

## **We have to think of the Next Generation Telecom Networks**

A question is often raised "What will survive – Mobile Telephones or Fixed Telephones." Try to define to yourself what is fixed and what is mobile. The answers are not clear. Today, increasingly fixed telephones are using wireless as the last mile. British Telecom is launching schemes wherein calls from/to mobile subscribers inside a building would be transferred to a fixed network. Industry estimates indicate that 60-70% mobile calls are originated/terminated within a building and if they can travel on the fixed line network, enormous amounts of spectrum can be saved.

Earlier fixed and mobile services were regarded as services regulated under separate licenses with operators having different rights and obligations. Gradually, when last mile was allowed through wireless and the telephone was not connected by wire - problems started arising, since the wireless telephone could inherently move and with call forwarding and over the air registration, move to any area. In India, we tried to tackle the situation by unifying the access gradually. In the first stage, fixed line telephones became fixed wireless, followed by limited mobile and fully mobile phones later. For level playing field reasons, the

fully mobile paid an entry fee equivalent to what the cellular telephones had to pay and the access was unified in the Unified Access License. Fixed Wireless and limited mobile telephones were also allowed to continue as separate entities, but again there are large number of complaints and problems about movement of fixed wireless telephones.

All networks can be divided into an access network and a core network. In today's network, fixed and mobile consumers are served by distinct access networks. With increasing technological developments and use of wireless technology in access networks, we have had problems in identifying which wireless network is exclusively fixed and which is mobile. These problems are now increasing. In the next generation networks, multiple access networks can connect customers to a core network based on IP technology. These access networks include fibre-optics or coaxial cable networks connected to fixed locations or customers connected through wi-fi as well as to 3 G networks connected to mobile users. As a result, in the future, it would be impossible to identify whether the next generation network is a fixed or mobile network and the broadband wireless access would be used both for fixed and mobile services. It would then be futile to differentiate between fixed and mobile networks – both fixed and mobile users will access services through a single core network.

Earlier we were dealing with the problem of convergence of access networks and had finalized a Unified Access License. But now the problem will move to core networks and with the increasing use of “Next Generation Networks – NGN” regulatory problems would also increase. There would be severe problems on security on NGNs – but gradually multiple solutions are being identified to monitor servers and routers instead of monitoring switches. So far in the traditional networks, we could distinguish between type of services. Telephony, data or television services had separate networks. With the efficient and cheaper IP technology forcing telecommunications networks to migrate to ‘Next Generation Networks’, triple play would become common and would not be a value added service. Traffic of different services of data, television and subsequently voice would be simply enclosed in internet protocol packets, transmitted over these networks, and unless license conditions and regulations are light handed, it would be virtually impossible to regulate.

Sometime back the Secretary, Information Technology, of a State Government, came to TRAI with a proposal which he had sent to the Government regarding setting up of a IP network for e-governance in the state. He claimed that the network was so cheap that it could be set up

almost at a capital cost that was equal to the amount being demanded by the telecom operators as annual lease charge for leasing such lines for e-governance. As a result of this cost structure and particularly if “best effort” Internet is used for carriage of voice over long distances, the transmission costs come down drastically and the services would be delivered at cheaper rates. The ‘Next Generation Networks’ would develop many more new services with much more flexibility than the traditional network offers. Such networks would also offer opportunity for third party service providers to develop and operate services over the networks. To make it simple, the next generation network would be divided into access, transport, control and applications and different operators would compete with each other in different layers and since these layers are open, competition would be far more aggressive, giving immense benefits to the consumers while providing huge opportunities to innovative service providers. Such networks would be advantageous particularly for rural areas where there is huge demand for information, telecom, TV and video and if these services could be delivered at cheap prices, the market would be huge. India is the only country in world where cable TV connections are more than fixed line telephones and such networks would open up the possibility of delivery of cable TV channels in rural areas.

The Chairman of FCC, USA recently described Internet Telephony as a disruptive technology. It surely is, as the business model and also the regulatory models based on traditional networks would not be applicable to the next generation networks and the extended operation of the Internet Protocol (IP) would permit convergence of services to include not only data, pictures, music and video, but also voice communication and may be many other services, as technologists and operators would discover.

Operators and regulators around the world are deliberating upon how to create business opportunities and how to permit infrastructure investment in an open environment of the next generation networks. In the United Kingdom, there is an extensive telecom network, yet they have been forced to move to 21<sup>st</sup> century network and by 2008-09, they plan to move to an entirely new IP based next generation network. It is estimated by British Telecom that the next generation network would annually save for them 1 billion pounds, but this exercise would also throw up multiple problems of regulation, viable business models and security issues. Despite some unresolved technical challenges and entry barriers, VOIP is proliferating fast and is expected to result in penetration of over 50% of Broadband households in mature Broadband markets like Japan, France, Hongkong, Korea, Austria, U.K., Taiwan, Venezuela, Italy, Netherlands and

Malaysia. VOIP would have a big impact on the traditional circuit switched telephony, initially fixed line followed by mobile, driving prices and margins down, forcing far-reaching changes in industry and consequently in the regulatory and licensing regimes. The Governments and the Regulator will have to ensure that the changeover is smooth.

We, in India, have severe regulatory problems today in dealing with the present definition of services and networks. We find that operators are trying to move on to voice over internet protocol which is creating regulatory problems for the licensor and the regulator. They are trying to move to such networks as the services can be delivered at cheaper costs and consequently at cheaper rates to the consumer. The consequence will be a tremendous boost to the services that can be offered and more importantly since these services will move to the edge devices, a large number of new entrepreneurs will challenge the traditional offerings by existing operators. Not only will they offer these services at much lower costs, the mainstay of to-day's operation, viz. voice communication will now be challenged by the new operators. This will directly impact the existing business models with their new lost voice offerings using VOIP. The heritage networks will need modifications and reorientation of the business approach of the existing operators. The regulatory implications are huge. When we get into the details of regulatory issues we find that

for promoting such developments, issues like numbering plans will have to be tackled and number portability will become an essential requirement, broadband promotion will be a key issue as VOIP can proceed only with abundant bandwidth available to the customer. QoS will be yet another issue.

In India, we have a number of advantages. Our telecom networks are not so intensive as developed country's telecom networks and our teledensity low particularly in rural areas. But we have number of advantages. 670,000 route kilometers of optical fibres has been laid in India by operators, even in interior areas and the process continues. BSNL alone, has laid optical fibre to 30,000 out of their 35,000 exchanges, thus having a fibre connection down to an average of 20 villages. Keeping in mind the viability of providing services in rural areas, an attractive solution appears to be one which offers multiple service facility at low costs. A rural network based on the extensive optical fibre network, using Internet Protocol and offering a variety of services and the availability of open platforms for service development, viz. the Next Generation Network, appears to be an attractive proposition. Our fibre network can be easily converted to NGN and then used for delivering multiple services at cheap costs

Ultimately the networks, the services and the platforms are designed and provided upon by the operators. The question is whether we should change regulation and licensing regime in a manner that the operators are free to choose the best and the cheapest networks and technologies. We were able to sort out the problem of access, once we move to Unified Access Service License. Do we now have to move further towards convergence? Some of these problems have been dealt in TRAI's proposal in regard to Unified License. Such a license can easily deal with the converging technologies, carriage, service and platform. The transition would be difficult – but would bring with it, great benefits to the Indian and particularly the rural economy, which has a very large demand for telephony, broadband, TV and other services, if they can be delivered at the 'right' price. The 'Unified License' would give an opportunity to service providers to innovate towards the best solution. Another option could be to bring a converged regime, as has already been done in a number of countries, by promulgating a "Convergence Act".