HOW CARRIER MIGRATION TO 5G WILL IMPACT LAWFUL INTERCEPTION

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As cellular carriers begin to deploy 5G, we're hearing our colleagues and customers talking about the challenges, benefits, and potential issues of this new technology. As it turns out, there is a good deal of speculation and misinformation being passed around in these conversations. In this article, we'll give straightforward answers to some of the top questions people are asking about 5G and what it means for lawful interception.

WHAT'S COMING WITH 5G?

The key promises of 5G include decreased latency, increased speed, increased capacity, and enhanced security. The speed and capacity increases will likely require more edge-computing practices—for example, shifting processing from the cloud to devices that are closer to users. This shift could require a significant

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change in infrastructure, so it'll likely only be deployed in select areas like densely populated urban centers—where it makes the most sense for carriers.

WHEN WILL 4G BE OBSOLETE?

5G does not immediately make 4G obsolete. In fact, 3G technology is only now being shuttered. 4G was launched in 2009 and is still considered current technology. The major carriers are still actively supporting 4G, and 4G is expected to coexist and be supported along with 5G—as was the case with 3G after the arrival of 4G—for another decade.

Agencies may need to invest in higher speed and greater bandwidth in their networking, as well as increased storage.

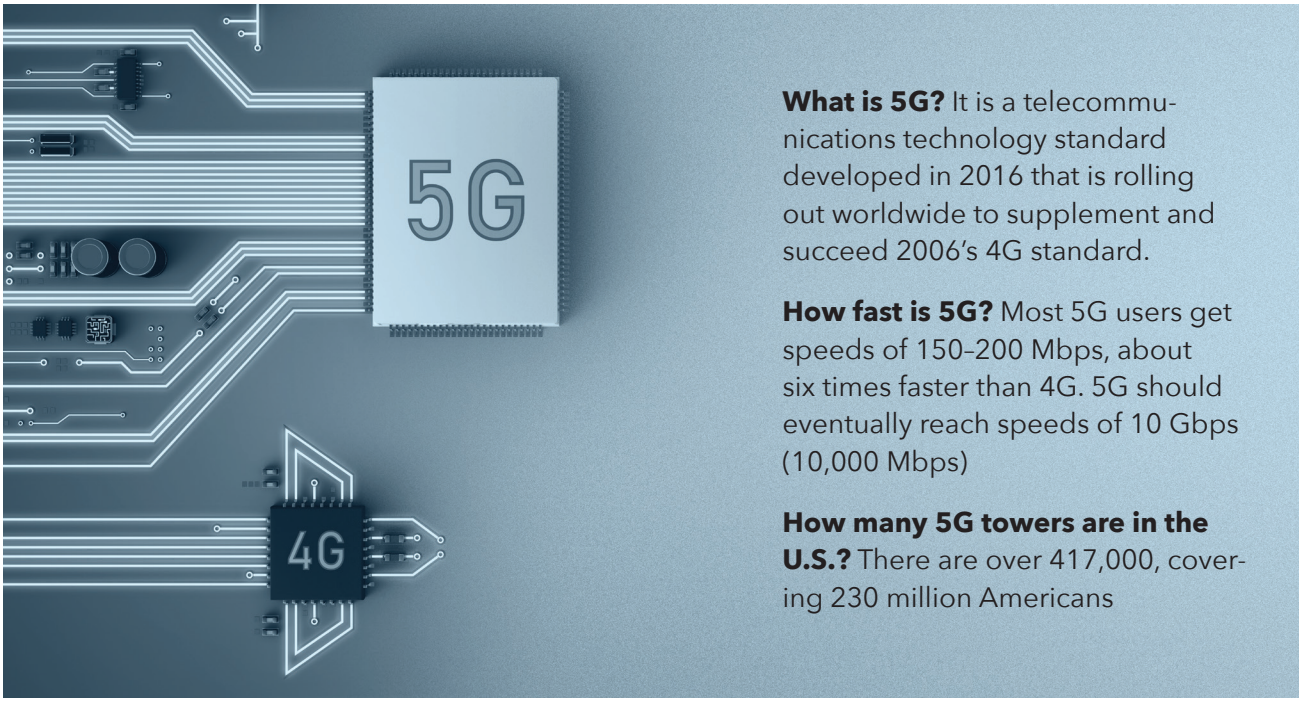
We're also in early days with 5G—carriers are just now beginning to test their 5G implementations for lawful interception purposes—whereas 4G is proven, reliable technology that's in widespread use in the U.S. While China and Japan are adopting 5G quickly, deployment in the U.S. is proceeding more slowly for several reasons, including FAA concerns about interference with air-travel safety.

HOW WILL LAW ENFORCEMENT INTERCEPTS BE IMPACTED?

First, it's important to understand that just because a new generation of technology enables certain new features, those features won't necessarily be used within lawful interception until the carriers are fully ready. For example, one element of 4G that's thought by many to be its hallmark feature, VoLTE, was deployed in 2012, but wasn't used for lawful interception until a few years ago.

5G's increase in throughput likely won't have a major impact on voice-call interception. Voice calls will still be voice calls, using supported lawful interception standards and encoding. On the other hand, the increase in throughput could affect data interception and collection. If an investigator gets an order to go up on a target's entire traffic—voice, text, and data—the volume and speed of data transmission, once the 5G network is built out, could be far greater than is seen today on 4G. Agencies may need to invest in higher speed and greater bandwidth in their networking, as well as increased storage. Much of the volume of packet data communications will be encrypted, so practices may need to evolve to save only packet metadata—the IP addresses, ports, payload sizes, etc., that do have investigative value—and give operators the option to discard the largely useless encrypted payloads themselves.

5G uses new security protocols that are different from 4G's. These protocols include en-



What is 5G? It is a telecommunications technology standard developed in 2016 that is rolling out worldwide to supplement and succeed 2006's 4G standard.

How fast is 5G? Most 5G users get speeds of 150–200 Mbps, about six times faster than 4G. 5G should eventually reach speeds of 10 Gbps (10,000 Mbps)

How many 5G towers are in the U.S.? There are over 417,000, covering 230 million Americans

hanced encryption and random mobile identifiers. Should carriers choose to implement end-to-end encryption or deploy solutions from others, such as Google, who have implemented end-to-end encryption, enhanced encryption could impact the ability to intercept the content of Rich Communication Services, which is an evolution of SMS messaging. The random identifiers used by 5G will impact ISMI catchers and other types of off-air interception technologies, but will not impact lawful interception. To comply with CALEA, carriers will likely need to provide law enforcement with a static identifier and/or continually update law enforcement with new random identifiers in the data delivered. It's very possible that once 5G is pervasive, lawful interception technologies will be used to enable off-air interception techniques to continue to be effective.

With 5G, network architecture can be more flexible. Networks can be virtualized and hosted anywhere. Depending on how the infrastructure is set up by the carriers, this could have an impact on lawful interception.

PENLINK IS WELL-INFORMED AND POSITIONED TO HELP

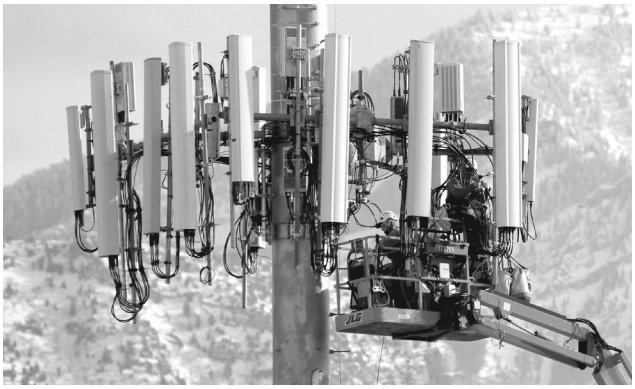
For over a year now, PenLink has been working directly with carriers who utilize our solutions within their laboratories to validate and ensure CALEA compliance as they develop and roll out new features for lawful interception. We are well positioned to have our live-collection solution ready to handle whatever they deliver.

In addition, as a voting member of the Alliance for Telecommunications Industry Solutions (ATIS) subcommittee responsible for developing the standards used for lawful electronic surveillance throughout the communications industry, PenLink becomes aware of proposed and pending changes to delivery standards, allowing us to be prepared prior to their implementation. Our role leaves us well-positioned to advocate for the needs of law enforcement and to proactively influence proposed changes to standards.

CONSIDER THE POSSIBILITIES

Since 5G is still in the early stages of deployment, many of the questions around its use are still speculative and concern what if? scenarios. Still, it is important to consider some of the possibilities we may be facing with 5G, such as:

- What if a U.S.-based carrier's network is no longer hosted in the U.S.?
- What if an international target can continue to use a foreign network, even while they're physically in the U.S.?
- What if domestic targets continue to use a domestic infrastructure, even while abroad?
- How will the details and optional elements of 5G LI standards be implemented by the carriers?



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These are all important questions, and we have many more that we are actively asking and considering as we keep an eye on how 5G technology is being implemented by the carriers and how they will meet their lawful interception obligations.

While the challenges for off-air technologies will be immediate, for lawful intercepts things will largely remain business as usual. 4G will be here and in use for years to come. What's important now is to make the best use of the technology we have while engaging the carriers, learning the details of their plans, and adapting our practices and solutions accordingly.

To learn more about efficiently capturing and processing live interception data, contact info@penlink.com

ABOUT PENLINK

For 35 years, PenLink has been the industry-preferred provider for communications, surveillance, and forensics data analysis. Our state-of-the-art solutions help law enforcement collect, normalize, and analyze complex data faster and more efficiently—revealing essential insights and helping them build stronger cases.

We are proud to support agencies around the world in their effort to fight wrongdoing. PenLink is headquartered in Lincoln, Nebraska, U.S.A., and operates a regional office in Washington, D.C., U.S.A.

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