

Real Time Notification During a Disaster or Other Emergency

Internet2 Member Meeting Disaster Recovery BoF

11:45-1:15, April 23rd, 2007, Crystal City, VA

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Recent Events

- Our hearts and prayers go out to our colleagues from Virginia Tech, and to all the members of the Virginia Tech community affected by the terrible tragedy there.
- Please note that any observations or suggestions made during this talk are not meant to "second guess" the handling of the Virginia Tech tragedy in any way, particularly since details surrounding that incident are still emerging.
- At the same time, we know that tragic event has generated tremendous interest within higher education, particularly when it comes to concrete steps which other campuses might be able to take to improve their own readiness.
- One area which seems to particularly resonate at many sites is a mechanism for **real time emergency notifications**.
- Given the disaster recovery focus of this group & the system and network-related roles many of us play, here we are....²

Why Is Real Time Emergency Notification Service Needed?

- Real time emergency notification can provide a mechanism for campus authorities to provide guidance while an emergency is ongoing, including both:
 - **information about the nature of the emergency**, and
 - **actions which the community can take**, such as:
 - avoid a particular area of campus
 - lock down/shelter in place
 - be on the lookout for/report the location of a missing child, disoriented elderly person, escaped convict, etc
 - evacuate a particular building, etc.
- You should also be aware of campus "timely warning" obligations imposed by **The Clery Act**.

The Clery Act...

- Federal law enacted 1990 (subsequently amended in 1992, 1998 and 2000), following the murder and sexual assault of Jeanne Clery, a freshman at Lehigh University, and the discovery that campus had not been apprised of 38 violent crimes on campus in the 3 years preceding that attack.
- Applies to all institutions receiving Federal Title IV student financial aid funds (e.g., virtually all of higher ed)
- The Department of Education is charged with enforcement
- Penalties include fines of \$27,500/incident, and may even include revocation of institutional permission to participate in all federal student financial aid programs
- Clery Act Handbook available from Department of Education at <http://www.ed.gov/admins/lead/safety/handbook.pdf>
- Why is this relevant here? The Clery Act includes a "timely warning" provision for specific enumerated crimes.

Timely Warning: 34cfr668.46(e)

- **Timely warning.**

(1) An institution must, in a manner that is **timely** and **will aid in the prevention of similar crimes**, report to the campus community on crimes that are--

(i) Described in paragraph **(c)(1) and (3)** of this section;

(ii) **Reported to campus security authorities** as identified under the institution's statement of current campus policies pursuant to paragraph (b)(2) of this section or local police agencies; and

(iii) Considered by the institution to represent a **threat to students and employees**.

(2) An institution is not required to provide a timely warning with respect to crimes reported to a pastoral or professional counselor. [emphasis added to the above]

Section c(1) Reportable Crimes

- (i) Criminal homicide:
 - (A) Murder and nonnegligent manslaughter.
 - (B) Negligent manslaughter.
- (ii) Sex offenses:
 - (A) Forcible sex offenses.
 - (B) Nonforcible sex offenses.
- (iii) Robbery.
- (iv) Aggravated assault.
- (v) Burglary.
- (vi) Motor vehicle theft.
- (vii) Arson.
- (viii) (A) **Arrests** for liquor law violations, drug law violations, and illegal weapons possession.
- (B) [as (A), except referred for **campus disciplinary action**]₆

Section c(3) Reportable Crimes

- Reported crimes if a hate crime.

An institution must report, by category of prejudice, any crime it reports pursuant to paragraphs (c)(1)(i) through (vii) of this section, **and any other crime involving bodily injury reported to local police agencies or to a campus security authority, that manifest evidence that the victim was intentionally selected because of the victim's actual or perceived race, gender, religion, sexual orientation, ethnicity, or disability.**

Some Clery Act Questions

Quoting from PDF pages 75-76 of the ED Clery Act Handbook,

"By now you are probably asking, "What do you mean by 'timely'?" and "How do you expect me to alert everyone?" Neither the Clery Act nor ED define "timely." The warning should be issued as soon as the pertinent information is available because the intent of a timely warning is to alert the campus community of continuing threats especially concerning safety, thereby enabling community members to protect themselves. [emphasis added]

"Although the format for the warning has not been mandated, the notice must be timely and reasonably likely to reach the entire campus community and aid in the prevention of similar crimes. Therefore, timely warnings must be issued in a manner that gets the word out quickly communitywide. They may be e-mailed, posted around campus, or otherwise distributed according to your institution's policy. A combination of dissemination methods may be used. Timely warnings may not be issued in a manner or posted in a location that requires the campus community to make requests for them or to search for them. The responsibility for the warning rests solely with the institution."

Some Non-Clery-Related Potential Emergency Notification Scenarios

- **Severe weather**, such as a tornado threatening the campus, or similar **natural disasters** including floods, mudslides, earthquakes, etc.
- **Widespread class cancellations** due to power failure, burst water mains, heating system failures or other campus **infrastructure issues**
- **Bomb threats** or other situations where one or more campus buildings need to be evacuated
- **Hazmat** contamination-related incidents
- The list of potential incident categories justifying implementation of a real time emergency notification capability is fairly long...

Who Might Be Notified?

- All members of the campus community in a particular part of campus, such as all people in a particular building
- Those with responsibility for particular facilities or buildings (building managers, resident assistants in residence halls)
- Institutional executive leadership
- Emergency response teams
- Communications staff
- Students/employees who may be at home or in transit (sometimes you'd like folks who are currently off campus to simply stay off campus until an incident has been resolved)
- Parents and others who may be worried about family members going to school at the site of an incident
- Or simply all members of the campus community

Users With Special Needs

- When planning for real time emergency notification systems, be sure to keep users with special needs in mind:
 - if you're doing voice or audio notifications, alternatives which will work for deaf users merit consideration
 - if you're doing text-based notifications, you'll want to evaluate how those text-based notifications interact with screen readers or other adaptive technology solutions which may be in use by blind users on campus
 - university environments may have a larger than normal number of non-native-English speakers, including family members accompanying visiting international faculty, etc.
 - university members are also more likely to be "on the road" than typical users, including doing field work in remote areas or overseas; options for staying in touch with those users (beyond email) may also need attention₁

Institutional Contact Database

- Doing notifications require **current** and **correct** contact information for all those being notified. At a minimum:
 - Name
 - **Email addresses** (including the one they actually read!)
 - **Phone numbers** (work, home, cell, pager, fax)
 - **Location information** (classroom locations & class times, work address, residence hall address or other local address, home address)
- This data is needed not just for students, faculty and staff, but also parents and other family members, etc.
- That leads to the question: how does this database get **initially populated** and **maintained over time**?
- Missing and stale data can be a real bear...
- This is also data which needs to be carefully protected from being leaked (spammers would love this sort of data!)

Control Over Emergency Notifications

- Because we're talking about an extremely powerful and potentially disruptive capability, you really don't want unauthorized emergency notifications getting sent by a hacker/cracker, nor do you want inappropriate notifications getting sent (cancellation of this week's ball game, while disappointing and unfortunate, is not an emergency)
- This implies that any decision to use a campus real time emergency notification system needs to be vested with senior officials, whether that's the chancellor/president/provost's office, the campus police, campus communications staff, legal counsel, or some combination of the above.
- Caveat: at the same time, you don't want an approval process that's so tightly controlled that it's impossible to get critical notifications sent during a genuine emergency!
- Document and test your policies and procedures!

How Might Notifications Be Done?

- Automated phone notification (to cell phones, campus phones, home phones, plus fax machines and TDDs)
- Email
- Short message service/text messaging to portable devices
- Postings to the university's web site (RSS support?)
- Desktop/laptop notification via a specialized client
- AM/FM broadcast radio; broadcast and cable TV
- Instant messaging
- Campus two way radio systems (as used by facilities, etc.)
- Tone alert radios (such as those from warningsystems.com)
- Campus signs/electronic reader boards/public area video
- Fire alarm intercom service/campus PA system/sirens

Automated phone notification is the highest profile option

(Some) Phone Notification Vendors

<http://www.amcomsoft.com/notification.cfm>

<http://www.athoc.com/AtHocSite/default.asp>

<http://www.coderedweb.com/>

http://www.codespear.com/MassCitizenAlert_4679.aspx

<http://www.dccusa.com/high-speed-notification.asp>

<http://emtel911.com/>

<http://www.enera.com/>

<http://www.e2campus.com/>

<http://www.group2call.com/>

<http://www.madah.com/>

<http://www.messageone.com/crisis-communications/>

<http://ntigroup.com/>

<https://www.onecallnow.com/index.asp>

<http://www.redalerts.com/>

<http://www.reverse911.com/index.php>

http://www.sendwordnow.com/crisis_communications.aspx

<http://www.swiftreach.com/srn2/>

<http://www.teleminder.com/>

<http://www.tfcci.com/>

<http://www.tti.net/>

<http://www.3nonline.com/>

Redundant Channels

- For a suitably serious emergency, use of redundant notification channels may (or may not) be appropriate.
- Why?
 - Some notification channels may not work (e.g., the cellular phone system may be down or **overloaded**)
 - Some users may not have access to their email or to messages left on a home answering machine, or they may not think to check the institutional web site, etc.
- On the other hand:
 - If you go overboard, you may **contribute to overloading** critical emergency communication systems at a key time
 - Even if you don't directly contact EVERYONE, if you at least contact ENOUGH people, those you miss will get the word from those you did successfully reach

Feedback on Delivery Attempts

- Because not all delivery attempts will succeed, your mass notification system should (ideally) be able to identify:
 - Failed phone calls (system busy, line busy, number out of service, pickup-and-hangup, answering machine, etc.)
 - Bounced email (invalid email address, spam filter issues, overquota accounts, other non-delivery scenarios)
 - etc., etc., etc.
- If you can identify failures as they occur, you may be able to *selectively* employ redundant communication channels, particularly for high priority notification targets, thereby insuring your message makes it through, but in a way that does not contribute to overloading communication systems.

Priority Communication Access?

- Speaking of communication system overloading during emergency periods, sometimes you may hear reference to special "high priority" communication capabilities.
- An example of this is <http://wps.ncs.gov/> (the Federal Wireless Priority Service, aka "star 272" service), which allows approved national security/emergency preparedness users to complete emergency calls on overloaded networks.
- Be careful about mass notification service touting the ability to broadly employ priority access since things like WPS (and GETS, the Government Emergency Telecommunication Service, the wireline equivalent of WPS) specifically include terms such as "GETS and WPS access codes and PINs may not be programmed into mass calling equipment"
- BTW, an interesting article on priority calls and next gen IP networks at http://www.ncs.gov/news/2007/signal_article1.pdf

So, Since Cellular Voice Networks May Be Crushed In An Emergency...

- Campuses may want to consider partnering with cellular providers now to increase capacity servicing campus areas, including facilitating the placement of additional campus cell sites (but I'm not sure it is economically possible to build out enough capacity to allow everyone with a cell phone to all place a call at the same time during an emergency!)
- Alternatives to cellular **voice** mass notification systems may be worth considering, such as SMS (short message service)
- Just as cellular networks may experience extreme loads during an emergency, you may want to consider "overbuilding" or adding additional capacity to campus email and web servers, instant messaging infrastructure, campus voice mail servers, etc.

And Speaking of Email

- As part of your planning for real time emergency notification capabilities, you may want to review your existing ability to actually do mass emergency notifications via email.
- Because of potential non-emergency email "intrasпам" concerns, many sites may not have existing the ability to do mass campus notifications via email, or if those capabilities do exist, they may be primitive at best. For example:
 - how long would it take to email all users?
 - could you send emergency email just to students in a particular residence hall? or just to students and faculty with classes in a particular campus classroom facility?
 - do you have pre-written template messages for potential scenarios, handling things like the orderly evacuation of facilities, instructions for locking down/sheltering in place, or letting folks know that things are all clear?

Web Infrastructure

- After an initial succinct "push" real time mass notification, expect campus community members to seek more detailed information on a "pull" basis as events unfold.
- Do your prepared template messages address how you'd like users to get that additional information? For example, do you want them to look at your home page, or do you want them to watch a local TV station or call a special recorded emergency information number for further information?
- At most sites, getting accurate information up on the institutional home page should be a high priority, including construction of an FAQ based on inquiries and concerns that staff may be hearing from students, the news media, etc.
- A ready-to-go mechanism which will allow users to "check in," or report that they are safe, may also be of substantial interest in the event that another "9/11"-scale incident occurs.

Communication System Survivability

- Beyond issues of available capacity on potentially overloaded critical communication systems, it may also be important to plan for sheer system survivability in an emergency scenario: depending on the nature of an emergency, some critical infrastructure (such as commercial power, landline telephone system, the campus network, campus systems, etc.) may be unavailable for real time emergency notification purposes.
- Real time emergency notification related facilities should be hardened to resist these sort of outages:
 - secure data center resistant to extreme weather
 - backup power (commercial plus campus power sources, with a generator backed UPS?), via redundant feeders
 - backup HVAC (system overheating can be a huge issue!)
 - multiple local POTS providers
 - etc., etc.

Want A Simple Warning System?

- You may also just want a simple backup, like a campus siren.
- Local siren systems don't have the sophistication of phone mass notification systems, but they are simple, time-proven, potentially affordable (or potentially quite expensive!), and offer the ability to reach those who may not have a phone.
- On the other hand, siren-based systems can't deliver fine-grained alerts – even two or three different siren "codes" may be confusing or misunderstood. Quick, what's the difference between a steady signal from a siren and a rising and falling signal? How about a pulsed on/off signal? Keep it simple!
- (Some) current siren vendors:
 - <http://www.americansignal.com/>
 - <http://www.atisystem.com/>
 - <http://www.federalwarningsystems.com/>
 - <http://www.hormannamerica.com/>
 - <http://www.klaxonsignals.com/>
 - <http://www.sentrysiren.com/>
 - <http://www.whelen.com/>

Speaking of Sirens, What About the Federal Emergency Alert System?

- 47 CFR Sec. 11.55 EAS [Emergency Alert System] operation during a State or Local Area emergency.
 - (a) The EAS may be activated at the State and Local Area levels by broadcast stations, cable systems and wireless cable systems at their discretion for day-to-day emergency situations posing a threat to life and property. Examples of natural emergencies which may warrant activation are: tornadoes, floods, hurricanes, earthquakes, heavy snows, icing conditions, widespread fires, etc. Man-made emergencies may include: toxic gas leaks or liquid spills, widespread power failures, industrial explosions, and civil disorders.

www.access.gpo.gov/nara/cfr/waisidx_03/47cfr11_03.html₂₄

Other State or Federal Assistance?

- Depending on an institution's location or status, additional state or federal support may be available, although I'm not seeing any directly applicable federal grant programs for real time mass notification systems from FEMA, the Department of Homeland Security, or other obvious agencies (but I may have missed something applicable).
- Be sure to check with your state emergency management office for relevant grants, training or other support opportunities.
- Thanks for the chance to talk today! Any questions?