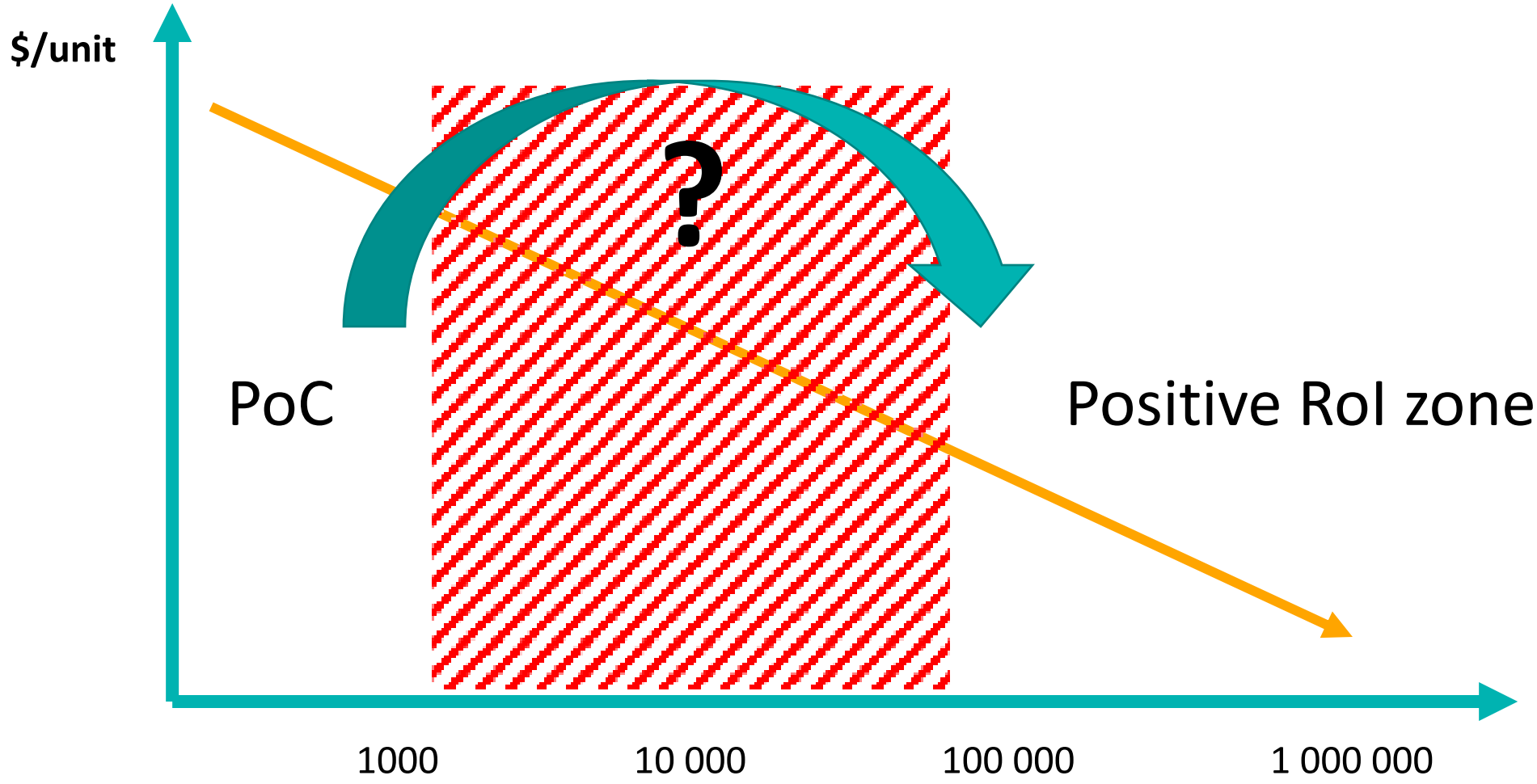
Actility
Connecting with intelligence

Smart Water webinar

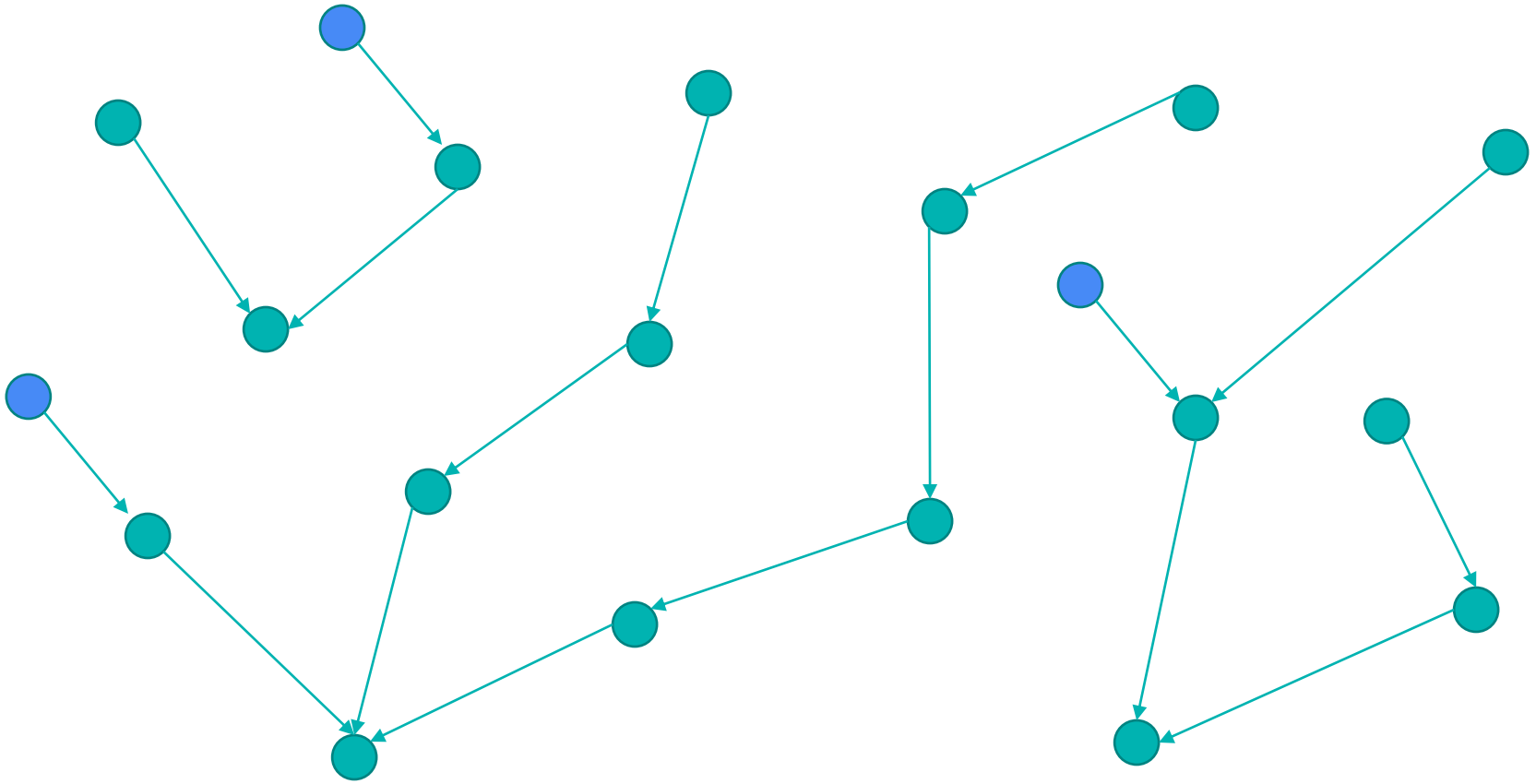
Olivier Hersent

IoT use cases & infrastructure costs: the quantum leap issue



Actility

The « big-bang » model: Wi-Sun metering projects

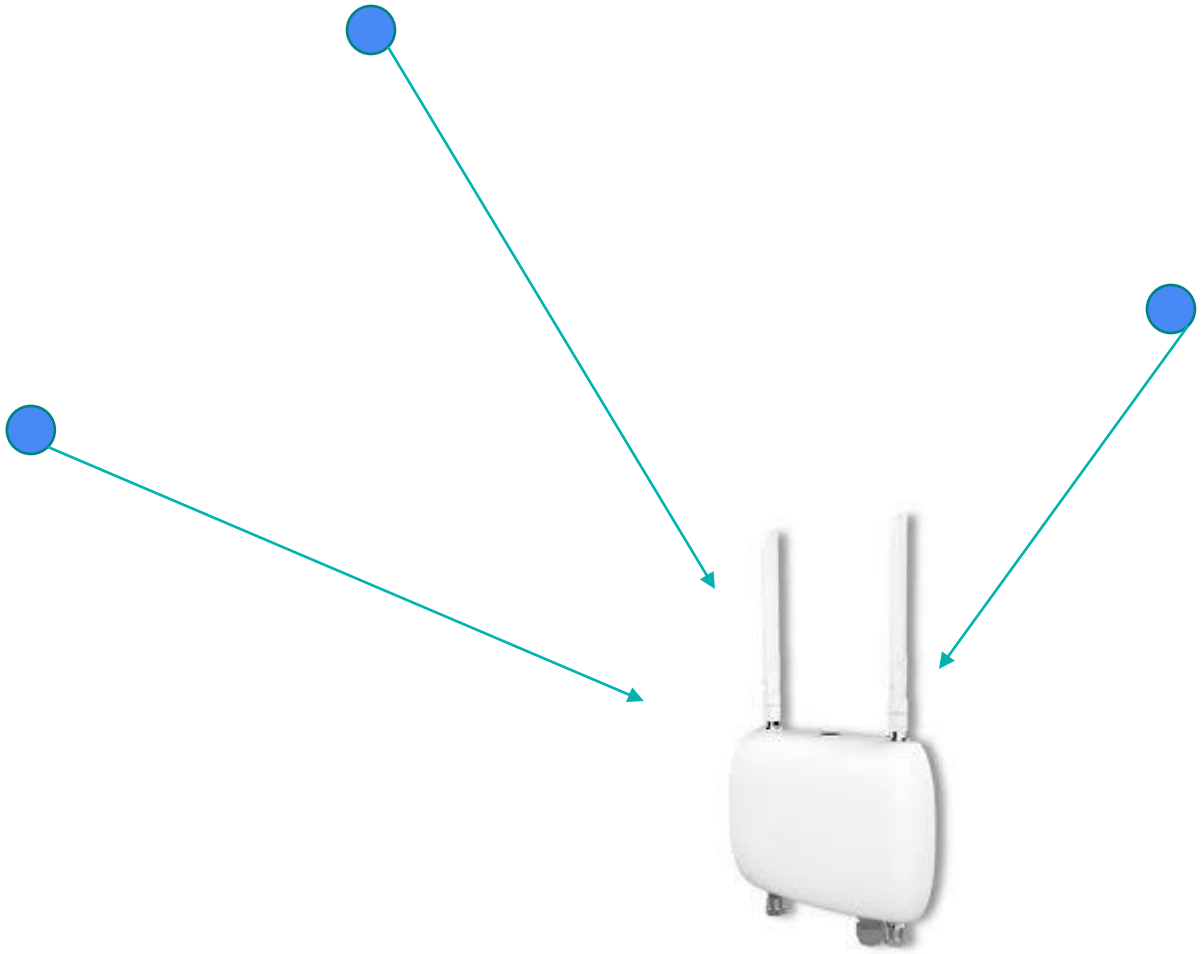


(1) Bootstrap high density utility project

(2) Add-on utilities (3rd party dependency)

Actility

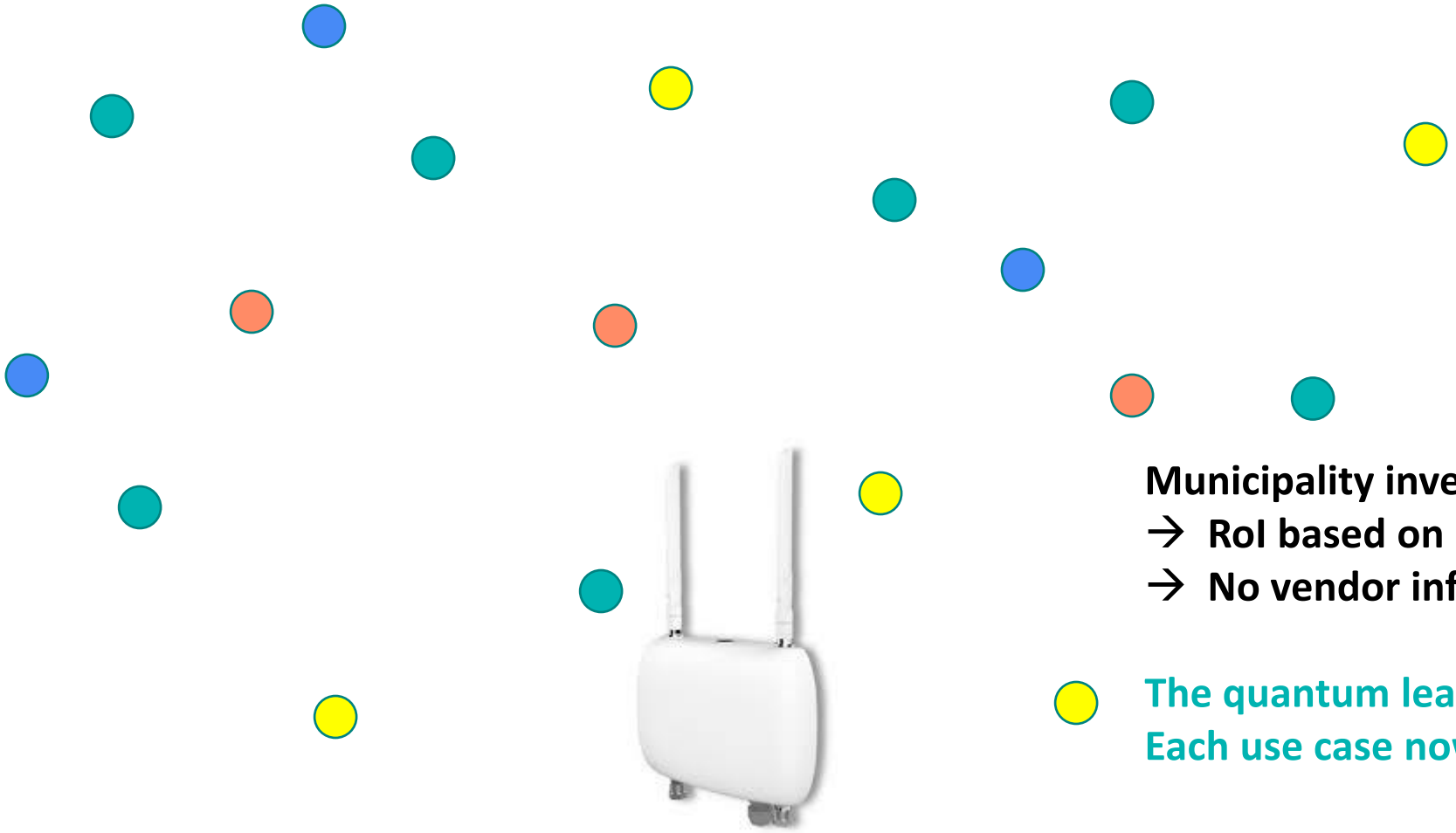
LoRaWAN does not need a big bang



… but how to manage the
Infrastructure cost quantum leap ?

Actility

LoRaWAN enables use-case/infrastructure unbundling

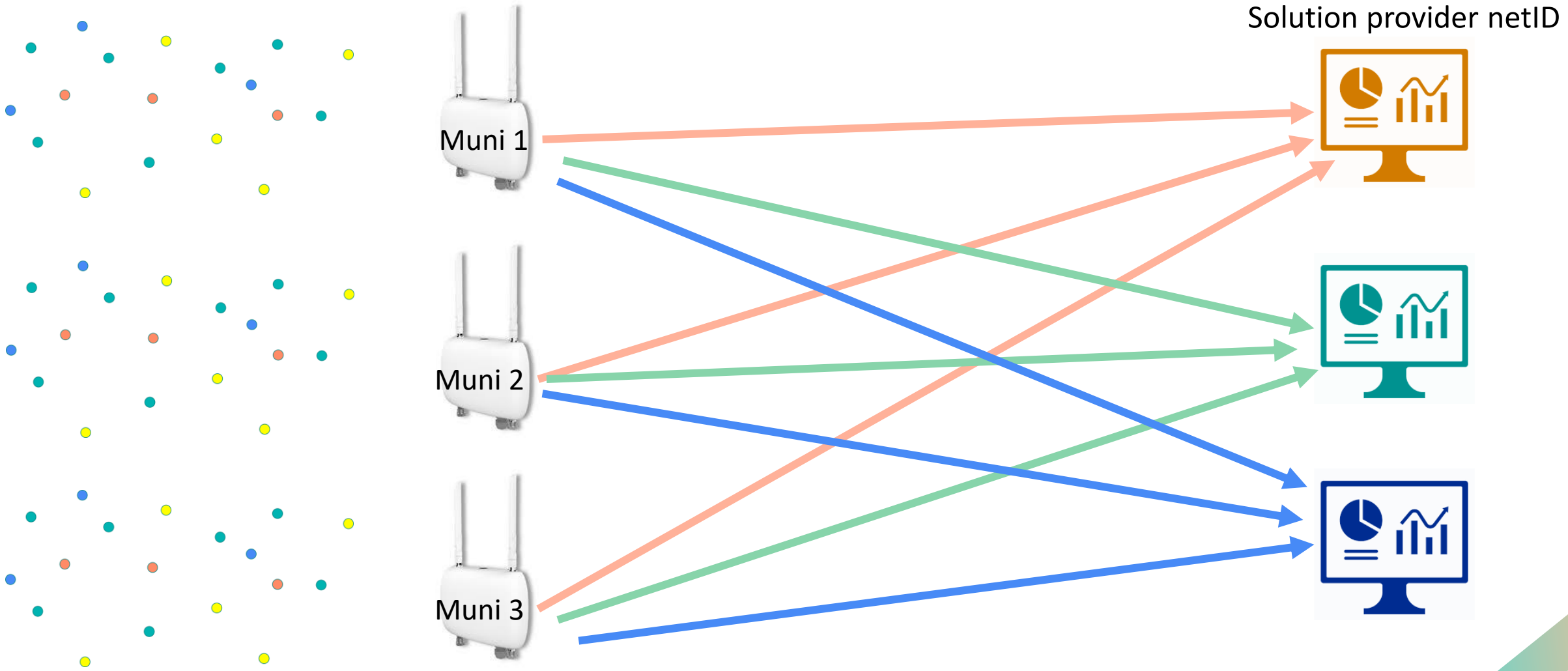


Municipality invests in agnostic infrastructure
→ RoI based on sum of all use cases
→ No vendor infrastructure lock-in

The quantum leap:
Each use case now sees low marginal infra cost !

Actility

Roaming as key enabler for unbundling



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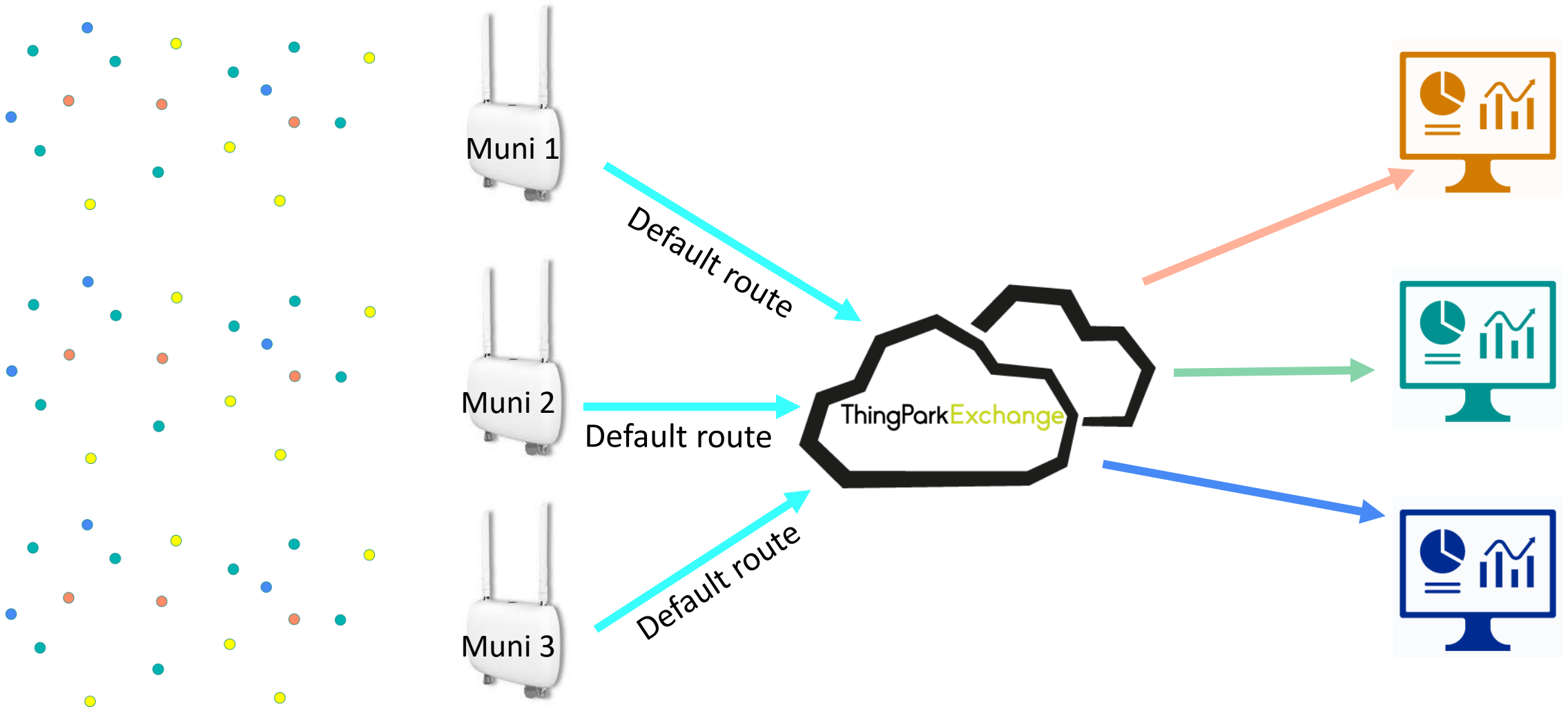
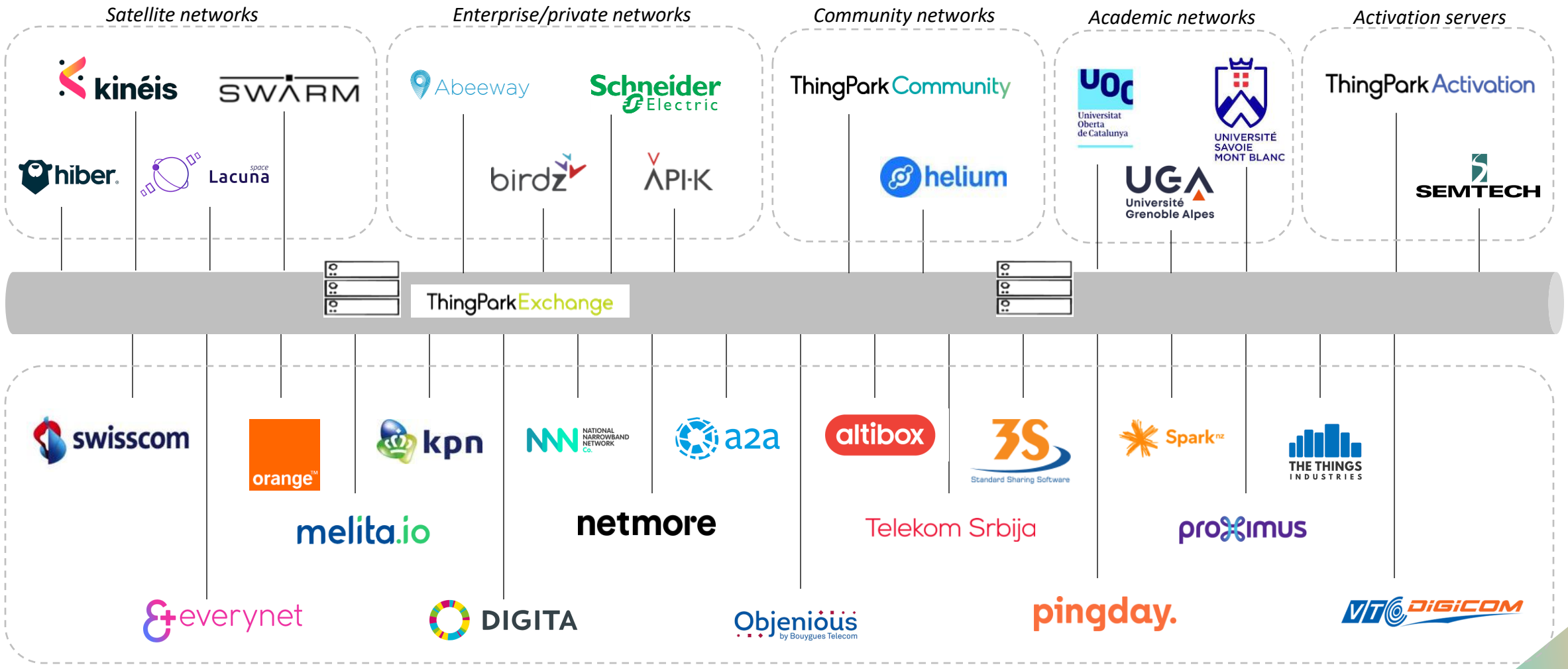
Scale-up with TEX



Actility

LPWAN Backbone



Actility

Pierre Emmanuel Dubois

Actility

Smart Water and LoRaWAN

birdz par VEOLIA

Dec 2021

1

BIRDZ AT A GLANCE

Environmental IoT/Data operator for digital cities

- **Incorporation :** 2017
- **From the merger between :**
  - m2ocity (2011)
  - Homerider Systems (2000)
- **IoT experience :** 20 years
- **Staff :** 170 employees
- **4 locations :**
  - Paris Fr (50p)
  - Lyon Fr (70p)
  - Gradignan Fr (40p)
  - Neuchâtel - Suisse (10p)

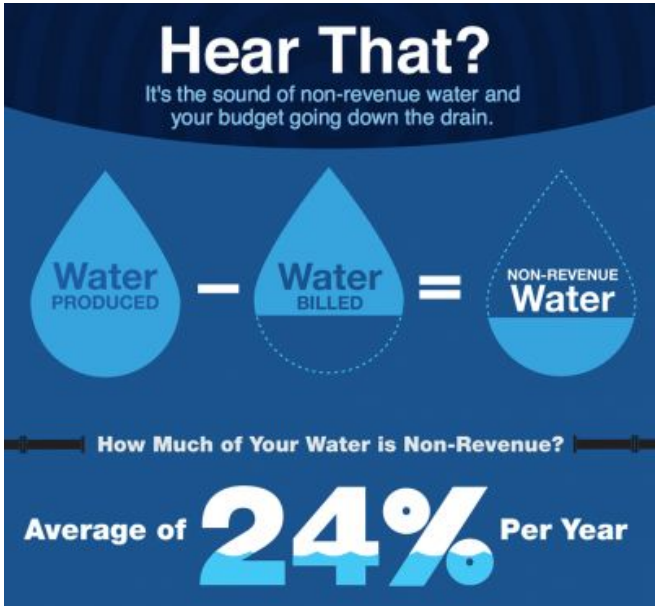
- **7 000 000** devices delivered
- **3 400 000** connected & operated devices
- **3 300** municipalities serviced
- **38 000 000** messages issued daily
- **352 620 000** data extracted daily
- **18 years old**, oldest IoT device in operation

WATER WASTE ENERGY OIL & GAS

2

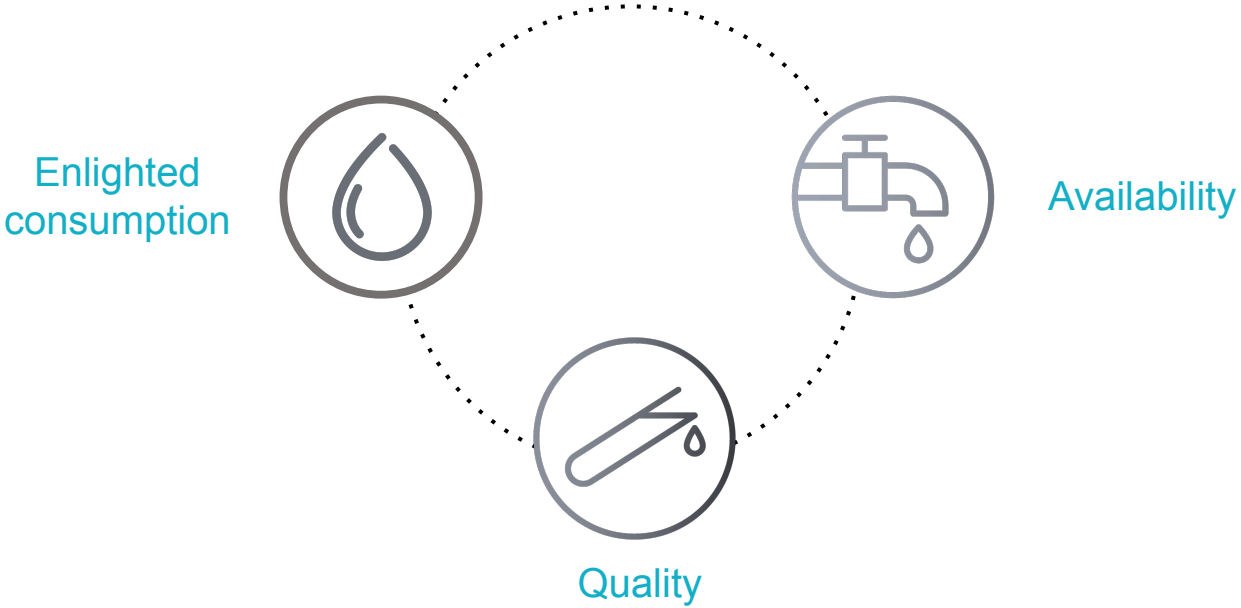
CHALLENGES FACED BY WATER SUPPLIERS

NON-REVENUE WATER : THE TOUGH REALITY



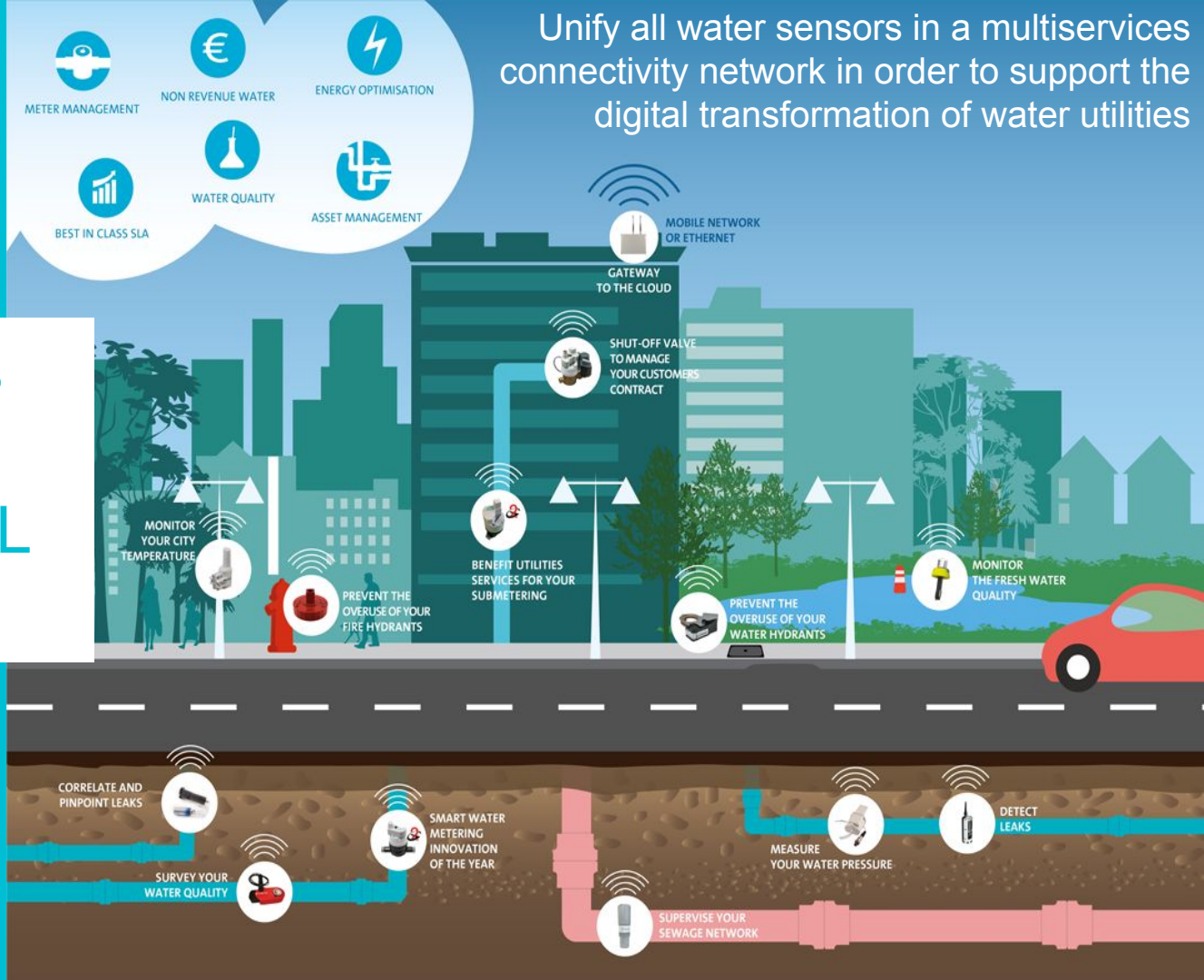
HELP CITIES AND WATER UTILITIES TO BETTER MANAGE WATER DISTRIBUTION AND IMPROVE WATER MANAGEMENT

Provide a comprehensive digital water solutions to maximize balance of 3 water KPI



FROM SENSORS TO ENVIRONMENTAL SERVICES

Unify all water sensors in a multiservices connectivity network in order to support the digital transformation of water utilities



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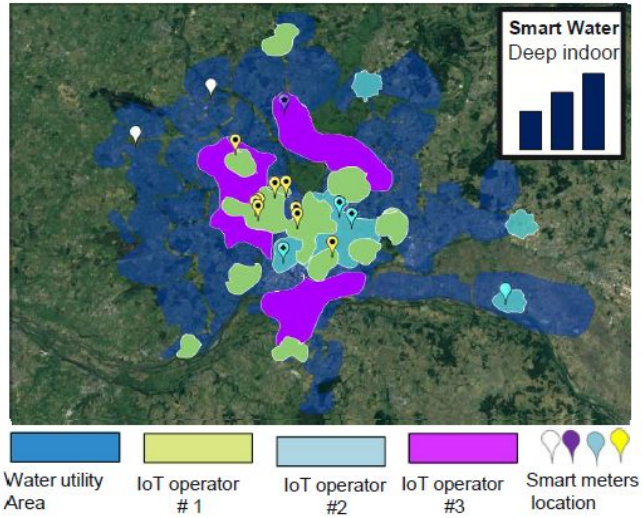
DIGITAL WATER NETWORK:
WHICH IoT TECHNO IS BEST SUITED?

Which Techno-Mix to choose ?

Which technology to choose ?

- Connectivity cost
- Ultra Low Power
- Long Range
- Security & Privacy
- Network Capacity
- High QoS & SLA

What IoT operator to choose ?



G3 SMART WATER METERS : INTEROPERABLE BY DESIGN

HYBRID AMR & AMI

MULTI-VENDORS

MULTI-LPWAN

Compact meters

G3 SMART METERING

Remote meters

Acquisition layer

Radio module

Pulse transmitter

Water meters

Itron DIEHL Metering Honeywell ARAD Water Measuring Technologies sensus a xylem brand

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DATA REDUNDANCY IS KEY

Spatial Redundancy

- Multiple LPWAN gateways to set a strong coverage
- A radio frame can be received several time
- Protect data SLA achievements from gateway unavailabilities

Time Redundancy

- Send the same information, several time, in different radio frames
- Up to 13x chances to collect one midnight water index, each day
- Up to 8x chances to collecte Qmin/Qmax & metrologic data, each day

Raise the bar of data SLA performances to win “Large Projects”

ILLUSTRATION OF LARGE SMART WATER PROJECTS DEPLOYMENTS

CASE #1 : EAUX DU GRAND LYON (FR – 2014)
One the largest LoRa digital water network project in Europe

- 54 municipalities
- 1,3 million supplied customers
- 400.000 metering points
- 97,4 millions m³ distributed water per year
- 4 000 km distribution pipe network

Positive Outcomes:

- 1200 new water leaks found and repaired
- 1 million m3 of water saved annually in production
- increase of water network efficiency in four years, from 77% in 2014 to 85,2% in 2018

CASE #1 : EAUX DU GRAND LYON
Description of the Smart Water Network program

Smart Instrumentation

- 400.000 Smart Water meters
- 6.000 Acoustic Correlators from Gutermann
- 100 Fire and Water Hydrants
- 50 KAPTAS quality sensors

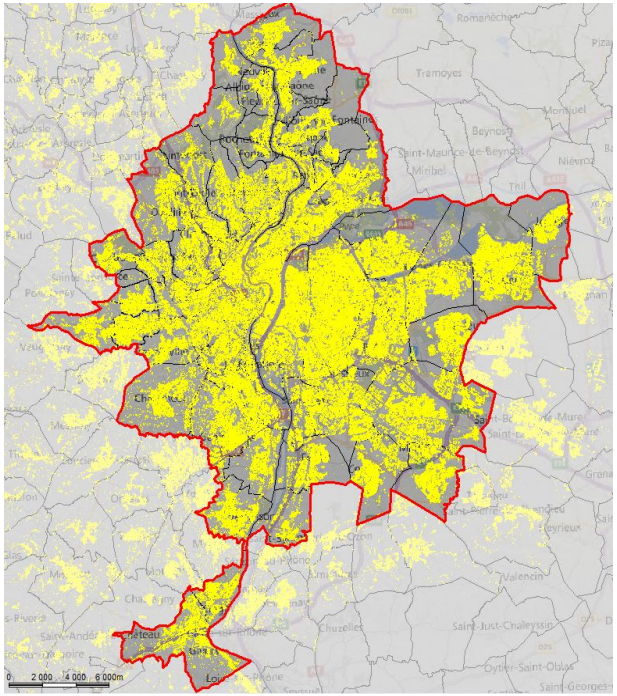
A Tough program

- Roll-out planned from Feb-2015 to Jan-2019
- O&M over 10 years duration
- Reference Project in terms of KPI and SLA for Water Conservation

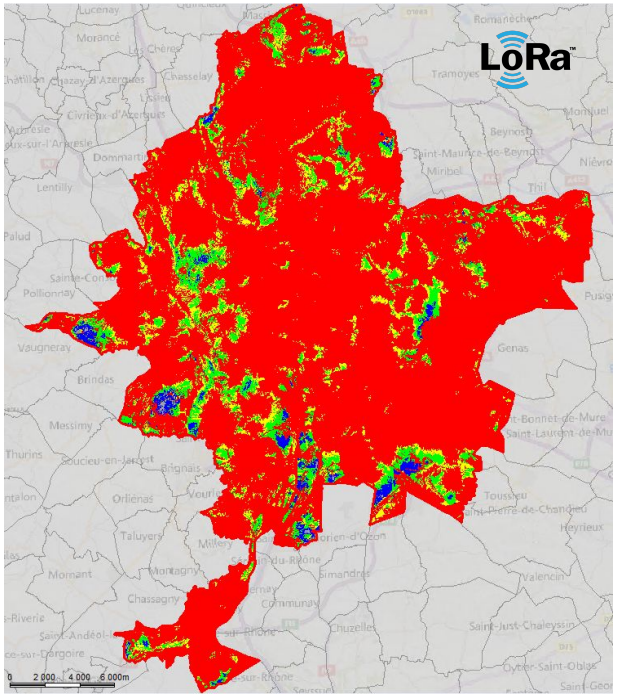
Contractual SLA & KPI

- **100% of smart water meters must be connected** to Eaux du Grand Lyon Business ERP (Public Service compliance) and **service** continuity **is guaranteed for 10 years**
- Data Collection KPI : **98% of the smart meters must send all daily midnight index…** each day in a month
- If KPI are not satisfied, a **financial penalty is applied** (the client doesn't pay the monthly fee for faulty meters.
- Example : 97% Measured vs 98% KPI, means 7,9k faulty smart meters, **Financial penalty equal to -2,0% on monthly contract revenues for 1% deviation from KPIs**

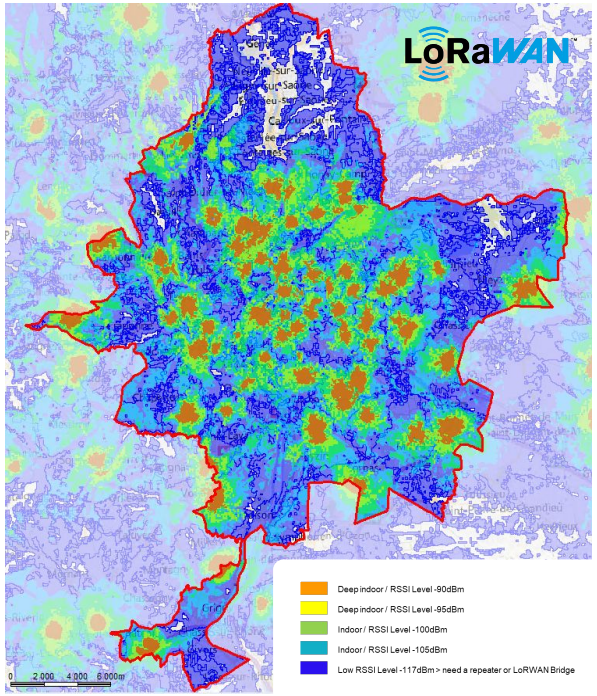
CASE #1 : EAUX DU GRAND LYON
Proprietary LoRa AMI Network vs Public LoRaWAN Network?



Geographical distribution of smart meters



LoRa enabled proprietary Network by Birdz



Public LoraWAN network

CASE #2 : CAPA (Corsica – 2018)
First Veolia project with public LoRaWAN operator

- 10 municipalities
- 85,104 supplied customers
- **30 000 metering points**
- 450 km distribution pipe network
- Most of cities are on the seaside, with hills
- Contract duration : 12 years

Veolia will deploy over 3 million smart water sensors in France on Public LoRaWAN network

- Over 3 million LoRaWAN water meters will be connected in the next 10 years in France notably via Orange LoRaWAN network, powered by Actility
- Additional water sensors are scheduled for deployment in order to transition from pure metering to environmental services
- Unify all water sensors in a multiservice connectivity network to support digital transformation of water utilities

1,1 million
Smart Water modules sold, to date

Benefit: Reduced water loss, optimised operations, increased customer satisfaction

Honeywell DIEHL Metering Itron Actility Objenious by Bouygues Telecom orange

birdz par VEOLIA

ADDITIONAL WATER MANAGEMENT USE CASES

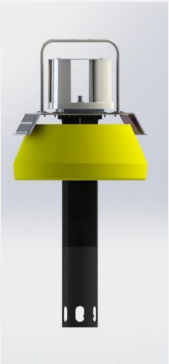
MONITORING OF WATER QUALITY IN PIPELINES & LAKES, AND OF FIRE HYDRANTS

KAPTA

Monitoring of water quality in water networks

SWARM

Monitoring of surface water in lakes and reservoirs



APILINK

Monitoring of fire hydrants

birdz

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@birdz_iot

linkedin.com/company/birdz

hello@birdz.com

birdz.com

Thank you

RAD's & Actility use case in Australia

Actility webinar , November 2021 v.2

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Leor Karp
Lead Engineer at **SGA** - SAFEgroup Automation

About RAD

Your Network's Edge®

- Global Telecom Access Solutions Provider
- Founded in 1981, privately owned
- Part of the $1.5 billion RAD Group
- Global presence: 15 offices, 200 partners, 16.5M units deployed

PUSHING THE EDGE OF 40 years INNOVATION

SecFlow Family
Industrial IoT Gateways with Edge Computing

Your Network's Edge®

SecFlow-1v

SecFlow-1v LoRa

SecFlow-1v IP66

SecFlow-1v PLC

SecFlow-1p

GPS LTE Wi Fi

Common Options

RAD received three IoT Evolution's 2020 Awards for the SecFlow-1v

2020 Ft. Lauderdale IoT Evolution Expo BEST of SHOW

SECURITY EXCELLENCE IoT Evolution 2020

2020 IoT Evolution Product of The Year

*Roadmap

SecFlow a Multiservice, Secure IIoT Gateway with Edge Computing

Process Monitoring and Local Control

Motor/ Valve

RTU/ IED

Actuators

PLC

LoRa

Inputs

Ethernet/PoE
Fiber Optic/SFP
WiFi
LoRa
NB-IoT*
Serial RS232/ 485
Analog input
Digital I/O
Dry Contact
GPS

- Multi Service integrated like a ***"Swiss Army Knife"***
- Cost / Effective edge device
- Multiple Inputs and Multiple Outputs
- Edge computing for custom applications
- Security
- Protocol convertors
- Rugged, Industrial -40c to 75c , Fanless
- Compact size
- ZTP (Zero Touch Provisioning)

Outputs

Ethernet/PoE
Fiber Optic/SFP
LTE / LTE-M / 5G
CBRS
Unlicensed P2P Radio
Dry Contact
USB
SD Card

Network Connectivity to Supervisory Control/Mgt.

SFP OPTICS

Unlicensed Microwave Radio

SCADA

Server

Cloud

*in 2022

About SGA

- SAFEgroup Automation (SGA) is a leading Australian provider of control system engineering services.
- SGA offer a comprehensive range of control system services, extending from electrical engineering and design through to business system integrations and data analytics, includes:
- Control System Engineering - Networking & Telemetry, Cybersecurity, PLC, RTU, HMI, SCADA, Historians.
- Support , Field Services, Expert Advice ,Digital Data & Business Systems , Safety & Reliability
- 80 Employees
- 5 regional offices

RAD & Actility solution – Use Case

The customer

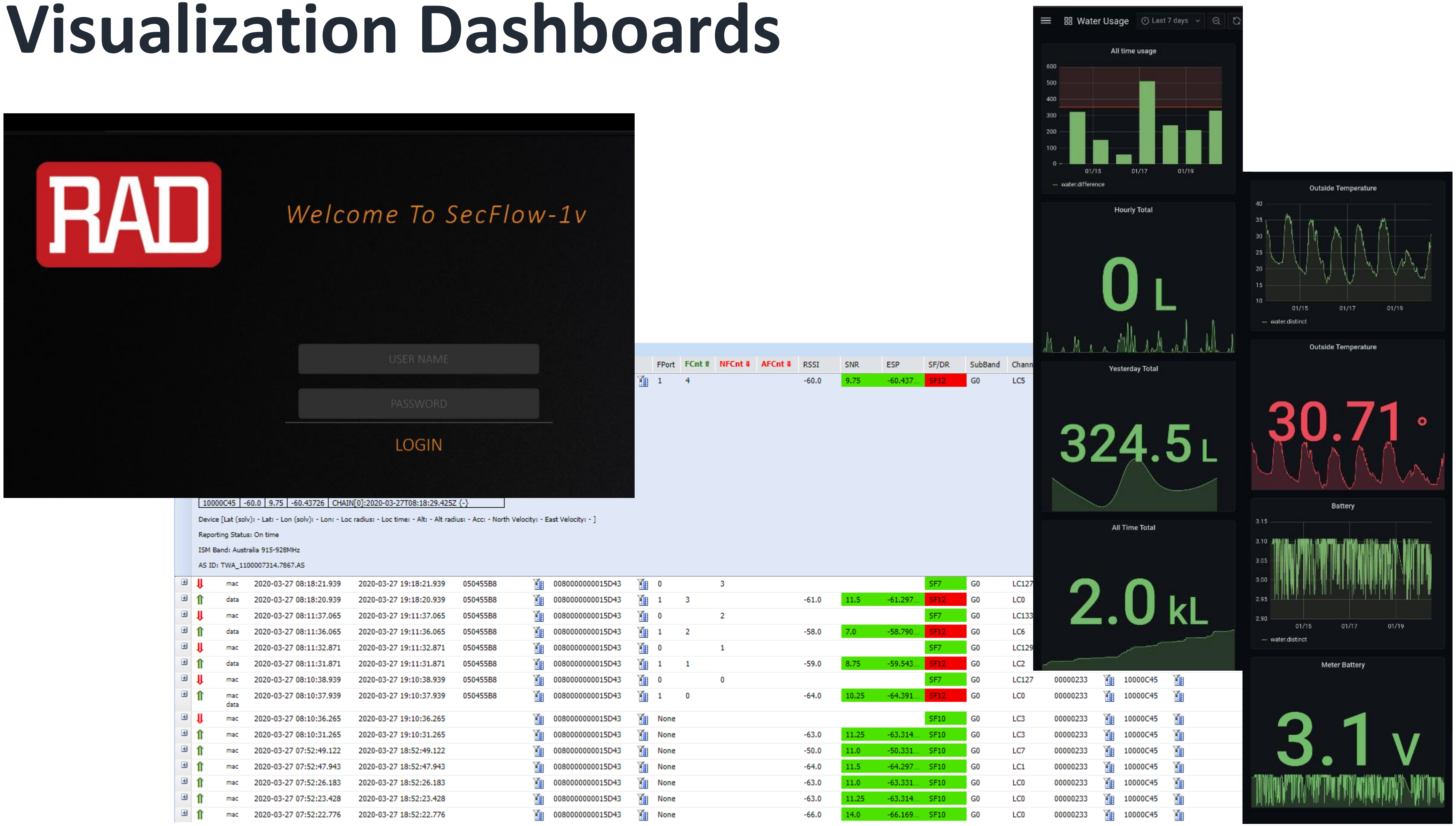
- City Council In Australia
- Region: South cost of Australia
- Population: ~ 100,000
- Area: ~ 4,500 km²

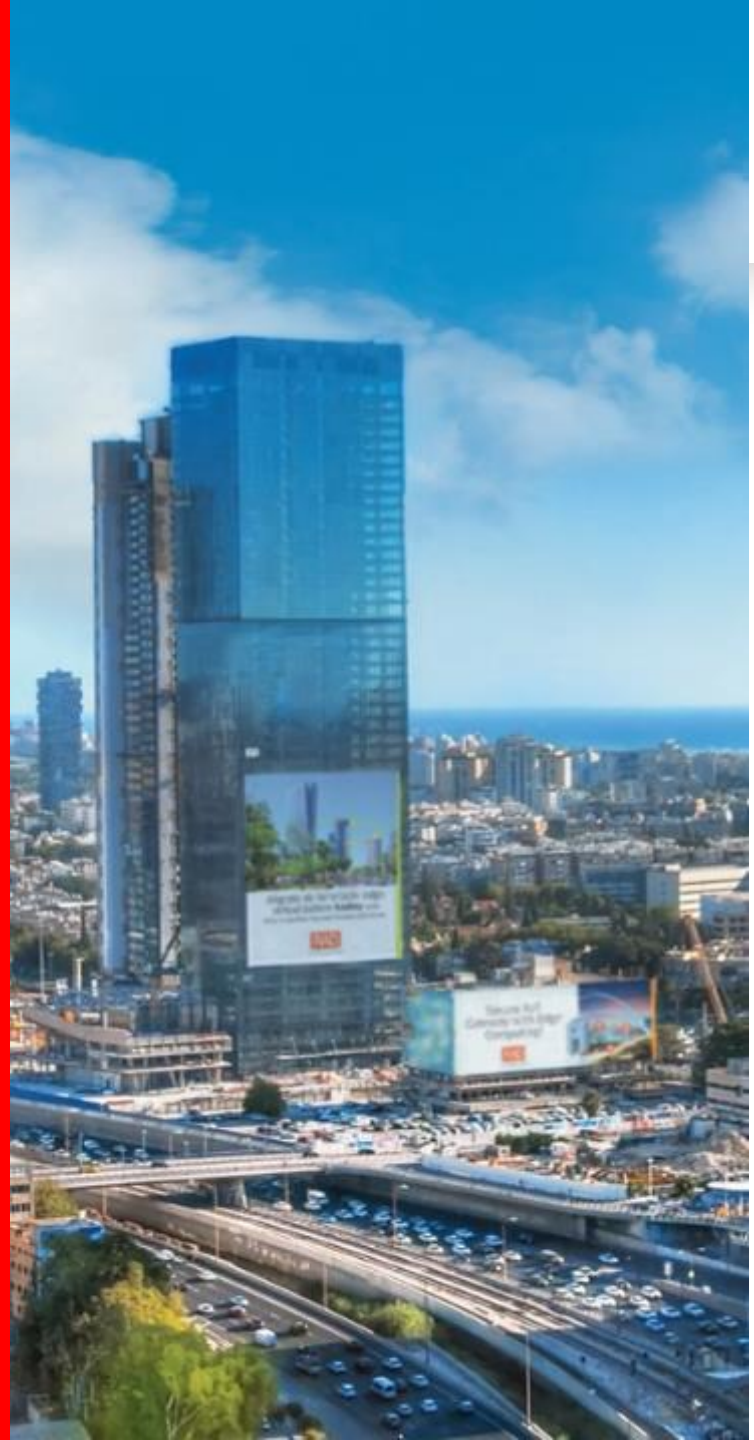
Applications

- Tank monitoring
- Water metering
- Manhole float
- Council asset monitoring (e.g. Park smart lighting, Garbage bins)
- Reading from a Chlorine Analyser

SecFlow-1V- LoRa
Validated for TPE and TPW

Data manipulation and Visualization Dashboards





Takeaways

Your Network's Edge®

- RAD's 40 years of global experience in Industrial and Critical Infrastructure
- Innovative, LoRaWAN Secure Industrial IoT Gateway with Edge Computing
- SecFlow is a versatile , flexible and multiservice device
- Ecosystem partners with powerful, industry leading solutions
- Flexibility in support LoRaWAN + Legacy Industrial infrastructure
- Future proof technology to adapt to evolving utility applications

Nicolas Guillou

Co-Founder and CEO, Anian Sdn Bhd.

ANIAN

ACCELERATING BRUNEI
SMART NATION INITIATIVE

Smart Water and LoRaWAN®

WHO WE ARE?

A Bruneian IT& Telecommunications System Integrator specialized in digital transformation, deploying technologies based around the Internet of Things (IoT), enabling Smart Nation initiatives, and providing professional and consulting services to plan, design, deploy, implement, and operate information systems, ICT and telecommunications technology

MISSION

Provide innovative digital transformation services to help Brunei transition towards becoming a truly Smart Nation by enabling and empowering people with the right skills, technologies and processes

ANIAN CAPABILITIES & SOLUTIONS

	Internet of Things	Vertical Solutions	Telecom Product & Services	IT Integration Product & Services	Professional Services	Other Services
ANIAN Current products & services	LoRa Network Operator	Smart utilities	OSS/BSS	Cloud Strategy & Solutions	Technology Consulting	Geospatial Business Solutions
	Application Design & Customization	Smart Building	Network Security	Cybersecurity	Project & Program Management	Traffic & Video Analytics solutions
	IoT devices	Smart Agriculture	Data Centre	Business Intelligence Analytics	Solutions Design & Development	Industrial hardware and SCADA
	End-to_end integration	Smart Transport	OTT,Video gaming	Carrier Grade WiFi	Managed Services	
	Training	Fleet Management	Submarine Capacity	Hospitality Solutions		
Our Partners & Solutions	Actility, Kheiron IoT Suite, FAST Groupe Claire					

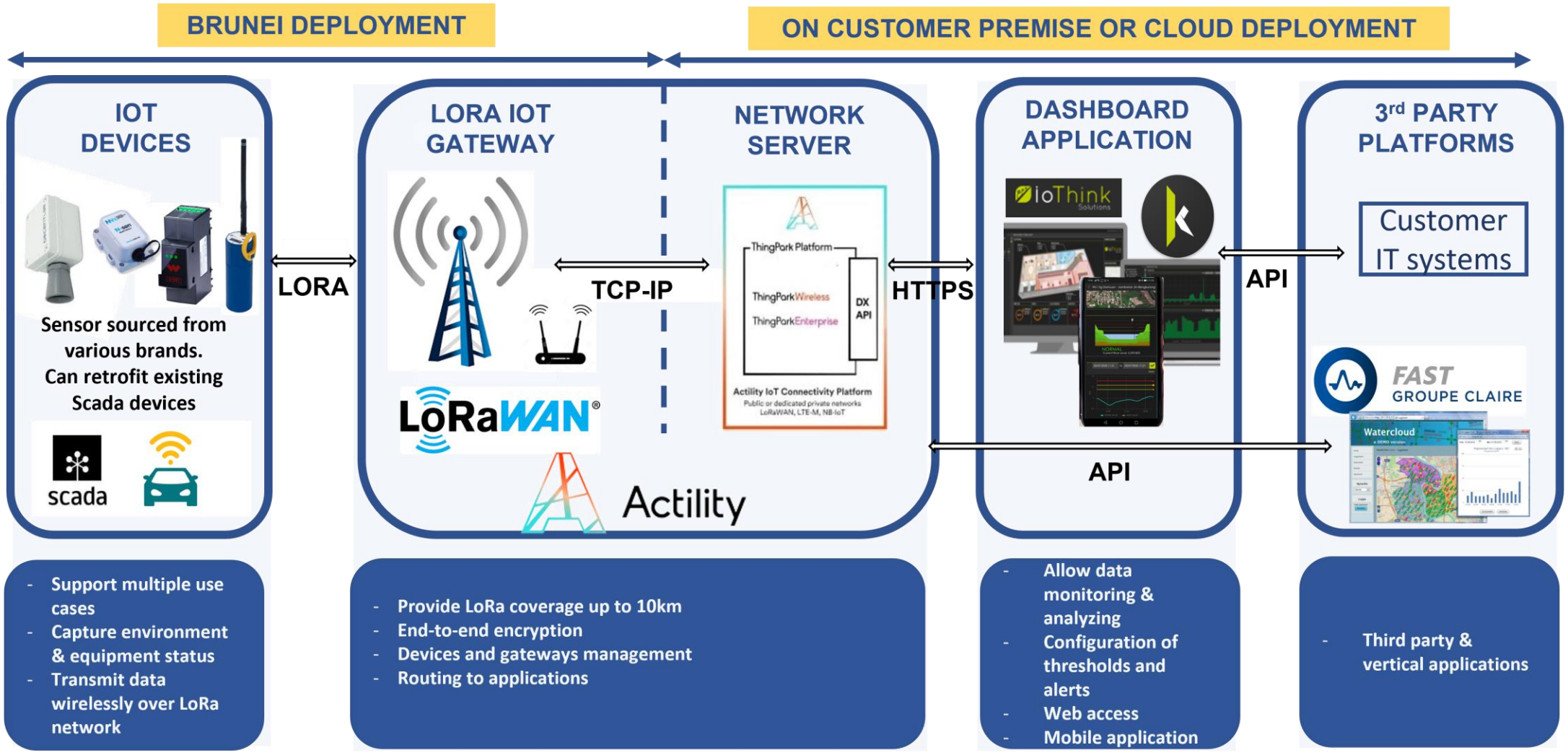
IOT STRATEGY

1. Implement new program to build the first commercial Internet of Things (IoT) network in Brunei
    - Enable multiple Smart Nation initiatives for the government, private companies & the people of Brunei
2. Take leadership in domestic market in delivering IoT solutions based on Industry 4.0 standards
3. Support government Smart Nation initiative with innovative high-tech digital transformation services
4. Support development of local ICT environment & create employment opportunities in ICT sector
5. Work in partnership with Brunei universities & educational institutes in the development of innovative solutions & opportunities for students as to build a sustainable industry in Brunei

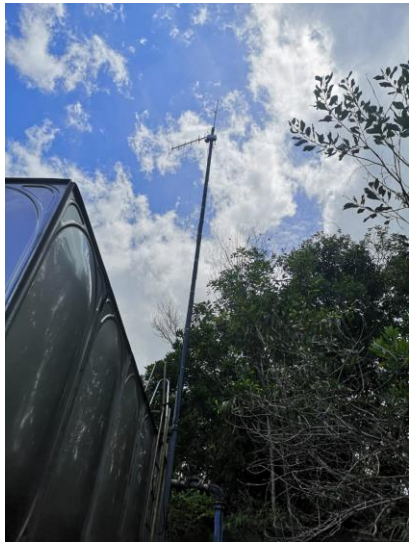
IOT STRATEGY

6. Develop local expertise in Smart Nation applications & setup Brunei as a regional hub for IoT & smart services
7. Deploy LoRa network supporting IoT & Smart Nation applications created by others
    - Foster the growth of smart technologies in Brunei that can then be exported to the region
8. Provide end-to-end IoT solutions to Brunei market (IoT connectivity, devices, applications, deployment & managed services)
9. Drive IOT adoption across industries in Brunei

ANIAN IOT ECOSYSTEM



ANIAN NETWORK COVERAGE



Network solution from Actility and gateways deployed on Ministry of Development infrastructure:

- Water reservoirs
- Bridges
- Rooftops

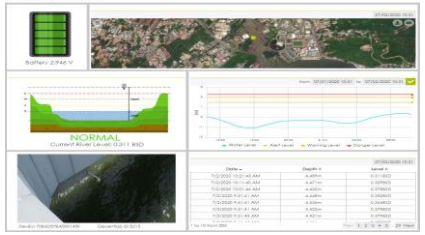
Actility

PUBLIC WORKS DEPARTMENT
MINISTRY OF DEVELOPMENT | BRUNEI DARUSSALAM

IOTHINK KHEIRON DASHBOARD PLATFORM

IoT platform for data visualization via web access or mobile application

Allow customization of dashboard, widgets, alerts, etc.



Saas/Cloud environment

Solution can be white labeled & installed on customer premise for commercial deployment

DEVICES SOLUTIONS ALREADY INTEGRATED BY ANIAN

SMART BUILDING
- Occupancy/light/temperature
- 3-phase current
- Water leak detector with rope
- Emergency push button
- Door/window sensor
- Power outlet
- Particles in the air (PM1, …)
- Wireless siren
- Doorbell
- Temperature & humidity
- CO detector
- Liquid level ultrasonic sensor
- Water meter

SMART AGRICULTURE
- Soil moisture
- Soil water pressure & temperature
- Weather station
- Particles in the air (PM1, PM2.5, PM10)
- Temperature & humidity sensor

SMART SECURITY & EMERGENCY
- Wireless siren
- Smoke detector
- CO detector

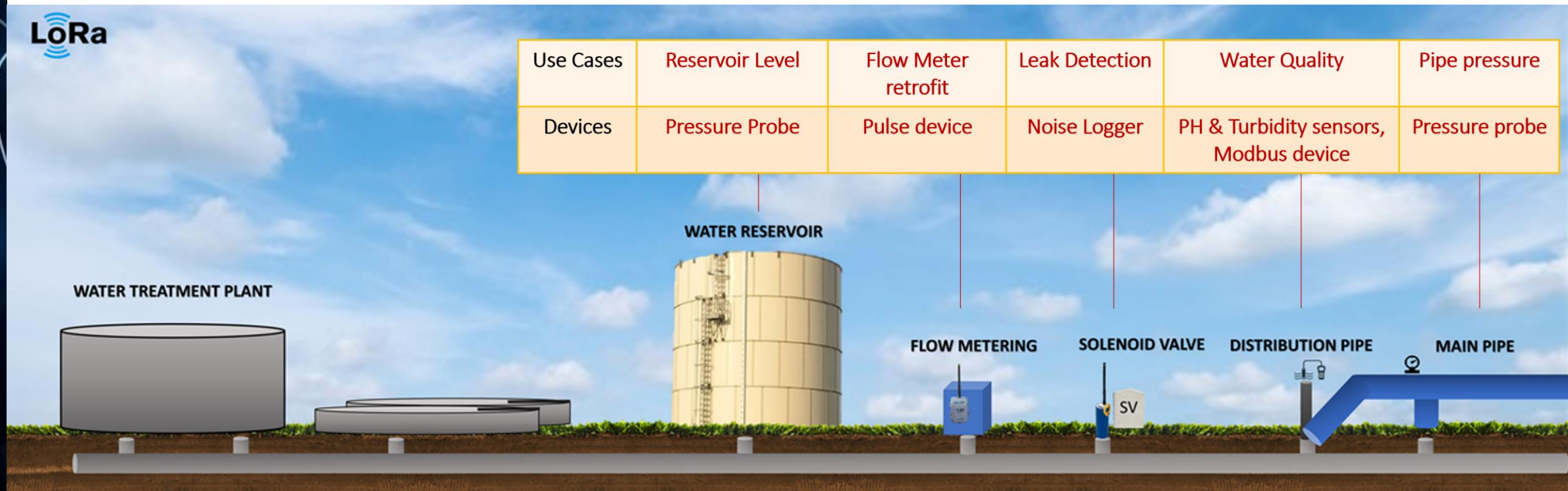
SMART ENVIRONMENT
- Particles in the air (PM1, PM2.5, PM10)

ASSET TRACKING & GEOLOCATION
- Personal and asset tracker
- Fleet vehicle tracker

SMART WATER, WASTEWATER & UTILITIES
- Liquid level ultrasonic sensor
- Water meter
- Noise logger (detect leaks in pipe)
- Pressure sensor (water/oil/gas)
- Limit switch sensor
- Water overflow
- Water quality (PH, DO,..)
- Retrofit flow meter
- Oxygen level detector
- H2S + O2 gas sensor
- Particles in the air (PM1, PM2.5, PM10)
- Accelerometer & surface temperature
- Rain gauge
- Pulse device
- Modbus gateway
- Vibration
- 3-axis movement
- 2-gang thermocouple
- CO detector

WATER NETWORK MONITORING

- **Legacy solutions** : High-cost SCADA & telemetry for water reservoirs, sim-based flow meters , adhoc inspections on customers complains, reactive maintenance
- **New IoT solutions** : Low cost, low power and flexible IoT solutions, early alerts and optimization of maintenance, web and mobile customized applications



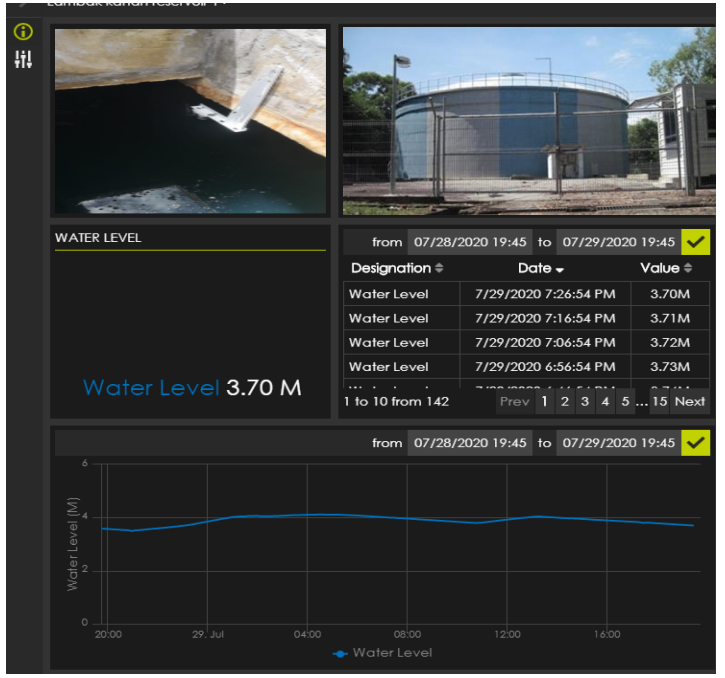
WATER NETWORK MONITORING

Monitoring at 7 locations in Brunei-Muara district

- Highway main distribution pipes pressure
- Residential areas **water pressure**
- **Reservoirs level** monitoring
- **Water quality** from distribution pipe
- **Flow meter retrofit**

Positive Outcomes

- ✓ Reduce customer complains
- ✓ Increase public satisfaction
- ✓ Early alert on equipment failure
- ✓ Reduce service interruption
- ✓ Optimize workforce



WATER LEAK DETECTION SYSTEM

Leak detection system for 15 locations in Brunei-Muara district using smart LoRa noise loggers deployed at existing valves and fire hydrants locations. The daily analysis on the noise level is made via a dedicated software from Fast Gmbh

Positive Outcomes

- ✓ Reduce customer complains
- ✓ Increase public satisfaction
- ✓ Early alert on equipment failure
- ✓ Reduce service interruption
- ✓ Optimize workforce

System Data

Raw Data

Zone: Lambak | New District | Delete District

Recycle bin | Logger allocation | Read-In | Add Logger | Audio Files

Filter | Move Elements | Export Logger

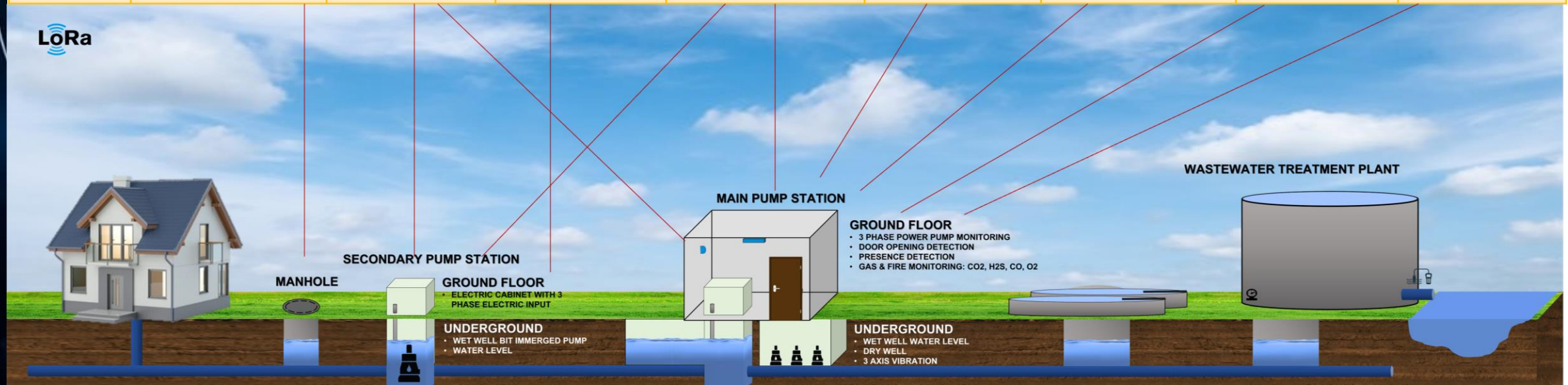
Serial number	Leakstate	Time	Amplification	Base Level	AL	AH	30.08.2021	29.08.2021	28.08.20
50089		30.08.2021 07:00:00	hoch	0	--	--	19	9	36
50090		30.08.2021 07:00:00	hoch	0	--	--	13	10	9
50092		30.08.2021 07:00:00	hoch	0	--	--	4	4	4
50093		30.08.2021 07:00:00	hoch	0	--	--	5	3	3
50095		30.08.2021 07:00:00	hoch	0	--	--	32	36	30
50096		30.08.2021 07:00:00	hoch	0	--	--	50	11	9
50097		30.08.2021 07:00:00	hoch	0	--	--	1	1	1

FAST
GROUPE CLAIRE

WASTE WATER NETWORK MONITORING

- **Legacy solutions** : High-cost SCADA & telemetry for main pump stations, adhoc inspections on customers complains, reactive maintenance
- **New IoT solutions** : Low cost, low power and flexible IoT solutions, early alerts and optimization of maintenance, web and mobile customized applications

Use Cases	Manhole overflow detection	Wet well level	Pipe pressure	Pumps on/off detection	Pumps vibration monitoring	Hazardous Gas and fire detection	Door opening detection	Presence detection
Devices	Floater device	Ultrasonic or Pressure probe	Vacuum Pressure probe	3 phases power device	3 Axis devices	CO, C02, O2, H2S sensors	Door opening	Infrared device



SEWERAGE NETWORK MONITORING

Sewerage monitoring at 6 locations in Brunei-Muara district which includes following use cases :

- Wet well water level
- Water overflow detection in manholes
- Pumps vibration & power monitoring
- Hazardous gas detection
- Security (door opening & presence detection)

Positive Outcomes

- ✓ Reduce customer complains
- ✓ Increase public satisfaction
- ✓ Early alert on equipment failure
- ✓ Reduce service interruption
- ✓ Optimize workforce

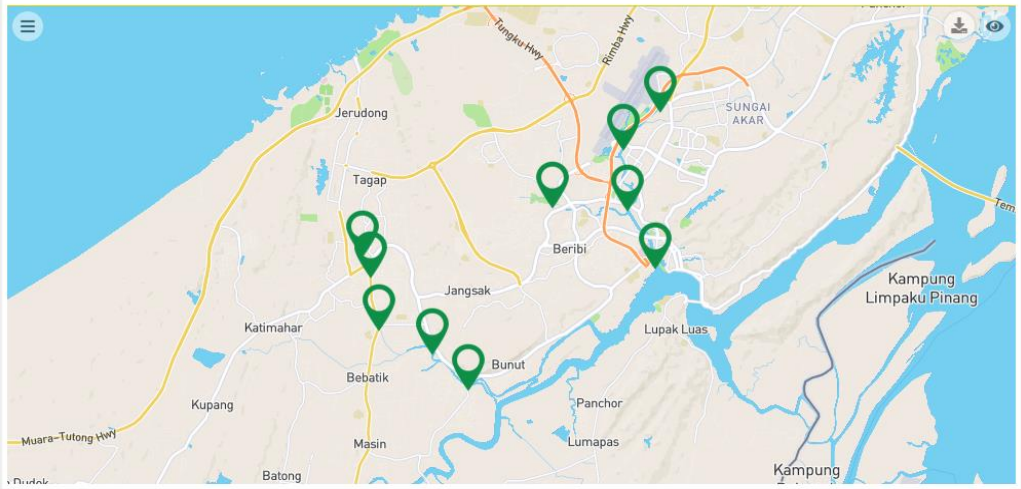
RIVER LEVEL & FLOOD DETECTION

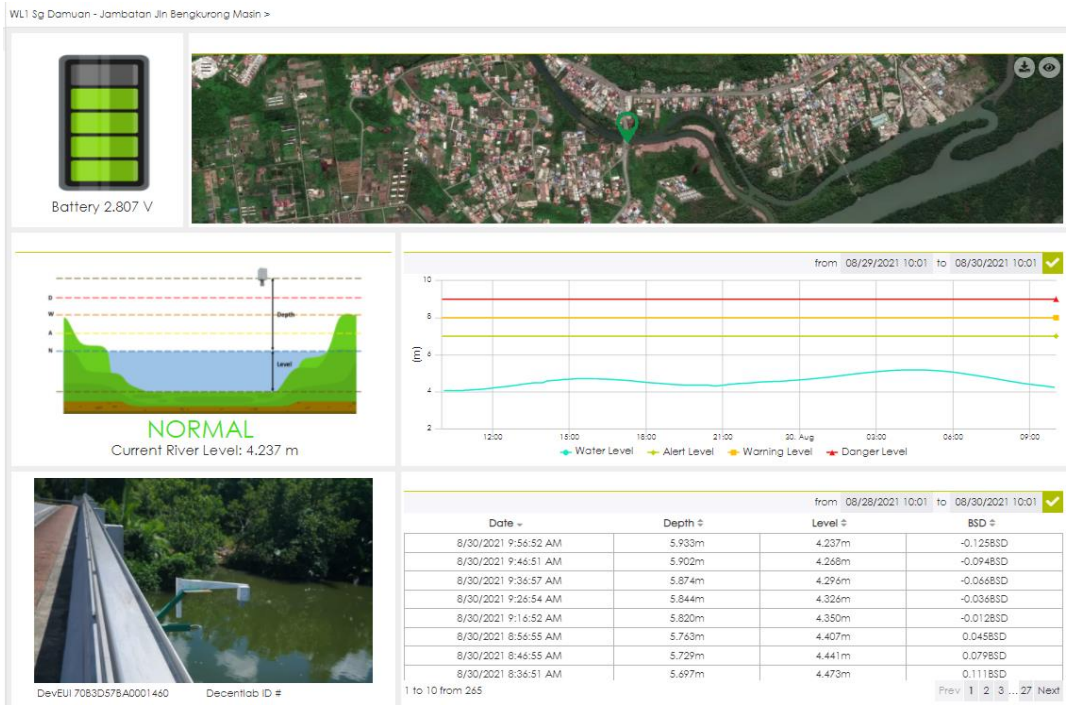
Drainage & river level monitoring at 10 locations in Brunei-Muara district (Sungai Damuan & Sungai Kedayan) with 10 ultrasonic devices currently deployed. Alert can be received via mobile notification and/or email inbox.

Positive Outcomes

- ✓ Increase public satisfaction
- ✓ Early alerts on flooding risks
- ✓ Optimize workforce

PUBLIC WORKS DEPARTMENT
MINISTRY OF DEVELOPMENT | BRUNEI DARUSSALAM





ANIAN

END