



WITH LIVES AT STAKE,
AMERICA'S BRAIN TRUST
TURNS TO NETCRAFTSMEN



The National Academies is one of the most intellectually prestigious organizations in the world – a collection of nonprofit institutions providing expert advice to researchers and academics confronting the most pressing challenges in science, medicine, and engineering.

And when the Academies had a problem with its phone system — with lives at stake — it called upon NetCraftsmen for a solution.

Consisting of the National Academy of Sciences, National Academy of Engineering, Institute of Medicine, and National Research Council, the Academies produce groundbreaking studies and research that have informed U.S. policy and action on a wide range of scientific and engineering issues.



Its work has included:

1. **An extensive report that inspired the FDA to take more than 40 actions to improve the drug safety system.**
2. **Research that anchored re-authorization of the America COMPETES Act, making the nation more economically competitive.**
3. **Research that raised awareness of, and informed policy decisions concerning, global climate change.**
4. **Deep post-Katrina analysis that included guidance for improved hurricane protection protocols.**
5. **A report that helped ensure the continuation of NASA's Hubble Space Telescope program by shedding light on its impact on astronomic research.**

The private, non-profit institutions constituting the National Academies are a national treasure of brainpower, all dedicated to saving lives and improving the human condition by identifying unknown problems and suggesting novel solutions.

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CHALLENGE

"Our critical issue was that when someone within any of our buildings placed a 911 call, emergency services would show up without really knowing where the call came from or where the caller was," explained Butch Coward, the National Academies' manager of communications. "Yes, they would respond to the correct building, but the National Academies has more than 1,700 dedicated phones throughout three buildings in the Washington, D.C./Northern Virginia metro area. We have about 1,200 staff, but in excess of 1,700 phones if you include everyone's desks as well as common areas and conference room phones. That's a lot of potential points for call origination. We needed much greater precision in our emergency call system."

Coward added that while two of the office buildings are located in downtown Washington, the third, a data center, is in Vienna, Va. Despite the separation, National Academies wanted a system that would accommodate all three, and take into account the size and staff density of each.

In emergencies, seconds count, and any delay could carry tragic consequences. Leaders at the National Academies realized that they needed to act promptly to find an improved emergency call solution.

"To give you a sense of the challenge," Coward added, "consider that our headquarters building on Constitution Avenue is itself 170,000 square feet. The other downtown building, on 5th Street, has 11 floors of staff and five levels of parking. And that data center in Vienna? It's the old AOL headquarters."

Size and spread of the buildings aside, the challenge really stemmed from National Academies' emergency call process. Any 911 originating from within a National Academies building was first routed through that building's security desk, resulting in a potentially dangerous delay. "If someone needed to make an emergency call," noted Coward, "they first called security in their building, who in turn made the external call to 911. You can imagine how that additional time might impact response to a real emergency."

Moreover, he said, "Sometimes people would make an emergency call from their desk using their cell phone. It was a logistical nightmare."

And if, as is typical with many emergency situations, more than one person called about the same incident, the National Academies' security department would be flooded with calls. Security personnel had to become experts in call triage, managing inbound calls while simultaneously dialing out to external emergency service providers.

Coward also explained that this process applied only to valid emergency calls. Because National Academies has so many visitors unfamiliar with their phone system, people would often dial 9 to get an outside line when using a conference room or common area phone. That turned out to be the cause of an abundance of false-alarm calls.

"It was way too much to expect from our third-party security provider," Coward concluded.

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STRATEGY

The existing emergency response system at the National Academies made it impossible for emergency services to know exactly where a caller was located.

"The severity of that speaks for itself," said NetCraftsmen Senior Engineer Andre Wright, the project lead. "Firefighters, EMS, or police responding to a call would know the building, and perhaps what floor, but that was essentially the limit of their knowledge."

The telecommunications team within the National Academies, led by Coward, knew they needed better, so they turned to the Cisco Emergency Responder (CER) System.

The CER System offers an effective solution in multi-phone, multi-location situations in a VoIP environment because it is engineered to achieve four main objectives:

1. **Route emergency calls to a local public-safety answering point (PSAP) — in this case the 911 operator/dispatcher.**
2. **Alert appropriate personnel of emergency calls via both email and phone.**
3. **Keep an automated log of all calls.**
4. **Provide the PSAP with a caller's precise geographic location.**

Implementation of a CER system couples the Cisco Unified Communications Manager with Computer Telephony Integration (CTI) to pinpoint a phone's location. It specifically identifies the "Route Points" within the Unified Communications Manager, which are in turn tied to an organization's 911 directory number.

To reap the advantages of the CER system, the National Academies needed a partner that is highly knowledgeable in Cisco solution implementation — a partner that could execute and fine-tune the solution as quickly as possible. So the Academies turned to NetCraftsmen and the team led by Andre Wright. The experts at NetCraftsmen understood

that implementing the CER System was critical for ensuring employee safety, and they knew how to get the system in place fast, with as little disruption as possible.

"Essentially," explained Wright, "you have IP-based voice communications, so you need a means for instantly determining where a call is originating from, in terms of the servers. CER essentially illuminates the CTI route points within [Cisco Unified Communications Manager], and the National Academies can rest assured that they are getting precise, rapid response."

Of course, realizing the advantage of the system required more than technical proficiency. Both Wright and Coward noted that there are intricate state legislative requirements and organizational protocols that must be factored in. Taking shortcuts on those could jeopardize both the system's effectiveness and the project's regulatory compliance.

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"We had to look at the development of the National Academies' CER solution through the lens of myriad emergency zones. These are areas within the buildings — floor by floor and even sub-areas on each floor or office — that provide a way to compartmentalize the response locations," explained Wright. "You can really fine-tune call visibility thanks to CER, and we did our homework making sure the system would adhere to state mandates."

Andre adds that because of the distribution of National Academies' facilities — the two in downtown Washington and third in Vienna — determining building location for a call was not as significant an issue as knowing where, internally among those buildings, a call would have originated. That's a big reason why designating those emergency zones would help direct first responders to a specific building or floor within that building — and even to the caller's cubicle and workstation.

And achieving that level of specificity required establishing and maintaining good, clear dialogue between NetCraftsmen and the National Academies; reviewing possible emergency scenarios; and carefully weighing the pros and cons of how emergency zones should be set up, especially in light of state compliance requirements.

As Coward noted, the contemporary office building environment — with its dedicated phone lines and workstations, and personnel equipped with wireless devices and mobile phones — poses remarkable challenges of technological integration and management, challenges unimaginable just a decade ago. Patchwork solutions had been put in place to deal with these issues as they arose, but this piecemeal approach had fallen short. The National Academies required a more innovative, integrated approach.

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RESULTS

A critical component to NetCraftsmen's success in implementing the CER System was the team's ability to design, develop, and deploy it within an incredibly compressed timeframe.

"An implementation like this can typically take a few months," noted Wright. "But we knew, without exaggeration, that every minute saved meant realizing improved safety and peace of mind for our client" — who was concerned not only about the well-being of its personnel, but also that of its many visitors and guests who flow through its buildings.

Wright and his NetCraftsmen team were able to execute in only eight weeks a solution that typically requires three or four months to realize. Yet the NetCraftsmen team didn't cut corners or try to force off-the-shelf thinking on National Academies. Instead, the team engaged in constant, clear dialogue with its client, and relied upon hard-earned experience in efficiently standing up CER solutions.

The results, according to Coward, have been tremendous.

"We've eliminated the double-call delay, and the confusion caused by imprecise response. When minutes or even seconds count, the value of that kind of improved efficiency is immeasurable."

"The CER as made possible by NetCraftsmen has given National Academies' users the ability to call 911 and contact first responders directly, with no lag whatsoever," said Wright. "Responders know exactly where the calls come from," and the Academies' personnel in turn also know that their location is clearly visible. "We've eliminated the double-call delay, and the confusion caused by imprecise response. When minutes or even seconds count, the value of that kind of improved efficiency is immeasurable," added Coward.

Asked about the first big change as a result of the solution, Coward didn't hesitate. He noted that prior to the CER system deployment, all of National Academies' phones had stickers on them, instructing users to call internal security in case of emergency, rather than 911. "The immediately visible impact of the new system," said Coward, "is that we took the stickers off all the phones."

Coward further noted that the system's reliability has improved dramatically; users no longer need to worry about dropped calls. The emergency dispatcher can see exactly where the call originated from — right down to the workstation. If a user places a call and gets disconnected for any reason, the answering point has information displayed to their computers.

Another important benefit: The new system alerts building security personnel in real time and informs them of the call's origination point. This gives building security the ability to get to an individual or respond to a situation even before emergency services arrives. Rather than being tied up on the phone placing an out-going call to 911, security officers are on the move, helping to address concerns with informed immediacy.

"The National Academies management team is much more at ease, thanks to the CER solution," said Coward. "The fact that we were able to make this happen for 1,700-plus phones in three different buildings, all in just two months... NetCraftsmen did a heck of a job."



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About NetCraftsmen

Founded in 2001, NetCraftsmen is a consulting company whose engineers are true Master Craftsmen, world renowned for their expertise and experience. NetCraftsmen clients Rest Assured knowing that a team of industry leaders, visionaries, and innovators are dedicated to ensuring that their IT network is built and managed to meet and adapt to today's enterprise demands.



About The National Academies of Sciences, Engineering, and Medicine

The National Academies of Sciences, Engineering, and Medicine are private, nonprofit institutions that provide expert advice on some of the most pressing challenges facing the nation and the world. Academies produce groundbreaking reports that have helped shape sound policies, inform public opinion, and advance the pursuit of science, engineering, and medicine.

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