An Inside Look at the Tech that Fueled First Responders During OCR

Cutting-edge technologies work in tandem with first responders to help improve situational awareness, communication and response for those on the ground, in command centers — and everyone in between.

verizon

Just as a raging wildfire is being brought under control by firefighters armed with drones, aerostats and portable data networks, a C-130 fire suppression aircraft suffers mechanical failure and crashes into the burning hillside. A handful of air passengers are sickened by an unknown contagion before first responders — equipped with body-worn cameras, 4D visualizations, artificial intelligence and telemedicine — swoop in to help quickly contain, triage and begin treatment of the affected. A team of crisis management personnel, aided by autonomous vehicles, satellite backhaul connectivity, rapidly deployed secure software defined networks to help mitigate the aftermath of an active cyberattack on a municipal dam whose floodgates have been triggered to open, bringing a community to its knees.

Those are just some of the simulated disaster scenarios that played out at Verizon and Nokia's third annual Operation Convergent Response 2019 (#OCR2019) event, which showcased the powerful role cutting-edge technologies play in how first responders react to and mitigate a crisis.

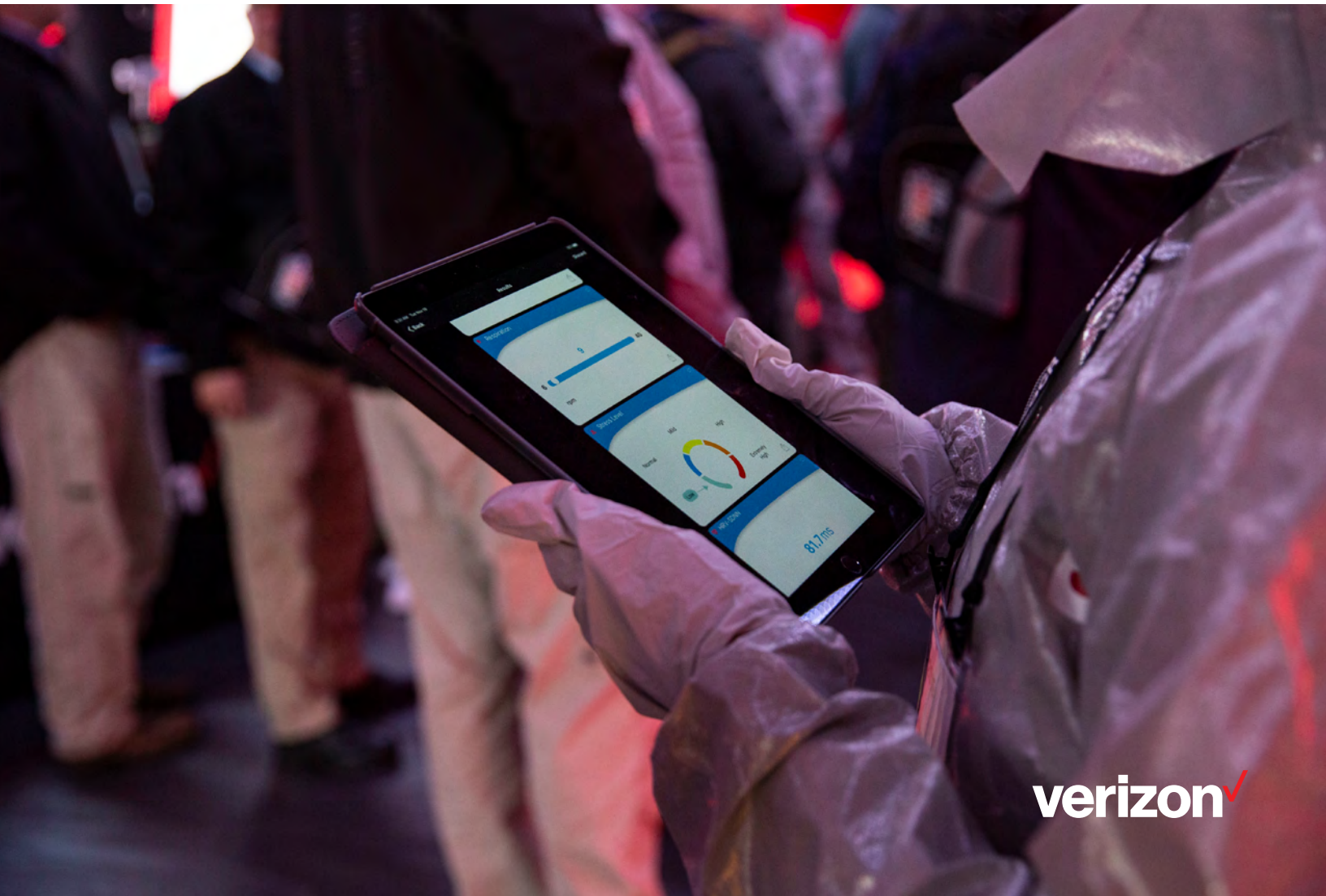
Over the three-day event held in Perry, Georgia, public safety officials, first responders and crisis management professionals representing federal, state and local agencies took part in realistic crisis scenarios, learned about the latest technologies and witnessed firsthand how various solutions powered by Verizon's network work in tandem to boost first responder capabilities.

The Need for Interoperability

The scenarios at OCR demonstrated a few key critical elements, which Verizon and Nokia representatives at the event emphasized: The need for application and network interoperability, a common operating picture, reliable communications and sensor-based, AI-augmented situational awareness.

With countless devices, sensors, communication systems, software, and response tools employed by agencies on the scene, interoperability proved crucial for first responders to access all the tools and information quickly and easily. But achieving interoperability is easier said than done, especially with communication platforms that can differ across and even within agencies.

Verizon's Joint Operations Center at OCR, however, aimed to prove interoperability is possible. Set up in the showcase area at the Guardian Centers, the JOC provided emergency planners and first responders with an immersive and interactive real-time view of events on the ground, in the air, on the water and even subterranean. The center's main goal was to help the regional incident response team support local commanders to make informed decisions as quickly as possible. To do so, a large, multi-monitor common operating screen displayed camera feeds and live-streamed video, sensor data, network performance,



satellite data and cyber threat analytics as well as other crucial information to command staff.

“When we're dealing with public safety, the most important thing is reliable communications at the moment of crisis,” said Tammy McLean, Verizon OCR program manager, speaking during the OCR event. “People need to be able to rely on the technology and rely on the network when they are in harm's way. We always want to make the end user more effective, more efficient and safer.”

Drones, Satellite, Radio: Help from Above for First Responders

A 4D visualization application developed by Verizon’s Public Safety Product team allows incident commanders to monitor land, sea, air and subterranean spaces from anywhere on the planet. The app also provides this information in three dimensions. For instance, a floor-level view allows operators to see inside a building, or if the structure has caved in, obtain a visual of what it looked like before it toppled over.

“After we had this disaster [scenario] unfold at this building, we were able to fly over with LIDAR in an unmanned aircraft, scan the building and then quickly rebuild a model that tells us this is what the collapsed structure looks like,” said Jeffrey Schweitzer, Verizon’s asymmetric solutions architect and OCR network, comms, and air operations lead.

That instantaneous damage assessment capability allowed first responders to begin looking for survivors in a damaged structure quicker and in a way that helped mitigate risk to those involved in the response.

“I was able to trigger alerts off different systems that tell me I've got a first responder over here and now they need assistance, they need a medevac,” Schweitzer said. “I can go anywhere in the country and have this kind of information immediately.”

Drones and other unmanned aircraft are an increasingly common sight in the skies and can play an important role in disaster response — but their unauthorized presence can actually threaten manned aircraft. Verizon has built a system that helps allow drone operators to track — both visually and electronically — any aircraft flying in a specific area at any time. Those kinds of capabilities provided insight into what’s going on in the air as well as on the ground during OCR.

“People need to be able to rely on the technology and rely on the network when they are in harm’s way. We always want to make the end user more effective, more efficient and safer.”

verizon

"This is an integrated system of different types of drone detection capabilities," said Jad Muntasser, Verizon's asymmetric solutions manager and OCR scenarios and technology lead. "When you layer them together, it creates a digital dome of concentric rings of detection by different types of sensors. This approach increases probability of detection, identification of the aerial object and in some cases, now even being able to detect the operating pilot on the ground."

Tactical radio communications, called MANET network radios, were used to provide the command center with live video in a subterranean environment and in areas 4G LTE can't penetrate. The incident commander has the ability to connect a radio group in the center to a team entering a building that now needs to transmit video out over another network.

Underpinning this technology is a Medium Earth Orbit satellite constellation. It provides gigabit connectivity from space and enables an entirely new way of thinking about disaster response. These satellites represent the way emerging technology has expanded even into orbit, opening up new possibilities for global, high-throughput connectivity than their satellite predecessors.

"These dishes move back and forth, and so about every 30 minutes ... a new satellite comes across the sky and we're using one dish to pick it up and the next one to catch the next one as it comes," Schweitzer said. "It's a complex dance of space-space communications, if you're doing it right."

Layered, Mobile Connectivity Extends Safety

In a disaster, first responders must be able to communicate swiftly and reliably. OCR highlighted how portable power systems, a "cloud in a box" and air vehicles help personnel to do so when cell towers are down or compromised.

The response team also has assistance from Verizon's "Big Red" — one of eight mobile connectivity trailers that can be set up within an hour of an incident and create a "bubble of connectivity" using a 4G LTE network. Verizon's Satellite Solutions Group operates and deploys Big Red at nearly every major domestic disaster. The trucks are strategically located around the country in a way that allows them to reach any location in the continental U.S. within 24 hours.

The response team can also help deploy larger assets, such as the so-called Cell on Wheels (CoWs). These portable mobile cellular sites are generator powered, satellite backhauled and provide temporary network and wireless coverage to areas with minimal or compromised cellular coverage.

"You've got to think of them as a layer that we can bring in, depending on the scale of the incident," said Earl Struble, senior manager of response and critical communications at Verizon, who manned the command center at OCR. "It's about speed and delivery, when disaster strikes."

Technology can also help responders provide a human touch in the aftermath of disaster. During Hurricane Florence, which ravaged the Carolinas in September 2018, over 600 people were rescued from the roofs of their homes. Many of them had no means of communication. The Verizon response team made sure shelters had power and connectivity so these survivors could make calls and let their loved ones know they were safe.

"It's the little things like that, that make a difference and try to get back to normalcy," Struble said. "That's sort of our go-to, how we respond."

"You've got to think of them as a layer that we can bring in, depending on the scale of the incident. It's about speed and delivery, when disaster strikes."

The OCR event provided a unique stage for highlighting the cutting-edge tools that first responders can turn to in a variety of disaster scenarios.

While the different tools and technologies differ in key ways — from sensors and drones to augmented reality and expanded cell capacity — Verizon's Joint Operations Center showcased how various platforms can work together to improve the mission and save lives.

To learn more, visit: enterprise.verizon.com/publicsafety

verizon