

Most people buying the new iPad opt for the Wi-Fi only version. Why? The 4G LTE versions are more expensive, for one thing. And since you can't switch carriers later, it means you're locked in to either AT&T or Verizon Wireless. Interoperability should extend from 700 MHz to AWS spectrum and Verizon SpectrumCo should be denied. The fact that an AT&T iPad can't be used on Verizon and Verizon's iPad can't be used on AT&T troubles many of these consumers. After all, aren't they using the same LTE network technology? And aren't they even using the same 700 MHz spectrum for this network? So what gives? Devices built for either AT&T's and Verizon's 4G LTE networks can't be used on the other's network. The new iPad is a great example of this. If you want 4G LTE connectivity on your new iPad, you have to decide when you buy the device if you want to use AT&T's or Verizon's service. And neither iPad with 4G LTE will be able to connect to Sprint's 4G LTE network once it's built nor will it operate on MetroPCS's LTE network or any other smaller carrier's LTE network.

As a consumer I find this fact extremely frustrating. I thought the whole reason that major carriers around the world, such as Verizon, were deploying 4G LTE instead of some other technology was because it would make it easier for subscribers to roam onto other networks.

I also naively expected Verizon's 4G LTE to usher in a new era of openness, since the carrier was basically forced through an "openness" condition on the spectrum it's using to build its 4G LTE network. Before Verizon bid in the 700 MHz spectrum auction, the FCC put a condition on the spectrum forcing whoever bought it to agree to keep the network "open." But the conditions were worded broadly, and after Verizon ended up with the spectrum, it claimed that it was keeping the network open allowing new applications and offering a streamlined process for device makers and others to build devices for its network. Still, I think consumers are getting short-changed. What they really want is the ability to take any device to any 4G LTE network. And that isn't what is happening today.

The reality is that interoperability for 4G LTE services in general is nonexistent. There's no roaming among carriers in the U.S. or abroad on these networks. And there are no interoperable devices. Strangely the situation is even worse than it is for the older 3G network technology in the U.S., where the market is split between two major U.S. GSM carriers and two CDMA providers.

There are some technical reasons for why AT&T's and Verizon's LTE networks are incompatible with each other and every other wireless carrier in the world. Some operators use completely different spectrum frequencies for their LTE service. For example, AT&T and Verizon are using 700 MHz spectrum, while Sprint is using 1900 MHz and some 800 MHz spectrum. That's why those networks are incompatible, even though the underlying technology is the same.

So why can't AT&T and Verizon interoperate since they're both using 700 MHz spectrum? This is a very good question. And the answer is that the 700 MHz band of spectrum is simply a mess. It was originally used for broadcast TV. And over the years, the FCC, which regulates our wireless airwaves, has moved broadcasters off of the spectrum and sold different portions of the spectrum, creating different so-called band-classes. As a result, the 700 MHz chunk of spectrum was split into two parts, an upper portion and a lower portion. And because of interference issues, different band plans were adopted for the spectrum, making it so the two portions couldn't interoperate. Verizon got a nationwide license in the upper C block. That's what it's using to provide its 700 MHz spectrum. AT&T bought smaller licenses in the lower portion of the 700 MHz band. Some smaller carriers, who also own spectrum in the lower half of 700 MHz complain that AT&T has made the situation even worse, by adopting a different band-class for the spectrum it's using for LTE. The result is that smaller regional carriers, which also have 700 MHz in the lower portion of 700 MHz can't interoperate with AT&T. Not only does this mean that their customers can't roam onto AT&T's network, but it also means

that they will have a harder time getting handset makers to create devices for their networks. These carriers have far fewer subscribers than AT&T or Verizon.

"There are several regional operators with 700 MHz spectrum to build 4G LTE networks," said Steve Berry, CEO of the Rural Cellular Association trade group. "They have the spectrum and the cash to build their networks. But what they really need is interoperability so they can build an ecosystem of devices and so their customers can roam."

Berry, who sat down to chat with me in an interview this week, believes AT&T and Verizon have cleverly engineered their networks and the spectrum they are using to ensure that they don't have to provide this interoperability. But the FCC could figure out a way to get all wireless carriers using the 700 MHz band on the same page, he said, eventually there could be interoperability across the entire band.

The FCC is currently reviewing the interference issues in the lower section of the 700 MHz band. If these issues can be worked out, the FCC can start to force more interoperability and perhaps eventually it can get Verizon to interoperate, too. The lack of compatibility among the networks hurts consumers in several ways. Not only is there a big possibility that smaller carriers will simply cease to exist because they can't compete with cutting edge devices. But it will also limit which devices even get 4G LTE capability. While consumers may already be used to choosing a cell phone based on which carrier offers it, they are far less likely to lock themselves into a carrier when buying a digital camera or any other consumer electronic device or connected appliance.

Imagine if you had to buy a new TV simply because you wanted to switch cable providers. That sounds nuts, right? And there are many people, including retailers, such as Best Buy former CEO Brian Dunn who think that what carriers have been doing in terms of locking devices particular networks is bad for the growth of the entire consumer electronics business. At the Mobile World Congress trade show in Barcelona in February, he called on

retailers to open their devices and allow them freely roam on other wireless networks. He said this would greatly reduce the price of products and would spur more adoption of connected-devices..

"This inefficient supply chain is driving costs up instead of down," he said.

Unfortunately even if the FCC seeks to harmonize the 700 MHz band carriers can still lock their devices into working only on their network.

I hope that the FCC eventually addresses this issue, but I wouldn't hold my breath expecting things to change much anytime soon. Unfortunately, one of the consequences of having two major wireless carriers serving most of the customers in the U.S. market is that they have a lot of power. And they can use that power to dictate how spectrum is used as well as influence which specifications suppliers build for. And if they want to keep customers locked into their networks via the devices, they can do that.