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The Sunset of 2G/3G Is Coming. Is Your Business Ready?

What You Need to Know to Avoid Business Disruption

Redefining the Connected Conversation

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Introduction

Did you know the sunset of 2G/3G networks will affect more than 50% of all IoT devices?[i] The sunset of 2G/3G is happening, and now is the time for companies to map their plans for migration to 4G/5G solutions. 4G offers better spectral efficiency, higher network capacity, improved cost efficiency, and increased bandwidth for data-hungry applications as well as lower latency and energy efficiency on low-power, low-bandwidth applications. Businesses need to connect with the right service provider now to help avoid network blackouts and disruptions.

Why?

Since the advent of networking, service providers have shut down legacy networks as they transition to the next evolution in network technology. The longer a technology is in place, the more its capabilities and quality of service fades. This happens at the same time that innovation and investment in new network technologies occur. The rationale for the sunset is for network operators to reduce operational costs and free up resources and money to invest in initiatives that will improve service.

James Brehm & Associates recently conducted a survey of businesses regarding the sunset of 2G or 3G networks and found that many companies are unaware that their IoT solutions are in peril. The impending shut down will soon present them with major decisions.

There are some technology changes that only require a software upgrade; however, this network sunset is a bit more challenging as it may force hardware modifications or revisions.

Over 50% of cellular connected IoT deployments today are 2G or 3G.

Completing a network migration is no small undertaking. In this paper, we provide information for businesses on why preparing for the sunset is critical, the challenges and opportunities associated with the sunset, and how to best go through the sunset without disrupting business models and revenue streams.

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State of the Industry Today

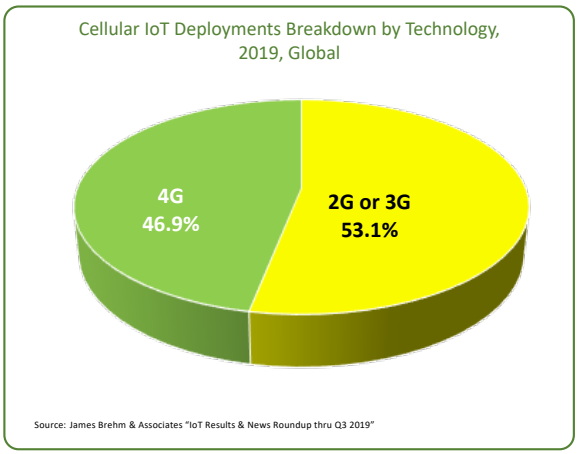
64 Million 2G and 3G devices are facing sunset.

If we look historically at the generations of wireless technologies, we see the following: 2G managed calls and simple text messages, and entrepreneurial organizations adapted the network to capture small amounts of telemetry data. 3G opened a new world of connectivity, with internet, videos, and music available on mobile handsets, while offering the ability to have 2-way control (upstream and downstream) of M2M and telemetry data. 3G, however, was still slow and needed special formatting for web pages and data to be displayed. 4G LTE technology gave rise to IoT and provided analytics to machine-type data.

There are more than 125 million cellular IoT devices deployed.[ii] Of those deployments, 53.1% are running on 2G or 3G networks and will be impacted by the service provider sunset. Close to 47%, *or 61 million devices*, utilize 4G LTE technologies for connectivity.[iii] Although some companies have begun planning for the sunset, far too many have yet to address it meaningfully.

47% of survey respondents reported that they had not been notified by service providers of network shutdown.

While a good percentage of new connections such as connected car, video surveillance, and branch office failover solutions are high bandwidth use cases, and can use up to a gigabit per month or more, our research has shown that approximately 75% of the 125 million cellular IoT connections use less than 1 MB of bandwidth per month. For that reason, over the past two years, U.S. mobile network operators (MNOs) have launched low-power LTE network technologies (e.g. LTE-M and NB-IoT) that have been specifically designed for IoT. The common benefits of low-power LTE networks include extended battery life, low module costs, greater penetration for indoor and outdoor locations, and future-proofed technologies to avoid network obsolescence within the next 10 years.



While the buzz and interest around these low-power solutions has been incredibly high, actual adoption by device manufacturers has been underwhelming, with less than 2 million devices deployed in the U.S. by the end of Q4 2019. We expect that to change dramatically as chip and module manufacturers ramp production volumes up to capture the majority of the 64 million 2G and 3G devices that will soon face sunset.[iv]

Challenges

According to the survey, these are the top challenges a business faces by the network sunset.

Security and technology concerns lead to inaction. Many companies are wary of making big technology moves, in part because they're not sure how it will affect network security. They let their fear of making the wrong decision cripple them. They suffer from what analysts call "the paralysis of analysis." In many cases, this fear is compounded by an organization's prior negative experiences, such as security breaches or lack of success with technology-related endeavors. It can even stem from lacking personnel with the right skill sets to navigate a large technology-centered project. Sometimes it's procrastination.

~ 75% of the total existing 125 Million cellular IoT connections use less than 1 MB of bandwidth per month.

Top 3 Inhibitors to IoT Adoption

1 Security
2 Cost
3 Lack of Experience

As tech executive Meg Whitman[v] is noted for saying, "The price of inaction is far greater than the cost of making a mistake." This is especially true for a business preparing for the sunset. If your company's connected devices are only capable of 2G or 3G service, they will no longer work as the carriers shut down legacy networks and repurpose the spectrum to 4G LTE or 5G. Time is of the essence.

Cost. In our research, 44% of respondents ranked cost as one of the top three factors impacting IoT, while 35% of respondents reported having no idea what the limitations of their budget were or how much the migration would cost. Budgeting for the change can have a dramatic impact on the corporate budget. Initial IoT products using 2G or 3G had budgets based on a fixed bill of materials and legacy network costs, which provided a calculated rate of return. Should a business fail to budget for the additional costs of migration, then that business will eventually have to deal with what could potentially be a very large, unplanned, initial expenditure.

35% of respondents don't know their budget or how much migration would cost the business.

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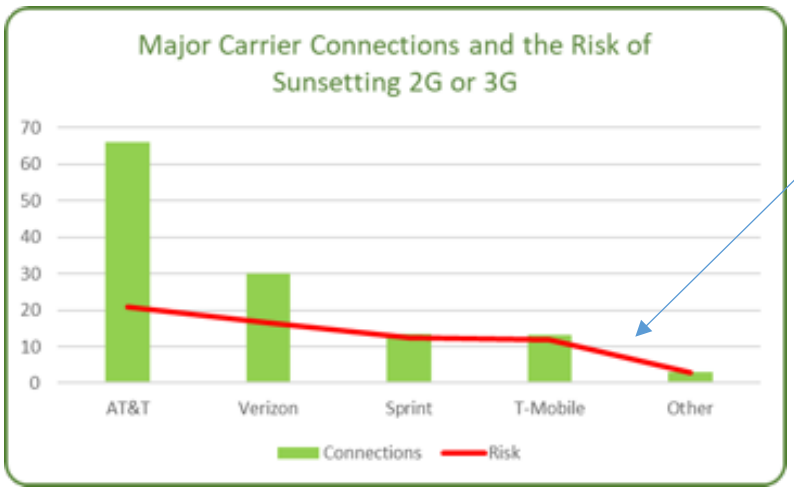
Lack of training and technology can lead to a knowledge gap. Determining whether or not to simply upgrade a communications modem or module within an existing product or if a new product must be built and deployed represents the first of several technology issues that must be addressed.

Other considerations include:

- *What hardware do we use in the upgrade?*
- *Is it time to source a totally new solution?*
- *Are the vendors selected previously capable of making the change and are better solutions available?*
- *What pricing or financing is offered to ease the fiscal impact of the network sunset?*
- The sunsetting of the 2G or 3G networks means new devices need to be specified and sourced. Some solutions will require service provider certification.

NB-IoT and LTE-M (in 4G and 5G networks) may be ideal for many existing 2G or 3G business implementations.

Other challenges to consider. Deployed IoT solutions have been used by customers as part of their day-to-day operations. Take an industrial vacuum cleaner company, for example. Along with monitoring quality of service (QoS) and warranty claims, that company sends refillables and consumables automatically based on 2G or 3G-dependent IoT. Not migrating before the sunset represents a risk in loss of revenue from consumables, the uncertainty of unhappy customers who may look for alternative products, and exposure and liability QoS issues when the 2G or 3G connected product goes dark.



The amounts above the red line represent 4G connections and amounts below the red line represent 2G and 3G connections that are subject to sunsetting.

Additionally, performance guarantees or warranties on products may be contingent upon continuity of connectivity. If nothing is done, those obligations will surely not be met.

Finally, timing is a factor in determining how and when to implement the migration. *How does the new deployment impact internal operations? How do you deploy the new solution with minimal impact to internal and external production? Is the company capable of supporting the deployment or will professional services be required?*[vi]

The price of IoT connectivity declined as much as 40% in 2019.

Opportunities: The Benefits of Sunset

Many opportunities exist for enterprises to benefit from the sunset and the migration to new technologies: the reduction of costs, improvement in performance, faster processing, and the ability to reengineer the IoT solution and improve level of service.

The price of IoT connectivity for enterprises has declined over time as networks have become more efficient.[vii] Needing fewer personnel to operate, lower operational costs (due to reduced power consumption), and more economically priced off-the-shelf hardware, have all contributed to this reduction in price. As a matter fact, service providers' monthly IoT Average Revenue Per Unit (ARPU) has dropped by 20% - 40% over the last year. With prices down, it frees more capital for businesses to invest in accelerating their migration to 4G/5G.

Additionally, the price of silica, hardware, and sensors continues to drop thanks to the impact of Moore's Law, freeing additional capital to invest in a 4G/5G network that allows businesses to place newer, faster, and more intelligent hardware closer to the edge thanks to improved network efficiency.

With the migration to 4G, and the resulting need to upgrade hardware, enterprises have an opportunity to rethink and streamline their technology strategy. This can be as simple as a replacement of the modem or module, or as involved as total evaluation of how they might improve operations with an IoT solution. What's more, the reduction in costs combined with the network sunset is providing enterprises with the opportunity to review and renew contracts, SLAs, and warranties.

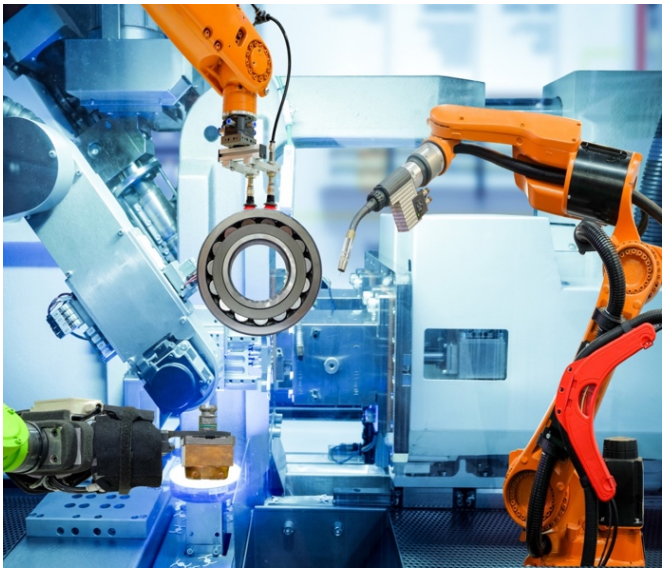
Planning for Change

Change is inevitable. Before making tough decisions, however, enterprises must review a detailed and thorough inventory of their connected device offering.

To create a connected device inventory, the following questions can serve as a guide.

1. *How many connected devices do you have?*
2. *Are they managed or unmanaged?*
3. *Will you need to change business models?*
4. *Which devices are connected with which carriers?*
5. *What network technologies (e.g. 2G,3G, LTE) do the devices use?*
6. *Are any scheduled for end-of-life?*
7. *What is your device inventory level?*
8. *Are CAPEX or OPEX models used?*
9. *Where are your current 2G or 3G devices located? Will a truck roll be necessary?*

The answers to these questions and more can provide the basis of a successful device and network transition. By conducting a comprehensive analysis on your device inventory, having a thorough understanding of the state of the market, and knowing how MNOs are transitioning, you can begin to understand the impact of the network sunset and formulate a tactical plan to move your devices.



Continuity is key. To ensure continuous business operations with no service interruptions, there are 6 things a company must do:

1. Know your service provider and their timeline.

When does your service provider plan to shut down their 2G or 3G network? Are there any drop-dead dates other than the shut-off date? When is the last day to certify devices for the network? Does your service provider have its 4G and 5G networks available yet? If not, when? Will they be shutting down based on geography or a specific day?

AT&T is ranked in the top 5 IoT cellular operators globally, working with over 500 carriers and providing service in 200+ countries.

2. Identify a strong project manager.
Deploying IoT solutions is a complex task and requires a strong organized, deadline driven project manager. Project Managers need to be effective communicators and keep up-to-date progress reports, most importantly for reporting when deadlines are in jeopardy.

3. Identify a network replacement.
Cellular networks could include 4G, 5G, LTE M, and NB-IoT. The choice may also involve the selection of a carrier since not all technologies are deployed, and not all service providers are supporting the same solutions.

4. Determine a hardware strategy.
It is possible that a simple modem or module swap will be all that is needed to support the legacy 2G or 3G IoT solutions that have been created and need to be certified by the carrier.

5. Understand logistical requirements.
Once devices have been identified, procurement and order management are the starting point for managing logistics. Managing the inventory includes the installation, testing, and kitting of the devices. Devices may require trained personnel and a costly truck roll for deployment.

6. Select the right partners.
75% of companies surveyed are willing to pay for professional services. Having a partner that can bring resources that are missing or need to be supplemented with your enterprise is essential.

75% of respondents are willing to pay for professional services and believe that having a partner that can bring the missing resources is essential.

Why AT&T Business?

AT&T Business is the leading IoT service provider in the U.S. with a total of over 65 million IoT connections. AT&T operates one of the top five global networks, working with over 500 carriers worldwide and providing service in 200+ countries.[viii]

The AT&T Professional Services team features more that 50 engineers and developers.

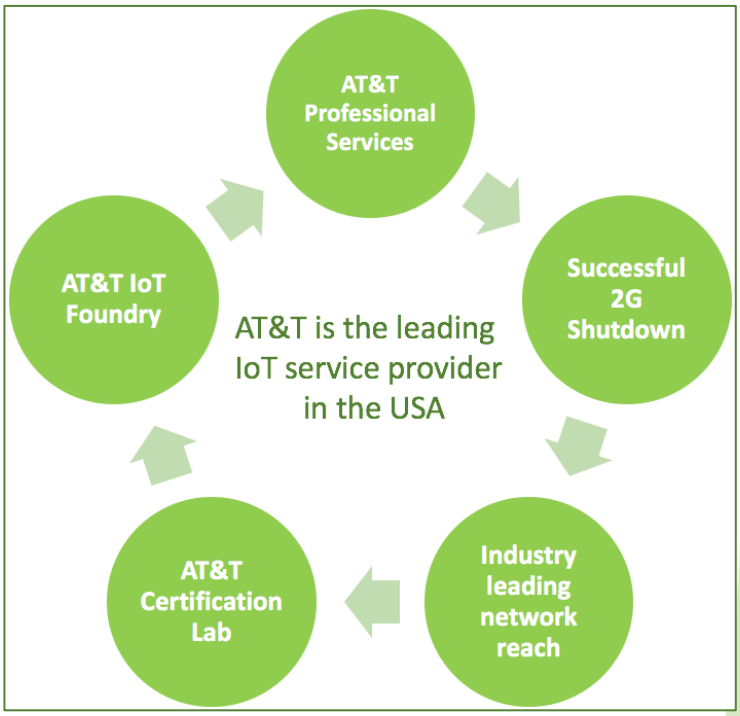
AT&T IoT Professional Services. AT&T Professional Service[ix] carries the experience and skill set to provide strategy, business planning, and IoT technology roadmaps for successful implementation of IoT solutions. With a team of more than 50 engineers and developers, not only can they help you with network sunsetting issues, but they can also assist your team with integrating IoT into your legacy products and services. Whether an enterprise needs support in truck roll deployments or requires a managed service for a more robust solution, AT&T Professional Services can provide the support.

[x] **AT&T IoT Foundry.** The AT&T Foundry[xi] is a group of vertically and technologically focused innovation centers which operate in six different cities around the world. Their personnel can assist enterprises to move from ideation to implementation. Foundry projects are designed to be quick, with communicative, collaborative teams who work with you to co-create solutions to real problems. The Foundry offers strategy, technology recommendations, rapid prototyping, and other advanced services that shortcut the time it takes to bring applications to life.

AT&T Certification Lab. AT&T Business assures the enterprise deployments run smoothly on their network. Having certified over 2,600 devices, we provide enterprises with device recommendations based on the portfolio of approved devices.[xii] For solutions that are not certified, AT&T Business provides lab and field testing.

The ability to execute comes from resources that AT&T Business has, including their robust set of APIs for developers and enterprises, their experience with vertical applications, and their strategic IoT relationships.

Having migrated over 16 million 2G devices in 2016, AT&T Business is the only company in the U.S. to date to have successfully and fully migrated all of their 2G devices off of the 2G network.[xiii] Additionally, it moved over 80,000 devices (asset tracking, remote monitoring, smart building, and fleet) in less than 6 months.[xiv] With the experience of managing their own transition as well as their 2G migration of their customers under its belt, AT&T Business is capable of taking on the problems and requirements you face in your deployment.



Conclusion

The success of an IoT deployment is often measured by its performance and longevity. In the midst of the 2G and 3G sunset, long-term transition plans and migration strategies are vital for enterprise success. With so many changes happening and so many choices to consider, including moving from 2G or 3G to 4G LTE or even 5G, selecting the right technology for your business is undoubtedly a challenge.

LTE has become the standard for wireless communications, and virtually all IoT devices can benefit from services associated with 4G LTE or 5G. Whether the need is for greater speed, large data capacity, or for services tailored to small data transmissions, the migration will be providing better service. Having a reliable network is crucial for any connected device—especially monitoring systems that rely on near-real-time updates.

The benefits of 4G LTE and 5G capabilities are available today. Now is the time to make the change!

The network sunset is real and coming faster than you may think. With the benefits of 4G LTE and 5G available today you do not have to let your business get left behind in the dark. By planning now, you will not experience a blackout. Now is the time to make the change.

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[i] James Brehm & Associates "IoT Results & News Roundup thru Q3 2019"

[ii] James Brehm & Associates "The 2G and 3G Sunset Survey" (2019)

[iii] James Brehm & Associates "IoT Results & News Roundup thru Q3 2019"

[iv] James Brehm & Associates "State of the Market" (2019)

[v] https://thestateofwomen.com/secrets-of-the-worlds-most-powerful-women/

[vi] James Brehm & Associates "IoT Results & News Roundup thru Q3 2019"

[vii] James Brehm & Associates "Worldwide Market Forecast" (2019)

[viii] https://www.business.att.com/categories/design-develop-and-expand.html

[ix] https://www.business.att.com/categories/iot-professional-services.html

[x] James Brehm & Associates "IoT Results & News Roundup thru Q3 2019" **and** https://www.business.att.com/portfolios/internet-of-things.html

[xi] https://www.business.att.com/solutions/service/internet-of-things/foundry-innovation-centers/iot-foundry.html

[xii] https://www.business.att.com/content/dam/attbusiness/briefs/att-global-device-certification-brief.pdf

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