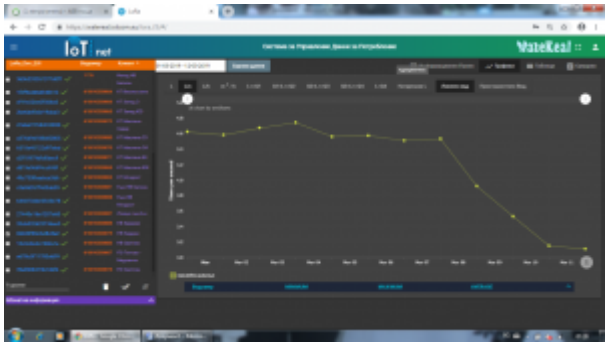
Water supply industry – two cases on heavy incidents and results of their neutralisations.

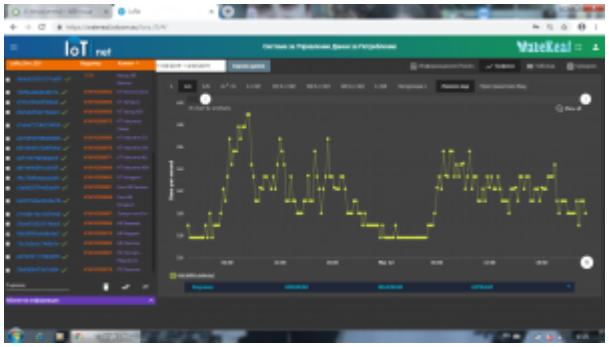
Two use cases, reported by a water utility company in two towns in North-East Bulgaria, that bring sustainable water service and savings

The Water utility company is using water consumption real time monitoring solution provided by IoTNet as IoTNet LoRaWan network, delivered by Everynet, IoTNet own LoRaWan pulse metering devices and “WateReal” MDMS system to control and supervise the water infrastructure and resources consumption.

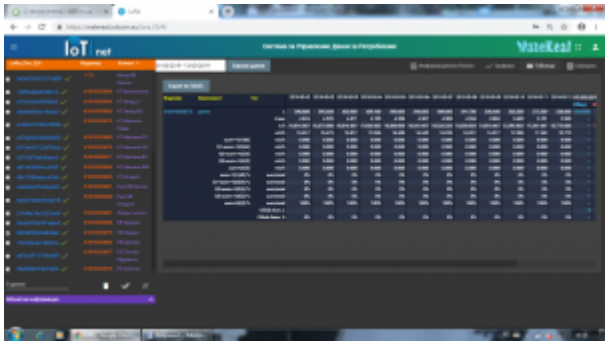
The reported cases are on the field, where observed high level of water consumption due to data in real time from LoRaWan network and investigating large terrain area to discover two underground leakages that were raising the total consumption from 3.1 L/s to 4.6 L/s.

After problem resolution, the consumption returns back to the normal levels





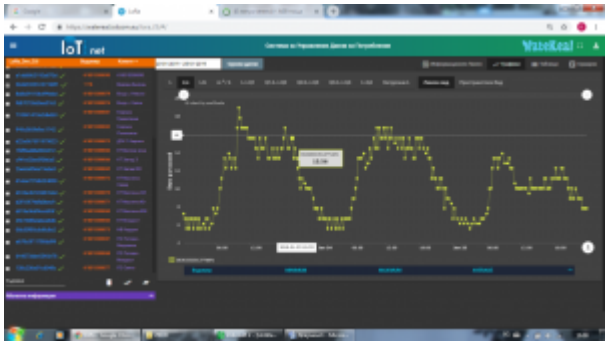
The sum-up of the data is that the problem resolution saves 135 m3 (tones) pump water to be supplied, these are 4000 m3 (tones) per month, this is equivalent (with utilisation coefficient of 0.7) to 3000 kWh energy saved only! On top saved the actual water pumped (4000 m3 monthly) that can be used and provided to other places .

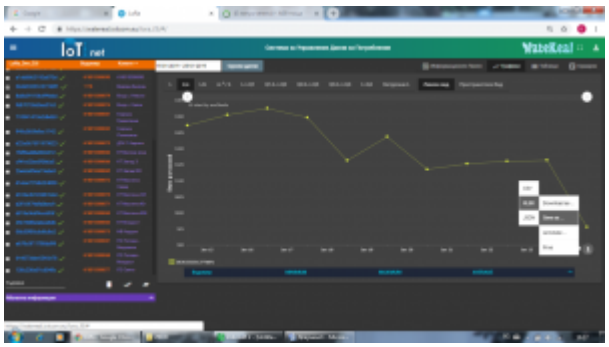


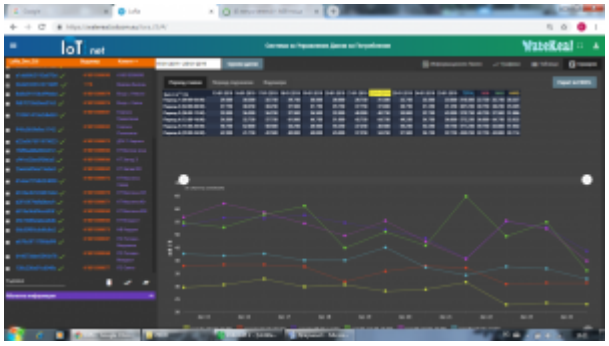
The second case is pure indication on problem solving, bringing the high level of water consumption from 17 L/s to 14 L/s, as well as the minimal water consumption (in low traffic hours) from 2L/s as constant flow to 0 L/s

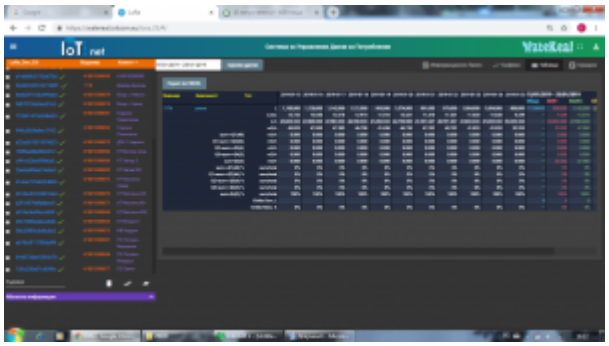
The water savings are 120-150 m3 (tones) daily or 3500 – 4500 m3 (tones) monthly.

All data is present on the MDMS system both graphical and table view thanks to LoRaWan solution , providing consumption data in real time









Water supplying industry – high in the mountains use case

One use case, reported by a water utility company in high mountain area with a very difficult access during the winter

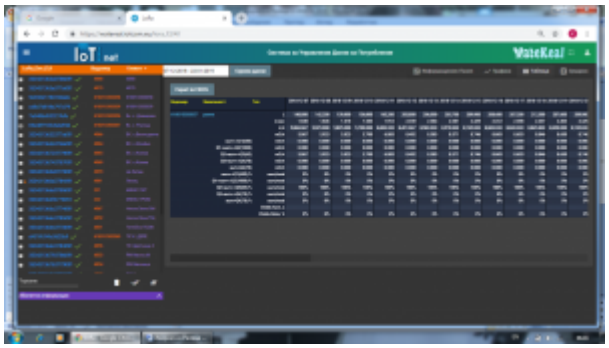
The Water utility company is using water consumption real time monitoring solution provided by IoTNet as IoTNet LoRaWan network, delivered by Everynet, IoTNet own LoRaWan pulse metering devices and “WateReal” MDMS system to control and supervise the water infrastructure and resources consumption.

The water consumption daily trend, indicated by the LoRaWan based monitoring solution, started to be suspiciously high during the winter, jumping from 1.6 L/s to 2.7 L/s average consumption, however very difficult to get access to water infrastructure places and verify the case. Normally this type of investigations are left for several months before the weather conditions and access allows to make the regular

inspection on site, without any preliminary information to be present

However the LoraWan based monitoring solution served as a clear indication that the problem exists is at a quite big scale . Succeeding to get on site in difficult weather and road conditions, the utility company succeed to rectify the problem and bring the water consumption in normal levels.

The extra consumption per day was around 70 m3 (70 tones) and leaving the problem unsolved for additional 1 or 2 months will give extra consumption of 2000 – 3000 tones water, supplied by water pumps – and this requires water pumps operation every day at average consumption 100 kWh daily, or around 6000 kWh for 2 months. This the equivalent cost of additional expenditures (in our case converted to actual savings) if the problem was not rectified on time.



Water supplying industry – Sayatchi village use case

One typical use case, reported by a water utility company in village Sayatchi, Central Bulgaria.

The Water utility company is using water consumption real time monitoring solution provided by IoTNet as IoTNet LoRaWan network, delivered by Everynet, IoTNet own LoRaWan pulse metering devices and “WateReal” MDMS system to control and supervise the water infrastructure and resources consumption.

While the village normal water consumption is 0.8 – 1.2 L/s, sudden jump of the consumption to 2.7 L/s around 15:00 lead to major problem indication, since the consumption started to jump up and down:

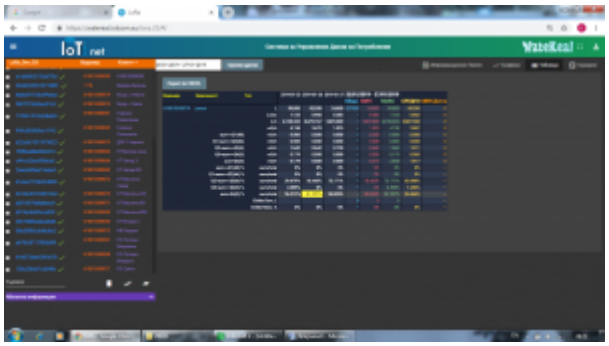
The water consumption mirrors the operational regime of the village reserved tank – the water in the network is fully utilised, following by start of the water pumps to supply water from the reserved tank, it is utilized again on the next day and again finished.

This is the normal operational regime of pump system when regularly filling the tank and going to standby regime

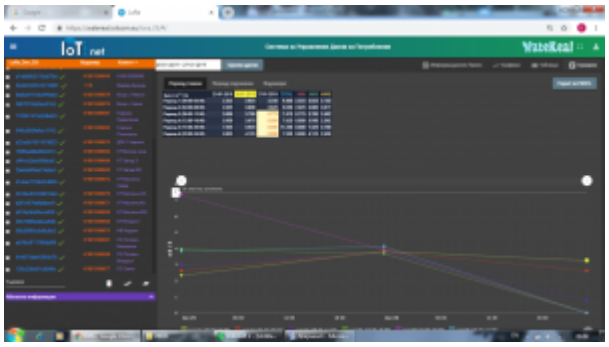
On the first chart seen that after getting the problem indication and maintenance work start, the problem is resolved and the water consumption returns to normal levels and normal trend.

There is clear indication on the MDMS platform, that during the problem timeframe, the water meter went into saturation regime of more than 80% of the time being > Q4 parameters,

while after the repair went back to normal regime between Q2 and Q3 as 73% of the time



Thanks to MDMS system also seen, that during the problem the water consumption is almost equal the whole day in different time slots and will go back to normal trends after the repair



LoRa Alliance Passes 100 LoRaWAN™ Network Operator Milestone with Coverage in 100 Countries

Fremont, Calif. – Jan. 22, 2019 – The LoRa Alliance™, the global association of companies backing the open LoRaWAN™ protocol for the Internet of Things (IoT) low-power wide-area networks (LPWANs), today announced that it has experienced explosive growth in 2018, exceeding the 100 LoRaWAN network operators milestone globally at the end of December. Wider availability of LoRaWAN networks makes it easier than ever to deploy IoT solutions leveraging existing infrastructure, allowing products and solutions to be offered and connected now.

More than 100 network operators have deployed and operate LoRaWAN networks, which are both public and private, significantly broadening the technology's reach. This

flexibility is a unique differentiator of LoRaWAN compared with other LPWAN technologies. In addition, the number of end-devices connected to LoRaWAN networks is reported to have tripled since the beginning of the year, which demonstrates significant acceleration of adoption compared with other technologies yet to achieve such an expansive footprint.

“Reaching this operator milestone is a major achievement for the LoRa Alliance,” said Donna Moore, CEO and Chairwoman of the LoRa Alliance. “Only LoRaWAN has strong, established networks with broad coverage areas, while also offering the private network option. For companies looking to launch IoT products and solutions today, the LoRaWAN standard is the only viable solution. Features like firmware updates over the air and the fact that LoRaWAN is an open specification with a robust certification program ensure network and device interoperability. These benefits give confidence to the market that companies are future-proofed and can deploy solutions today with assurance they will work in the future.”

LoRaWAN networks are being actively deployed globally, with the Asia-Pacific and European regions showing the most growth, at 30% and 50%, respectively, throughout 2018. Regional specifications are established in all key regions with additional regions being added continuously. The total operator investment in LoRaWAN is significant on a global basis, offering compelling proof that network operators are making a long-term commitment to the LoRaWAN standard and supporting the market demand for IoT applications.

“Orange is pleased to see the growth of the LoRaWAN ecosystem and the adoption of this open and interoperable standard in all parts of the world. Orange selected LoRaWAN™ for its first network dedicated to the IoT in 2016 to address sensors and other affordable objects consuming little energy. The Orange LoRaWAN network covers over 30,000 municipalities and 95% of the population of Metropolitan France. In 2018, Orange Slovakia launched a service using LoRaWAN for Smart Cities use

cases. And to support its international customers and French companies with needs outside of France, Orange Business Services launched on-premise LoRaWAN connectivity suitable for a range of applications especially in smart cities and industry, including energy and fluid management, on-site tracking, geo-fencing, waste control, environmental metering, lighting and parking monitoring."

– Ronan Le Bras, Head of Technical Strategy – Wireless Networks; Orange

"American Tower's (ATC's) LoRaWAN-based network in Brazil already covers the metro areas of São Paulo, Rio de Janeiro and Belo Horizonte. These large markets are responsible for around 24% of the Brazilian GDP, and ATC plans to continue rolling out this network to cover 50% of the Brazilian GDP, or approximately 80 cities, by mid-2019. Brazil is a key component of ATC's global innovation strategy and a crucial market in Latin America. We believe we can continue to play a key role in the deployment of telecommunications infrastructure to support advanced use cases for a number of years to come."

– Abel Camargo, Senior Director of Strategy & New Business Development; American Tower Brazil

"As a founding and contributing member of the LoRa Alliance, Senet is excited about this milestone. This is yet another proof point of how the open ecosystem and technical superiority of LoRaWAN have driven it to become a leading IoT communications technology. Leveraging these technical and ecosystem benefits, Senet offers cloud-based network operating platforms and network delivery services for the on-demand build-out of global LoRaWAN connectivity, coupled with the the tools needed to on-board and manage connected devices with the scale and security required by enterprise IoT applications. These platforms are being used today to operate the largest public carrier-grade LoRaWAN network in North America and

deliver network coverage and connectivity readiness in over 80 countries. We look forward to supporting the LoRa Alliance and contributing to its expanding ecosystem in our collective efforts to achieve another record-setting year for LoRaWAN.”

– Bruce Chatterley, CEO; Senet

“LoRaWAN has seen tremendous interest and growth in India in the past year. In that market alone we already provide network coverage in 30 cities to support IoT applications such as smart metering, smart parking, and smart waste management solutions

and see no signs of this slowing as we enter 2019.”

– Ali Hosseini, Founder & CEO, SenRa

“We view LoRaWAN as the IoT technology of choice for Minol ZENNER Group because of its ability to bridge different IoT requirements and to enable real value-add benefits for all our customer segments in the group.”

– Alexander Lehmann, GM; Minol ZENNER Group

“Reaching the 101 LoRaWAN network milestone globally confirms the IoT acceleration and confirms Proximus’ ambition to guide all companies in their digital transformation.”

– Frédéric Lhostte, Head of IoT & Analytics; Proximus Group

“This new milestone demonstrates the maturity of the market and the palatability of customers for LoRaWAN ™ around the world to grow their business.”

– Stéphane Allaire, President; Objenious by Bouygues Telecom

“This is a huge milestone as it proves LoRaWAN Internet of Things, just as the real internet, doesn’t care about country borders. With The Things Network and The Things Industries we are happy to be present in more than 89 countries and can

provide LoRaWAN connectivity in all corners of the world.”

– Wienke Giezeman, CEO & Co-founder, The Things Network

“Building a powerful IoT ecosystem that aided in the acceleration of IoT enabled innovation is paramount for Swisscom. As a result we were among the first operators to roll out LoRaWAN nationwide in 2016. Today, the Swisscom LoRaWAN network covers 96.6 Percent of the Swiss population.”

– Julian Dömer, Head of IoT, Swisscom

“DNX / Digital Nordix is an independent IoT/LoRaWAN™ operator that provides LoRaWAN network operation services in EMEA. DNX’s has its DevOps base in Luleå Sweden and operates LoRaWAN networks in Europe, Middle East and Africa. Our focus is to ensure a robust and customizable wireless IoT network. Unlike other IoT providers, DNX works closely with independent partners to provide customization and system integration for best possible IoT solution.”

– Mats Pettersson, CEO, Digital Nordix AB (DNX), Stockholm, Sweden

“IoT can make processes more efficient, change our lives and our society for the better plus have a positive impact on the environment. LoRaWAN has dramatically accelerated the diffusion and adoption of IoT applications all around the globe. LORIOT was one of the first movers in the market, and our Network Server is designed for interoperability and flexibility in order to meet the requirements of every kind of user, from IoT enthusiasts to global companies. Our distributed public network infrastructure provides excellent performance regardless of the users’ location because our mission is to enable IoT everywhere in the world and allow everyone to access its disruptive potential.”

– Julian Studer, Founder & COO/CFO; LORIOT

“Hitting the 100 LoRaWAN network operator milestone worldwide, we are sure domestic demand for LoRaWAN services will continue rising as well. We are looking forward to the technology finding new applications and contributing to the development of solutions to problems Japanese society is facing.”

“By running one of the largest LoRaWAN indoor gateway-based networks for Minol, which uses LoRaWAN for submetering, heat-cost allocation and smoke detector services for their housing industry customers, we are proud to take the next step with Minol ZENNER Connect GmbH in expanding the overall LoRaWAN coverage in Germany.”

– Hartmut Ritter, MD; Minol ZENNER Connect GmbH www.mz-connect.com

“Minol ZENNER Group is enabling cities, utilities and industry customers to run their own IoT networks. As a LoRaWAN network operator, Minol ZENNER Connect GmbH, we are open to running, combining and integrating these networks into one system.

We are excited about expanding the LoRaWAN coverage through collaboration with other LoRa Alliance members and ecosystem partners in the German market, thereby soon ensuring a comprehensive coverage with LoRaWAN.”

– Markus Kirchdörfer, MD Minol ZENNER Connect GmbH www.mz-connect.com

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Do you know what is an “intelligent measurement”?

Прочети още

на: https://www.bgonair.bg/okolosvetsko/2017-11-28/znaete-li-kakvo-e-umno-izmervane

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How technologies can convert Sofia into a … smart city?

LoRa-Alliance released LoRaWan 1.1 specification

LoRaWan Specification and Regional Parameters

LoRaWAN 1.1 Specification

The latest LoRaWAN Specification features the following capabilities:

- Support for handover roaming, which allows transferring control of the end-device from one LoRaWAN network to another. Earlier versions of this specification can already be used for passive roaming, which is transparent to the end-device.
- Bidirectional end-devices with scheduled receive slots (Class B) are part of the specification enhancements and are now officially supported.
- Enhancements for additional security hardening.

In order to support heterogeneous deployments and not force a globally coordinated upgrade, both LoRaWAN 1.1 end-devices and networks will support backward compatibility to interoperate with their LoRaWAN 1.0.x legacy peers.

LoRaWAN Backend Interfaces 1.0 Specification

The new LoRaWAN Backend Interfaces 1.0 specification enables the following capabilities:

- Has the ability to break down the network into network server (NS), join server (JS) and application server (AS).
- Enables roaming for both LoRaWAN 1.0.x (passive roaming only) and LoRaWAN 1.1 networks (both passive and handover roaming).
- Identifies the entity that stores end-device credentials (including root keys) as JS. It can be separated from networks and administered by an entity independent of the networks that the end-device may be using. This allows networks to offload the authentication procedure to a dedicated system, which can also be operated by a third party. This third-party JS also enables an end-device to be manufactured without having to be personalized for the networks it may eventually be connecting to.

□

LoRa deployments in Europe

LoRa is a Low Power Wide Area Network (LPWAN) specification intended for wireless battery operated objects in a regional, national or global network. LoRaWAN targets key requirements of internet of things such as secure bi-directional communication, mobility and localization services.

Europe has seen a lot of activity in terms of deployment of LoRa networks. In a number of countries, telecoms operators have already reached nationwide coverage while in others, the main urban areas already have LoRa coverage.

Dutch telecoms operator KPN announced the deployment of a nationwide LoRa network for IoT applications last year. The operator switched on its first LoRa network equipment in November 2015 in Rotterdam and The Hague, and now offers nationwide connectivity.

KPN also said that over 1.5 million devices are currently using the network infrastructure across the country.

KPN said its LoRa network is a supplement to the existing 2G, 3G and 4G networks. The network eliminates significant barriers (cost, consumption and energy) so that numerous devices can be connected to the internet. KPN has equipped hundreds of existing mobile transmission towers across the Netherlands with a LoRa gateway and antenna, allowing millions of devices to be connected.

French telco Orange has been also actively deploying LoRa connectivity across France. Orange recently said that its LoRa network currently covers close to 4,000 towns and industrial sites across France. The carrier expects to reach national coverage with its network by the end of 2017.

The operator said that over 100 customers of Orange Business Services have already chosen the LoRaWAN connectivity solution

in various business sectors, intelligent communities, smart homes, health, industry and agriculture, for uses as varied as smart buildings, connected parking garages, patient home monitoring, supply chain and geolocation.

Orange Business Services offers a selection of objects (connected objects, modems, gateways, starter kits, modules) which have been tested and certified by the operator. One of them is the LoRa Explorer Kit, a full development kit to prototype LoRaWAN connected objects and test projects and services on the Orange LoRa network in France. The IoT device catalogue will include 75 objects by the end of June

Also in France, Bouygues Telecom, offers LoRa connectivity since 2015, when it launched its LoRaWAN network following a 16-month test in the city of Grenoble.

The telco was expecting to reach nationwide coverage with its network by the end of last year. In February 2016, Bouygues Telecom announced the creation Objenious, a subsidiary which will exploit the LoRa network currently being rolled out by Bouygues Telecom.

Objenious has unveiled a catalogue of B2B and B2B2C services ranging from vehicle fleet management, remote meter reading, predictive maintenance and geolocation.

In 2016, French firm Actility, which specializes in LPWAN technology, and telent, a German network systems and solutions provider, started the roll-out of a nationwide LoRaWAN network in Germany. The network had been initially deployed in Stuttgart, with national coverage expected to be complete by 2018.

The network infrastructure, powered by Actility’s ThingPark wireless IoT solution, allows the implementation of smart city solutions, machine-to-machine connectivity and new digital applications. In the smart city space, Netzikon will offer services including remote reading of meters, street light

control, smart parking systems and intelligent waste management solutions.

Rwandan ‘smart park’ uses LoRaWAN to protect threatened animals

Security has long been a major concern at wildlife reserves in Africa, where rhino and elephant populations have been decimated by poachers in recent years. But a park in Rwanda is betting on a new networking technology to change that.

This week, Rwanda’s Akagera National Park launched a new system that allows park rangers to monitor animals, visitors, and equipment in real-time. Developed by the Dutch conservation organizations ShadowView and Internet of Life, the so-called “smart park” system is based on a Long Range Wide-Area Network (LoRaWAN) – a low-bandwidth, low-power networking technology that can blanket large areas at relatively low costs.

LoRaWAN technology has already been used to develop internet of things (IoT) networks in Amsterdam and other “smart cities;” the groups behind the smart park think it could help keep poachers off protected lands, as well. Unlike easily interceptable radio frequencies, commonly used to track animals in other parks, the smart park’s signals are sent on a closed network across multiple frequencies, making the network more difficult to access. And LoraWAN systems are far less

expensive than satellite-based tracking, offering an extra advantage to cash-strapped parks. As the system evolves, it could also provide a valuable source of real-time data to help managers and rangers respond to incidents across the 433-square-mile park, where 3G and 4G connections are unreliable.

https://vimeo.com/219977156

So far, animal tracking technology has been something of a double-edged sword. Parks and scientists have used radio signals to track threatened species, but a paper published earlier this year warned that poachers may be using VHF receivers to intercept such signals. Poachers in India, the study noted, tried to hack GPS trackers that were placed on Bengal tigers. Tim van Dam, the founder of Internet of Life, says the smart park system would be far more secure because its signals are sent across frequencies that constantly change, and the data sent across it is encrypted.

“What we’re trying to create is like a Jurassic Park, but to keep the bad guys out and without the dinosaurs, of course,” says ShadowView founder Laurens de Groot. “What we’d like to do is make everything measurable inside the park. And when you know that information, you can predict where things might be happening, and you can plan ahead and make the right decision on how to protect certain areas.”

The LoRaWAN network is created from gateways within 12 towers placed at high-elevation points around the park. One hundred solar-powered sensors placed within the park send constant signals to the gateways, which are then relayed to a central control room where officials can track their location in real-time. (The system can be scaled up to incorporate 100,000 sensors, according to van Dam.) The sensors can be used to monitor the location of tourist vehicles and park staff, or to check the status of electric fences and other infrastructure.

Van Dam, whose organization installed a smaller version of its smart park in Tanzania last year, says the next step will be to place the sensors on animals, which is "a whole different ballgame, because every animal needs a different approach." But he notes that the sensors are small enough to be placed inside a rhino's horn or under its skin.

Such sensors could also collect valuable data for researchers, though van Dam says his organization's immediate goal is to combat poaching. Although African populations of the black and white rhino have rebounded in recent years, according to the World Wildlife Fund (WWF), they remain under threat from poachers. African elephants are under similar threat, with populations dropping from 3 to 5 million at the beginning of the 20th century to about 415,000 today, according to the WWF. Both rhino horn and ivory elephant tusks are highly valued on the black market in Asia.

"Research is really important, of course, but this is a war," van Dam says. "We will be generating really valuable data for research, but this is not the primary focus of the system," he adds.

"NO TECHNOLOGY IS A SINGLE PANACEA TO PREVENTING CRIME."
Faye Cuevas, chief of staff of the International Fund for Animal Welfare (IFAW), says the smart park system "looks very sophisticated and can have an important role in improving wildlife security," though she cautions that "no technology is a single panacea to preventing crime and keeping wildlife service rangers safe in their mission to protect wildlife." Cuevas, who leads the IFAW's anti-poaching program in Kenya,

said in an email that the value of the system depends on how its data is analyzed, and “that type of analysis takes human eyeballs and algorithms to integrate the threat picture with the data being collected.”

Van Dam and de Groot hope to eventually incorporate live video feeds in the network at Akagera, which is home to the African elephant, black rhinoceros, cape buffalo, African lion, and African leopard – animals collectively referred to as the “big five” because of their high desirability among big game hunters. And although they acknowledge that poachers will continue their efforts to infiltrate national parks and reserves, whether through corruption or technical means, they hope that the smart park system can at least allow authorities to stay one step ahead.

“Most of the time, in the Western world, we’re chasing the guys who are already ahead of us with new technology,” says de Groot, a former police officer. “In Africa, in these parks, we have an opportunity, with the technology we’re using, to stay ahead of the bad guys.”

“So they might come up with a solution to avoid our technology, but hopefully by then we’ll have something else in place.”

LoRaWAN: The Future of IoT Connectivity

LoRaWAN technology opens up another subset of IoT entrepreneurship, bringing smart cities and smart homes ever closer to reality. But we’re not there yet. Our Inventors are hard at work exploring all that LoRaWAN has to offer and

creating an enhanced reality geared toward helping individuals, communities and businesses accomplish more.

A lot of attention was paid to the Internet of Things (IoT) in 2016, and by now the concept has filtered down from the tech elite to mere mortals like you and me. Platforms and ecosystems have evolved to the point where even elementary school children can plug-and-play puzzle pieces to develop their concept and design skills early on. However, whether it's a child's maker project or an enterprise-level oil fleet tracking system, one rule holds true: Without connectivity, the system is nothing more than a sheet of silicon.

"Indeed, just one LoRaWAN router in your living room could provide IoT connectivity to low-powered devices all over your home, greatly enhancing important parts of your daily life."
For most IoT entrepreneurs, owning, renting, or utilizing a continental system of cell towers to aid in discovery and innovation isn't an option. No matter. We still have Bluetooth® for short range communications (about 100 meters in a best-case scenario) or Wi-Fi for long range communications as options, right? But what is new and available now?

Enter low power, high range, wide area networks – or LoRaWAN. Intended for wireless, battery operated devices, LoRaWAN targets key requirements of IoT such as secure bi-directional communication, mobility, and localization services in regional, national and global networks. With a range of 1–5 miles and the ability to integrate into a mesh network (where each router can connect wirelessly to another to increase range), small communities to large cities can be covered with very few devices. Indeed, just one LoRaWAN router in your living room could provide IoT connectivity to low-powered devices all over your home, greatly enhancing important parts of your daily life.

Technically speaking

The LoRa Alliance, a nonprofit group of industry innovators, provides this quick description of the system and its flexibility:

“Communication between end-devices and gateways is spread out on different frequency channels and data rates. The selection of the data rate is a trade-off between communication range and message duration. Due to the spread spectrum technology, communications with different data rates do not interfere with each other and create a set of “virtual” channels, increasing the capacity of the gateway. LoRaWAN data rates range from 0.3 kbps to 50 kbps. To maximize both battery life of the end-devices and overall network capacity, the LoRaWAN network server is managing the data rate and RF output for each end-device individually by means of an adaptive data rate (ADR) scheme.”

National wide area networks targeting IoT applications such as critical infrastructure, confidential personal data, or critical functions for society have a special need for secure communication. This has been addressed by several layers of encryption:

Unique Network key (EUI64) ensures security at the network level
Unique Application key (EUI64) ensures end-to-end security at the application level
Device-specific key (EUI128)
More information about different classes for the specification is available here, but what is impressive so far is how wide the possibilities for the technology are at during this early stage of development. Extensibility – the ability to extend or add new functionality to core capabilities – and Flexibility appear to have been primary considerations in the technology from the start.

Your life, connected

LoRaWAN technology opens up another subset of IoT entrepreneurship, bringing smart cities and smart homes ever closer to reality. Whether it’s a geofenced area around your own house or an alert system to identify when your pets leave a predetermined range, LoRaWAN is at its best solving the minutiae and tasks of our daily lives.

Imagine a system of connected home devices that start kicking off events as you approach your home –doors unlocking, stoves preheating, furnaces or air conditioners firing up – extended beyond to a city filled with smart parking spots all broadcasting if they are empty or filled. With LoRaWAN, we now have the capability to create seamless, long range experiences without the common reliance on an internet or cellular provider.

“LoRaWAN technology opens up another subset of IoT entrepreneurship, bringing smart cities and smart homes ever closer to reality.”
But we’re not there yet. One of the biggest challenges facing a mainstreamed system is adoption. As with any new platform of services, there are many competing solutions. Wikipedia’s LPWAN page lists more than a dozen implementations in a mixture of proprietary and civic usage. This bodes well for future development as it details both private and public interest is moving the technology forward. Fortunately, the LoRaWAN specification is open source and eager for early adopters to make this technology widespread and attractive to the development community.

What’s next for LoRa?

With LoRa as a base, it doesn’t take much of a leap to envision ways to extend this technology with APIs like Microsoft’s Cognitive Services, IoTHub, or Machine Learning Studio to create devices and experiences that can see, hear, speak and to some degree – think and predict.

At Vectorform, we see LoRaWAN solutions as a way for humans and machines to interact – to connect – in new and natural user environments where your day-to-day experiences are enhanced by devices providing a hyperawareness of the world around you. Our Inventors are hard at work exploring all that LoRaWAN has to offer and creating an enhanced reality geared toward helping individuals, communities and businesses accomplish more.

LoRaWAN: The Future of IoT Connectivity
Published on January 15, 2017
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