

What do defense leaders need to know about TDM modernization?

Advancements in network technology are a key enabler for future Department of Defense missions, but the lingering presence of time division multiplexing (TDM) threatens to impede progress.



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The Pentagon's drive toward Joint All-Domain Command and Control (JADC2) is heating up. "Everything we're doing fits directly into enabling JADC2 for our combatant commanders and our allies," said the Department of Defense's Chief Information Officer, John Sherman, at AFCEA's TechNet Cyber.

And during a discussion with GovCIO's Deputy Editor, Kate Marci, Sherman explained how the DoD is supporting and enabling decision-makers by allowing them to pick and choose the route which works best for them.

"We've laid out in our strategy a kind of "pick your own adventure," he tells GovCIO. "There's three big courses of action they can choose. One is a brownfield approach where they lay over the IL-1 capabilities on their existing enterprise. Secondly, they leverage the Joint Warfighting Cloud Capability through commercial clouds that we have through Oracle, Microsoft, Amazon, or Google and then [there is a third course of action] which is a private cloud option or some combination therein."

Regardless of the route chosen, pursuing network modernization on this scale is a complex and multi-year effort. And as the Pentagon pursues network modernization, leaders should take note and address the lingering presence of TDM. If not addressed, the presence of TDM can cause performance and operational issues, as next-generation technologies require more bandwidth. "You can't effectively leverage all the new security technology and will struggle to achieve the policies and guidance from zero trust architecture unless you have a network that's modernized," says Lamont Copeland, director of federal solutions architecture at Verizon.

Despite the importance of pursuing network modernization, defense leaders cannot simply "rip and replace" all Synchronous Optical Network (SONET)- or Synchronous Digital Hierarchies (SDH)-based sensors, switches and routers; to do so would risk jeopardizing overall mission readiness.

Instead of "ripping and replacing" defense leaders should consider leveraging TDM-to-packet-based solutions that support a gradual approach to network modernization.

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Director of Federal Solutions Architecture | Verizon

Case study: How Verizon pursued TDM network modernization

Much like its federal partners, Verizon noticed the benefits of network modernization. Verizon's move to modern, capable services did not happen overnight. Copeland describes the shift to packet-based architectures as strategic and deliberate, "we had to modernize [while] continuing to deliver services to our government and enterprise customers."

For Verizon, full scale "rip and replace" was not an option. Verizon's team partnered with Ciena to plan for and execute on a deliberate network modernization plan over their entire enterprise. At the heart of this plan were Ciena's technology solutions, designed to help Verizon enable continuity with minimal disruption to customers.

"One of the things [Ciena Government Solutions] has done is made sure that the equipment targeted at modernization efforts supports both the older protocols and the newer, more modern protocols," explains Jim Westdorp, chief technology officer at Ciena Government Solutions. "Supporting both protocols allows you to interoperate as needed while providing a migration path. So, after a period of time, you can actually start to retire those old TDM services and convert them over to packet-based services."

Ultimately, this partnership helped Verizon effectively and efficiently pursue modernization. Together, Verizon and Ciena were able to deliver better network performance and reliability to customers, while Verizon leaders were able to reduce cost expenditures.



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Powering informed decision-making

When working alongside partners to drive modernization efforts, defense leaders should focus on four separate phases, says Westdorp.

- **Planning:** To begin, leaders should define agency goals and map out desired outcomes: What parts of the network will be subject to modernization? What is the maximum amount of time the system can be down without impeding mission delivery?
- **Evaluation:** During the evaluation stage, agency directors should take stock of the number of devices connected to the network and their configuration. For legacy devices still communicating via TDM, there are solutions that can help enable TDM-to-Packet conversions without having to sunset mission-critical applications or devices.
- **Execution:** This is when teams perform upgrades and monitor outcomes.
- **Analysis:** At this time, leaders and team members catalog all the changes made to the network. Once all changes are made, teams should work to measure the impact of modernization efforts.

Although these steps seem simple on paper, Westdorp cautions that timelines may vary depending on factors such as the complexity and the number of different services the agency is looking to migrate.

“You’re looking at something that could be as quick as several months or be as long as a year or more,” Westdorp said.

Copeland agreed, emphasizing that agencies cannot simply “uplift the whole network in one day” and expect to run on Ethernet the next. Modernization is a complex process, but partners can help defense agencies overcome obstacles and stumbling blocks to migration.

“[Our] teams will come out and work with different agencies to give them a view of what the innovation side of this will look like and what is the art of the possible,” said Copeland. “Industry is ready to work with the DoD to figure out the available technology, the outcome they’re trying to achieve, and then help build a roadmap to get there.”

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“IT departments need the ability to access large quantities of data and to be able to program that from a security perspective, for regulatory and policy reasons. It’s important for them to have control of their encryption policy and capabilities to make adjustments when and where they are needed.”

Jim Westdorp
Chief Technologist | Ciena Government Solutions

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About Ciena

Ciena Government Solutions, Inc. (CGSI), a wholly owned subsidiary, helps government agencies meet their missions using critical network infrastructure as a strategic asset. Ciena's technologies, solutions, and services allow agencies to build networks that improve mission effectiveness.

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