

The Future of 5G in Defense and Beyond

Government and industry are working together to bring the capabilities of 5G connectivity to the federal space.

The potential of 5G is expansive. For the Department of Defense, it could modernize the interoperability of the air, land, sea, space and cyber domains. In fact, the DOD created a cross-functional team to accelerate the adoption of 5G and future-generation wireless networking technologies in 2022, to prepare the department for new, innovative opportunities.

Outside of defense, 5G can enhance supply chain and warehouse logistics, support open standards and strengthen communications while maintaining secure networks. Thought leaders from government and industry spoke at a recent [FedInsider webinar](#) to discuss the challenges 5G brings to military networks, the use of cloud-native technologies and interoperability hurdles.

The Need for 5G in Government

Leveraging a 5G network could provide a more secure, private wireless communication option for war fighters, allowing the government to maintain a security posture while still offering on-demand communications.

Lt. Col. Benjamin Pimentel with the Marine Corps' FutureG Office in the Office of the Under Secretary of Defense for Research and Engineering, said one of

the projects they're currently developing is supporting 5G communications in an expeditionary program at Marine Corps Base Camp Pendleton.

"Think operating in and around an island chain. You need either long-range precision flyers or persistent [Intelligence, Surveillance, and Reconnaissance], that moves quickly between locations," Pimentel said. The new 5G technology could support all of that.

FutureG is working to bring private 5G standalone network to the edge. It must be compliant, secure data in transit, and provide the throughput, latency and reliability needed at the edge. This would also provide mobile edge compute - and eventually with the increase of artificial intelligence and machine learning capabilities - reduce, remove and automate Marines' time-consuming tasks. This capability could also be used to scan the perimeter via image recognition to ensure war fighters are safe.

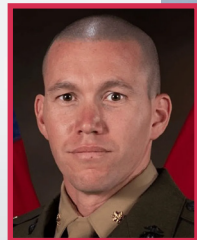
"With a 5G network, I have throughput and latency to offload that computer to a centralized mobile edge compute capability, do the calculation, send it back for action by the drone and now I'm able to accomplish perimeter security with a smaller number of Marines who are underpinned by the 5G capability," Pimentel said.

Featured Experts:

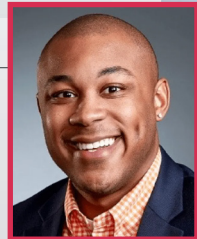
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■ **LT COL Ben Pimentel**
FutureG, OUSD(R&E),
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■ **Chris "CT" Thomas**
Technical Strategist,
Dell Technologies



Ushering in a 5G Government

"5G has been at the forefront of our programs for a number of years now," said Ben Camerlin, SATCOM program manager with the General Services Administration. In efforts to help other agencies with their 5G journey, GSA developed secure 5G acquisition guidance that complies with the national policy for secure 5G.

"With that document in mind, we looked at trying to empower acquisition professionals across the federal government to help provide some insight into the technology, use cases, as well as a lot of the policy to ensure they are doing those complied acquisitions," Camerlin said. GSA also has increased some of the mobility standards in its Enterprise Infrastructure Solutions contract to allow agencies to procure 5G technologies.

Chris Thomas, technical strategist at Dell Technologies, said his team takes a data-centric approach to helping customers adopt 5G so the network can be tailored to

support specific needs, use cases and innovative levels. Not every device needs to connect to the network and communicate with all other devices, for instance.

"We have also started to figure out if connective devices are more viable to us than a disconnected device, just having it sitting there on closed airgap network," Thomas said. "It really is tailoring it to the actual business meeting needs for the environment."

The Status of 5G in Government

Camerlin said GSA is at the mid-stage of deployment on the private side with carrier networks, currently focusing on building out networks and deploying the mid-band spectrum. "I think really the sweet spot for a lot of the more rural disconnected user base in the country is going to be mid-band spectrum," he said.

Camerlin is also seeing interest in 5G standards with non-terrestrial networks and with satellite providers, as industry moves to a more standardization-type of network architecture rather than legacy communicators.

Pimentel said the DOD is about halfway through its release cycle. "We are still early in device availability and deployment, and the majority of the network functions are available with the older providers," he said, "and largely that is due to trying to find ways to monetize it."

The type of network sites the DOD needs isn't typically built yet in the commercial space, so the DOD is focusing on use cases, experiments, and research and development. As use cases build, as will the technology needed to support these network sites.

From a business sense, Thomas said private networking has never been done before and there's little return on investment. "For a lot of use cases we need, the justification for the business is just not there to drive it."

Experimentations help, but the technology and Wi-Fi integration needs to catch up, and standards must be met. And while Pimentel said they have use cases for it, those must still be incentivized for the industry in a dual use case where it can be used for commercial applications too, because the DOD can't shift the market on its own.

The Impact of 5G

The future of 5G could mean connecting rural and remote communications via increased satellite and internet access. "It provides a lot more capacity to the rural conductivity," Camerlin said. "There's a lot of different options of how those networks can be applied now where you don't have to run the capital-intensive optical cables all across Appalachia or the Wild West of Montana, so you can leverage a lot of different technologies."

The influx of lower orbit constellations will usher in conductivity via space to all types of applications, which will enable new capabilities and use cases with direct-to-device satellite services.

Mobile network operators are also working to provide their wireless spectrum via satellite so users can roam freely off a traditional network onto a satellite network, which would be transparent to the user. These capabilities could span to military applications, providing global coverage from anywhere.

Plus, 5G provides advanced security and resiliency. "5G has a lot more tools, and it lends itself to be more secure in that fashion, with it being called native in the service-based architecture," Thomas said. "I can really focus that to the individual user, I can support multi-tenancy in a way that it could not before."

Advancing 5G in government will take work, collaboration, maturing technology, strategic acquisition and even a cross-functional federal team – but the unified connectivity options, especially for the military, will be valuable and far reaching.

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