



Wireless Infrastructure : A Step Away *India is all set to embrace new technologies; it needs flexible infrastructure to migrate to evolved versions*

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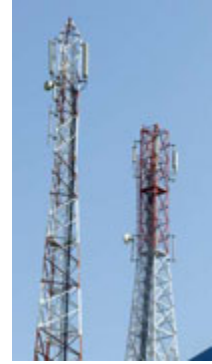
The year gone by has seen a lot of action on the wireless front in India. If all things had settled in place as had been planned, India should have by now carried out the spectrum auction for 3G, the most sought after technology that supports high speed mobile broad connectivity, and an array of IP-based services. The auction of spectrum for Broadband Wireless Access (BWA) services is also awaited.

India has long been deriving benefits of various wireless technologies, including 802.11, Bluetooth, TDMA, GPRS, WAP and WLAN. Growing need for more data and more speed is pushing service providers toward wireless technologies that offer higher bandwidth and high speed. Though wireless technologies have great opportunities in store, there are also certain serious concerns that tag along.

An unsecured network is highly vulnerable and can easily be exploited, the recent terror attacks have unveiled the threats an unsecured network poses.

The two hot trends observed in the wireless infrastructure are security and high bandwidth data transfer. For applications like Internet connectivity, the required bandwidth is not much whereas in applications like videoconferencing, VLAN segmentation, etc, the bandwidth requirement is high and products supporting the required amount of bandwidth needed to be implemented.

While the demand for bandwidth is growing, and will unarguably continue to grow, it is the pace and volume of growth that is difficult to predict for operators. As a result, operators are looking for network infrastructure solutions that are scalable and future proof-platforms that provide a cost-effective capacity solution today, while having the necessary flexibility and scalability to address the capacity needs of tomorrow. Given the limited fixed infrastructure in India and the high cost of deploying fixed last mile, wireless technologies are essential to increase broadband penetration.



TDM-based wireless backhaul, the traditional architecture, has been successful to date because of the limited amount of capacity that was required. However, as the bandwidth requirements and the number of cell towers increase, this is causing about 40% of the opex to be spent on just backhauling the traffic from the cell sites to the switching site, where the data is processed. In addition, microwave technology is currently in use and will continue to be used in the future. In the case of microwave backhaul, operators need to ensure that the supporting network elements are compatible with the microwave technology. The advent of less expensive and highly reliable Ethernet technologies is leading to re-engineering in this part of the network.

In the area of network migration to NGN, or implementing Carrier Ethernet backhaul, there are two distinct approaches for optimal evolution.

Existing operators, who already have a TDM backhauling installed-base, should leverage their existing TDM infrastructure, and expand capabilities to support Carrier Ethernet as well. The IEEE has been working on the standards that enable Carrier Ethernet. This would pave the way for Network Operators to deploy Carrier Ethernet systems that scale to several 10s of Gbps, and would lower network infrastructure costs.

Greenfield operators do not have legacy investment to consider and are more inclined to deploy all IP networks from day one. In this case the implementation of Carrier-Ethernet backhauling is done through Carrier-Ethernet Switch Routers (CESRs) that are designed explicitly for this purpose, and bring improved cost-efficiency to greenfield implementations.

In India, the wireless technologies being evaluated are WCDMA/HSPA, CDMA-EVDO, WiMax and Wi-Fi mesh. All these technologies promise very high bandwidth speeds enabling applications such as video streaming, VoD, distance learning, and music downloads among others.

Experts panel

Michael Kuehner, head of India and Nepal sub region, Nokia Siemens Networks

Kiran Pande, head of new regional business unit for India, Sri Lanka and Nepal, ECI Telecom

Neeraj Gulati, managing director, Ciena India

DK Ghosh, chairman & managing director, ZTE Telecom India
Chandran Mendiratta, VP, service provider-system engineering, Cisco India & Saarc
Siva Ramamoorthy, group director, marketing, Tejas Networks
Subhendu Mohanty, country head, home & networks mobility business, Motorola India
Subhashini Prabhakar, chief technology manager, Dax Networks

All of the big operators are already undertaking 3G trials (WCDMA/HSPA and CDMA EVDO). A few of the big integrated operators are also deploying WiMax networks as a part of their strategy to provide connectivity to enterprises.

Evolved Versions

HSPA evolved by restricting CDMA techniques to a large extent (limiting it to a spreading factor of 16) and co-opting developments associated with the emerging 3.5G/4G OFDM wireless technology. 802.16e is now commercially available, and is a precursor to 4G.

By the end of the year, the next-generation 802.16m will be standardized as a candidate for 4G, and promises to provide data throughputs of the order of 100 Mbps in 15 MHz spectrum. At the same time, another recently released OFDM-based standard, LTE.

All the major vendors are looking at expanding their offer these would be LTE, WiMax based on 802.16e, GPON/GEPON, to name a few. Vendors have some interesting plans for rural expansion along with renewable energy (solar and wind) solutions. The vendor's GSM portfolio is well equipped to take its GSM customers from 2/2.5 G to LTE directly.

However, the enterprises are increasingly opting for multi-point high bandwidth IP/Ethernet services to efficiently interconnect multiple offices. In addition, enterprises are looking to reduce their ICT expenditure by pushing more intelligence into service provider networks. This brings about the need for service providers to offer Ethernet services as defined by the Metro Ethernet Forum (MEF) like E-Line and E-LAN. With hard SLAs, Carrier Ethernet can offer this in a very cost-effective way.

Tips for CIOs

- CIOs must keep in mind the availability and adoption of standards
- Inter-operability between equipments of different technologies and vendors
- Choice and availability of spectrum
- Availability of devices/ handsets for the choice of technology made
- Scalability

Growth Boosters

New applications and usage of wireless like voice over WLAN, WiMax, 802.11n, ultra-wideband UWB can be a driving factor. The implementation of state-WAN across all states will

drive last mile wireless implementation on rural areas with e-governance initiatives. The rapid growth in mobile density and a steep growth in VAS services with further fuel the wireless infrastructure growth.

One of the main challenges any network operator faces is predicting customer demand and preparing the network to support it ahead of time. Improving or even sustaining a solid RoI is a significant challenge for all network operators, more so in a country like India where ARPUs are some of the lowest in the world. By using converged and scalable infrastructure, operators are able to improve their RoI on network infrastructure.

Cost Constraints

In the present scenario, uncertainty looms large over the 3G spectrum availability, which in turn affects the affordability of the infrastructure for it. A growing demand for mobile broadband services is motivating operators to adopt 3G based infrastructure. Besides, transition solutions to next generation vary, and operators are challenged with choosing the optimal evolution of their infrastructure, one which best leverages their capex and opex investments. The operators are faced with their own set of concerns. In wireless project implementation it is the line of sight. In order to cover large distances, greater height is needed. So, tower erection increases cost. The best way to optimize cost is to opt for scalable infrastructure.

Slowdown Impact

The financial crisis may have a ripple effect in India but foreign players are still bullish on the market as its fundamentals are strong. Hence, these players will be willing to acquire stakes in Indian companies. The Indian telecom sector presents a huge opportunity for financial investors and foreign telecom operators. The reason for this is that India, despite being the fastest growing and second largest telecom market in the world, still has a very low teledensity level that stands at approximately 29% today. This is indicative of the fact that a huge market is still waiting to be tapped. Telecom service providers are ramping up investments, expanding into new regions, trying out new technologies and acquiring overseas assets.