Aircel/TRAI/Corr/2014/156

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Sub: Response to Consultation Paper on "Migration to IP based Networks"

Dear Sir,

This is with reference to Consultation Paper on "Migration to IP based Networks" dated 30th June'2014.

In this regard, we hereby enclose our response to the above mentioned consultation paper. These comments have also been sent through e-mail at advqos@trai.gov.in ;

We hope TRAI will take our inputs into consideration while finalizing recommendations/regulations.

Yours Sincerely
For **Aircel Group**

Ramesh K
Sr. General Manager –Corporate Regulatory Affairs

Encl: as stated above (Total 10 pages)

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Aircel Group Response to TRAI Consultation Paper on "Migration to IP based Networks"

Preamble

Globally, IP networks have gained ascendancy by their ability to offer ubiquitous, seamless, standards based access and transport over speeds from dial-up to 100 Gbps. IP networks have two major aspects:

1. Network - Interconnect related aspect
2. Subscriber – End user related aspect

A. Network – Interconnect related aspect:

It is now well known that technologically, mobility networks have started significant advancements with the introduction of the 3G and BWA layers in the network. BWA network layer is capable of providing flat IP services via packet access. Within the 3G layer significant portion of subscriber services are provided with circuit switched technologies. Around half of the mobility subscribers are served by a network which can presently support TDM interconnects only. The deployment of new network equipments for 2G/2.5G (as well as for 3G CS services) is generally IP enabled for last few years. However, same can't be used in "As is" manner for IP interconnection with other networks since, it needs separate equipments like SBC, IP cards, datacom routers, IP enabled transport equipments etc for enabling IP interconnection with other networks.

For an operator who has an existing TDM network in place, it makes it logical for it to deploy IP networks for additional increase in traffic. However for existing traffic, it is equally logical to continue with the same TDM networks since, conversion of all such traffic would mean change is huge existing network equipments deployed or in inventory, with humungous cost associated as well as no sizeable benefits being accrued to. Presently, there is huge amount of existing network structure which work on TDM and it would not be possible to decommission the entire network structure and replace with IP enabled infrastructure.

This activity has to evolve by itself and any attempt to mandate it, will lead to huge cost for the operators in the existing bad financial health, coupled with no relative benefit getting accrued.

B. Subscriber – End User related aspect

Vast majority of mobility subscribers (>95%) are served with legacy 2G/2.5G technologies. Additionally, only a tiny fraction of subscribers are served by All-IP BWA network equipments, having capability of IP enabled services and IP interconnect both. Further, with huge customer base still on 2G/2.5G, it indicates that there is no significant customer demand for IP based services, which could propel operator's expenditure towards shift to IP networks. However, as the market progresses and there is increase in demand of IP based services, operators would eventually transform the networks into IP

based networks. But, from economic viability perspective, these two have to move forward with each other.

Therefore to summarize, there are no comparable advantages for a mandatory IP enabled networks as it would lead to huge capital cost with miniscule revenue or benefits attached.

Besides, it is imperative to have standards for IP interconnection considering Indian conditions (like circle wise license etc) as such, we urge TRAI for recommending to TEC for prescribing the standards as well as Interface requirements.

Question-wise Response

Interconnection Issues:

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.

AIRCEL comments:

We would like to agree on a fact that operators are moving towards converging into an IP based network operator and same is happening in a phased approach, linked with the growth in traffic.

However, at the outset, we most humbly request TRAI that IP interconnection should not be mandated, due to the following reasons:

A. Gradual Evolution:

It is widely agreed that IP interconnection would be a natural progression of the network evolution towards IP. However, presently the majority part of network is legacy platform based and yet to evolve to a significant level of IP enabled NGN networks. The evolution cycle in any network is planned on customer and business needs, and ability to satisfactorily serve them with existing investment. As the customer and business needs undergo changes alongwith availability of an supporting ecosystem and existing investment is unable to meet requirements, a transformation is natural culmination.

In India, the situation is different that global counterparts wherein we have circle based licenses and networks. As such, there would be some circles where partially core network has been transformed to IP enabled one alongwith 3G & BWA roll-out, however there would be also many such circles where none such IP enabled transformation have had happened. This would be probably true for many of the other operators as well.

B. Growth in Data services:

There is already substantial growth happening in data services leading to increase in deployments of more and more IP enabled packet core switches. For the past few quarters, data subscribers have been increasing at 4 to 5% (approx.) which is a clear indicator of start of a data tsunami where IP enabled networks would play a great role and would need to be facilitated instead of forcing a capital intensive IP interconnection mandate. With this growth, the market appears to be playing its role of bringing IP enabled networks closer to reality.

C. Promoting rather mandating efficiencies:

Mandate for IP interconnection at this stage would be an additional burden on operator finances, which while resulting in increased investment as well as cost to serve customers, would not add any value benefits to the customers. On the other hand, "promoting" IP Interconnect regime without a mandate would have beneficial effect in terms of allowing for efficiencies, where they are feasible, while avoiding early burden of investment.

Considering all above, we recommend that IP interconnection should not be mandated by TRAI at this stage, instead it should be promoted & facilitated by TRAI while allowing natural evolution of networks still on legacy platforms.

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.

AIRCEL comments:

Yes, both TDM and IP interconnection should be allowed to coexist. There should be no restriction on interconnect technology to be used and same should be facilitated by TRAI.

In so far 'Reference Interconnection Offer dated 12th July 2002' is concerned, we verily believe that same is comprehensive, stood test of time w.r.t. private operators and do covers National Standards for interconnection of Networks including future technologies. The relevant extract of RIO is reproduced as follows:

> ***"6.1 National Standards***
> *Interconnection of Networks and Systems shall conform to National Standards as set by the Telecom Engineering Centre and Regulations applicable to Telecommunications Services in India. In the absence of National Standards set by the TEC and Regulations, they shall conform to the relevant Recommendations of the ITU. References to typical standards have been indicated in Schedule 4 of this Agreement.*
>
> ***6.4.5 PSTN/ VOIP Interoperability Standards:***
> *For Interoperability between Circuit based switching and IP based networks, the interface will conform to relevant national standards or guidelines of Licensor/ Regulator. Media gateway,*

Signaling Gateway and Gatekeeper shall conform to relevant ITU-T Recommendations and Internet Engineering Task Force (IETF) standards, as applicable."

The RIO guidelines, under Section 11 also covers Billing and inter-carrier charging on a cascaded basis. The ecosystem has adopted cascaded charging as de-facto standard as such, this could be used as primary mode of charging.

It is amply clear from above, that Regulation already covers the interoperability between circuit based switching and IP based networks and also allows interconnection between technologies based on ITU standards (in case TEC standards not available). Therefore, in our view the existing RIO'2002 does allow the same.

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

AIRCEL comments:

We reiterate our views that IP interconnection should not be mandated for the reasons stated at comments to question no 1. In between private operators, generally the existing bilateral agreements have derived their structure mostly from TRAI's RIO 2002 wherein charges for any change desired in provider's network are borne by seeker. The seeker role is played for initial 2 years and thereafter both parties bear the cost for their outgoing traffic respectively, in a fair manner.

However, biggest drawback of TRAI's RIO 2002 is its inapplicability to BSNL owing to litigations and BSNL having its own RIO resulting in extremely one-sided Interconnect agreements, creating a complete non-level playing field.

We most respectfully request TRAI to ensure speedy resolution of this issue so that RIO regulation can be effectively applied to all, in a fair, transparent & reciprocal manner.

IP Interconnect Exchange:

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.

AIRCEL comments:

We support peer-to-peer mode for interconnection and differ with any Exchange mode for interconnection.

The operators already have an infrastructure (i.e. POI, bandwidth/fibre etc) for existing peer-to-peer interconnection. This infrastructure has been created over the years, after extreme difficulty and incurring lot of cost because of laying of cables, Microwave, media, Right of Way permissions etc. We do not forsee any benefits from Exchange mode of Interconnection.

However, optimum utilization of scarce resources is of national interest as such, an alternative route can be created by TRAI, by pushing & facilitating transit of traffic through other operators. In this regard, PSU's have been stumbling roadblock and we request TRAI to facilitate traffic to be transited through other operator for termination on the PSUs.

Besides, TRAI has itself also observed in the consultation paper, the reasons due to which Interconnect exchange will not be beneficial in Indian context, be it central or regional. There are additional reasons for not supporting Interconnect exchange mode of interconnection, given as follows:

- The costs of carrying traffic from across LSAs would be prohibitive as such, not commercially viable than local switching.
- The capacity requirements at the national layer interconnect would be humungous, perhaps 20/30MErl or 2/3 Tbps of voice traffic, with additional capacity for the data traffic.
- Massive changes in the licensing regime, network architectures/capacities and render NLDO layer redundant.
- Architecture challenges with creation of vulnerable single point of failure for all telecom networks.

Location and Number of Points of Interconnection:

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.

AIRCEL comments:

We suggest that there is a need to review the present restriction of setting up switching centres within the LSA only. To facilitate IP based interconnection and for cost effective high capacity network element models to pitch in, the license should allow setting up of switching centres outside the LSA.

However, setting up of switched outside the LSA should be subject to a caveat that the POIs should be provided from within the LSA only. Else, this may lead to unfair practices by interconnection provider operators asking to connect to switches located outside the service area, at the bandwidth cost of interconnection seeker operator.

Wholesale Interconnection Charges:

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.

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.

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.

AIRCEL comments:

Presently, the Indian telecom industry has a very robust and stable IUC regime wherein the network cost, interconnection cost, wholesale cost and retail cost, all are available in terms of per minute. In our view, the ecosystem is working fine and there appears no need for any modifications.

We would like to state that the charging principles in case of IP interconnect have to be realistic & reasonable for implementation over IP interconnection, especially to be compatible with the current charging regimes, so as to have minimum variations and obstructions.

Towards this aim, the objective can be met with continuing on "per minute" billing framework. The billing details of the minutes of calls are available with the operators (originating and terminating) as well as retail subscribers who are also being billed on "per minute" basis usually. Hence, the overall interconnection charges framework should continue to be in terms of 'Units which are clearly understood' over more than two decades and established for billing and metering.

Therefore, in case of peer to peer IP interconnect it would introduce minimal changes to telecom networks and IT systems.

For scenarios of "interconnection exchange", the architecture of Interconnection Exchange would necessarily include elements such as SBCs, required for security/transcoding/routing needs etc. The SBCs are also usually well capable of deriving the voice call usage in terms of the "minutes".

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?

AIRCEL comments:

The objective of IP interconnection would be optimum utilization as well as reducing costs as such, we request TRAI to facilitate a framework for Port Charges for such IP based interconnection.

Charging of Content and Data Services:

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.

AIRCEL comments:

- **No, we do not visualize any interconnection requirement for application & content service provider. Also, there should be no charging mechanism prescribed for them and current practice should continue.** In so far OTT players are concerned, TRAI is already in process of review.
- Interconnection should only be dealt in terms of telecom licenses, Indian Telegraph Act as well as TRAI Act i.e. interconnection between telecom operators.
- There is already a market driven charging mechanism available for application & content service provider, which is working very fine. The existing charging mechanism is based on product/VAS value to the customer, utility of content, pricing and availability of such content/VAS to customers through other content providers.
- In brief, this is driven based on customer experience and satisfaction, which a telecom operator is best equipped to be aware of. Having multiplicity of services/content partners as well as uncontrolled ways of delivering service, would create huge dissatisfaction for customers and would also lead to adverse impact to an operator's brand & market competitiveness.
- The application and content service providers work in alignment with the network of operators. With advanced IP based networks being deployed, operators would in any case push for better delivery of services, VAS etc. including through application & content providers as well.

Quality of Service Issues:

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.

AIRCEL comments:

We strongly recommend that QoS parameters for IP based interconnection and IP network services should not be prescribed at this stage.

IP interconnection and "IP network services" are two discreet aspects, which bring forward a real challenge of assuring the QoS in a packet services environment. The challenges are of two fold nature:

- **Subscriber related QoS Parameters for Legacy and 2G/3G services**

  These are parameters which relate to the voice quality, data throughput as well as call success rates etc.
  For the 2G & 3G networks, the introduction of the IP within the network for services such as IP based has no bearing on the services offered to subscribers hence, no impact on QoS.

- **New IP Network services and IP interconnection**

  We would like to state that QoS parameters should not be prescribed for IP based network services and the POIs on IP interconnection, at this stage. So far, there are limited operators who have launched IP based network services and there is already very limited ecosystem available for the same. On top of it, if QoS parameters are prescribed, same would only discourage and slow down adaptation of IP based services.

  Infact, we would like to recommend that TRAI should observe the launch of such services for next 2/3 years and once it reaches a stage of launch of such services by multiple players and crosses the initial tethering thereafter, consultation for QoS parameters be initiated. Till such time, operators be allowed time to stabilize the network, induce innovating approach with network elements/architecture, provide new services & products to enrich experience of customers.

Therefore, we request TRAI not to prescribe QoS parameters for IP based network services and the IP Interconnection, at this stage.

Operational Issues:

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.

AIRCEL comments:

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Yes, we feel that sharing of IP based core and access network element by different telecom service providers be allowed as same would lead to improved utilization of network resources and improved customer offerings. Application of equipment sharing should not give differential treatment based on nature of technology or interconnection being used.

Hence, sharing should be allowed for TDM as well as IP based networks elements.

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?

AIRCEL comments:

This is different from IP network interconnection and is related to IP based services. To move ahead on IP based services, it is essential to have alignment with Global practices. For both TDM based services & IP based services to co-exist, it is a pre-requisite that mobile numbering issues be resolved.

We recommend that Public infrastructure ENUM can be considered for the translation between legacy E.164 numbers and IP/SIP addresses. This can be modelled on similar lines as done for MNP operators.

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.

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.

AIRCEL comments:

Provision of Emergency number dialing facilities are part of Access license conditions irrespective of technology deployed as such, there should not be any doubt over its implementation and it should be continued to be a mandatory service. We believe that the Emergency number dialing from IP telephony

subscribers is required to be continued as a mandatory requirement due to its large scale public benefit however, methodologies of such implementation be left to service providers.

The problems highlighted in terms of Caller location delivery and priority routing can be addressed on best effort basis, which are presently the only avenue feasible on IP network services. Any advancements in the IP network services would enable the ecosystem to gradually improve the efficiency in addressing the concerns related to both of these aspects.

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