New iPad Hungry For More Spectrum

Recently, Apple unveiled its third-generation iPad. A week later the company said the 4G LTE versions of the device which can connect via Verizon and AT&T mobile broadband networks had sold out.

It took 15 years for laptops to reach 50 million units sold in a year. It took smart phones seven years. For tablets (not including Microsoft's clunky attempt a decade ago), just two years. Mobile device volumes are astounding. In each of the last five years, global mobile phone sales topped a billion units. Last year smartphones outsold PCs for the first time – 488 million versus 432 million. This year well over 500 million smart phones and perhaps 100 million tablets could be sold. Smartphones and tablets represent the first fundamentally new consumer computing platforms since the PC, which arrived in the late '70s and early '80s. Unlike mere mobile phones, they've got serious processing power inside. But their game-changing potency is really based on their capacity to communicate via the Internet. And this power is, of course, dependent on the cloud infrastructure and wireless networks.

But are wireless networks today prepared for this new surge of bandwidth-hungry mobile devices? Probably not. When we started to build 3G mobile networks in the middle of last decade, many thought it was a huge waste. Mobile phones were used for talking, and some texting. They had small low-res screens and were terrible at browsing the Web. What in the world would we do with all this new wireless capacity? Then the iPhone came, and, boom — in big cities we went from laughable overcapacity to severe shortage seemingly overnight. The iPhone's brilliant screen, its real Web browsing experience, and the world of apps it helped us discover totally changed the game. Wi-Fi helped supply the burgeoning iPhone with bandwidth, and Wi-Fi will continue to grow and play an important role. Yet Credit Suisse, in a 2011 survey of the industry, found that mobile networks overall were running at 80% of capacity and that many network nodes were tapped out.

Today, we are still expanding 3G networks and launching 4G in most cities. Verizon says it offers 4G LTE in 196 cities, while AT&T says it offers 4G LTE in 28 markets (and combined with its HSPA+ networks offers 4G-like speeds to 200 million people in the U.S.). Lots of things affect how fast we can build new networks — from cell site permitting to the fact that these things are expensive ($20 billion worth of wireless infrastructure in the U.S. last year). But another limiting factor is spectrum availability.

Do we have enough radio waves to efficiently and cost-effectively serve these hundreds of millions of increasingly powerful mobile devices, which generate and consume increasingly rich content, with ever more stringent latency requirements, and which depend upon robust access to cloud storage and computing resources?

Capacity is a function of money, network nodes, technology, and radio waves. But spectrum is grossly misallocated. The U.S. government owns 61% of the best airwaves, while mobile broadband providers —*where all the action is* — own just 10%. Another portion is controlled by the old TV broadcasters, where much of this beachfront spectrum lay fallow or underused.

They key is allowing spectrum to flow to its most valuable uses. Last month Congress finally authorized the FCC to conduct incentive auctions to free up some unused and underused TV spectrum. Good news. But other recent developments discourage us from too much optimism on this front.

In December the FCC and Justice Department vetoed AT&T's attempt to augment its spectrum and cell-site position via merger with T-Mobile. Now the FCC and DoJ are questioning Verizon's announced purchase of Spectrum Co. — valuable but unused spectrum owned by a consortium of cable TV companies. The FCC has also threatened to tilt any spectrum auctions so that it decides who can bid, how much bidders can buy, and what buyers may or may not do with their spectrum — pretending Washington knows exactly how this fast-changing industry should be structured, thus reducing the value of spectrum and probably delaying availability of new spectrum and possibly reducing the sector's pace of innovation.

It's very difficult to see how it's at all productive for the government to block companies who desperately need more spectrum from buying it from those who don't want it, don't need it, or can't make good use of it. The big argument against AT&T and Verizon's attempted spectrum purchases is "competition." But T-Mobile wanted to sell to AT&T because it admitted it didn't have the financial (or spectrum) wherewithal to build a super expensive 4G network. Apparently the same for the cable companies, who chose to sell to Verizon. Last week Dish Network took another step toward entering the 4G market with the FCC's approval of spectrum transfers from two defunct companies, TerreStar and DBSD.

Some people say the proliferation of Wi-Fi or the increased use of new wireless technologies that economize on spectrum will make more spectrum availability unnecessary. I agree Wi-Fi is terrific and will keep growing and that software radios, cognitive radios, mesh networks and all the other great technologies that increase the flexibility and power of wireless will make big inroads. So fine, let's stipulate that perhaps these very real complements will reduce the need for more spectrum at the margin. Then the joke is on the big companies that want to overpay for unnecessary spectrum. We still allow big, rich companies to make mistakes, right? Why, then, do proponents of these complementary technologies still oppose allowing spectrum to flow to its highest use?

Free spectrum auctions would allow lots of companies to access spectrum — upstarts, middle tier, and yes, the big boys, who desperately need more capacity to serve the new iPad.