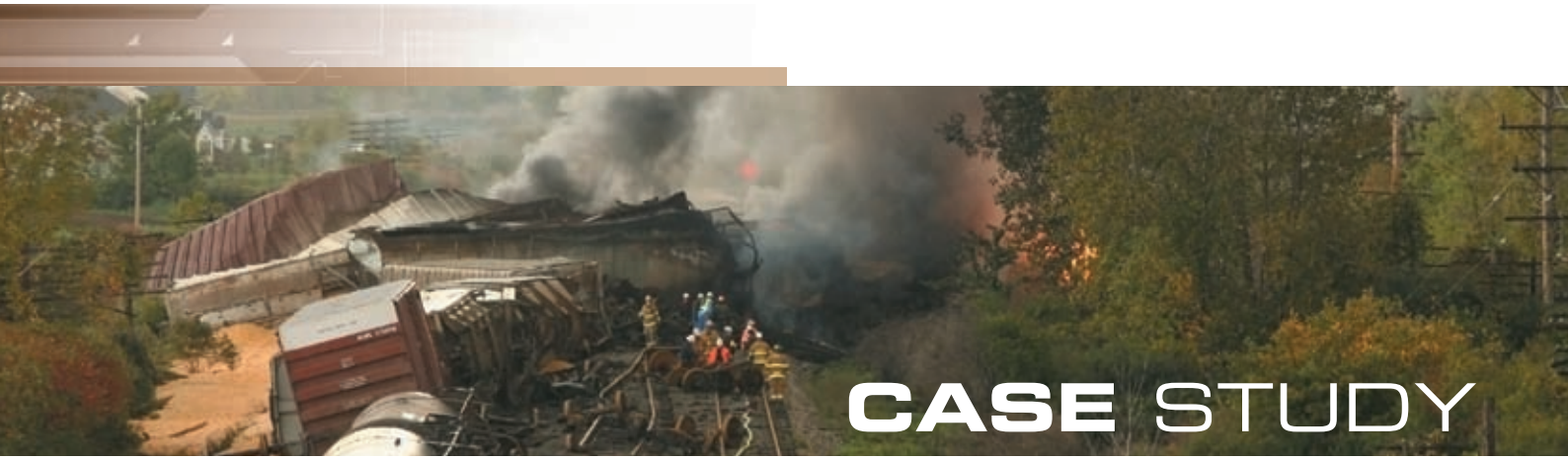

CASE STUDY

Emergency Response Systems from Kentucky Consortium Rely on BGAN from Stratos

A Kentucky consortium of universities funded by the U.S. Dept. of Homeland Security has spent three years developing and testing rapidly deployable incident command systems for use in the first critical hours following an emergency. To ensure data and voice communications over the Internet regardless of the situation, each system comes equipped with radio, cellular, and satellite technology — including BGAN from Stratos.

Compact BGAN satellite terminal (circled) on top of a Hazmat vehicle, connected to a laptop, during a biological incident in rural Kentucky. Photo courtesy of Mark Garland, Murray State University.

Ensuring Multiple Channels of Communication

Several years ago, after Congressman Harold Rogers of Kentucky was appointed first chairman of the House Subcommittee on Homeland Security, he obtained funding to create the Kentucky University Homeland Security Consortium, an initiative administered by the National Institute for Hometown Security. The consortium provides applied research and validation of information technologies essential to disaster preparedness, homeland security and defense.

In 2004, the Information Technology Research Center (iTRC) at the University of Louisville — a member of the Consortium — received a federal grant to develop rapidly deployable communication systems from commercial off-the-shelf technologies. Murray State University's Center for Telecommunications Systems Management (CTSM), directed by Dr. James Gantt, has been principal technical partner on the project.

"We were selected in the first round of funding for a project we call MITOC, for 'Man-portable, Interoperable Tactical Operations Center'," explains Jim Graham, former Director of the iTRC. "Until recently, most communication systems used in law enforcement and emergency response have been huge

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mobile command vehicles with a half million dollars worth of equipment and a big satellite dish that takes an hour or two to get up and running. A state like Kentucky might have one of these, because they're terribly expensive. And they might take five hours to get from one part of the state to another. We needed a totally self-sufficient 'man-portable' system that could serve the communication needs of first responders and incident command teams for the first few hours of an emergency — no matter where that might be."

The MITOC system provides radio interoperability, a wireless network, Internet access, data and voice communications over multiple cellular and satellite networks — now including BGAN (Broadband Global Area Network) from Stratos. BGAN is a portable broadband satellite system that provides telephony, data and streaming video over the Internet using a lightweight terminal about the size of a laptop.

The MITOC easily fits in the back of an SUV, boat or aircraft and can be deployed quickly wherever needed. "Our first version of the MITOC was designed to support up to 25 or 30 personnel at a longer-term incident scene," says Graham. "It uses a VSAT dish mounted on an SUV and provides pretty hefty bandwidth for all those users. But we also wanted to scale down the satellite access for smaller, rapid response teams. One of our satellite experts told us about plans for BGAN service to come to North America, and showed us an early mock-up of a compact terminal. So we spent a couple years chomping at the bit for this technology to launch."

"To me, the most amazing thing about BGAN is that you can throw a little satellite terminal, laptop and VoIP handset in a bag, go anywhere, and have phone, email, even videoconferencing."

— Mark Garland, Research Scientist, CTSM

Once BGAN became available in North America during 2006, Graham went looking for a reliable service provider. "I found Stratos online," he adds. "They had an outstanding web site with a well-produced multi-media section on BGAN [www.thepowerofBGAN.com]. Stratos looked like a company with real depth. When I sent an inquiry, they responded immediately and offered me a demo unit to evaluate. I was impressed with Stratos, and we fell in love with BGAN because it's so portable and easy to set up."

Both versions of the MITOC today can access the Internet via BGAN as a back up to radio, broadband cellular or VSAT. "BGAN from Stratos is on every MITOC deployment," says Graham. "There are plenty of rural areas that still don't have cell phone service, much less broadband. And wherever cell towers are damaged or inoperable, even in metropolitan areas — like New Orleans after Katrina — BGAN would be invaluable."

Hazmat Response Delayed Without BGAN

Two Hazmat incidents highlight the need for local and regional first responders to have reliable broadband Internet access in emergencies where other telecommunication options are limited or unavailable.

Mark Garland, a research scientist with Murray State University's CTSM, is also an officer with a Hazmat Regional Response team. Last fall, his team was called by state police in Fulton, Kentucky about 35 miles away to respond to a chemical leak at a train yard. At the time, he didn't have BGAN or a MITOC.

"We had to evacuate about half of the town," Garland recalls. "Turns out a strong acid mixture was dripping out of a railcar and forming a huge cloud

of corrosive gas. I was getting ready to send in people in suits, but I needed more information on this acid. How strong is it? How long can our guys be exposed before it eats through their suits? And, oh, it's getting ready to rain — what will that do to this cloud?"

Garland called a national center that maintains the latest technical data on hazardous materials. "Now, understand, we were in a remote part of the state with no Internet access, and it was two o'clock in the morning," he explains. "So I had to wander around this rail yard looking for an unlocked building with a fax machine. Meanwhile, the acid just kept leaking. It took almost two hours before we got that information. If I had had a BGAN unit there, imagine how quickly I could have gotten it."

BGAN from Stratos Resolves Bio Incident Faster

A few months later, Garland's Hazmat team was called to investigate an illegal laboratory authorities had discovered in the back of a mobile home. The area was evacuated. "We didn't know what we were dealing with," he says. "My entry team found shelves full of bags and boxes of biological specimens shipped from somewhere in the Middle East. This guy had pyrotechnical chemicals too. We were in a trailer park in the middle of nowhere, and the nearest ATF [Bureau of Alcohol, Tobacco & Firearms] agent was four hours away. The team took photos but, once again, there was no local Internet access, no broadband WiFi or cell phone service. Our radios didn't even work out there."

"BGAN from Stratos is on every MITOC deployment. Plenty of rural areas don't have cell phone service, much less broadband. And wherever cell towers are damaged, even in metropolitan areas — like New Orleans after Katrina — BGAN would be invaluable." — *James Graham, former Director, iTRC*

This time, however, Garland was equipped with a portable BGAN unit from Stratos. "I placed the terminal on top of the Hazmat truck, pointed it in the right direction, and got the satellite signal," he notes. "With BGAN hooked up to my laptop, I emailed photos to our friends in the FBI [Federal Bureau of Investigation] and ATF, who helped us identify these substances. And they sent us the right Material Safety Data Sheets on how to treat them. BGAN enabled us to solve the problem and get people back into their homes a whole lot faster."

In January 2008, Jim Graham joined a defense contractor in Washington and the iTRC closed. Murray State University's CTSM is handling all further work on the MITOC grant. MITOC systems are now being commercialized, and every one comes equipped with BGAN from Stratos.

The Man-portable Interoperable Tactical Operations Center (MITOC) was developed based on commercial off-the-shelf technologies—including BGAN from Stratos. Photo courtesy of the University of Louisville's iTRC.

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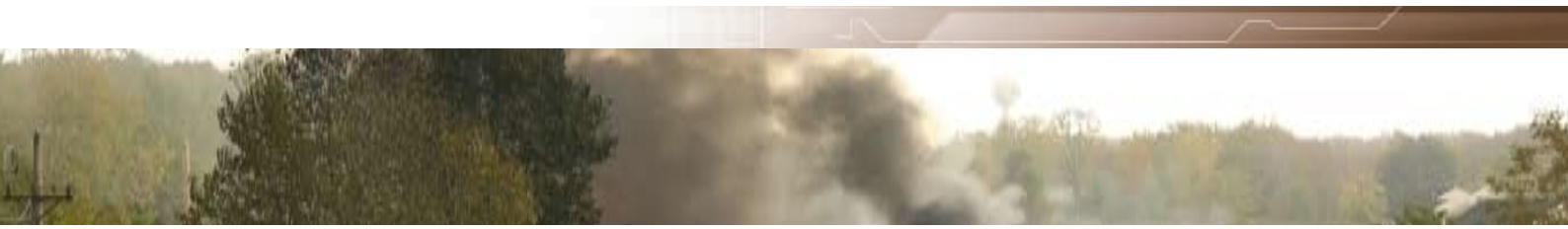

BGAN from Stratos. First on the scene. Anytime. Anywhere.

www.thepowerofbgan.com

BGAN from Stratos Benefits and Key Features

BGAN users can access e-mail, corporate networks, the Internet, transfer files, make telephone calls, and transmit streaming IP data via satellite. Key benefits and features of BGAN include:

- A range of small, light-weight, highly portable and rapidly deployable terminals
- Ability to communicate from anywhere, even when terrestrial networks are not operational
- High-speed wireless IP data and circuit-switched network
- Shared capacity IP data rates up to 492 kbps
- Streaming IP data rates up to 256 kbps
- Simultaneous voice and data – on different channels
- Optional guaranteed bandwidth
- Support for legacy applications and a platform for new IP-based solutions
- Support for supplementary services, e.g., call hold, call waiting, call forwarding, SMS and voicemail

The Stratos Advantage

- Stratos Dashboard™
  - Credit Watch Facilities – Our extensive online BGAN customer care Dashboard provides realtime information on voice and data-usage. Customers can monitor, manage and limit consumption per SIM as well as per groups of SIMs.
  - Instant Online Self Provisioning – BGAN Dashboard also gives customers the means to review their contracts and installed base, as well as the ability to instantly activate, de-activate and change service configurations.
- Stratos Trench™ (Customer Managed Firewall) – Trench is a personal firewall between the internet and the BGAN network. (Web) traffic and applications can be authorized or blocked via an user-friendly interface.

About Murray State University's CTSM

The Center for Telecommunications Systems Management (CTSM) at Murray State University (www.murraystate.edu/tsm/ctsm) is a member of the Kentucky University Homeland Security Consortium, an initiative administered by the National Institute for Hometown Security to harness the research capacity of the Commonwealth of Kentucky's post-secondary educational resources toward solving critical infrastructure and resiliency issues. The CTSM has been actively engaged in the development and testing of the Man-portable Interoperable Tactical Operations Center (MITOC) since receiving a grant from the U.S. Department of Homeland Security's Science & Technology Directorate in 2004.

About Stratos

Stratos is the world's trusted leader for vital communications. With more than a century of service, Stratos offers the most powerful and extensive portfolio of remote communications solutions including mobile and fixed satellite and microwave services. More than 20,000 customers use Stratos products and industry-leading value-added services to optimize communications performance. Stratos serves U.S. and international government, military, first responder, NGO, oil and gas, industrial, maritime, aeronautical, enterprise, and media users on seven continents and across the world's oceans. For more information visit www.stratosglobal.com.

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