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Connecting India

*Bajpai:
wireless is the
way to go*

Tikona uses licence-free Wi-Fi technology to deliver fixed broadband services

"After two decades of strong growth in voice, data services will be the next trigger for growth in the Indian telecom market – for both the wireline and wireless segments," says Prakash Bajpai, founder & CEO, Tikona Digital Networks, who has three decades of experience in the Indian IT and telecom industry. Bajpai started his career with IBM as an electronics engineer and was one of the first few employees of Tata Telecom. Prior to launching Tikona, he was the president and CEO at Reliance Communications.

Armed with his experience across the sector, Bajpai went for a new venture in mid-2008. He roped in private equity investors like Goldman Sachs, Indivision India Partners, Oak India Investments and L&T Infrastructure Finance to pump in money into Tikona. The total debt and equity comprised about ₹2,000 crore.

While other Indian telecom operators are complaining that they do not have enough spectrum to satisfy demand for broadband wireless,

Tikona has chosen a radical alternative – licence-free Wi-Fi technology to deliver fixed broadband services as an ISP. "We decided to see how Wi-Fi could deliver quality that is equivalent to wireline. We were the first in the world to see Wi-Fi as an outdoor technology," says Bajpai, using the microcell architecture for the Wi-Fi base stations so that one can create a Wi-Fi cloud and beam signals to homes and offices.

Tikona has 2,25,000 customers, small- and medium-business including 10,000 small and medium business customers across 39 cities in India. "We continue to add about 25,000 subscribers every month which is roughly about 25 per cent share of monthly additions in the markets we operate in," adds Bajpai.

Fixed broadband is no alternative. There has been little investment in wireline equipment "and the old copper is decaying every year," Bajpai says. "India doesn't have the basic wireline connectivity. We are stuck with the basic mobile experience.

I can't see any wireline plant being built. It is just too expensive." So, Bajpai and his colleagues decided to look at wireless equivalents of fixed broadband. But the problem – of course – was lack of spectrum. "It is a scarce and expensive resource."

Mobile operators are already complaining about the lack of spectrum for voice, "and voice is a much lighter application: with video downloads, you need a thousand times the bandwidth you need for mobile voice," he says. So, Bajpai decided to look elsewhere. Any licensed system "was not going to be available in large quantities, so we thought about unlicensed spectrum – the Wi-Fi band. This has not been used to deliver wireline quality broadband. That was the challenge we had: necessity is the mother of invention."

Tikona never intended to compete with mobile: it does not aim to serve moving customers, so it does not have the challenges of varying signal strengths or handing off coverage from cell to cell. Its users are in their homes or offices with fixed antennas directed at the nearest base station. "Users are in buildings and our aim

is to deliver a steady and highly reliable service.” The company does not promise that the Tikona’s signal can be received directly by a laptop or a tablet such as an iPad. That would give a limited range. It has customer premises equipment, a Wi-Fi transceiver that connects with the base station through a steady and powerful radio link.

Necessity, not luxury

For the project, ‘The US-based Ruckus Wireless is the prime participant,’ says Bajpai. Other vendors include Cisco, HP and Alvarion. “The aim was to create a link that is strong day in and day out, in every single building and every single apartment in every building. We needed a responsive technology partner that understood our requirements and that could create new features. Ruckus has been responsive enough for our needs.” Tikona uses 60 megahertz of bandwidth in the 2.4 gigahertz band to operate between base stations and customers – that’s 24 times the licensed spectrum MTS



India survives with. But the government is relooking at the use of spectrum by ISPs and is demanding that they start paying significant fees. Another 50 megahertz of bandwidth in the 5.8 gigahertz band is for backhaul, connecting to an extensive fibre backbone passing through all the neighbourhoods in the coverage area. “So, with 110 megahertz we are delivering wireline-equivalent services.”

“Broadband penetration in India is at an abysmally low level of less than 1 per cent. In contrast, reported teledensity, which started off at low levels a decade ago, is now in excess of 65 per cent. We believe that broadband access service, like mobile service, is

no longer a luxury but is increasingly becoming a necessity. As broadband services proliferate, data service providers, including Tikona, should witness explosive growth,” says Dhanpal Jhaveri, partner and CEO, Everstone Capital Advisors, explaining Indivision’s rationale for investing more than \$300 million in Tikona.

The growth of broadband in India has remained relatively slow, largely due to an inadequate cable plant. So far, only wireline technology was adept in providing high speed capacities for multiple distribution and consistent throughput. By early 2011, there were just over 13 million broadband subscribers – a low penetration (by population). No operator has been investing in creating new cable plants or rolling out wireless networks to build capacity for broadband. To dig roads now is difficult. According to a report, for fixed line, the investment cost required per home is \$1,200-1,500, against an average revenue per user (ARPU) of merely \$10.

“This is a typical case of business

unviability. China has large copper plants with the capacity of 450 million lines, while India has only 30 million, out of which the plant suitable for broadband is a still smaller subset. The 3G operators have only 5 MHz, just about enough for small screen and, hence, low usage Internet users. Thus, broadband is a tough equation to solve. There is a tremendous opportunity for operators who decide to roll out fixed and mobile broadband services using available wireless spectrum and 4G technologies such as LTE (long-term evolution). But these licences were won by others as well. There were two slots, of which PAN India was won by Reliance and TDD. As part of the plan to protect its business Tikona also bid for various circles. A slot of 20 MHz was won by Tikona Digital Networks (five circles), Bharti (four), Qualcomm (four), Aircel (seven) and Augere (one).

Future is wireless

Tikona has won the broadband wireless access (BWA) spectrum in five contiguous circles – Gujarat, Rajasthan, Uttar Pradesh East, Uttar Pradesh West and Himachal Pradesh. “We plan to roll out the 4G LTE commercial services in these circles in the next 12-18 months progressively, starting with top cities and then going down to Tier II & III cities and towns of these states,” says Bajpai. He believes that the next generation 4G LTE services will change the way India lives, transacts, and communicates. This will be beneficial for the consumer as, unlike 3G, which offers an average usable data transfer speed of 1-3 MBPS, 4G technology will offer about 10 MBPS.

“The success of the mobile and now the DTH revolution have clearly shown that wireless is the way to go if broadband is to go mass in India. The onset of 3G services and expected broadband wireless technologies like LTE, will spur the spread and uptake of broadband. We expect both wired and wireless broadband to complement each other for many users, rather than be alternatives, as wired broadband offers consistent speed and better web experience,” says Rajiv Rajagopal, CEO, broadband/data, Bharti Airtel,

Wi-Fi versus 3G

Wi-Fi is an indoor data technology, which allows Wi-Fi-supporting devices like laptops and smart phones to access home and office networks (includes Internet). Wi-Fi allows device/user limited mobility within the coverage area (upto 300 ft). It can support throughputs as high as 54 Mbps (11b/g) -150 Mbps (11n) and doesn't add any extra cost in terms of broadband usage charges to one's existing plans. In the case of 3G, it is mobile wireless technology which allows 3G-enabled devices like smart phones and tablets to access Internet while on the move. 3G operates in the licensed band. Because of limited spectrum availability and high number of users per cell, 3G Internet speeds are far lower than Wi-Fi (1 Mbps-3 Mbps). 3G costs can range from Re1 to ₹10/MB for usage beyond what is included in the plan.

So, which one is better? It's really not the right question to ask, as these two can be considered complementary technologies. Depending on your application and budget, you can decide which to adopt. When you are in office/home, Wi-Fi will give you much better throughput at a fraction of the cost of 3G. Applications such as VoIP, video and gaming run better on Wi-Fi. However, when you are outdoor, switch to 3G for a seamless mobile data experience.

who feels the convergence of technologies and devices will bridge the digital divide between rural and urban areas, redefining access and addressability. “As the largest telecom service provider that has significant stakes in both the mobile and broadband space, we are uniquely positioned to lead this emerging opportunity.”

“We believe that 3G will cater to data services on mobiles (thin applications), whereas 4G will be used for high bandwidth applications on fixed PCs, laptops and also on tablets, PADS and smart phones. Also, 4G operators effectively have at least three times spectrum as compared to the 3G operators, allowing them to create several times larger capacity to service high usage applications as well as volume of subscribers,” says Gaurav Dixit, AGM, CARE Ratings

Tikona provides wireless broadband services to customers without digging through premises to customers in the Enterprise, Home and SME segments. ‘Home’ is by far the fastest growing segment followed by SME and Enterprise. Both SME and Enterprise customers are looking for Internet solutions beyond dumb bandwidth. Tikona offers a variety of solutions that aim at increasing the uptime of Internet in offices through media and service provider diversity features, load balancing across multiple diverse links, secure enterprise grade office Wi-Fi, differential speed to select users in the office, video conferencing offload and secure guest access in board rooms, among others.

Recently, Tikona acquired 100 per cent stake in HCL Infinet (now known as Tikona Infinet), the data services arm of HCL, which has helped it jumpstart into the Enterprise space. Tikona Infinet now serves more than 6,000 locations of large Enterprises through a combination of fibre and licensed band microwave.

Indian homes are getting richer, with newer devices and wireless appliances that connect to the internet – smart phones, tablets, PADS, PCs, laptops, printers, digital photo frames, surveillance cameras, media centres, etc. With Wi-Fi, these households will find convenience of using these devices wirelessly. The all-home wireless solution promises to simplify the complex task of networking of these devices without spoiling the interiors. Wireless technologies are essential to increase broadband penetration in India, given the limited reach of wireline technologies that have a high cost of deployment. And surely, newer technologies like 4G and BWA, being wireless in nature, will help broadband go wider.

Tikona is keen to expand to all the major cities, but needs finance to fund 200,000 base stations and the required customer equipment. The current capacity of the system is 2 million residential broadband customers. “We are not yet profitable but by the time we have 3,50,000 customers, we will be. We are on the journey now,” concludes Bajpai.