



Campus-Wide Mass Notification: Reaching everyone, everywhere, at any time

It has been four years since the shots at Virginia Tech University reverberated throughout college campuses across the United States. Administrators wasted little time reviewing their own security policies and technological capabilities to disseminate emergency messaging. Many streamlined the decision-making process for activating warnings, added sirens, and upgraded what were primarily web-based alert systems. Threat assessment teams were developed.

The main campus of Northern Illinois University (NIU) was one of the universities that instituted emergency notification improvements and quickly realized how worthwhile their investments were. Having studied the lessons learned from Virginia Tech, NIU enhanced their notification system by integrating additional communications modalities and adopting new policies. So, when a mentally ill former student killed five students and wounded 18 before committing suicide a mere 10 months after the Virginia Tech shootings, everyone on NIU's campus received an immediate warning and instructions on what to do. Messages and updates continued until the crisis was resolved.

White Paper

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Reaching Everyone with Mass Notification

When an emergency occurs, it is essential to simultaneously warn everyone with what could be life-saving information. With so many students, faculty, staff and visitors spread across a wide area and engaging in a variety of activities, there needs to be a way to deliver critical safety information to everyone regardless of the time of day or what they may be doing. Whether driving, working on a computer, walking to class, attending a sporting event, or sleeping, such messages must reach everyone immediately. If warnings are sent and received in a staggered fashion, or if only part of the campus community is notified, the stage is set for rumors, high anxiety, and confusion. Officials must then contend with a significant information management challenge - correcting misinformation and controlling panic, which draws resources away from responding to and handling the actual emergency.

Those responsible for communicating a warning on campus should have the best, most effective tools available to carry out their mission and provide a comprehensive, timely and informative message to take protective action. The only way to accomplish this is by using all relevant methods of communications to get the message out rapidly and simultaneously to everyone. A Mass Notification System (MNS) sends emergency alerts and instructions to cell phones, computer screens, landline phones, closed circuit TV screens, loudspeakers, and more. A robust, reliable MNS provides peace of mind that all concerned parties will receive an emergency alert.

A comprehensive, multi-modal MNS includes a full range of communications modalities. By connecting the various layers of messaging, those responsible for issuing the message can be assured that the whole campus is alerted at the same time.



Multi-Modal, Integrated MNS

Until recently, people had to rely on sirens and radio and television broadcasts for emergency information. Fax machines, computers, cell phones, Facebook, and iPods were unheard of. Today's electronic tools and instant connectivity offer many more options for rapid, mass notification. A comprehensive, multi-modal MNS includes a full range of communications modalities that offers, for example, web-based systems as one layer, mass-dialing systems as another, closed circuit television as part of another, and so forth. Since the goal is to reach everyone at anytime, the various modalities need to include communications vehicles that actively interrupt as well as those that are more passive (e.g. a user must take action to access the information as from a website, a text message, etc.).

A multi-modal MNS includes visual warnings (text, flat panel and message board displays, strobe lights for the hearing impaired, etc.) as well as audible warnings (voice instructions through a fire alarm system, sirens, outdoor speakers, etc.). All communications modalities are critical and necessary. By connecting the various layers of messaging, those responsible for issuing the message can be assured that the whole campus is alerted at the same time - wherever they are and whatever they are doing.

New technology allows campuses to build onto their current communications and information infrastructure, connecting additional modalities and networking all the pieces so they operate together. In an integrated, multi-modal MNS, all components function from one platform thereby eliminating the need to operate several disparate systems. All parts of the communications system are connected and can be scaled up or down depending on the situation.

Additional Options and Flexibility

In addition to layering different communications modalities, messaging can be organized according to different groups and locations or levels of alert. For example, if there is a fire in a building, the occupants of that building and adjacent buildings need to be alerted, but people in buildings a block or more away might not need to be. Likewise, a gas leak in one building might pose a safety risk for those in the immediate vicinity, but not to individuals on the other side of campus. Since it may not be necessary or even general practice to evacuate all the buildings on campus when an emergency occurs, notification can be targeted to the locations and occupants that need to know.

Not all emergency communications involve imminent danger or a crisis situation; they might provide notice of a possible natural or manmade threat. Such information is regularly provided, for example, by the National Weather Service. Their severe weather "watches" communicate that an event might occur and provide a timeframe so that people can prepare for the possibility. If that weather does materialize, the watch is upgraded to a warning with corresponding heightened alert and more frequent broadcasts. That sort of message staging can be programmed into an MNS.

Likewise, a campus MNS can store pre-scripted emergency messages based on likely scenarios. These can be made part of the MNS and downloaded so that the operator can then insert particular details and disseminate the message quickly, saving time. Creating basic message content in advance is standard practice at most Emergency Operations Centers. Campuses can be guided by the Institute of Electrical and Electronics Engineers (IEEE) standard number 1512-2006: Standard for Common Incident Management Message Sets for Use by Emergency Management Centers. Likewise, the Organization for the Advancement of Structured Information Standards (OASIS) established a Common Alerting Protocol (CAP) and an Emergency Data Exchange Language (EDXL) Distribution Element. All of these are integral to the National Incident Management System (NIMS) that all levels of government, and many private entities such as airports, follow.

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- Campus Safety Magazine, 2009 survey on mass notification



75% of colleges and universities do not have the capability to broadcast an audible warning within their residence halls that includes instructions on what actions to take
 - National Campus Safety and Security Project, 2008 survey

A Web-Based Notification System is Not Enough

It would be hard to find anyone who does not own some type of personal communications device. As such, it is tempting to think that sending out text alerts or leaving a voice message will cover all the bases when it comes to emergency communications. Generally, however, those messages will only be received if and when users register or opt in to be alerted through the campus system. Many schools do not make registration mandatory. A 2009 survey on mass notification conducted by Campus Safety Magazine found that the average percentage of students who signed up for an automatic text alert system was less than 50%. The 2008 National Campus Safety and Security Project found that only about one-fifth of campuses surveyed (340 schools responded) had any real success with registration for emergency notification. One solution that some colleges and universities have used is to make registration an opt-out rather than an opt-in choice.

Codes and Standards

There are other reasons for ensuring that a campus MNS is not exclusively restricted to web-based communications. New code provisions are the yardstick against which MNS systems are being measured now and will continue to be in the future. For example, the 2010 edition of the NFPA 72 code states very clearly that a web-based alerting solution by itself is not enough and should be combined with other audible/visual components. This requirement, in addition to several others currently on the horizon call for more reliable, extensive and integrated mass notification technologies and capabilities.

Sections of the Occupational Safety and Health Administrations' (OSHA) Part 1910 declare that workplaces (including colleges and universities which receive federal funding) must have emergency action plans and employee alarm systems. The alarm systems must use distinctive signals to indicate the type of action that should be taken, e.g. evacuate the area or other responses per the established emergency response plan. The employee alarm "shall be capable of being perceived above ambient noise or light levels" ...[and] "tactile devices may be used to alert [individuals] who would not otherwise be able to recognize the audible or visual alarm." (1910.165(b)(2)) United Laboratories is planning to add emergency mass notification systems to its list of products for which UL attaches standards for testing and approval. The final standard would pave the way for allowing non-fire voice messages to be layered onto a fire alarm voice system.

Reliability Issues

Web-based notification can be unreliable. Natural disasters like tornados and hurricanes can damage cell phone towers. Topographical conditions sometimes create spots where reception is poor, and experience has shown that such systems are quickly overwhelmed when a major event occurs (the day of the shooting, Virginia Tech experienced a 3,000% increase in web site access and a 50,000 call increase over normal volume to the switchboard; internet gateway capacity had to be increased by 300%). In addition, cell phones, computers, and other devices which rely on web-based technology are not always turned on, monitored, or able to be heard. It is concerning that, in another of its survey results, the National Campus Safety and Security Project found that 75% of colleges and universities do not have the capability to broadcast an audible warning within their residence halls that includes instructions on what actions to take. At 3:00 in the morning, should such an incident occur, this could present a serious problem.

Anyone who has ever managed disaster communications knows how quickly systems can become overrun. Cell phone calls cannot get through due to volume and land lines generate a constant busy signal. One of the features of a multi-modal, integrated MNS is the ability to ramp up to full capacity rapidly during surge requirements when communications systems are stressed.

Tell Them, then Tell Them Again

Research shows that a message has to be delivered multiple times in multiple ways for it to be taken seriously and for recipients to act accordingly. We know this from our own experience. When, for example, someone tells us that a blizzard will bring 12 inches of snow the next day, we check with others to see if they have heard the same thing. We turn on the radio and we watch the weather report on the evening news for formal confirmation and additional details. Repeating emergency information is necessary – a multi-modal, integrated MNS allows for messages to be delivered using an array of messaging technologies.



Cost-Benefit Issues: Making the Case for MNS Upgrades

There will obviously be costs associated with upgrading an MNS to a multi-modal system that can be integrated with your legacy system. As with any budget item, this one will compete with others for priority. The main question that needs to be asked is what are the overall benefits of a layered, integrated MNS?

Universal Benefit

An investment in life safety is one that pays dividends for the entire campus community: students, administrators, faculty, staff, and visitors. Building the capacity of an MNS equally benefits everyone who studies at, works for, or lives on campus. If one divides the cost of a layered, integrated MNS by the total number of students, administrators, faculty, and staff, the cost per individual is quite low.

Single Point Operation

An integrated, multi-modal MNS can bring multiple stand-alone systems under one umbrella to connect all data points, processes, and procedures related to life safety, information sharing and communications. An upgraded MNS allows operators to monitor the system in all buildings. When functionality is compromised, the MNS can automatically send an alert to a radio or phone, providing these individuals with an immediate diagnosis and remedy. The system also records the steps which are necessary for reporting and review. Many of the current manual procedures can be eliminated with an integrated MNS through automated functionality. This can significantly improve business workflow and produce associated cost savings.

Augment, Not Replace

Most campuses have already made a significant investment in life-safety, communications and information technology. Supplementing existing systems to enable them to operate faster and more efficiently is a smart decision that maximizes the functionality of the installed base. When serious incidents or natural disaster occur, an integrated, multi-modal MNS is an essential tool for all aspects of emergency preparedness: warning, response, recovery, and mitigation. Beyond providing critical information to responsible campus staff, the integrated video, access control, and third-party alerts can assist local fire and rescue teams and police departments as well.

Though the first priority is immediate and thorough emergency communication, a comprehensive MNS can also serve as an all-purpose system for regular information dissemination, including reminders about campus events, school or building closings, deadlines for adding or dropping classes, and more.

Protection from Litigation

Campus security directors as well as administrators at every level are intimately and continuously concerned with reducing costs and limiting the risks and liabilities to which their school is exposed. Disastrous situations present unique risks, and although not all emergency situations threaten potential legal consequences, one of the more serious concerns involves the inability to immediately and effectively communicate accurate, actionable information. Inadequacy in this regard can result in serious and far-reaching legal problems. Costs attributable to Virginia Tech's communications failures were in the millions of dollars and included legal counsel, case preparation, and awards to plaintiffs. As a result of both this and the tragedy itself, the school has instituted many upgrades to their system, adding and integrating a wider range of communications modalities and correcting their alert authorization policy.

Universities work hard to build and maintain excellent reputations for academics, research and 'the college experience'. Ensuring that the campus also excels in safety is becoming an increasingly important factor in how a school is rated and perceived. A solid reputation as a safe campus that cares about its students and employees is very important to recruitment, growth and support from alumni and the surrounding community.

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Compliance with Clery Act Changes

Changes to the Clery Act, effective July 1, 2010, have a direct impact on campus security and emergency communications. The term “campus” is now more comprehensively defined as all buildings and property in support of the educational mission, including residence halls and other school–owned buildings or property (whether controlled by the university or not) such as eating and retail establishments. In essence, the responsibility for security, life safety, monitoring and emergency communications covers all locations reasonably contiguous to, owned by, and used as part of the institution’s mission and campus life.

Colleges and universities are now required to annually submit a security report that includes a description of the policies for timely warning. The Clery Act primarily pertains to crime so warning is mandatory for all instances that pose an ongoing threat, including those where the perpetrator has not been identified and/or arrested. That said, warning as it relates to any threat to life and safety is applicable. Failure to comply carries some tough penalties, including loss of eligibility to participate in student federal aid programs. This is not an idle threat: Virginia Tech is in jeopardy of losing \$98 million in federal student aid in addition to paying various fines based on noncompliance with the timely warning requirements of the Clery Act.

Steps for Determining Mass Notification Improvements

A good way to begin planning for MNS upgrades is to start with ensuring that the goals are clearly understood and comprehensively spelled out. For example, what do you want to achieve and what is the timeframe in which you want to make improvements? Next steps include adhering to and following a standard planning process. What mass notification capabilities are already in place and what upgrades are needed to have a fully integrated, multi-modal system (including web-based and non web-based functionality)? Consider all possible scenarios for which the campus community would need to receive immediate notification and instructions, and factor in any extenuating circumstances. If there is a widespread power failure, how will you communicate? If it is the middle of the night, how will students in residence halls be reached?

Once you identify what you want to accomplish and where the gaps exist in your ability to meet objectives, you can then specify the requirements of necessary upgrades. Document the capabilities you are looking for and use those as a shopping list when identifying potential vendors. The following capabilities are appropriate ones to include on any list you create:

Desired Capabilities for Mass Notification

1. Ability to reach the entire campus and surrounding community in the event of an immediate threat
2. Provide real-time device status, information and instruction utilizing multiple communication modalities
3. Provide communications visually and audibly; indoors, outdoors and off-campus through personal and public means
4. Allow simplicity of activation of multiple messages via a single point of activation
5. Provide multiple means of two-way communications for event reporting and message verification
6. Provide an audit trail for detailed post-alert reporting
7. Maintain back-up capabilities that address system vulnerabilities
8. Be flexible and scalable with long-term vendor commitment to address changing needs and technology advances



Final Note

It is important to remember that an MNS is one component of a larger, more comprehensive campus emergency preparedness and response program. The functionality, capabilities and standard procedures of MNS need to be reflected in an emergency communications plan, the overall emergency management plan, and in the procedures of the security monitoring facility or emergency operations center. System security is an important consideration as well. It is essential to ensure that notification policies (who is authorized to send alerts, what the hierarchy or priorities are for disseminating information, and who is in charge of managing public information related to disasters) are aligned with MNS technology. There should be clear guidelines for how the system is used to communicate non-emergency information and how it will switch over to high-alert mode in the event of an emergency. In the best cases, technology, people, plans, and policies operate in conjunction with one another, are consistent, and mutually support security and emergency communications goals. This presents an ongoing but critical challenge as it potentially impacts the welfare of all who consider the campus their home and source of pride: students, administrators, faculty and staff and the surrounding community.

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Subject to change without prior notice
Order No.: 153-FIS-104
Printed in USA
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