Wireless Data Comes Of Age

Net Forecasts – Peter J. Sevcik
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One of the biggest enablers of Internet applications is the cost and availability of broadband access. There are many investments, technologies, and service providers trying to get a piece of the last-mile pie. However, it is also a place to make colossal missteps.

Most of the analysis and betting has been on the two access titans—cable operators (cable modems) and the telephone companies (DSL). However, just as the stakes are rising, new wireless players are arriving at the party. It sure would be good to understand how some of the cards are stacked and the implications of the outcome.

Very Different Cost Structures

We modeled the basic costs over time of several access approaches. The model includes the last-mile technology, user aggregation equipment and an uplink to the Internet. We also added RADIUS, DHCP and DNS service in order to provide minimal services. All the costs are shared across the user population. Value-added services like email, Web hosting and spam filtering are not included. The results are shown in Figure 1.

Cable is the most economical way to deliver broadband to the consumer and small-medium business. The cost differential between cable and DSL is significant and will widen as the cable operators extend their hybrid fiber/coax (HFC) distribution systems. In contrast, DSL is on the slowest cost improvement slope due to its reliance on the old copper plant that is difficult to maintain and labor-intensive.

Fixed wireless that primarily relies on unlicensed spectrum is on a very steep cost curve. There will be many variations of 802.11 ("Wi-Fi") and 802.16 ("Wi-Max") systems, which cover a broad range of projected costs as shown in Figure 1. Aggressive fixed wireless deployments will start to undercut DSL in 2005 and even cable by 2008.

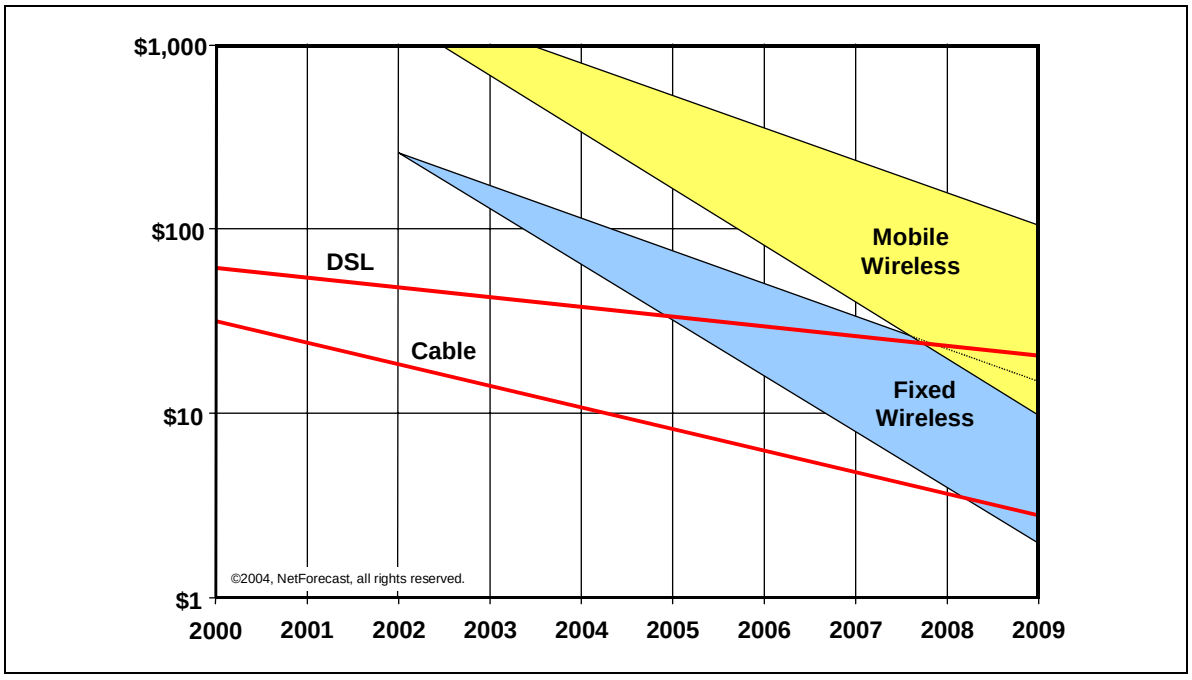

Figure 1 – Alternative Last Mile Costs ($/Mbps/month)

So the long-awaited third alternative last mile technology is poised to make its move. It has already appeared in several pockets of underserved communities in rural Virginia.

Mobile wireless has long provided less than broadband data rates, relegating it to niche applications like short messages or emails without attachments. Mobile costs are always higher than their fixed alternative because they must use licensed spectrum, operate multiple towers (cells) with a complex hand-off solution, and are compelled to operate a regional or national network. The large network of towers is never fully utilized as mobile users shift location. Think of the many high-capacity cell towers along a highway that are there only for rush hour traffic and otherwise operate at very low utilization.

Given all of these factors it would look like mobile wireless is not a contender as a user's only last mile choice. However, new advanced technologies that go beyond 3G are poised to permit practical mobile broadband.

All the previous cell-phone technologies (1G to 3G) and their data derivatives are fundamentally circuit-switched with a data option. The next-generation technology is being designed to operate over any cellular licensed spectrum between 0.4 GHz and 2.3 GHz (as well as the MMDS bands); it is not yet standardized, but will have some clear distinctions from all the previous mobile wireless approaches.

True broadband mobile data will be a packet-switched air-link that seamlessly uses IP in a LAN-like service. For example, Flarion has equipment that is already deployed in a few commercial services offering LAN-like performance for IP applications, with no changes to devices or settings. These services treat voice and data as packets over one high-performance network that can scale to thousands of subscribers per cell.

The lower-cost portion of the mobile wireless cost range in Figure 1 is based upon these next generation IP-based technologies. The figure shows that they can offer mobile wireless at an order of magnitude lower cost than traditional telephone-based wireless systems. It is also interesting to see that by 2008 they even start to affect the fixed wireless alternatives. Just as no one would have foreseen households relying solely on a cell phone for telephone service, by the end of this decade we will see data customers that only buy mobile access—even from their home and office. And since they will be getting their voice calls as VOIP, they will always be connected with all the services the need.

Alternative Market Strategies

The currently popular telecommunications service strategy is to find the "triple play" offering of telephone, television and Internet access in an integrated package. Clearly, the cable operators are already well along the way toward that goal by providing two of the three and now are starting to roll out telephone service over the same access plant as well.

However the local exchange carriers (LECs) are fighting back by adding satellite TV to their already-bundled telephone and data-over-DSL offerings. Verizon and Bell South just started to offer DirecTV, while SBC and Sprint will soon offer the Dish Network.

This is the second time around for LECs trying to get into satellite TV. The first time was a failure due to poor marketing and weak bundling of services. This time around they claim to have learned from their mistakes, and the initial pricing of these bundled LEC services appears to be very similar to the cable companies'.

Nevertheless, the telephone companies are not likely to succeed this time around, either. First of all, most analysts agree that satellite-TV penetration has peaked at about 25 percent of households that pay for any TV service. Since reaching that level, the satellite alternative has begun to lose ground to cable. When you add the cable companies' lower cost structure for supplying the data part of the triple play, as described above, the road to success for the LEC/satellite combination looks mighty hard.

However, there is another strategy to consider—the mobile double play. Let us assume that television is primarily an entertainment medium that users want to sit and watch in high-definition form. That combination of "sit" and "high-definition" implies ultra-broadband over a fixed delivery system.

However, users will increasingly see voice and data as information that is needed everywhere all the time. Mobile wireless access for all your voice and data from a single service is a real market.

Implications Of Wireless Success

Permanently un-tethering the computer will have big implications. Many industries are taking advantage of mobile computing to improve the productivity of delivery drivers, track inventory and eliminate clerical data entry errors. Hospitals are letting nurses work their full shift caring for patients rather than losing an hour per shift to updating records. Similarly, police departments can keep a cop on the beat instead of in the office writing reports. In both cases, documentation of the day is automatic as the day progresses. Furthermore, with mobile data, both the nurse and the police officer have instant access to much more information that is directly relevant to their immediate needs.

Seamless mobile broadband will finally usher in the age of simpler enterprise computing. Most enterprises have seen a constant migration of their data to employee and partner laptops. The critical data required to completely operate a company walks home or goes on trips every day, since users must take their data in order to perform their work.

Imagine a day when the data can stay in the office and the user can reliably interact with it from a lightweight device. There would still be a keyboard, screen and mouse, with some local processing, but the actual files would be locked down and reliably archived back at the datacenter. Once that happens, we will have the freedom to use many more varied and even borrowed terminals. It will also provide a much more cost-effective way to improve data security. Mobile broadband will usher in the death of laptops as we know them!

Companies Mentioned

Bell South (www.bellsouth.com)
DirecTV (www.directv.com)
Hughes (www.hughes.com)
Dish Network (www.dishnetwork.com)
Flarion (www.flarion.com)
SBC (www.sbc.com)
Sprint (www.sprint.com)
Verizon (www.verizon.com)

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