Wireless Broadband: Finding the Right Balance

Andrew M. Seybold

Network operators need more spectrum for wireless broadband but there is a spectrum shortage. To help alleviate the shortage, the FCC will auction more spectrum in 2013 and this will be followed by the incentive auctions. Further, the NTIA/FCC is exploring spectrum sharing options. However, none of these actions will result in more bandwidth anytime soon.

I keep reading about everything the network operators are doing—more femtocells, more off-loading to Wi-Fi, more picocells in congested areas, LTE Advanced, which will provide spectrum aggregation, and more. I am not reading about how users can help conserve bandwidth or how developers can write applications that are more data-friendly. Both of these are needed. It cannot be simply a matter of network operators trying their best but not being able to meet the demand. We, as users, have to understand the issues and use some common sense instead of taking for granted that the bandwidth and capacity will always be there and is never-ending.

The network operators would love to be in a position to offer us all of the bandwidth and capacity we want, all of the time, and at a fair price. However, cellular technology has limits. Each cell sector offers users the full network capacity and bandwidth and a cell site is usually made up of three sectors. So if a customer is the only one requiring wireless broadband in a given sector, theoretically he/she will have access to all of the capacity in that sector. However, many networks limit the data speeds even for a single user in order to be able to provide better service to more customers in the same cell sector. If there are twenty users in the same cell sector, all demanding streaming video, the network will appear slower and at some point customers asking for service won’t be able to obtain it.

Bandwidth and capacity are shared—albeit in a small area known as a cell sector—but in a major city it is possible that even LTE networks will seem sluggish. One reason the networks (with one exception) have moved away from all-you-can-eat data plans is to help manage broadband service demands. We have yet to see pricing that increases based on usage, as we normally see for our water and electric services, but that day may be coming.

What Can Be Done

Understanding that there will NEVER be enough bandwidth available to satisfy everyone, developers should work on tightening up their applications and making

them more data-friendly. I am reminded of one of the first data systems we installed for a police department. It was in the 1970s and data speeds over wireless were really slow, 300 or so bits per second. The first attempt at requesting a license plate check was a disaster, taking five or more minutes. Upon investigation, it was discovered that the software developer was sending ALL of the screen data up to the system and not simply the license plate number. When corrected, the system delivered responses that were sub-minute, which, in those days, was acceptable. Applications don't have to check for updates in data all that often, turn-by-turn directions can be downloaded to the device instead of being sent in real time (except, of course, when you make a wrong turn), and other applications can employ data compression and other techniques to cut down the amount of "chatter" between the network and the device.

Steaming video is the latest big thing. But can you really watch and enjoy a movie or a baseball game while you are doing something else? I believe in sending shorter, important video clips when needed. For example, do you really have to watch every pitch during a baseball game or would you be happy being notified when there was a hit or some other action and seeing a video clip that was a few minutes delayed? Developers are creative people but I believe they need to be better educated in the art of broadband capacity and services. Years ago, some developed applications that would measure the capacity available on a network and then hold off downloading or uploading large files until the device moved into a Wi-Fi hotspot, but the applications did notify the customer so if the file was urgent it could be downloaded over the wide-area network.

While network operators continue to make available as much capacity as possible, the number of smartphones, tablets, and other Internet-capable devices is growing rapidly—so is the demand for wireless broadband. We need to view the use of the available capacity as a partnership between network operators, developers, and wireless customers. If customers' attitudes are that it is all about me, then no matter what the wireless providers do, their networks will become overcrowded and congested. If we all understand the issues and use the capacity that is available wisely, it will be better for all of us.

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