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HEADLINE: Firefighters Combat Wildfire With Data
Proven In Calif., Wireless Networks Could Be Key 1st Responder Tool

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BODY:
The recent deployment of a high-speed wireless data network as a tool to fight a California wildfire may demonstrate how such networks increasingly could be used by first responders-including in the area of homeland security.

More than 1,700 firefighters had been struggling to control the so-called Coyote Fire last month in California when California Department of Forestry and Fire Protection (CDF) Emergency Command Center Chief Jim Garrett contacted networking researcher Hans-Werner Braun at the University of California at San Diego.

Braun is principal investigator for the High-Performance Wireless Research and Education Network (HPWREN), a prototype high-speed wireless network funded by the **National Science Foundation**.

Braun and his team had been working with California forestry officials in recent years, and when firefighters needed wireless network capability to battle the 19,000-acre Coyote blaze, Garrett turned to Braun. Touched off by lightning July 16, the Coyote Fire was contained by July 24 and controlled by July 27.

Use of the HPWREN at the Coyote Fire operations center, which served as a command post for firefighters, enabled fire officials quick access to such data as satellite maps, infrared imagery, forest fuel conditions and weather conditions.

"The dissemination of information and incident intelligence up and down the command-and-control chain of command is more important than ever," Garrett said in a statement. "The connectivity provided to CDF for the Coyote Fire was a real-life exercise that clearly demonstrated how valuable and useful the technology provided by HPWREN is to our agency. HPWREN provided us an invaluable service that cannot be overestimated."

More bandwidth

Braun said he performed some analysis on the firefighters' use of the network, and he said they used it quite a bit.

"They could have used much more bandwidth than we provided," he said.

The most significant of deploying HPWREN against the Coyote Fire is that the network was deployed in an ad hoc fashion, Braun said.

"Jim called us one morning and, initially actually, I thought it was not possible to reach [the fire] site."

On further reflection, Braun felt it would be possible by installing a relay to carry the signals to and from the remote operations center.

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"We just deployed it the same day," he said. "Then it turned out at the camp we needed another relay because the camp was a little bit behind trees."

What is new about deploying the HPWREN in the Coyote Fire case is that it was done in "near real-time for a large-scale, real event that's not an-exercise," Braun said.

"To be able to be called in the morning by Jim and being able to deploy this stuff the same day is probably the major accomplishment here..." he said.

Braun said in hindsight that his team actually could have done it in half the time it took if it had done better planning.

"The main significance is really the ability to create multi-megabit-per-second Internet connectivity in random areas in the boonies, basically, fairly quickly by deploying other relays in the middle," he said. "I think that is mainly the new thing."

Attention to detail

Better preparation will be important if such networks are to be effectively deployed in the field in the future, Braun said.

"The main lesson learned is: If you want to do this for real, we need to be a bit more prepared," he said.

Braun said that attention to small details is important, down to the tripods used to set up the necessary network gear.

"... One of the tripods that you see on the mountain is like some old thing from my wife's floodlight for our horses," he said. "It was not even a good tripod, so I could not mount very good antennas. So I ended with fairly flimsy antennas. So the setup itself is very basic and could be improved with very little incremental effort."

Braun said he hopes the successful test of the HPWREN in a real-world case spurs more first responders to use advanced wireless data networks to aid their work, but it may be too early to tell.

"Both the San Diego Sheriff's Department as well as the California Department of Forestry made comments that they really like what we are doing and they would like, actually, in the long term to build their own operational networks, perhaps modeled after what we are doing," he said. "See, what I'm doing is very prototype-ish. I'm not trying to compete with anyone; I'm just trying to see how far we can push the envelope."

Braun also said he looks forward to wireless networks having a broader emergency response role, such as in the area of homeland security.

"I think there are all kinds of very interesting opportunities ... I'm just trying to demonstrate what can be done, rather than make too much fuss over it," he said.

Although wireless networks may offer incident response agencies key advantages and functions, those agencies have to deal with old systems and procedures, Braun said.

"They will not change overnight," he said of the agencies. "They have good attitudes; they are very helpful; and they are very cooperative. But they also have a lot of legacy technology and a lot of legacy mindsets, relative to how to do communications. So you need to have, probably, a fairly long time horizon for very significant changes."

"A large scale data network with near-real-time deployability is not something that just happens next week, just because we had this demo last week," he said.