

# INCREASING MARKET ACCESS WITH SATELLITE IOT

**Demand for the Internet of Things (IoT) is exploding, as more and more companies in a wide range of industries look to capitalize on the promises of IoT to improve their efficiency and increase their revenues. The opportunity for satellite to play a role in the IoT ecosystem is here, but the satellite industry has to overcome the challenge of integrating seamlessly into the complex IoT framework. However, with an appropriate understanding of end-user needs and careful planning, satellite service providers have the chance to fulfill the unmet, voracious demand for all things IoT and reap the rewards of this technology's explosive growth.**

## **The Voracious Demand for IoT**

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The Internet of Things – an expanding ecosystem of connected devices, industrial sensors, and intelligence sharing assets – is on a rapid growth trajectory. It's being driven by companies in nearly all vertical markets that share a need for increasing digitalization and a common desire for greater efficiency and transparency. Consider the following:

- According to Global Forecast, the global IoT market is expected to grow by 19.75% and reach \$2.488 billion in the U.S. by 2022.
- The GSMA report that by 2025 there will be more than 30 billion IoT devices connected with the information grid. They report the market size will be double the size of PC, smartphone, connected car and wearable markets.
- Data from NSR indicate that although most M2M and IoT services require only low bandwidth, over the next decade some verticals will demand additional bandwidth to support applications such as big data analysis, engine telematics and live data streaming.

The core value of IoT is best understood as operational efficiency, not merely connectivity. Global industry looks to IoT to transform business and improve the bottom line through real-time monitoring of thousands of assets, increases in efficiency, reduced waste, increases in output, and improvements in safety. The value of IoT is enabling businesses to connect, monitor, streamline, and save.

## **Addressing Availability and Ease of Access – The Satellite Opportunity**

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A fully realized IoT ecosystem will require more than one type of connectivity. This is because the growing number of different IoT applications use a diversity of data types, capacity bandwidth, latency/speed requirements, and more. Within this spectrum of possibilities and unique needs, satellite plays a critical role: Filling gaps that no other technology is properly equipped to handle. Most notably, satellite is exceptional in eliminating deficits in availability, reliability and accessibility.

With satellite technology, users can extend the availability and reliability of IoT to devices operating in remote regions. Terrestrial connectivity can be unreliable or unavailable for many businesses that operate in remote locations over wide geographical stretches of land or sea. Satellite technology, on the other hand, enables consistent, reliable connectivity in these areas, making it an invaluable resource for remote IoT.

The markets that are primed to benefit most from satellite as a part of their IoT ecosystems are the same industries that have relied on satellite for decades:

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|-----------------------|----------------|
| • Transport           | • Utility      |
| • Maritime            | • Construction |
| • Government/Military | • Mining       |
| • Energy / Oil & Gas  | • Agriculture  |



The demand drivers for these verticals are as diverse as the markets themselves. In transportation and logistics, for example, the advantage of IoT is the real-time tracking of vehicles and assets. Businesses in this sector need to know where exactly their assets are located and what condition those assets are in at a given moment. They also want to monitor as many inputs as possible. In a situation like cargo tracking, these inputs could include monitoring utilization or environmental factors like air quality, water quality, and weather conditions.

Energy use cases revolve around visibility into the generation and transmission of electricity or any other utilities. There is a particular emphasis for these utility companies on smart metering.

Mining and construction have similar needs to that of transportation with primary demand drivers being asset management, real-time asset monitoring, and knowing with specificity where and when assets are in particular locations.

Agriculture requirements for IoT include tracking of cattle and other livestock, proactively monitoring of environmental and weather conditions, and automating farm equipment. Additionally, the insights that IoT technology provides can help farmers increase the output of their yields while reducing inputs like water and fertilizers.

In maritime, use cases include many described for other markets as well as more specific requirements such as monitoring buoys, fishing vessels, and catch reporting of fish.

Satellite IoT can address all these markets and applications in two ways: through direct to satellite or indirect through aggregation of bandwidth from endpoints.

### **IoT Aggregation**

In an IoT aggregation model, several devices, or endpoints, connect to a single device or third-party gateway device, which then connects to the satellite. This model is low efficiency and works best for use cases with a low density of terminals and high power, high data rate requirements – the type of use cases similar to those that a VSAT would enable. For example, the IoT aggregation model is suited for localized deployments on a farm to collect all the data from all its equipment. For most use cases, an IoT aggregation model will use an IP protocol.

### **Direct-to-Satellite**

In a direct to satellite model, each device is connected via a modem and an antenna directly to a satellite – usually one device per connection. To contrast with the aggregation model, direct to satellite applications are high efficiency with a high density of terminals and low power, low data rate requirements. With lower data rates, applications using the direct model can have a lot more devices on that network and are more power-efficient because they run on smaller batteries. The direct model is best suited for wide area deployments. As opposed to the IP protocol used by the aggregation model, the direct model prefers proprietary messaging protocols.

## Exponential Growth in Requirements Create Opportunity Despite Challenges

Satellite IoT is on the rise. In fact, global IoT via satellite is expected to reach \$2.6 billion by 2027 according to NSR. For end users and service providers alike, there traditionally have been three factors that limited the viability of a satellite-enabled IoT solution: Cost, data, and interoperability.

Satellite connectivity has traditionally come at a premium compared to terrestrial alternatives and for many use cases, satellite IoT is no different. But, today, major advances within the satellite industry and falling costs to launch missions have combined to bring down the price of connectivity, lower the total cost of ownership.

The next challenge historically has been data: How much data is the end-user going to be pushing over the satellite network? What's the payload size? How many times in a day does the end-user's data need to be sent? Daily, hourly, minute-to-minute? Understanding the mix of quantity and frequency for a particular end user scenario is crucial to satellite's success in that market. And no data discussion is complete without the follow-up consideration of latency. What is the tolerance? Does information need to be available immediately or is some latency applicable for the end-user's specific application?

In the past, GEO satellite connectivity was limited to supporting high data rate (HDR) applications, such as SCADA connectivity for voice and data with throughput ranges from 100kbps to 500kbps. Today, however, with the advent of more powerful high-throughput satellite (HTS) capacities, advances in the bandwidth allocation, and flat panel antenna design, GEO satellite solutions bring new capabilities that are making medium data rate (MDR) and low data rate (LDR) applications more viable—this includes applications such as events-based or demand-based throughput of up to 100kbps or roughly 25MB per month.

The final challenge that has often deterred implementation of satellite-based IoT solutions is interoperability, or ease of integration. How do you ensure that any connectivity option that you deploy is able to retrieve information, analyze it, and process it? If satellite is to be seen widely as not only a viable, but a valuable part of the ecosystem, then it needs to be freed of its perception as another layer of added complexity to an already complex IoT system.



## Service Provider Options to Establish New IoT Revenue

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In the past, service providers had limited options if they wanted to offer a satellite IoT service offering. But today, the same service providers are at the nexus of enormous advances in satellite technology and the parallel demand for always-on data flow of their customers. Satellite IoT is the key to reaping all of the potential rewards of this insatiable demand for data, but only if it is easy to plan, install, and operate, while providing affordable service. Service providers can enable such an offering if they can quickly deploy highly efficient, small, and very inexpensive satellite terminals. The result is immediate revenue generation and OPEX reduction.

## What ST Engineering iDirect Can Offer

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Service providers that want to build new satellite IoT service offerings or those that are new entrants into the satellite IoT market in general will require a highly efficient, cost-effective solution with a platform that can be deployed and operated easily. That is why at ST Engineering iDirect we are offering a robust, cost-effective and highly scalable offering, facilitating connectivity with compact terminals and flexible service deployment models for different IoT use cases. It gives service providers a complete IoT connectivity solution, building on a flexible service enablement model, paired with IoT-as-a-service options for immediate access to a wide range of markets including transportation, energy, mining, utilities, agriculture and construction.

Built on our scalable VSAT platforms, these solutions incorporate an IoT-optimized waveform, cloud-based Network Management System, and small form-factor IoT terminals supporting fixed or mobile IoT applications.

Contact us to find out more or visit [www.idirect.net/products/iot-solutions/](http://www.idirect.net/products/iot-solutions/)