

TCL Response to TRAI CP on Internet Telephony

There are 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). The primary difference between voice services on managed and unmanaged IP Networks is quality of speech. However this difference is getting diminished with technological advancement, new coding techniques and availability of higher bandwidth as provided by broadband connections. (Source: TRAI Recommendations dated 18.08.2008).

The topic of unrestricted Internet telephony has consistently been debated and discussed within the ambit of Indian Regulations since 2002 as Internet telephony as a service and as technology gained prominence across the world. 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) but later on license fee was imposed on Internet Telephony services revenues.

In March 2006, Unified Access Service Providers (UASPs) and Cellular Mobile Service Providers (CMSPs) were permitted to provide Internet telephony and broadband services. However Internet Telephony services were not provided by any of the Access Providers as an Access Service using Internet as a medium/technology. This position continues till date.

A significant step in this direction was the keenly debated and participated consultation process undertaken by the Authority in the year 2007-08 culminating into path breaking recommendations of TRAI dated 18th August 2008 which recommended permitting ISPs to provide unrestricted Internet telephony. However these recommendations were not accepted in that period by the Government.

Subsequently there have been a significant change in the Licensing Framework for all services especially for Access Services by way of the Unified Licensing Regime being implemented, Spectrum being delinked from the license and Internet telephony being allowed to Unified Licensee (Access Services) by virtue of the new UL regime. However, for 'unrestricted Internet Telephony' the current unified licensing regime requires either to take a full-fledged Access Services authorization or be able to only offer restricted Internet Telephony services under the Internet Services Authorization. In order to proliferate the broadband services in the country, in our view, it may be prudent to create a new authorization which allows the ISPs provision of 'unrestricted Internet Telephony' as a separate authorization accordingly namely UL -ISP with unrestricted Internet Telephony However such licensees may not be permitted other non-telephony services permissible under UL-AS license like VPN services.

It is also imperative to consider the operational aspect of unrestricted Internet telephony and the power of Internet in general so that the same can be used to enable better access, quality, affordability and opportunities for the consumers.

Adding to the context is the tremendous growth in the IP technology and Internet access globally which has ensured that the service delivery increasingly has got delinked with the provision of network and connectivity. Not only the same, some of the advancements in services are intrinsically linked to IP technology with no parallel application in a circuit switched

– TDM domain for example the High Definition Voice services enable by virtue of IP Codec developments, needs end to end IP network and cannot be replicated in the TDM domain.

With proliferation of high speed broadband and 3G/4G services the convergence of voice, data, messaging services has disrupted the traditional business models of Telecom Operators across the world. It's not wrong to say that today the biggest voice traffic carriers in the world are not the Telcos but over the top players like Skype, Whatsapp, etc.

The immediate fall out of the same has been the extensive re-evaluation of the business models deployed by Telcos as they see more and more voice revenues getting cannibalized or getting transformed into data revenues.

It may not be wrong to say that the enhancement in IP technology and proliferation of Internet has been a factor leading to democratization of the telecom services which has led to Telcos looking at more innovative ways to retain customers and earn revenues.

It is an important aspect to consider that in the current hyper connected world, the consumer is fully aware of the limitation and potential of Telcos as well as OTT offering and is adopting new ways to fulfil their communication needs. In perspective of such transformative changes occurring across the world, it is extremely pertinent to evolve suitable regulatory mechanism to ensure the benefits of Internet telephony are enabled for the Indian Consumers along with an enabling platform for Telecom Operators to compete with OTTs on level playing field.

Keeping in view the above, we shall like to submit our views on the question under consultation as below:

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?

TCL Response:

While the Unified License (Access Services) authorization allows for unrestricted Internet Telephony however there is a need to evaluate an intermediate authorization between a full-fledged Access Services License and the Internet Services License which allows restricted Internet Telephony Services i.e. a public internet based voice telephony service along with provision of internet /broadband and triple play service (Telephony, Messaging and Media) to the end consumer.

Hence we shall like to submit that a new authorization for Internet Services with unrestricted internet Telephony may be added in the Unified License enabling a service area wise licensing.

The license will enable the provision for ISPs/new operators intending to offer Internet Services with Voice Telephony and simultaneously allowing for ISPs intending to continue to offer only Internet Service as per the current Internet Services authorization to be maintained.

For enabling the same, it is proposed that the entry fee, Performance Bank Guarantee (PBG) and Financial Bank Guarantee (FBG) should be aligned with the entry Fee, PBG and FBG of UL(VNO)-AS license as internet telephony services also rides on the last mile infrastructure of the Access Provider.

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?

TCL Response:

It's extremely important to review the interconnection mechanism for the Internet telephony Services/network with circuit switched Voice Telephony services/network.

The various scenarios of call handover have to be evaluated due to non-geographic nature of Internet Telephony services. As per the existing interconnection regime in the circuit switched network the following are the point of interconnections enlisted:

1. Local/Intra Circle Calls
 - a. Fixed origination – Fixed Termination: Handover at SDCC Tandem Interconnection
 - b. Fixed origination – Mobile Termination: Near end or Far End Handover at Level –II Tax Interconnection
 - c. Mobile Origination – Fixed Termination: Near or Far End handover at Level – II Tax interconnection
 - d. Mobile Origination – Mobile Termination: Interconnection at Level-II Location MSC
2. Inter-circle Calls- NLDO
 - a. Fixed Origination: SDCC Tandem or designated fixed line gateway
 - b. Mobile Origination: GMSC
3. International Calls
 - a. Fixed Origination: SDCC Tandem – NLDO
 - b. Mobile Origination: GMSC-NLDO at non Level –I Tax location
 - c. Mobile Origination: GMSC-ILDO at Level-I Tax Location

In the Internet telephony services case the allocated IP may not be geographically nailed except whether the IP provided is a valid static or dynamic IP hence an equivalent scenario of handover points may not be feasible for IP generated calls.

The likely scenarios of calls in case of unrestricted Internet Telephony can be envisaged as below:

- Internet telephony to Internet telephony
- Internet telephony to domestic PSTN /Mobile
- Internet telephony to International PSTN/Mobile
- Domestic PSTN/Mobile to Internet telephony
- International PSTN/Mobile to Internet telephony

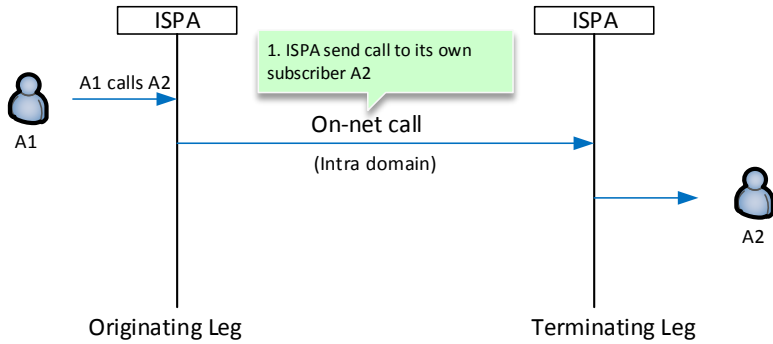
Assumptions

- Each Internet telephony customer to get E.164 number.
- A separate number series would be assigned for Internet telephony based subscriber
- ISP would interconnect using only number series allocated by the licensor.
- Internet telephony to PSTN PLMN calls are non-geographic in nature and can be local or NLD or ILD calls
- All International outgoing calls needs to be routed through an ILD operator to ensure
 - Compliance to fundamental routing plan
 - All international calls are traced
 - There is no End to End encryption of such calls.

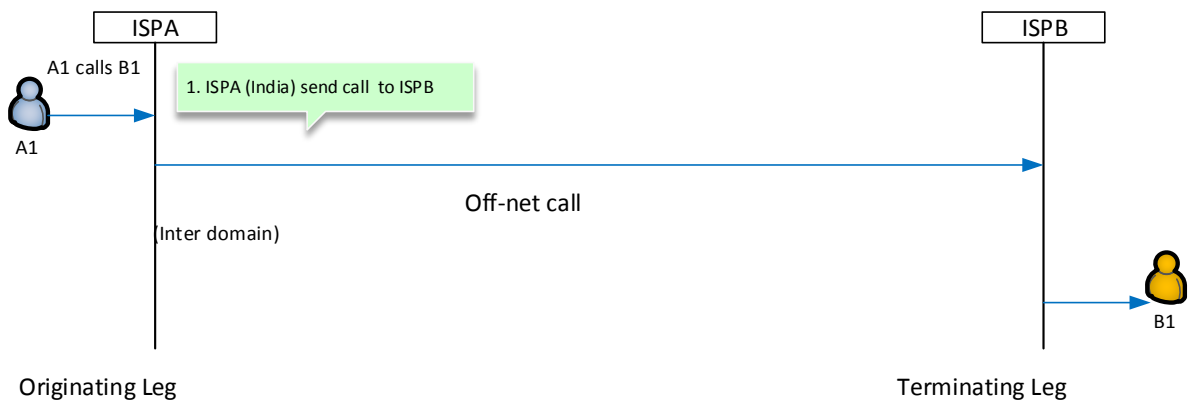
- There is no loss of revenue to Government
- NLD operators are allowed to query the MNP database to route the calls

Internet telephony to Internet telephony

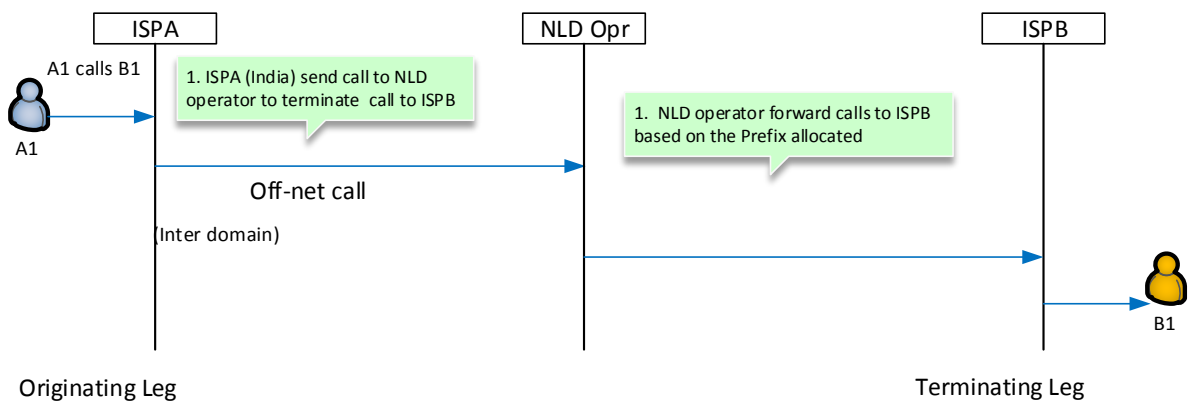
Call flow 1A) **Internet telephony to Internet telephony On net call (within same domain)**
 Customer of ISP A makes a call to another customer of the same ISP A(Same domain) On-net



Call flow 1B) **Internet telephony to Internet telephony Offnet call (in different domain)**
 Customer of ISP A makes a call to another customer of a different ISP B (Different domain) OFF-net

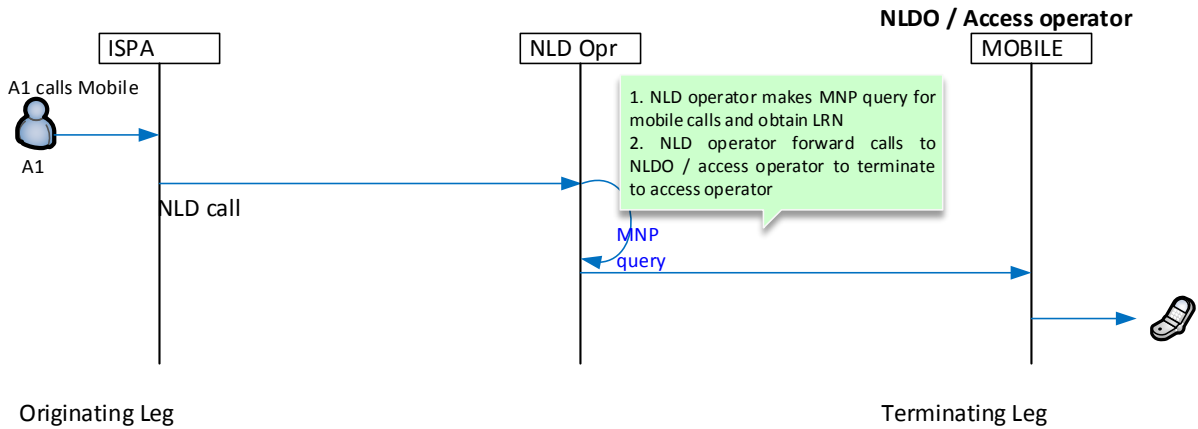


Call flow 1C) **Internet telephony To Internet telephony Offnet call (in different domain)**
 Customer of ISP A makes a call to another customer of a different ISP B (Different domain) OFF-net

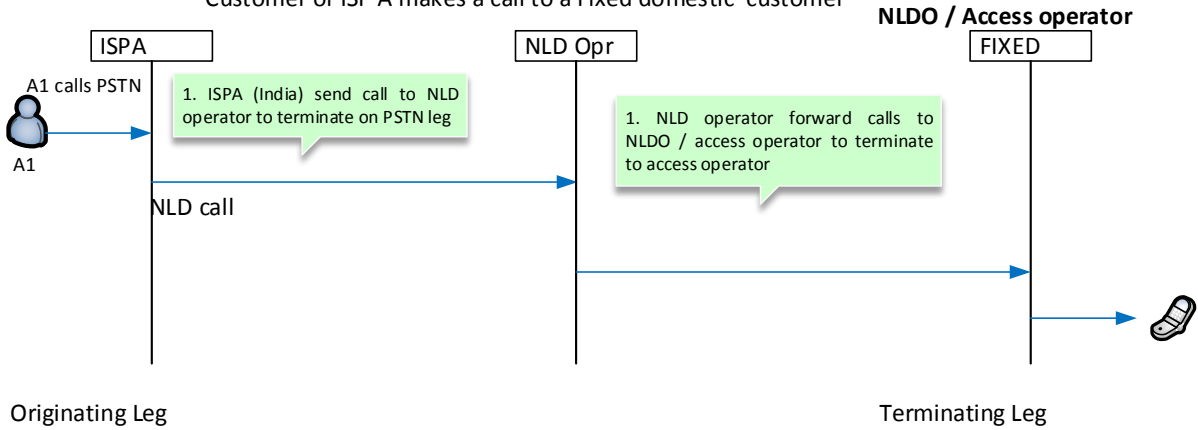


Internet telephony to domestic PSTN /Mobile

Call flow 2A)

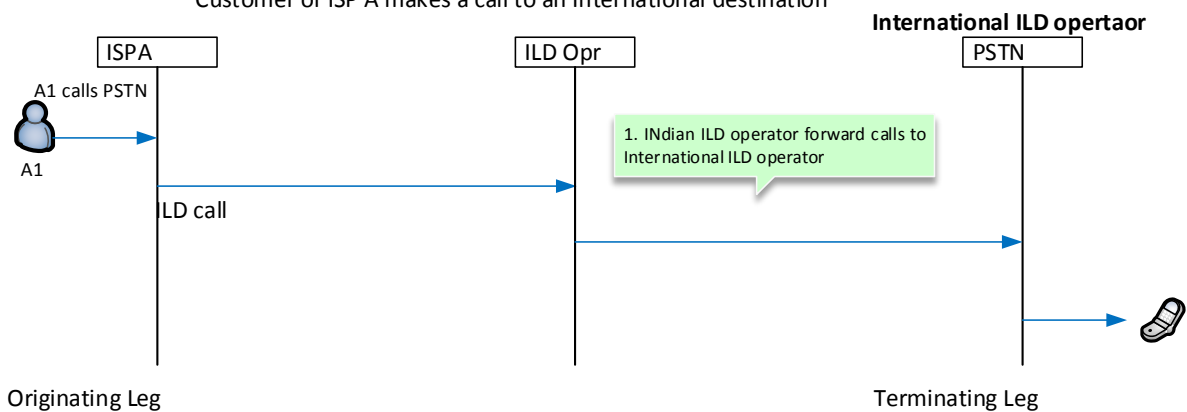


Call flow 2B) **Internet telephony to NLD call**
Customer of ISP A makes a call to a Fixed domestic customer



Internet telephony to International PSTN/Mobile

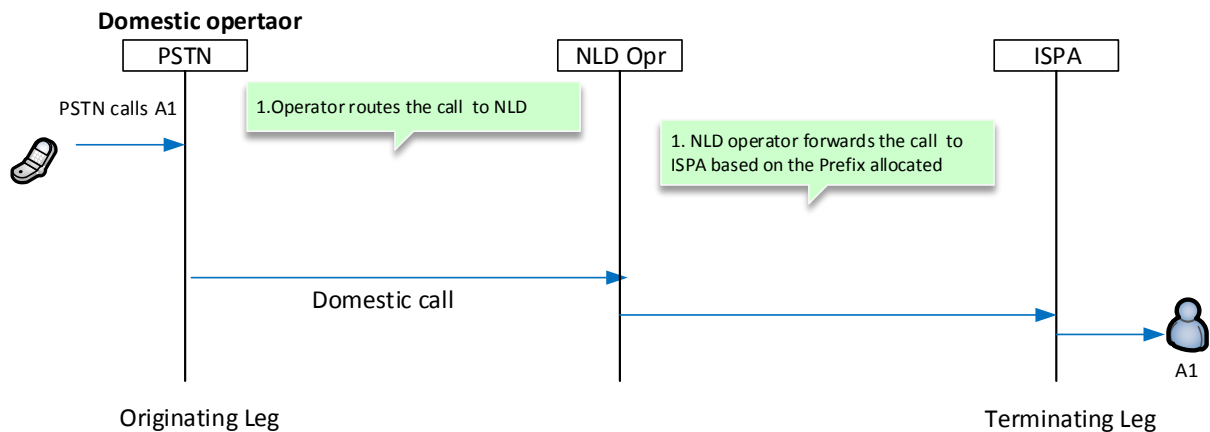
Call flow 3) **Internet telephony to International call**
Customer of ISP A makes a call to an International destination



Domestic PSTN/Mobile to Internet telephony

Call flow 4) **Domestic PSTN to Internet telephony call**

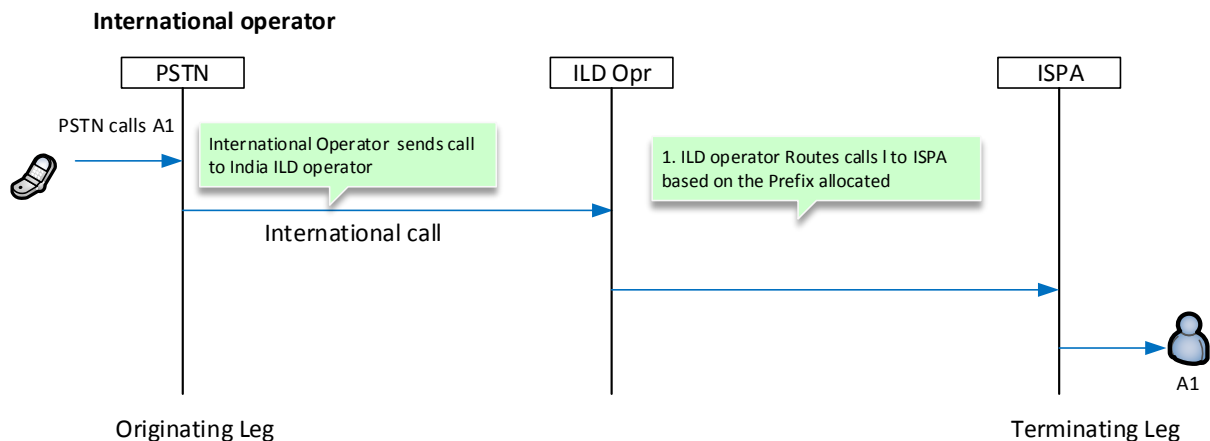
PSTN/Mobile domestic customer makes a call to Customer of ISP A



International PSTN/Mobile to Internet telephony

Call flow 5) **International to Internet telephony call**

International Incoming call to Customer of ISP A



References are drawn to the Para 3.11 of the Recommendations on Issues related to Internet Telephony dated 18th August 2008 issued by the Authority where in the subject matter of Interconnection is appropriately handled.

We believe that by virtue of the Internet Telephony calls being different from the nature of normal PSTN/PLMN circuit switched calls, the recommended approach to handle all traffic by way of handover to NLDOs is the best mechanism to facilitate the interconnections between the Circuit Switched and Internet telephony based Packet Switched networks.

Its pertinent to note that majority of the Access Networks in India continue to use TDM or circuit switched technology while the NLD backbones deployed by most of the NLDOs are based on NGN – IP technology. The interfacing medium of NLDOs provides a suitable technological way of enabling interconnections. The handover should apply to all Internet Telephony calls as it would be technically infeasible to segregate Internet telephony based calls geographically.

**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.**

TCL Response:

Public IP is not geography binding to any location or city and hence cannot be treated as an extension of fixed or mobile services. It should be considered as a separate service. As IP cannot be translated into exact Geographic location of the device.

As mentioned in our response to the Question No.2 by basic nature of IP technology the origination or termination of internet IP calls cannot be construed to be nailed to geography. The very nature of IP address being configurable through over the air/virtual means renders the following attributes to an IP connection:

1. IP based CPE becomes portable to multiple physical sites and cannot be nailed to a single location
2. IP address dynamic allocation provides a default portability mechanism for the subscriber to de-register from one operator and register to another operator literally on the go.
3. The Subscription and connection become truly independent of the operator, underlying network or geography.
4. The subscriber can continue to use different operators' subscriptions for voice telephony while they may be consuming Internet packs of another operator (Over the top usage).

Considering the above inputs a call traversing through public Internet (internet access of any other TSP) cannot be considered as extension of fixed line or mobile services of the TSP depending on the application being availed by the user.

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.

TCL Response:

We believe there is no case of reviewing the Transit charges as of now and the ceiling of Rs. 0.15 per minute for transit charges should continue to be maintained.

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

TCL Response:

There should be no termination charges for calls terminating into Internet Telephony. By necessary design of internet telephony services, the consumer subscribes, even for receiving calls the subscriber shall be incurring charges on the internet packs hence the service provider providing the internet connectivity (the network service provider) is getting compensated by default by way of such packs charges. Accordingly, there is no case of termination charges for Internet Telephony calls.

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

TCL Response:

The Termination charges for calls originated from Internet Telephony Network and terminated into the wireline and wireless Network should continue to be as per the applicable Interconnect Usage Charges Regulations as reviewed from time to time

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

TCL Response:

Based on the call flow envisaged for un-restricted internet telephony, it may be seen that except for calls which are handled by the same service provider (On-net Internet Telephony calls), it may be mandated that the calls have to be handed over to NLDO for transit to the corresponding termination network (the terminating network party can be another Internet Telephony provider or a PSTN/PLMN service provider). By way of this call flow the applicable Interconnect Usage Charges can be followed for all inter-carrier traffic being handled by various TSPs and ISPs. This suggested mechanism shall ensure that while the flexibility of cost benefits is achieved due to optimization of network resources, the due share of costs are also distributed in a non-discriminatory way between the internet telephony provider and other telecom service providers including the NLDO and ILDOs.

Since, call tariffs are under forbearance, the Originating Internet Telephony service provider shall be free to decide the tariffs for such calls at the same time the mechanism shall ensure that no predatory pricing is issued by any service provider and all tariffs continue to be in governed by the guidelines issued by the authority from time to time.

The international incoming call termination charges aspects has to be looked into especially here.

Since its technically difficult to interpret the geographic nature of origination of Internet telephony calls directly from the origination CLI or other mechanism it may be difficult to devise a mechanism to segregate International origination calls from domestically originated calls.

Its pertinent to note that the International inbound call Termination Charges currently determined as Rs. 0.53 per minute are not based on the work done principle and have been determined to be differential against the cost based termination charges determined for domestic calls' fixed line and mobile termination (Fixed line being Nil while Mobile to Mobile being Rs. 0.14 per minute).

The review of the Inbound termination charges is merited here. As internet increasingly becomes all-pervading with access to digital resources being facilitated through 3G and 4G rollouts and fall in tariffs making it more affordable for the consumers to avail internet services any artificial charges for international inbound termination only ensures to increase the arbitrage between the local termination and international call termination.

Accordingly, its suggested that termination charges for international calls should be brought down to the same level of termination charges as currently applicable for domestic termination i.e. Nil for fixed line and Rs. 0.14 per minute for mobile termination traffic. This will ensure that any concerns of termination charges being avoided by unscrupulous service provider if any are proactively addressed.

By the expanse of VoIP technology becoming prevalent, it is evident that any attempts now to restrict internet telephony will only put the licensed operators to disadvantage the relevant questions put up under this consultation paper are a proof enough for the same. The regulations and licenses need to facilitate that the Indian Licensed operators are able to compete at a level playing field with Over the top players and are able to service their customers with all value adds instead of being observers while the business is churned from them to such OTTs.

Keeping in view the above the interconnection regime proposed for internet telephony calls ensures that all stakeholders in the licensing regime – Access Providers, Internet Providers, NLDOs and ILDOs get their due share at the same time the regime progressively allows the benefits of Internet to be provided to the consumers.

We again submit that the interconnection usage charges should be reviewed to align with cost based usage charges for all the license holders to create a seamless interconnection regime.

1. Termination Charges for Fixed Line: Nil
2. Termination Charges for Mobile Termination: Rs. 014 per minute
3. Termination Charges for Internet Telephony Termination: Nil

Additionally, the revision should align the carriage applicable for all calls (including international inbound calls) and receivable by the NLDO as well as ILDO to be a ceiling of Rs 0.35 per minute.

To clarify, for all domestic calls handling/carriage the carriage payable to NLDO by TSPs/ISPs should be Rs 0.35 per minute at the same time a carriage of Rs 0.35 per minute should be notified receivable by ILDOs for all inbound calls being terminated by the ILDO to the various Access Service Providers/ISPs.

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?

TCL Response:

Internet Telephony is a service which cannot be nailed to a particular geography by the very basic nature of service itself. In case of the Internet telephony the underlying identifier is not the phone number, IP address, physical network or location information but the SIP registration of the account.

Due to the SIP registration and authentication mechanism, Internet telephony is not dependent upon any hard wired SIM card or even IP address as the same can always be dynamically allocated.

Any Internet telephony service account may enable a subscriber of one service provider to make calls through internet access service connection provided by another service provider.

Hence to enable restriction on Internet telephony calls to limit them to SDCA/Service Area may not only be technically cumbersome but limit the potential of Internet Telephony.

One of the advantages of IP technology is its mobility where an end point or a user need not be fixed to location. This is one of the reasons why we have seen a jump in mobile users and reduction in landline phones.

Enterprises or corporates today need flexibility to support customers from any location to initiate or receive calls. Keeping this in view it is important that we provide the flexibility in initiating or receiving calls from outside the SDCA.

So we propose that there should not be a restriction on origination of the calls by the internet telephony service provider but the same needs to be routed via an ILDO/NLDO for termination. You may kindly refer Call flow 2, 3, 4 & 5 as mentioned in our response to Question number 2.

Arguments may be given that this will lead to cannibalization of revenues or imparting a status equivalent to mobile services to the internet telephony services. Its pertinent to note that while the licensed operators continue to be bound by regulatory and licensing guidelines, the consumer increasingly is adopting over the top services to circumvent these tariff or artificial technological barriers. If any cannibalization has to happen, that has already happened by way of churn of increasing number of users and enterprises to VOIP based applications. Hence this argument does not merit a consideration in the fast changing global scenario and the licensing and regulatory regime should envisage a fair, non-discriminatory regime which allows for all service providers to compete as per the merit of their services and the provision of the licenses.

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?

TCL Response:

The Internet Telephony by design of the service requires SIP registration and SIP authentication for the calls to be made. The mechanism can be either be using a public internet or a managed internet connection. Any restriction on the A end leg may be restrictive. Hence its recommended to allow flexibility of originating the calls on Internet Telephony as long as the PSTN/Mobile leg abides by all the interconnection rules and regulations concerning NLDO and ILDO.

It is this flexibility which would render better reach for remote location where circuit switched network have issues reaching.

As on today with current regulations, we are seeing internet telephony has increasingly preferred choice of users or corporate houses to transmit voice wherever regulatory regime allows them considering flexibility, ease of management, simplicity and improvement in security that IP network brings to the table.

So we shall like to submit that the last mile for an internet telephony subscriber may be left to be public internet or managed IP network to allow for the flexibility to the Licensed operators to compete in a non-discriminatory manner specially against the OTTs.

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

TCL Response:

For internet Telephony a separate numbering scheme should be allocated in line with the National Numbering Plan 2003. We have seen that in certain countries a prefix (separate number series) is assigned for Internet telephony based telephone numbers hence we

propose that a separate Prefix or number series to be assigned for Internet telephony service.

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

TCL Response:

We shall like to submit that initially number portability in the internet telephony domain may not be a mandated requirement. It may be pertinent to note that to keep the parity between PLMN and Internet Telephony service while allowing the Indian consumers to avail the benefits of IP technology the aspect of PLMN with number portability and internet telephony without number portability may be a prudent regime to implement to start with.

Since the subject matter of number portability of internet telephony requires deeper evaluation it may be prudent to look at this aspect as a separate consultation itself later on as per opportune time as Authority deems fit.

This issue needs to be examined in detail at an appropriate stage.

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?

TCL Response:

Internet Telephony is a service which cannot be nailed to a particular geography hence it would not be possible to provide location information to the police station, when the subscriber is making Internet Telephony call to Emergency number.

In some countries limited Emergency service is offered whereby the VOIP customers' needs

- To provide location or other information to their VoIP providers, and update this information if they change locations, for their Emergency service to function properly.
- Needs to install a backup power supply or maintain a traditional phone line or have a wireless phone as a backup. In case if power is out or internet connection is down

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?

TCL Response:

Yes, advance intimation should be provided to the subscriber during signing up of subscription that calls to Emergency service is not available.

Incase subscriber makes a call to Emergency services then an announcement needs to be played before routing calls stating that "it is being routed currently but it is advised that the subscriber make this call using a Mobile/PSTN network for faster response"

Internet Telephony service provider should ensure that they route such calls to the nearest Emergency service incase the subscriber dials calls to these services.

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.

TCL Response:

Regulations will need to define QOS for the Internet Telephony Service provider which may need to include the following:

1. QOS requirements on the Internet Service Provider to provide minimum QOS for enabling the voice calls
2. QOS Requirements for handling of calls by NLDOs/ILDOs for IP- PSTN/PLMN conversion

Below documents are issued by relevant authority

- TEC Standard No:TEC/SD/IT/IPI-001/01 NOV -2015 IP based interconnection between service providers networks .
- TRAI Notification No 402-30/2001-Fn(pt) dated 16th April 2004, Regulation on Quality of service for VOIP based international long distance service (3rd Amendment). 2004
- TRAI Notification No 305-25/2008 –Qos dated 20th March 2009 , The standards of Quality of service of basic telephony service (wireline) and cellular mobile telephony service regulation 2009

It is proposed that QOS parameters to be prescribed should be in reference to the above documentation.

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

TCL Response:

Authority may like to review the aspects of provision of VAS through Internet Telephony services.

