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The Vital Role of Satellite

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In the world of the industrial Internet of Things (IoT), two simultaneous phenomena are driving unprecedented convergence. Customers are demanding more data from service providers, but at the same time, crucial 2G and 3G cellular infrastructure is being deprecated. To meet this need for more data, service providers are turning to satellite to improve reliability and avoid interruption in connectivity. As satellite and cellular networks transform, the future where they coexist and work seamlessly together is the future of industrial IoT.



To meet customer demands, industrial IoT service providers are moving from dated reporting systems to modern, unified cloud-based platforms providing more data, better analytics and real-time decision making. These new platforms are designed with the user in mind, offering enhanced customization, more data points, and crucial integrations. This access to information requires higher network usage, however, driving up usage costs for customers. As they require more information, service providers are expected to provide solutions that are always on and process thousands of data points a day. For that reason, IoT solutions are consuming more data than ever before. This demand exists for both satellite and cellular solutions.

Data demand on the rise

At the same time, [2G and 3G networks are being shut off](#) in many parts of the world in favor of 4G and 5G. Customers are being forced to upgrade or replace their IoT solutions to accommodate the shutdown. This is happening in phases, but it presents a unique challenge for IoT users: the networks they've relied on for a decade or more are becoming unavailable, which means replacing dozens, hundreds or thousands of devices in order to keep their assets connected.

While the demand for more data drives the adoption of higher-data-rate services and always-on solutions, network shutdown also encourages customers to seek out future-proof solutions. Neither cellular nor satellite can offer all those things. Cellular is not future-proof, as evidenced by ongoing network shutdowns, and it doesn't offer always-on connectivity. Cellular can be unavailable due to blind spots, congestion, weather conditions and more. At the same time, most satellite networks are limited in data rate, and connectivity typically comes in at a higher price than cellular.

Dual-mode solutions

Where do customers turn if they can't get everything they need in either network? The answer, for many, is to choose both. ORBCOMM has launched dual-mode solutions that are able to capitalize on the best of both worlds: the low cost and good coverage of cellular connectivity combined with the global coverage and longevity of satellite networks. For many customers, dual-mode is the only way to address the complexity and reliability needs of today's industrial IoT solutions.

The idea of dual-mode industrial IoT solutions is not new. In many cases, it has been the only way to effectively track and connect assets. The maritime industry uses dual-mode IoT to reliably track vessels at sea using satellite, switching to cellular at port to reduce costs. Some vehicle fleets, particularly those in heavy industries or oil and gas, often travel to remote regions where work is being carried out. These vehicles travel across areas with and without cellular connectivity. Being able to switch between networks as needed is crucial to effective monitoring and maintaining operational efficiency. Now, more industries than ever are realizing the benefits of satellite and cellular IoT.

Dual-mode IoT solutions take many forms, and their features can vary by use case. Automatic network switching is a key component, which keeps data costs down by prioritizing the cellular network when available. Some of ORBCOMM's unique solutions include both cellular and satellite antennas in the same terminal, offering a device that doesn't need to be integrated, making things easier for our partners when developing solutions. Other solutions of ours provide satellite connectivity with an accessory added to the cellular terminal. Most satellite networks have global or nearly global coverage, but an added value for some dual-mode solutions is a global SIM card. This allows mobile assets to be tracked seamlessly on different cellular networks as they travel between regions.

Adoption challenges

These core features can address many user concerns, but solution providers still face challenges convincing customers to adopt dual mode. For one, there remains a misconception around satellite services that they are extremely expensive. This perception held merit many years ago, when satellite was being introduced to the IoT market, but [satellite services have significantly come down in cost since then](#). At the same time, many organizations relying on industrial IoT solutions believe that cellular connectivity is sufficient, on its own, for always-on tracking. Due to blind spots, congested networks, and regions without cellular service, most organizations face

interruptions in connectivity. This can be disastrous, even with minimal interruption, in many industries. One example is in the refrigerated freight transport industry, where regulatory compliance can only be ensured with always-on connectivity, alongside avoiding spoilage of goods, which can be extremely costly.

Another major challenge in introducing dual-mode IoT solutions to the market is deployment. For organizations that have spent six or seven figures deploying IoT devices, asking them to replace these devices, unless necessary, is not likely to resonate. To overcome this challenge, solution providers are offering clever ways to allow organizations to upgrade. The aforementioned “satellite as an accessory” solution is helpful for organizations that have already deployed cellular IoT. In the case of a transportation fleet that uses cellular telematics, being able to quickly install a satellite add-on to their assets is extremely valuable. Downtime is costly for fleets, so being able to get trucks and trailers back on the road is paramount.

To capitalize on the evolution of satellite networks, ORBCOMM is also offering over-the-air device updates. As we launch new, high-data-rate services, we need an easier way to make these services available to customers. By providing over-the-air updates, we allow customers to capitalize on services that can give customers the insights they are demanding from their IoT solutions, without incurring added costs and time.

The way forward

As satellite and cellular converge to provide more complex and reliable IoT solutions, what does that mean for the future of the industry? It certainly doesn't mean that standalone satellite or cellular solutions are going anywhere. Satellite is crucial for use cases such as maritime vessel tracking, or fixed assets outside of cellular range, such as gas pipelines. At the same time, cellular-based solutions are sometimes sufficient for tracking assets that don't travel into remote regions, particularly where cost, rather than reliability, is the primary factor in choosing a solution. Still, more and more organizations will choose both to achieve the best in reliability and futureproofing.

Think, for example, of a transportation fleet that rarely, if ever travels outside of cellular range. What happens if the infrastructure the fleet relies on is damaged in a natural disaster, like a tornado? The added reliability of [satellite can be crucial during natural disasters](#) to maintain operational efficiency and customer communications. The addition of satellite to a cellular IoT solution ultimately comes at a low cost—all it takes is a simple antenna or communications device. The airtime represents a small portion of total usage, keeping costs low.

The future of the industrial Internet of things is likely to include a lot more collaboration between satellite and cellular. This can only be a good thing: customers get better services as costs come down, while also driving innovation in both networks. We'll see [higher data rates and lower costs](#) from satellite, while cellular will achieve better reliability. This is good for every organization in the industrial IoT. Whether a company is using satellite, cellular or both; everyone gets to reap the benefits of network convergence.