Reliance Communications Ltd. Response to TRAI Consultation Paper on Migration to IP Based Networks

Executive Summary

- Co-existence of Both TDM and IP interconnect should be permitted to continue.

- Decision to migrate to IP networks and the pace of migration should be driven by the business requirements / plans of the telecom operators.

- RIO should not be mandated. Based on the points of confluence of their respective network architecture, interconnection between TDM and IP network should be permitted to be a bilateral agreement between two operators.

- A "Light Touch" regulation by the Authority would catalyze migration to IP interconnect arrangements.

- For the present, backward compatibility from IP based network to TDM interconnects should be mandated.

- There is no need for establishing an Interconnect exchange as Telcos have already established IP interconnections between their networks, for past many years.

- Based on the network architecture, the network operators are best placed to decide the locations and structure of PoI for IP based network, hence regulatory intervention should not be there.

- Given the simplicity of accounting and competitive benefits to consumers, Bill and Keep (for termination charges) is the most attractive framework of Interconnection Usage Charge for future deployment of technologies like IP based Networks.

- Access to the end consumer being the prerogative of licensed service provides, Content and Application service providers can either be mandated to obtain a license before being permitted to acquire customers directly, else they may continue to access the end customer through the TSPs network after signing standard commercial agreements similar to VAS services.

- QoS being the distinguishing USP between the operators', would be driven by market forces rather than Regulatory intervention.

- The existing QoS benchmarks, stipulated in 2002, are considered adequate for a mixed environment of TDM and IP based network and should be persisted with.

- Mandating of QoS, if any, should be resorted to in full IP environment and should be based on the 3GPP parameters albeit they should be marginally lowered to account for the non ideal situations and conditions of the deployed networks.

- To improve business efficiency and cost of network operation, sharing of IP based core and access network elements by different sets of telecom operators should be permitted.

- For ensuring a smooth transition to IP networks, especially in the access network, TEC should constitute a task force, comprising of the government agencies and industry representatives, to study the feasibility and implementation nuances of ENUM numbering in India.

- The feasibility and modalities of implementing VoIP based Emergency number dialing, Caller location delivery and priority routing of calls to the emergency centre should be entrusted to TEC, as one of the scope while deliberating on the revision of NNP and numbering scheme to be adopted in the all IP network era.

- In IP domain, handing over of traffic at the mutually agreed POIs (e.g. LDCAs), without any transit charges, should be mandated unlike present day situation where BSNL insists on handing over of traffic at SDCA else they levy transit charges.

- PSU telecom companies should be mandated to adopt the industry best practice for not levying any port charges.

- TSPs shall be in no position to support lawful interception of communication applications hosted ex-India and should not be held accountable for the same.

Q1. Is there a need to mandate IP interconnection? If so, what should be the time frame for implementation of the same? Please comment with justifications.

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Q2. Whether both TDM and IP interconnection should be allowed to coexist? If so, whether the existing regulation i.e. 'Reference Interconnection Offer dated 12th July 2002' addresses the requirements of IP interconnection also? Please comment with justifications.

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Q3. In case IP interconnection is mandated in India, whether the enforcement of interconnection agreements should rely on

(i) Bilateral agreements and dispute resolution; or

(ii) Mandatory reference offer

<u>**RCOM Response:**</u>

- As per the license, the service provider has flexibility to choose any digital technology for the access network including the use of packet switches. The operators based on their business plans and strategies are evolving from current technologies to the next generation technologies and networks. In fact, most of the switches/ equipments being offered today are IP based and the existing TDM switches are/will reach to end of service life with

no/minimal vendor support available, thereby leaving no choice with the operators but to migrate to IP.

- It may be noted that the core of the network of most of the operators is already IP based and with the advent of 3G, 4G and high speed data services, operators are themselves migrating towards deployment of high capacity IP based networks from the current circuit switch network. Thus, service providers are in best position to decide network architecture and decide the timings and need for adoption and deployment of any technology including NGNs. Since the licenses are technology neutral and already provide enough flexibility to operators to deploy technology of their choice including NGN, **there is no need to mandate migration to IP and both TDM and IP interconnection should be allowed to co-exist.**

- Indian telecom market is characterized by the presence of 6-10 service providers in each LSA which are already interconnected and no new operator is coming up for interconnection. Thus**, mandatory IP interconnection would be taxing to the debt ridden telecom industry.**

- One cannot ignore the fact that service providers have large sunk cost in creating predominantly circuit switched TDM interconnect based networks and the same cannot be scrapped/discontinued in near future, unless there is very strong business case for doing it. Therefore, **both TDM and IP interconnection should coexist and the existing interconnection regime and the rules governing interconnection should continue** to be the basis for all network roll outs in order to ensure spread of infrastructure to the remotest and most distant corners of our country.

- We suggest that Government should foster a supportive, transparent, pro-competitive and predictable policy, legal and regulatory framework, which provides the appropriate incentives to investment and community development in the information Society.

- NGN network standards defines compatible interface for interconnection with TDM networks, however to ensure that the operators who have migrated to IP based networks provide compatible interfaces for TDM networks the provision of such interfaces should be made mandatory by the regulator. This is similar to the R2MF support being available and allowed today.

- **Summary of Recommendations**

  o **Both TDM and IP interconnect should continue to coexist and operators should be free to migrate to IP network as per their business need/plan.**
  o **Interconnect between TDM and IP network should be based on bilateral agreement b/w two operators i.e. no need to have mandatory RIO.**

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o **A "Light Touch" regulation by the Authority would be beneficial for migration to IP interconnect arrangements.**

o **Backward compatibility from IP based network to TDM interconnects should be mandated.**

Q4. In an IP based network scenario, which mode of interconnection is preferable to carry traffic:- peer-to-peer, Interconnect Exchange or combination of both? Please comment with justifications.

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Q5. In case an Interconnect Exchange is required, should such Exchange be placed within each licensed service area or a single Interconnect Exchange will be adequate for the entire country? Please comment with justifications.

<u>RCOM Response:</u>

- Today almost all telecom networks in the country are providing voice and data services over **IP as core network and operators are constantly migrating to IP based networks from TDM based networks based on their business plans and market demand.** Thus, the interconnection between the licensed operators in India is already working well, with most of the operators are connected to each other.

- At this stage, there does not appear to be any need to have a common point (IP exchange) of interconnection and **the established peer to peer arrangement should continue**. The common interconnection in the form of internet exchange will restrict competition and will encourage monopoly, since this will act as a major toll. **Whereas the peer to peer arrangement aids creation of robust and redundant networks as multiple routing options are available.** We therefore submit that the point of interconnection (POI) should be as dictated by the respective network architecture and governed by the **Interconnect Agreements** between the Service Providers as is being done currently on **peer to peer basis.**

- Establishment of interconnect exchange shall also lead to skewed loading of the network as all traffic between the operators shall have to reach the exchange before it is handed over to the other operator. It shall also prevent the use of shortest path (first protocol for ensuring communication speed) leading to the increase in latency and congestion in the network. Licences in India are circle based and some of the operators have operations in few circles only, thereby leading to the more cumbersome interconnection arrangement for these operators.

- **Summary of Recommendations**

  - There is no need to set up an Interconnect exchange for interconnectivity of various operators as it will put additional burden on the Telcos, who already have established successful, proven, robust interconnection for the last many years.
  - Moreover, it does not bring much value in the chain as the issues like Inter-Carrier Billing, Intelligent Network Services are already being addressed currently, and hence the concept of Interconnect exchange is not required.

Q6. Whether any regulatory intervention is required to mandate the locations and structure of points of interconnection (POI) for IP based network architecture? Please comment with justifications.

RCOM Response:

- IP is characterized by shortest path first protocol for ensuring communication speeds. Since it is possible to define multiple levels of interconnect in IP domain, hence **based on the network architecture, the network operators are best placed to decide the locations and structure of PoI for IP based network**. Moreover, Licences in India are circle based and operators have already defined their network architecture accordingly, any new regulatory intervention would only add complexity and is best avoided, therefore no regulatory intervention should be there for POI locations.

- "Light touch" regulation by the Authority would be beneficial for migration to IP based interconnections, as it would create confidence among the operators and encourage them to make adequate investments to migrate from current system to IP based networks.

- We are also of the view that identification of locations and structure of POI by the Authority at this stage would only amount to micro-management by the Authority and would adversely impact the migration to IP based networks.

- **Summary of Recommendations**

  - **Based on the network architecture, the network operators are best placed to decide the locations and structure of PoI for IP based network.**

  - **"Light touch" regulation by the Authority would be beneficial for migration to IP based interconnections.**

Q.7 What are your views on the migration from the existing interconnection regime-measured in terms of minutes of traffic to an IP interconnection regime replaced by measures of communication capacity? Please comment with justifications.

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Q.8 In an IP interconnection between networks, comment on the type of charging principles that should be in place

(a) Capacity based in terms of Mbps.

(b) Volume based in terms of Mbps.

(c) QoS based.

(d) a combination of the above three.

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Q9. What should be the criteria to estimate the traffic minutes in IP environment if interconnection charges continue to be minute based? Please provide justification in support of your answer.

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Q10. In addition to the above, any other modifications or components of IUC which are required to be reviewed in the IP based network scenario? Please provide all relevant details?

<u>**RCOM Response:**</u>

- As brought out in our response to earlier questions, the existing networks are a mix of IP and TDM interconnects. The existing charging mechanism for end to end voice services across PSTN/PLMN are based on distance and time-duration (Minutes of Usage) of the voice call. Similarly, for data services the billing for the subscriber or is settled on the volume (Bps) of traffic downloaded / uploaded using the data channel.

- With the advent of next generation HSD technologies like 3G and 4G, prudence dictates that operators deploy an IP based high capacity core network. In an all IP network, it is not possible to differentiate between voice and data traffic as voice is just an application over the data network and it too gets transported as data packets only. However, with the <u>existing networks</u> being a mix of IP and TDM circuits and switching equipment, it is recommended that the existing metrics of minutes per usage for voice shall have to be persisted with as it is the best metric for the same. Data on the other hand can be measured in terms of volume for the subscribers as well as across an IP interconnect, between two TSPs networks, irrespective of the capacity (bps) and type (IP / TDM) of interconnect.

- Presently, in India, we have adopted the cost based IUC which include origination, carriage and termination charges. Also, we understand that TRAI has already proposed[1] reducing the mobile termination charges and a glide path to Bill and Keep in 3 years. This was done after studying all the models of determining of IUC charges i.e. FAC, LRIC, Hybrid LRIC, LRIC+, pure LRIC etc. **In the TDM and IP based interconnect co-existent scenario, we completely support TRAI's view for progression towards a BAK for termination charges.**

- **All IP Transition of Networks.** Introduction of all IP (Access and Core) networks would bring about a paradigm shift in the networking philosophy and accordingly, the regulatory framework too would be required to be realigned as it is predominantly voice services driven at present. Some of the regulatory realignments that would be required, especially for voice services charging and billing mechanism are as follows.

  o **QoS.** With voice being treated as data application, it too can have different Class of services like managed and unmanaged, etc. Accordingly, the call charges can vary as the QoS for an unmanaged call would be left to fend for itself as it would depend upon the bandwidth and server capacity available in the end-to-end network i.e. the regulatory requirements for QoS for VoIP need to reflect the underlying network, the VoIP application and the application hosting hardware.

  o **Differential Call Charges.** Voice shall also have different types of services like VoIP to VoIP peering, VoIP to PSTN or vice versa. A VoIP to VoIP call would be cheaper than a VoIP to PSTN through an interconnect arrangement.

  o **Secure Vs Unsecure call.** Since, in the IP domain there is no one-to-one relation between the service and the physical infrastructure, maintaining the integrity of the voice signal can be a challenge. Accordingly, there can be a differentiation on provisioning secure communications with due encryption or a plain non encrypted communications, especially for voice.

- Migration to an all IP network scenario would substantially affect the network costs and the relationship between the cost of carrying traffic and distance over which traffic is carried. **In view of the complexity of differentiating voice and data traffic across an interconnection, it is most ideal that the termination charges, here as well, be kept simple as Bill and Keep.** It is also important to specify an Interconnection Usage Charges (IUC) regime which gives greater certainty to the Inter-operator settlements and facilitates interconnection agreements.

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[1] As per TRAI affidavit in Supreme Court on IUC matter in 2011-2012

- The BAK charging arrangements offer the best long term interconnection regime. This approach entails levying no termination charges on interconnecting carriers at all. Major advantage is that this method avoids the administrative burden of billing one another for exchanged traffic. In case of co-existence of various technologies, BAK solves the problem of determining cost of termination for each technology and hence reduces the complexities involved. There are innumerable cases which are pending on cost determination with regard to TRAI determination. All these legal tangles can be sorted out using BAK regime.

- Convergence[2] of telecoms and the internet requires taking the additional step from **low termination rates to zero termination rates (BAK).** With Wi-Max, High Speed packet Access (HSPA), Fixed Mobile Convergence (FMC) and Next Generation Network (NGN) available on access devices, it would be possible for subscribers to connect each other through internet cloud. In this situation, it will be unsustainable to have different interconnection arrangements for competing services. Operators across the globe have already started offering flat charging for voice and data services to their customers, wherein the consumers have to pay the single charge for bundled voice and data services under IP environment. FCC (USA) is the best of example of BAK and convergence of services provided under flat charging schemes.

- **Internationally, Bill and Keep is considered the most popular IUC regime being implemented, especially as it incentivizes efficiency, migration to NGN network models and reduces network costs.** European Regulators Group (BEREC) in its a statement titled " Next Generation Networks Future Charging Mechanisms / Long Term Termination Issues " dated June 2010 has specifically assesses Bill & Keep as best alternative to the currently used IUC regime in Europe: calling Party Network Pays (CPNP) and has concluded that**:**

  'To conclude, BEREC considers BaK more promising than CPNP as a regulatory regime for (voice) termination in the long term. Strict application of cost orientation in the current CPNP environment in the short/medium term for mobile and fixed networks, particularly bringing down mobile termination rates to efficient cost levels, is a major step towards BaK representing the level effect as identified in this CS.'

- The CPP regime has stimulated take-up of mobile services, but at the cost of substantially depressing the usage of mobile phones. A better trade-off between adoption and use of communication services is needed through Bill and Keep regime. In the longer term, BAK is the most appropriate and most sustainable economic model. This systems is economically efficient, encourages usage ; they ease the task of the regulator, to the extent that regulatory rate-setting is not required; and they pose no conceptual or implementation difficulties in the world of the NGN or co-existence of number of technologies. **In ITU GSR 2007**

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[2] Convergence means that telecoms and internet services are becoming direct substitutes for each other

discussion paper on "Interconnection on an IP-Based NGN Environment" there is specific reference to India for adoption of BAK regime. The relevant para is reproduced below**:**

"In the nearer term, CPNP systems with much lower termination fees than those typical today might represent a promising interim step. Experience in India suggests that CPNP arrangements with mobile termination fees less than 0.01 USD per minute can be compatible with both high usage and rapid adoption. By reducing the spread between CPNP and Bill and Keep, the regulator also greatly reduces the pain associated with a subsequent transition to Bill and Keep arrangements should such a transition prove necessary." (Page 53)

- **Summary of Recommendations**

  o **Given the simplicity of accounting, benefits to consumers, competition promotion and the need to have a single interconnection regime for telecoms and the internet, Bill and Keep (for termination charges) is the most attractive framework of Interconnection Usage Charge for future deployment of technologies like IP based Networks.**

Q11. Do you envisage any interconnection requirement for application & content service providers? If so, what should be the charging mechanism? Please provide all relevant details justifying your comments.

RCOM Response:

- We do not envisage any interconnection requirement for application and content service providers. The reason thereof is as below:

- The telecom licenses are granted under Indian Telegraph Act 1885, to provide, establish, maintain and work telegraph. Since, Content and application Providers neither provide nor establish/maintain work telegraph, they cannot be a licensed operator in the telecom market and are not allowed to have direct interconnection with TSPs.

- Moreover content providers being unregistered/un-licensed players, have no obligations to provide any LI facility, QoS and emergency calling and are thus vulnerable to security concerns of IB.

- In case content and application service providers are desirous of gaining access to the end consumer, they are free to do so after acquiring an access license or **alternatively they can continue to access the end customer through the network of an access provider after signing standard commercial agreements.**

- The charging mechanism should be left to the commercial negotiations and mutual agreement between the various stakeholders viz. TSPs and application and content providers. Interfering into the commercial negotiations would destroy the free play of market forces. The commercial arrangements of TSPs and application and content providers are guided by the demand, acceptability of the product, technical arrangements on the network and other support services like billing arrangements, marketing agreement etc.

- **Summary of Recommendations**

  o **Access to the end consumer being the prerogative of licensed service provides, Content and Application service providers can either be mandated to obtain a license before being permitted to acquire customers directly, else they may continue to access the end customer through the TSPs network after signing standard commercial agreements similar to VAS services.**

Q12. Whether the existing regulatory framework for measuring and reporting quality of service parameters as defined for PSTN/PLMN/Internet may continue to apply for IP based network services? Please comment with justifications.

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Q13. In the context of IP based network Migration, if the parameters in the existing QoS regulation are required to be reviewed immediately then please provide specific inputs as to what changes, if any, are required in the existing QoS regulations issued by the Authority. Please comment with justification.

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Q14. In case new QoS framework is desirable for IP based network, do you believe that the QoS be mandatory for all IP based network services. If yes, what should be QoS parameter and their benchmarks?

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Q15. What should be the mechanism for monitoring the parameters for end to end QoS in IP based network environment? What should be the reporting requirement in this regard? Please comment with justification.

RCOM Response:

- In today's ultra-competitive scenario, TSPs are regularly monitoring their networks to provide good quality of service to the customers. Due to the emergence of Mobile Number Portability, service providers are under pressure to maintain their QoS standards, for them to sustain in the market. Hence, QoS are driven by market forces and there should not be

any forced approach for adoption of QoS benchmarks. If operators don't keep a self-check and measure their own performance, they can't maintain high service quality or address performance and quality issues as when they arise. Hence as a regular practice, Operators at their end do independent monitoring of the networks and other customer service aspects so that they can become more competitive by addressing customer satisfaction, capacity, service and quality issues.

- In view of that we believe that QoS is driven by market forces rather than by Regulatory intervention and Service provider are meticulously adhering to the reporting requirement of TRAI.

- Notwithstanding the above, if the Authority feels that there is need to have QoS parameters for wired IP based interface then to start with, some of the parameters as suggested in the VOIP regulations of 2002 for Toll Quality networks may be applicable as follows:

    o MOS ≥ 4 or R-value of 80 or higher
    o One-way end-to-end delay ≤ 150 ms
    o Packet loss not to exceed 0.1%
    o Jitter should not exceed 5 ms

    These parameters may be reviewed after 3 years when the IP networks will extend further.

- **Validity of existing QoS parameters.** The networks today are at a transitory stage, i.e. they are architectured with a mix of TDM and IP technologies based equipment. The <u>access network</u> is predominantly TDM technologies based. The <u>transport / core network</u> has a mix of IP and TDM technologies with IP riding over TDM technology (SDH) based equipment. Since QoS is required to be measured as an end to end parameter, the network QoS parameters should be benchmarked as per the network element that can support the least QoS in the entire chain of communication. **Therefore it is felt that at this stage, the existing VOIP QoS benchmarks that were stipulated in 2002 are adequate for a mixed environment of TDM and IP based network.** Also, gradual network migration to IP environment through increased proliferation of IP interconnects will only enable support for higher grade of service delivery capabilities in existing networks and therefore lead to operators being able to offer better level of QoS.

- **Requirement of revision of QoS parameters.** The proliferation of data networks has enabled de-layering of the network itself. Services like voice and messaging which were considered native to a Telecom network are being provided through third party applications, i.e. access network is provided by the TSPs but voice applications like Skype, Viber, Tango, WhatsApp, Hike etc are of another business entity. In such a scenario, QoS is

dependent not only on the TSPs network conditions, but also on the server loading / application performance /malicious attack on the network elements or applications server / state and optimization of the application server or the users handset / users distance from the BTS / number of users simultaneously accessing the network, etc. Accordingly, it is imperative that a holistic view of the QoS parameters is evolved for the entire communication eco-system right from the user equipment to the server, the intervening access and transport networks and the software applications.

- **Summary of Recommendations**

    o **QoS is driven by market forces rather than by Regulatory intervention and Service provider are meticulously adhering to the reporting requirement of TRAI.**

    o **Notwithstanding which, the existing QoS benchmarks that were stipulated in 2002 are adequate for a mixed environment of TDM and IP based network and should be persisted with.**

    o **The QoS if any is to be mandated in full IP environment, it should be based on the 3GPP parameters albeit they should be marginally lowered to account for the non ideal situations and conditions of the deployed networks.**

Q16. Should sharing of the IP based core and Access network element by different telecom service providers be allowed in IP based network scenario? What are the challenges, opportunities and problems of such sharing? Please comment with justifications.

RCOM Response:

Switch sharing is already allowed under licences and licensees are doing it to improve their cost of operation and business efficiency. DoTs Active sharing guidelines of 2008, allows sharing of antenna, feeder cable, Node B, Radio Access Network (RAN) and transmission system, however licence amendment including the implementation modalities is still pending from DoT.

Considering the need of network efficiency and the fact that there is hardly any distinction between core and access network of different TSPs, we agree with the view that sharing of IP based core and access network elements by different sets of telecom operators should be permitted.

- **Summary of Recommendations**

    o **To improve business efficiency and cost of network operation, sharing of IP based core and access network elements by different sets of telecom operators should be permitted.**

Q17. Do you see any issues concerning the national numbering plan with regard to the migration towards IP based networks?

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Q18. Do you believe that ENUM has to be considered when devising the regulatory policy for IP based networks as it will provide essential translation between legacy E.164 numbers and IP/SIP (Session Initiation Protocol) addresses.

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Q19. Which type of the ENUM concept should be implemented in India? What should be the mechanism for inter-relationship between number and IP addressing, and how it will be managed?

- **National Numbering Plan.** As stated earlier, core / transport networks of most of the TSPs are already IP based and the existing numbering plan or the facilities like MNP, roaming, etc are working as desired. However, with the migration of access networks in IP domain, it is envisaged that the effects on features like MNP, roaming, CLI, etc need to be studied in detail. Though solutions like mobile IP and ENUM are available, but they are yet in infancy and would take time to mature to enable provisioning of features similar to those available over the existing voice networks.

- **ENUM.** ENUM has been evolved specifically for the IP based access network. Enhanced lifespan of the existing numbering plan, even with migration of the access networks into IP domain, is a major advantage accrued by adopting the ENUM standard. This enables continuance of the role of telephone numbers as key identifiers for telecommunication services. However, it is envisaged that the Govt. would be required to address the following issues before the NNP is migrated to ENUM standards.

  - Introduce more flexibility in numbering plans by broadening the uses for existing number ranges.
  - Ensure segregation of IP addresses for voice and data services.
  - Evolve adequate safety mechanisms to ensure that the number identifiers are not cloned / phished and misused by unscrupulous individuals.

- **ENUM Varieties.** The availability of multiple varieties of ENUM implementations (Public ENUM, Open ENUM, Private ENUM, Carrier / Infrastructure ENUM) is a potential source of confusion. Moreover, with their standards being still evolved by IETF, it is felt that pinpointing the best ENUM implementation at this stage would be premature. With each ENUM implementation having its own set of characteristics, a thorough and detailed study would be required to identify the most ideal solution for our country.

- **Regulatory implications.** With the introduction of all IP networks there would be a paradigm shift from voice based networks to data networks. Accordingly, voice shall be treated as another application over the data network, with its own QoS parameters and its regulatory implications are envisaged to be as follows.

  o ENUM / mobile IP shall have to be considered when devising the regulatory policy for IP based access networks.

  o The charging mechanism for voice, which is presently as per minutes of usage, shall have to be based on either per session / duration of the session / volume of data transferred, etc.

  o Apart from E.164 number dialing, in the IP world, it is possible to dial by IP address, with applications like click to dial. Such applications pose difficulty for LIM as it is today with third party free applications.

- **Migration to all IP networks is a reality that cannot be wished away. In order to ensure a smooth transition, especially in the access network, it is suggested that the TEC should be entrusted to constitute a task force, comprising of the government agencies and industry representatives, to study the feasibility and implementation nuances of ENUM numbering in India.** The same viewpoint has also been elucidated earlier in the 2007 report of the NGN expert committee, wherein it was recommended that the '*NNP needs to be modified to include the NGN and TEC should study and give detailed recommendations in this regard*'.

- **Summary of Recommendations**

  o **For ensuring a smooth transition to IP networks, especially in the access network, TEC should constitute a task force, comprising of the government agencies and industry representatives, to study the feasibility and implementation nuances of ENUM numbering in India.**

Q20. Is there a need to mandate Emergency number dialling facilities to access emergency numbers using telephone over IP based networks platform? Please give your suggestions with justifications.

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Q21. How will the issues, of Caller location delivery and priority routing of calls to the emergency centre in IP based networks environment, be handled? Please comment with justifications.

RCOM Response:

- It is our view that when an internet telephony exchange is interconnected to the PSTN then it should be considered at par with any other technology for access service and no

regulatory advantage / dilution of mandatory services should be permitted. Additionally, it is brought out that ISP licence does not allow VOIP call termination on PSTN network, however for UASL, UL licencee, the feasibility of Emergency and PCR services should be evaluated in detail for IP based networks.

- Access to emergency services, authentication of calling party and called party identification are mandatory in the current licenses irrespective of the technology used for provisioning the services. Therefore, network deployment based on NGN / IP technology, by existing licensee(s), cannot be grounds to absolve it from the mandatory obligations of the license.

- It is learnt that in USA it is mandatory for all interconnected internet service providers to ensure provisioning of 911 emergency services. Though this suggests that mechanisms for provisioning emergency services, Caller location delivery and priority routing of calls to the emergency centre in IP based networks environment exists but their efficacy is suspect.

- **Now when the authority is examining the issue of voice calls over all IP networks (VoIP), it is suggested that the feasibility and modalities of implementing Emergency number dialing, Caller location delivery and priority routing of calls to the emergency centre be entrusted to TEC, as one of the scope while deliberating on the revision of NNP and numbering scheme to be adopted in the all IP network era**. This shall be inconsonance with the recommendations in the 2007 report of the NGN expert committee wherein it had been suggested that

    " Emergency Number dialing from IP telephony subscribers be mandated, however, methodologies of such implementations be left to the service providers".

- <u>**Summary of Recommendations**</u>

    o **The feasibility and modalities of implementing VoIP based Emergency number dialing, Caller location delivery and priority routing of calls to the emergency centre should be entrusted to TEC, as one of the scope while deliberating on the revision of NNP and numbering scheme to be adopted in the all IP network era.**

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Other issues to be considered by the Authority.

1. **TRANSIT CHARGE:**

- Further, we would like to highlight the issue wrt the transit charge as discussed by the Authority in section 2.13 of the consultation paper :

- At the outset, it is submitted that present licence does not allow transit of other operator's traffic. However, if at all transit is done within the network of an operator then there should not be any charge wrt the same. To exemplify, Private operators are constrained by BSNL to handover their traffic to BSNL at Level-II TAX and pay the transit charge of Rs 0.15/min for carriage of calls to SDCA. This should also not to be charged.

- In other case where BSNL is not able to provide interconnection at SDCA to the NLD operator, they should allow the traffic to be handed over at the LDCA and the transit from LDCA to SDCA should not be charged.

- Looking in to the above, the industry does not meant any new arrangement where one or the other operator may force such unilateral conditions in future. Therefore, there should not be any transit or carriage charge at the termination end.

2. PORT CHARGES

- Port charges are part of the interconnection related charges and the Authority's port charges regulation is notified under the same powers used for IUC regulation. To maintain the homogeneity and consistency, it is essential to review the Port charges in the present IUC review exercise of TRAI.

- Currently, Port **charges between private operators are already zero and** BSNL is the only entity that currently imposes port charges. The cost incurred by BSNL is substantially lower than the current level of port charges and the complete cost is recovered from the interconnection seeker, although both the interconnection seeker and provider use the facility. Although, TRAI vide its regulation dated 18 Sep, 2012 has already reduced the port charges to Rs 4000 and Rs 10000 for GMSC and Level I TAX connectivity, however the port charges imposed by BSNL are much higher. We therefore request that the port charges like other components of interconnection should also be based on the usage by the respective interconnecting parties. Further, **we submit that the port charges being imposed today should be eliminated as has been a practice between private operators.**

3. Lawful Interception and Monitoring (LIM):

- In all IP based scenario, a telecom services subscriber is exposed to plethora of options for communications (WhatsApp, facebook, google+, Hike, etc for messaging and Viber, Tango, Skype, etc for voice and video communications), other than those native to the telecom service provider. Hosting of these application based communications are provisioned through clouds whose hosting is location agnostic. This results in collection and storage of

communication logs and contents being stored at a location outside the international boundary of India and therefore they are not governed by the Indian Judicial system.

- From security stand point, legal interception of these communications is important, but with the information being held outside India, the legal agencies are required to request the cloud hosting country for providing the data. Their request may or may not be acceded to depending on the bilateral agreements between India and that country as well as the local laws prevalent there.

- In view of the above, TSPs shall be in no position to support lawful interception and should not be held accountable for the same.

- LIM is a major issue as there are multiple applications available today which subscribers are using and it is difficult to have an interception in the readable format.

- **Summary of Recommendations**

  o **In IP domain, handing over of traffic at the mutually agreed POIs (e.g. LDCAs), without any transit charges, should be mandated unlike present day situation where BSNL insists on handing over of traffic at SDCA else they levy transit charges.**

  o **PSU telecom companies should be mandated to adopt the industry best practice for not levying any port charges.**

  o **TSPs shall be in no position to support lawful interception of communication applications hosted ex-India and should not be held accountable for the same.**