Interoperability Technology Today

A Resource For the Emergency Response Community

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Fairfax, Arlington, and Alexandria Counties EOCs First to Integrate CAD-to-CAD Interoperable System

Talk to any public safety professional—including fire, rescue, and Emergency Medical Services practitioners—and they will tell you that there has long been a gap in the emergency response community's Computer-Aided Dispatch (CAD) system interoperability. Many emergency response agencies have hit plateaus when it comes to progressive data interoperability.

While it is a great accomplishment that responders in the field can now communicate during an emergency, it is also important that, well before responders communicate, dispatch centers can communicate. All too frequently, CAD interoperability has meant relying on phone calls between dispatch centers to track assets. These phone calls waste precious time in situations that do not have a moment to spare.

Fairfax County, Virginia, was no stranger to this limitation. Fairfax County dispatchers, like many other counties, did not have direct access to personnel and resource information in neighboring jurisdictions. For many years, dispatch centers maintained other jurisdictions' units in their own CAD systems and worked from recommendations based on the closest unit prediction. Frequently, dispatchers were forced to rely on time consuming phone calls to track down and dispatch the closest resources—keeping with reciprocity agreements. After making significant progress over the last 10 years in voice operability, Fairfax County's Public Safety Communications Center (PSCC), in collaboration with Virginia's Arlington County and City of Alexandria, turned its attention to CAD interoperability and is currently recognized as the first group of PSCCs to integrate a CAD2CAD interoperable system.

Steve Souder, Director of Public Safety Communications in Fairfax County, has experienced these advances first hand. "There was a lot of opportunity to take information exchange within dispatch centers to the next level. The technology was available, and the relationships had been built to break down previous barriers," he said.

CAD Interoperability Background

When an emergency strikes, it does not matter from where emergency responders come; they simply need to arrive immediately. Forty-two years ago, the three jurisdictions of Fairfax County, Arlington County, and the City of Alexandria established an agreement to share resources during initial and subsequent alarm events based on a handshake. Prior to this agreement, only the community receiving the alarm responded to the event, regardless of which area resided closest. These jurisdictions realized the available opportunity to share resources in a way that would save lives and reduce costs. Ultimately, this handshake served the area well, and over the years, these three counties went onto tackle important issues together—such as voice interoperability and basic CAD interoperability.

"Because we've leveraged each other's assets, we've literally saved millions and millions of dollars in 42 years," Souder said.

Despite the advancements these historic relationships provided to emergency response, phone calls still were needed to confirm resource availability. For example, basic CAD interoperability could show dispatchers static information, including where the 20 closest units were stationed, but not if they were in service or available for dispatch. Dispatchers used tie-lines—phone lines directly tied to reciprocating agencies—to communicate with each other in order to identify available resources, but the time spent going back and forth tracking assets continually wasted precious time. These CAD systems lacked the ability to provide a dynamic unit status update of these resources to other CAD systems. The reliance on static data could result in a delayed response time, spanning up to two minutes.

"Whether your house is on fire or your loved one is having a heart attack, one minute and 44 seconds is a long time. We labored with this time for 42 years," Souder said. Souder further explained that, in today's world, all fire, EMS, and other responders are equipped with GPS or auto vehicle location. "For this reason, it is then vital that CAD systems are able to share this real-time data," he said.

Initial Hurdles to Overcome

Solving the CAD interoperability problem would require overcoming a number of challenges. Initially, CAD vendors had to be convinced to come on board. In order for this venture to be successful, vendors needed to collaborate with emergency responders. While vendors initially wanted to protect their technology and did not want to share it with others, one by one, the three jurisdictions convinced their CAD vendors to collaborate by demonstrating the widespread need to develop a solution that complied with national standards. These standards would ensure the ability to share information across systems, ultimately saving time and resources. As with all new initiatives, creating this CAD system required funding.

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About Interoperability Technology Today

Interoperability Technology Today is published quarterly by the Science and Technology (S&T) Directorate within the U.S. Department of Homeland Security (DHS) at no cost to subscribers. Its mission is to provide the emergency response community, policy makers, and local officials with information about interoperability initiatives nationwide, best practices, and lessons learned.

S&T interoperability programs address both data and voice interoperability. S&T is creating the capacity for increased levels of interoperability by developing tools, best practices, technologies, and methodologies that emergency response agencies can immediately put into effect. S&T is also improving incident response and recovery by developing messaging standards that help emergency responders manage incidents and exchange information in real time.

Through a practitioner-driven approach, S&T creates and deploys information resources—standards, frameworks, tools, and technologies—to enable seamless and secure interactions among homeland security stakeholders. With its Federal partners, S&T is working to strengthen capabilities to communicate, share, visualize, analyze, and protect information.

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Homeland Security
Science and Technology

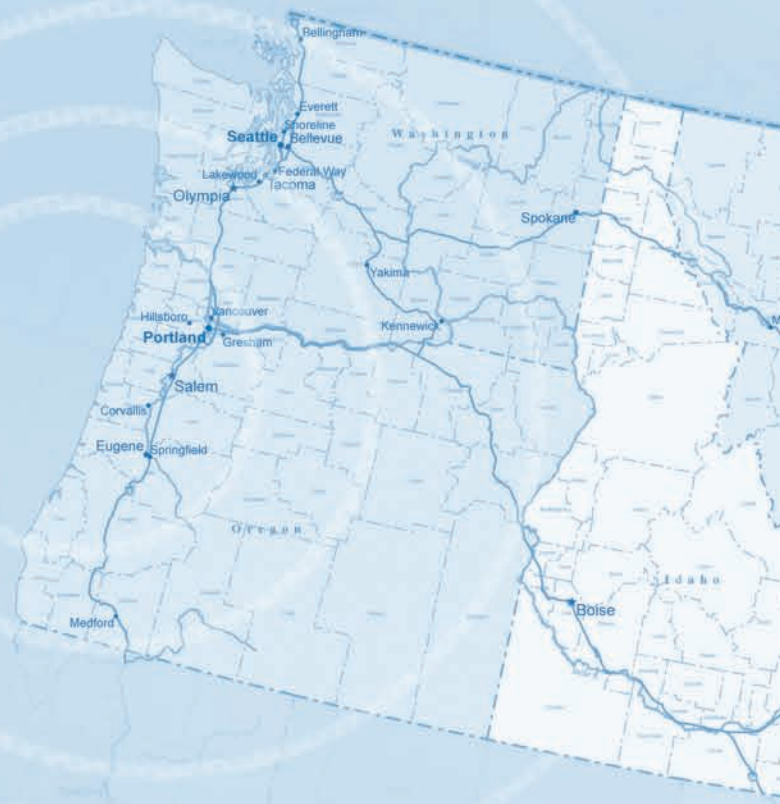
Upcoming Events

Events & Conferences

International Wireless Communications Expo
March 9 -11, 2011
Las Vegas, Nevada
http://iwceexpo.com/iwce2011/public/enter.aspx

National Emergency Management Association
March 20 - 24, 2011
Alexandria, Virginia
http://www.nemaweb.org

Geospatial Solutions Conference
April 10 -14, 2011
Dallas, Texas
http://www.gitaservices.org/websites/gita2011/index.php?p=1



SCIENCE AND TECHNOLOGY DIRECTORATE UPDATE

The Science and Technology (S&T) Directorate of the U.S. Department of Homeland Security has seen first hand how the integration of technology solutions with information-sharing practices can benefit the emergency response community, and as a result, improve the Nation's safety and security. One of S&T's newest initiatives, Virtual USA (vUSA), specifically addresses this vital mission. In its most basic sense, vUSA is committed to the creation of a nationwide capability that significantly improves information sharing and decision making during emergencies.

In order to promote vUSA's environment of information sharing, S&T is spearheading regional pilots that work directly with practitioners to develop insights into ways that emergency management operations can become more efficient and streamlined. Before new technologies and concepts are introduced as hard and fast solutions, pilots play an instrumental role in proving that these tools actually work. A single pilot demonstration rarely generates sufficient information to serve as a national model since every jurisdiction and geographic region possesses different needs and issues. Therefore, it is our goal to conduct pilots in as many places as possible—especially since each pilot builds on those that went before and allows us to develop additional critical capabilities.

One of the newest vUSA pilots is currently underway in the Pacific Northwest (PNW). The PNW Pilot is committed to operationalizing the tenants of vUSA and therefore is focused on information sharing and collaboration on a regional level. Based on current and emerging technologies, the overall goal of the PNW Pilot works to improve emergency management by ensuring that professionals at all levels have access to the information they need to make decisions, when they need it.

Significant Strides in the Pacific Northwest

The PNW Pilot was officially launched in September 2009 in Idaho, Montana, Oregon, and Washington. Once completed, the PNW Pilot will demonstrate a capability that significantly improves information sharing and information availability, thus aiding decision making during day-to-day operations and emergencies from the local level to the national level and across all jurisdictions. In early spring 2010, the S&T Pilot Implementation Team visited each state in the PNW and hosted a two-day workshop to gather an understanding of each state's current operational requirements, business processes, and technical inventory. From these meetings, we gained critical insights that will help to provide a roadmap for each state as they further enhance their information-sharing capabilities.

Regional information sharing continues to advance rapidly due to the efforts in the PNW. In late July, we held a second regional Plenary in Camp Murray, Washington. The Plenary aimed to bring together the PNW states to discuss and demonstrate the progress of states and regions thus far—paying particular attention to the development of vUSA information-sharing capabilities and to identify and define the path forward on regional objectives for the pilot effort as a whole.

During the Plenary, DHS demonstrated vUSA's Generation II Prototype and, in turn, states offered their input and feedback for the use of collaborative development and PNW regional implementation. Additionally, each state received the opportunity to report out on their information-sharing progress and capabilities.

The relationship between S&T and the PNW states represents a true partnership in which roles and responsibilities are clearly articulated in accordance with an approach that each state deems most appropriate. It was communicated during the Plenary that the pilot rests in the hand of each state, and therefore each state is encouraged to stand up and support the work that is currently taking place.

In Memory of Jim Thomas

The homeland security Visual Analytics community has experienced a great loss with the sudden passing of James (Jim) Joseph Thomas on August 6, 2010.

Thomas, a visionary and a leader, inspired research and development in the field of information technology for the duration of his career. He joined the Pacific Northwest National Laboratory (PNNL) in 1976 and rose through its ranks to become a Laboratory Fellow. His international reputation in the area of information visualization laid the foundations for him to become a leader amongst top scientists in academia, industry, and government. He ultimately became a founder of the Visual Analytics field. In 2004, when the U.S. Department of Homeland Security (DHS) established the National Visualization and Analytics Center (NVAC)—housed at PNNL—Thomas was named its founding Director. He served as Director until his retirement in 2009, actively leading outreach, research, and educational activities in Visual Analytics throughout the U.S. and the world. Before his retirement, Thomas received the distinguished Homeland Security Award from the Christopher Columbus Fellowship Foundation for top science and impact in contribution to homeland security.

Over the course of his career, Thomas advanced information visualization techniques and participated in numerous groundbreaking technological advances. In the 1980s, he served as a member of the founding team who conceptualized and developed the core concepts for what is currently used today by the Department of Energy's scientific-user facility at PNNL—the William R. Wiley Environmental and Molecular Science Laboratory. In the early 1990s, to address the problem of information overload, Thomas led a team of information technology researchers to develop the SPIRE document and analytics system. The successor to this groundbreaking system, known as IN-SPIRE™, is still in use today. IN-SPIRE™ can quickly and automatically convey the gist of large sets of unformatted text documents—such as technical reports, web data, newswire feeds, and message traffic. The system allows analysts to spend more time exploring the information they find most relevant and less time sifting through the masses of irrelevant documents. IN-SPIRE™ has been deployed into numerous government agencies. This and other technologies developed under Thomas' leadership, such as the Fused Analytic Desktop Environment and the Law Enforcement Information Framework, continue to be developed and deployed into government and law enforcement agencies.

Jim Thomas in November 2009 at the Capitol Building in Washington, D.C. accepting the 2009 Homeland Security Award from the Christopher Columbus Fellowship Foundation for top science and impact in contribution to homeland security.

As a PNNL Fellow and the NVAC Director, Thomas' greatly influenced and impacted the Visual Analytics community with his innovative career. He organized the Association for Computing Machinery's Special Interest Group on Graphics and Interactive Techniques (ACM SIGGRAPH) conference in 1987, founded and organized the first ACM User Interface Software and Technology gathering in 1989, chaired ACM SIGGRAPH from 1989 to 1992, served as editor-in-chief of Institute of Electrical and Electronic Engineers (IEEE) Computer Graphics and Applications from 2002 to 2006, and chaired the IEEE Visualization Conference in 2003. He also helped found the IEEE Visual Analytics Science and Technology Symposium in 2006. Additionally, Thomas served on numerous industry, government, and international advisory boards.

Many in DHS regarded Jim Thomas as a trusted science advisor and groundbreaking contributor to the Visual Analytics field. He will be missed.

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• In Memory of Visual Analytic Visionary, Jim Thomas