City of Madrid

Coordinated emergency response raises public safety to a new level

Overview

The Need
Following the 2004 Madrid train bombings, the city sought to radically improve its emergency response capability.

The Solution
Madrid teamed with IBM and IBM Business Partner Indra to create the CISEM command center, which combines information from many sources including video feeds, field reports and mobile computers.

What Makes it Smarter
Because of insight generated by a comprehensive, real-time view of events across the city, emergency managers can better assess needs, prioritize and coordinate actions, and proactively deploy assets to address—and potentially prevent—multiple, complex incidents.

The Result
"The most innovative aspect of the center is its scope—the integration of all the people involved and the systems they use."

— Fernando Garcia Ruiz, head of innovation and development, Department of Security, City of Madrid

On March 11, 2004, Madrid suffered a major terrorist attack when several commuter trains were bombed. As with the 9/11 attacks in the United States, this tragic incident highlighted the need for greater coordination among first responders. "The different emergency entities—the police, the fire department, the ambulance service and the mobile police—intervened independently, and all of them had disparate communication systems and technologies," says Fernando Garcia Ruiz, head of innovation and development, Department of Security for the City of Madrid. There was no way to organize a unified response to incidents, and there was a lack of centralized command and control.

A key lesson was that more than one major incident can happen simultaneously, and emergency assets may be needed in more than one place. Different incidents may be related, or have nothing to do with one another—without a clear overall picture, it may be impossible to tell if there is an important pattern emerging. This potential for complexity poses a significant challenge for emergency managers. They not only need to coordinate activity, but also require a thorough understanding of everything happening in the metropolitan area so as to properly allocate limited resources to provide the best response to each incident. In addition, proactive measures such as limiting access to impacted areas, or crowd and traffic control for public events, has to be included in the mix.

The need, therefore, was not only for top-down coordination, but also for the ability to capture and integrate information to give managers the understanding and insight required to quickly make the right decisions.

A centralized model for command and control
In the aftermath of the March bombings, the Madrid City Council took action to better protect the public by commissioning an advanced emergency command center for the city—the Centro Integrado de Seguridad y Emergencias de Madrid, or CISEM.

Business Benefits

- Unified view of incident data enables faster, better decision making with the ability to handle multiple, complex situations simultaneously

- Emergency response time reduced by 25 percent

- Enables end-to-end coordination of emergency and municipal assets

- Robust, wireless infrastructure connects diverse first responder agencies with shared, interoperable equipment and protocols

- SOA infrastructure seamlessly integrates agencies, systems and information

The mission was ambitious, but clear-cut: reduce emergency response time, integrate information, standardize procedures and protocols, provide seamless coordination and planning, enable shared use of resources, optimize information management and promote prevention through better planning.

IBM Business Partner Indra, a leading regional systems integrator specializing in the public sector, teamed with IBM to provide the integrated, service-oriented IT infrastructure that would make CISEM a reality, along with needed business process transformation to enable coordination among all of the stakeholders.

Building an emergency infrastructure from the ground up

"The key to CISEM is integration—of information, systems, data sources and people," Garcia says, "but it was a challenge. Not only do we have to integrate all the applications currently used by the different entities, but we also have to integrate other external organizations, like Madrid 112, the video surveillance center, and the M30 highway control center."

Because each of the first responder agencies had its own communication technology, a common mobile infrastructure had to be deployed. Most vehicles, from police cars to ambulances to fire engines, are equipped with mobile wireless computers or PDAs that are connected to CISEM. The mobile infrastructure is critical; it provides true interoperability among the various agencies and also enables a two-way interchange of information—which gives managers vital, on-the-scene input that helps them develop a better understanding of what is happening in the field.

Smarter Public Safety: Faster, more precise emergency response
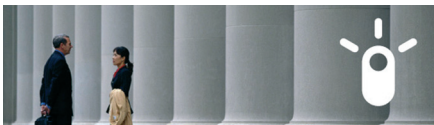
	Instrumented	Information from first responders, the public, video surveillance, traffic control and other sources is fed into the CISEM system.
	Interconnected	CISEM integrates information, people, processes and systems to enable better coordination and situational awareness for first responders.
	Intelligent	A holistic, real-time view of incidents gives commanders an understanding of how complex emergencies affect the city as a whole, enabling them to more rapidly and effectively assess and respond to incidents, and thus better protect the public.

Solution Components

Software
- IBM DB2® Everyplace®
- IBM Tivoli® Directory Integrator
- IBM WebSphere® Everyplace Connection Manager
- IBM WebSphere Everyplace Deployment
- IBM WebSphere Integration Developer
- IBM WebSphere MQ
- IBM WebSphere Process Server
- IBM WebSphere Transformation Extender

IBM Business Partner
- Indra

Commanders are now able to understand how complex and/or multiple incidents affect the entire region.

The effective coordination of responders depends on reliable communications, so close attention was paid to creating a reliable way to keep all agencies in touch. A multilayered, redundant communications infrastructure links to existing telephony systems, VoIP, satellite communications, a private radio network and 3G wireless networks to ensure continuous communication. IBM WebSphere® Everyplace® Connection Manager provides seamless, reliable, secure access to CISEM resources by automatically selecting the best available network and encrypting all communications. IBM Tivoli® Directory Integrator adds an additional layer of access security.

CISEM's need to maintain consistency across all emergency resources makes the rapid development, integration and uniform rollout of information and applications essential, so IBM helped build a flexible, powerful SOA platform to enable it. New information flows and business processes are built and managed using IBM WebSphere Integration Developer and IBM WebSphere Process Server. Dissemination to field units takes place quickly and easily, thanks to IBM DB2® Everyplace and IBM WebSphere Everyplace Deployment, with an underlying support layer that includes IBM WebSphere MQ and IBM WebSphere Transformation Extender for system messaging and data formatting. This robust software platform helps CISEM managers adapt to fast-changing needs without disruption to vital services—a key capability in fulfilling their core mission of protecting the public.

Flexibility and insight

The combination of forward-looking system design and end-to-end integration gives emergency managers in Madrid the tools needed to not only deal with today's threats, but also handle rapidly evolving situations and technologies as they emerge. Any sensor input—video, data or voice—from any source can be readily incorporated into the data stream and accessed by anyone who needs it.

Situational awareness is now at an unprecedented level. Not only do commanders at CISEM understand the full situation, but those in the field are also made aware of the status of other teams and resources.

This single, unified view of status and events reduces confusion and enables far faster and more effective decision making. Managers are now better able to deploy the right assets the first time, reducing response time by 25 percent.

Perhaps most significant, though, is the entirely new dimension that CISEM has given to emergency management. Commanders are now able to understand how complex and/or multiple incidents affect the entire region, and can allocate and deploy emergency resources in a truly coordinated and effective manner that takes into account all of Madrid's needs, not just those of a single incident.

In addition to CISEM's new capabilities, Fernando Garcia concludes by emphasizing that "CISEM is built for change. We have more flexibility to innovate in our day-to-day operations, but we are also better equipped for any major challenges the future may have in store. The beauty of it is that it allows us to make incremental changes without ever interrupting our emergency operations."

For more information

To learn more about how IBM can help you transform your business, please contact your IBM sales representative or IBM Business Partner.

Visit us at: **ibm.com**/government

IBM.

Please Recycle

ODC03154-USEN-00