Belgian fire department wields pioneering wireless solution in the fight to save lives

Executive Summary

Customer Name

Beveren Fire Department, Belgium

Industry

Public sector: government/first responders

Business Challenge

- To improve the Fire Department's ability to act swiftly and with full situational awareness in a high-risk area of the Port of Antwerp

Solution

- A secure wireless network that supports data, voice and video, created by a Cisco Mobile Access Router in the command vehicle at the fire scene
- Fast communications links that allow the on-site commander to access a database of hazardous materials in real time and to send three-dimensional images of the scene back to headquarters

Business Results

- Greatly improved situational awareness and ability to share data with other emergency services – bringing information to people, not people to information
- Faster and better informed decision-making on the part of the on-site commander and the governmental authorities
- Increased public safety; reduced environmental and commercial risk

With a high concentration of hazardous materials continually in transit through its territory, the Beveren Fire Department needed to identify them ultra-fast in the event of a fire. The department decided to provide real-time wireless access to a dangerous substances database from the fire scene. It soon realised that such links offered huge potential for improving the region's disaster response mechanisms in other ways. The result is a breakthrough in modern firefighting based on secure wireless technology from Cisco Systems.

Business Challenges

In a crisis, the ability to make informed decisions quickly can save lives. The Beveren Fire Department in Belgium understands this better than most. Their territory, in the north-western province of East Flanders, includes Waaslandport, a major extension of the Port of Antwerp on the left bank of the River Schelde. Out of 80 companies currently operating here, 20 handle and store hazardous materials that are subject to the European Union's Seveso Directive on the prevention of chemical accidents. On average, a truck enters or leaves the port every three seconds. With so much activity, and with many warehouses being shared by several companies, tracking the movements of hazardous materials can be difficult.

A large fire at a warehouse in Waaslandport in 1996 highlighted the dangers. It took firefighters several hours to locate the information they needed to tackle the blaze effectively and offer reliable advice to the municipality on public safety issues. The main problems were lack of real-time access to accurate information on the type and location of hazardous materials at the site, and less-than-optimal communications between the command vehicle at the fire and the crisis centre back at headquarters.

Solution

When the Beveren Fire Department set out to fix these problems, its first priority was to create a database of hazardous materials that could be updated and accessed online. Known as BTOX, this database has been operational since 2005 and it contains regularly updated information that companies provide in Excel spreadsheets over the Internet. BTOX will eventually hold details from all the businesses handling hazardous materials at Waaslandport.

> "When the Mayor communicates with the public about health and safety issues, [he/she] must be certain of [his/her] facts. Now that we have established a wireless method of distributing data, the information we give to the community is more likely to be accurate. This helps people to protect themselves and reduce risk."
>
> Wim Van Zele
> Kapitein Commandant
> Beveren Fire Department

The next challenge was to provide senior fire officers at the site of an incident with real-time access to BTOX. This would enable them to make decisions as quickly as possible, instead of wasting vital minutes waiting for information to come from headquarters. Wireless capability was also essential, to allow officers to retain their network connection while moving around the site.

The fire department realised that they could exploit such a system still further to improve the feedback from the site to the crisis centre, by transmitting images of the fire over the same network. The ability to carry voice traffic was also seen as desirable for the future, offering the possibility of many new ways of sharing information with colleagues, with the municipal authorities, and with other emergency services.

> "I believe it's important for fire departments to use new technology in order to continue improving the service they provide to their communities. We have seen how live video and data links can help us to work more effectively in a high-risk environment, and we plan to introduce other functions so that we can evolve still further."
>
> Wim Van Zele
> Kapitein Commandant
> Beveren Fire Department

Less critical, but still important, requirements included a 'plug and play' solution that would function at the site of an incident with little or no set-up, extreme portability so as not to hamper the firefighters, and enough growth potential to protect the original investment.

Searching for a workable solution, the Beveren Fire Department issued a Request for Proposal (RFP) in November 2004. Out of the responses it received, the only one to meet all the department's needs came from Cisco Systems. At the heart of its solution is the Cisco 3200 Mobile Access Router, a robust and compact piece of equipment that sets up a wireless network around the command vehicle in which it is situated.

Wireless access points located in various positions – in this case, on companies' premises at Waaslandport – create 'hotspots' which connect to the wireless network and provide the firefighters at the site with high-speed, secure Internet access. The Cisco Mobile Access Router also functions as an access point, providing a wireless link to a camera mounted on a turntable ladder. This is the source of the three-dimensional images that can be transmitted back to a remote crisis centre in real time and shared with other agencies or experts. A demonstration of 21st-century public safety networking in action, it provides access to practicable information when it is needed, where it is needed.

Cisco's proposal was successful because it offered the only technology solution that exactly fitted the needs of the Beveren Fire Department. As importantly, the Cisco team showed an understanding of the issues facing the department and a willingness to work with the firefighters to help them achieve their goals. A pilot was launched in April 2005 which ran for one year and demonstrated, primarily through training exercises, both the immediate and longer-term benefits of the wireless network.

During the pilot, which was largely funded by the Municipality of Beveren, the wireless network was used to obtain accurate information from BTOX at the fire scene and to transmit images of the fire back to headquarters. In the future, however, it will be used for a broader range of applications, including voice communications (complementing existing systems) and transmission of the results of smoke analysis performed at the site.

Business Results

The most significant benefit of using the Cisco-based solution has been to improve the situational awareness of the on-site commander. Arriving at the scene of a fire with little or no information, firefighters need to acquire as much knowledge as possible within a very short time. This allows the officer in charge to make a number of critical decisions on how to deploy the team, what extinguishing products to use, or what other resources may be needed.

The ability to consult BTOX in real-time and obtain three-dimensional images of the fire provides the on-site commander with a much more complete and accurate view of what is happening than ever before. In the first hour of a blaze, this is essential to making well informed decisions that will bring the fire under control as quickly and safely as possible while also protecting the firefighters at the scene.

"The pilot has shown that the decision-making ability of the on-site commander has improved tremendously, both in terms of the speed and quality of those decisions," says Kapitein Commandant Wim Van Zele, the Head of the Beveren Fire Department.

In any crisis, the governing authority also needs precise facts in order to assess whether or not a fire poses any wider threat to the community or the environment, and to make decisions on measures such as evacuating certain neighbourhoods. It is also necessary to keep the community informed of the situation, using the media and other channels.

Now, thanks to fast and secure wireless communications, the Mayor of Beveren and other authorities can base their decisions on real-time images from the fire scene. The images can also be shared with the police and ambulance services to improve their response to the crisis, or forwarded to universities or other sites for further analysis by experts. In a location like Waaslandport, where a wide variety of hazardous materials is present at any time, this capability could significantly reduce the damage caused by a fire.

"When the Mayor communicates with the public about health and safety issues, [he/she] must be certain of [his/her] facts," says Wim Van Zele. "Now that we have established a wireless method of distributing data, the information we give to the community is more likely to be accurate. This helps people to behave appropriately to protect themselves and reduce risk."

Another advantage of live links is that the Mayor becomes less dependent on the on-site commander for information, so both individuals are better able to concentrate on their own tasks. The officer in charge is also able to remain mobile throughout the site without losing the network connection, or to stay at the command vehicle without missing out on vital data, thereby enjoying much greater flexibility.

"I cannot emphasise too much the impact of live images on our operation," Wim Van Zele comments. "We used to try to describe

> "I cannot emphasise too much the impact of live images on our operation. We used to try to describe the fire scene verbally over the telephone – a time-consuming and unsatisfactory exercise. Now we have so much more information, and it is both accurate and immediately accessible."
>
> Wim Van Zele
> Kapitein Commandant
> Beveren Fire Department

the fire scene verbally over the telephone – a time-consuming and unsatisfactory exercise. Now we have so much more information, and it is both accurate and immediately accessible."

The Beveren Fire Department is believed to be the first in Europe to use IP and wireless technologies in this way. The resulting improvements in communications have been achieved through trial and error. For example, a smaller camera has been identified as a more efficient alternative to the one originally used in the pilot. In general terms, however, the Cisco-based solution has proved to be reliable, safe and easy to use – so much so that the Beveren Fire Department secured funding from the Province of East Flanders to extend the scheme in spring 2006.

The funding will initially provide coverage for the whole of Waaslandport and potentially for the harbour of Ghent, which is the provincial capital and the Governor's seat. There are also plans to equip command vehicles with a satellite dish to guarantee broadband access which is essential for transmitting video. This will greatly increase both the range and the usefulness of the solution, by removing the requirement for multiple wireless access points and ensuring high-speed coverage throughout the province.

"I believe it's important for fire departments to use new technology in order to continue improving the service they provide to their communities," says Wim Van Zele. "We have already seen how live video and data links can help us to work more effectively in a high-risk environment. In future, we plan to introduce other functions such as Voice over IP and real-time smoke analysis so that we can evolve our operational capabilities still further."

Wim Van Zele
Kapitein Commandant
Beveren Fire Department

"The pilot has shown that the decision-making ability of the on-site commander has improved tremendously, both in terms of the speed and quality of those decisions."

Wim Van Zele
Kapitein Commandant
Beveren Fire Department

Technology Blueprint

The Cisco Mobile Access Router, part of the Cisco 3200 Series of wireless and mobile routers, is a rugged device offering secure data, voice and video communications. It has been modified to meet the requirements of the Beveren Fire Department and is built into the command vehicle, which also contains a water and shock-resistant portable computer with a pen-operated touch screen.

The Cisco Mobile Access Router supports numerous wireless technologies including integrated 802.11b/g and 4.9 GHz. It automatically switches from one network connection to another – for example, while the command vehicle is on the way to the scene, access is via GPRS. Where several connections are available, the Cisco Mobile Access Router selects the one offering the highest bandwidth.

Standards-based Mobile IP in the Cisco Mobile Access Router ensures transparent roaming for mobile applications, while Cisco IOS Software provides inherent security features. To further protect the wireless communications over its network, the Beveren Fire Department has installed at its headquarters advanced firewall services from the Cisco PIX Security Appliance Series and a Cisco VPN 3000 Series Concentrator. The latter makes it impossible for non-authorised users to read information that crosses the network by setting up a virtual private network (VPN) for each transmission and encrypting all information end-to-end so that it can be safely sent over the Internet.

Cisco received the 2005 Frost & Sullivan Award for Technology Leadership for its Metropolitan Mobile Network solution based on the Cisco 3200 Series Mobile Access Router.

Three companies based in Waaslandport took part in the pilot and they each installed a Cisco Aironet 1200 Series Access Points. With speeds of 11 to 54 Mbps, these secure devices offer sufficient bandwidth to transmit substantial quantities of data, video and voice traffic.

The customised BTOX database was developed using Ecomaster, a software system designed for the management of dangerous substances and environmental issues.

Corporate Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 526-4100

European Headquarters
Cisco Systems International BV
Haarlerbergpark
Haarlerbergweg 13-19
1101 CH Amsterdam
The Netherlands
www-europe.cisco.com
Tel: 31 0 20 357 1000
Fax: 31 0 20 357 1100

Americas Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-7660
Fax: 408 527-0883

Asia Pacific Headquarters
Cisco Systems, Inc.
168 Robinson Road
#28-01 Capital Tower
Singapore 068912
www.cisco.com
Tel: +65 6317 7777
Fax: +65 6317 7799

Cisco Systems has more than 200 offices in the following countries and regions. Addresses, phone numbers, and fax numbers are listed on the Cisco.com Website at www.cisco.com/go/offices.

Argentina • Australia • Austria • Belgium • Brazil • Bulgaria • Canada • Chile • China PRC • Colombia • Costa Rica • Croatia • Cyprus • Czech Republic Denmark • Dubai, UAE • Finland • France • Germany • Greece • Hong Kong SAR • Hungary • India • Indonesia • Ireland • Israel • Italy Japan • Korea • Luxembourg • Malaysia • Mexico • The Netherlands • New Zealand • Norway • Peru • Philippines • Poland • Portugal Puerto Rico • Romania • Russia • Saudi Arabia • Scotland • Singapore • Slovakia • Slovenia • South Africa • Spain • Sweden Switzerland • Taiwan • Thailand • Turkey • Ukraine • United Kingdom • United States • Venezuela • Vietnam • Zimbabwe

Copyright © 2006 Cisco Systems, Inc. All rights reserved. CCSP, CCVP, the Cisco Square Bridge logo, Follow Me Browsing, and StackWise are trademarks of Cisco Systems, Inc.; Changing the Way We Work, Live, Play, and Learn, and iQuick Study are service marks of Cisco Systems, Inc.; and Access Registrar, Aironet, ASIST, BPX, Catalyst, CCDA, CCDP, CCIE, CCIP, CCNA, CCNP, Cisco, the Cisco Certified Internetwork Expert logo, Cisco IOS, Cisco Press, Cisco Systems, Cisco Systems Capital, the Cisco Systems logo, Cisco Unity, Empowering the Internet Generation, Enterprise/Solver, EtherChannel, EtherFast, EtherSwitch, Fast Step, FormShare, GigaDrive, GigaStack, HomeLink, Internet Quotient, IOS, IP/TV, iQ Expertise, the iQ logo, iQ Net Readiness Scorecard, LightStream, Linksys, MeetingPlace, MGX, the Networkers logo, Networking Academy, Network Registrar, *Packet*, PIX, Post-Routing, Pre-Routing, ProConnect, RateMUX, ScriptShare, ScriptShare, SlideCast, SMARTnet, StrataView Plus, TeleRouter, The Fastest Way to Increase Your Internet Quotient, and TransPath are registered trademarks or trademarks of Cisco Systems, Inc. and/or its affiliates in the United States and certain other countries.

All other trademarks mentioned in this document or Website are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (0502R)

Printed in the UK
31241/ecoutez/js/jun.06