025, United States of America.

Please direct any further correspondence regarding the Petition to us. WhatsApp LLC reserves all its rights.

Yours sincerely,

Gauhar Mirza, Advocate (D/4139/2010)

On behalf of Shardul Amarchand Mangaldas & Co.

Advocates for WhatsApp LLC (formerly known as WhatsApp Inc.)

Gauhar Mirza
Partner

Shardul Amarchand Mangaldas & Co
Advocates & Solicitors

Amarchand Towers, 216 Okhla Industrial Estate, Phase III, New Delhi - 110 020, India

D ext. 4094, M +917042398844

T +91 11 41590700, 40606060 F: +91 11 2692 4900

E **gauhar.mirza@AMSShardul.com**

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ANNEXORE - P-31

250

WhatsApp Business

WhatsApp LLC Communication

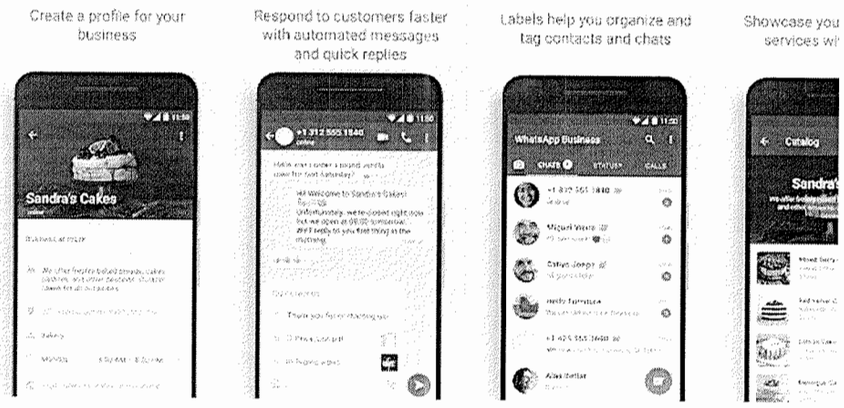
58,55,325

3+

This app is available for all of your devices

Add to wishlist

Install



WhatsApp Business from Facebook

WhatsApp Business enables you to have a business presence on WhatsApp, communicate more efficiently with your customers, and help you grow your business.

If you have separate business and personal phone numbers, you can have both WhatsApp Business and WhatsApp Messenger installed on the same phone, and register them with different numbers.

In addition to the features available in WhatsApp Messenger, WhatsApp Business includes:

• BUSINESS PROFILE: Create a profile for your business to help your customers find valuable information — like your website, location, or contact information.

• BUSINESS MESSAGING TOOLS: Be more responsive to your customers by using Away messages to indicate when you're away or Greeting message to send your customers an introductory message when they first message you.

• LANDLINE/FIXED NUMBER SUPPORT: You can use WhatsApp Business with a landline (or fixed) phone number and your customers can message you on that number. During verification, select the "Call me" option to receive the code over a phone call.

• RUN BOTH WHATSAPP MESSENGER AND WHATSAPP BUSINESS: You can use both WhatsApp Business and WhatsApp Messenger on the same phone, but each app must have its own unique phone number.

• WHATSAPP WEB: You can more efficiently respond to your customers right from your computer's browser.

WhatsApp Business is built on top of WhatsApp Messenger and includes all the features that you rely on, such as the ability to send multimedia, free calls*, free international messaging*, group chat, offline messages, and much more.

*Data charges may apply. Contact your provider for details.

Note: once you restore chat backup from WhatsApp Messenger to WhatsApp Business, you will no longer be able to restore it back to WhatsApp Messenger. If you would like to go back, we recommend that you copy the WhatsApp Messenger backup on your phone to your computer before you start using WhatsApp Business.

We're always excited to hear from you! If you have any feedback, questions, or concerns, please email us at:

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COLLAPSE

REVIEWS

Review policy and info

4.2

5
4
3
2
1

58,55,325 total

M Yousuf
3 October 2021
999

Good app,just one issue we cannot pin more than 3 chat and group chat must be separated from single person chat,please solve this issue in serious mode.please consider this problem.thanks in advance.

Asyranie Idris
3 October 2021
438

I try to log in many attempt but still couldn't log in. it keeps on telling me to retry because of poor connection . My connection was totally fine! stress la macam ni nyampah

Njunge Wamaitha
2 October 2021
700

Am stuck at the registration stage. Once I put my number its just displaying connecting n stops there for a long time. What cd be the issue?

Tyon Hyundai Chanel
3 October 2021
67

It took forever to upload even single status update, please rectify this problem, still facing the problem after updates, im using android 11

READ ALL REVIEWS

ADDITIONAL INFORMATION

Updated
28 September 2021

Size
Varies with device

Installs
500,000,000+

Current Version
2.21.19.21

Requires Android
4.1 and up

Content rating
Rated for 3+
Learn more

Interactive Elements
Users interact, Shares location

Permission
View details

Report
Flag as inappropriate

Offered By
WhatsApp LLC

Developer
Visit website
smb@support.whatsapp.com
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1601 Willow Road Menlo Park, CA 94025

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WhatsApp I
WhatsApp LLC

WhatsApp \
WhatsApp LLC

ANNEXURE – P- 33

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Telecom Regulatory Authority of India

Consultation Paper

On

Regulatory Framework for Over-the-top (OTT) services

27th March, 2015

Mahanagar Doorsanchar Bhawan

Jawahar Lal Nehru Marg,

New Delhi – 110002

2.40 Under the current telecom licensing regime, voice and messaging services can be offered only after obtaining a license. Apart from traditional voice and messaging, IP based voice and messaging services can also be offered by TSPs as unrestricted Internet Telephony Services, which are permitted under the scope of the Unified Access Service (UAS) license in terms of the UAS Guidelines dated 14th December 2005. Similar provisions exist for Cellular Mobile Telephone Service (CMTS) and Basic Service Licences. However, the scope of the Internet Services Licence[24] was restricted to Internet Telephony Services without connectivity to Public Switch Telephone Network (PSTN) / Public Land Mobile Network (PLMN) in India.

2.41 According to the Cellular Operators Association of India (COAI), voice services provided by OTT players substitute the PSTN/ Internet Telephony Services offered by licensed TSPs. In the present licensing regime, Internet Telephony is a licensed service permitted only under the UAS/ISP or Unified License granted under Section 4 of the Indian Telegraph Act 1885. Hence, according to COAI, companies offering OTT voice services, without holding a telecom license in India, circumvent Indian telecom licensing provisions and provide services that are otherwise permitted only under a telecom license.

2.42 COAI further opines that the licensed TSPs in India are subject to many licensing provisions, including but not limited to regulatory fees such as Entry Fee, License Fee and Spectrum Usage Charges. They are also subjected to various statutory regulations such as Quality of Service Regulations, Tariff Regulations and, Consumer Protection Regulations. They also need to ensure emergency services, confidentiality of customer

[24] In terms of internet Service guidelines dated 1st April 2002 and 24th August 2007

information, privacy of communication, undergo regular audits and ensure proper lawful monitoring and interception. However, 'unlicensed' OTT providers are not bound by any such conditions. This opportunity for arbitrage enables OTT players to offer Internet Telephony either free or at very low tariffs and that too by riding on the TSPs' networks. Such OTTs can and will unfairly garner a substantial chunk of voice service usage, as they have done in the case of messages, because they directly compete with voice services provided by TSPs. And, the OTT business model, with low or zero tariffs, results in usage shifting from PSTN/Internet Telephony Voice to OTT Voice (Internet Telephony). As a result, both licensed operators and the Government are deprived of their legitimate revenues.

2.43 The TSPs also argue that allowing the use of VoIP/Internet Telephony on such a massive scale, without a licensing regime, would result in a significant disruption to the existing business of TSPs and could substantially derail their investment capability. Such a situation would jeopardize the national objective of affordable and ubiquitous telephone and broadband access across the country. Further, the proliferation of OTT communication services would lead to a significant loss of revenue for the exchequer.

2.44 On the other hand, OTT players offering communication services argue that such services (voice call, chat, messaging) are offered to users through the internet services provided by Licensed Telecom Operators and the TSPs levy applicable usage charges. Therefore, OTT providers argue that they are offering communication services over the internet but the TSP is paid for the internet services consumed by an end-user.

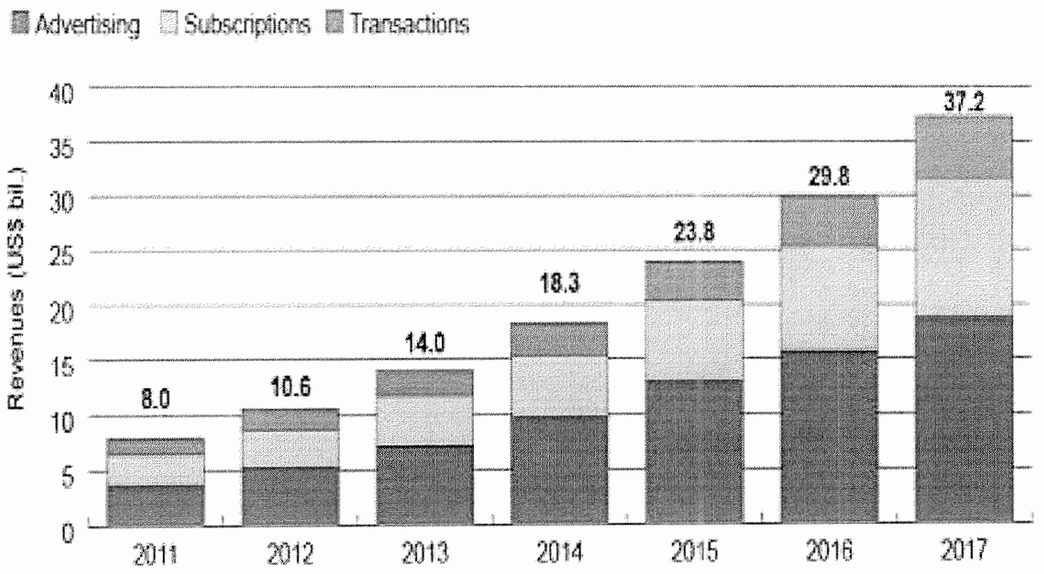
2.45 The OTTs are quick to point out that increased data usage augments revenue flows of the TSPs. This is indeed true. However, whether this

revenue sufficiently compensates the TSPs needs further examination. Further, there is a technological caveat to the general proposition that increased OTT app usage augments revenue flows of TSPs. With the evolution of new coding techniques (I2S for audio and HVEC for video) apps are being designed to consume minimal bandwidth and improved call/ video quality. If so, will there be any revenue increase and would it still sufficiently compensate the TSPs?

Media services

2.46 The delivery of video, audio and other media content over the internet can be termed as OTT media. It refers to third party content delivered to an end-user device over the TSP's network. The rise in OTT media traffic has been subsumed in the rise of internet traffic. However, these media apps clearly seem to be one of the few services that are earning large revenues for the providers. Figure 2.9 depicts the forecasted increase in OTT video revenues, the majority of it coming from advertisements.

Figure 2.9: OTT media revenue forecast[25]



[25] Informa Telecoms and Media

भारतीय रिज़र्व बैंक
RESERVE BANK OF INDIA
www.rbi.org.in

ANNEXURE—P-34

RBI/2017-18/153
DPSS.CO.OD No. 2785/06.08.005/2017-2018

6 April 2018

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The Chairman and Managing Director / Chief Executive Officers,
Authorised Payment Systems /
All Scheduled Commercial Banks including RRBs /
Urban Co-operative Banks/State Co-operative Banks /
District Central Co-operative Banks /Payment Banks / Small Finance Banks and Local Area Banks

Madam / Sir,

Storage of Payment System Data

Please refer to paragraph 4 of the Statement on Development and Regulatory Policies of the First Bi-monthly Monetary Policy Statement for 2018-19 dated April 5, 2018. In recent times, there has been considerable growth in the payment ecosystem in the country. Such systems are also highly technology dependent, which necessitate adoption of safety and security measures, which are best in class, on a continuous basis.

2. It is observed that not all system providers store the payments data in India. In order to ensure better monitoring, it is important to have unfettered supervisory access to data stored with these system providers as also with their service providers / intermediaries/ third party vendors and other entities in the payment ecosystem. It has, therefore, been decided that:

i. All system providers shall ensure that the entire data relating to payment systems operated by them are stored in a system only in India. This data should include the full end-to-end transaction details / information collected / carried / processed as part of the message / payment instruction. For the foreign leg of the transaction, if any, the data can also be stored in the foreign country, if required.

ii. System providers shall ensure compliance of (i) above within a period of six months and report compliance of the same to the Reserve Bank latest by October 15, 2018.

iii. System providers shall submit the System Audit Report (SAR) on completion of the requirement at (i) above. The audit should be conducted by CERT-IN empaneled auditors certifying completion of activity at (i) above. The SAR duly approved by the Board of the system providers should be submitted to the Reserve Bank not later than December 31, 2018.

3. The directive is issued under Section 10(2) read with Section 18 of Payment and Settlement Systems Act 2007, (Act 51 of 2007).

Yours faithfully

(Nanda S. Dave)
Chief General Manager-in-charge

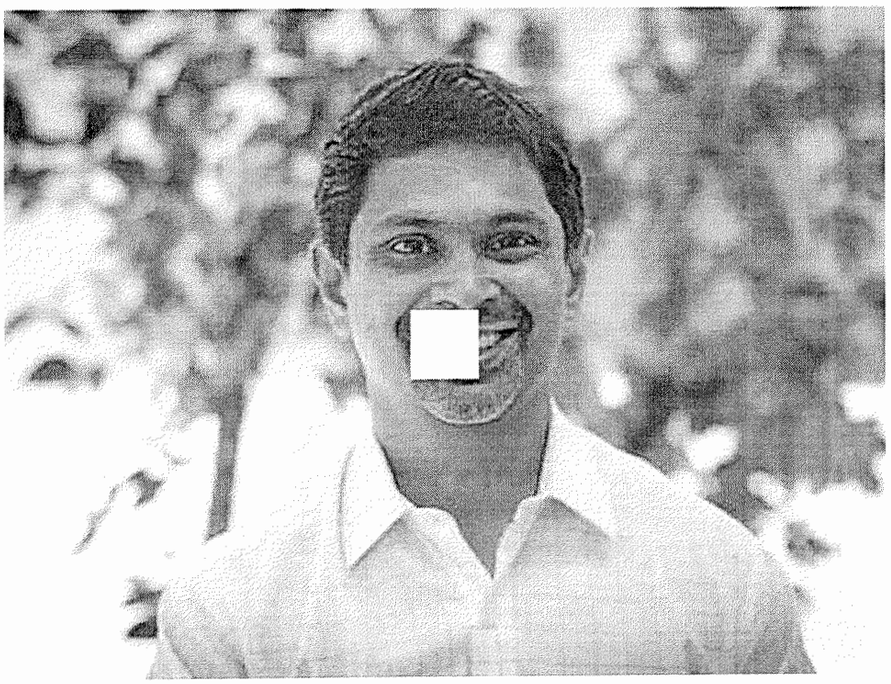
भुगतान और निपटान प्रणाली विभाग, केंद्रीय कार्यालय, 14वीमंजिल, केंद्रीय कार्यालय भवन,शहीद भगतसिंह मार्ग, फोर्ट, मुम्बई - 400001
फोनTel: (91-22) 2264 4995; फैक्सFax: (91-22) 22691557; ईमेल-e-mail : cgmdpssco@rbi.org.in
Department of Payment and Settlement Systems, Central Office, 14th Flr, Central Office Building,
Shahid Bhagat Singh Road, Fort, Mumbai - 400001

ANNEXURE-P-35 258

Alert: Manabe, Hasselmann and Parisi win 2021 Nobel Prize in Physics

WhatsApp appoints Abhijit Bose as head of WhatsApp India

Synopsis
Bose, who joins WhatsApp from Ezetap where he has served as co-founder and CEO will build WhatsApp's first full country team outside of California and will be based in Gurgaon.



WhatsApp ropes in Abhijit Bose as India head

WhatsApp announced on Wednesday that it has appointed Abhijit Bose as head of WhatsApp India. Bose, who joins WhatsApp from Ezetap where he has served as co-founder and CEO will build WhatsApp's first full country team outside of California and will be based in Gurgaon, the company said in a statement.

WhatsApp said Bose and his team will focus on helping businesses, both large

the WhatsApp Business app for small business owners and the WhatsApp Business API to serve larger businesses that engage with customers at scale. Today, there are over one million users of these WhatsApp business products in India.

"WhatsApp is deeply committed to India and we are excited to keep building products that help people connect and support India's fast-growing digital economy. As a successful entrepreneur himself, Abhijit knows what it takes to build meaningful partnerships that can serve businesses across India," said Matt Idema, Chief Operating Officer of WhatsApp.

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"WhatsApp is special and can be a major partner for financial inclusion and economic growth in India. It's not only how so many families stay in touch, but increasingly it's how businesses are engaging with their customers. WhatsApp can positively impact the lives of hundreds of millions of Indians, allowing them to actively engage and benefit from the new digital economy." said Bose.

Bose joins WhatsApp from Ezetap where he has served as co-founder and CEO. Founded in 2011, Ezetap is an electronic payments company. Bose is a graduate of Harvard Business School and Cornell University.

Bose will join WhatsApp in early 2019.

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Synopsis

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Crypto Tales by CoinSwitch Kuber, a new series where our host, Jatin Sapru will meet some of the experts, the gurus, the pioneers, of the Indian Cryptocurrency universe. In this episode, Jatin meets Saurabh Sharma, Founder of The Blockchain School - a cutting edge ed-tech startup offering

IN THE SPOTLIGHT

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In Video: **Crypto Tales by CoinSwitch Kuber | Ep.4 ft. Saurabh Sharma**

(This article is generated and published by ET Spotlight team. You can get in touch with them on etspotlight@timesinternet.in)

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Send Payments in India with WhatsApp

ANNEXURE– P– 36

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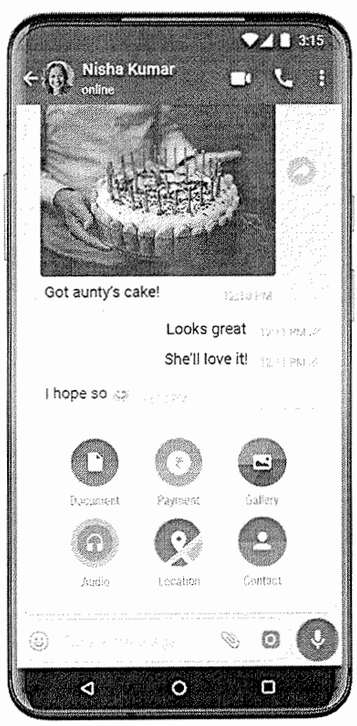
Starting today, people across India will be able to send money through WhatsApp. This secure payments experience makes transferring money just as easy as sending a message. People can safely send money to a family member or share the cost of goods from a distance without having to exchange cash in person or going to a local bank.

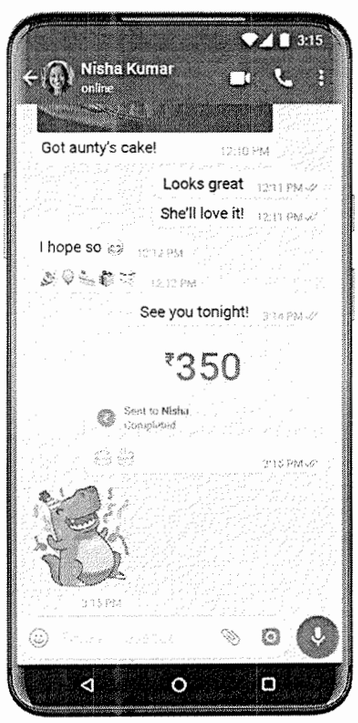
WhatsApp designed our payments feature in partnership with the National Payments Corporation of India (NPCI) using the Unified Payment Interface (UPI), an India-first, real-time payment system that enables transactions with over 160 supported banks. We're excited to join India's campaign to increase the ease and use of digital payments, which is helping expand financial inclusion in India.

To send money on WhatsApp in India, it's necessary to have a bank account and debit card in India. WhatsApp sends instructions to banks, also known as payment service providers, that initiate the transfer of money via UPI between sender and receiver bank accounts. We're delighted to be working with five leading banks in India: ICICI Bank, HDFC Bank, Axis Bank, the State Bank of India, and Jio Payments Bank. People can send money on WhatsApp to anyone using a UPI supported app.

In the long run, we believe the combination of WhatsApp and UPI's unique architecture can help local organizations address some of the key challenges of our time, including increasing rural participation in the digital economy and delivering financial services to those who have never had access before.

Just like every feature in WhatsApp, payments is designed with a strong set of security and privacy principles, including entering a personal UPI PIN for each payment. Payments on WhatsApp is now available for people on the latest version of the iPhone and Android app.





November 6, 2020

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17 MINUTES AGO

ANNEXURE – P-37
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Facebook's WhatsApp to partner with more Indian banks in financial inclusion push

By Sankalp Phartiyal

FILE PHOTO: The Whatsapp logo and binary cyber codes are seen in this illustration taken November 26, 2019. REUTERS/Dado Ruvic/Illustration/File Photo

NEW DELHI (Reuters) - Facebook Inc's WhatsApp plans to team up with more Indian lenders to expand banking services in rural areas and for lower income individuals, the messaging platform's country head said on Wednesday.

WhatsApp, which counts India as its biggest market with 400 million users, has already tied up with banks including ICICI Bank and HDFC Bank, allowing them to communicate with customers via automated text messages on its business service.

"We now want to open up with more banks over this coming year to help simplify and expand h

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the unorganised, informal economy easily accesses three products - insurance, micro-credit and pensions," Bose said.

Apart from its partnerships with banks, the U.S. company has also been running its own payments service in India with limited users for more than two years, waiting for regulatory clearances on issues such as data localisation, ahead of a fully-fledged launch.

WhatsApp has said it has complied with India's requests to store customers' data locally.

It hired Bose, the co-founder and chief executive of Indian mobile payments firm Ezetap, in late 2018, a move signalling its ambitions in the payments space.

Parent Facebook's $5.7 billion investment in Reliance Industries' digital unit is expected to give WhatsApp an inside track on payments for the Indian conglomerate's retail business, which aims to serve tens of millions of small shops across India.

Reporting by Sankalp Phartiyal. Editing by Jane Merriman

Our Standards: The Thomson Reuters Trust Principles.