# The Frontline of Edge Computing

As more mission-critical sensors and data move to the edge, the DoD is looking for solutions that will help them bolster their capabilities in these critical areas—whether on premise or in a public or private cloud.

Last October, some 3,000 U.S. military troops deployed to the Middle East, accompanied by two fighter squadrons, an Air Expeditionary Wing, two Patriot Batteries and one Terminal High Altitude Area Defense system, to assist with the defense of Saudi Arabia, where temperatures routinely surpass 114 degrees.

Those troops and their comrades in arms deployed to protect U.S. interests throughout the world rely on sensors, Internet of Thing devices and a wide variety of autonomous offerings, such as drones, vehicles and other such agents. Internet connected-devices are becoming essential to defense operations. The recently announced $10 billion JEDI cloud contract – a milestone in the Defense Department's growing reliance on cloud computing – indicates that defense agencies are making moves to leverage

the proliferation of data and applications that operate outside of traditional data centers.

The Pentagon, though, is simply a microcosm of a larger trend. By 2025, there will be 55.9 billion global connected devices and 79.4 ZB of data created by connected IoT devices, according to the global market intelligence firm IDC.

The abundance of internet-connected devices and the wealth of new data derived from them is a boon to the Defense Department, bolstering capabilities and promoting mission advancement in ways that otherwise would not be possible.

Yet new capabilities bring new challenges. "DoD frequently processes data at the edge in one of two ways," says Sam Ceccola, DoD Account Chief Technologist at Hewlett Packard Enterprise. "They are forced to choose between ruggedized laptops running Intel Xeon D processors or traditional

data center-quality compute devices. Both options have their limitations," Ceccola says.

"Both situations presented some unique challenges for our customers. On the Xeon D side, you only have so much processing in those devices. You've got four or maybe eight cores at your disposal. And with all the data they're collecting at the edge, it presented a challenge to get mission results to the warfighters and other forward-deployed individuals in a timely fashion," he says.

If deployed warfighters lack sufficient processing power at the edge, they're unable to analyze collected data and present real-time results to would-be end users. Not only is the data wasted, lives could be at risk. Equipping remote deployments with data center-equivalent options is also very difficult.

Data center-level compute and storage require 220 volt

power, cooling to between 65 to 70 degrees ambient temperature. Heavy and bulky, they require specialized transport, as well. "With the requirements for a two- or four-person carry that exists in some of these environments, that meant they could only have one or two servers out there – at best," Ceccola adds.

In addition, such an implementation requires special tents for the HVAC systems and high voltage power needed to run servers in austere locations. The bottom line is that agencies can end up with either too little compute to analyze their data or the need to incur significant costs in order to provide the required level of processing.

## Best of Both Worlds

Exemplifying the challenge is a DoD program that uses an airplane outfitted with multiple sensors to collect data and store it on a server in the aircraft's hold until the hard drives can be placed in a data center and, ultimately, moved to an analytic platform. A better option would be to manage the data on the plane, at the edge. Forward-looking agencies

and organizations are moving data functions to the edge. Approximately 40 percent of enterprises are expected to double their IT asset spending at the edge and at colocation facilities, according to IDC.

"Organizations that have embarked on a digital business journey have realized that a more decentralized approach is required to address digital business infrastructure requirements," says Santhosh Rao, senior research director at Gartner, in a research note. "As the volume and velocity of data increases, so too does the inefficiency of streaming all this information to a cloud or data center for processing," he says.

This is significant. The edge, including IoT devices and sensors, is the source of most new data. The ability to quickly and efficiently analyze and act on new data information enables Defense organizations to optimize mission-critical operations. Analyzing data at the edge, provides an edge.

HPE recently released a new server system – the HPE Edgeline EL8000 system – that solves data challenges at the edge. From a processing

perspective, the Edgeline 8000 has data center-quality compute, memory, and storage. Its form factor – 8.8-inch wide, 16.9-inch deep, 8.6-inch high – runs on 110 volt power and operates at up to 135 degrees Fahrenheit and 92 percent humidity. The unit fits into a flyaway case and can be placed in a commercial airliner's overhead bin.

"On the Edgeline 8000, we're talking about a box that has 1.5 terabytes of memory per processor with four processors, up to six terabytes of memory in that small space. This single box can fit up to 112 cores, 28 cores per processor," Ceccola says. "Because of this, agencies can put whatever applications they would normally run in the data center right on to it. There's no more need for rewriting to work in a smaller processor. And since it uses commodity parts its cost is a lot lower than some of the systems they are running at the edge today." In addition to commodity parts, the HPE Edgeline 8000 includes HPE's innovations in security. These innovations center around HPE's Silicon Root of Trust and Secure supply chain, making this server the most secure industry standard server in the industry.

The HPE Edgeline EL8000 system shipped in Q4 2019. Customers are tapping the system for VDI and network analysis. "Anything you can run in the data center, you can run on this box," Ceccola says.

As agencies look to do more computing at the edge, they expect edge servers to run every application that ran in the data center without the necessity of custom development. The HPE Edgeline Innovation Network is ensuring that its solution meets the expectations of its public sector clients. The HPE Edgeline Innovation Network is an appliance and solution development program that helps agencies in a hybrid cloud environment to optimize edge-computing capabilities. Its value starts with the ability to pre-validate software applications.

"We tell customers, 'Bring your software. Let's do what we need to do to make sure you're 100 percent comfortable that this is going to run on it,'" explains Ceccola. "It seems to be working well," Ceccola says. "I had one customer in the DoD that we shipped the box to. They loaded their environment from their data center onto the hardware, and they were up and running in an hour."