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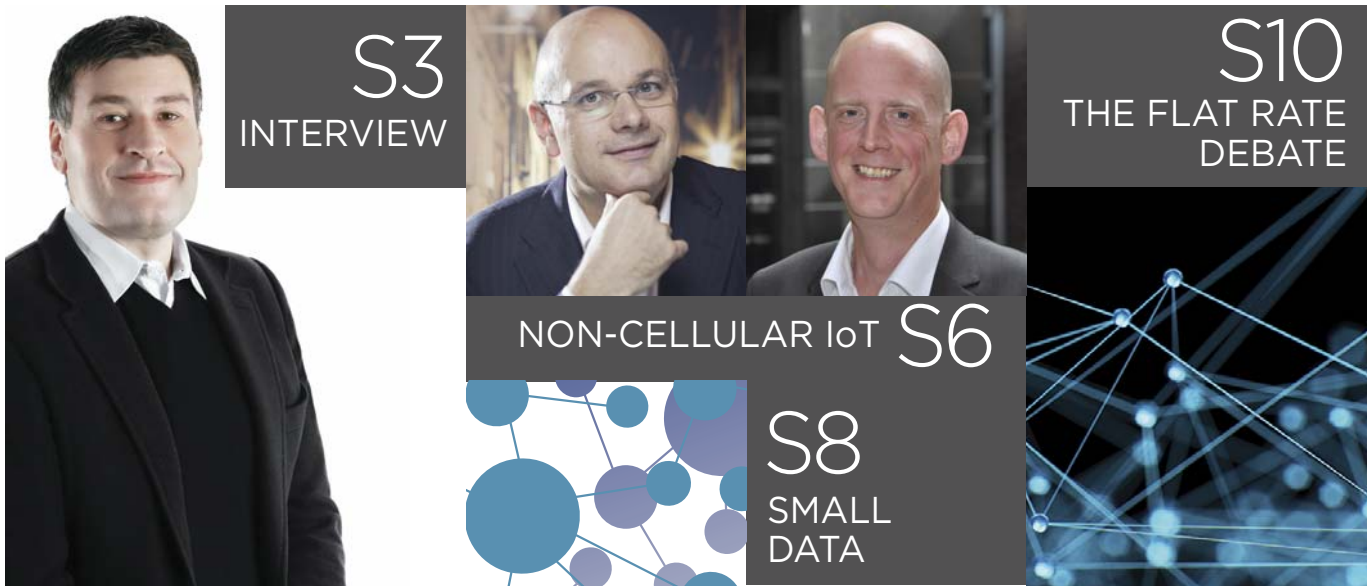
1NCE's Alexander Sator
reveals why the IoT market
is ready for ten year,
€10 connectivity deals



PLUS: Inside the flat rate debate • Beecham Research on why it's the small data that holds the key to building the mass-scale IoT • Why IoT connectivity is about bits, billions and cents rather than gigabits, sub-thousand device deployments and large annual fees • News at www.iot-now.com



IoT Now IoT CONNECTIVITY SUPPLEMENT 2018



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Pioneering the uncharted – how new connectivity offerings are changing the face of the IoT

Although much of the talk and excitement around connectivity for the Internet of Things (IoT) focuses on the different network technologies available to support IoT apps, the reality is that, for the vast majority, only modest bandwidth is required. Regardless of whether the bearer is 5G, 4G, 3G or 2G cellular, one of the new low power wide area (LPWA) technologies or other satellite and radio alternatives, the real challenge is in how the connections are managed and charged for. This is because the nature of many IoT applications is that connectivity is required to transmit only relatively small packages of data

For example, a sensor monitoring the water level of a reservoir may only need to send a few bits of data on a daily or weekly basis. Supporting this via a traditional mobile telecoms model of a contract with a monthly bill would mean that the cost of administration and support outstrips the cost of the network capacity used by the app and can potentially make the app itself unviable. For some IoT apps, the cost associated with creating bills and managing contracts can be greater than the service itself can be sold for.

Therefore a new approach to providing connectivity is needed. This is new territory

that few have entered but one pioneer is 1NCE, which has recently launched to offer straightforward IoT connectivity packages such as its flat rate offer of 500MB over ten years for €10. This one-time fee can be adapted to fit the lifespan of an IoT device and clearly meets the needs of low value IoT apps because the connectivity can be provided for €1 per year. The founder and chief executive of 1NCE, Alexander Sator, recently spoke to George Malim, the managing editor of IoT Now, to explain what the company offers and why now is the time for a simplified, commoditised approach to IoT connectivity to hit the market. ▶

IoT apps, the cost associated with creating bills and managing contracts can be greater than the service itself can be sold for

SPONSORED INTERVIEW



Alexander Sator,
INCE

There are 50 billion machines waiting to be connected and for this to happen a game changer is needed in connectivity

George Malim: Why have you established INCE? What new approaches are you bringing to the IoT connectivity market place?

Alexander Sator: To make a long story short, the reason for starting the company was mainly about timing; we believe that the market place is ready to change now. By that I mean that we're finally at the tipping point where billions of IoT devices need to be connected. A decade ago we also saw the predictions of tens of billions of devices but this has taken longer than expected to come to fruition. Access to cost effective connectivity that is appropriate for individual IoT applications has been one of the barriers holding back the development of IoT into the multi-billion device mainstream.

There are 50 billion machines waiting to be connected and for this to happen a game changer is needed in connectivity. The broad approach of providing a specific offering to address every IoT deployment's requirements has kept connectivity prices up even though a product that simply delivers all a deployment's requirements - even those that are currently unknown - exists and can be delivered efficiently.

We created INCE to make IoT connectivity finally as simple as it needs to be to connect everything everywhere. Simplicity is our watchword, we come with one price and one data plan only - there are no extra fees on top, the customer only pays once and gets connectivity services for ten years on their devices - that's it!

GM: To what extent do you think traditional approaches to acquiring connectivity services are holding back the development of IoT in general?

AS: It's an unavoidable fact that complex offerings come with complex processes and the more tailored and individualised a service, the greater that cost. We see this approach of excessively looking to provide bespoke connectivity packages as one of the most significant handbrakes hindering IoT progress. If customers today want to connect their devices, they need to be ►



We see our key points of differentiation as our ability to provide the best quality and the best network at the lowest price, using the simplest process

aware of many technical specifications but these are complicated and time-consuming to learn and master, adding cost and wasted resource to an IoT business model.

Companies in IoT want to build new businesses and revenue streams, not become experts in the technical characteristics of wireless connections. With INCE we're taking away this waste by covering all the requirements IoT customers are challenged with today. From the customer's perspective the complexity is made irrelevant because they pay us once and we provide the package of connectivity they need for a decade.

GM: I'm intrigued that you're offering a data package for ten years as a flat rate fee. How do you see this revolutionising the market place by enabling new IoT opportunities and transforming the practicalities of bringing services to market?

AS: It's only revolutionary today because it hasn't been done before. However, we expect this model to become standard within the next decade because it provides what users want - connectivity that is simply delivered for the lifetime of the connected device. I should also point out that we're not limited to providing connectivity for only ten years, if a customer device has a longer life, our customers can simply extend the service for another ten years.

The value we provide is that, because we allow customers to calculate and control their connectivity costs with one simple agreement and payment, they can focus on developing their IoT solutions, not managing a complex web of different connectivity providers from on-boarding through to device retirement. We're a fire-and-forget offering, hire us and you're connected for the next ten years at a fixed price. I know I keep saying it's simple, but it really is.

GM: What are the challenges of bringing simplified propositions such as these to market? How important for the mass-scale IoT is it to eradicate traditional connectivity procurement practices?

AS: Anything new is regarded with some caution in any market that has an established way of doing things. However, mass market IoT is a market that does not have an established method of operation. Therefore new approaches are welcome especially because the traditional approach, which basically involves force-fitting a consumer cellphone contract to an IoT device

with an entirely different usage profile, won't work.

The need is obvious but I can understand that customers want to ensure that an offering such as ours is sustainable and solid and will deliver the ten years of robust connectivity we claim. In this respect we have a huge advantage because we're not simply a start-up trying to be a middleman that simplifies connectivity purchasing. We have enormous support from our host network, Deutsche Telekom, to make this a reality and customers can take confidence from the network's strength and footprint globally.

Our belief is that connectivity for IoT has to be made as easy to buy as a Big Mac. Customers will just buy it and use it, the global network of Deutsche Telekom means they can trust us to enable exactly this.

GM: Do you think the market is ready for the new models that INCE is enabling?

AS: I'm sure we have the right offering at the right time. The feedback we have already received from the market illustrates this and we are clearly addressing demands for simplicity with good offerings that perfectly match the market's needs.

We see our key points of differentiation as our ability to provide the best quality and the best network at the lowest price, using the simplest process.

GM: When do you foresee traditional approaches to selling IoT connectivity ending?

AS: Until now, the connectivity for IoT market has never been transparent. Our offerings, with their simplicity, make it completely transparent and I think that is of great value to companies engaging in IoT activity. Connectivity is only one part of the complex equation involved in bringing an IoT service to market successfully. By making it clear, simple and addressed by one payment per decade, we're taking a significant task off the list of IoT innovators so they can devote more attention to the services they're offering.

For this reason, I really can't see IoT service providers continuing to pore over connection options, contracts and service level agreements when they can come to INCE, agree the package they want and pay a simple, one-off charge for the connectivity they need for the next ten years. Why make connectivity more difficult than it needs to be? ■

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IoT connectivity is about bits, billions and cents

Non-cellular IoT providers need to make the most of Mobile World Congress 2018, as those backing 3GPP-based alternatives will use the show as an opportunity to seize the initiative, writes Nick Wood

The LoRa Alliance is certainly bullish, but the same cannot be said for every player in the non-cellular LPWAN market

The stakes are high, with **Dell'Oro** predicting in January 2018 that global wide area IoT revenues will hit \$33 billion by 2022, and that cellular technologies will account for more than 98% of IoT service provider revenue. With forecasts like this doing the rounds, it is crucial that the non-cellular side of the IoT market proves its worth.

"We cannot rest on our laurels, ever," says Olivier Beaujard, the senior director for **LoRa Alliance** at **Semtech**. "We have to make sure that the number of people who choose LoRa grows in volume."

LoRa is arguably the most prominent of several narrowband technologies that use unlicensed spectrum to offer low power wide area networking (LPWAN) at low cost. Unlicensed IoT techs are typically aimed at devices that send and receive small amounts of data when needed, rather than devices that require constant connectivity.

Beaujard joined Semtech – which makes semiconductors for LoRa-based sensors and gateways, and develops reference designs and software – last July and is in charge of its activities relating to the LoRa Alliance, of which he is also a board member.

Driving awareness and uptake of the latest version of LoRaWAN – the LoRa Alliance's open LPWAN standard – and attracting new members are two major priorities for Mobile World Congress and for 2018 as a whole, he says.

The Alliance's membership topped 530 last year, as big names including Chinese e-commerce giant **Alibaba**, US cable provider **Comcast**, and Japanese microcontroller maker **Renesas** joined its ranks.

2017 also saw the release in October of LoRaWAN 1.1, which adds new security features, as well as roaming and geolocation capabilities. This specification upgrade opens the door to more advanced services previously considered the domain of satellite and cellular IoT providers, such as cross-border asset tracking.

Service provider **TrackNet** and LPWAN specialist **Senet** became the first to show off these new LoRa features in a production demonstration at CES in January.

"I expect at MWC you'll see more of these demonstrations," Beaujard says.

Demos like this are indicative of a shift in the conversation about LoRa that is expected to take place this year, as the talk turns from network deployments to service launches.

"The operators that have invested in deploying [LoRa] infrastructure – guys like **SK Telecom** in Korea, **Tata** in India, and **Orange** in France – these guys have been at it for over a year and they have pretty good coverage in their geographies," explains Vivek Mohan, marketing director for **Semtech's** wireless IoT product line. "So, what you're going to start seeing ... is more services announced by these operators, and price points and business models."

Mohan sees agriculture; select smart city services including street lighting, parking sensors, waste management, and utility meters; supply chain and logistics; and smart building as key verticals for LoRa in future. Healthcare is also emerging as a possible LoRa vertical too, with healthcare providers looking at how they can use it to keep track of Alzheimer's and dementia patients, he says.

Mohan is excited about the insurance industry too, because more and more assets will become insurable as they become connected to the network.

"Previously there was no indication as to when things like water pipes or certain equipment might fail, but now with LoRaWAN you can predict when these breakdowns might happen," he says.

Semtech and the LoRa Alliance are certainly bullish, but the same cannot be said for every player in the non-cellular LPWAN market.

Revelations last year of ructions between senior figures at proprietary LPWAN provider Sigfox about the company's business model, as well as missed financial and operational targets, have cast doubt in some quarters over the company's current strength.

Another proprietary LPWAN player, **Ingenu**, also had a bumpy 2017, with the abrupt departure of CEO John Horn in July. The company tweaked its strategy to prioritise the licensing of its Random Phase Multiple Access (RPMA) technology in a bid to drive ecosystem growth.

These travails could leave the door open to those backing cellular IoT technologies like narrowband IoT (NB-IoT) and LTE-M.





The likes of Sigfox, LoRa and Ingenu stole a march on the mobile industry, which "did a lot to trigger action by the GSMA to get 3GPP to have an alternative," notes Matt Hatton, vice president of research at **Gartner**. Now, "3GPP techs are coming over the horizon backed by the muscle of the mobile operators."

Indeed, with cellular IoT standards included in LTE Release 13, mobile operators last year began rolling out LPWAN services that use their own spectrum. Momentum is expected to pick up in 2018, and therefore IoT this year "will be a much more competitive market in terms of number of techs," predicts Hatton.

According to figures published last year by **Machina Research**, NB-IoT and LTE-M together will account for 56% of global LPWAN connections by 2022. That equates to 862 million active connections for cellular IoT, versus 672 million for non-cellular.

Yet, those on the non-cellular side of the IoT market seem unphased by the prospect of the mobile industry serving up its own LPWAN technology.

"IoT is about bits, billions and cents," says Lawrence Latham, managing director of LoRa provider **Everynet**. He explains that for the LPWAN market to function for the benefit of customers and the industry, narrowband connectivity to billions of devices must be provided at the lowest possible cost. "LPWAN is a misnomer. It should be LCWAN; the 'c' standing for cost."

As an open standard, anyone can develop a LoRa product and submit it for certification by the LoRa Alliance, and any company with enough funding can deploy a network. This has resulted in low barriers to entry and a flourishing ecosystem.

By comparison, "cellular solutions require spectrum, which is expensive; some kind of SIM solution; and a more complex chip, which needs more power," Latham says. All of which adds to the cost. "Certain verticals and certain markets are extremely price sensitive. Why would they choose a more expensive solution over LoRa?"

Everynet has embarked on an ambitious global strategy of rolling out wholesale LoRa networks in tandem with local partners. It is underway in the Americas and the company has also since opened offices in select markets in Europe and Asia Pacific. Everynet has generally targeted more price-sensitive economies that are likely to prefer cheaper IoT tech like LoRa.

"We started doing this in early 2017, and by 2020, we will have covered Latin America and 40% of the US," Latham says. "We have already begun deploying in the U.S. In Brazil, we have covered all of the major cities, we've covered the capital of Uruguay and we're spreading out across the countryside, and we're already in Buenos Aires and spreading out across Argentina."

Everynet has also signed contracts with partners in Colombia and Mexico, he says.

In terms of use cases, Latham says asset tracking is particularly compelling in Latin America, where it can be used to curb theft. Latham said that one such use case involves installing sensors on manhole covers, which are frequently stolen for scrap metal.

Similarly to Semtech, Everynet also aims to capitalise on LPWAN demand from the agriculture; logistics; utility metering; and smart city verticals.

The sheer potential size of the IoT market also means that there is room for both cellular and non-cellular technologies to coexist.

Latham sees room for LoRa alongside cellular IoT standards like LTE-M, which support more bandwidth-hungry services. "Some services will require broadband," he notes.

3GPP-based services "can probably offer lower latency and better quality of service," making it suitable for certain mission-critical applications, Mohan adds. "But it will come at a price." ■



Olivier Beaujard, LoRa Alliance



Matt Hatton, Gartner

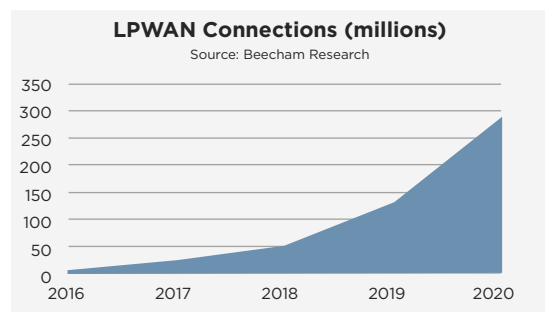
Everynet has embarked on an ambitious global strategy of rolling out wholesale LoRa networks in tandem with local partners

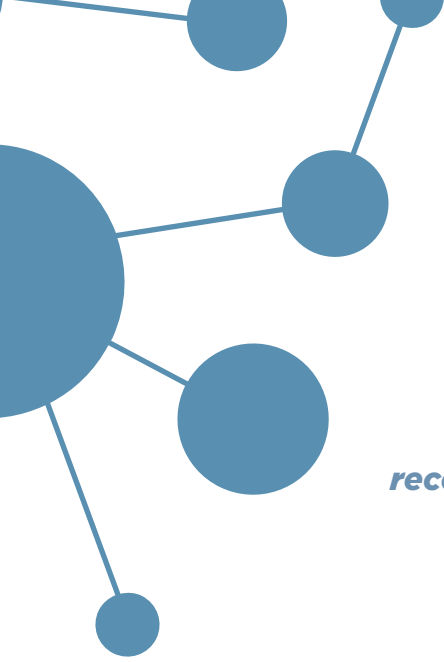


Connect small data - the key to building the IoT

For the Internet of Things (IoT) to truly fulfil its promise, there is a fundamental need to collect data from as many things that can generate data as possible from wherever they are located. This especially includes those things with small datasets - small data, because there are a great deal more of them than those with large datasets. At the same time, the lower the cost of connecting, the more of them will actually be connected, writes Robin Duke-Woolley, the chief executive of Beecham Research

A very low connection cost is going to make it viable to connect many more things and is the promise of low power wide area (LPWA) technologies. But which of these is most likely to achieve the high volumes? So far, the ball has been with the unlicensed spectrum technologies including LoRa and Sigfox. This year marks the turn of licensed spectrum technologies, in particular narrowband IoT (NB-IoT) and LTE-M as extensions of 4G cellular networks. This year - 2018 - is also when the market for LPWA is expected to really start taking off. ▶





There has been much attention in recent years on deriving value from the IoT using big data techniques



Robin Duke-Woolley,
Beecham Research

1NCE: Simple, narrowband connectivity at one low flat rate

To connect a very large number of small data things at low cost, it needs to be simple to do so. Manual intervention must be minimised. The connectivity plan must be particularly straightforward and installation must essentially be a case of fit and forget.

This is where a new mobile virtual network operator (MVNO) called 1NCE is positioned. Partnered with Deutsche Telekom and offering narrowband connectivity for IoT applications only, the company is pioneering an especially simple connectivity offer at one, low, flat rate: €10 for ten years of narrowband cellular connectivity, delivering a maximum of 500MB over the ten-year period. It is a pay once offer - hence the company name 1NCE. However, if this maximum needs to be exceeded, then it can simply be rebooked online - as often as necessary.

Significantly, although the offer is based around NB-IoT, it is in fact technology-agnostic. If NB-IoT is not available where required, then the offer extends to any available cellular technology - 2G, 3G or even 4G. The point is, customers should not need to worry about the technology. They just get a connection that works wherever they need it, limited to a low bandwidth suited to their use case. 1NCE also offers an innovative, in-house developed SIM management platform for full control of deployed SIMs. This means that the following functions are included in the rate: subscription management, technical setup, SIM identification/authentication and the SIM itself. The flat rate covers everything associated with the connection to get it working.

1NCE serves any size of customer. A direct sales force will cover all sales activities for key accounts, while at the other end a web shop will cover lower volume purchases. Just like the connectivity offer itself, the ordering process is designed to be easy-to-use, simple and fully automated for all order types. In Phase 1 (2018), the service will cover the EU28+2 countries with regional presence in many key European locations.

Connectivity as a feature

In addition to these, 1NCE is introducing a further innovation - connectivity as a feature for original equipment manufacturers (OEMs). With the pay once model, OEMs can

now include connectivity as a new differentiating feature in their products where it is paid for as a very small part of the capex spend. Customers can then use it without needing to choose a connectivity provider or managing any payments - it is all done and instantly available. We expect this to become a popular feature.

Building the IoT

There has been much attention in recent years on deriving value from the IoT using big data techniques. Yet it is not big data that is building the IoT. The true building blocks of the IoT are very large numbers of small datasets from an enormous range of things connected to an ever-wider variety of different applications and services. It is the connectivity for all these things that the IoT is actually built on and it is the connectivity that has so far not been in a form to fulfil the promise of the tens of billions of connected things so often predicted.

Here are just a few examples of the many things with small datasets that need just narrowband connectivity to create new IoT services:

- Bicycles
- High value assets
- Machine tools
- Pallets
- Pipelines, including for water
- Security alarms, smoke alarms
- Smart agriculture
- Smart meters
- Smart parking spaces
- Street lights
- Waste bins
- White goods
- Shopping carts

For all of these and many more, what the vast majority of IoT customers want when buying connectivity is simplicity at low cost. Their requirements are limited and they do not want to have to learn the jargon of the IoT industry to get what they need. They do not want to have to understand the ins and outs of the technologies. They do not want to have to deal with complicated agreements. This is what 1NCE is pioneering - innovative simplicity at low cost for the IoT. IoT without the frills. ■



One size does not fit all for IoT connectivity billing

One of the many issues facing the IoT industry still to be ironed out is billing for connectivity, writes Peter Dykes. Will it be a one-off charge based on the lifetime of the device or will it be a per-bit tariff? Could it be included in the cost of devices or are there other possible charging models being such as flat-rate for IoT connectivity or connectivity being included in the upfront lifetime cost of IoT sensors and other devices?

If a customer can predict their data usage and is happy to commit, then flat rate deals would seem attractive

The issue is complicated by the varying lengths of expected operational lives of IoT devices, making it potentially difficult to charge for lifetime connectivity. One thing is clear, charging models for cellular connectivity and LoRa-type systems will be very different. In both cases however conventional billing and charging systems will not suffice and a rethink on charging models is needed.

Neil Hamilton, the vice president of business development at **Myriad Thingstream**, says, "IoT connectivity pricing has to evolve. Licensed spectrum from carriers will continue to be sold as monthly subscriptions, perhaps bundled in exotic ways such as pooled data plans across fleets of SIMs or through intermediary exchanges that optimise and route traffic onto the best available tariffs; fundamentally an opex-based model." He observes that there are different models being used for unlicensed spectrum, saying, "With LoRa's offering, capex needs to be invested in building a private network, with device fees and associated maintenance also required, similar to any corporate network, [but] Sigfox breaks this mould and operates more like a carrier, selling committed unit volume over time periods."

What about flat-rate pricing?

If a customer can predict their data usage and is happy to commit, then flat rate deals would seem attractive. However, while there is provision for overage built in to many charging models, in others there is a risk that the customer could pay for more than they actually need. And, while some IoT applications require a device to be connected at all times, many do not. For example, tracking assets such as shipping containers around the world only needs them to be connected when in transit and a logistics carrier would be reluctant to pay just to know that a container is currently sitting in the docks. This is leading some connectivity providers to offer a different model. As Hamilton says, "[Such use cases] are why Thingstream offers a PAYG model where it only charges for active devices. This makes commercial sense for businesses and breaks the traditional carrier model."

However, in the B2C sector, there is a distinct move towards flat rates for most IoT services. Simon Forrest, the director of connectivity and connected home segment marketing at **Imagination Technologies**, believes this to be



Neil Hamilton,
Myriad Thingstream



Yann Guiomar,
Sensing Labs



Jon Hill,
InVMA

true. He says, “Some security services are being charged in single monthly units, covering only the period when a customer is on holiday for example; others charge a flat rate for annual subscriptions, often at a price more favourable than taking the monthly option. Consumers generally expect data/broadband services to be unmetered and charged a fixed monthly fee, likewise with mobile contracts also, and we expect to see IoT providers follow the same business model.”

Indeed, the migration of B2C models for M2M charging looks like the way forward when defining charging strategies for IoT, but including connectivity in the upfront cost of devices is not popular in some quarters, the issue being that different IoT devices have differing lifetimes due to device characteristics, usage and battery life. Yann Guiomar, the chief executive at **Sensing Labs** says, “We have a pure hardware product business model but in this case, we don’t want to include the upfront connectivity cost and in any case, from our view, this upfront has to be limited to a certain period of time - five or ten years - and can’t be unlimited [as] our product and the battery can live up to 20 years.”

Guiomar’s view is echoed by Jon Hill, business development director at systems integrator and managed services provider, **InVMA**, who says, “We are seeing that [connectivity included in the lifetime device cost] already, but the lifetime being limited or associated with battery life expectancy. We are also seeing private networks such as LoRA and 4G being alternatives for this, while low power Bluetooth and using an existing connection is an alternative.”

The fact is, IoT devices that require varying amounts of storage, such as video or audio devices, will typically cost more to administer and run than those that have much lower data requirements, such as lighting and heating

control. Fortunately those devices with long lifespans - most often sensors and actuators - are also those that require only limited network bandwidth. Sensors, actuators and switches are normally things the consumer is not expecting to change frequently. As Forrest points out, “In this instance, the cost of the service can be calculated up-front by the provider. Conversely those IoT devices that consume most bandwidth will continue to be offered on a subscription basis. Overall, as long as the cost of the device and service are transparent to the consumer, it probably makes little difference.”

So, it would seem that high bandwidth users will be stuck with subscription-only data plans whereas low traffic applications can be billed on a per-usage basis. But are there overheads on billing for small amounts of data and where do the real costs in providing IoT services lie, particularly in the high-usage enterprise/industrial sector? According to Todd Krautkremer, the chief marketing officer at **Cradlepoint**, these days wireless carriers have highly automated and optimised billing systems with very low production costs. The real cost for high-usage customers IoT will be in the long-term storage of the data in the cloud, and to a lesser extent, the processing costs.

He says, “A large IoT deployment with millions of sensors can generate petabytes of data over the course of a year, sometimes even faster. This is why fog/edge computing is so compelling - it’s all about reducing the amount of null data from the network, central processing units (CPUs) and storage,” he adds. “Outside of these costs, deployment and ongoing management of IoT devices and sensors networks is the main cost area, which includes security monitoring. This is where cloud and software-defined networking technologies will play a big role - orchestrating and automating IoT networks.” ■

IoT devices that require varying amounts of storage, such as video or audio devices, will typically cost more to administer and run than those that have much lower data requirements



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