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Network Modernization

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Getting to a higher performing, more efficient network is key to IT modernization
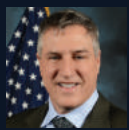
BY JASON MILLER

PANEL OF EXPERTS

Geoff Fowler, Chief Information Officer, Bureau of Intelligence and Research, State Department

Rodney Alto, Director, Global Infrastructure Office, Central Intelligence Agency

Andy Gomer, Highly Qualified Expert on DoD Transport, Defense Information Systems Agency

Jim Westdorp, Chief Technologist, Ciena Government Solutions

Colin Gosnell, Head of Solution Engineering, Comcast Government Services

Shortly after the White House declared a national emergency because of the coronavirus pandemic, the Defense Department sent hospital ships to places like New York and other cities to assist with the medical care of citizens.

The Defense Information Systems Agency quickly jumped into action to set up the network for these hospital ships and other necessary services to communicate and share data.

"We had to get those ships up and we did in one night. We actually put up the entire network in one night. So it was very impressive and we moved very fast. We're able to keep up with the environment, keep up with the network and keep up with the bandwidth that was needed at that time," said Andy Gomer, a highly qualified expert focused on transport with DISA, during the panel discussion Network Modernization for Federal Agencies sponsored by Ciena Government Solutions and Comcast Government Services. "You have to be able to get all the bandwidth you want whenever you need it. We can't afford to be late. Diversity is very important, but so is bandwidth. You cannot be short; you have to have all the

bandwidth you need. I don't want the mission to fail because I didn't give the Air Force or the Marines or the Army enough power to do their job."

DISA is not alone in its experience during the pandemic. Agencies, both civilian and Defense, used the crisis to upgrade and expand network infrastructure in record time to ensure employees could meet business and mission needs.

The desire for bandwidth surged as quickly as federal employees started working remotely.

Colin Gosnell, the head of solution engineering at Comcast Government Services, said the provider saw an unprecedented increase in network infrastructure demand during the first six months of the pandemic.

"We're seeing about a 32% increase in network traffic, and 36% in mobile data. We're seeing a 285% increase in voice and video calls. That's a large demand on a network requiring high performance in order to meet the expectations of the end customer. We've also seen about 40% increase in the use of virtual private networks," he said. "As the government is looking to simplify their operational structures within how they manage data between data centers, they're asking for their carriers to take on more responsibility for ensuring that data packets are reaching the final destination, both in just latency and point-to-point connectivity, and adding security and additional services on top of it, to enable the missions to have that end-to-end data flow and access to the information they need to complete their vital mission."

Speed, reliability, scalability

Quickly, many agencies, like DISA, realized speed, reliability and scalability all mattered much more than ever.

"It's about reducing that complexity, making it easier to upgrade, making it easier to push out updates to the system. And when there are problems, and there always are, it's easier to correct them as well," said Geoff Fowler, the chief information officer at the Bureau of Intelligence and Research at the State Department. "You have to have that strong foundation. Complexity, particularly in the technical world, will eat you up. You have to keep things as simple and as clean as you can. Advancing the mission is sort of the yin to the yang of complexity, you're going to have to introduce complexity because the mission needs it. But you need to have the bandwidth and you need to have the capacity within your institution to be able to respond to what those mission needs are."

To reduce complexity, agencies have several options. First, the use of a multi, hybrid cloud environment enables data to be easily accessible from anywhere, at anytime. Second, agencies can move away from legacy technology and move toward a software-defined approach.

Jim Westdorp, the chief technologist at Ciena Government Solutions, said network complexity has been growing over the last decade or more and now agencies need to start addressing that challenge.

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"There's a big push from our customers, and for us as a supplier, to provide tools that help manage that complexity. What that means is new automation and orchestration tools that allow operators to provide better and more dynamic services for their users," he said. "You can't do it in a way that doesn't scale. With networks that are doubling and tripling in capacity, you can't afford to double and triple the amount of time and effort it takes to run that network."

Network outages

Over the last 15 years, the CIA has been rethinking its network in an effort to remove some of its complexity, and ensure the reliability and scalability.

Rodney Alto, the director of the Global Infrastructure Office at the Central Intelligence Agency, said network outages can cause ripple effects across the intelligence or oversight communities.

"Our warfighters depend upon the information CIA must deliver 24/7/365. So resiliency is incredibly important, our networks must have high security standards, and then we build upon those security standards to make sure our networks are secure all the time," he said. "Finally, our networks are built to be agile in response to our mission demand, and we need our networks to be available where mission is anywhere at any time."

Alto said the CIA is turning to automation services to reduce complexity and the need for people to fine tune its networks. He said automated services also is a mission necessity.

"With both reliability and predictability, the potential savings from automation will be the investment engine that allows us to reinvest into new IT capabilities that will position IT ahead of mission demand," Alto said. "The second topic for us in their focus area is artificial intelligence (AI). Today's modern networks and devices can generate terabytes of information daily, on the health and security status of your network and your infrastructure. We need AI to analyze this data. We needed it to drive operational efficiencies, anticipate the network and infrastructure failures and highlight the needle in a haystack that could be that cyber challenge. And this all has to happen in real time."."

Ciena's Westdorp said adaptive networks using AI, orchestration and next generation modem technologies allow the network to be a sensor unto itself.

"In order to support the automation, there's a tremendous amount of information the network has about the traffic that's flowing over it, where it's going, the statistics of that traffic, the health of the network and even the end points. You can actually take this information and use it as part of artificial intelligence engines in the various automation tools to make your network adaptive, but also more reliable and secure than it has been in the past," he said. "That's another thing: Using the network as a sensor to drive improved auomation allows providers to do a much better job of operating the network than they could in the past."

5G is the future

The CIA, like many agencies, also has its eye on 5G. Alto said the agency hopes 5G capabilities will help enhance edge computing by bringing faster and more secure networks.

DISA's Gomer said DoD also is accelerating its use of 5G by putting towers at bases so more bandwidth can get to places like runways and other hard to reach locations.

DoD recently added seven new installation sites in its second round of 5G technology testing and experimentation, bringing the total to 12 bases.

Comcast's Gosnell added 5G represents a new access technology into the network from an architecture standpoint.

"What we see with 5G is it's that last segment within the architecture and we still need that network infrastructure in the background that can handle that traffic that's coming in. So we see it as a further acceleration of demand into the overall network architecture," he said. "It's about integrating the new technology into the existing architecture, rather than rip and replace it and build new every time a new technology comes in."

Capacity remains king

But before agencies can hang their future networks on 5G and other emerging technologies, the pandemic, budget pressures and IT modernization efforts are forcing agencies to take a step back and review their business processes. By relooking at how the mission side works, it gives agencies like State or DISA or the CIA, the data to upgrade the network to meet those needs.

"For us our agility was thinking differently with respect to the business and the operating environment," State's Fowler said. "Rather than trying to distribute a classified compute, classified work capability that could be done at local homes and residences and whatnot with all of the difficulties that that would entail, we actually partnered with our mission elements and helped them rethink the way they approached business period. It became less a function of how do you access your classified intelligence and it became more about how do you access alternative sources of information that allow you to as effectively or almost as effectively address the intelligence or information consuming needs of your customers."

Ciena's Westdorp observed that this discussion still comes back to managing network complexity and ensuring adequate bandwidth for growth.

"There's a capacity revolution going on, not just on the terrestrial side between cities and towns in the U.S. and overseas but also in the undersea cables that go between the continents. A lot of the same technologies that are being applied to terrestrial networks are also being applied to the undersea network," he said. "We're seeing dramatic increases in capacities between the continents; this helps with geographic diversity and allows customers to be able to access data centers at larger worldwide locations. If you want your network to use converged, cost effective, high capacity infrastructure, you need a way to be able to transition your network away from older technologies."