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Learning the lessons of 9/11

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By Geoffrey Nairn

One of the many lessons learned from the terrorist attacks of 9/11 was that poor communications severely hampered the effectiveness of rescue workers and compounded the tragedy. Public safety bodies are thus taking a close look at how new wireless technologies can improve communications in times of trouble.

Thanks to the mobile phone, communications are of course, a lot easier than they used to be and cellphones often provide a lifeline for rescue workers and loved ones.

One of the most poignant memories of 9/11 was the final cellphone calls made by passengers onboard the hijacked aircraft. But 9/11 also revealed the big weakness of cellular networks - that they were never designed with disasters in mind.

In Manhattan, the cellular infrastructure collapsed after the attacks because the huge increase in calls overloaded networks already weakened by the loss of more than 14 cellular base stations. For those all-important first few hours after the attacks, New York was plunged into a communications blackout.

A notable exception was the Mobitex wireless data service and New Yorkers frantically pecked out messages on their BlackBerry handheld devices.

Originally developed for public safety applications, the 10-year-old Mobitex network found a new consumer market due to the BlackBerry, although technology has moved on and today's BlackBerry devices mostly use newer high-speed cellular networks. Mobitex may be slow compared with newer networks and it does not support voice, but its advantage is its robustness, as demonstrated during 9/11.

"Mobitex has shown its mettle in these kinds of environments, because it keeps operating when other networks do not," says Richard Donnelly, vice president for engineering at Velocita Wireless, which last year acquired the Mobitex US network from Cingular Wireless.

Through the terrorist attacks and during the resulting surge in traffic, Cingular kept the Mobitex network running despite losing many base stations in Manhattan.

Cingular also provided BlackBerry devices to rescue workers from the New York Police Department and other authorities, allowing them to communicate when other networks were down or overloaded.

After 9/11, police and fire departments as well as federal authorities signed up for BlackBerry devices running on the Mobitex network. The US House of Representatives also decided to equip all of its members with the devices.

According to Mr Donnelly, Mobitex kept running during 9/11 while others failed because it is better suited to emergency use. It is a data-only technology and so does not have to share precious bandwidth with voice. Also, it does not matter if an e-mail gets delayed a few seconds because of heavy network congestion. If the message cannot be sent immediately it is queued and sent later.

The latest enhancement to Mobitex extends on this idea by allowing the network operator to prioritise traffic in an emergency based on different classes of service.

Velocita has also developed a GPS tracking device that uses Mobitex to communicate the location of firefighters and other "first responders".

In spite of these enhancements, there are no plans to address Mobitex' biggest drawback, namely its slow speed - 12.5 kilobits per second. "We looked at increasing bandwidth but it involves too many trade-offs and so we have chosen to focus on the types of [low-speed] application that Mobitex does best," says Mr Donnelly. "First responders need a set of solutions, some can be done with narrowband while for others wireless broadband has to be used."

Falling in the latter category are applications such as remote surveillance, chemical and biological weapons detection, bomb squad support and video feeds from helicopters.

These applications might seem like something out of Mission Impossible, but some are already reality. During President Bush's recent inauguration, Secret Service officials used broadband wireless to transmit video images from surveillance cameras scattered around Washington.

"They had never been able to do this before," says Robert LeGrande, deputy chief technology officer for Washington DC.

The federal capital has built what it claims is the first citywide deployment of a broadband wireless network dedicated to public safety. The showcase network, built using technology from US vendor Flarion Technologies, is designed to provide high-speed video, audio and data feeds to first responders, as well as support more esoteric users such as the Secret Service and hazardous materials (hazmat) teams.

Mr LeGrande says hazmat people want to use the network for "plume projection" - predicting the fallout of dangerous substances based on data from biological sensors and weather data. Using the broadband network, the plume projections can be sent as moving images to emergency workers carrying laptops equipped with a Flarion data card.

The Washington pilot of the Flarion technology currently covers 12 sites but such is the interest in this technology that the city has funding of \$100m to extend it to 300 sites covering the entire metropolitan area.

Nevertheless, Mr LeGrande says broadband wireless is still very new and Washington has not ruled out using other technologies, such as WiMax or CDMA EV-DO for this expansion.

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