Florida State University Panama City puts experts and investigators "on site" at underwater crime scenes in real time.

Overview

- ***Business Challenge***
  Florida State University Panama City's Underwater Crime Scene Investigation (UCSI) team needed a way to connect divers to investigators and experts on shore, to make the investigation and preservation of underwater crime scenes more effective.
- ***Solution***
  UCSI teamed with IBM and Cisco to build a first-of-its-kind, Web-based, WiFi-networked communication and collaboration solution that enables observers – located anywhere with Internet access – to see and interact with on-site underwater investigation teams in real time.
- ***Key Benefits***
  - *Speeds investigations by facilitating on-the-spot analysis*
  - *Enables experts to be virtually connected from anywhere in the world*
  - *Helps preserve crime scene integrity*
  - *Provides thorough documentation of the scene as well as divers' actions*
  - *Provides exceptional situation awareness for shore-based investigators*

A need for better underwater forensics

For crime scene investigators, the underwater environment presents an enormous challenge. Not only can it be difficult to locate evidence or victims' remains, the acts of discovery and recovery can irrevocably damage vital clues.

As part of its response to the October 2000 terrorist bombing of the USS Cole in Yemen that killed 17 U.S. sailors and injured 37, the Department of Defense (DoD) contacted the Underwater Crime Scene Investigation (UCSI) team at Florida State University Panama City and asked them to come up with a way to stabilize an underwater crime scene. It had become apparent that there was no good way to conduct a proper investigation in an underwater environment.

> *"Getting 'eyes and ears' on the scene is invaluable in our line of work. It lets us not only do our job faster and more effectively – which helps us protect the public better – but it also helps protect our field personnel."*
>
> – Tom Kelley, UCSI director

Business Benefits

- Speeds the investigation of underwater crime scenes, since analysis can be done on the spot rather than having to be conducted after the vessel returns to shore
- Enables experts to be virtually connected from anywhere in the world
- Helps preserve crime scene integrity
- Provides thorough documentation of the scene as well as divers' actions
- Merges input from any type of sensor (e.g., sonar, video, radar) as well as any type of voice communications (e.g., cell phone, radio), making it possible for shore-based investigators to maintain exceptional situational awareness
- Leverages existing technology

A nexus of information

The Florida State University Panama City UCSI team is a global leader in its field. Its expertise is so well regarded that it has been asked to develop distance-learning programs for investigators worldwide.

UCSI has taken a leading role in developing underwater investigative techniques and "wrote the book" on underwater crime scene investigation: As part of the Department of Defense request, standardized, certified investigative protocols were established which have since been accepted by the State of Florida and are being considered for adoption elsewhere. But UCSI didn't stop at the procedural level. They had a larger vision, one in which technology could be leveraged to put their expertise to work in the most effective way possible. This use of technology was actually written into the DoD protocols.

UCSI assembled a team of academicians as well as people with extensive field experience to tackle the challenges inherent in underwater crime scene investigation that make it different from its on-shore counterpart. It was immediately recognized that the key need was to give everyone involved the ability to see the situation and interact in real time, whether they are on shore or at the scene – even underwater. Existing procedures involved gathering information such as underwater video footage and/or recovering evidence or bodies, returning to shore, and then assessing the situation afterward. Without the ability to perform assessments on the spot and *in situ*, vital information could easily be lost and evidence damaged.

The UCSI team envisioned a "crime bulletin board" that would present a variety of information, such as media reports, live reports from the field, information about equipment – in short, everything having to do with the investigation – in one place at one time, and in an easy-to-grasp form. In addition, UCSI saw the need to enable interaction and collaboration with officials and experts located in geographically dispersed locations.

> *"The real power of the solution lies in its integration and modular technology. We can tie just about anything we can think of into it."*
>
> – Tom Kelley

"That was the concept from the beginning," says Tom Kelley, director for UCSI. "From that point on we were looking for a solution that would accomplish it. We needed the ability to show the feedbacks from the field – data from all the different types of technology in use – as well as external inputs. For example, we wanted to incorporate media feeds to take advantage of that viewpoint. And we needed some way to have direct contact with team members, most especially those on the scene. The important part was to get all of that information put together simultaneously and in real time, to make it useful in the field," he notes.

"It's the ability to extend expertise to the scene itself that is most important," according to Kelley. "Getting 'eyes and ears' on the scene is invaluable in our line of work. It lets us not only do our job faster and more effectively – which helps us protect the public better – but it also helps protect our field personnel."

From vision to reality

The first step was a demonstration project run by the military a few years ago, in which there was a simulated terrorist attack on a fuel depot. A system was set up that accomplished some of UCSI's goals, but it was less than ideal. "We had information coming in on multiple screens," Kelley notes. "It wasn't being presented in an integrated, cohesive manner, and we felt that was very important."

Kelley engaged in discussions with IBM and found that a more robust solution was possible. Working with IBM and Cisco, a first-of-its-kind, end-to-end demonstration project was set up and conducted live and in real time during the International Marine Investigative Conference, held in Panama City, Florida, in February 2007.

The scenario was the recovery of a missing person, a murder victim who had been trapped under 32 feet of water, some 1.5 miles offshore. Communication and collaboration had to be set up between the field team and divers on a ship at the scene, a simulated Emergency Operations Center (EOC) at the convention center where the conference was being held, and a remotely located medical examiner in another city.

The technology platform was set up to incorporate a variety of sensors including sonar and video, a communications link located in a building at the waterfront, laptops at the "EOC" and a simulated medical examiner's office in Atlanta, Georgia. The link from ship to shore, and to the EOC, was wireless, while the medical examiner was tied in via the Internet.

The scenario unfolded flawlessly. Remote sensors detected an object on the ocean floor, the deployment team dispatched a remotely operated vehicle and divers, and once it was confirmed that the object was a "body," collaboration was opened with the EOC using the platform's incident management software. The EOC, following the UCSI's underwater protocols and processes, assessed the situation using the live information made available from the field. Once it was confirmed that the body was in fact the person they were looking for, the medical examiner was alerted and accessed the platform via the Web. He then collaborated with both the EOC and the field team in his own assessment, and mobilized EMS and support resources to retrieve the body.

Key Components

Hardware

- IBM ThinkPad
- IBM eServer™ xSeries® server
- Cisco Tactical Communications Kit (part of IBM Crisis Management platform)
- Cisco Wireless Technologies
- Cisco IP Phones

Software

- IBM WebSphere® Application Server
- IBM DB2®
- IBM Tivoli® Access Manager
- IBM Tivoli Identity Manager
- IBM Lotus® Collaboration
- Cisco IPICS communications interoperability

Services

- IBM Global Technology Wireless Services
- Cisco Network Engineers

Why it matters

Florida State University Panama City UCSI team is taking underwater crime scene investigation to a new level by using technology to not only document and secure the scene, but also to enable real-time communication and collaboration between on-site personnel and investigators on shore, no matter where they might be located. The first-of-a-kind solution not only makes investigations more effective, it helps protect people by providing improved situational awareness as well as giving investigators the ability to solve cases more quickly.

Leveraging IBM and Cisco expertise, the team merged multiple communications media formats (marine and police band radio, instant messaging, video, VoIP and Internet access, as well as remote database look-ups) using the Cisco Unified Wireless Network to share IP communications across a single network platform. Cisco provided its IP Interoperability and Collaboration System (IPICS) software, which ties together communications from a variety of hand-held devices (e.g., radios, cell phones and Voice over IP telephones).

The platform also incorporates the IBM Integrated Information for Intelligence (I3) Framework, a Service Oriented Architecture (SOA) incident-management component that is built on IBM WebSphere, IBM DB2, IBM Tivoli Security and IBM Lotus Collaboration software. This solution supports a virtual command and control center or "fusion center" that enables cross-agency data and information sharing for first responders. This solution transforms information into actionable knowledge and results for public safety operations.

Proven processes and flexible technology…a solution that works

The total solution fulfills UCSI's original vision: seamless blending of information from a variety of sources, combined with communications and collaboration, all in real time, and driven by proven, established processes. "This is one of those situations where the whole is much greater than the sum of its parts," says Tom Kelley. "All of the technology is off-the-shelf. What's new and truly exciting is the concept of using technology to enable our proven, certified processes in a unique way that's transparent to the users."

Kelley is particularly proud of the system's future potential. "The real power of the solution lies in its integration and modular technology. We can tie just about anything we can think of into it. Right now we're looking at things like technology that allows divers to see in zero visibility conditions, as well as remote sensing devices. We have a proven concept and processes to make it work; now the challenge is to expand our capabilities. We're just scratching the surface."

For more information

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