

Webinar:

**Enhancing Operational
Efficiency with LoRaWAN®
IoT in High-Security Sectors**

Your event will start shortly



Activity

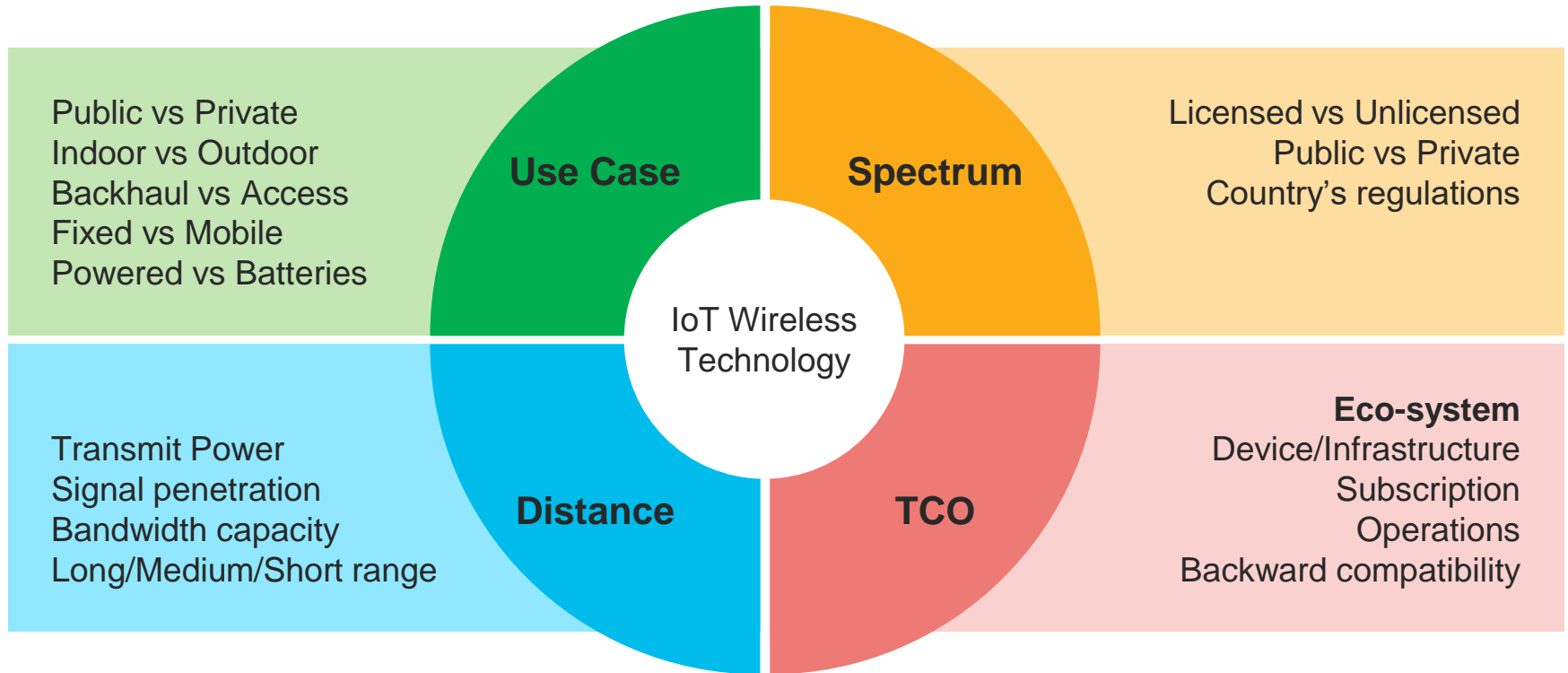




LoRaWAN for Logistics and Manufacturing

Mike Harttree
harttree@cisco.com

Industrial & IoT Wireless Selection Criteria



Industrial & IoT Wireless Landscape Trends

Wi-Fi 6

Spectrum: Unlicensed

Infrastructure: Public & private

Data rate: 1.3Gbps to 6.9 Gbps

Distance: Medium range

LoRaWAN

Spectrum: Unlicensed

Infrastructure: Public & private

Data rate: 250 bit/sec – 5.4 kbit/sec

Distance: Long range

4G/LTE

Spectrum: Licensed or shared licensed

Infrastructure: Public & private

Data rate: 100/50 Mbs/s (cat.3), 150/50 Mb/s (cat.4), 300/50 Mb/s (cat.6), 20/60kb/s (NB-IOT, half-duplex), 1200/150 (cat.18)

Distance: Long range

5G

Spectrum: Licensed or shared licensed or *unlicensed*

Infrastructure: Public & private

Data rate: 4.9Gb/s to +10Gb/s

Distance: Long range and short (mmWave)

LoRaWAN for Manufacturing, Logistics and Safety

Eliminating Digital Blindspots

Digitization in manufacturing

Our LoRaWAN deployments are only one part of a broader adoption of 'Industry 4.0'



Uptime



Product Quality



Safety



Connected
Machine



Additive
Manufacturing



Industrial
Security



Digital
Twin

Manufacturers are converging to secure, end-to-end standard networks

Objectives and challenges in industrial plant environments

Customer objectives



Reduced risk



Compliance & regulatory goals



Asset utilization and OEE



Employee productivity



Innovate & differentiate

Customer challenges



IT - OT alignment



Security concerns



Data accessibility and control

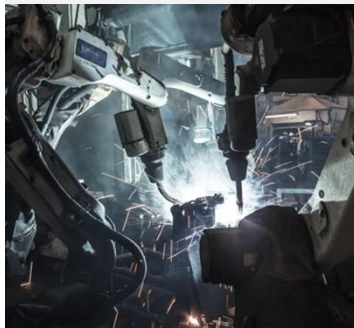


Lack of standardization

Materials



Automotive



CPG



Pharmaceutical



Food and Beverage



LoRaWAN for Manufacturing, Logistics and Safety

Customer Overview

- Industrial production environment
- Global footprint
- National security impact

Business and Technology Drivers

- No visibility into material flow during production
- Manual process for locating finished product for shipping
- Interest in using technology to improve worker safety
- Strict security standards for all technologies





Outdoor Gateway



Indoor Gateway

Asset Location Sensor



Door and Motion sensors



Indoor BLE Anchors



Asset Location Sensor



Inside the truck



LoRaWAN + BLE Solution

Solution Needs:

- Indoor and outdoor tracking (no GPS indoor)
- Hazardous Class 1/Div 1 environment
- Strict data security requirements (no cloud)

Our Solution

- Abeeway sensors (LoRa and BLE radios)
- Smooth transition from GPS to BLE as assets move from outdoor to indoor
- Cisco gateways, routers, industrial switching, security
- Actility TPE and WMW on-premise

Business Outcomes

- Full visibility of material location during production process and finished product during storage
- Ability to identify safety violations and provide real-time alerting
- Capability to generate KPIs for productivity and safety

Cisco LoRaWAN Gateway Portfolio

Flexibility for your use case requirements

Cisco IXM LoRaWAN Gateway



IP67 outdoor rated

OR

Cisco IR1101 Router with LoRaWAN PIM



New!
LoRaWAN
PIM

Compact, modular and low power

Cisco IXM LoRaWAN Gateway

- ✓ FIPS 140-2 compliant
- ✓ Ruggedized IP67
- ✓ Cloud or on-prem managed
- ✓ Redundant RF antennas
- ✓ GPS capability



868/915 MHz
ISM Bands
Globally

CPF or LRR
Packet
Forwarder

16 Channel

Cisco IR1101 with LoRaWAN PIM

- ✓ Compact, modular form factor
- ✓ Ruggedized IP30, ATEX certified
- ✓ FIPS 140-2 complaint
- ✓ GPS capability
- ✓ Cisco IOS XE, IOx
- ✓ Optional integrated cellular backhaul
- ✓ Cloud or on-prem managed



New!
LoRaWAN PIM



868/915 MHz
ISM Bands
Globally

CPF or LRR
Packet
Forwarder

8 Channel



WMW

IoT Solved



Can we do this secure?

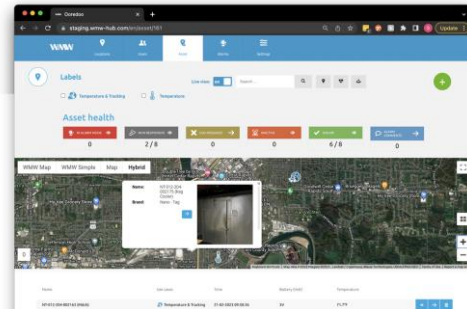
In every level of the solution



From the devices



Over the network



In the application



Abeeway
encryption



LoRaWAN
security & key
management



Cisco router
management

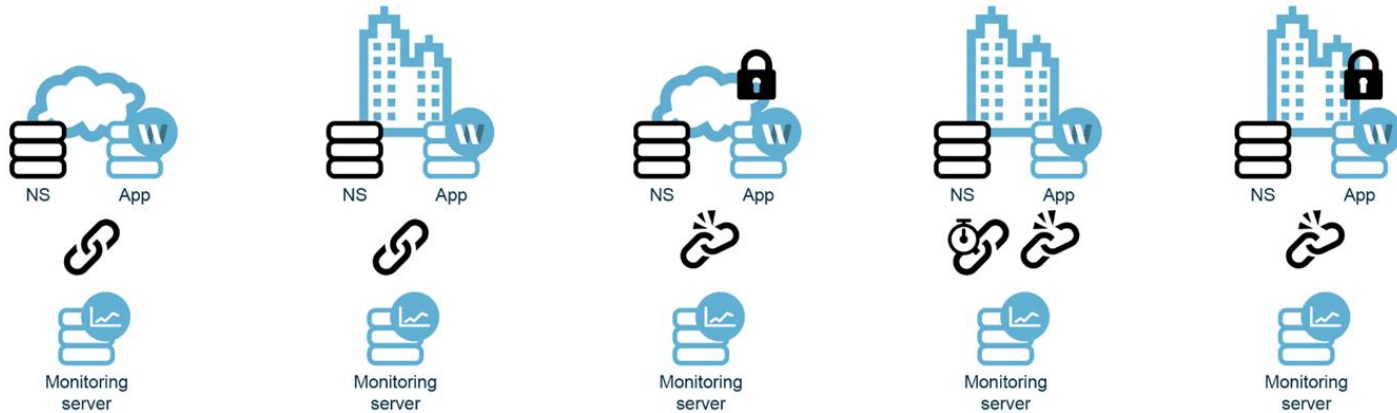


WMW
Data encryption &
secure hosting

Ensure data consumption (the right app) while keeping data sovereignty

WMW & Thingpark can be set up in multiple ways

Deployment capabilities



WMW SaaS
Including WMW monitoring,
server management
& platform updates

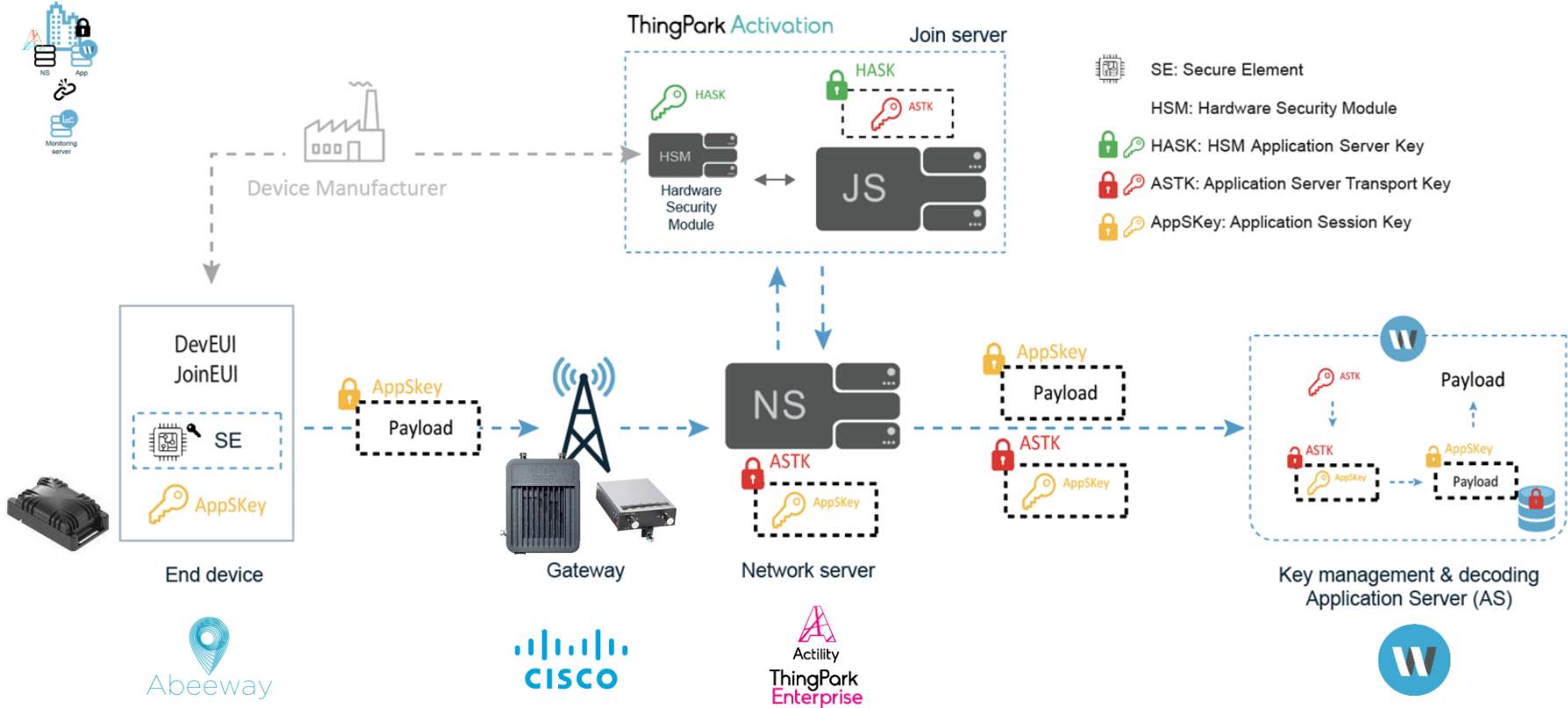
WMW OnPrem
Including WMW monitoring,
server management
& platform updates

WMW Secured SaaS
Excluding WMW monitoring
and server management
Ad hoc platform updates

WMW DarkSide
Excluding WMW monitoring
Ad hoc server management
& platform updates

WMW Full DarkSide
Excluding WMW monitoring
and server management
Ad hoc platform updates

End 2 end security



Objectives and challenges

Customer objectives



Reduced risk



Compliance & regulatory goals



Asset utilization and OEE



Employee productivity



Innovate & differentiate

Customer challenges



IT - OT alignment



Security concerns



Data accessibility and control



Lack of standardization



Smart boots



Transport reporting



Set management



Employee safety



Smart label



Coding framework



Already explained



Open API

KPI's
Custom dashboards



Integrate all standards

We adapt to OT



Smart Boots

Reduced risk

This application is built to monitor worker movements throughout the day where around 24 different 'Activities' are captured by two pressure sensors in the insoles.

- Registered Slip, Trips & Falls
- Activity Risk levels
- Activity Thresholds (min/day)
- If over threshold:
 - Short term injury risks
 - Body parts at risk



Worker view



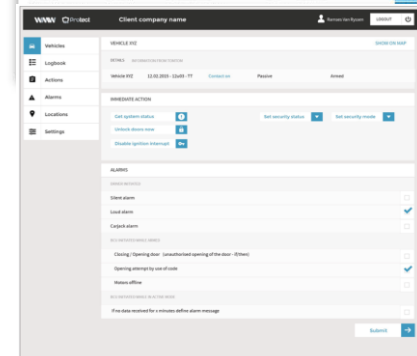
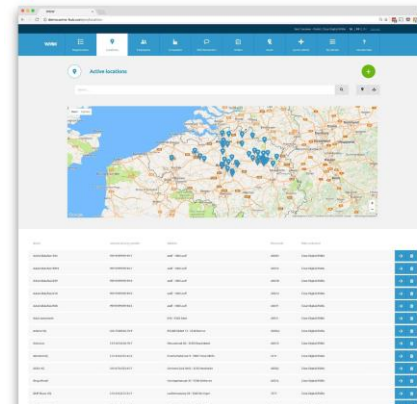
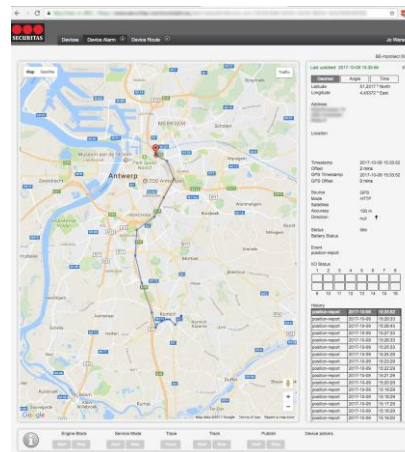


Example: High Security Transport

Compliance & regulatory goals

For Nuclear and Monetary transport special pen-locks are mandatory. They are remotely managed and the trips / behaviours also initiate special processing and reporting to government officials.

- Route optimisation
- Zone detection
- Secure user management
- Maintenance planning
- Live reporting (Police control room)
- Driver management
- Grouping
- History
- Connected locks





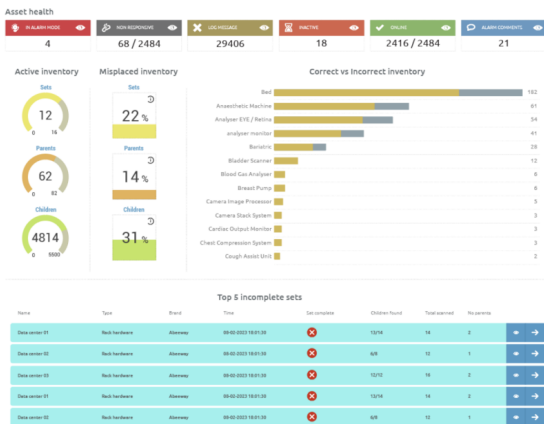
Set management

Asset utilization and OEE

Advanced version of set management with a Parent/Child relationship

- Define Parent Asset (Tracker or BLE gateway)
- Define Children (BLE tags)

This special application not only reports BLE children that are linked to a Parent and have been picked up, but if these BLE children have the capability to send certain parameters – like Temp & Humid –, these can be shown per child as well



MORO Homecare Monitor

Set Management

Live view: On Search: Filter by: +

Name	Type	Brand	Time	Status	Battery	Set complete	Children found	Total scanned	No parents																																																																																	
Data center 01	Back hardware	Abravay	08-02-2023 18:01:30	In use	9V	✗	1374	14	2																																																																																	
<table border="1"> <thead> <tr> <th>Name</th> <th>Type</th> <th>Brand</th> <th>Time</th> <th>Status</th> <th>Battery</th> <th>Set complete</th> <th>Children found</th> <th>Total scanned</th> </tr> </thead> <tbody> <tr> <td>Data center 01 - 061</td> <td>Back hardware</td> <td>Abravay</td> <td>08-02-2023 18:01:30</td> <td>In use</td> <td>9V</td> <td>✗</td> <td>778</td> <td>14</td> </tr> <tr> <td>10106</td> <td>Switch</td> <td></td> <td></td> <td>In use</td> <td></td> <td>✓</td> <td></td> <td></td> </tr> <tr> <td>43354</td> <td>Switch</td> <td></td> <td></td> <td>In use</td> <td></td> <td>✓</td> <td></td> <td></td> </tr> <tr> <td>87687</td> <td>Router</td> <td></td> <td></td> <td>In use</td> <td></td> <td>✓</td> <td></td> <td></td> </tr> <tr> <td>35423</td> <td>Switch</td> <td></td> <td></td> <td>In use</td> <td></td> <td>✓</td> <td></td> <td></td> </tr> <tr> <td>78787</td> <td>Switch</td> <td></td> <td></td> <td>In use</td> <td></td> <td>✓</td> <td></td> <td></td> </tr> <tr> <td>334453</td> <td>Switch</td> <td></td> <td></td> <td>In use</td> <td></td> <td>✓</td> <td></td> <td></td> </tr> <tr> <td>1045345345106</td> <td>Router</td> <td></td> <td></td> <td>In use</td> <td></td> <td>✗</td> <td></td> <td></td> </tr> </tbody> </table>										Name	Type	Brand	Time	Status	Battery	Set complete	Children found	Total scanned	Data center 01 - 061	Back hardware	Abravay	08-02-2023 18:01:30	In use	9V	✗	778	14	10106	Switch			In use		✓			43354	Switch			In use		✓			87687	Router			In use		✓			35423	Switch			In use		✓			78787	Switch			In use		✓			334453	Switch			In use		✓			1045345345106	Router			In use		✗		
Name	Type	Brand	Time	Status	Battery	Set complete	Children found	Total scanned																																																																																		
Data center 01 - 061	Back hardware	Abravay	08-02-2023 18:01:30	In use	9V	✗	778	14																																																																																		
10106	Switch			In use		✓																																																																																				
43354	Switch			In use		✓																																																																																				
87687	Router			In use		✓																																																																																				
35423	Switch			In use		✓																																																																																				
78787	Switch			In use		✓																																																																																				
334453	Switch			In use		✓																																																																																				
1045345345106	Router			In use		✗																																																																																				
Data center 01 - 062	Back hardware	Abravay	08-02-2023 18:01:30	In use	9V	✓	474																																																																																			
<table border="1"> <thead> <tr> <th>Name</th> <th>Type</th> <th>Status</th> <th>Parent</th> <th>Set complete</th> </tr> </thead> <tbody> <tr> <td>10106</td> <td>Switch</td> <td>In use</td> <td>Data center 02</td> <td>✓</td> </tr> <tr> <td>43354</td> <td>Switch</td> <td>In use</td> <td>Data center 02</td> <td>✓</td> </tr> <tr> <td>87687</td> <td>Router</td> <td>In use</td> <td>Data center 02</td> <td>✓</td> </tr> <tr> <td>35423</td> <td>Switch</td> <td>In use</td> <td>Data center 02</td> <td>✓</td> </tr> <tr> <td>78787</td> <td>Switch</td> <td>In use</td> <td>Data center 02</td> <td>✓</td> </tr> <tr> <td>334453</td> <td>Switch</td> <td>In use</td> <td>Data center 02</td> <td>✓</td> </tr> <tr> <td>1045345345106</td> <td>Router</td> <td>In use</td> <td>Data center 02</td> <td>✗</td> </tr> </tbody> </table>										Name	Type	Status	Parent	Set complete	10106	Switch	In use	Data center 02	✓	43354	Switch	In use	Data center 02	✓	87687	Router	In use	Data center 02	✓	35423	Switch	In use	Data center 02	✓	78787	Switch	In use	Data center 02	✓	334453	Switch	In use	Data center 02	✓	1045345345106	Router	In use	Data center 02	✗																																									
Name	Type	Status	Parent	Set complete																																																																																						
10106	Switch	In use	Data center 02	✓																																																																																						
43354	Switch	In use	Data center 02	✓																																																																																						
87687	Router	In use	Data center 02	✓																																																																																						
35423	Switch	In use	Data center 02	✓																																																																																						
78787	Switch	In use	Data center 02	✓																																																																																						
334453	Switch	In use	Data center 02	✓																																																																																						
1045345345106	Router	In use	Data center 02	✗																																																																																						
Data center 02	Back hardware	Abravay	08-02-2023 18:01:30	In use	9V	✗	478	12	1																																																																																	
Data center 03	Back hardware	Abravay	08-02-2023 18:01:30	In use	9V	✓	1270	14	2																																																																																	





Employee productivity

Panic & Motion tracking

Tracking of assets or people indoor & outdoor.

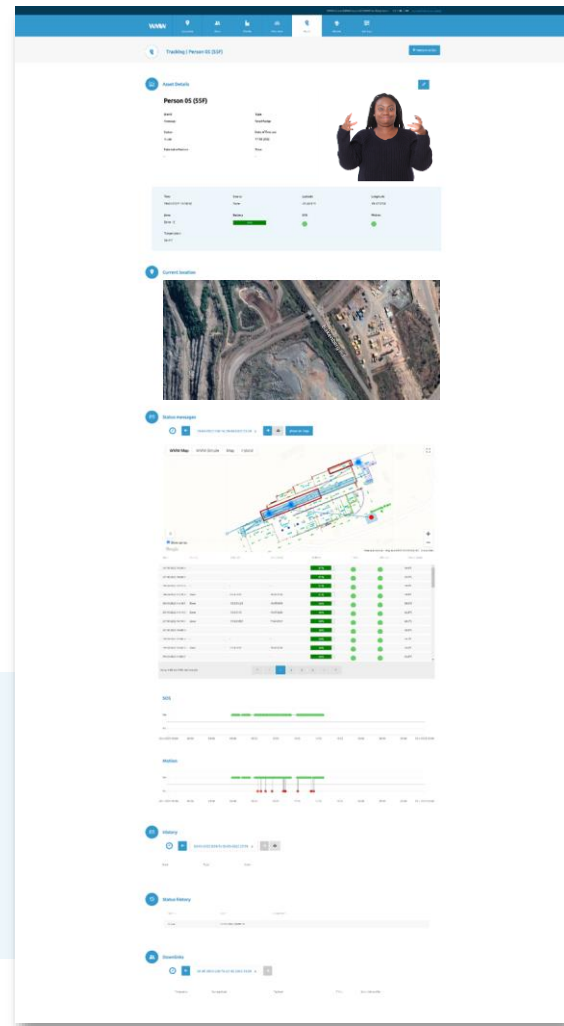
Outdoor the GPS will give us the right place of the asset or person and indoor we can use BLE for zone detection or triangulation.

With our location management you can create locations, within you can add floors and zones, even upload a floorplan of the location for more visualizations.



Date	Type	Event
04-05-2022 13:37		Arrived at WWW Tracking Demo - Zone - 3
04-05-2022 13:37		Departed from WWW Tracking Demo - Zone - 2
04-05-2022 13:16		Arrived at WWW Tracking Demo - Zone - 2
04-05-2022 13:16		Departed from WWW Tracking Demo - Zone - 3
04-05-2022 13:14		Arrived at WWW Tracking Demo - Zone - 3
04-05-2022 13:14		Departed from WWW Tracking Demo - Zone - 2

Time	Source	Latitude	Longitude
04-05-2022 14:59:43	Zone	-33.63113	19.473228
Zone	Battery	SOS	Motion
Zone - 2			
Temperature			
22.3°C			





Innovate & differentiate

Temperature & tracking



SDG 12 (responsible production and consumption)

Responsible management of chemicals and waste / Substantially reduce waste generation / Develop and implement tools to monitor sustainable tourism / Remove market distortions that encourage wasteful consumption / ...



What typically happens to field-grown tomatoes meant to be sold fresh in developed countries?

Loss rate for every 100 tomatoes

4-6 tomatoes

are damaged, packed incorrectly, mislabelled, or sent to the wrong destination; these tomatoes are either discarded or returned to the farmer's processing facilities for disposal

59-72 tomatoes make it to the retailer

Produced → Picked → Stored → Harvested and quality controlled → Processed and packaged → Ready and transported

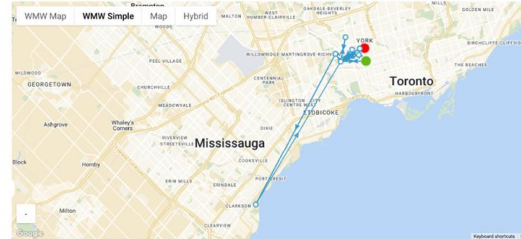
McKinsey & Company



10-11-2022 0:00 To 12-11-2022 23:59

Status messages

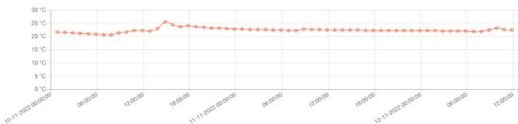
Show on map



Time	Battery	Temperature
10-11-2022 11:52:22	-	22.5°C
10-11-2022 10:52:22	-	22.7°C
10-11-2022 09:52:22	-	23.1°C
10-11-2022 08:52:22	-	22.5°C
10-11-2022 07:52:23	-	21.8°C
10-11-2022 06:52:23	-	21.9°C
10-11-2022 05:52:23	-	22°C
10-11-2022 04:52:23	-	22.1°C
10-11-2022 03:52:23	-	22.1°C
10-11-2022 02:52:23	-	22.1°C
10-11-2022 01:52:57	-	-

Show 1 till 50 of the 65 results

Temperature



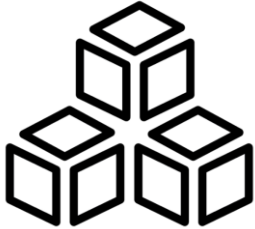


IT - OT
alignment



Modules

Limitation on what solution
you can build (only what the
module allows)



Micro modules

A little more granular options,
but only 80% of the solution
for every custom



Library - framework

Unlimited customizability
to tailor the full 100% to
every use case or customer

WMW is an IoT-application building framework

The framework approach allows
much faster bespoke application
building and/or adaptation ...

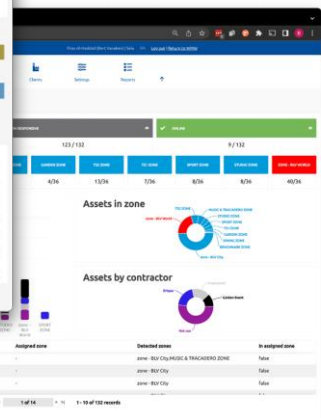
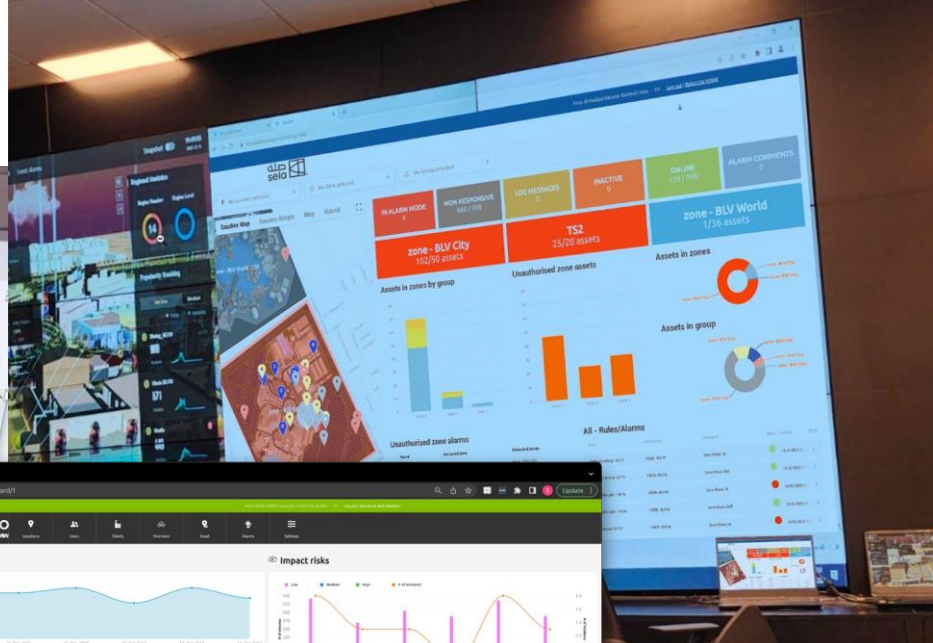
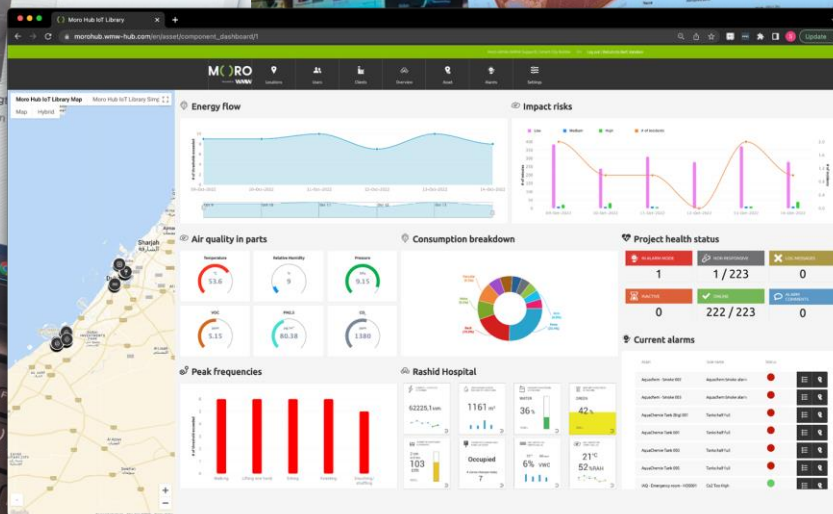
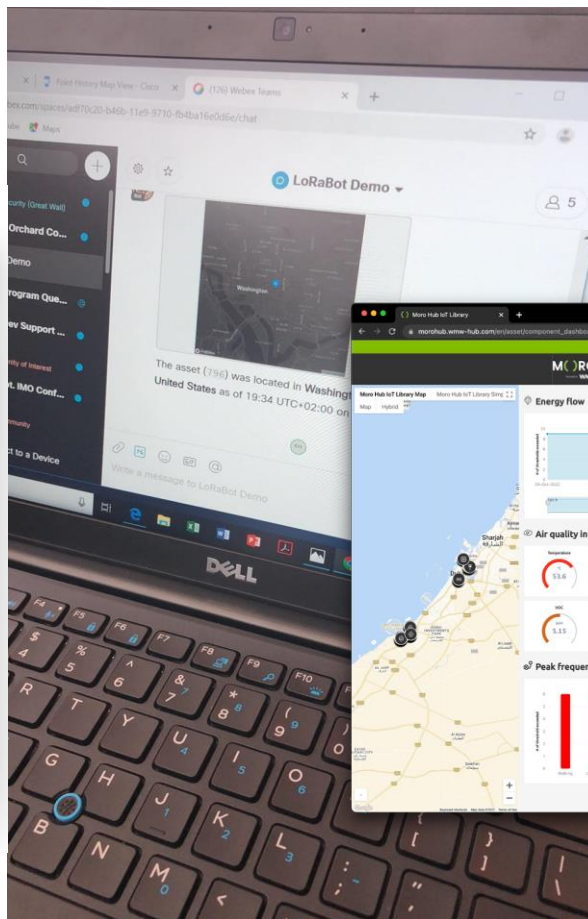
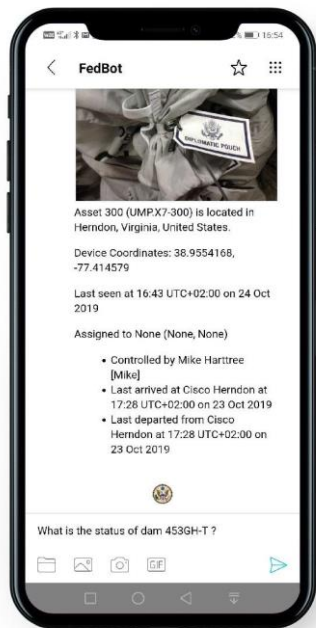


Security
concerns



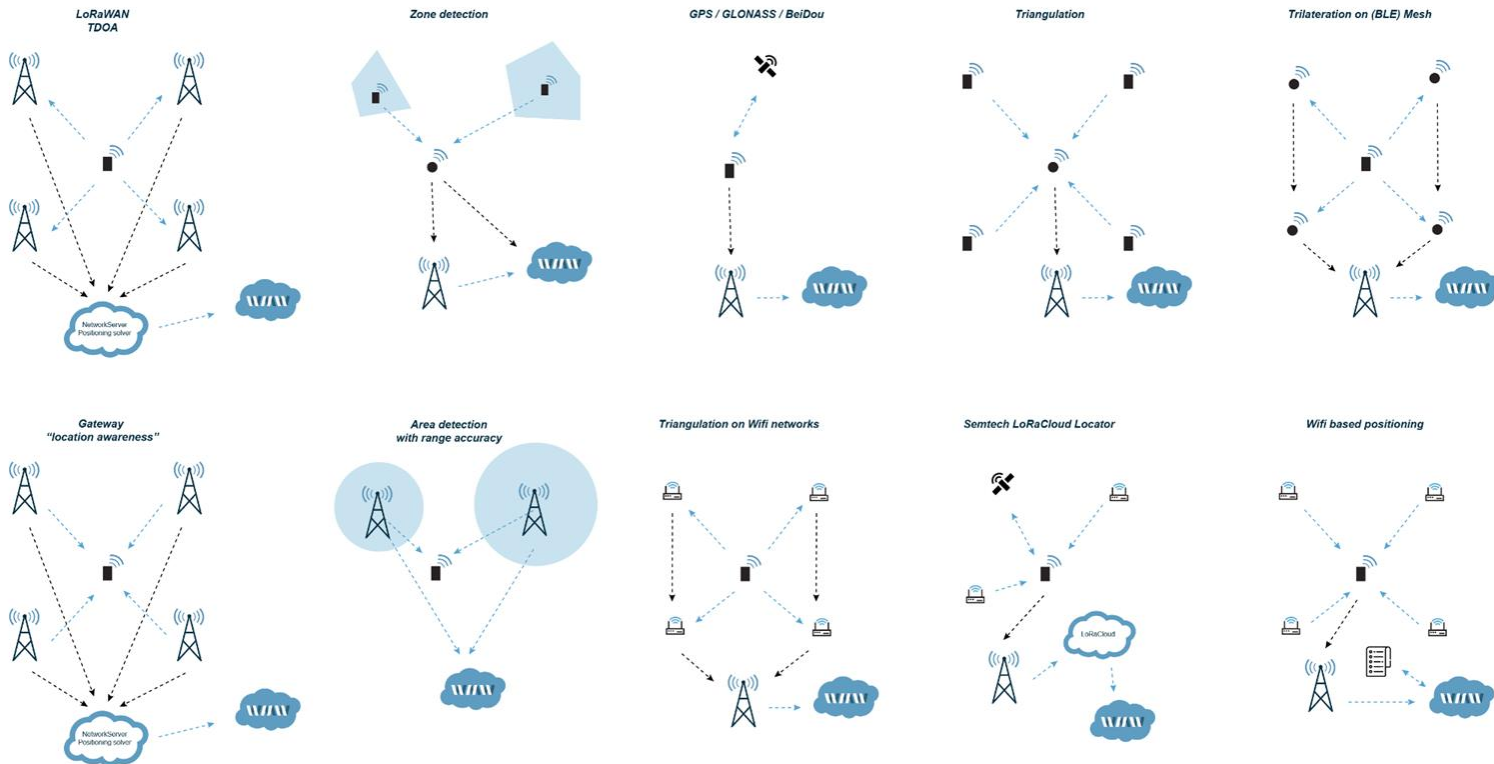
Consume the data

Data accessibility and control

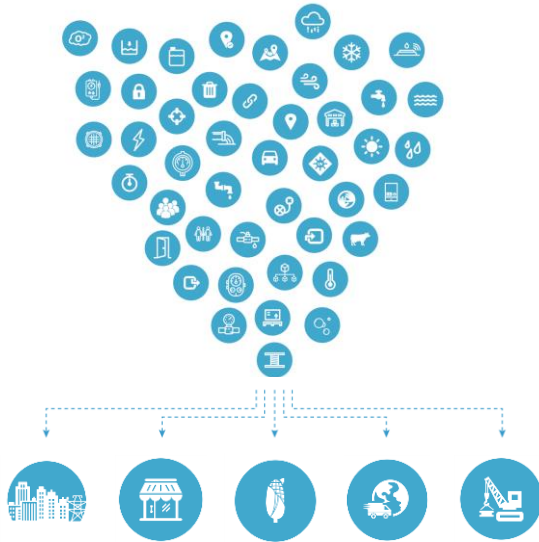




10 different ways and asset can be positioned in WMW using various technologies



WMW has built +200 applications to date ...



- Cold Chain
- Powertool Management
- Manhole tamper monitoring
- Manhole height & tamper monitoring
- Bobbin tracking
- Wander detection
- Rainfall monitoring
- Electricity meter
- Electric power consumption
- Gas meter
- Cattle management
- Waste management
- Water level Management
- Temperature & Humidity
- Traffic matching
- Pesticide Spray monitoring
- Generator monitoring
- Silo Monitoring
- Door counter
- Soil moisture
- Pallet tracking
- Fragile logistics
- Geo+Altitude
- Waiting Queue Density monitoring
- Parking Capacity MGT
- Ski Tracking
- Trolley Tracking
- People counting
- Passage speed counting
- Room occupancy
- Illuminance
- Water metering
- Hospital assets
- Orders & Tasks
- Unemployment Registration
- High Security Transport
- City bin management
- Air quality
- Nurse call system
- Parcel logistics
- CI@W Badge
- CI@W App
- CI@W Zoning
- Access Control
- Time & Attendance
- Smart Parking
- Temp & Humid Logistics
- Powerline Copper Theft
- TDOA tracking
- Non-GPS T&T
- Equipment Maintenance
- Demolition Transport
- Document reading
- Personnel planning
- Chain of Custody
- Network Testing
- Roadsign Management
- Motorised Tool tracking
- Connected train
- Desk management
- Gully monitoring
- Burning installation / Machinery
- Tank Filling
- Container Tracking
- Pipe Pressure
- Machine operation
- Leak detection
- Smoke detection
- Valve position
- Water Quality
- Smart Plug
- Wind
- Irrigation monitoring
- Frost detection
- Double level monitoring
- Electric fence
- CO & Sound & Lux
- Flow metering (nsen)
- Globalsat Wearables
- Environmental Light
- Greenhouse
- OK or NOK
- Pulse
- Pulse Number
- Nsen
- Street lights
- Venue
- Dead reckoning

Smart City	Building Facility	Infrastructure Construction	Retail	Transport Logistics	Mobility Airport	Healthcare	Agriculture Livestock	Energy Utilities	Industry	Oil & Gas Mining	Security Safety
93	100	76	49	51	63	49	67	36	103	82	55

Thank you!





Activity
Connecting with intelligence

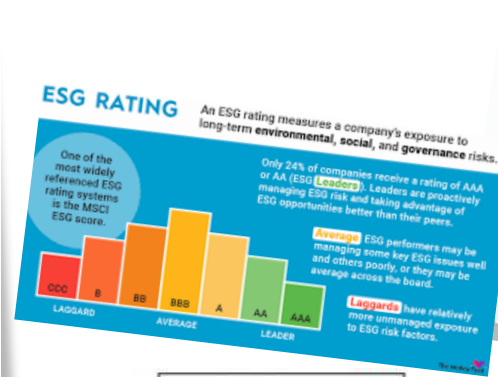
IoT meets business : the power of KPIs

Leveraging IoT for change management

26/1/2023

The new trend of light-touch regulation

Instead of working on a formal law...
introduce a new label !

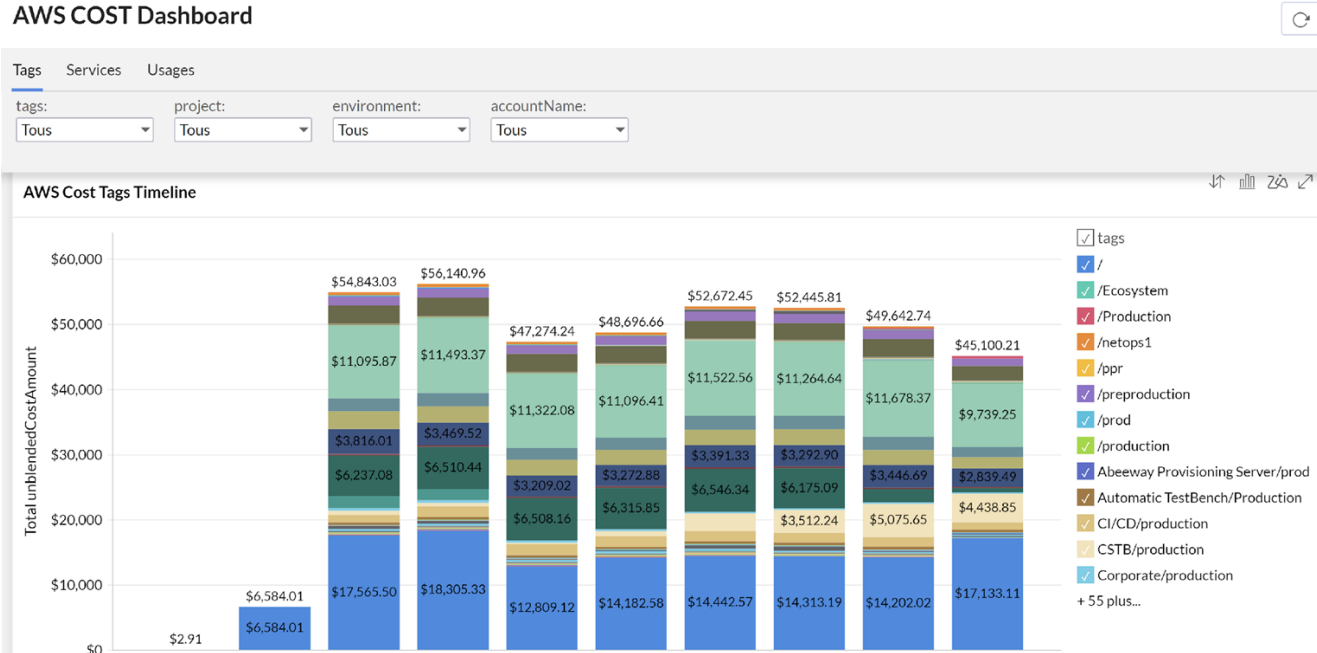


is fair

**equal
pay
day, -**

The same idea applies to any organization

Instead of forcing precise targets or crafting complex compensation plans...
introduce quantitative KPIs.



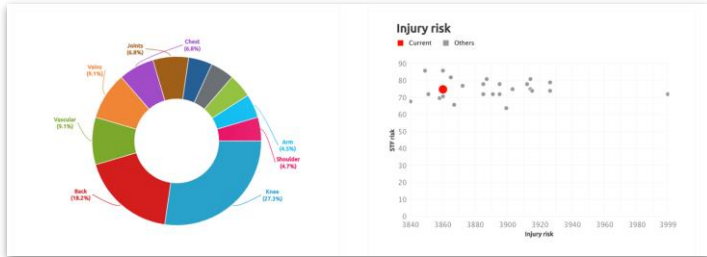
As a source of KPIs, IoT is a powerful transformation tool

- Most operational costs / performance indicators can be derived in real-time from IoT
- Real-time KPIs are very rewarding as they provide instant feedback on individual contributions: **“measure it to improve it”**

Customer objectives

- Reduced risk
- Compliance & regulatory goals
- Asset utilization and OEE
- Employee productivity
- Innovate & differentiate

The risks on your body parts



You compared to the rest of your team

How many asset-sets are complete vs incomplete

Asset health

- IN ALARM MODE: 4
- NON RESPONDING: 68 / 2484
- LOG MESSAGE: 29406
- INACTIVE: 18
- ONLINE: 2416 / 2484
- ALARM COMMENTS: 21

Active inventory

- Sets: 12 (0 / 16)
- Parents: 62 (0 / 82)
- Children: 4814 (0 / 5500)

Misplaced inventory

- Sets: 22%
- Parents: 14%
- Children: 31%

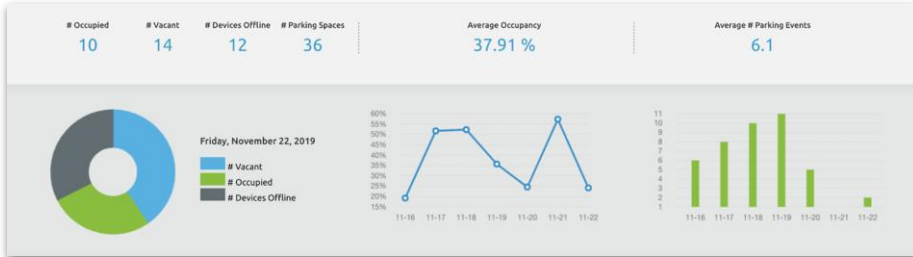
Correct vs incorrect inventory

Bed	182
Anaesthetic Machine	61
Analyser EYE / Retina	54
analyser monitor	41
Bariatric	28
Bladder Scanner	12
Blood Gas Analyser	6
Breast Pump	6
Camera Image Processor	5
Camera Stack System	3
Cardiac Output Monitor	3
Chest Compression System	3
Cough Assist Unit	2

Top 5 incomplete sets

Name	Type	Brand	Time	Set complete	Children found	Total scanned	No parents
Data center 01	Rack hardware	Absent	08-02-2023 18:01:30	✗	13/14	14	2
Data center 02	Rack hardware	Absent	08-02-2023 18:01:30	✗	6/8	12	1
Data center 03	Rack hardware	Absent	08-02-2023 18:01:30	✗	12/12	16	2
Data center 01	Rack hardware	Absent	08-02-2023 18:01:30	✗	13/14	14	2
Data center 02	Rack hardware	Absent	08-02-2023 18:01:30	✗	6/8	12	1

The parking events on your campus



Over 600 devices available today for almost any sensing need

ThingParkMarket
by Activity


Search entire store here...

FR My Account My Cart

IoT Solutions **IoT Devices** IoT Connectivity LoRaWAN Gateways IoT Platforms Accessories Services FAQ Blog

Home > IoT Devices

IoT devices








Filtering options

Sort By Position ↑

CATEGORY ^

- Current & Electricity Monitoring Sensors (35)
- Distance & Liquid Level sensors (47)
- Environmental Sensors (125)



Q&A



Michael Harttree, Federal IoT Architect at Cisco



Bert Vanaken, Founder & CEO at WMW-Hub



Actility

Olivier Hersent, CEO at Actility