

Beat the Clock: Replacing All Those Outdated Radios

The coming demise of 2G networks and the POTS sunset are forcing installing security contractors to undertake the arduous task of upgrading clients to new alarm communications technology. Go inside the forces at play and learn cost-effective alternatives to help your company successfully navigate this transitional period.

BY AL COLOMBO

THE ALARM BUSINESS OF TODAY relies on quality, reliable signal transport between a security client's alarm system and a central station. If one or more channels of communications happen to fail at the most critical, inopportune moment, such as during an actual alarm event, it can easily result in a sizable financial loss for the subscriber. Even worse, it can result in undo injury or the loss of life because rapid police or firefighter response was not assured within a reasonable period of time.

All of this can lead to angry customers, lawsuits and a potential loss of recurring monthly revenue (RMR). Even when there is no financial loss or physical injuries involved, repeated failure to communicate can erode a company's credibility within the community and stifle word-of-mouth promotion.

There are two significant reasons why installing security contractors need to seriously evaluate the alarm signaling technologies they currently use. The first is the ongoing demise of Plain Old Telephone Service (POTS), which was once the most reliable means of alarm signal communication ever devised; and the second concern is the looming 2G sunset, presumably due to occur in less than two years.

Let's delve into the factors that compel installing security contractors to hasten their move to adopt new communications solutions. We'll also discuss cost-effective, uncomplicated alternatives available in the marketplace today that can assist security companies with upgrading their clientele with new alarm communications.

RISING PERIL OF POTS SUNSET

Historically speaking, POTS technology, which is part of the Public Switched Telephone Network (PSTN), uses cir-

cuit-switched technology that has served the alarm industry well. The technology upon which POTS is built may not be the fastest at transmitting alarm data from an alarm panel to the central station, but it is undoubtedly the most fault-tolerant means of signal transport in existence.

The reason for POTS' excellent track record is the fact that each telephone company central office is required by law to have a sustainable source of backup power. This includes a large bank of batteries and, sometimes, a gas-fired generator to recharge them when power begins to wane during an extended blackout. A typical phone line will continue to provide a dial tone and communication with the outside world well into a power outage of almost any duration. Enforced by the Public Utility Commission (PUC) in each state, regulations require carriers to maintain power in reserve, so when the public electric bus fails they maintain telecommunications services. Unfortunately, packet-switched networks are not built to the same standards, yet.

"In the old days, each telephone line went to each home, each on its own copper pair of wires. Everything was powered from the huge bank of batteries at the central office. These batteries were charged all the time using rectifiers connected to the power company," says Ray Vaughan, manager, telecommunication, Viacom. "When the power went out, the batteries could run the whole phone system for hours. But within seconds a huge generator kicked in and started charging the batteries again. It's just like a huge UPS [uninterrupted power supply]. That is why the phone network was considered one of the most reliable networks in the world."

All of this has changed, however. For starters, there is less and less demand for circuit-switched services as home

and business owners opt for cellular and other means of broadband communications that use packet-switched technology. Also, consumers want high-speed broadband capability, especially on the mobile front, because of the advanced applications that are available. For these reasons, phone company return on investment (ROI) is higher with these newer technologies than the older ones.

This has resulted in carriers giving a reduced amount of attention to the upkeep of their POTS networks. Instead, they are devoting most of their time and monetary resources to developing and building high-speed, high-throughput methods of communications. Of course, the game is to eventually phase out POTS altogether.

Another aspect to the demise of POTS relates to the massive, relentless effort by the telephone carriers to legislate a final end to the technology. The alarm industry

fought tooth and nail for more than 20 years to maintain POTS service by way of the FCC, but telephone companies have done an excellent job of convincing the feds that POTS has outlived its usefulness. Their aim is to replace POTS with newer, high-speed technologies, such as cellular and FIOS, which is a high-speed fiber-optic solution.

The following passage — which appeared in a 2009 BetaNews article — is an example of AT&T's effort to alter the path and flow of data nationally: "The business model that sustained circuit-switched voice service over the last century is dying. For decades, POTS was the primary if not the exclusive option for voice communications, and nearly all households subscribed," reads AT&T's federal filing. "But in recent years technological change and market forces have made POTS and the PSTN increasingly obsolete. Those same forces make a full transition to broadband inevitable."

"The fact is true landlines are slowly going away. Even the landlines at my house are IP-switched at the central office," says Nick Markowitz, owner of Markowitz Electric & Integration in Verona, Pa. "In addition, cell units are so much better designed and reliable than phone lines."

All of this as a whole is driving the demise of POTS. For alarm dealers, turning to cellular and Internet-based reporting systems is not really a choice — it's soon going to be a necessity.

ACT BEFORE END OF 2G NETWORKS

If the loss of POTS wasn't bad enough, yet another crucial means of alarm signal communications is scheduled to cease working on Jan. 1, 2017. At that time, the 2G Global System for Mobile Communications (GSM) cellular network will no longer provide signal transport for alarm systems. Communications will also be lost for the millions of machine-to-machine (M2M) 2G devices employed in all kinds of equipment, such as soda and candy dispensers, ATMs, car alarms and



The impending sunset of 2G transmission technology is creating both a challenge and opportunity for installing security dealers, many of whom are using communication modules to upgrade existing customers to 3G signal transport.

many other applications. Like the facilities these cellular communications units protect, these M2M applications involve the supervision of product levels, detection, vandalism and theft.

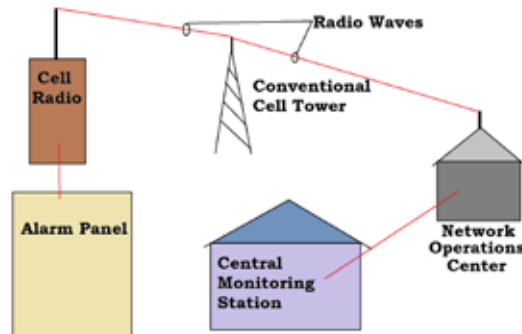
Consider this telling section reported by The Associated Press in 2012: "AT&T said it's shutting down the older network, which doesn't support high data speeds, city by city. It said earlier this year that the process has started in New York City, and it's trying to move the city's 2G subscribers to new phones. By shutting down 2G and using the same space on the airwaves for 4G, AT&T can increase data capacity by more than a hundred-fold. Data use is skyrocketing as people adopt smartphones, and the company is facing a 'spectrum crunch' in some areas."

Since that time other 2G carriers have come forward to make similar announcements. Also in 2012, Verizon — which employs Code Division Multiple Access, the other major radio system used in cell phones — not only announced the demise of its 2G CDMA service, but also its oncoming 3G CDMA as well.

"Verizon Wireless plans to shutter its 2G and 3G CDMA networks by 2021, giving the carrier close to a decade to move its customers off those networks," says Mike Dano, executive editor for the Telecom Group for FierceMarkets, which includes Fierce-Wireless and other publications. LTE is an acronym for Long Term Evolution, which promises data throughput of 5Mbps to 12Mbps, as opposed to General Packet Radio Service (GPRS), the data side of GSM, which has a data rate of 56 to 114kbps.

You have to wonder how Verizon can make such a prediction so many years ahead of time, but it's obvious that changes in technology are, for the most part, well planned and dated. Even more difficult to believe is that despite more than seven years of advanced warning, there are still alarm companies that have, for whatever reason, procrastinated in making the 2G-to-3G switch.

"Believe it or not, the push to replace 2G units is only now getting underway," says Mike Steffancin, an inside security sales consultant with Security Source, a security



The illustration above shows the progression of alarm signals using a cellular reporting system.

Contending With Signal Failures Even Before Fall of 2G

The pending 2G sunset may not arrive till Jan. 1, 2017, but some installing security contractors have already have experienced 2G service failures. The two most common reasons for this are the cellular carrier prematurely pulled the plug on the local 2G network or because AT&T already shifted 2G service to a higher frequency.

"AT&T is arbitrarily turning off 2G service [city by city] even though the sunset date is in January of 2017. So what we run into from time to time is a cell radio that simply stops working," says Fred Milam, owner of Sentry Alarm Systems in La Habra, Calif. "When we stop receiving test timer signals we call [equipment manufacturer] Napco. Nine times out of 10 we're told the carrier has turned the 2G off in that area, so we have to rush to get it replaced. We use the Napco line of StarLink universal radios."

Milam says that he pays for the additional test timer feature with every cellular reporting account because he simply

wants to know what's going on with each account. This gives him early warning of 2G outages, including that final moment when the carrier pulls the plug locally.

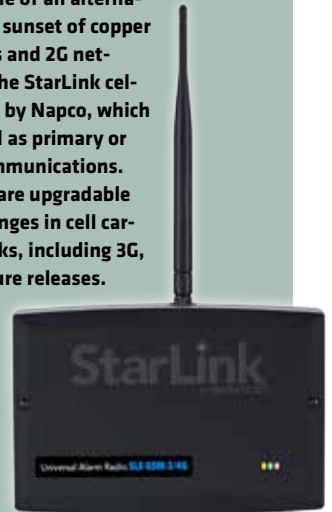
Regarding the second cause of failure cited above, AT&T is routinely allocating premium frequencies for 3G use. This means the cellular carrier is slowly but surely migrating 2G use from lower to higher frequency bands, which is not as effective for alarm system reporting.

In a typical cellular system, a cellular carrier commonly deploys on two frequencies — 850MHz and 1900MHz. The lower frequency is more effective for alarm systems because cellular signals are better able to penetrate walls than at the higher frequency. By placing what's left of 2G service onto these higher frequencies, a stationary cellular radio may experience occasional reception problems or it may stop working altogether.

In this case, the alarm dealer has a decision to make; the math is easy to

figure out. They can install an external antenna, which can cost anywhere from \$50 to \$150, or they can upgrade the radio by installing a newer 3G model, which in some cases carries a lower price tag.

One example of an alternative for the sunset of copper phone lines and 2G networks are the StarLink cellular radios by Napco, which can be used as primary or backup communications. The radios are upgradable for any changes in cell carrier networks, including 3G, 4G and future releases.



and fire/life-safety equipment distribution firm in Parma, Ohio. "Right now, Napco [a longstanding top security equipment manufacturer] is leading the charge in assuring that all alarm dealers know about the issues and that they have time enough to do something about it."

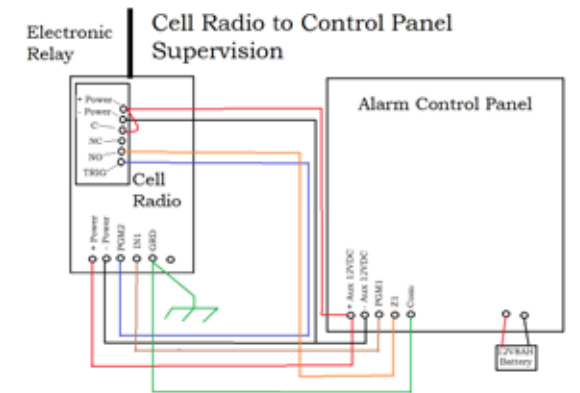
NEED FOR TAKING A PROACTIVE APPROACH

A few alarm dealers began hearing about the demise of AT&T's 2G service before it was officially announced to the world. Some firms began looking at the issue in a proactive manner in order to solve the problem as quickly as possible. After all, it had only been three or four short years since the same cellular carriers switched from Advanced Mobile Phone System (AMPS) to what some first dubbed D-AMPS, which is known today as 2G.

At the time of the 2012 announcement, most alarm equipment manufacturers did not have a solution to the problem. Many vendors continued to provide 2G units despite the looming demise of 2G GSM. There were only a few cellular radio manufacturers that offered 3G-compliant replacements and they appeared to be ahead of the curve.

"We, as a company, have known about the 2G sunset issue for at least five years," says Jim Corbett, a partner with United Alarm Services of Brookfield, Conn. "We have addressed the issue and are in the process of switching our remaining 2G units to the Napco StarLink. We have approximately 700 radios, of which we've already replaced between 300 and 400."

In 2011, the author of this whitepaper was working as an operations manager of an alarm company in Canton, Ohio, when he learned about the 2G sunset through Steffancin at



Using this wiring arrangement between a cellular radio and an alarm panel, both units can be supervised so in the event RF connection is lost a local alarm sounds. When the panel experiences a critical failure the cellular radio will also send out a special supervisory signal to the central monitoring station.

Security Source. It was then that the author asked Steffancin to find an immediate solution to the problem, which he did.

At the time, the manufacturer of the alarm equipment used by the alarm company in Canton was still pumping out 2G cellular radios; the manufacturer did not have a date when 3G-compliant units would be available. The alarm company decided to move ahead with 3G/4G-compliant hardware made by a different manufacturer. The alarm company resolved that it made no sense to continue its use of 2G cellular radios when in only a few years they would have to be replaced with 3G units. Since then, under the direction of

another operations manager, the alarm company swapped out all of the 2G units with 3G-compliant radios.

With all of this said, be aware that not all 2G networks will go offline Jan. 1, 2017. Alarm dealers using a CDMA 2G solution, for example, will not be affected. Not yet at least. T-Mobile, for example, has not declared a sunset event for its 2G network.

"The T-Mobile 2G radios are still working and I'm still going to eventually replace them," says Fred Milam, owner of Sentry Alarm Systems in La Habra, Calif. "But where my T-Mobile 2Gs are positioned there is no AT&T or Verizon service available, so I'm stuck with these 2G radios until T-Mobile comes up with a 3G replacement."

FIRE ALARM SIGNALING CODE CONSIDERATIONS

3G-compliant cellular radios should be UL Listed for use with commercial and residential intrusion and fire alarm systems. For fire, it must bare labels that show compliance with NFPA 72 and UL 864 Ninth Edition.

"Communication methods for supervising station monitoring hinges on the radio sending supervisory signals at least every five minutes," says Markowitz. "And when properly set up with cell coverage that includes two or more towers, I see no problem. I use cell backup mostly for my fire jobs because land lines and digital phone lines are becoming unreliable."

Dealers and integrators that are accustomed to installing dual telephone lines on a fire alarm panel may find it odd that code- and standards-making bodies would accept a single radio, single-path solution for alarm and supervisory signaling. But the fact that phone lines are disappearing has made it necessary for these organizations to embrace new methods of signal transport. As such, they have sought to make these methods as safe and foolproof as possible. For example, consider Sections 26.6.3.1.1 and 26.6.3.1.5, NFPA 72, 2013 Edition:

Section 26.6.3.1.1, entitled Conformance, says, "Communications methods operating on principles different from specific methods covered by this chapter shall be permitted to be installed if they conform to the performance requirements of this section and to all other applicable requirements of this Code."

Section 26.6.3.1.5, entitled Single Communications Path, says, "Unless prohibited by the enforcing authority, governing laws, codes, or standards, a single transmission path shall be permitted, and the path shall be supervised at an interval of not more than 60 minutes. A failure of the path shall be annunciated at the supervising station within not more than 60 minutes. The failure to complete a signal transmission shall be annunciated at the protected premises in accordance with Section 10.15 (Trouble Signals)."

To initiate a supervisory/trouble signal requires the use of a relay, either onboard the radio or a separate module driven by a voltage output on the cellular unit. By connecting the normally closed output with the customary EOL (end of line) resistor to one of the IDC (initiating device circuit) or SLC (signaling line circuit), the panel will annunciate the failure of the cellular signal path locally on the intrusion/fire alarm keypad/annunciator. When using cellular with a

StarLink Dealer Incentive Offer

With the success of its universal StarLink Radio brand, Napco has improved on its 2G trade-up plan. The program is designed to help installing security contractors transition and safeguard their accounts, as well as pay for making the investment in the future of their business. This helps offset the cost for both the new hardware and its installation.

StarLink's 2G Radio incentive program works with virtually any brand panel installation in the United States. With a suggested dealer price under \$100, plus a trade-up credit incentive that's been increased to \$70, the net intrusion radio cost can be as low as \$30 to the dealer. That's the least expensive solution on the market to protect dealers' account bases. There is no limit on the number of radios that can be purchased under the trade-up plan.

"It's a win-win all around. The dealer protects the account and keeps that RMR, the alarm system continues reporting on the latest network using StarLink's proven signal reporting technology, and the consumer continues to have the peace of mind delivered by their security system into the foreseeable future," says Judy Jones-Shand, vice president of marketing, Napco.

Moreover, adds Jones-Shand, because StarLink radios are enabled for data-centric networks, consumers can use an accompanying smartphone app to remotely arm/disarm their security systems. This provides dealers a key inroad to upsell their clients on new connected home services. By popular demand, the StarLink series also includes commercial fire alarm communicators and mercantile (metal) models that are commercial UL- and NFPA 72 code-compliant.

second signal path, local supervision is not necessary.

In commercial fire applications, code allows remote monitoring stations to verify alarms, providing it does not require more than 90 seconds to do so. Depending on the NFPA standard year, code also requires that the integrity of the cell pathway be supervised at least every five minutes. Subject to the cellular carrier and the intermediate, third- or fourth-party processing center, even shorter supervisory periods are available. And, just as it always has been, commercial systems must send a test signal every 24 hours.

Residential applications are slightly different. Test signals are required every 30 days. According to section 29.7.9.3, NFPA 72, 2013, "Household fire alarm systems shall be programmed by the manufacturer to generate at least a monthly test of the communication or transmission means."

Security dealers and integrators need to act now by moving their present intrusion and fire alarm systems into the 21st Century. You need to seek a cellular 3G solution at this time if you haven't done so already. Do not wait until after the last POTS line is dead and 2G GSM cellular service goes dark altogether.

As the old saying goes, "He who hesitates is lost," and that is exactly what installing security contractors who continue to procrastinate will be if they fail to act soon.

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