Scenario

Tinder-box brush conditions, abnormally hot weather, strong gusty Santa Ana winds, and persistent drought, combined with an arsonist’s cigarette lighter, ignited a series of wildfires that had already consumed 500,000 acres of land in California between Los Angeles County and the U.S.-Mexico border. A medium-sized liberal arts college was right in the path of the flames.

Knowing that because of the college’s location there was a good chance it would face a wildfire incident at some point, the school’s security administrators and IT management had collaborated the previous year on developing a multi-modal emergency notification system (ENS). Even before they saw the smoke rising in the distance from this fire, campus authorities mobilized to notify campus constituents—students, faculty, administrators, and other on-site workers—about the threat. Several ENS elements went into play simultaneously, with messages going out over multiple communications media to all people on pertinent subscriber lists. A collection of recorded and visual notices was disseminated via e-mail, text messages, voice mails, the school’s automated call system, its website, and digital signs in all classroom and lab buildings. Thanks to a hosted-services agreement the school had recently arranged, people were able to receive the messages over the web, landline and cell phones, PDAs, and other wireless equipment. A pre-recorded template message announced the wildfire emergency, and this was followed by a live text-to-speech message that reported real-time conditions as they were developing and directed all non-emergency personnel to evacuate the campus. Lastly, traditional technologies—outside sirens and loudspeakers—had been deployed throughout the campus.

By utilizing a variety of media, the college increased the pool of all possible recipients who heard the news and were directed to leave or stay away from the campus during the emergency. No one communications type predominated—a good thing, since the huge two-way traffic in SMS messages created an overload situation that blocked almost three percent of the text messages. Luckily, voicemails to the cell phones of those same intended recipients picked up the slack.

What is it?

An emergency notification system (ENS) provides broad-based notification to pertinent on- and off-campus communities in the event of a crisis or emergency, including natural disasters and acts of terrorism. Emergency communications management is concerned with policies, procedures, and operations that function in concert with an ENS. The tools involved in an ENS can be as simple as external sirens or as complex as solutions that combine elements such as a campus website, telephony, e-mail, text messaging, paging, the campus CATV system, digital signage, network pop-ups, RSS feeds, and fire alarm panels with voice enunciation.

How does it work?

Most ENS operations revolve around the network of subscribers and the institution’s telephony solutions. ENSe’s also use e-mail, texting, campus websites, social networks, and tools such as Twitter. The most effective operations balance technology and human intervention. For instance, at St. Peter’s College, which in 2008 received a threat that resulted in a five-hour campus lockdown, the campus security staff obtained information about the crisis and triggered a notification response, and the IT staff monitored communications infrastructure to ensure the smooth operation of phone, wireless, and campus network systems during the response. Within minutes of receiving the threat, campus security sent out several types of communications. Anecdotal evidence suggests that—though potentially less accurate—word-of-mouth transmission remains a useful adjunct to equipment-based ENS. To reliably communicate with those who need to know, e-mail addresses and phone numbers on emergency distribution lists must be regularly updated.

Simplicity is another goal: Invoking the ENS has to be an easy and straightforward process, kept securely in the hands of trusted operators and mechanisms. In the wake of the 2008 floods that inundated the University of Iowa, emergency planners developed and pre-approved template messages for a variety of crisis situations. These templates also use TTS (text-to-speech) enunciation to announce information as it becomes available, for a combination of live and prepared speech. This process eliminates the need to write accurate, fully informative messages in the midst of a crisis. Voice, however, was just one component of a multi-modal solution that Iowa used to guard against reliance on any one communications medium. The warning system will be expanded to include social networking site notifications. To ensure reliability, it’s necessary to test systems so that the roles of individuals and the limitations of system performance are well understood. (Indeed, as of July 1, 2010, new federal regulations require annual testing of emergency response and notification plans.) In the Virginia Tech shooting of April 2007, the heart of the emergency communications response was an ENS solution that used several different contact methods. If one system fails, others serve as backup.
3 Who’s doing it?
Although virtually every college and university has in place some procedures and protocols for handling emergencies, the readiness to apply effective notification procedures and systems varies widely. While many schools are working to enhance their emergency notification capabilities, they often fall behind in devising ENS applications that can adequately serve their increasingly mobile and wired campus constituents. Of the respondents to an ENS survey conducted by the Steering Committee of the EDUCAUSE Net@EDU Converged Communications Working Group, 84% reported implementing significant features of the ENS operation deployed at their sites; 88% said they would be augmenting these systems in the future in a variety of ways, such as deploying new infrastructure, expanding in-house capabilities for improved contact tracking, and integrating with additional technologies like PA systems, digital signage, television, and alarms.

4 Why is it significant?
Quick, accurate, and widespread dissemination of information in a crisis depends on the smooth operation of a comprehensive ENS. Campus emergencies have become more frequent and more violent; a sophisticated and coordinated ENS can lessen the damage from these incidents. The growth in the speed and variety of Web 2.0 applications requires an ENS infrastructure that can link directly with the kinds of feature-rich messaging opportunities that are now commonplace and that represent an increasingly vital communication channel in a fast-developing emergency. There’s an important psychological factor involved, too—having an effective ENS operating in almost real time during a crisis can calm fears that might otherwise feed on misinformation or a lack of detail.

5 What are the downsides?
However comprehensive and sophisticated an ENS, no single mechanism can contact everyone who needs to know what’s happening. Each mechanism is individually fallible, so a mix of backups and redundancies has to be employed to increase the likelihood of contacting everyone. SMS text messaging carries several weaknesses, the first being that it competes directly with cellular calls for network resources. In emergency situations, an institution might disseminate thousands of SMS and phone warnings, even as students, faculty, staff, and parents are sending their own messages and making calls. The clash between the two streams of texts can hurt the network’s performance and prevent messages from getting to their target destinations. Also, the 160-character limit compromises message scope, and the format can easily be abused with frivolous or inscrutable messages. Another complicating factor is building an accurate distribution list for contact information. In a simple opt-in process, recipients provide cell phone numbers, which makes it easy to join the list. But when colleges and universities require an extra step, in which recipients also must respond to a verifying SMS message, enrollment rates tend to suffer. When the University of Notre Dame switched from this so-called double-opt-in model to simply auto-loading cell phone numbers, student participation jumped from 62% to 99.8%. Another impediment to ENS solutions is cost: In an April 2009 study by Campus Safety magazine, nearly one-third of respondents said cost was the primary obstacle to mass notification.

6 Where is it going?
ENS deployments are trending toward emphasizing multimodal techniques to contact people in a crisis and using more than one alert system. The campus will control most technical elements in these operations. What’s becoming desirable, especially for larger institutions, is having the flexibility to add information subscribers and integrate with existing notification systems. Blending ENS technology with accurate emergency messaging in this way requires a close, comfortable synergy between campus security and IT officials. ENSs in higher education are becoming more common—in the 2009 Campus Safety survey, 63% of respondents had deployed new or renovated ENS in the past year, and 51% planned to do so in the coming year. The modes that institutions intended to implement were loudspeakers (38%), text messaging (35%), e-mails (35%), and digital displays (31%). Making advance decisions is assuming critical importance, too, so that communications can be set in motion almost as soon as an emergency is identified. This includes having pre-recorded and pre-defined message templates for specific types of emergencies and alerts. The policy objective is to avoid confusion, indecision, and delay between the initial observation of the crisis and the authorization to dispatch emergency notifications.

7 What are the implications for higher education?
If an institution’s ENS fails to adequately notify the academic community of an emergency situation, applications could see a significant decline. Because high-tech connectivity will become more widespread and more important to all the communities on campus, universities must decide whether their ENS operation will be available for non-emergency communications, too. If it is, its effectiveness will be compromised in a crisis. As colleges and universities refine their ENS posture in response to new emergencies and product and service breakthroughs, they must coordinate many dimensions of emergency preparedness—cutting-edge notification technologies, communications management protocols, and operational and strategic policies. Because higher education bears a responsibility for the safety and welfare of students, faculty, staff—and, to some extent, the surrounding community—ENS development and maintenance must be among their highest priorities. And, since technologies and the ways in which they’re used are always changing, colleges and universities must continually evaluate and refine their ENS plans to be as prepared as possible for the next crisis.

EDUCAUSE is a nonprofit membership association created to support those who lead, manage, and use information technology to benefit higher education. A comprehensive range of resources and activities is available to all EDUCAUSE members. The association’s strategic directions include focus in four areas: Teaching and Learning; Managing the Enterprise; E-Research and E-Scholarship; and the Evolving Role of IT and Leadership. For more information, visit educause.edu.