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How a bunch of tech geeks helped save Nepal's earthquake victims

By Brian Fung
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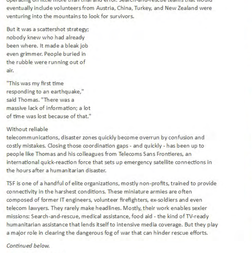

A Red Cross worker in Nepal stands before a VSAT antenna. Photo / American Red Cross

It was a few minutes before noon when it hit. The massive earthquake in Nepal touched off multiple avalanches in the snow-capped Himalayas, forcing hundreds of thousands from their homes. That day in April, a year ago this week, turned into the bloodiest Mount Everest has ever seen. The quake killed roughly 9,000 people. More than twice as many were injured.

The Nepalese earthquake would be Alexander Thomas's fourth time ever being deployed. Thomas had spent the last two days trying to reach the site of the disaster, which by then had become one of the least accessible places on Earth. The airport in Kathmandu - which was roughly a 5.5-hour drive at best from some of the hardest-hit areas - had largely been shut down to prioritise military airlifts.

When he finally arrived, Thomas discovered a massive international aid effort operating on little more than trial and error. Search-and-rescue teams that would eventually include workers from Australia, China, Turkey, and New Zealand were venturing into the mountains to look for survivors.

But it was a scattershot strategy; nobody knew who had already been where. It made a bleak job even grimmer. People buried in the rubble were running out of air.

"This was my first time responding to an earthquake," said Thomas. "There was a massive lack of information; a lot of time was lost because of that."

Without reliable telecommunications, disaster zones quickly become overrun by confusion and costly mistakes. Closing those coordination gaps - and quickly - has been up to people like Thomas and his colleagues from Telecoms Sans Frontieres, an international quick-reaction force that sets up emergency satellite connections in the hours after a humanitarian disaster.

TSF is one of a handful of elite organizations, mostly non-profits, trained to provide connectivity in the hardest conditions. These miniature armies are often composed of former IT engineers, volunteer firefighters, ex-soldiers and even telecom lawyers. They rarely make headlines. Mostly, their work enables sexier missions: Search-and-rescue, medical assistance, food aid - the kind of TV-ready humanitarian assistance that lends itself to intensive media coverage. But they play a major role in clearing the dangerous fog of war that can hinder rescue efforts.

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The Red Cross has deployed communications specialists to Sierra Leone and the Philippines. The networking company Cisco runs a humanitarian team it calls TacOps - short for "tactical operations" - that initially began as an outside support unit for the U.S. military but has responded to areas devastated by Hurricane Sandy as well as a series of Colorado wildfires in 2012. Ericsson's emergency telecoms team responds to an average of one crisis a year. And TSF, in its 17-year existence, has parachuted into dozens of crisis zones - earthquakes in Algeria, flooding in Bolivia and armed conflict in Algeria and Pakistan.

Few who operate in this world can say which organization's emergency telecom services developed first. But can they point to a particular disaster that kicked off the demand for them. But what is clear is that advances in technology have helped unlock tremendous new lifesaving capabilities. Although humanitarian missions are often about the what - relief supplies, medical aid and other goods and services - connectivity and communications have dramatically changed the how, as well.

Humanitarian groups began seriously turning to satellite technology sometime within the last decade. Those early years required huge logistical efforts to bring large, bulky antennas and other equipment to disaster zones. But as the cost and size of this technology has shrunk, it's enabled organizations to respond more quickly and develop new, innovative techniques for delivering aid.

> *"The reliance on telecommunications and particularly IT is becoming stronger and stronger in every disaster we see."*
> - Glen Bradley, Red Cross

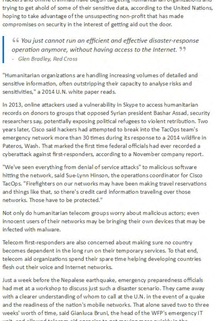
Today, teams of emergency telecommunications workers can deploy anywhere in the world in the opening hours of a crisis. All they need is a laptop-sized satellite antenna that can be unpacked to become a voice and Internet hotspot supporting download speeds of 500 kilobits per second.

These terminals aren't designed for binge-watching Netflix. They cost hundreds of dollars a day to operate and they get a tiny amount of bandwidth relative to the average U.S. household. But they're highly portable, they work pretty much anywhere in the world and in some of the toughest environments you can find. In short, they make for an amazing stop-gap solution.

Glen Bradley is a Red Cross volunteer who landed in Nepal with his wife, also a volunteer, 48 hours after last year's earthquake. The Internet, he said, has shown aid workers how much more they can accomplish with real-time digital communications in hard-to-reach places.

"Logistics people need to have ways to requisition equipment to support the disaster, and they need to be able to track that equipment," said Bradley, a former IT worker for the Defense Department. "They need [geographic] information so they know how to get the equipment to the warehouses - and from warehouses into the field - so relief units can distribute it. They need to have aircraft, truck or ship manifests, so people know what's going in or out."

Advancements in technology have also helped humanitarian organizations use their people more efficiently. With a satellite connection, doctors who can't physically get to a disaster site can talk directly to patients, or analyze their X-rays, or review blood test results remotely. The result is a significant boost to the quality of care.



Sita Kerka, who suffered two broken legs in last year's massive earthquake, arrives by helicopter from the heavily-damaged Ranachour village. Photo / AP

Data networks don't just help in disaster situations; they are also becoming integral to many humanitarian organizations' day-to-day business. The World Food Program, for example, now sends $1.2 billion a year in cash and food vouchers via text message, which makes accessing benefits more timely and convenient. When a country's networks go down in the middle of a typhoon or earthquake, so do these lifelines.

That makes telecom first-responders vitally important. But the technology doesn't come cheaply. TSF, for example, can spend up to $15,000 a day providing aid workers and victims with data access with its portable antennas, according to Thomas. Groups like the Red Cross use higher-capacity equipment known as VSATs; these satellite antennas offer more bandwidth at a lower price, but are bulkier and still cost more than $200 a day for a 5 Mbps connection. Still, these groups say, it's worth it.

"The reliance on telecommunications and particularly IT is becoming stronger and stronger in every disaster we see," said Bradley. "You just cannot run an efficient and effective disaster-response operation anymore, without having access to the Internet."

With the growing dependence on technology comes some significant new risks. Hackers and online criminals have begun targeting humanitarian organizations and trying to get ahold of some of their sensitive data, according to the United Nations, hoping to take advantage of the unsuspecting non-profit that has made compromises on security in the interest of getting aid out the door.

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> - Glen Bradley, Red Cross

"Humanitarian organizations are handling increasing volumes of detailed and sensitive information, often outstripping their capacity to analyse risks and sensitivities," a 2014 U.N. white paper reads.

In 2013, online attackers used a vulnerability in Skype to access humanitarian records on donors to groups that opposed Syrian president Bashar Assad, security researchers say, potentially exposing political refugees to violent retribution. Two years later, Cisco said hackers had attempted to break into the TacOps team's emergency network more than 30 times during its response to a 2014 wildfire in Pateros, Wash. That marked the first time federal officials had ever recorded a cyberattack against first-responders, according to a November company report.

"We've seen everything from denial of service attacks" to malicious software hitting the network, said Sue-Lynn Hinson, the operations coordinator for Cisco TacOps. "Firefighters on our networks may have been making travel reservations and things like that, so there's credit card information travelling over those networks. Those have to be protected."

Not only do humanitarian telecom groups worry about malicious actors; even innocent users of their networks may be bringing their own devices that may be infected with malware.

Telecom first-responders are also concerned about making sure no country becomes dependent in the long run on their temporary services. To that end, telecom aid organizations spend their spare time helping developing countries flesh out their voice and Internet networks.

Just a week before the Nepalese earthquake, emergency preparedness officials had met at a workshop to discuss just such a disaster scenario. They came away with a clearer understanding of whom to call at the U.N. in the event of a quake and the readiness of the nation's mobile networks. That alone saved two to three weeks' worth of time, said Gianluca Bruni, the head of the WFP's country IT unit, and allowed telecom aid agencies to get moving more quickly in the aftermath.

"People in Nepal gathered around hospitals - they had emergency generators and could charge their mobile phones," he said. "The ability to communicate is essential for people, and we hope at some point it'll be recognised as a humanitarian need at the same level as receiving food, medicine and anything else."

- Washington Post

By Brian Fung

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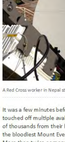

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