

Selecting the Right Outbound Notification and Emergency Communications System (Part 2 of 2)"



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Concluding this two-part series, Leo A. Wrobel and Sharon M. Wrobel, of b4Ci Inc. and NaSPA, discuss some of the issues involved in choosing a notification system, including a newer option that could forward incoming calls automatically to a working number in an emergency.

In [part 1 of this series](#), we discussed how intelligent selection of the right outbound notification/emergency communication system for your organization can help you to organize your recovery effort, keeping you in control. We continue in this article with some solutions for the large enterprise user, and considering the sophisticated requirements for such a system.

Restoring Inbound Customer Calls

Even today, verbal communication is still arguably the most common method of communication. Therefore, the ability to communicate by voice after a disaster—particularly for emergency responders, who need to share information with each other—is a critical requirement of any disaster recovery plan. Such communications should include alerting the right individuals to the situation and delivering instructions to orchestrate a safe and effective response. Large enterprises also need their systems to be capable of maintaining service to inbound callers, because those callers are the organization's revenue stream and lifeblood.

The next most important feature of an emergency communications system for the enterprise is the ability to redirect inbound telephone numbers *instantly* to a working telephone number. A lot of places and technologies can be used as backup sites, including branch offices, homes, and disaster recovery centers. Numerous technologies can be employed to answer calls: wireless, VoIP, or satellite phones, for example, or other types of equipment. But this redirection must take place *without having to call the phone company*. After all, the telephone company might just be where the disaster has occurred.

Communication redirection must also be as transparent to the end user as possible. For example, if your organization uses voice prompts for inbound callers (and who doesn't these days?), these prompts should continue unchanged. Your proposed inbound call recovery service must therefore have the capability to duplicate call prompts just as they exist today in your network: "Press 1 for sales, 2 for customer service," etc. Transparency to the customer preserves the appearance of normal business, projecting the mirage that everything is okay—even if the caller knows that a disaster has occurred.

These rules work as long as connections of *some* kind still exist after a disaster. But what if the disaster affected the phone company as well as your organization? During Hurricane Katrina in 2005, 34 telephone central offices were flooded, and a king-sized hole in the middle of the 504 area code went black. Today companies are combining technologies in order to increase their chances of surviving such a disaster. In the following pages, we'll briefly review some of the telecommunications technologies that can be employed in conjunction with your emergency communication/outbound notification system. Used in concert, they're dynamic. If you can find an emergency communications provider that also uses some or all of these other technologies, that provider should almost certainly be a finalist in your selection process.

Satellite Communications

Satellite has enjoyed a huge resurgence as a disaster recovery technology, since it is often the only service available after a widespread disaster such as a hurricane or tsunami. One technology that we rely on is kind of a "PRI on the fly." The idea is to connect a Primary Rate Interface (PRI), also known as a "T1," to a satellite link.

At this point, you might object on the grounds that typical data rates over satellite are only about 256 kilobits per second (Kbps), whereas PRI is 1.536 megabits per second (Mbps). This is true if you use 64 Kbps channels, but you don't need all that bandwidth just to carry voice. With today's technology, you only need 1/6 of the bandwidth to carry this hypothetical PRI, and that's still more than enough for good voice quality. Hence, you get 1.536 Mbps of voice capacity for the cost of 256 Kbps.

A couple of companies have even married this capability to a PBX. Telecom Recovery and Rentsys Recovery Services offer boxes that convert raw satellite bandwidth to the four-wire circuit and PRI signaling that your PBX expects to see. If you can restore a single PRI and its associated direct inward-dial (DID) numbers to a medium-sized hospital, for example, for all practical purposes you have restored communications to that hospital. The same goes for government offices, businesses, and essential services. That's why we think that this particular "PRI on the fly" idea is really cool. Combined with a good outbound notification/emergency communication system as previously described, this setup is just awesome.

Collocations and Carrier Hotels

Collocations, or "carrier hotels," are exactly what the name implies. Generally, they're well-hardened facilities; almost without exception, they allow carriers to connect with one another under both day-to-day and emergency operations. In a disaster, they can become indispensable. A typical collocation can house one or more of the following kinds of technologies:

- Cable and fiber optic connections to the incumbent local exchange carrier (ILEC), such as AT&T, Qwest, or Verizon
- Connections to all major long-distance companies
- Connections to competitive local exchange carriers (CLECs)
- Connections to wireless providers
- Connections to wireless Internet service providers (WISPs)
- Connections to Voice over IP (VoIP) carriers
- Connections to satellite communication providers

Being in a collocation facility offers a big advantage to a potential service provider, an emergency communications system, or even a day-to-day communications system. For example, if connections to the ILEC go down, the connections could be purveyed quickly from a CLEC or long-distance provider. If everything on the ground goes bad as happened during Katrina, satellite and VoIP might still survive. Such capabilities are particularly effective when combined with other technologies, such as the Internet Protocol (IP). You may recall from [part 1 of this series](#) that IP dates back to a time when U.S. war planners envisioned scenarios in which every AT&T primary central office would be destroyed in a nuclear attack. Therefore, the Internet Protocol was designed so that packets of information could bypass these lost hubs and get through using only the facilities that survived in outlying areas. This technology is equally useful today when major communications hubs are affected by major disaster or even terrorism. Even better, the technology allows voice to be carried, hence the term *Voice over IP*. After all, spoken language is really data, just as computer languages are data. The same bitstream is used to carry voice or data, regardless of speed.

When you sum it all up, it's possible to maintain the U.S. military's desired "4C" (*command*, *control*, *communications*, *computers*, and *intelligence*) on both data and voice bases by cobbling together surviving transport communication facilities and then employing IP. There's no better place to do this than in a collocation facility. Interestingly, this is precisely how the military planners of the past envisioned that IP would be used, except that now voice can be carried over IP as well. Today, civilian organizations demand a military level of disaster recovery.

Communications Recovery Through Local Number Portability (LNP)

To this point in this series, we've discussed a number of ways to maintain 4C after a disaster. But while outbound notification systems, email recovery, inbound call recovery, and other technologies certainly have their place, one technology truly stands out for voice communications recovery: Local Number Portability (LNP). The LNP database is administered by a private company called NeuStar, Inc., which we'll discuss in more detail shortly. If we can get past

few regulatory issues, LNP has the potential to eclipse many of the technologies discussed thus far and actually become the gold standard in voice recovery.

NOTE

NeuStar also performs numerous services for carriers such as telephone number administration and the U.S. Common Short Codes. Additionally, NeuStar provides various infrastructure services such as technology migrations and network optimization.

In a disaster, voice is the preferred communications medium, and the Public Switched Telephone Network (PSTN) in the USA and other countries remains the central connectivity hub for voice. Mobile telephone, wireless, satellite phones, and Voice over IP all connect to the PSTN through some form of switch or gateway. Wireline telephone users are connected to the PSTN in order to communicate with other PSTN-connected users, as well as to other technologies such as wireless and VoIP. As we pointed out earlier in this series, recovering voice communications requires at least some level of participation by the local telephone company. The individual local telephone companies do things a little differently from each other, sometimes on a proprietary basis. Thus, end users must assume responsibility for precisely how to maintain their voice communications services. That's also why we all need solutions such as outbound notification and inbound call recovery services so that we can stay in control and not depend on the phone companies.

These "bolt-on services" depend on call-forwarding technologies of various flavors. Call forwarding is completed by programming the call-receiving central office switch to receive and forward a call to a designated location or device. This process can be activated locally at the phone set by dialing *72 on the line itself, or remotely by using a feature called Remote Access to Call Forwarding (RACF).

Another possibility is the Advanced Intelligent Network (AIN). AIN can be thought of as a data network that tells the voice network what to do; in fact, it uses many of the same components as a Signaling System #7 (SS7). AIN is a telephone network architecture that separates service logic from switching equipment, enabling a service provider to create the capability within its switching fabric to facilitate automatic rerouting of telephone calls. If the receiving central office switch is out of service for any reason, AIN can be used to reroute calls elsewhere. Since AIN is usually a proprietary technology, it's generally capable of rerouting calls only within a single carrier or service provider's network.

AIN, RACF, and a "command routing" capability for 800 services are pretty much what we've had available to use with outboard solutions such as those deployed by Telecom Recovery, Dell MessageOne, and Telecontinuity. However, on the horizon are systems based on Local Number Portability, which promise to add a whole new dimension to the science of restoring 4C communications. Local Number Portability transfers ("ports") telephone numbers from one service provider to another or one technology to another, based on the information in the LNP database.

Many of us, particularly in the Generation X demographic, have used the LNP porting process without even knowing it. Many end users have abandoned wireline phones in their homes in favor of wireless devices. During this kind of switch, many wireless carriers offer the option of keeping your old phone number as an option that takes advantage of LNP.

The benefits to using LNP in an emergency are obvious. When the caller dials a telephone number, the call is completed regardless of the status of the wireline's central office switch. Because calls can be ported to a wireless line, satellite, VoIP, or WISP almost instantly by use of the LNP database, survivable technology can be placed in service transparently through the use of number portability. Updating the LNP database can be accomplished by any carrier, and the change becomes effective in as few as 15 minutes.

However, this idea isn't popular with carriers. Why not? First, they don't want to pay for it. Second, they don't like the effect that it could have on their customers and revenue if they were to experience a disaster themselves. Think about it: If your carrier has a disaster, and you move to another provider temporarily, you might decide never go back to your original carrier. So if you call your carrier to port a number, you may be told that the process takes up to a week, even though it takes only a few minutes to update the LNP database. (We know this from experience, because we used to be a CLEC and have made such changes personally.)

So what's the solution? At present, anyone that has a disaster can call the Federal Communications Commission at 1-888-CALL-FCC (1-888-225-5322) and get permission to coordinate a number move on an emergency basis. We also recommend that you participate in forums at the FCC that are dedicated to formalizing this process. It's the role of government to mandate the role of carriers in this regard, and the FCC or your state utility commission is the proper

forum.

The rapid evolution of this industry demands constant activity in this regard, according to Barry W. Bishop, Senior Director of Public Safety for NeuStar:

While strengthening the United States infrastructure is important, rapid restoration in response to a widespread interruption of service arguably should be the number-one priority to ensure real-time accessible communications.

In our opinion, the use of LNP represents nothing less than a totally new concept for restoring voice communications in times of emergency. LNP utilizes an existing centralized database capable of dynamically rerouting telephone numbers in time of disaster. It's not a mass-notification system per se, but it surely would work great with such a system if we could only get some rules formalized as national policy. Unquestionably, LNP could help when used in conjunction with these systems if a Katrina-style disaster should strike again. LNP could also be attractive to governments, organizations such as banks and brokers whose facilities happen to straddle earthquake fault lines, users based in coastal areas prone to flooding, and so on.

Meanwhile, NeuStar has developed its own disaster recovery service. With Port DR, telephone companies (but not yet users) can point traffic away from a disabled central office switch and toward another switch or technology that's still working within the affected service provider's network, or to an affiliated network or even a competitor's network. The actual process is largely the same as when you port your landline phone to a wireless phone, or vice versa. Using the LNP database, NeuStar can restore services for anything from a single phone line to an entire area code, which is what happened during the Katrina emergency, when some of the 504 area code for Louisiana was redirected to Dallas, Houston, and even Atlanta! As we've mentioned, this solution is currently available only to communications carriers. If you're an enterprise user or other consumer of telecom services, all you can do right now is nag your local provider to contact NeuStar to implement Port DR.

Summary

We hope that this series has helped enterprise users to understand some of the issues involved in selecting an emergency communications/notification system. As contingency planners, it's important that we protect the lives and assets of our organizations, but we also can use our influence to help service providers cross regulatory hurdles and reach into an even more profitable disaster-recovery market. Until next time, good luck and happy planning!

NOTE

Whether your organization is a service provider for an outbound notification/emergency communications product, or a phone company with vision, or you just have an interest in making the LNP dream come true, consider contacting us directly for assistance. We previously owned a 50-state phone company and are well versed in the useful and potentially lifesaving capabilities that could be employed via the LNP database. In addition, Leo is a former public official, having served as a local mayor and as a city councilman, and has frequently lobbied state regulatory commissions and the FCC.

In addition to his work with his own two companies, TelLAWCom Labs Inc. and b4Ci, Inc., Leo A. Wrobel is honored to have been elected president of the Networking and Systems Professionals Association (NaSPA), a not-for-profit company concentrating on the needs of tens of thousands of members since 1986. NaSPA specializes in career development, employment, information technology, and disaster recovery. Contact Leo at 214-888-1300 or email leo@b4ci.com.

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