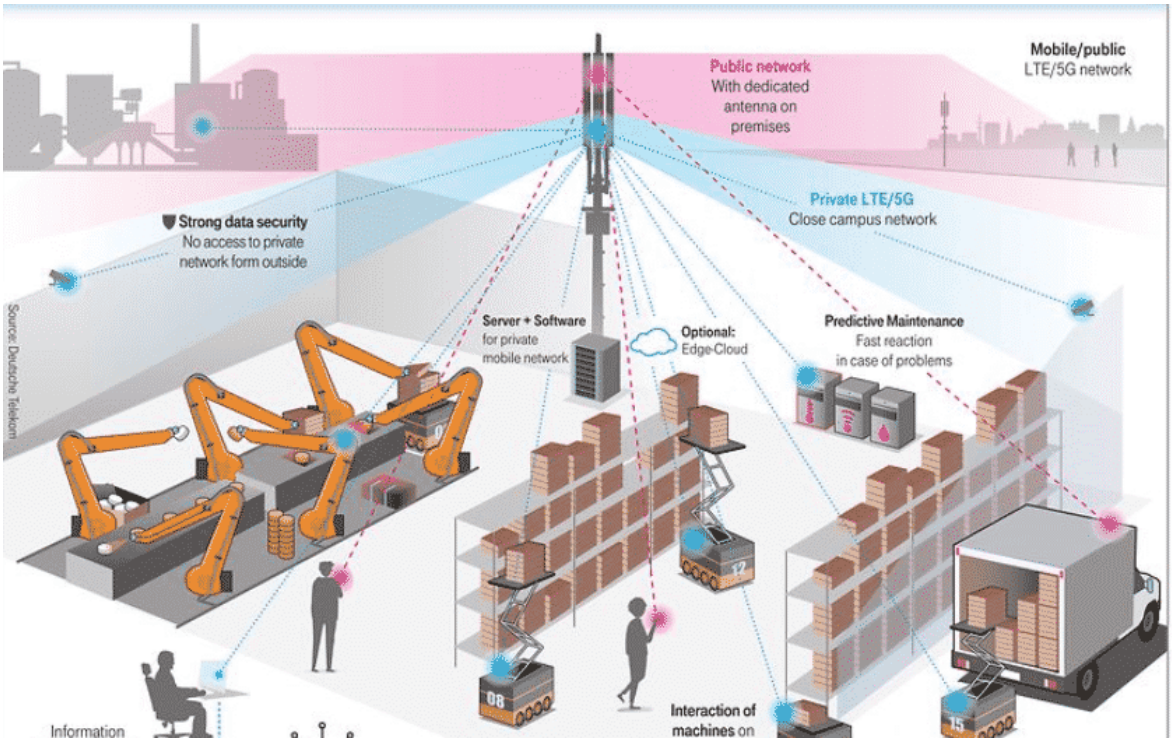

T-Mobile: IoT And 'The Transformative Promise Of 5G'

T-Mobile paid to have this article appear on the CNBC website, and you can read for yourself that 5G is all about the IoT and tracking things that move. T-Mobile's 5G network will operate at the ultra-high frequency of 600MHz. □ TN Editor

The 5G future of networking promises high speeds, low latency and plenty of bandwidth to support concurrent connections, all of which will be transformative. But the excitement over this next-gen tech is about more than a speed or capacity bump. The 5G era has the potential to radically transform the way we think about and use mobile networks and networks in general.

The networks of the future need to carry enhanced mobile broadband, a far greater volume of machine-to-machine communications to support the Internet of Things for both consumer and industrial applications, and the mission-critical business traffic that will enable Industry 4.0. And to support global business supply chains, these networks need to enable seamless communications worldwide.

The concept of a 5G campus network could meet the needs of smart manufacturing facilities with heavy utilization of the Industrial Internet of Things (IIoT) and specific tailoring for the demands of the digital economy, including enhanced data security, careful attention to customer experiences and digital logistics.

The architecture of a campus network involves a “dual slice” solution: two slices being broadcasted — a public network (the “public slice”) and an exclusive private network (the “private slice”) — running on the same hardware. Superficially, this resembles the commonplace setup of a business using a WLAN for data exchange, such as industrial purposes, while employees and customers connect to carrier 4G/LTE networks for their personal communications. But the implications are very different and wide ranging.

For one thing, the campus network marks a radical shift towards mobility. Instead of having a network supplier provide infrastructure and a mobile network operator providing the cellular network from the outside, the mobile network operator is both the provider for smartphone data and the enterprise network at the core of the system.

Today, a company’s wireless network infrastructure — the equivalent of a “private network” — is Wi-Fi. Outside of a company facility, employees’ mobile devices run on a carrier’s 4G/LTE network. Of course, switching between Wi-Fi and mobile networks can happen automatically on employees’ smartphones. But what about a robot? Or a pallet full of goods that you need to track as it leaves a facility, during its journey in a shipping container, and as it arrives at a distribution warehouse?

That’s where the advantage of a campus network — especially in a 5G era world — is clear. As 5G becomes common virtually everywhere, having a single network protocol to think about can greatly simplify operations. And with a growing opportunity to develop and deploy 5G radios that can operate within the unlicensed spectrum currently used by Wi-Fi, as well as on licensed bands allocated to carriers regionally, companies may not need to worry about national boundaries. Think of it as a sea of carrier coverage, within which are islands of private coverage, with seamless roaming between them.

This opens up tremendous possibilities for scaling machine-to-machine communication and manufacturing mobility. And today's private campus networks — those "islands" — are both a step towards and a laboratory for experimentation with future public 5G services.

One concept Deutsche Telekom is currently piloting is the delivery of a campus network as a service (NaaS). In this use case, a wireless carrier supplies and maintains the infrastructure, delivering a private slice serving the client's mission-critical needs while also giving the client use of the carrier's public slice for other purposes. In a large campus installation — an airport, seaport or industrial park — multiple private slices could exist and scale as needed, with clients using portions of carrier spectrum or purchasing rights to specific frequencies in a given geographic area as needed.

And that scalability is the key to making NaaS more than a business model. The advantage for customers is flexibility. Delivering the network as a service will eventually provide the same elasticity that cloud computing does — a customer can get a certain base amount of capacity and have access to overflow if they need it.

As part of another pilot, Deutsche Telekom demonstrated the strengths of the concept in the context of a large-scale test implemented at the Port of Hamburg, with multiple network slices flexibly adapted to suit specific needs over time. Individual virtual networks were spun up to serve public mobile access, emergency services, sensors for real-time analysis of environmental data and a high-bandwidth network to support the testing of augmented reality services for maintenance workers. Another test installation by Deutsche Telekom, at a light manufacturing plant in Schwabmünchen, Germany, focused on IoT applications, including automated, guided vehicles.

While the first large-scale national rollouts of 5G service are just appearing this year (T-Mobile launched its 5G network on existing 600 MHz spectrum nationwide on December 2, 2019), the biggest implementations are set to come online over the next few years. The implementation of pilot private networks on manufacturing campuses gives us a chance to see the future in action right now: faster, yes, but

more flexible, more connected and more mobile than ever before.

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