

Beyond 3G? Personal Broadband

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Introduction

Personal broadband is one of the hot new topics. What is it exactly? What does personal broadband add to a combination of fixed broadband at home and in the office and 3G in all other places that can keep you connected most of the time? Personal broadband expands the availability of a true broadband connection beyond the home and the office, allowing subscribers to have access to the same level of service and the same applications regardless of location. Depending on the technologies deployed, personal broadband may provide less throughput than its wired broadband last mile technologies, or not be as ubiquitous as cellular networks. Personal broadband, however, brings a precious advantage: convenience.

With a single subscription, personal broadband subscribers can get online regardless of location, without having to worry about throughput, service availability, or metered charges at some locations. Personal broadband is located at intersection of the evolution trends in Internet access, from dial-up to always-on broadband to Wi-Fi wireless network, and the shift towards mobility in voice communications, which in the US now account for more minutes than the fixed lines for the average subscriber. Subscribers value a flexible service that follows them wherever they go.

Some 3G users with flat-fee plans have started to use their subscription as a sort of personal broadband service: they keep their 3G connection active regardless of location and, when they need more bandwidth and they are at home or in the office, they switch to the wired network. In the current 3G networks, this is only possible because there are still very few users using the service and therefore congestion is not a problem. At the current price levels of \$60–80 per month and above, this is also clearly a service aimed at a small niche of business users that are relatively price insensitive. Personal broadband is aimed at a wider subscriber base that includes both business and consumer users and therefore needs to rely on technologies that are scalable and cost-effective, and provide high throughput.

It is still too early to know which applications personal broadband subscribers will use, but one thing is clear: there will be no killer app. Instead, the appeal of personal broadband is to make available all the existing applications everywhere. Web surfing, VoIP, email and VPN connectivity, downloads are likely to be among the most popular applications. Service providers do not need to develop specific applications or content before rolling out the service, as they did for cellular data services, where the throughput limitations have required the development of optimized applications. This removes a big burden from service providers which have been to date not very successful at this task and allows them to focus on their core business.

New applications that leverage the ubiquity of personal broadband will emerge in due time, however. Mobile search is an example of an application that could greatly expand from its fixed form: searches are often location specific and, when traveling, subscribers facing in a place they never visited before are likely to have more queries. Price comparison and product information searches may become even more attractive if subscribers can use them while they are shopping. Another interesting opportunity is offered by CE devices, which may use a personal broadband service for specific applications like gaming. The user may buy a game device that preset to use a personal broadband connection which allows the users to play against other users wherever they are.

Personal broadband: WiMAX and other technologies

Personal broadband is a service and, as such, it is not exclusively tied to a technology or a combination of technologies. A combination of DSL, public Wi-Fi access and 3G could provide a personal broadband service, if a partnership among service providers is established to this end. In the US, for instance, Sprint's deal with cable modem providers may be leveraged to this end, especially when combined with next-generation cellular technologies like HSPA, EV-DO Rev B, or LTE that offer more throughput than currently deployed 3G networks.

WiMAX however is a clear winner for personal broadband services, as it can support personal broadband services on both fixed and mobile settings because of its high spectral efficiency and wide channelization and of the advanced antenna technologies (MIMO and beamforming) it supports. This flexibility in providing both fixed and mobile access within the same infrastructure is unprecedented among wireless technologies, which are typically optimized for either mobile or fixed access.

A WiMAX service provider can therefore offer personal broadband service entirely on its own network, if it is able to establish wide enough coverage. Operators like Wateen in Pakistan or WiMAX Telecom in Austria, Slovakia and Croatia have national licenses that allow

them to roll out personal broadband services across their countries. Operators like Clearwire in the US or MVS in Mexico own spectrum only in some markets and need to establish roaming with other WiMAX operators to establish a national footprint. In other cases, like BT in the UK, the service provider may combine a WiMAX network in high density areas with DSL for home access and 3G for wide area access. Finally, mobile operators may decide to combine 3G with WiMAX to achieve the desired mix of throughput, capacity and coverage.

Is the market ready for personal broadband?

Being a new service, it is difficult to estimate availability and adoption of personal broadband services. Furthermore, personal broadband will gain subscribers among current fixed broadband subscribers and 3G subscribers, in addition to Internet user without a broadband subscription. In all these cases, it is necessary to move beyond the dichotomy between fixed and mobile services and the one-subscriber-one-device approach that is currently used. Personal broadband subscribers are at the same time fixed and a mobile subscribers, and can have multiple devices and more than one connectivity accounts (fixed or mobile).

Personal broadband is unlikely however to become a major threat to fixed broadband or cellular operators, as the need for a fixed data link or a mobile voice connection is not going away because of the emergence of mobile broadband. We expect it however to be a rapidly growing market, especially in those countries where innovative service providers will offer captivating services, that combine flexibility, aggressive pricing and wide coverage that will initially attract the highly mobile segments in the market, like students, young professionals, and business users.

Developed countries are clearly the best positioned to take advantage of personal broadband services, because of the higher penetration rate of laptops and other data-centric devices like PDA and the lower price sensitivity. In several countries, however, spectrum scarcity and competition from wired and mobile incumbents may

slow down the deployment of WiMAX-based personal broadband networks and converged personal broadband services that rely on a combination of wired and wireless technologies may be only possible to service providers that operate in both areas. As a result, emerging markets, like India, Russia or Brazil, may take the lead in WiMAX-based personal broadband services, and skip entirely the intermediate steps of wired broadband and 3G.

The business case challenge for WiMAX

The demand for personal broadband may be growing, but is it growing quickly enough to justify the huge capital investment needed to build a WiMAX network that covers most metropolitan and urban areas? It is a difficult question whose answer cannot be generalized across markets and across operators. Markets with a limited wired or wireless broadband infrastructure present a more immediate opportunity than countries like Japan with almost complete wired broadband and 3G networks, but there the overall level of demand and expected ARPUs are lower. In India, for instance, ARPU for DSL subscriber is about \$8 per month and only Internet users account for only 6% of the population, even though it is raising fast. In this environment, the opportunity for a WiMAX service provider can be large only if the network can be deployed cost-effectively and the operator is able to acquire a significant market share of new broadband subscribers.

The business case for a greenfield operator is a difficult one, unless it has the spectrum and the financial resources like Clearwire in the US to build a large network and attract enough users to have the necessary economies of scale. In markets where competition in the broadband market is scarce and coverage is limited, greenfield operators have the opportunity to become major players in personal, fixed and mobile services.

Established service providers can deploy WiMAX following an opportunistic strategy, that focuses on areas where they control spectrum and where demand is high. If they are mobile operators, they can use WiMAX as an

overlay network and can still guarantee ubiquitous coverage by allowing their subscribers to use the cellular network where WiMAX is not available.

A major worry in the industry is that the record to date for data-only networks is not positive. Does this mean that a data-centric WiMAX network will face similar difficulties in reaching profitability? Many pre-WiMAX networks that provide fixed connectivity are profitable or close to reach profitability, showing that that broadband wireless technologies have been improving lately in cost-efficiency and performance. More importantly, however, personal broadband services also address the market for traditional fixed and mobile access, as its two extremes usage cases. The ability to reach personal broadband subscribers, as well as fixed and mobile ones, is crucial to build a solid business case with a wide portfolio of services that enables the network operator to use efficiently its WiMAX infrastructure and to benefit from a larger customer base in terms of revenues and overall economies of scale.

References

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Acronyms

3G	Third Generation
ARPU	Average Revenue Per User

CE	Consumer Electronics
CPE	Customer Premises Equipment
DSL	Digital Subscriber Line
EV-DO	CDMA Evolution Data Optimized
HSPA	High Speed Packet Access
LTE	Long Term Evolution

VPN	Virtual Private Network
WiMAX	Worldwide Interoperability for Microwave Access

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Senza Fili Consulting provides advisory support on wireless data technologies and services. Our expertise extends to cellular communications, WiMAX, Wi-Fi, and other fixed and mobile Broadband Wireless Access (BWA) technologies. We assist vendors in gaining a better understanding of the service provider and end-user markets. We work alongside service providers in developing a wireless data strategy and in assessing the demand for wireless services. Independent advice, a strong quantitative backing, and an international perspective are the hallmarks of our work.

At Senza Fili we have in-depth expertise in financial modeling, market forecasts and research, white paper preparation, business plan support, due diligence, training, and evaluation of end-user requirements. Our clients are international and span the entire value chain: they include fixed and mobile operators, ISPs, wireless ISPs, other service providers, vendors, solution providers, system integrators, investors, and industry associations.

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