CONSULTATION PAPER

ON

"NEXT GENERATION NETWORKS"

(March, 2008)

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INTRODUCTION

1.1 The objective of this consultation paper is to seek views from the industry on the following:

(a) Issues relating to NGN, basis of those issues, what kind of regulatory framework can be adopted for NGN services to be provided in Pakistan.

BACKGROUND

2.1 A huge change is taking place in telecom infrastructure, with the traditional telephone systems being replaced by an IP-based infrastructure. This will facilitate data communications and file transfers via networked computers. IP is now adapted for voice communications (VoIP) and most corporate users are on IP networks. However, the true value of IP is that it is becoming the core of the next generation public networks (NGNs), facilitating affordable triple play business models that seamlessly integrate voice, data and video.

2.2 Emergence of efficient and cheaper IP technology forcing telecommunications networks to migrate to 'Next Generation Networks', triple play (voice, data and video) would turn into a basic service. Traffic of different services of data, television and subsequently voice would be simply enclosed in Internet protocol packets, transmitted over these networks. These networks can later support any number of additional value-added services and transmit them also as IP packets. In fact, a number of telecom operators in country are already planning to move to such networks. The deployment of NGN would face a number of challenges and obstacles related to evolution of new technologies and services, emergence of disruptive business models, network security risks and competition and level-playing field issues.

2.3 A number of operators in Pakistan have already deployed IP technology at core end of their networks and are considering plans to deploy 'Next Generation Network' (NGN) services. NGN can be defined in terms of both technical and service characteristics. The key technical characteristics of NGN are that it provides:

- A single IP-based core network handling the full range of telecom services;

- A single access platform supporting the full range of access technologies

and services (referred to as a Multi Service Access Node or MSAN);

• Distributed rather than centralized switching, routing and network intelligence enabling remote access, control and maintenance

2.4   NGNs essentially deliver convergence between the traditional world of public switched telephone networks, and the new world of data networks. From an operators perspective they provide a means of migrating from the old world to the new world, delivering substantial cost savings due to the economies of scope inherent in a single converged network

INTRODUCTION TO NGN

3.1   ITU defines NGN as "***Next Generation Network*** *is a packet-based network able to provide services including telecommunication services and able to make use of multiple broadband, QoS-enabled transport technologies and in which service-related functions are independent from underlying transport-related technologies. It offers unfettered access by users to different service providers. It supports generalized mobility which will allow consistent and ubiquitous provision of services to users."*

3.2   Similarly, Italy's regulator AGCOM defines NGN as *"a packet-based network able to provide telecommunication services and able to make use of multiple broadband, QoS-enabled transport technologies, and in which service related functions are independent from underlying transport-related technologies".*

3.3   There is however a tendency when using the term "NGN" for it to mean different things for companies and people using the term. For some, NGN simply means migration from the PSTN to an IP based network. For others, it is a more specific reference to, for example, international calling IP trunking, and/or IP in the local loop. Numerous vendors use the term NGN in their products and operators and providers setting out their vision refer to NGNs frequently for marketing and other purposes, but there is no reference to a single set of NGNs standards at this stage. At a minimum, NGNs are generally packet-based, IP-based, multi-service networks.

3.4   NGN is a future-oriented technology. Telecom Operators are moving to NGNs for a number of reasons including:

• Existing PSTN equipment may be reaching the end of its economical life, e.g. with ongoing maintenance support being harder and more costly to obtain.

 • Operational costs can be reduced by running a single converged

network rather than multiple legacy networks.
- Innovative services can be developed to improve customer experience.

3.5 Within the NGN there is an increased emphasis on service customization by the Service Providers whereby some of them will offer their customers the possibility to customize their own services. NGN should be comprised of service related APIs (Application Programming Interfaces) in order to support the creation, provisioning and management of services. The above-referred ITU document has characterized the following salient aspects of NGN:

a. Packet-based transfer;
b. Separation of control functions among bearer capabilities, call/session, and application/service;
c. Decoupling of service provision from transport, and provision of open interfaces;
d. Support for a wide range of services, applications and mechanisms based on service building blocks (including real time/streaming/non-real time services and multi-media);
e. Broadband capabilities with end-to-end QoS and transparency;
f. Interworking with legacy networks via open interfaces;
g. Generalized mobility;
h. Unfettered access by users to different service providers;
i. A variety of identification schemes which can be resolved to IP addresses for the purposes of routing in IP networks;
j. Unified service characteristics for the same service as perceived by the user;
k. Converged services between Fixed and Mobile networks;
l. Independence of service-related functions from underlying transport technologies;
m. Support of multiple last mile technologies; and
n. Compliant with all Regulatory requirements, for example concerning emergency communications and security/privacy, etc.

NGN TRANSITION AND LICENSING REGIME IN PAKISTAN

4.1 The transition from PSTN to NGN is unlikely to take place evenly across customer groups or geographical areas. The more profitable customers are likely to be the earlier movers to NGN networks. As traffic migrates to IP networks there will be fewer customers generating PSTN revenue from voice service. Customers remaining on the old network are likely to be clustered in poorer locations and demographic groups. Moreover, the migration from PSTN networks could

increase average per line costs of existing networks and lead to deterioration in quality of service. At some stage in the future, the PSTN could become uneconomic to maintain and their closure would become a possibility (unless obliged to remain in operation due to a USO). Indeed, closure of PSTN legacy networks would be a distinct prospect since an operator that is not burdened by the costs of also having to continue to maintain the PSTN network can only appropriates the cost reduction benefits from migration to an NGN network. As a result, the transition to NGN could raise significant universal service issues. There may be pro-competition reasons why the regulator may force the incumbent to continue operating the PSTN (at least for some time). But even where the PSTN is not permitted to be "switched-off" there could be concerns that the migration to NGN may create a 'digital divide' in regard to the quality and range of services between those with NGN access and those still using the PSTN.

4.2 In Pakistan, the Federal Government under its Telecom De-regulation Policy in 2003 has adopted, announced and maintained 'technology neutral licensing approach' without imposition of any bias restrictions upon the prevailing wish of licensed operators and as such they are allowed to employ any technology, such as IP, VoIP, DWDM, CDMA and so forth within flexibility of license. The Deregulation Policy for fixed line segment creates two types of licenses: one for fixed-line operators covering local loop ("LL") fixed-line telecommunications within a region, and the other for operators of long-distance and international ("LDI") fixed-line telecommunications. Therefore, the new entrants, i.e. TeleCard, DV Com, Wateen Telecom, etc started deploying their networks as per the new technology/networks trends while contracting ZTE and Nortel Networks, respectively for NGN solution[1]. NTC is also fully geared up to meet the new challenging environments in the competitive era after the deregulation and deployment of NGN. NTC is planning to deploy multi services access platform capable of providing POTs, XDSL, PRIs, IP Phone & other cost effective and value added services to the end users.

4.3 NGNs deployment status in Pakistan is satisfactory despite the fact that huge investments were already made in various segments of the industry and in particular the cellular mobile segment. The core networks are being replaced and/or integrated with NGN switches by PTCL and NGN switching platforms have been added to the core switching to provide flexibility and ease in delivery. Alcatel, Nortel, Huawei, Siemens and Cisco are a few of the major companies who dominate the NGN. The licensed service providers in the LDI segment including PTCL, Burraq, Wateen, Link Direct are deploying NGN and have awarded major contracts to these vendors and suppliers of NGN equipment. The

situation on the NGN access side is being focused by major players of the Industry with the extensive deployment of fiber in access networks. Nayatel, a licensed Local loop provider besides PTCL and Worldcall are laying fiber in local loops in the form of access rings for provisioning of broadband services including cable TV. Detail of various licensee's NGN solutions at core level is exhibited here under:

Operators	Type	Description
Callmate	IP	Class iv(Transit)
Wisecom	IP	Class iv(Transit)
Dancom	ATM	Class iv(Transit)
Telenor	IP +ATM	Class iv(Transit)
World call	IP	Class iv(Transit)
Link Direct	IP+ATM	Class iv(Transit)
Redtone	IP	Class iv(Transit)
Telecard	IP	Class iv(Transit)
Burraq	IP	Class iv & v(Transit & local)
Wateen	ATM+IP(MPLS)	Class iv & v(Transit & local)
DV Com	IP +ATM	Class iv(Transit)

4.4 In Pakistan, telecom sector was deregulated/liberalized with technology neutral approach at such a time when NGN solutions were already available in the market. Therefore, all new entrants have laid down NGN solutions at their exchanges, switches/pops. PTCL also has attempted to utilize NGN solutions in its networks alongwith legacy networks. Market forces, technology neutral licensing regime and fair competition in services and tariff levels have already forced the operators including PTCL and NTC to opt such solutions which are efficient and cost effective, therefore, they have upgraded their switches/systems by opting NGN solutions. Hence, there is no practical difficulty in Pakistan regarding transition from PSTN to NGN and no timeline is required in this regard. However, Pakistani market may face such issues which require consideration by the operator, policy maker and the regulator that include convergence of services/systems/mediums and the services provided over or by

using NGN solutions, billing and tariff issues, interconnection, QoS and security issues, etc.

GLOBAL NGN DEVELOPMENT

5.1   Various telecom incumbents world over have started deploying NGN in their core side of the network with an objective to reduce operating costs and network complexity thus improving the transmission network.

5.2   British Telecom set out its plans for 21CN in 2004. It will replace all BT's existing networks with a single multi-service network. BT aims for the 21CN to reduce cash costs (by £ 1 billion per annum), improve speed to market for new services, and improve the customer experience. Investment for the 21CN project is concentrated in the period 2005 to 2008, estimated to be around £ 3-5 billion.

5.3   Nippon Telegraph and Telephone Corporation owns large legacy public switched networks in Japan. NTT has decided to build its own Next-generation Network in conjunction with optical fiber-based broadband access as new network infrastructure through which a wide variety of broadband ubiquitous services could be delivered. As the first step of their Next Generation Network implementation, NTT began field trials in December of 2006. These field trials were intended to verify the technological and operational issues of their NGN's commercial deployment. Commercial deployment of NTT's NGN is targeted for the spring of 2008

5.4   Singapore's incumbent operator, SingTel, faces a slowdown in its home market as saturation and growing competition erode its fixed-line and mobile businesses. SingTel is turning to a converged approach by combining 3G and video services across mobile, fixed-line and broadband platforms. Its "3loGy" initiative, launched in Singapore in February 2005, is a triple play of 3G and video services across mobile, fixed-line and broadband platforms.

5.5   In January 2006 Telecom Regulatory Authority India issued a consultation paper on NGN issue and after analyzing comments received from stakeholders on 20th March 2006 issued its recommendations[2]. Summary of recommendations are as under:

> (i)   that TRAI's recommendations for unified licensing regime dated 13th January 2005 (as modified in recommendations on Issues

relating to convergence & competition in Broadcasting & Telecommunications dated 20.3.06) should be considered expeditiously taking into account the revised entry fee and annual license fee for different services, so that various operators can make best use of NGN platform to provide all types of telecom, data, video and broadcast services through a single license;

(ii)   that the niche operators for rural areas, which could be permitted through lower entry barriers as per the above recommendations should also be created at the earliest so that benefits of NGN based services are also passed on to rural masses to improve the rural tele-density and to reduce the digital divide in rural areas;

(iii)   that facilitating NGN migration in access network various provisions of broadband policy 2004 need to be followed up and reviewed expeditiously especially those pertaining to following:

   a. Unbundling of local loop (item 3.1(b) of Broadband Policy 2004)
   b. Delicensing of 5.1-5.3 GHz band for outdoor usage for Broadband access (item 3.1(e) of Broadband Policy 2004)
   c. Identification of additional spectrum bands, which are not in high usage, for deployment of Broadband services in access (item 3.1(e) of Broadband Policy 2004) (iv) TEC to be called upon to study and analyze various international developments pertaining to NGN so as to incorporate the same in Indian context and develop interface requirements for the same in a time bound manner;

(iv)   In addition, a cross industry joint consultative group consisting of TEC, Service providers, technical institutions, vendors to be set up etc. for analyzing NGN standards & their customization for national requirement.
(v)   Various issues related with legal interception and security monitoring as well as access to emergency services in NGN domain need to be studied in detail by associating the relevant agencies in coordination with security agencies; and

(vi)   that relevance of IPv6 for NGN networks and the related cost implications for the operators also needs to be analyzed in detail.

NGN REGULATORY ISSUES

6.1   The current circuit switched, telecommunication regulatory model, with

its oversight intensive approach to technical and economic regulation differs from regulatory approaches to the packet based Internet, which is generally less subject to regulatory intervention. The two have evolved differently, requiring disparate approaches by regulators to new developments. In some cases, simply augmenting current practices is sufficient i.e in countries where it is legal to offer Voice over IP services (VoIP), ensuring that VoIP operators have the right to interconnect to other operators and access to a national numbering plan. However, as NGNs combine the telecommunication and the Internet model at a technical level, it will therefore require planning and foresight by regulators and policy makers at the legislative and policy level too, in order to ensure that regulatory frameworks are designed or augmented to facilitate NGN deployment and development.

New technology developments generally raise some policy, regulatory or legal issues – and Next Generation Networks is not exception to it. In the transition phase towards next generation networks the existing regulatory framework needs to be evaluated with regard to changing technology and changing market structure. As the evolution of NGN is in progress and its policies, frameworks, regulatory approaches, regulatory framework, technological issues and their technological solutions are in the formation stage. There is controversy on the issue of regulation of NGN, its transition from PSTN to full NGN. Some are of the opinion that soft handed/light touch regulations should be applied by the regulators, if required, otherwise it should be left on the operators so that stupendous investment comes in the sector and innovative applications and services come under wider use. Whereas, on the other side, some are of the view that tighter regulations should be enforced by the regulator to avoid disruption of the market. They advance argument that the incumbent operator by providing NGN services may distort competition and drive out its competitors from the market. Therefore, the regulator should not merely watch this crucial game of interest but to intervene to complete the smooth transition from PSTN to full NGN.

Question 1. Do you agree that a light touch regulation regime is essential for NGN deployment in the country? What are benefits and risks of light touch regulation?

Question 2. Do you support that tighter and detailed regulation are required for smooth deployment and transition of NGN in the country?

Question 3. The operators have already installed IP based infrastructure in their exchanges/PoPs/switches, is there any need to intervene through regulations or otherwise there is no need for such regulations. Comment on it? What changes you propose in the existing regulatory arrangement?

6.2 COMPETITION

Due to the recent open and unrestricted polices of the Government of Pakistan coupled with the well accepted response from international investors which is mainly due to the abundance of the untapped local market potential, PTA is less concerned on issues like Competition. Considering its importance, it is believed that continuity of current telecom policies Pakistan will foster enough competition. However having said that, our biggest concern is to keep a balance between the incumbent and the new operators. PTA believes that various competition concerns may arise once the incumbent will start offering NGN services.

Question 4. Is current market structure competitive for NGN services? If No What possible regulatory steps can be taken to promote competition?

Question 5. What kind of impact the incumbent can play on competition through an early entry in the NGN market?

Question 6. What measures you suggest which are required to be taken to encourage competition in NGN context?

6.3. ACCESS

Understanding the importance of ACCESS for the convergence of Voice, Data and Video services. Primary focus is to identify cost effective network topologies for both the urban and rural applications.

PTA is aware of the fact that for NGN applications access networks are imminent that could offer high-speed data and extremely high speed video applications. The requirements of a residence would differ from that of a small-office-home-office while that of an enterprise would be significantly different. For a country like Pakistan it would be inconceivable to convert its access networks overnight into an IP based access. More than likely due to the poor and limited copper access in the local loop. Operators will have to continue to rely on copper based broadband technologies e.g xDSL supported with relatively medium speed wireless networks. However with the recent deployment of fiber it is expected that most of the business districts in the metropolitan cities will be equipped with decent amount of fiber-to-the-home networks. On the other hand deployment of wireless technologies (Wimax, WLL) is changing the landscape of the country offering Economical, Reliable and quality access to the urban as well as rural communities.

PTA believes that instead of separate NGN evolution of traditional PSTN and packet-switching network the right path is that NGN should emerge as a common platform for all networks.

Question 7. What are your views on likely access technologies for NGN services in Pakistan?

Question 8. What are your views on infrastructure sharing or unbundling of access networks for NGN Services?

6.4 LICENSING

PTA actively pursues and strongly believes in convergence. PTA has started convergence plan through simplification of its CLASS VALUE ADDED SERVICES licensing regime. All data value added licenses have been converted into a single license and the same have been adopted for voice value added services. LDI and LL licenses cover both data and voice services.

The licensing regime has been made simpler. Many IP based services have trickled down to registration only.

Question 9. Keeping in view the NGN scenario, Is there any licensing condition required to be included in the current licensing regime to facilitate the NGN Deployment? If yes please specify

6.5 INTERCONNECTION

The question of interconnect is possibly one of the most important issue that regulators will need to monitor or address. Most particularly, different operators will migrate to NGNs at different rates: one operator may be operating an NGN while another is still running a legacy TDM (time division multiplex) network. There would be two snareos: Legacy Network vs. NGN and NGN vs. NGN, there would be likelihood that NGN develops and legacy networks remain in operation, interconnection between NGN and legacy networks will be required. In such an arrangement, maintaining any-to-any connectivity for voice telephony and developing any-to-any connectivity for other new multi-media services would require networking arrangements between legacy systems and the NGN. Furthermore, current interconnection pricing may no longer be suitable for services in the NGN environment, because IP resources are not dedicated for the entire period to an application as in the case of the PSTN.

As there are concerns shown regarding the quality of service, therefore, operators/regulators may move from a price debate to emphasis on the quality of service in an IP network. This raises the challenge of whether there is a need for interconnection agreements to include service level agreements as well. No doubt, it will be a challenge for the regulators to set up the interconnection framework suitable for an NGN environment, which can encompass PSTN, mobile, Internet and cable TV traffic. So, it will be necessary for them to establish an interconnection framework, which allows different types of network interconnection agreements for different categories of services in the NGN environment.

Interconnect issues likely to be raised are:

• can the new technology cause compatibility/interpretability issues between networks?

• the locations of points of interconnect (POIs) are likely to move after a migration to NGN. Will there be fewer POIs or more?

• Interconnection charges,

• with operators migrating to NGN technologies at different rates, interconnect is likely to change from being between two TDM networks to being between an NGN and a TDM network, to eventually being between two NGNs. What additional costs will be incurred, and which operator carries the cost of that additional step?

Question 10. What technical issues need to be considered regarding PSTN interconnection with NGN's?

Question 11. With reference to PSTN signaling, What kind of interconnection issues should be considered?

Question 12. Is there a need for new models for settlement of interconnect service provision? If yes please specify them.

Question 13. Is there a need to have detail consultation with the Industry on interconnection issues?

Question 14. In your opinion how interconnection should be addressed in NGN context?

6.6 PRICING / TARIFF

It is expected that the cost of NGN networks as well as the services provided over the NGN are very low as compared to PSTN. The charges for packet based volume or pipe size based should be charged would be the emerging controversies in the NGN environment, which the regulator has to determine.

PTA has taken sound measures in rationalizing the leased line pricing structure. Similarly the differential between Mobile and fixed line pricing has narrowed due to regulatory changes and directives. Such features will help rationalization of fixed and mobile termination rates. The international consultancy on cost based interconnection charges will also help in streamlining the pricing structure further.

Question 15. Would it still be relevant for future IP based Voice services to be charged on a per minute basis or there should be other charging scheme (e.g flat rate)

Question 16. What is the methodology for tariff of services, i.e., volume of packet base or on size of pipe base and why?

6.6. QUALITY of SERVICE

Although there is some concerns that IP based services and the highly cutthroat tariff structure may lower the Quality of Service however PTA is bent upon maintaining high quality of service requirements. This will ensure quality services at affordable costs. The regulator is confident that the existing Quality of Service parameters coupled with some new network parameters based upon delays and latencies will adequately help in improving or at least maintaining the acceptable Quality of Service parameters.

However, some new services may require addition of QoS parameters through regulations, which had not been conceived at the time of issuing existing licenses.

Question 17. Should PTA place some QoS parameters for the minimum level of quality for NGN?

Question 18. What KPIs for QOS regarding new IP based NGN services do you propose?

6.7 SECURITY

Security of networks and communication is one of the obligations that operators and providers of services must meet. However IP-enabled NGN

by its nature have open end, which prompts to implement network protection systems against the risk of intrusion, Spam and viruses.

Regulators with the help of operators will have to develop procedures for security mechanisms to be deployed in the NGN networks keeping in view the security guidelines drafted by ITU recommendations **(Y.2701)**

Question 19. Is there a need to formulate common security architecture for NGN's?

Question 20. Do you agree that network security, spams, viruses and worms in IP enabled/NGN environment are global problems and require global solutions? Can international, regional, sub-regional or country to country cooperation in this regard play role to address these issues?

6.8. UNIVERSAL ACCESS/ SERVICE

As ICT penetration rates in developing countries still remain low and affordability and accessibility are key policy goals, current efforts to ensure universal access and service should not be abandoned or altered in a NGN environment.

The technological innovations associated with the transition to NGN have already started to transform the way universal access is being extended to rural and remote areas in both developed and developing countries. To a large extent, this transformation is fuelled by the introduction of new wireless technologies such a WiFi and Broadband Wireless Access (BWA) that have dramatically reduced the price of infrastructure deployment.

Although provisioning of Universal Access/ Service through 'Universal Access Fund' is outside the domain of PTA and is being taken care by the policy maker, however PTA sees NGN as a vehicle promoting" availability, affordability and accessibility" to ICT services.

Question 21. What kind of regulatory subsidies are required to facilitate NGN deployment in under served areas?

6.9 LAWFUL INTERCEPT

Lawful intercept can be more challenging in the NGN environment, in that data or some important call processing information does not necessarily pass through the IP network service provider's facilities. In addition, users are able to encrypt their data with relative ease. In a packet-based network there

is usually no dedicated path through the network. Packets may take different routes and the only feasible way to intercept communications may be in the access network.

It will be necessary for the regulators or law enforcement agencies to evaluate this issue in the NGN environment and to review whether, where and how to intercept IP traffic of various types, while ensuring practical solutions and costs for service providers and ensuring the authorised privacy of users.

Question 22. In a packet-based network there is no dedicated path through the network, then how the lawful intercept can be affected by enforcement agencies and how the privacy of users on IP enabled networks can be maintained?

6.10 NUMBERING, NAMING AND ADDRESSING

Numbering is treated as scarce resource in emerging telecom markets. For allotment and efficient use of numbers the regulators evolve numbering plans/numbering schemes and also charge nominal charges as administration cost of numbers. The operators install, maintain and adjust the licensed telecom system so that it conveys messages to telecom system and telecom apparatus in respect of which numbers have been allocated in accordance with the numbering plan/scheme. In PSTN environment E164 numbering scheme is in practice. The emerging NGN environment requires the regulators and the technology experts to, first of all, be well conversant with the numbering/naming/addressing issues, and then evolve the management mechanisms for them to avoid any complications.

Converse to PSTN, Internet can be accessed using an IP address such as e-mail address, and domain names which are allocated by registries, operating under the co-ordination of ICANN (Internet Corporation for Assigned Names and Numbers). IETF have already introduced ENUM (Electronic Numbering) as an integrated numbering scheme. However, there is no consensus yet on what numbers within national numbering plans should be used for NGN services, especially for VoIP. The issues relating to operation, administration and deployment of ENUM protocol based services are under consideration at ITU-T and Internet Architecture Board level.

There is likelihood that with the deployment of NGN, some countries may face numbering shortage within the numbering plans to allow access to certain types of numbers to the new service providers and for new services. On the other hand, increasing the number allocation may result in a significant cost increase for telecommunication network operators if they need to modify or upgrade switches to cope with the additional size of the

relevant routing tables. These factors justifiably lead us to the conclusion that the existing national numbering plans may become inadequate to accommodate NGN services, especially in the case of VoIP.

In NGN perspective a universal numbering plan/scheme may be agreed to follow under some arrangement/regulations of ITU.

Question 23. How the issues relating to numbering, naming and addresses in NGN environment should be handled? Do you agree that universal numbering plan, if approved by the ITU, may solve the numbering issues?

6.11 TECHNICAL STANDARIZATION

In NGN environment, the technical standards for NGN network/architecture/equipment and terminal equipment are required to be formulated. Internationally agreed technical standards for PSTN network have been developed mainly by large monopolistic network operators. In the current scenario where IP network is involved, to ensure ubiquity, interoperability and a competitive marketplace, NGN services and applications must be based on accepted open, voluntary, consensus-based international standards as laid down earlier.

Question 24. Should the regulator play its role in technical specifications for the NGN? Or this should be left over to the Industry?

6.12 LOCATION INDEPENDENCE and EMERGENCY SERVICES

Provision of access to emergency services is mandatory telecom service under the existing licensing regime. Such services will also be provided by NGN with differing qualities/grades of service. The issues will be the "best efforts" voice services and location of caller. E-164 numbers, which have historically been associated with phones with known fixed locations, but IP addresses cannot be reliably used as a basis to locate the caller. The PSTN has a direct mapping between the access link and a user's address whereas in IP access, particularly in case of VOIP, the direct mapping is not possible. In NGN environment it would be critical that how emergency services would be delivered. With the use of emerging integrated applications possibility is there that this factor also extends to other applications as well. Regulators will have to consider and evaluate this factor in the emerging NGN regime.

Question 25. Should the access to emergency services be made mandatory for an NGN operator? If No please specify the reasons.

6.13   CONSUMER AWARENESS & PROTECTION

PTA maintains its proactive role in consumer awareness campaigns through mass media, arranging workshops, seminars through participation of the private sector. Consumer friendly policies have been adopted and there is a constant encouragement coupled with regulatory push towards the establishment of consumer friendly 'Service Level Agreements'.

As is the case with PSTN services, NGN migration will continue to require adequate protections for consumers given the scale and complexity of the envisaged transition. The issues that will require attention include but are not limited to, quality of service, access to emergency services, rights and presence management, privacy and security.

 Protecting the rights of the consumers, it is imperative that the availability of open and multi-vendor interfaces for service and application delivery for fixed and cable networks are ensured.

Question 26. What steps can be taken to improve NGN awareness among the consumer?

Question 27. Should the access to emergency services be made mandatory for an NGN operator? If No please specify the reasons.

Question 28. What measures should be taken for protecting and safeguarding the interest of customers of telecommunication services in the NGN environment?

GENERAL QUESTIONS

Question 29. Should the regulator play its role in technical specifications for the NGN? Or this should be left over to the Industry?

Question 30. Is there a need to involve all related operators to focus on NGN issues? If yes how PTA should carry out this task?

Question 31. What could be the likely time frame for the country to achieve complete migration to NGN at core side?

Question 32. What possible regulatory actions could PTA consider to help the industry for smooth migration to NGN?

Question 33. Are there any other regulatory issues to be considered by PTA within the NGN context? .

RESPONDING TO THIS CONSULTATION

7.1 PTA invites written views and comments on the issues raised in this document, to be made by April 30, 2008.

7.2 PTA strongly prefers to receive responses as e-mail attachments, in Microsoft Word format, as this helps us to process the responses quickly and efficiently.

7.3 Responses may alternatively be posted to the address given below:

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