

**20**

**#NEXTLEVEL IOT  
DEVELOPER HACKS**



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What's worse than wasting time on unnecessary coding?

Okay, maybe Python import errors... but besides that, it's hard to find something more unproductive than playing solitaire in the terminal.

As developers ourselves, we know there's never enough time in the day to fine-tune your IoT project — especially when you're spending valuable minutes writing code that'll never be used.

That's why we've pulled together 20 growth hacks that you can use today to reshape the future of cellular IoT with your innovative project.

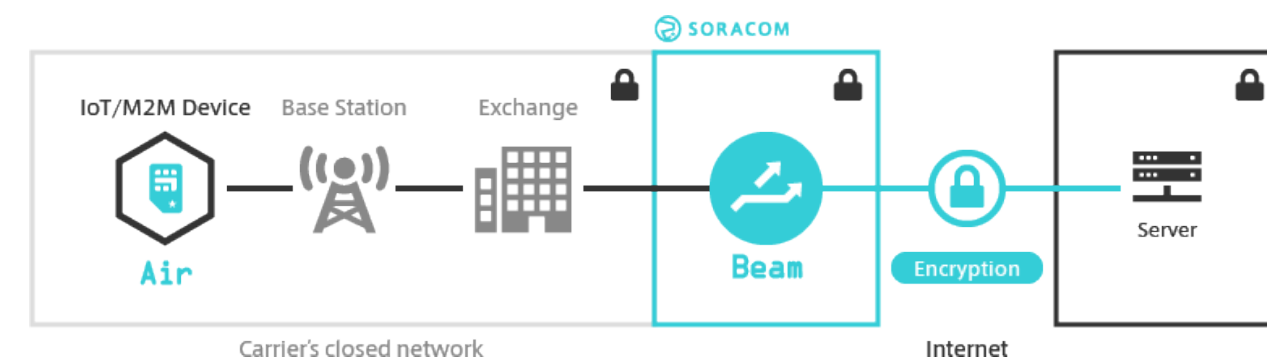
After all, why spend months when you can get it done in minutes?

# HACK #1: OFFLOAD CREDENTIALS FROM DEVICE TO CLOUD FOR 30% POWER EFFICIENCY

An award-winning IoT wheelchair company gained plenty from connecting to the internet, including the ability to remotely control the smart wheelchair using an iPhone app.

However, it also required close monitoring to ensure a customer's ride is safe and secure at all times. Many IoT projects hold credentials on their devices, which can be a security risk as they're vulnerable to physical tampering.

They fixed this by [offloading the device credentials to the cloud](#), skyrocketing security and reducing the amount of data each device needs to transmit.



With this, they could connect to the cloud without relay servers or SDKs while still supporting certificate management for their fleet of IoT devices, saving 30% in power costs and considerable data usage in the process.

And that's not all.

They also tied everything together with an easy-to-use [IoT management console](#) that allowed them to remotely start, stop, slow or speed up their devices from the comfort of their chair — or anywhere in the world, really.

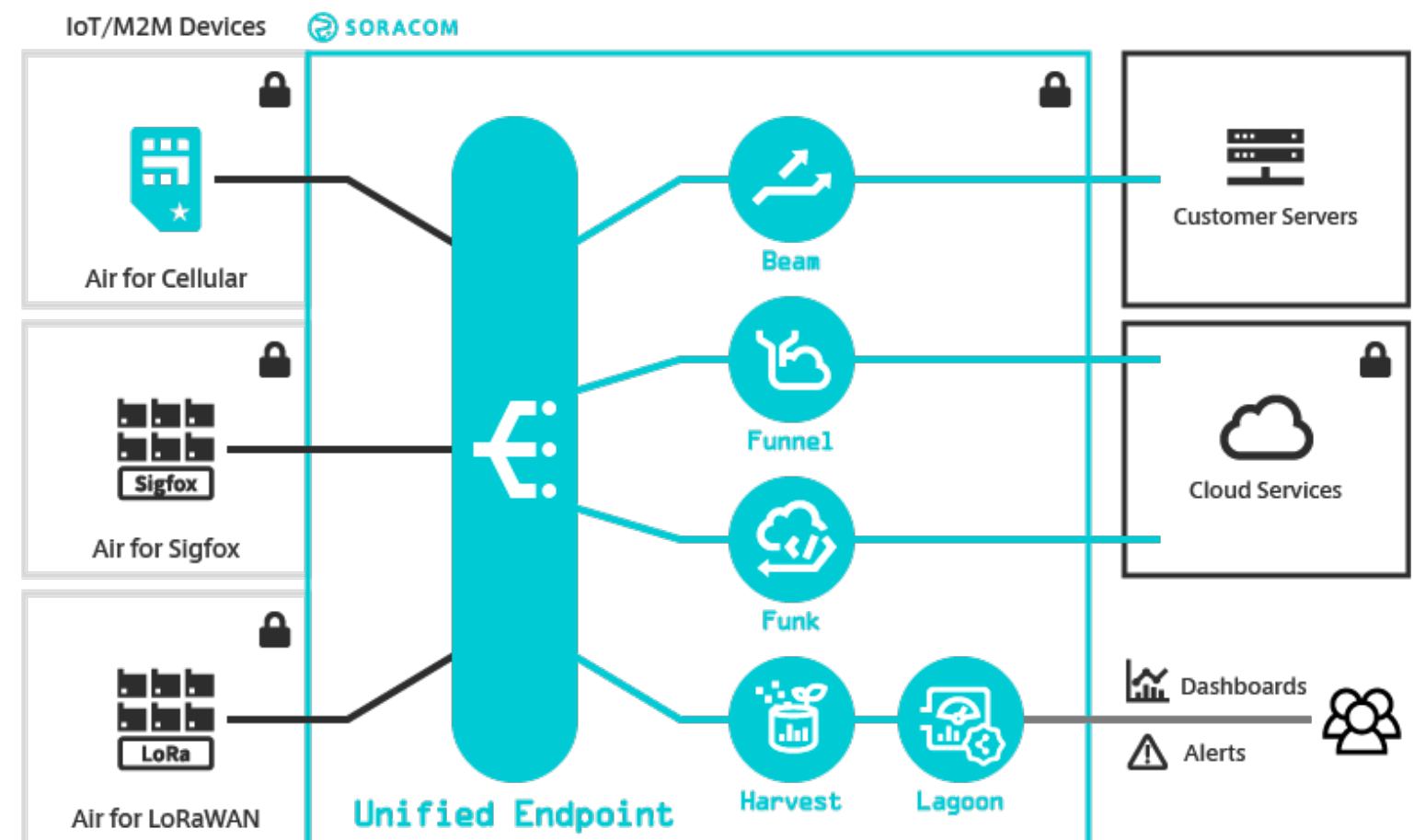
# HACK #2: USE PRE-BUILT ENDPOINTS TO SIMPLIFY DATA STORAGE

Recently, two software engineering interns decided to try their hand at building a [cellular IoT scooter](#) that functions as well — or in some ways better than — the ones you see in cities like San Francisco.

What hacks did they use to accomplish this feat? Well, one major shortcut they found was using a pre-built unified endpoint to eliminate the need to build a server API. That way, they could securely store and receive data from their devices with little coding required.

Plus, with a unified endpoint, data that needed to travel to different products or services could do so without having to be forwarded multiple times from each device, reducing the data cost drastically.

With nothing more than a Raspberry Pi, a SORACOM Air [IoT SIM card](#) and a few cheap sensors, they were able to build an incredible product fitted with surge pricing capabilities, data visualization and more.





## HACK #3: SIMPLE SCALING WITH AN IOT CLOUD ADAPTER

Connecting hundreds of thousands of devices to the internet doesn't have to involve an army of developers, months of labor and thousands of dollars.

One of the largest beverage companies in Asia expanded to 100k+ devices with ease by using an [IoT cloud adapter](#) to send data directly from their devices to the cloud — all without relay servers, SDKs or data-hungry on-device authentication.

With this, they were able to send data using unsecured HTTP to the cloud adapter where it was translated to HTTPS before reaching the cloud.

Not storing passwords on their devices allowed them to further protect their project from hackers while decreasing their overall data usage. Plus, they were able to access cloud services as they scaled without the drag of performing in-field setup and maintenance as they scale.

The result? Serious savings.

**They cut 9 months of development time, 100s of 1000s of dollars and countless headaches, allowing them to continue quickly expanding their business at a fraction of the cost.**

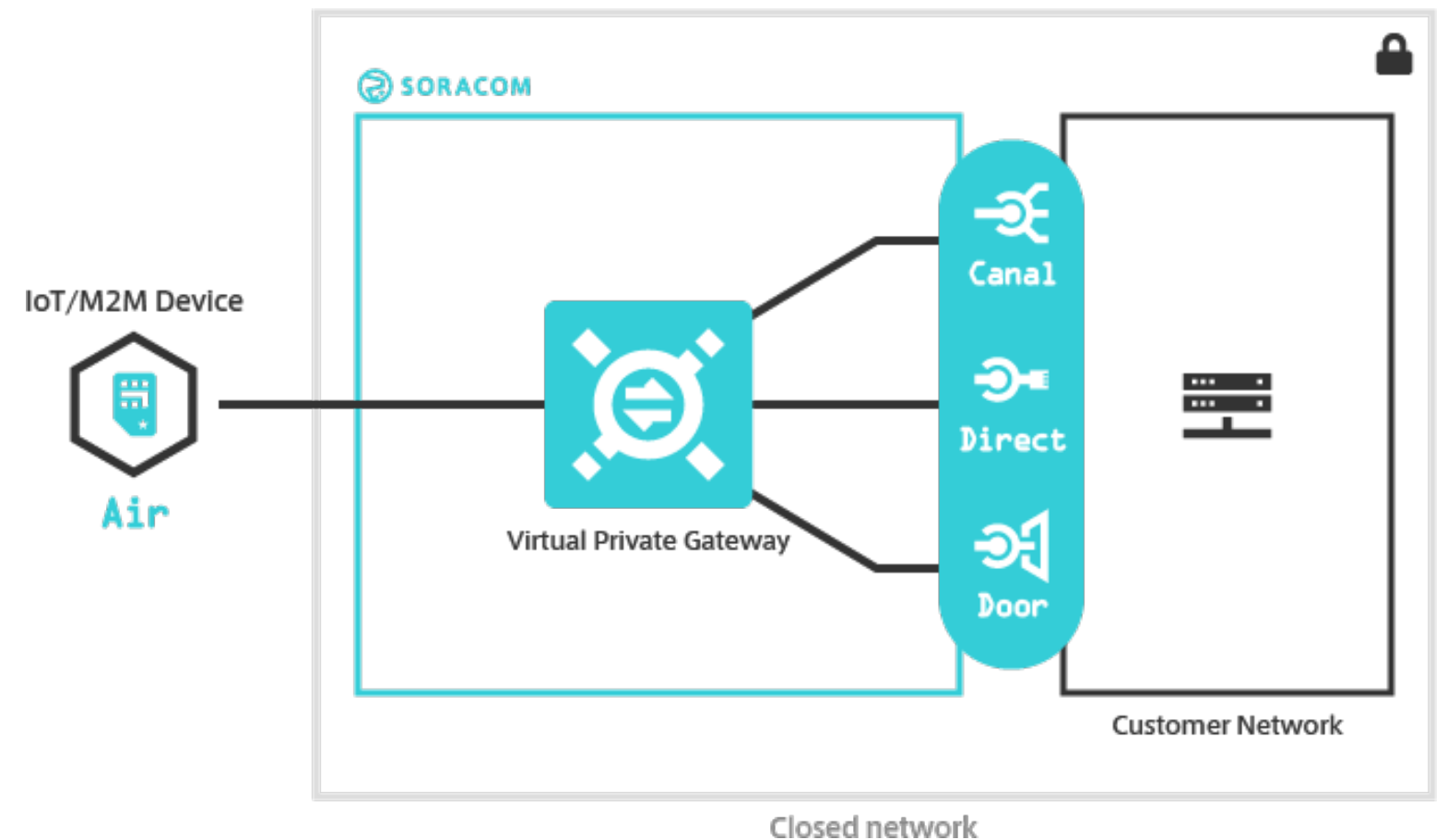
# HACK #4: USE VPGS AND CELLULAR CONNECTIVITY TO BYPASS LAN

A Japanese department store wanted to be one of the first retail stores to not use a VPN for their network's backup line. That way, they could cut costs and development time, allowing them to jump ahead of their competition.

With cellular connectivity, they were able to avoid 10s of 1000s of dollars in network and equipment costs — including access points and construction — all without sacrificing security or performance.

Each retail POS system featured an IoT SIM card that connected it to the network in case the main WiFi connectivity failed. Along with this, the department chain used a [virtual private gateway](#) (VPG) to peer with their AWS Virtual Private Cloud, ensuring a simple and secure connection the cloud.

These two growth hacks allowed them to limit the amount of time that they had to spend on their private cellular network, getting them up and running faster than ever.



# HACK #5: IMPROVE DEVICE INTELLIGENCE WITH BILATERAL COMMUNICATION



Sending data to and from your cellular IoT devices and the cloud – rather than one-way communication – can unlock new features and functionalities.

For instance, an IoT smart building company integrated their SigFox devices into AWS IoT, which enabled the cloud to communicate back to the cloud for troubleshooting, upgrades and other tasks.

This remote functionality simplified the management of their SigFox devices, allowing them to control data consumption and visualize per-device data usage across multiple countries.

Real-time monitoring is the hallmark of cellular IoT — and rightfully so. It's changing lives, enhancing transparency and giving life to new ideas and concepts.

A business tasked with visualizing “invisible” windsurfing races realized that anything short of real-time monitoring would be considered a failure. After all, it would limit the entertainment value and can put windsurfers at risk if they veer off-course unnoticed.

**To solve this problem, they installed a 3G/LTE module inside the waist pouch of each windsurfer and powering their project with a wireless inbound-outbound (WIO) board.**

This allowed them to easily — and accurately — track the stats of each contestant by the second.

Without discovering the real-time asset-tracking capabilities of cellular connectivity, it's likely that these exciting windsurfing races would remain invisible to this day.

## **HACK #6: DEPLOY PIN-POINT ASSET TRACKING WITH CLOUD CELLULAR CONNECTIVITY**







## HACK #7: USE DATA CAPS TO PREVENT SURPRISE CHARGES

Financial surprises can be devastating for businesses and people alike — especially when they go unchecked for months on end. Worrying about the unknown could result in more human errors, creating a snowball effect that can sink your business.

An IoT energy business addressed this issue by implementing data caps on each of their devices. With this structure in place, users are notified via email, Slack or SMS once device data reached a certain threshold as a result of overuse or data transmission loops.

By protecting their IoT project with data caps, they no longer has to worry about paying a premium on their device data due to unforeseen circumstances.



## HACK #8: SHIELD NETWORK FROM OUTAGES WITH FAILOVER CONNECTIVITY

Every IoT project relies on Internet connectivity. When there's only one line of defence (whether it's cellular, WiFi or another type of connectivity), outages can hurt your performance and disappoint your clients.

One telecommunications company protected themselves and their clients by deploying a cellular failover connectivity in case their main line went down, ensuring that they had a backup that could carry the load.

With this, they were able to continue performing without a hitch while other competitors without a backup IoT connectivity were struggling to reconnect.

Plus, it freed up time for their developers to create rather than correct, allowing them to continue building a stronger product for their customers.



## HACK #9: CONSOLIDATE OPERATIONS WITH GLOBAL CONNECTIVITY PARTNER

When your IoT project is scaling, it's hard to escape the countless partners that you'll need to interact with in order to set up and maintain operations. However, one company that handled precision irrigation management found that not only is it possible, but it can be a great way to simplify your business as you grow.

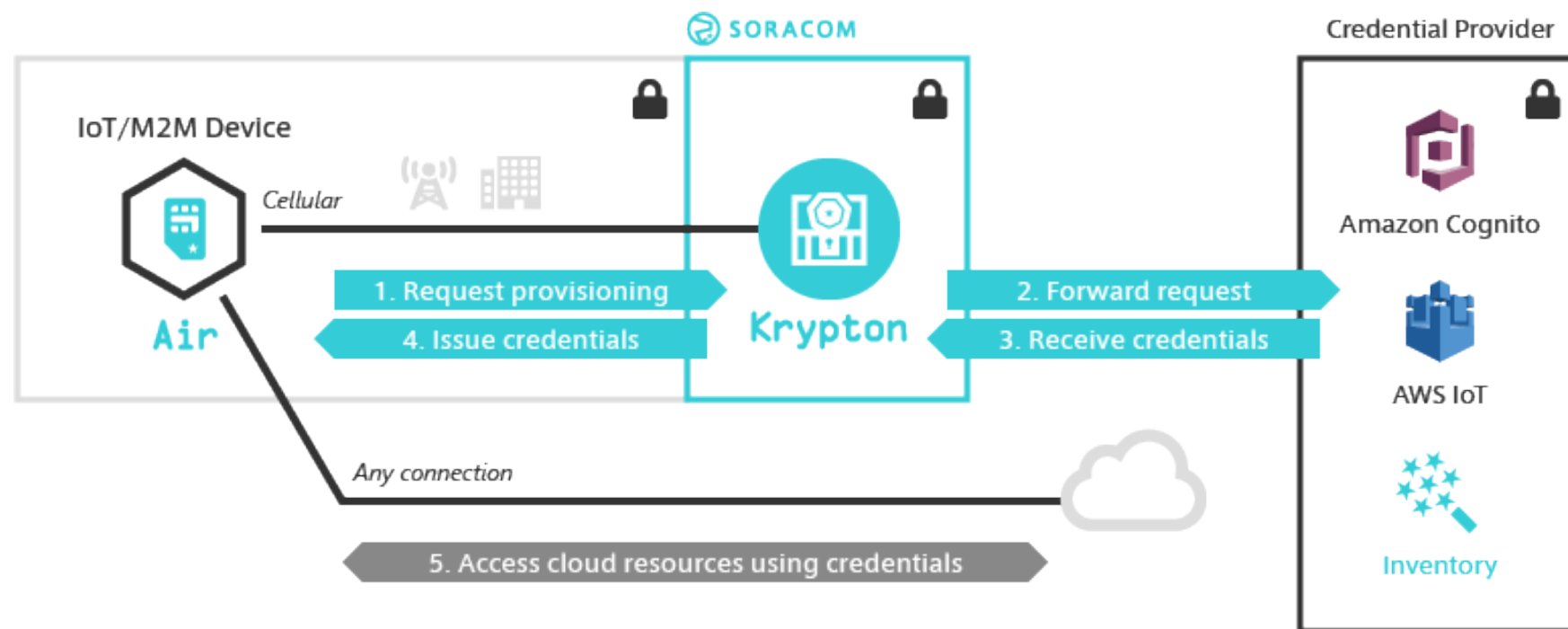
By deciding to trust in one global connectivity partner, they were able to circumvent signing contracts with regional connectivity providers while also improving troubleshooting efficiency and response time.

Plus, it simplified the pricing to one definitive rate rather than a dozen or more different prices that could change depending on roaming, device count and more.

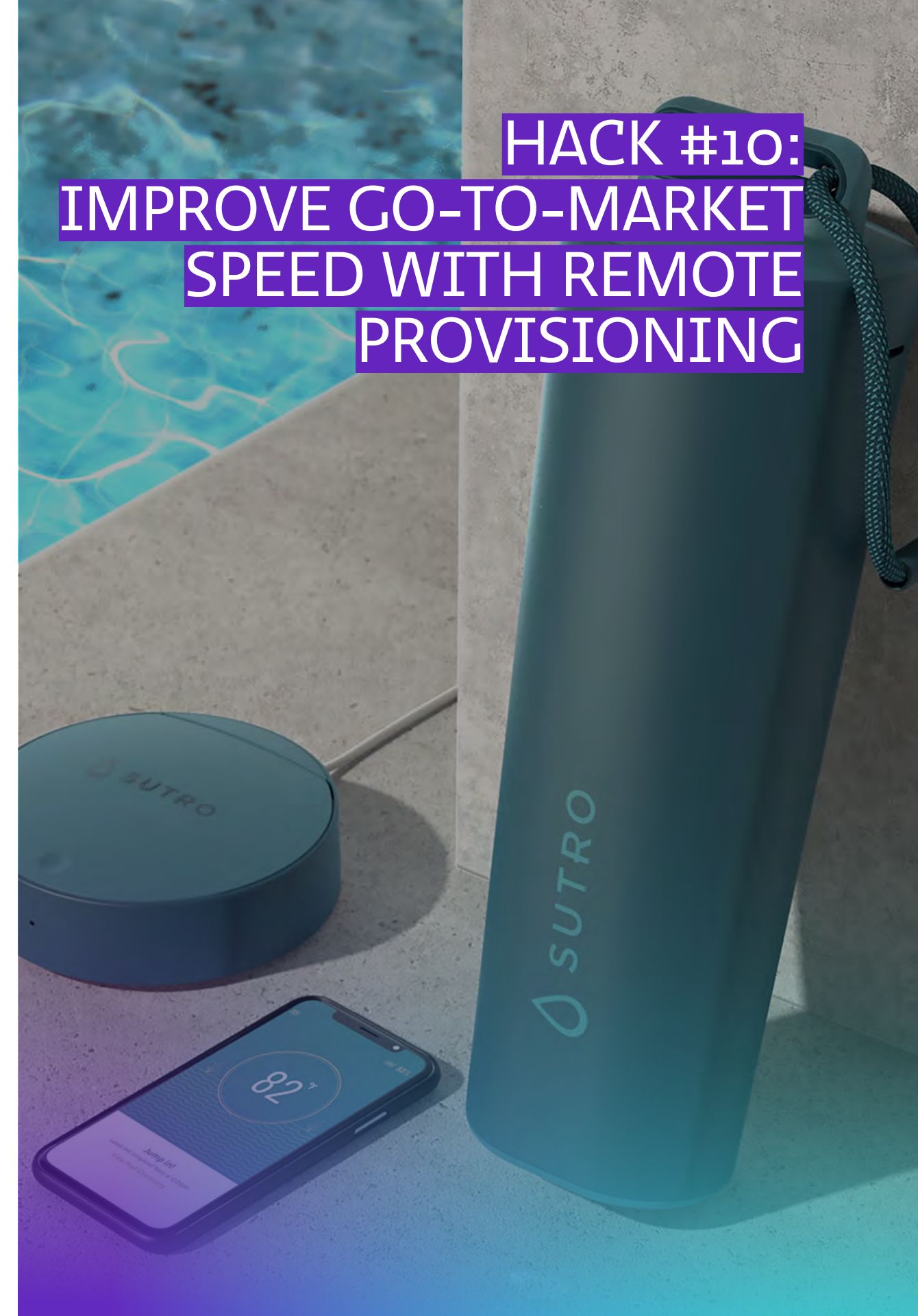
Without [device authentication](#), IoT projects would be vulnerable to external threats sending malicious data to their servers or accessing personal information.

However, while it's clearly important to secure your IoT devices with authentication protocols, it can be rather time intensive to implement at the time of manufacturing, delaying your products go-to-market date.

With on-demand remote provisioning, a pool and spa water maintenance company found a growth hack that allowed them to bypass this wait without sacrificing their security. This allowed them to remove the risk of human error at manufacturing and actually improved their device security by ensuring the credentials didn't rest within the device where they can be physically accessed by hackers.



## HACK #10: IMPROVE GO-TO-MARKET SPEED WITH REMOTE PROVISIONING





## HACK #11: ADOPT PAY-AS-YOU-USE IOT DATA PLAN FOR PROFIT

For consumers, the first thing that comes to mind when we think of cellular connectivity is the minimum commitment data plan that we have with our smartphone, forcing us to pay a set amount regardless of what we use.

IoT developers that power their projects with telcos face a similar fate — even those that use mere KBs a day.

To avoid painting themselves into a corner, a municipal transportation company decided to partner with a cellular connectivity provider that offered pay-as-you-use pricing.

**This created the flexibility that they needed to operate their city buses without fear of looming minimum commitment data charges, cutting their monthly rates by 90%.**

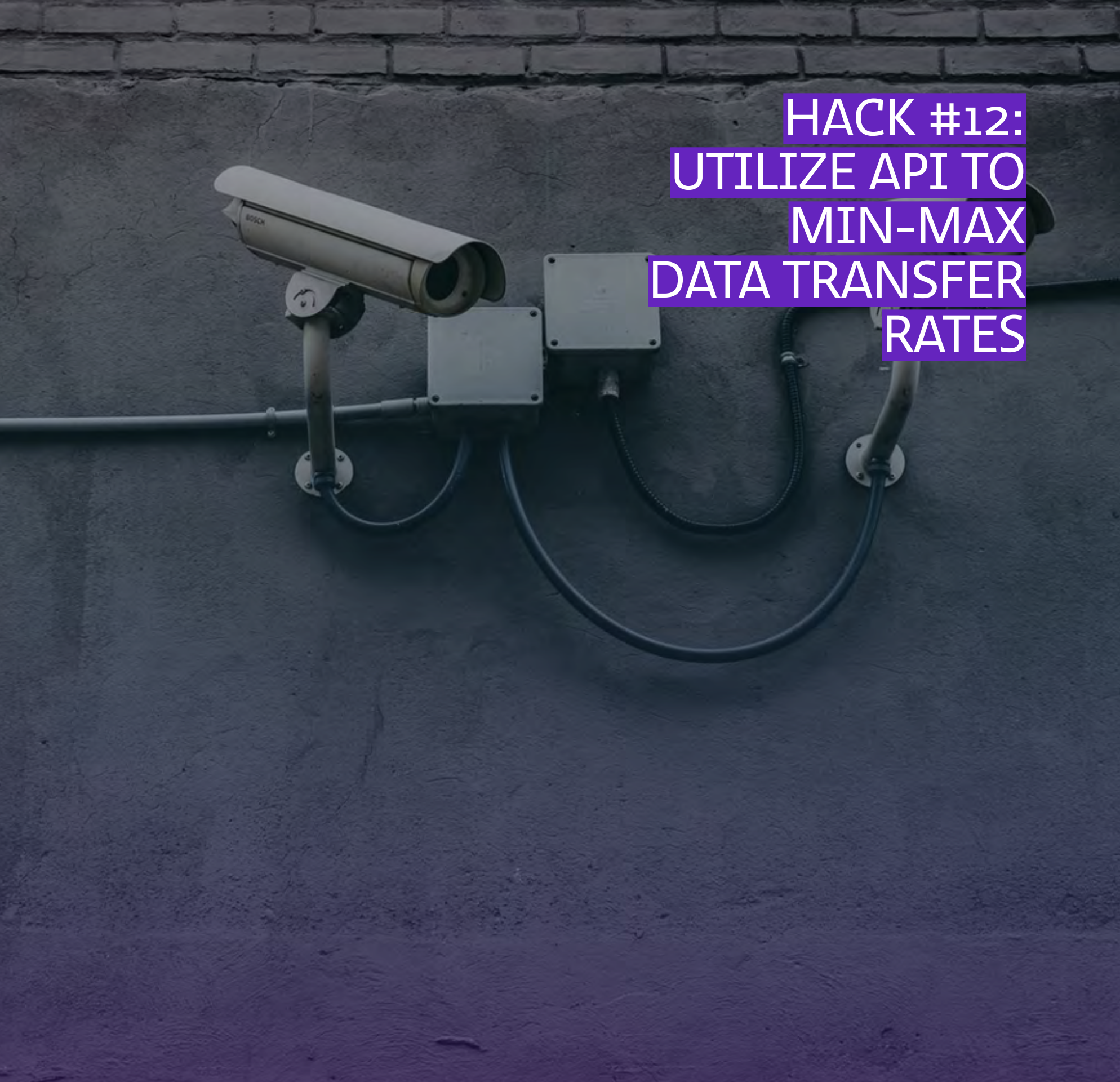
And that's not all!

Making the switch allowed them to stop and start devices depending on budget, traffic, and seasonality, adding more functionality to their cellular IoT business.

For many IoT projects, there are times when you need high data speeds, such as when you're streaming 4K video in real time. However, for the majority of the day, these lightning-quick speeds are accomplishing nothing more than burning a hole in your budget.

One surveillance company realized that this operational inefficiency was costing them dearly while providing no value to their business or to their consumers. To solve this problem, they used an API that enabled them to toggle data rates based on customer demand.

With this protocol engaged, the default speed is set to slow and will only ramp up when high bandwidth is required — rather than at all times. This cut their data spend drastically while ensuring that the quality of their service remained unaffected as the change is under the hood.

A security camera is mounted on a wall. The camera is white and cylindrical, with a lens at the front. It is connected to a power source and a network switch. The background is a dark, textured wall. A purple text overlay is positioned in the upper right corner of the image.

## HACK #12: UTILIZE API TO MIN-MAX DATA TRANSFER RATES



# HACK #13: BUILD LEAN OPERATIONS WITH SERVERLESS CLOUD FUNCTIONS

As technology progresses, we're fitting more and more functionality into a smaller size, and IoT is no different.

However, one of the latest innovative ways to improve device intelligence without compromising size is by actually offloading the logic to a serverless cloud function.

Two software engineers used this growth hack to create bilateral communication between an [IoT scooter](#) and the cloud. With the help of AWS Lambda, they were able to deploy surge pricing – charging a different rate depending on traffic location.



## HACK #14: EXTEND EQUIPMENT LIFE WITH PREDICTIVE MAINTENANCE

Maintenance and upkeep can be a costly affair for many businesses, especially when their equipment is shipped to different countries or deployed in hard-to-reach places. Failures can cost you money sending a technician and can hurt your reputation with your clients.

An elevator company is ushering in a new era of equipment upkeep with predictive maintenance using [IoT remote monitoring](#), allowing them to track their products health in real time from anywhere in the world.

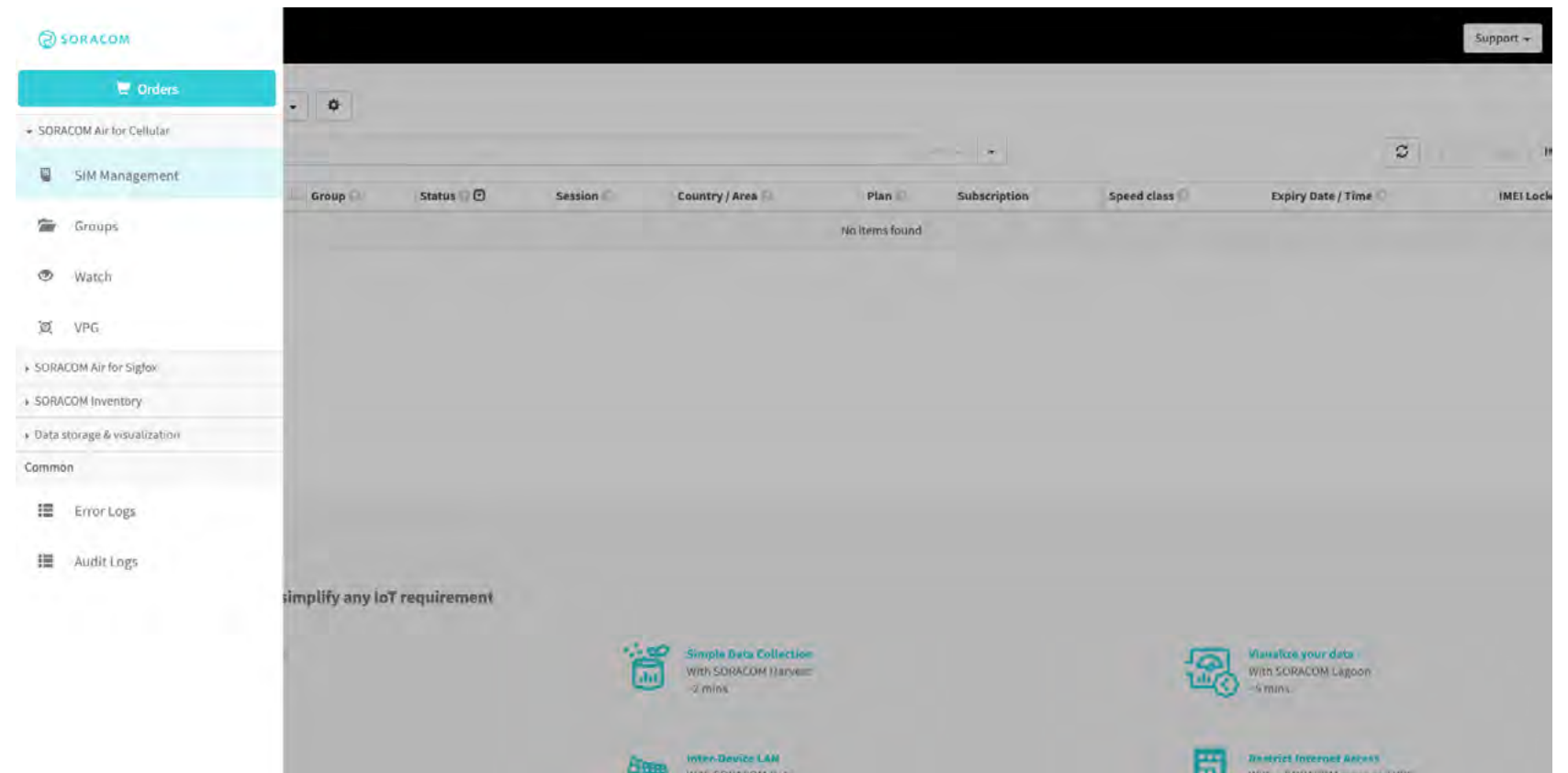
Plus, with the ability to locate and address equipment failures before they happen, they can use predictive maintenance to slash technician costs and reduce the amount of downtime that their clients have to experience.



# HACK #15: ENHANCE TROUBLESHOOTING CAPABILITIES WITH INTELLIGENT IOT MANAGEMENT CONSOLE

Unexpected errors can be a disaster for your IoT project, resulting in indefinite downtime and countless technician hours working to find a solution. This is especially the case when there's no way to find where the issue lies.

A real estate company found a way to pinpoint where problems were arising in their platform by using an intelligent IoT management console. As a result, they were able to deduce whether issues were coming from their devices, the connectivity or the cloud, supercharging their troubleshooting efficiency and allowing them to solve problems in minutes — not days.



## HACK #16: SECURE YOUR PROJECT WITH IOT SIM CARD AUTHENTICATION

For cellular IoT projects, it's not abnormal for devices to be protected by SIM identification. After all, that's the purpose of the SIM card.

However, when one food and alcohol wholesaler decided they wanted to vet which users can access their AWS VPC, they found that SIM authentication could be a unique way to keep their platform protected.

Instead of granting permission to everyone, they were able to set a specific number of devices that can access certain parts of the platform, lowering the risk associated with opening the doors to the entire company.



# HACK #17: LEVERAGE USSD, GSM BINARY PARSER AND SERVERLESS STORAGE FOR MAXIMUM RESULTS

When it comes to optimizing your cellular IoT project, why only choose one growth hack?

An IoT-connected remote garage door controller company knew they needed to build their business lean if they wanted to compete in the market.

After all, their products didn't require the high speed data transfer rates that video streaming and other services need to operate.

To accomplish this, they decided to cut costs and development time by utilizing USSD — a cost-effective messaging protocol that sends information from user to network and vice-versa, a better alternative to SMS for use cases with occasional data uploads.

Plus, they adopted GSM Binary Parsing to simplify the raw data being sent from device to cloud from an average of 8-24 bits all the way down to 1 bit, saving on data costs.

In addition, they used [serverless storage](#) to reduce the overhead and upfront costs by allowing you to pay for just the data you use rather than the associated server and storage.



## HACK #18: USE RAN AND SAY GOODBYE TO CUSTOM INTEGRATIONS

With hundreds of different file types and data protocols, it can be difficult at times to ensure that platforms can connect smoothly without any hiccups.

This is especially important for cellular IoT projects where data is being transferred in all directions to multiple destinations for analysis, storage and more.

To simplify the process, a precision irrigation management company decided to use a RAN that is native to the AWS IoT platform, ensuring that there would be no need for custom integrations in order to effectively send data to the cloud.

Plus, it improved their reliability by ensuring that the pathway for data to travel was drastically simplified, making for a cleaner system that could be scaled much easier.



## HACK #19: BUILD YOUR OWN PRIVATE GATEWAY

For cellular IoT projects that are in hard-to-reach places like mountains, mines or power plants, it can be difficult to get coverage – one of the most important parts of any IoT system.

This is particularly true for industrial IoT (IIoT) projects as they're often controlling heavy machinery and equipment, which aren't ideal candidates to be left unmanned.

By choosing to build your own private cellular gateway, not only can you receive coverage in any area that you choose to deploy your IoT project, but you can also move your gateway as the need arises.

**This can be particularly useful for products that revolve around seasonality such as monitoring mountaineering or windsurfing.**

Depending on the traffic, you can easily redeploy your IoT devices in another location without worry about finding suitable coverage, allowing you to adapt to market trends and stay flexible as you scale.



## HACK # 20: MONITORING SUPPLY CHAIN WITH BIG DATA, AI AND IOT

International businesses tend to have complex supply chains that stretch from country to country, involving dozens of third parties and plenty of transportation time – sometimes with products susceptible to spoilage.

Keeping this enormous operation moving smoothly can be a tall order especially without any real-time updates on the products as they travel from location to location.

Naturally, this has become a great application for IoT, but companies are taking it to the next level by implementing big data and AI within their IoT project as well.

The real-time remote monitoring capabilities of cellular IoT – combined with the in-depth analytics and automation enabled by big data and AI – allow businesses to deploy a truly intelligent global supply chain that sends automated alerts when their products reach critical levels on specific parameters set for individual products.

Plus, since they've incorporated AI into their supply chain system, this platform grows smarter by the day, promising greater returns for their investment in innovative technology.

# TIME TO GET CODING!

Well, hopefully far less now that you have these quick and easy growth hacks.

If you want a better product quicker — and at a better cost — there's no time like the present to try these shortcuts out.

Imagine all of the things you could accomplish with all of that extra time (mostly productive stuff, I'm sure).

At Soracom, growth hacks is in our DNA. We're reimagining IoT cellular connectivity as the world knows it, making it easier than ever to create and connect to the cloud.

After all, 15,000 customers across 122 countries can't be wrong, right?

Shoot us a message to learn how to level up your IoT project today — not tomorrow — with Soracom.

# 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.

Learn more about our intelligent IoT connectivity platform and cloud-based services at [www.soracom.io](http://www.soracom.io).



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