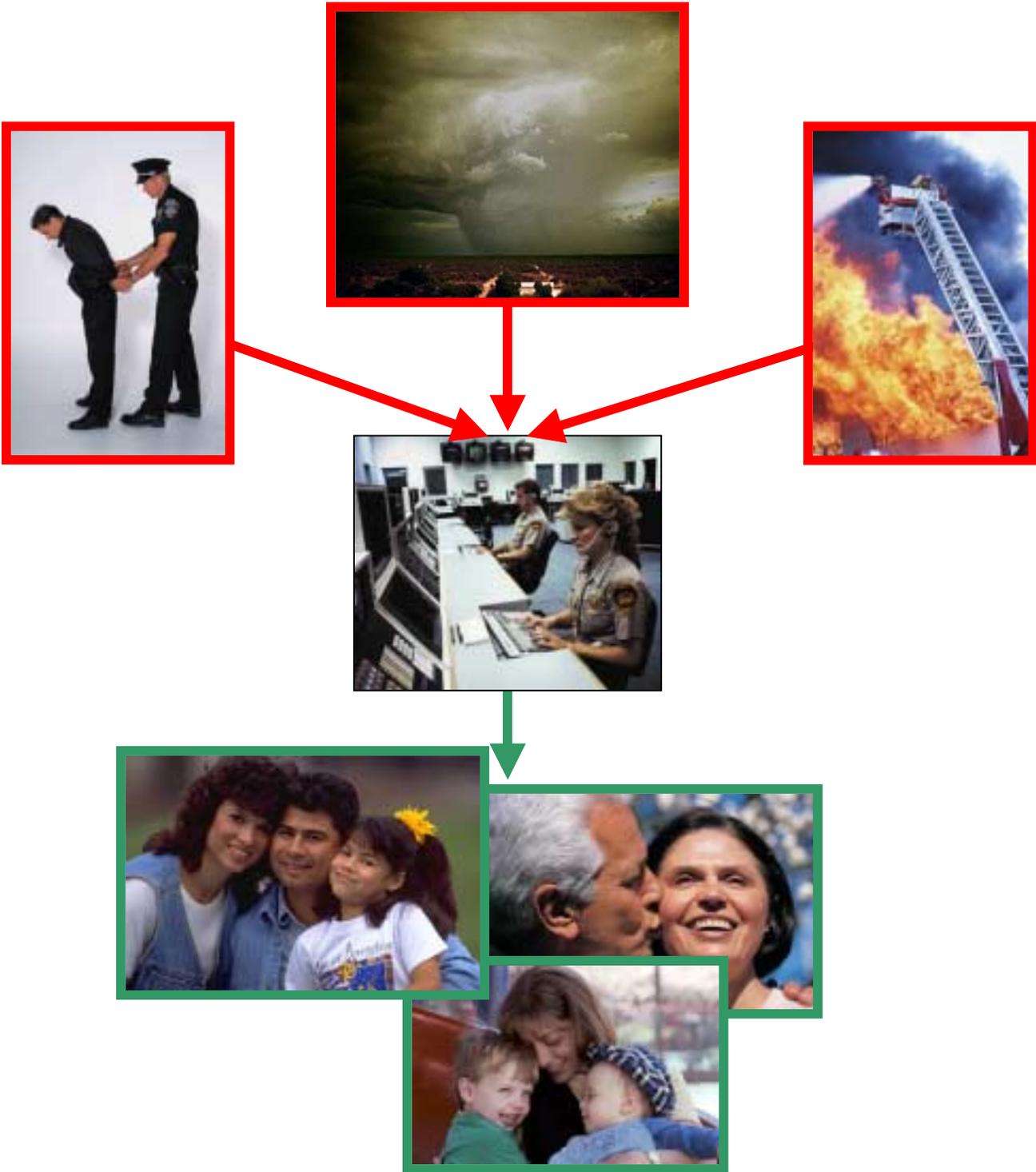


Emergency Telephone Notification: Critical Requirements

Prepared by Intrado®





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INTRODUCTION

Using the telephone to distribute event-specific information to distinct portions of the population in times of crisis is rapidly becoming a "must have" tool for public safety organizations nationwide. While no comprehensive industry-wide data exists, our research indicates that at least 15 percent of the nation's population is currently covered by some type of telephone notification system or service. In fact, by the end of 2003 major population centers such as Houston, Chicago and Phoenix have or will have put a telephone notification service in place.

The reason is simple: There is no more comprehensive means to communicate with large but geographically distinct portions of the population than the wireline telephone. Virtually every person in the country can be reached by wireline telephone, and each one of those telephones can be associated with a specific location on a map. Also, because telephones are an active communication device (something that people as well as machines will answer), the message has a better chance of getting through than with any other crisis communication tool.

Emergency notification via wireline telephone has tremendous potential. After reviewing existing alternatives, this white paper examines the critical requirements needed to ensure that your organization understands the dynamics involved in successfully realizing this potential.

EXISTING ALTERNATIVES

At least 15 percent of the nation's population is currently covered by some type of telephone notification system or service, including those described below.

BROADCAST ANNOUNCEMENTS AND EAS

Broadcast announcements and the Emergency Alert System (EAS) are good tools for distributing general information to a wide coverage area but are not well suited to delivering actionable information to distinct population segments. For the EAS to be effective, the intended audience must be tuned in, which actual practice demonstrates is not always the case, especially if the crisis occurs in the middle of the night when most residents are asleep.

SIRENS

Sirens can be effective in their ability to alert people within hearing distance that a crisis situation may exist, but the alarms emanated can be open to interpretation. The Natural Hazards Center has done significant research on this very topic, finding that most people, in fact, do not know what a siren alert means. (See <http://www.colorado.edu/hazards/ss/ss99/ss10.html>.) In many areas of the country, sirens are used only for specific emergencies, such as floods or tornados, and are of little use in helping law enforcement alert residents to other crises, such as a suspect at large or a missing child situation.

WEATHER ALERT RADIO

Similarly, Weather Alert Radio has limited applicability. Public safety officials have no way of being sure that *everyone* in their jurisdiction can be reached with such announcements because, similar to broadcast announcements, the intended audience must have a Weather Alert Radio and be tuned in to hear the announcement. In addition, by design, this crisis communication tool is similar to sirens, with applicability solely limited to weather related information.

DOOR TO DOOR

Door-to-door notification is an excellent way to communicate with specific individuals or neighborhoods, but it is time consuming and costly. When hours are taken to cover a large affected area, there is less time and fewer resources available to address the crisis at hand. In addition, door-to-door notification often endangers first responders by sending them directly into the path of the crisis in question, such as a storm or wildfire.

ADDITIONAL COMMUNICATION DEVICES

There are many communication devices available that may be able to receive emergency notifications—fax machines, pagers, PDAs and cell phones. However, as with Weather Alert Radio, their level of penetration throughout the population is too low to ensure effective message delivery. Selecting distinct population segments based on geography with such devices is also highly

problematic: no prevailing technology exists today to do so. (Please see appendix III for a discussion of Interactive Voice Response, or IVR, in emergency communications.)

TELEPHONE NOTIFICATION: CRITICAL REQUIREMENTS

Implementing emergency telephone notification is not a decision to be made lightly. There are a variety of factors involved that if not taken into account can have tragic—if not deadly—consequences. As with any public safety tool, it must be as close to a 100 percent level of reliability as technically and economically feasible. Consider the 9-1-1 network. Would it be acceptable for the 9-1-1 database to be 40 percent accurate? Would it be acceptable for 9-1-1 calls to be answered 60 percent of the time? Obviously not, considering that lives and property are at stake.

An emergency telephone notification tool must be held to the same high standards as the 9-1-1 network. Detailed below are the critical requirements we consider essential for an effective telephone notification tool.

MESSAGE DELIVERY

CRITICAL REQUIREMENT #1: AN EFFECTIVE EMERGENCY TELEPHONE NOTIFICATION TOOL MUST BE OFFERED BY A COMPANY WITH A HISTORY IN, AND A PRIMARY FOCUS ON SERVING THE NEEDS OF PUBLIC SAFETY.

Using the telephone to distribute a single message to a large group of individuals is nothing new. The telemarketing industry has been doing it for years. However, there is a significant difference between placing a call for telemarketing purposes and placing a call for matters of public safety. If the telemarketing call does not go through, the ramifications are not life threatening. But when the message is an evacuation notice due to a wildfire threat, for example, it can be a matter of life and death.

Before and after 9/11, numerous telemarketing companies determined that they could re-purpose their telemarketing offerings to address the needs of public safety for emergency telephone notification applications. In daily operation, however, the systems and staffing behind such offerings are designed to support telemarketing needs, not those of public safety. That generally means a lack of geographical diversity, system redundancy, and system monitoring capabilities. One must consider, therefore, whether the vendor in question is qualified and has a proven track record in successfully meeting the mission-critical needs of public safety. Such a vendor may not have the infrastructure in place to properly support specific local needs in times of emergency and may not be able to adequately assist when disaster strikes.

CORPORATE STABILITY

CRITICAL REQUIREMENT #2: AN EFFECTIVE EMERGENCY TELEPHONE NOTIFICATION OFFERING MUST BE FROM A FINANCIALLY STABLE COMPANY, ABLE TO SUPPORT ITS CUSTOMERS AND TECHNOLOGY OVER THE LONG TERM.

With a project as critical as the deployment and maintenance of an emergency telephone notification offering, it is important to look at the financial stability of the vendor. High tech companies have gone out of business with alarming regularity

over the past few years, so the concern of whether a specific vendor will be there to support you in the long run is a very real one. Therefore, it is crucial to determine if the vendor is financially stable. Is the company publicly traded? Will the vendor readily provide financial information and assurances of their company's health? Does it have the resources to make necessary long-term investments in systems and infrastructure as well as continue to provide support for any hardware, software and/or services acquired?

OPERATIONAL AND TECHNICAL SUPPORT

CRITICAL REQUIREMENT #3: AN EFFECTIVE EMERGENCY TELEPHONE NOTIFICATION OFFERING MUST PROVIDE FOR 24X7X365 TECHNICAL AND OPERATIONAL SUPPORT FROM HIGHLY TRAINED, DEDICATED STAFF.

Crisis situations occur any time of the day or night, any day of the week. Natural and man-made disasters are often highly unpredictable. Law enforcement activity occurs around the clock. The ability to rapidly distribute critical information in any of these situations is a necessity, requiring continual operational and technical support, because you only get one chance to get it right. It is critical for a vendor to have the time-tested organizational structure, procedures and systems in place to ensure that highly trained specialists are available to help you whenever and however needed.

REDUNDANCY AND TESTING

CRITICAL REQUIREMENT #4: AN EFFECTIVE EMERGENCY TELEPHONE NOTIFICATION OFFERING MUST OFFER FULL REDUNDANCY OF ALL COMPONENTS, AND THOSE COMPONENTS MUST BE TESTED REGULARLY.

In crisis situations, there is a very real danger that public safety systems can be disabled or completely destroyed. In fact, an emergency operations center in New York was destroyed on 9/11, and in May of 2003 the Madison County, Tennessee Law Enforcement Center was hit by a tornado. Even when man-made or natural disasters do not play a role, any piece of technology, no matter how reliable, can fail.

Any successful offering must have a full array of multiple back-up systems, fail-over procedures, and around the clock testing in place to ensure a high level of availability. Every aspect of the offering must be designed with such capabilities in mind.

DATA ACCURACY

CRITICAL REQUIREMENT #5: AN EFFECTIVE EMERGENCY TELEPHONE NOTIFICATION OFFERING MUST BE BUILT UPON THE MOST ACCURATE AND COMPLETE DATA SOURCE AVAILABLE—PREFERABLY EXTRACTED FROM THE 9-1-1 DATABASE—WITH PROCEDURES IN PLACE TO ENSURE THAT THE OUTBOUND NOTIFICATION DATABASE IS REGULARLY MANAGED, ERROR-CORRECTED AND UPDATED.

Any system is only as effective as the data upon which it is based. In the case of emergency telephone notification, this data consists of the telephone numbers used to create the outbound calling database. Industry data indicates that the nation's 9-1-1 database experiences about 300,000 record changes daily. The 9-1-1 network keeps up with these changes because it is the only way to ensure that the more than 250,000 9-1-1 calls made in the United States each day are correctly routed to the appropriate responders. These same record changes, when not accounted for in an outbound notification database, can have dangerous repercussions.

For example, late in 2002 a community in Florida used an outbound notification event to notify residents that they must boil their water due to the detection of foreign matter in the water supply. However, because the emergency telephone notification vendor was using telephone number data that was two-years old, it did not account for a recent area code change. The result was that only 40 percent of the intended audience actually received the message.

Effective emergency telephone notification is possible only when using accurate data upon which to build an outbound notification database. The 9-1-1 database is the only source to account for the daily record changes noted above. In addition, it is the only source to contain non-listed and non-published numbers, which—depending upon the area in question—may account for as many as half of all records. An outbound emergency notification database that starts at an accuracy level of 50 percent is not acceptable. (Please see appendix I at the conclusion of this white paper for information on the ability to use 9-1-1 data extracts for outbound emergency notification applications.)

GEOGRAPHIC CAPABILITIES

CRITICAL REQUIREMENT #6: AN EFFECTIVE EMERGENCY TELEPHONE NOTIFICATION OFFERING MUST ASSIGN EACH TELEPHONE NUMBER IN THE OUTBOUND CALLING DATABASE TO A SPECIFIC PHYSICAL LOCATION.

To appropriately affect public behavior, the right information must be delivered to the right people at the right time. This is only possible when a jurisdiction's telephone numbers are integrated with a geographic information system (GIS) database. Systems without such integration are nothing more than high tech calling trees, only able to contact lists of individuals. While there are applications for these types of offerings as first responder tools, notifying citizens must take precedence. If the people in affected areas remain uninformed, the job of first responders will be more difficult and the number of casualties will be higher.

Some systems do offer GIS integration but only in the form of inflexible zones and areas. As a result, notifications made with such imprecise data may reach too many people—causing undue panic and confusion—or too few people—endangering those who need to know.

The solution is an emergency telephone notification offering that assigns each telephone number to a specific physical location. Such a system gives public

safety officials the flexibility to place calls to any area needed, with no pre-determined, system-defined restrictions.

SPEED

CRITICAL REQUIREMENT #7: AN EFFECTIVE EMERGENCY TELEPHONE NOTIFICATION OFFERING MUST HAVE A DEMONSTRATED ABILITY TO INITIATE AND LAUNCH EMERGENCY CALLS TO THOUSANDS OF RESIDENTS IN MINUTES.

Even if the offering meets these first six requirements, it will not be effective if it does not allow public safety officials to contact thousands of people in minutes. Anything less and its ability to get the right information to the right people in time to respond to the crisis will be jeopardized.

An effective emergency telephone notification offering must be easy to use and offer a high calling capacity, preferably a minimum of 1,000 dedicated lines. However, it must not offer so much capacity that it threatens to “choke” a central office’s telephone network. (Please see appendix II for more on this topic.)

IMPORTANT QUESTIONS FOR POTENTIAL VENDORS

As a double check to ensure that the vendor you are considering in fact meets these critical requirements, we have prepared the following list of questions. If the answer to even one of these questions is “no,” the efficacy of the proposed offering is in doubt.

- ◆ Is the vendor primarily dedicated to serving the needs of public safety?
- ◆ Is the vendor financially stable and willing to share financials?
- ◆ Does the vendor offer 24x7x365 technical and operational support from emergency trained dispatchers?
- ◆ Is the vendor’s infrastructure operationally and geographically redundant?
- ◆ Does the vendor have a demonstrated ability to consistently and accurately manage public safety databases?
- ◆ Does the vendor integrate with GIS databases, allowing for precision in calling specific telephone numbers?
- ◆ Does the vendor offer capacity sufficient to place thousands of calls minutes?
- ◆ Can the vendor demonstrate they have never “choked” a network?
- ◆ Is the vendor’s offering available and accessible from any place, at any time and will it be unaffected by local crisis situations?
- ◆ Does the offering enable users to initiate and launch events in minutes?
- ◆ Is the vendor willing to share actual statistics from recent events as proof of the preceding four points?

SUMMARY

If the challenge is to rapidly distribute critical information to citizens in times of crisis, no method holds more promise than the use of wireline telephones. No other alternative has the potential to deliver essential information to distinct population segments as effectively and quickly.

However, an emergency telephone notification offering must meet the critical requirements listed below to realize this potential.

- ◆ Vendor has a history in and a primary focus on serving the needs of public safety.
- ◆ Vendor is financially stable, able to support its customers and technology over the long term.
- ◆ Vendor provides 24x7x365 technical and operational support from highly trained, dedicated staff.
- ◆ Vendor offers full redundancy and regular testing of all components.
- ◆ Vendor's offering is built upon the most accurate and complete data source available (preferably extracted from the 9-1-1 database), regularly managed for maximum accuracy.
- ◆ Vendor's offering assigns each telephone number in the outbound calling database to a specific physical location.
- ◆ Vendor has a demonstrated ability to initiate and launch emergency calls to thousands of residents in minutes, without choking local networks.

An emergency telephone notification service that meets these standards will be less prone to failure and more cost-effective than one that does not.

MORE INFORMATION

For more information on this topic please contact us.

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About Intrado

Founded in 1979, Intrado Inc. (NASDAQ: TRDO) is pioneering the technology of *Informed Response*[™] by providing telecommunications companies and public safety organizations with accurate, efficiently delivered, mission-critical information. Intrado has a proven record of deploying successful public safety offerings unmatched by any other company in the industry and is the trusted provider of 9-1-1 database management systems and services for virtually the entire United States.

APPENDIX I: 9-1-1 DATA EXTRACTS FOR OUTBOUND EMERGENCY NOTIFICATION

The Wireless Communications and Public Safety Act of 1999 requires telephone exchange service providers to provide both listed and unlisted subscriber information to providers of emergency and emergency support services.

“Emergency services” is defined in the Act to include emergency notification services.

To date, 9-1-1 data extracts are available in around half of the U.S. with that number increasing regularly as new regulations and Incumbent Local Exchange Carrier (ILEC) tariffs and standards are put into place.

As the users and beneficiaries of emergency telephone notification offerings built upon accurate data, interested municipalities are encouraged to work with their ILECs to ensure that data used to provision and update the 9-1-1 database is made available for emergency telephone notification. With this data, users gain a comprehensive and accurate outbound emergency telephone notification database for effective emergency notification purposes.

APPENDIX II: NETWORK CONGESTION AND OUTBOUND NOTIFICATION

We are often asked the following question by network engineers when deploying our service:

“What effect does a big disaster have on the call volume at the central office?”

During times of a large disaster, the Central Office (CO) in the affected area may receive a high volume of both internal and external calls. Internal calls (normally line-to-line within the CO) generally have a high concentration ratio (typically 8-to-1, 16-to-1) of shared service resources to complete the call. External calls (normally trunk-to-line) generally have a one-to-one ratio of concentration for similar type service resources.

The advantage of using an off-site, hosted service is that the calls would be coming in on a toll trunking network that would use the trunk-to-line configuration. Intrado has multiple calling platforms that are physically diverse and that use multiple carrier networks. Therefore, we would not be vying for dial tone within a local CO and would not have to contend with the possible line-to-line concentration impact.

Off-site, hosted services would not be as subject to local call blockage at the End Office because the calls will be entering by the trunking network. It is certainly possible that the toll trunking network would be at or above capacity but less likely than the line side of the CO.

So what does all this mean?

- ◆ Almost all notification services use the Public Switched Telephone Network (PSTN) for voice messaging, but they typically overlook interfacing with the host network engineers.
- ◆ Typically, on-site, PC-based system providers do not have a team of engineers to confer with host network engineers, instead taking a “plug-and-play” approach to emergency notification.
- ◆ An off-site hosted service represents the most efficient use of network systems so as not to overload COs.
- ◆ Effective systems are built as efficiently as possible because it is not in the interest of the emergency telephone notification vendor, nor is it in the interest of the citizens in danger, that communications be blocked.
- ◆ Quality vendors have in-house engineers who work closely with network maintenance centers to ensure that the outbound call platform is synchronized with switch throughput configurations.
- ◆ Quality vendors should have a demonstrated history of working with “downstream” host engineers to ensure network efficiencies.
- ◆ Quality vendors should have safeguards in place to ensure that their notification platform does not and has not “crashed” or “choked” a CO.
- ◆ Quality vendors should prefer to work with local network engineers to understand areas of potential capacity constraints prior to deployment.

APPENDIX III: FUNCTION VS. FORM

We are frequently asked to evaluate emergency notification systems and services by prospective clients and technology partners. To put our recommendation in perspective, it is essential that the following question be answered:

“What is your greatest need that will be served by an emergency notification solution?”

Through our years of experience, we have found these to be the most common responses:

- ◆ Immediately notify, warn, and inform the community or discrete population areas within the community
- ◆ Immediately notify first responders, civil authorities, and the media
- ◆ Both of the above

In virtually every case, speed and capacity are identified as essential characteristics. In fact, the characteristics most often identified as essential for an emergency notification solution are as follows (in order of importance):

- ◆ Speed
- ◆ Capacity
- ◆ System Availability
- ◆ Data Integrity
- ◆ Support
- ◆ Ease of Maintenance
- ◆ Versatility

Speed and capacity are the central critical factors when responding to a life-threatening emergency. Quality vendors have built their core application based on this concept. Consequently, quality offerings are fast, offering the greatest outbound calling capacity possible that can be supported by outbound carriers' switches. Features and devices added to the vendor's system should endure a rigorous engineering process designed to enhance, not diminish, the core strengths.

Agency requirements in proposals often refer to “delivering messages under different scenarios,” “delivering fax messages,” “attempting to contact a person through multiple methods if the initial contact fails,” “requesting a response before delivering a message,” and so on. Many of these add-on features require Interactive Voice Response, or IVR technology (“press 1 if you are on the haz mat team, 2 if SWAT,” and so on). Such requirements are not consistent with providing an immediate warning to a life-threatening event.

We believe that most of these requirements greatly diminish time and capacity needed for a notification system to perform its essential functions. Having

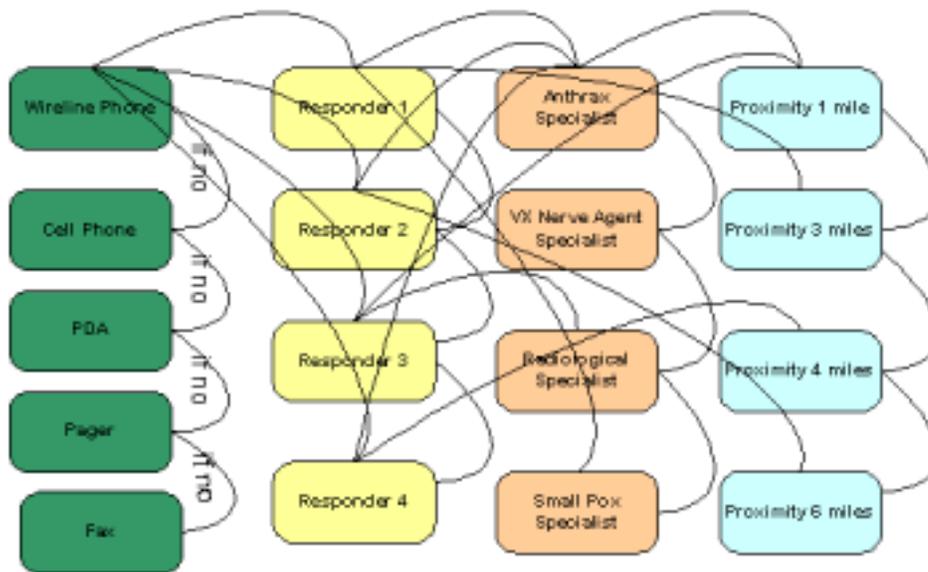
extraneous data transactions occur within the system during an emergency event launch can cause catastrophic delays in message delivery.

The time required to execute numerous iterations on phone numbers, e-mail addresses, delivering time-consuming fax messages, assessing responder availability, querying responder profiles, assessing responder proximity to the event; and so on, wastes the one precious commodity that can mean the difference between life and death: time.

The following example explains the complex activity required to execute a scenario-driven notification to a single first responder with multiple communication devices.



**Relatively simple scenario:
Notify nearest VX nerve
agent specialist**



If no response, resume attempts or roll to next alternate responder and start over

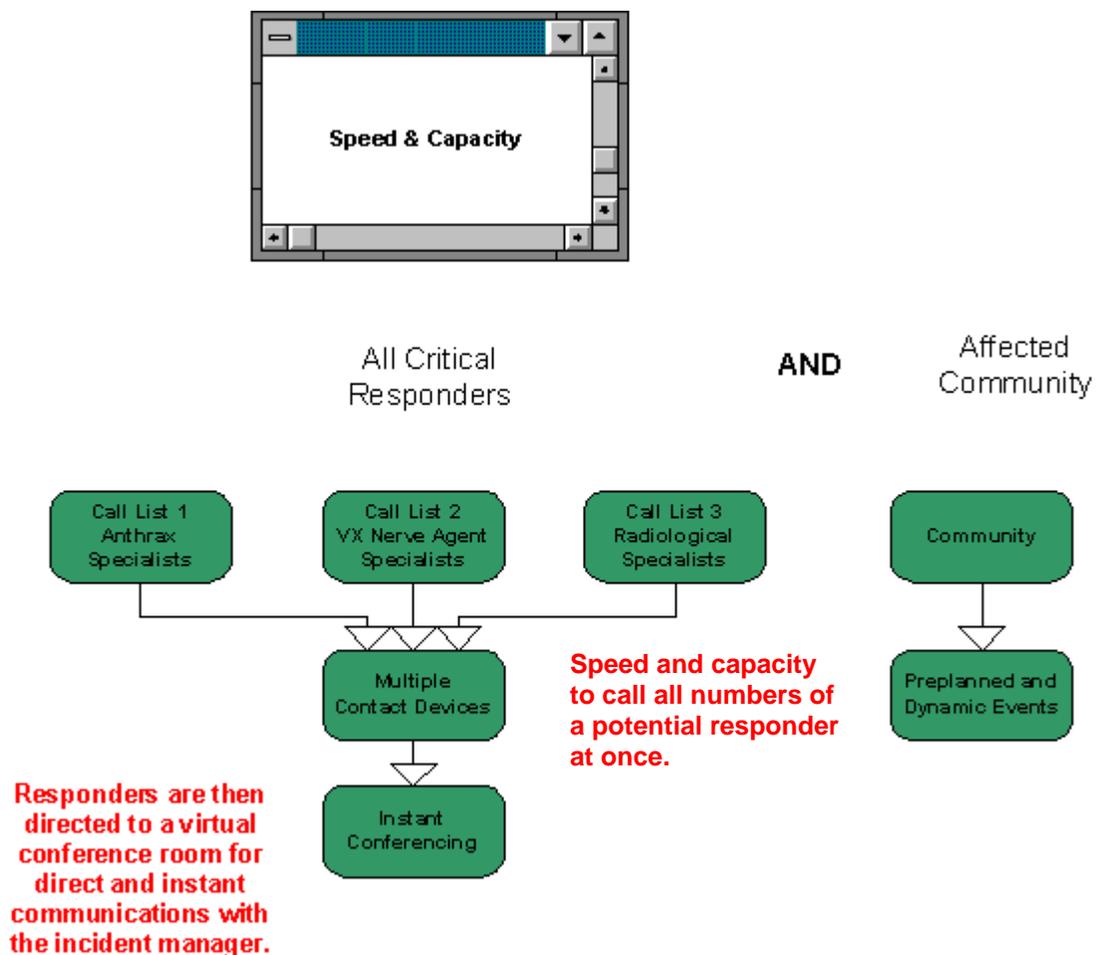
In this example, the launching agency wishes to contact a VX nerve agent specialist—a relatively simple task. A scenario-driven system needs to search through the datasets for each responder and find the one(s) that fit the scenario requirements. When it finds one that fits the scenario profile, the system needs to

contact the primary communication device and roll from one to the next if the responder does not answer or respond (this may include multiple call attempts on each device before rolling over to the next device). If there are answers from several potential respondents, the scenario-driven system must search the database to find the closest match and terminate the scenario.

Scenarios are data-intensive operations that depend on the maintenance of complex data profiles for each individual in the system. To be effective, each individual's profile needs to be updated at least daily to ensure the proper execution of a given scenario. This might be as simple as updating a cell phone number or tracking other more detailed profile information such as assignment changes, education changes, department transfers, certification updates, office relocations, and so on.

Even in a highly optimized environment with well-maintained datasets, this exercise carried out with tens or even hundreds of potential responders would divert critical time to **executing strategy** rather than to using that valuable time to actually **notify** potential responders.

A more effective system architecture follows:



Quality vendors offer *straight-line* emergency notification solutions. When time is of the essence, which it is with any life-threatening situation, the focus should be on rapid execution and direct communications, not on spending critical time searching, sorting, and soliciting one option at a time.

There is no advantage to having an automated system wait for a tone response from a key team member when that responder could be conferencing with team members from the time they answer the call. The team can be built in real time with non-essential personnel being identified, added, assigned, or dropped from the virtual situation room.

APPENDIX IV: EMERGENCY NOTIFICATION AND THE NEEDS OF THE DISABLED

Background

The Americans with Disabilities Act guarantees direct, equal access to government services to persons with disabilities. This is particularly important relative to emergency services, for which the more than 50 million disabled Americans nationwide may require additional assistance. Emergency telephone notification, when implemented effectively, can help to ensure that the disabled are adequately protected and informed in a crisis.

This paper uses the very real possibility of a terrorist threat to demonstrate the value of emergency telephone notification to the disabled community. There are many other relevant applications for telephone notification, including missing child/adult searches, contaminated water notifications, and weather-related emergencies. However, the complexity of a terrorist threat scenario allows for a full discussion of the role of emergency telephone notification in protecting the disabled community.

Scenario Description

It is 4:30 in the afternoon. Local officials have validated information that a dirty bomb has been left at the local bus terminal. The terminal, located in the heart of a densely populated area, serves as a commuter hub that will be teeming with commuters in a matter of minutes. A hospital and a retirement community nearby are also threatened.

Plume analysis, based upon the suspected agent, dispersal method, local weather and other factors, indicates that if the device is detonated, the agent will travel roughly northwest through the city, reaching both the hospital and the retirement community.

Based on this information, local officials determine the need for an immediate, orderly evacuation of the affected area.

Emergency Response

As part of the city's Emergency Management Plan, the Emergency Manager for the city must ensure that first responders, such as Emergency Medical Technicians (EMTs) and hospital emergency rooms, are adequately positioned to manage the crisis. A critical component of telephone notification, the call list, enables the Emergency Manager to deliver a single message to a previously defined first responder group. The message provides specific instructions on what the first responders need to do.

The Emergency Manager also delivers a call list notification to personnel capable of assisting with the evacuation of the hospital and retirement facility. He knows there will be individuals at both locations unable to evacuate the premises on

their own. To ensure an orderly evacuation, it is imperative that he include this contingency in the evacuation plan.

Concurrently the Emergency Manager records a message to deliver evacuation instructions to residents within the plume's path. Some residents in this area will need additional assistance. As part of his evacuation plan, he includes specific instructions—including a number to call for assistance—for those with mobility impairments or other disabilities that might affect their ability to leave on their own. In addition, on behalf of the hearing impaired, the Emergency Manager has made it a top priority to deploy a service that is able to communicate with TDD/TTY devices. All of these activities can occur within minutes of validating the threat.

Benefits

By addressing the needs of the disabled as an integral component of the emergency notification and evacuation plan, officials can better ensure an orderly and timely evacuation. The evacuation issues associated with areas like the hospital and retirement community can be mitigated with adequately trained personnel armed with the most effective tools to implement local emergency procedures. The need for door-to-door searches to find and assist those with disabilities can be minimized through the emergency notification process in two ways. First, the hearing-impaired can receive the instructions through their TDD/TTY devices. Second, those with mobility issues can identify themselves by calling officials at the numbers contained in notification messages.

Conclusion

This scenario demonstrates that emergency telephone notification can play a vital role in helping emergency personnel to rapidly ensure the safety of their disabled community during a crisis. Emergency telephone notification provides a level of flexibility not available with other emergency notification methods, allowing the needs of the disabled to be adequately addressed without investing in additional systems, committing scarce street personnel, or having to develop more complex methods and procedures.