

Expanding IoT Deployments with

Cost-Effective Satellite IoT



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Taking IoT Further



SORACOM

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The Business Case for **Truly Global IoT**

Growing technological sophistication in recent years has enabled IoT deployments to expand significantly, with ease, and at scale. From agriculture to energy, consumer, manufacturing, transportation and medical, integrators and end-users are exploring blended communications solutions, from cellular to LPWAN, including Sigfox, Wi-Fi or Ethernet, LoraWan, to Bluetooth, to meet an array of business needs.

Seamless, secure integration to an array of cloud services, including AWS IoT, Amazon Kinesis and Microsoft Azure IoT, is ensuring organisations can maximise the value of the IoT data collected. For integrators, an array of innovative tools

is accelerating the creation of sophisticated IoT solutions to meet very specific business and operational demands. Intuitive dashboards are empowering companies to get fleets of IoT devices up and running fast, with rapid access to data, including powerful real-time data visualisation. Furthermore, a range of payment options, including both CAPEX and OPEX, are supporting the business case for flexible and easy-to-scale IoT deployments. With 83% of organisations claiming to have improved efficiency by introducing IoT technology, it is little wonder that IoT solutions have the potential to generate \$4-11 trillion in economic value by 2025.



Yet these connectivity solutions still provide coverage for only 15% of the world. From agriculture to asset tracking, there is a powerful demand for a truly global IoT solution.



Truly Global Deployment

The addition of satellite connectivity is a natural next step, creating a complete, blended connectivity solution to support any IoT deployment and deliver complete, global coverage. Until now, however, the cost, complexity and lack of maturity of the satellite solution providers have deterred this vital next step. Many integrators and businesses still perceive satellite as inaccessible, complicated or expensive. This belief is reinforced by the traditional satellite solutions which are not designed for IoT, using unnecessary high bandwidth at a cost that is not affordable for the majority of IoT use cases.

This perception is no longer valid. The latest generation of affordable Satellite IoT (SatIoT) solutions is transforming the business case, allowing integrators to embed satellite within a blended IoT connectivity solution. Organisations can now join the new wave of connectivity providers to make SatIoT more accessible than ever before, meeting huge pent up demand for IoT solutions that are both global and portable.

This White Paper outlines the value of a blended IoT solution including SatIoT and explains how access to affordable, global, low power, bidirectional SatIoT is set to unlock the next wave of IoT innovation.



“Satellite IoT is a long-term trend. There is so much opportunity to deploy IoT devices away from areas of population, away from terrestrial cellular infrastructure: satellite connectivity will be a compelling solution for organisations deploying devices in remote areas.”

Kenta Yasukawa, CTO, Soracom

Confirming Satellite IoT Solution **Requirements**

This is a compelling market for integrators, but how easy is it to embed SatIoT into existing solutions and what are the essential components required to achieve both a powerful client offer and a successful deployment? For Soracom, a company providing global IoT network cellular connectivity to over 20,000 customers around

the world, the evaluation process, resulting in a partnership with Astrocast, included several key aspects: global coverage, the cost model, the power efficiency of devices connected to the Astrocast constellation and, most notably, the ease of operation of the Astrocast SatIoT platform and its integration into the Soracom solution.



Global coverage

From truly remote locations to goods in transit, Satellite IoT needs to deliver global connectivity that complements the existing cellular network options.

“We require global connectivity; our clients require global connectivity. Soracom’s vision aligns with Astrocast: not only do they operate an inherently global service but are also committed to operating in countries that support our vision.”

Kenta Yasukawa, CTO, Soracom



Affordability

IoT operations are incredibly cost-sensitive. Whether a business is looking to deploy ten devices or hundreds of thousands of devices, tiny differences in performance and lifetime will fundamentally change the return on investment (ROI).



Power consumption

The efficiency of power consumption has a direct impact on device battery life. With devices typically located in remote and inaccessible locations, making replacement or repair impractical and unaffordable, it is crucial to maximise battery life. A low power SatIoT solution will radically extend the life of a device – with batteries typically lasting between five and ten years.

“Many of the devices that will be operating on our combined networking platform will be quite severely constrained by the available power. Astrocast’s power-efficient operation is also a big advantage to Soracom.”

Kenta Yasukawa, CTO, Soracom



Bidirectional communication

Two-way communication is essential both to underpin innovative IoT applications and enable changes to the way the device operates. For example, a business can send a short message to change a device’s operating parameters – reducing the number of times each day a temperature recording is taken, from once an hour to just twice a day, would reduce power consumption, and extend battery life further.



Effective Integration

To ensure SatIoT’s commercial viability on the Soracom platform requires seamless integration, ensuring organisations can gain transparent access to IoT data irrespective of the underlying network. Astrocast’s proven API ensured a rapid interface development, enabling Soracom to add the SatIoT connectivity option for its customers.

“Within three months Soracom had verified the potential of the Astrocast SatIoT solution and reported back to our parent company, KDDI, and investors in Japan. The Soracom SatIoT service is new but there is enormous potential, and it is close to a commercial launch.”

Alexey Gabsatarov, Business Development, Soracom

Exploring the Power of a **Blended IoT Solution**

Soracom provides IoT connectivity and platform services to over 20,000 businesses, with solutions for every challenge in IoT. The addition of Astrocast's SatIoT to the Soracom IoT solution provides integrators and end customers with the additional piece of the puzzle to extend IoT deployments effectively around the world. Organisations can access Astrocast SatIoT by subscribing to the Soracom platform, taking advantage of the seamless, secure integration to a choice of cloud services.

Integrators have access to Astrocast support and a wide toolkit to accelerate the creation of innovative IoT solutions. They can also tap into extensive expertise and insight to understand how to add SatIoT to existing solution sets. Soracom's intuitive dashboard will automatically include any SatIoT data, ensuring the complete, end-to-end IoT application model is in place.

Application Development

For integrators, the Soracom solution set also includes network services and application enablement services that allow organisations to build their IoT application to meet specific needs. For example: store data, process data, change the protocol – such as sending binary data over the air to save costs – or inject additional encryption.

Integrators can opt for a blended IoT solution, with devices moving between networks as required – cellular-first for example, then switching to satellite when cellular is out of range. At every stage, the data automatically feeds through to the Soracom platform, with its tight integration to a choice of cloud storage options.



“At Soracom we want to make sure that satellite connectivity is a first-class citizen on our platform.”

Alexey Gabsatarov, Business Development, Soracom

Device Design

SatIoT will require a different IoT device. Astrocast can work with organisations to ensure the correct antenna design – the antenna must be outside and directed towards the sky – as well as supporting integration and certification processes.

Devices can be SatIoT specific – for example, a location tracker for farm animals located in remote areas, in which case antennas must be small and flat to avoid vegetation as well as robust to maximise lifespan.

Alternatively, devices can be multi-network, moving seamlessly between networks as an asset is in transit. Such devices will need to be super robust to withstand weather, especially if tracking assets at sea.

Soracom is partnering with ArrowSpot, an integrator that has already created a certified, multi-network IoT device, to provide companies with fast-track access to the complete IoT solution set.



“We’re excited about having a single device that supports multiple networks. We don’t want to just add satellite connectivity and leave it there; we want to help our clients to take the best out of the service. Providing this blended service, where they can have access to multiple connectivity types, is important.”

Kenta Yasukawa, CTO, Soracom

Astrocast can also support the integration of the SatIoT technology, including recommendations based on the specific use case, with high-quality, detailed documentation backed up by highly responsive interaction with technical experts.

Building on Proven Business Demand

There is a significant pent up demand across many industries for IoT deployments across 85% of the globe that currently has zero cellular coverage. The availability of cost-effective satellite technology is providing new opportunities for an array of organisations and use cases, from Smart Agriculture to preventative maintenance and asset tracking.



SMART AGRICULTURE

Many farmers have already explored IoT to remotely monitor soil moisture and temperature as part of the move to reduce water consumption while optimising productivity, as well as tracking animal health and well-being.

The challenge, however, has been to achieve effective connectivity to existing terrestrial networks – the addition of satellite connectivity to the IoT solution will completely change the business value by offering affordable, reliable connectivity across the globe.

SUPPORTING BEE HEALTH

IoT is used to provide commercial beekeepers with a complete colony management system, with wireless “Beecons” collecting real-time data from active hives, including temperature, humidity, movement, and even sound frequencies. Data is then passed from multiple hives through a solar-powered wireless BeeHub to the cloud for monitoring and analysis, providing beekeepers with the information required to track hive health.

Adding SatIoT enables new opportunities for commercial beekeepers – especially for hives that are routinely moved to wilderness areas. For example in remote areas of California where farmers rely on rented bee colonies to pollinate the majority of the world’s almond harvest, the use of SatIoT devices to monitor the weight of each hive will ensure beekeepers know when to collect each hive.



GLOBAL ASSET TRACKING

IoT has transformed supply chain visibility over the past decade. Mobile assets, from shipping containers to railway carriages, are routinely tracked as they move, providing freight owners and fleet managers with vital information about the status of the assets. With continued supply chain disruption predicted to cost organisations around the world an average of US\$184 million per year, demand is surging for better end-to-end visibility to improve resilience and response to disruption.

Mobile assets using IoT currently connect seamlessly to an array of networks, providing shipping companies, freight forwarders and freight owners with vital insight about location as well as performance – such as operating temperature. Adding SatIoT to this solution will extend asset tracking across the globe, allowing timely interventions to reduce wastage, improve security and manage customer expectations.



AUTOMOTIVE INSIGHT

Providers of high-value, ruggedised automotive equipment used in robust and often remote environments such as mining, increasingly rely on IoT to monitor performance. With tyre wear in challenging locations accounting for as much as a third of the operational cost, information about tyre usage and wear can provide vital information to improve maintenance and reduce costs. Ruggedised sensors that can withstand harsh environments are used to track the condition of industrial equipment, including vibration, temperature and tyre pressure. With so many of these operations occurring in remote areas that lack cellular services, the addition of affordable SatIoT is a compelling extension to the existing solution.

Conclusion

Collaborating for SatIoT Innovation

The power of IoT to transform operations is indisputable. What has been achieved to date is compelling; but there is so much more that can be achieved.



“From driving down costs through proactive and preventative asset main-tenance to enabling farmers to understand and respond to the impact of climate change, the addition of SatIoT to a blended solution will unlock a new generation of IoT innovation.”

Fabien Jordan, CEO, Astrocast

With an affordable and accessible IoT platform, Soracom’s addition of Astrocast SatIoT will transform the ease with which integrators and businesses can explore the power of SatIoT. Soracom and Astrocast want to work with partners and clients to accelerate innovation by combining their depth of insight and knowledge of IoT, with the expertise of individuals on the ground, developing and using IoT.



“We want to work collaboratively with our clients and partners to accelerate the adoption of truly global IoT deployments.”

Kenta Yasukawa, CTO, Soracom

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About Astrocast

Astrocast SA operates a leading global nanosatellite IoT network, offering services in industries such as Agriculture & Livestock, Maritime, Environment & Utilities to name a few. The Astrocast network enables companies to monitor, track, and communicate with remote assets from anywhere in the world. It relies on superior L-band spectrum through a strategic alliance with Thuraya. In partnership with Airbus, CEA/LETI and ESA, Astrocast developed Astronode S, an ultra-low power and miniaturized module compatible with inexpensive L-band patch antennas. Founded in 2014 by a renowned team of experts, Astrocast develops and tests all its products in-house, from the satellites to the module.

[Contact Astrocast](#)

About Soracom

Soracom is a global provider of smart IoT connectivity, offering cloud-native wireless service designed specifically for the needs of connected devices. Founded in 2015 to create a more connected world by removing the barriers to IoT development, Soracom now serves over 15,000 customers across all industries, from agriculture, energy, construction and transportation to consumer electronics, manufacturing, real estate and healthcare. From global enterprises to fast-growing start-ups, customers trust Soracom for affordable, reliable connectivity that accelerates speed to market and makes it easy to connect to the cloud. Soracom is an AWS IoT Competency Partner.

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