

Yanzi – IoT for Smart Buildings

From Sensor to Cloud



yanzi

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Jfokus 2018

WHAT IS YANZI?

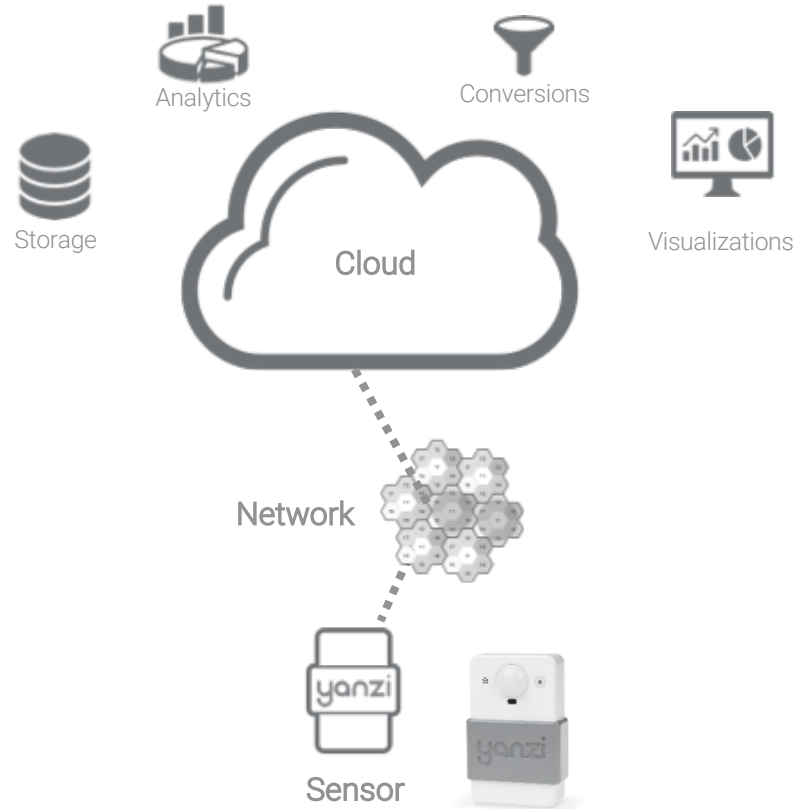


Headquarter is Stockholm, Sweden

25 employees, 80% engineers

Yanzi delivers

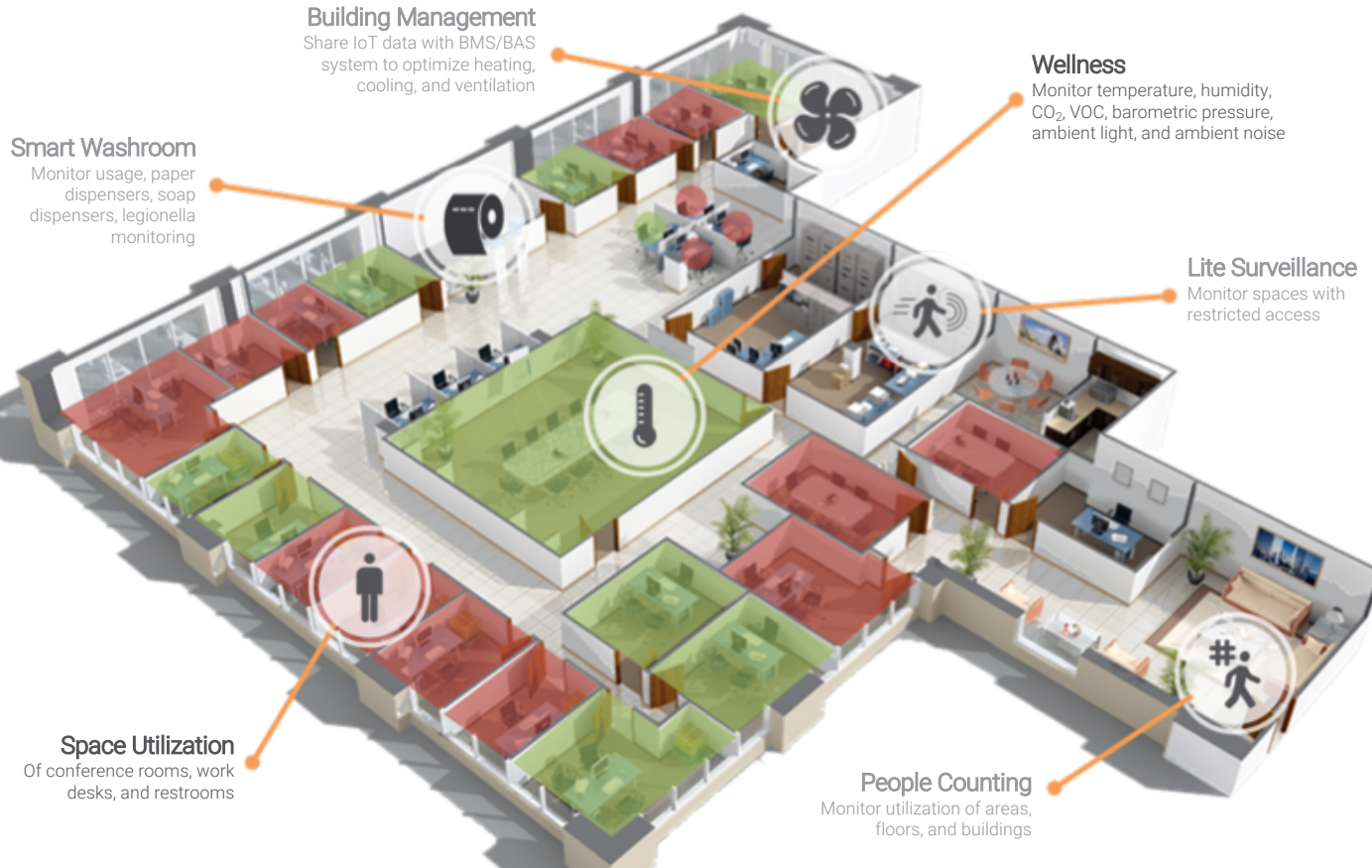
- A device management platform
- An IoT network stack for wireless IoT sensors
- A complete cloud platform





CUSTOMER VALUE

All-IP IoT Networks for Smart Buildings



Best technology

- All IP with mesh
- Based on open standards
- Highly scalable

Easiest to install & maintain

- 1,000+ sensors installed in 4 hours
- 10+ years of battery lifetime
- Remote upgradable

Most secure

- Enterprise security
- Automatic security setup



SMART BUILDING MARKET - Primary stakeholder focus

Property Owner

Energy

Electricity, Heating, Cooling



Optionally: Environmental, Safety,
Hard FM services

Facility Management

Time Efficiency

Minimize "waste"



Optionally: Reduce complains (fact
based information), Increase
service quality (SLA conformance),

Tenant


Space Efficiency & Productivity




Optionally: Health, Hip factor,
Individual information, App based

TYPICAL DEAL





\$28



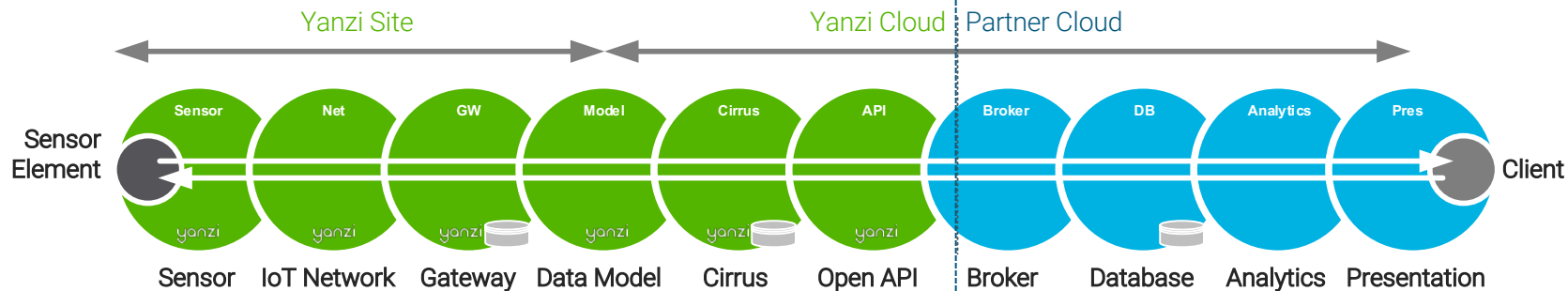
\$80

Cost per year and employee

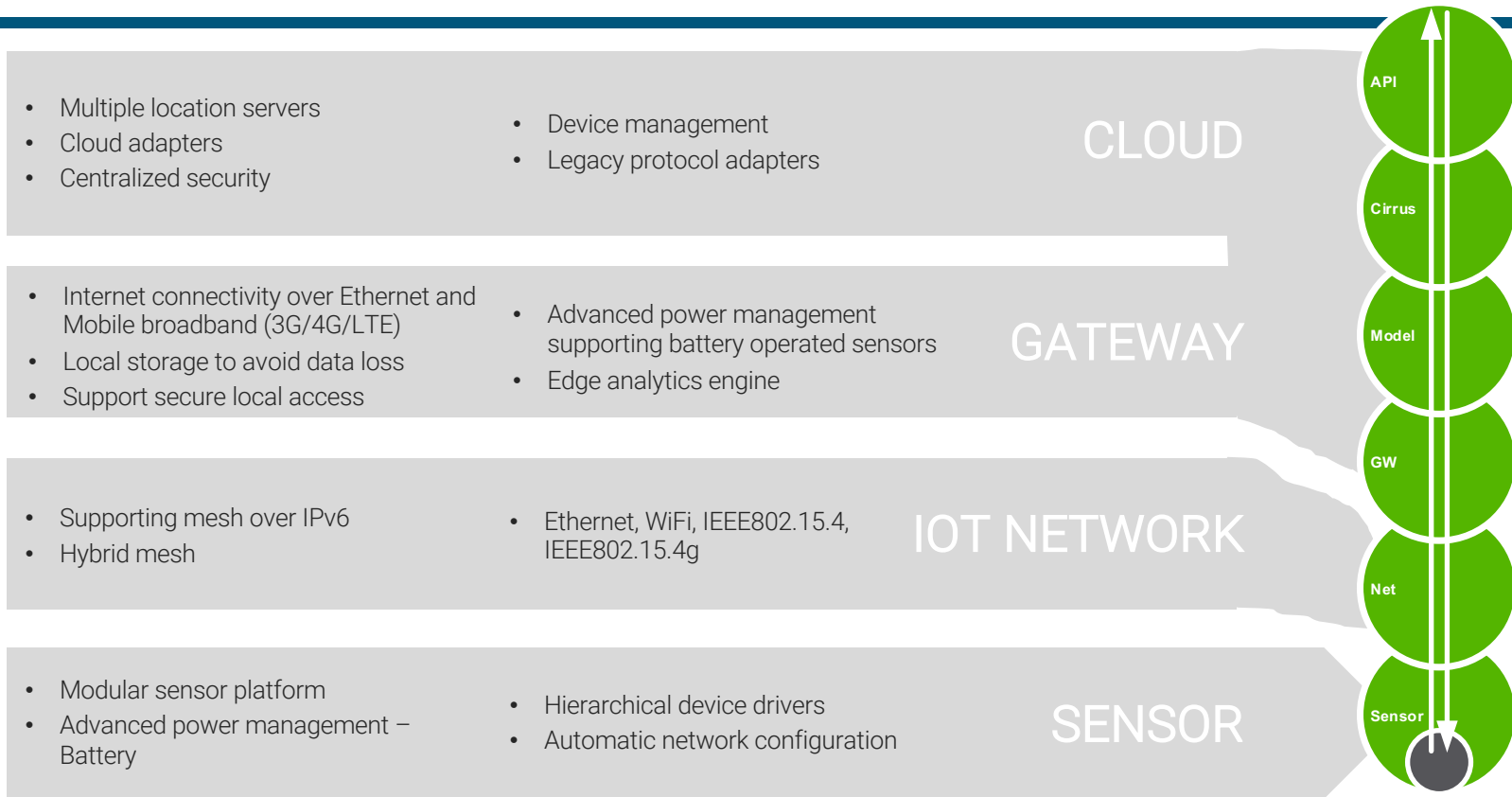


SOLUTION

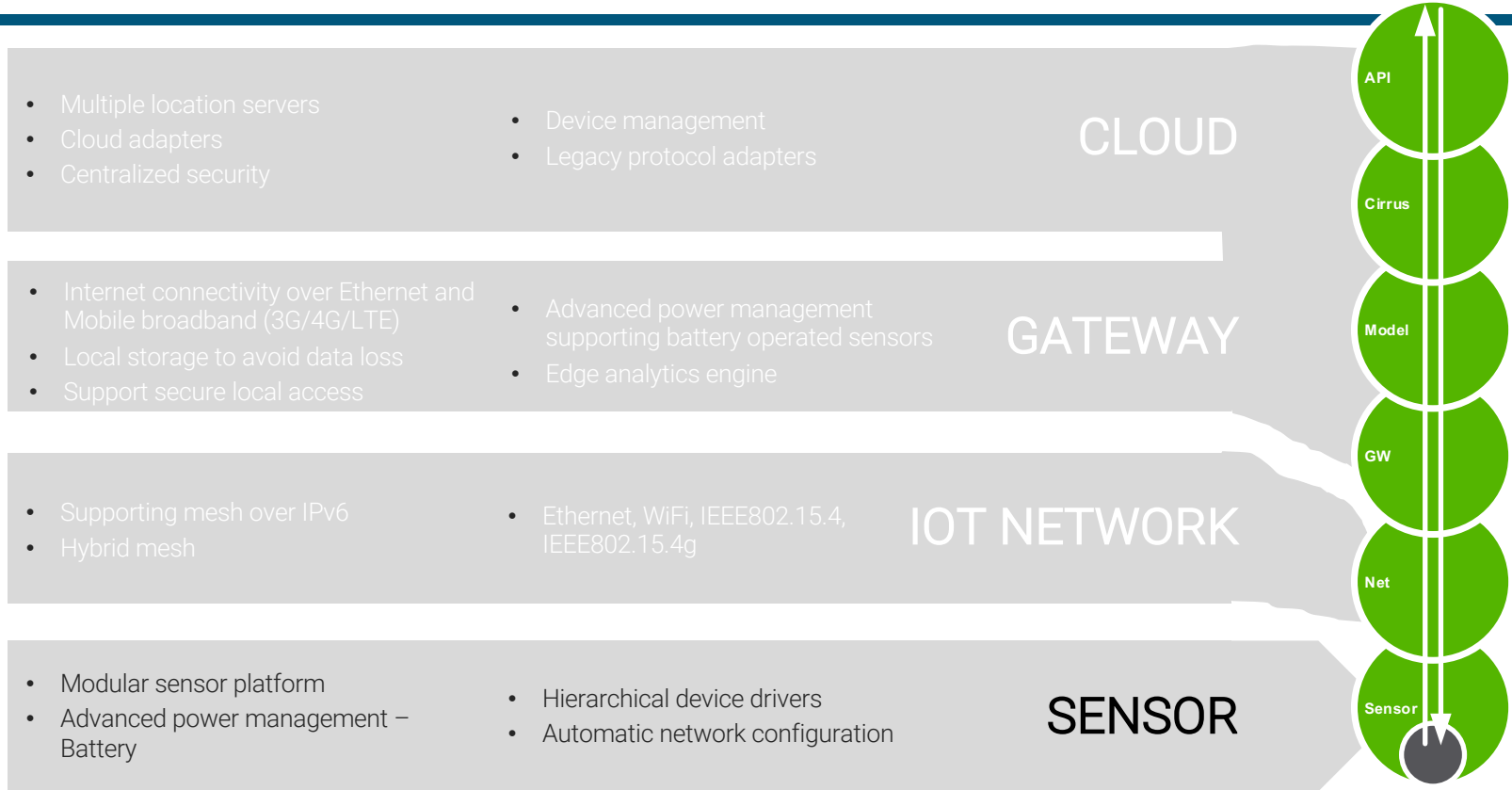
TECHNOLOGY STACK – FROM SENSOR TO PRESENTATION



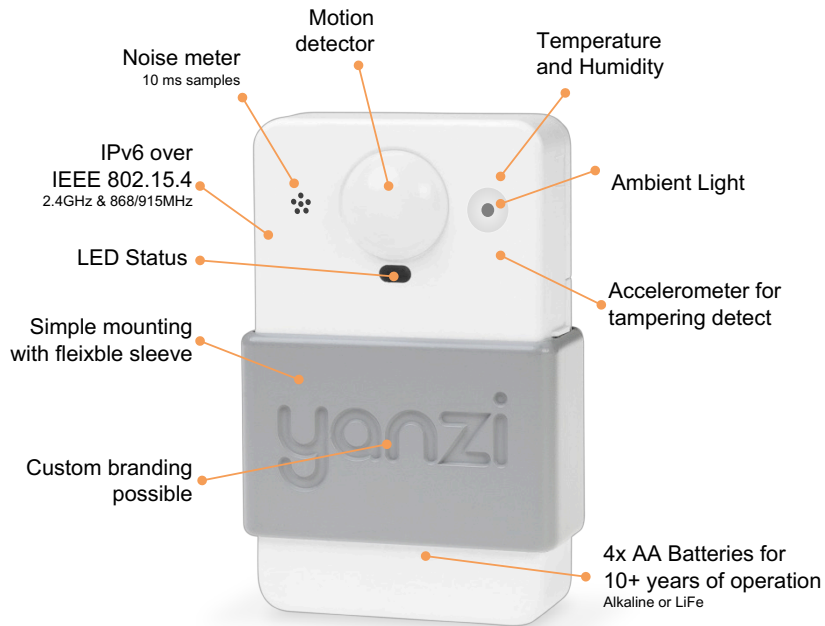
SYSTEM ARCHITECTURE. SENSOR – IOT NETWORK – GATEWAY – CLOUD



THE “THINGS” - SENSORS



ENTERPRISE SENSORS



Yanzi **Motion+** shown as example above

- ✓ Multi-sensor solution – all products support multiple sensor elements
- ✓ IP technology all the way to sensor integrates with standard enterprise networks
- ✓ Enterprise security model with individual keys and automatic key management
- ✓ Over-the-air upgradable allowing for future add-ons
- ✓ Standard communication over IEEE 802.15.4 (little brother to WiFi)
- ✓ Very low energy consumption enabling 10+ years of battery life
- ✓ Mesh technology for range extension
- ✓ Automated network configuration through zero touch provisioning
- ✓ License free ISM at 2.4GHz technology that can be used worldwide and is suitable for medium and high density environments

SENSOR PORTFOLIO TODAY



Yanzi Plug EU

- Measures electric energy
- Controls appliances via internal 16A relay
- Wireless communication
- Supports mesh



Yanzi Presence Mini

- Optimized for space utilization with 60% smaller package than Yanzi **Presence**
- Measures motion (PIR) and temperature
- Wireless with battery
- 5+ years of battery operation
- Ships with two AA Alkaline 1.5V batteries inserted



Yanzi Climate

- Optimized for comfortability
- Measures humidity and temperature
- Wireless with battery
- 10+ years of battery operation
- Ships with two AA Alkaline 1.5V batteries inserted



Yanzi Comfort

- Optimized for comfortability
- Measures CO₂, VOC, air pressure, ambient noise, temperature, and humidity
- Wireless with wall adapter
- Country specific wall adapter shipped separately



Yanzi Motion+

- Optimized for comfortability
- Measures motion (PIR), ambient noise, ambient light, temperature, and humidity
- Wireless with battery
- 10+ years of battery operation
- Ships with two AA Alkaline 1.5V batteries inserted



Yanzi Footfall

- People counter camera with local processing for high accuracy and to avoid large data volumes
- Ethernet/PoE

NEW RELEASES 2018'H1



Katrin Smart Towel

- Dispenser optimized for smart washroom
- Measures detailed usage of towels and temperature
- Wireless with battery
- 5+ years of battery operation
- Released for European market initially
- Ships with two AA Alkaline 1.5V batteries inserted

Eco-system Partner



Katrin Smart Toilet

- Dispenser optimized for smart washroom
- Measures detailed usage of toilet paper and temperature
- Wireless with battery
- 5+ years of battery operation
- Released for European market initially
- Ships with two AA Alkaline 1.5V batteries inserted

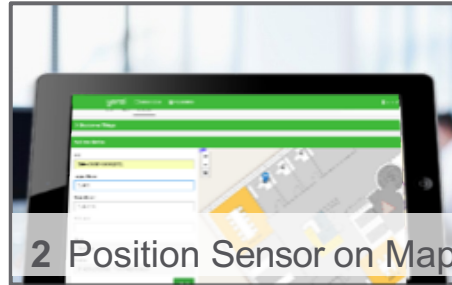
Eco-system Partner

SENSOR INSTALLATION PROCEDURE

From power up to data availability in minutes



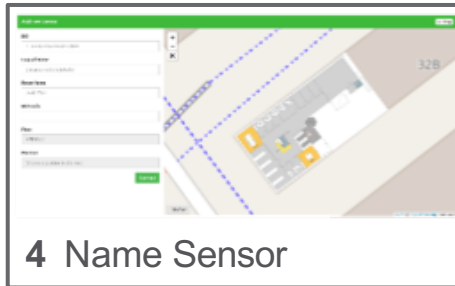
Flip the switch or insert batteries



Click on map



A good QRscanner makes this step fast



Optionally add name, room number, BIM code, etc.

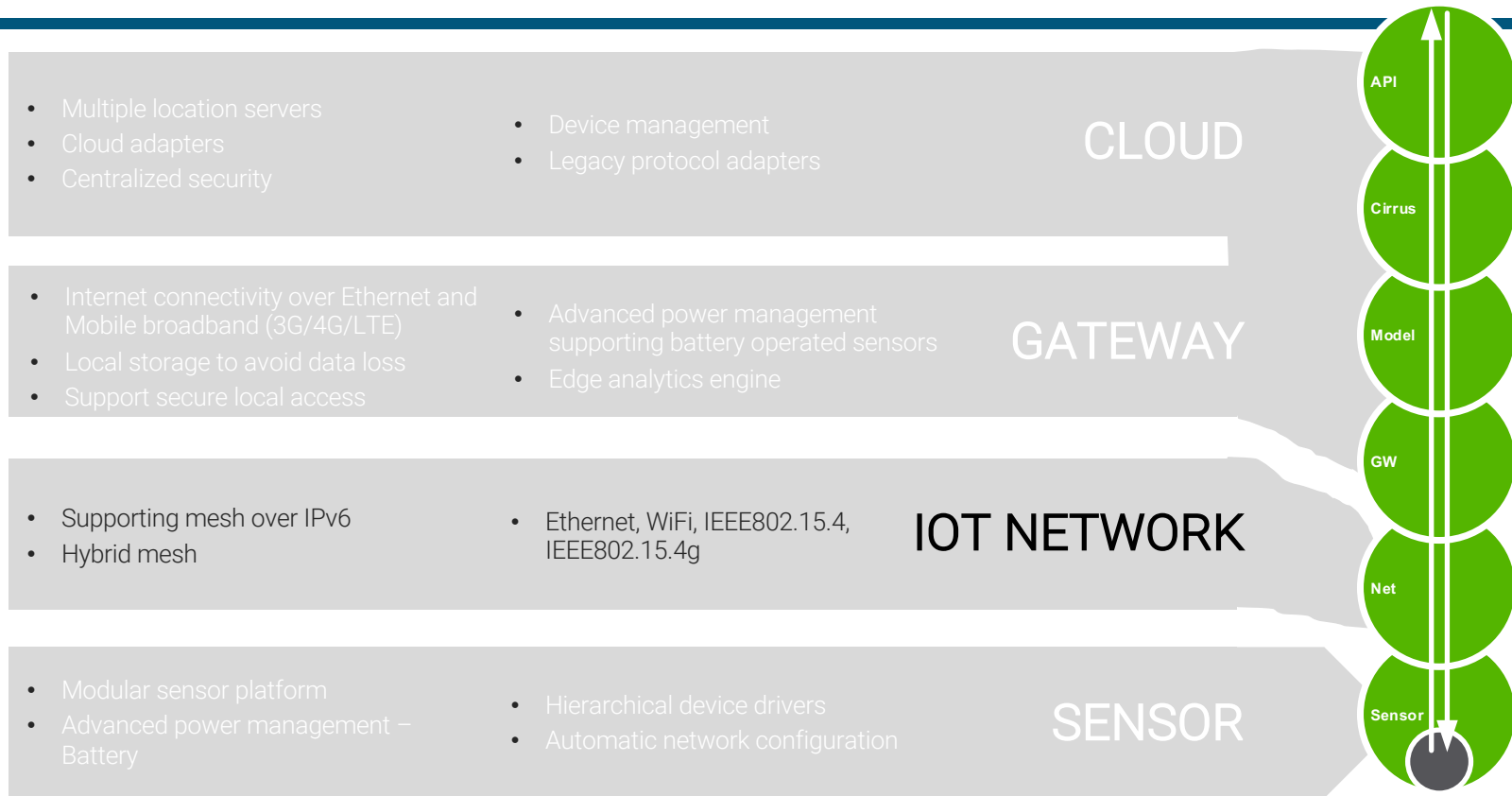


Use screw or adhesive tape and place according to installation guidelines

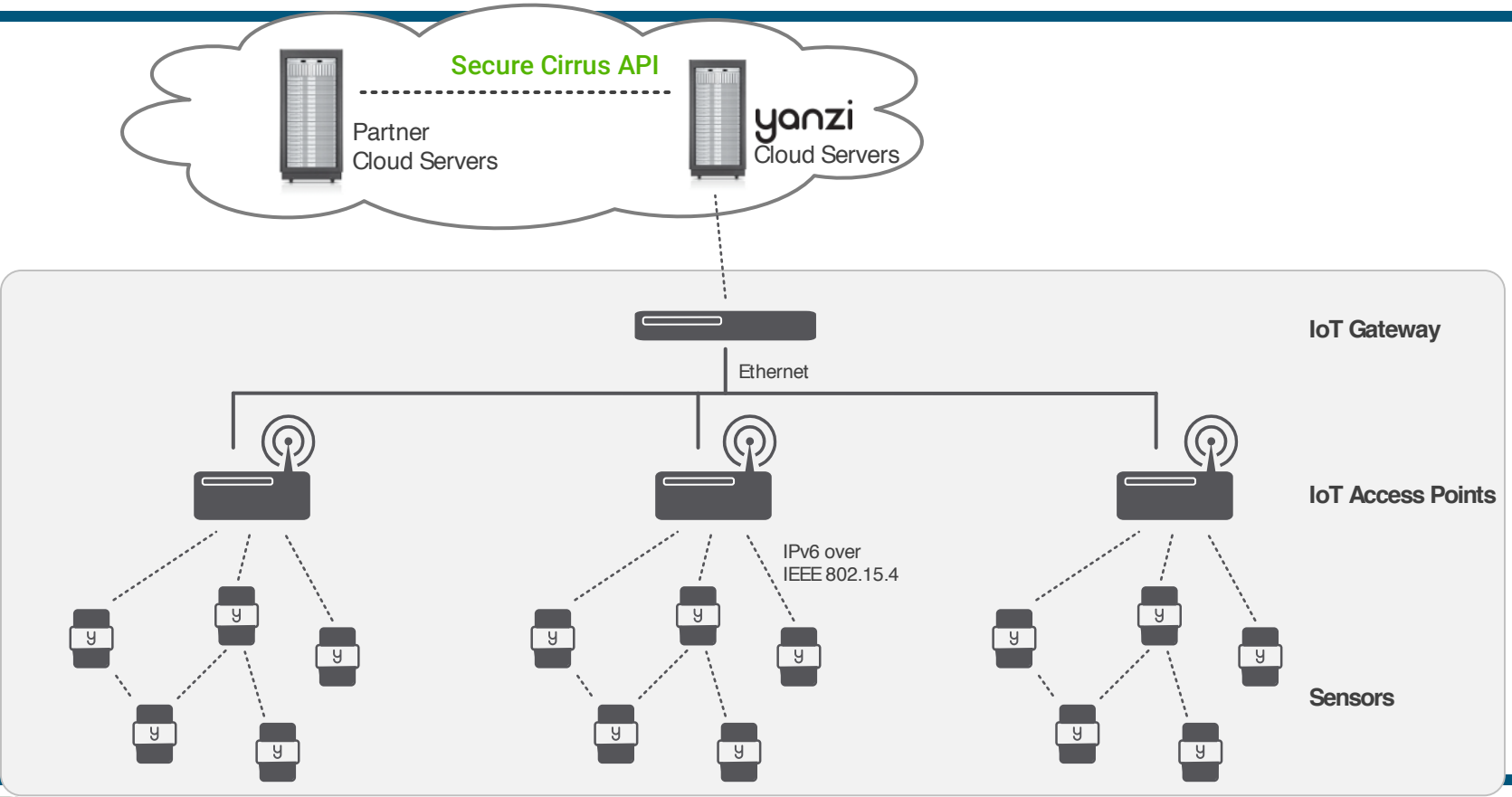


Within a few minutes, data is available in the installation tool and the end user application

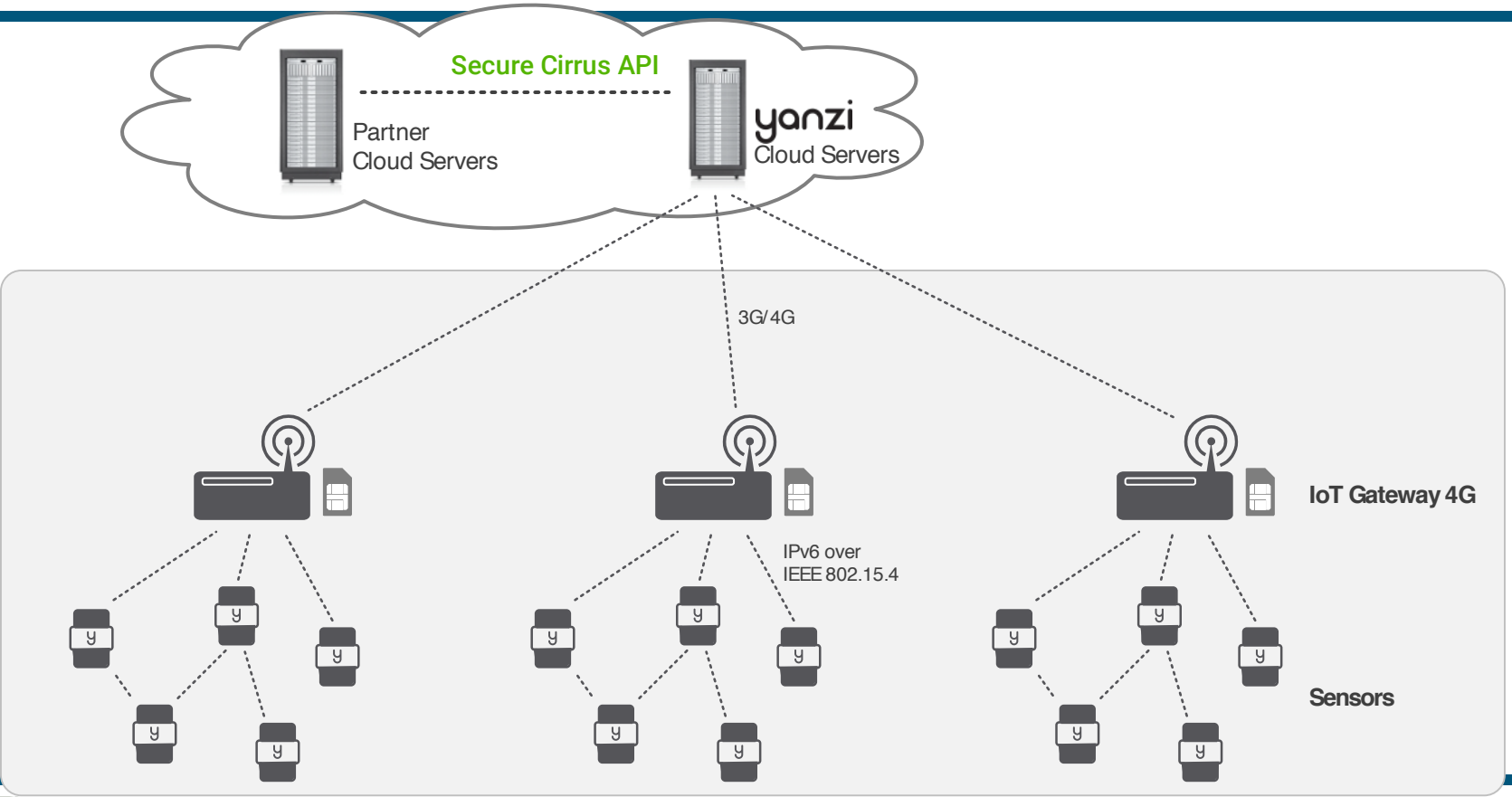
IOT NETWORK



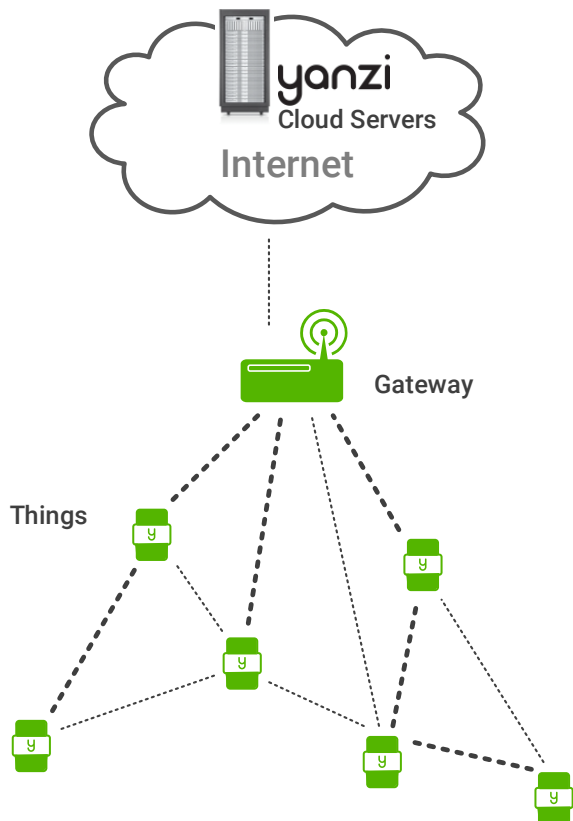
USE OF EXISTING INFRASTRUCTURE



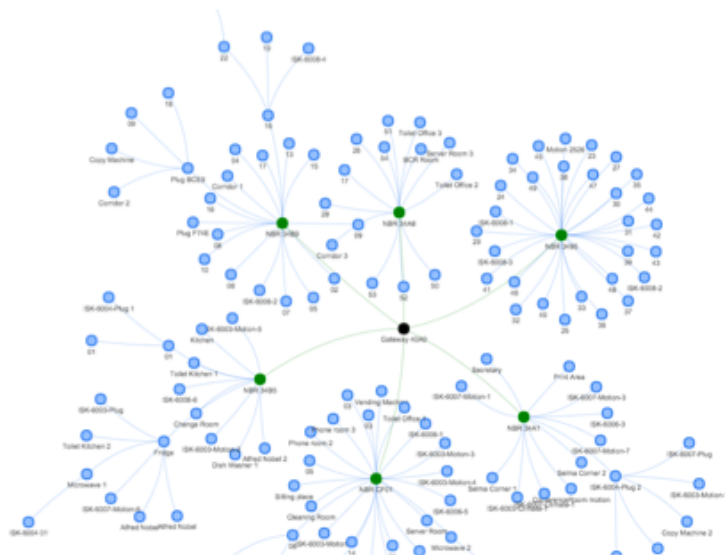
SCALE WITH 3G/4G GATEWAYS



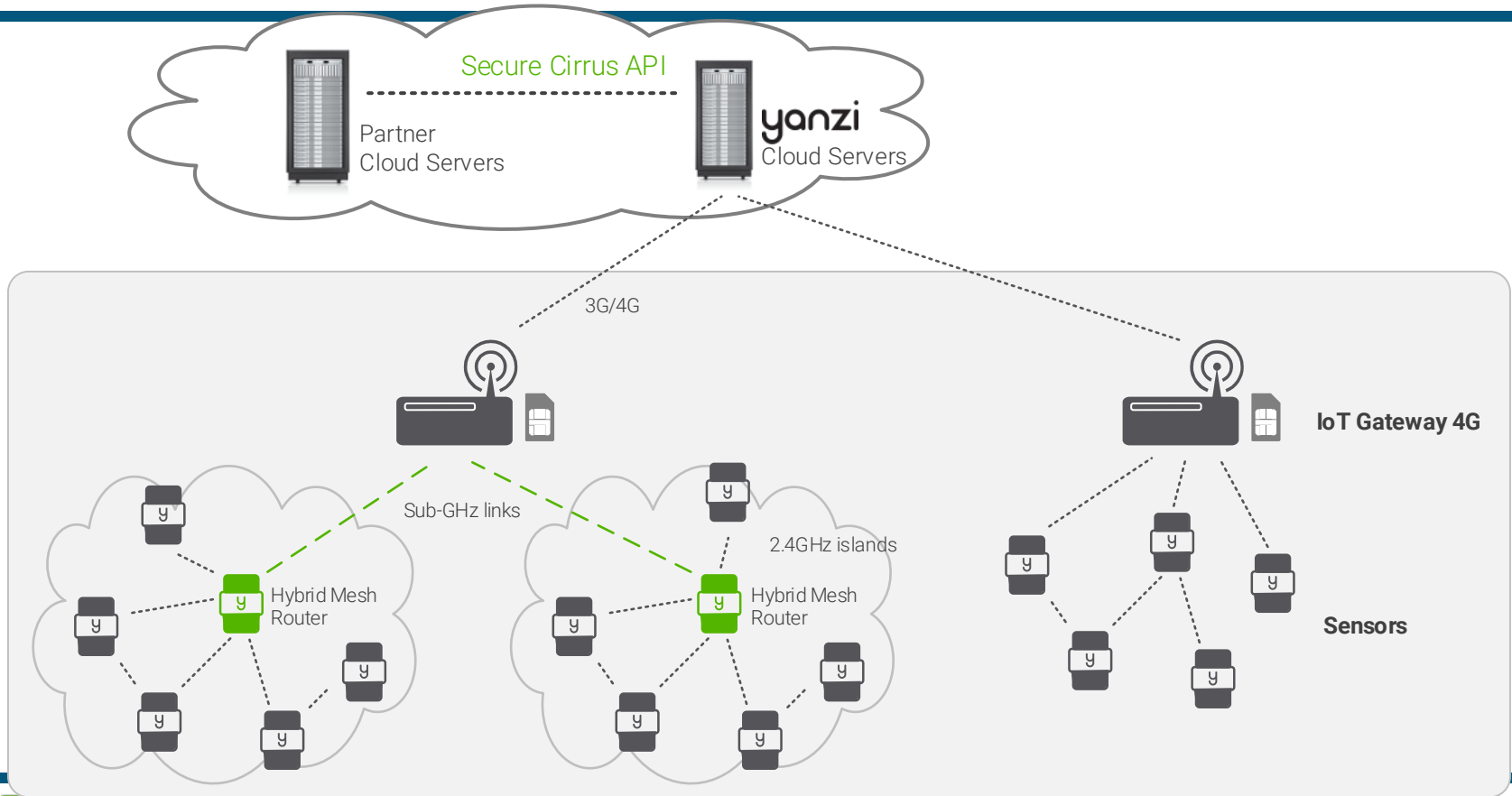
RADIO TOPOLOGY - MESH



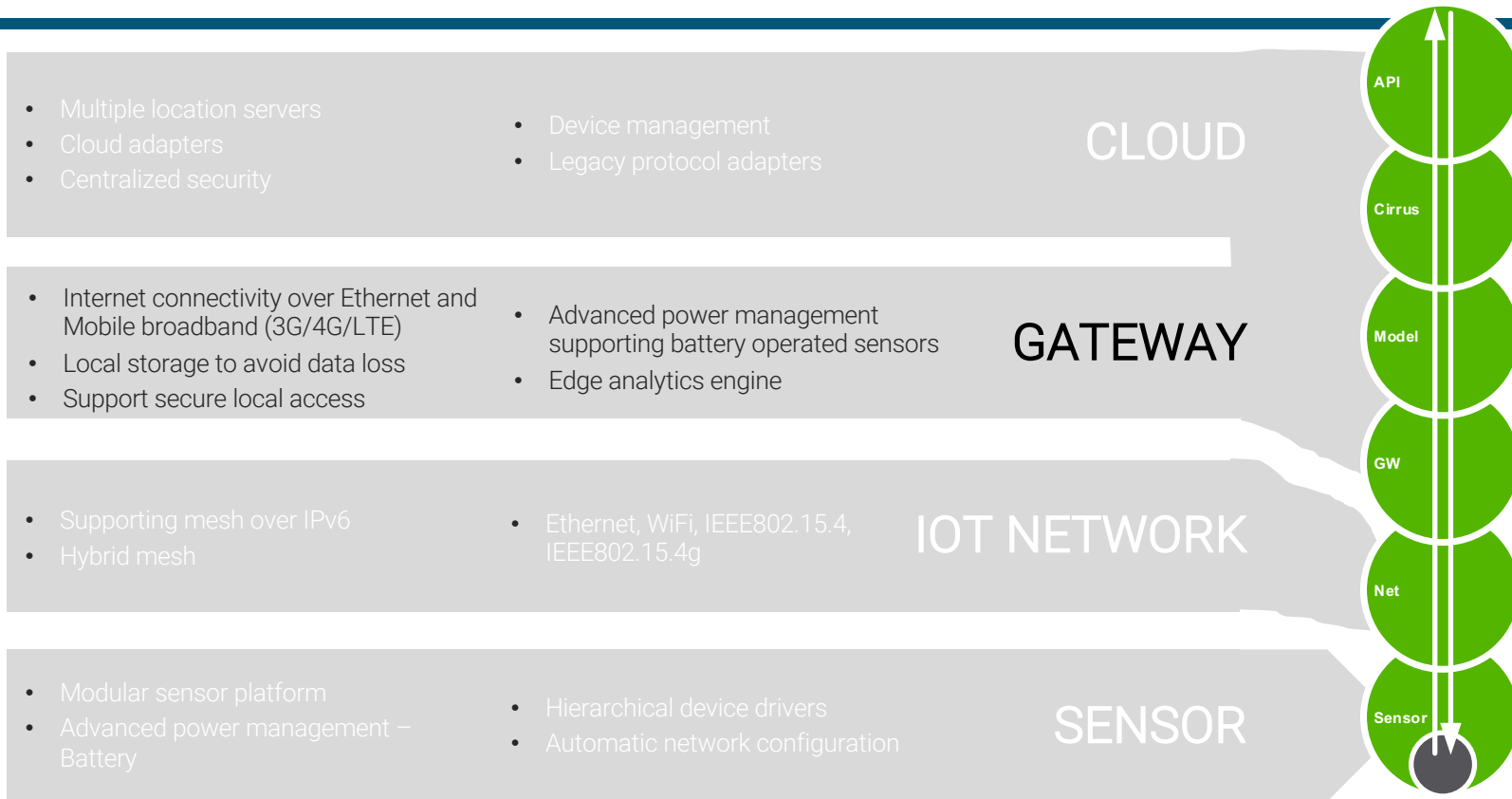
- Ethernet, WiFi, IEEE 802.15.4 (2.4GHz), IEEE 802.15.4g (868/915 MHz)
- Supporting mesh over IPv6
- Hybrid mesh (e.g. 802.15.4 -> Ethernet/IEEE 802.15.4g)
- Device management on top of IP



COVER LARGE AREAS WITH HYBRID MESH



GATEWAY



GATEWAY OVERVIEW



- ✓ All IP Gateway with 3G/4G, Ethernet, WiFi, IEEE 802.15.4 and IEEE 802.15.4g
- ✓ Large storage to support autonomous operation when Internet is not available
- ✓ Built-in battery backup supporting power outages up to 4 hours
- ✓ Automatic reconnect and cloud server selection simplifies installation and increases availability
- ✓ Automatic certificate management
- ✓ Firewall traversal
- ✓ Allow data compression when capacity is scarce or cost of communication is high
- ✓ Edge analytics and assets further reduce data
- ✓ No need for fixed IP addresses or statically configured cloud servers
- ✓ Local access with certificate. Same API as in Cloud.
- ✓ Local ModbusTCP for connection to BMS (Building management system)



Yanzi IoT Gateway 2

Optimized

- Cost optimized ARM processor
- 1GB RAM
- 32GB SD card storage

Reliable

- UPS backup battery
- PoE device support
- Built-in SIM for mobile broadband

All IP Communication

- 2x Ethernet
- IEEE 802.11 WiFi AP (EU and US)
- IEEE 802.15.4 High Density Mesh IPv6
- IEEE 802.15.4g Long Range Mesh IPv6 (2018)
- Mobile Broadband (4G)

Supports up to 250 sensors



Yanzi IoT Gateway Plus

Powerful

- Intel Atom E3805 processor
- 2GB RAM
- 120GB SSD storage

Reliable

- UPS backup battery
- Built-in SIM for mobile broadband

All IP Communication

- 2x Ethernet (LAN + WAN)
- IEEE 802.11 WiFi AP (EU and US)
- IEEE 802.15.4 High Density Mesh IPv6
- IEEE 802.15.4g Long Range Mesh IPv6 (2018)
- Mobile Broadband (3G)

Supports up to 500 sensors



Yanzi IoT Gateway Large / Extra Large

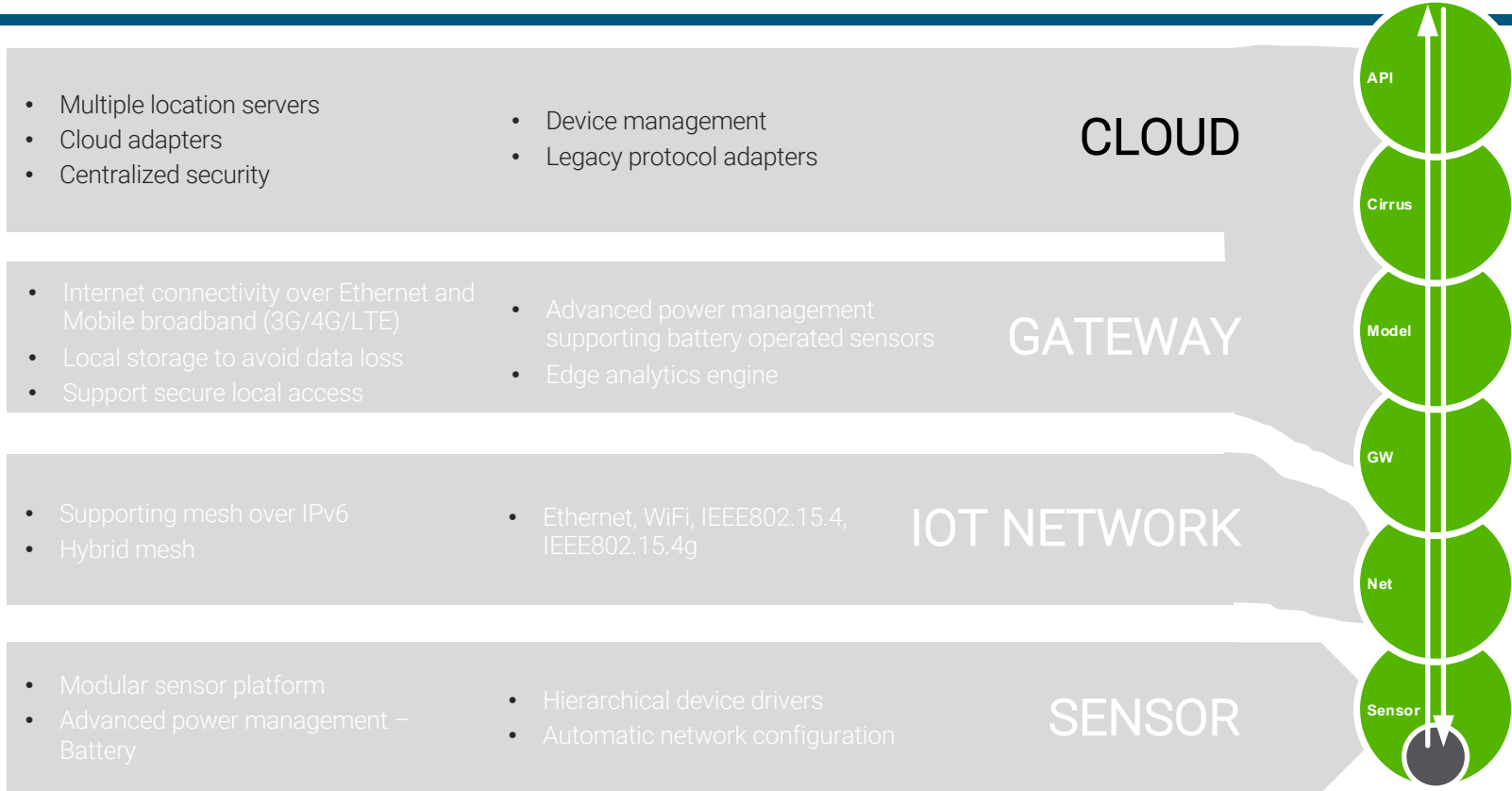
Powers any building

- High performance Intel processor
- 8/16GB RAM
- 120/1,000 GB SSD storage

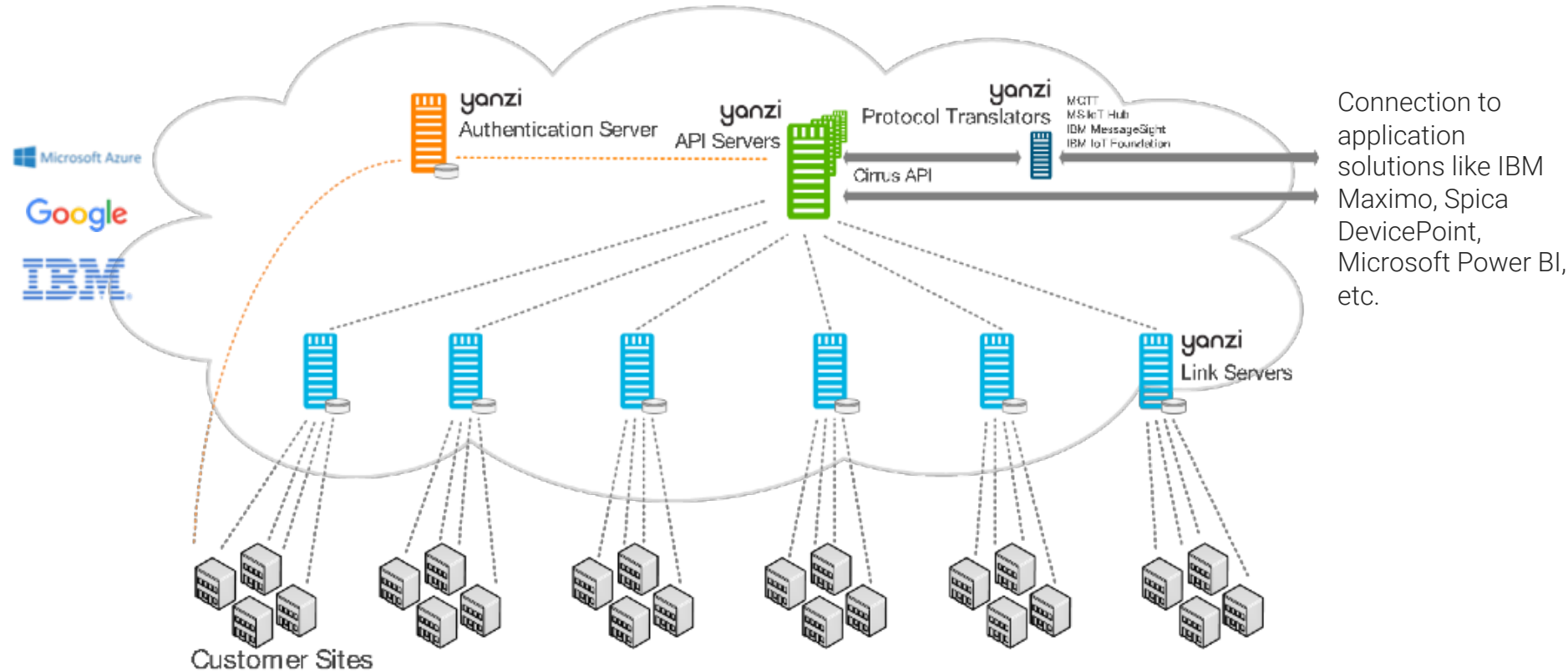
Scalable

- 2x Ethernet
- Extra Large supports custom configuration with more memory and more storage
- Large supports up to 1,500 sensors
- Extra Large supports 5,000+ sensors

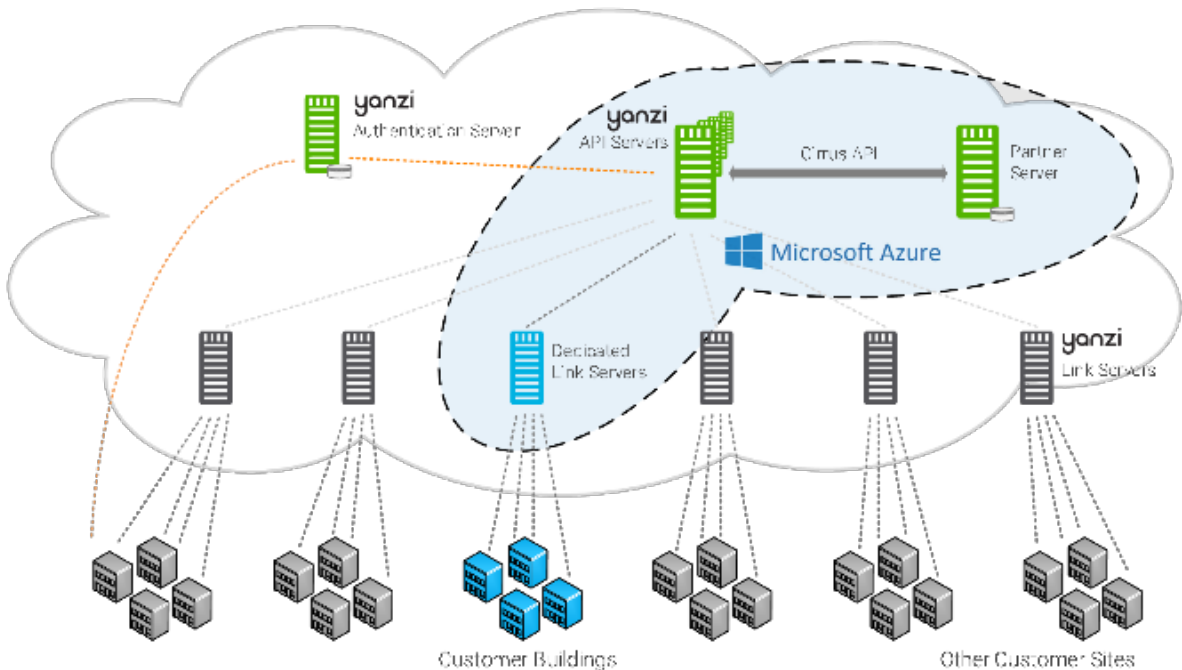
CLOUD



CLOUD SERVERS

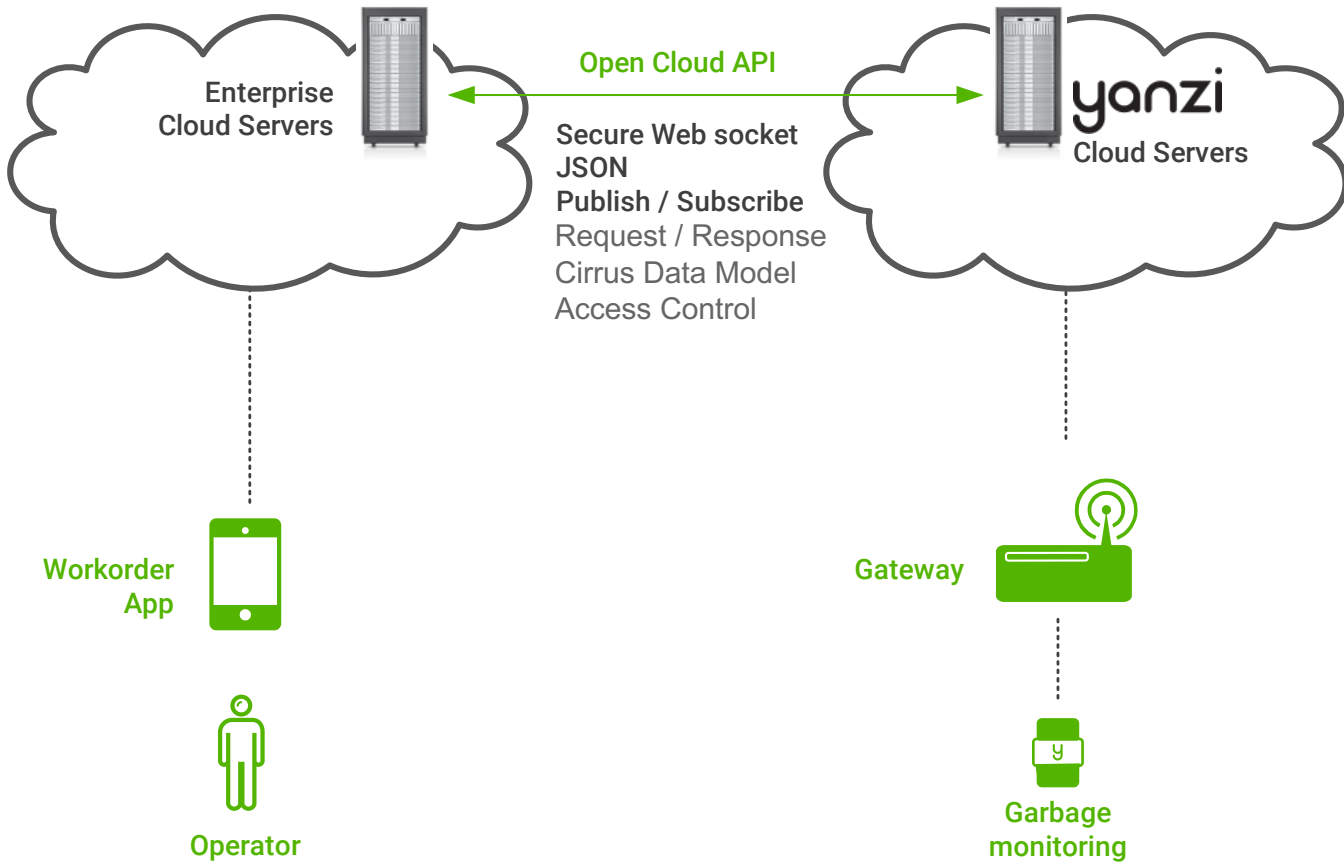


HIGH SECURITY CLOUD MODEL



- Two Cloud Server models:
 - Shared:** Servers are shared between customers
 - Dedicated:** All data is kept within the clients' preferred cloud provider.
- All access to IoT data is authenticated
- All links are authenticated with client and server certificates and all communication is made using SSL encryption
- Between the sensor and Gateway, communication is encrypted for both wired and wireless networks
- Data model
 - Authentication server** signs all certificates as well as redirects the Gateways to the correct Link Server
 - Link servers** manage Gateways and pass data to Client's cloud via **API Server**.
 - Local **Gateway** stores all sensor data to support autonomous operation when Internet connection is down
 - Data is never stored except for in Gateway and Client's cloud
- A local firewall in each building is preferred

CIRRUS API





IOT SECURITY

YANZI IOT SECURITY

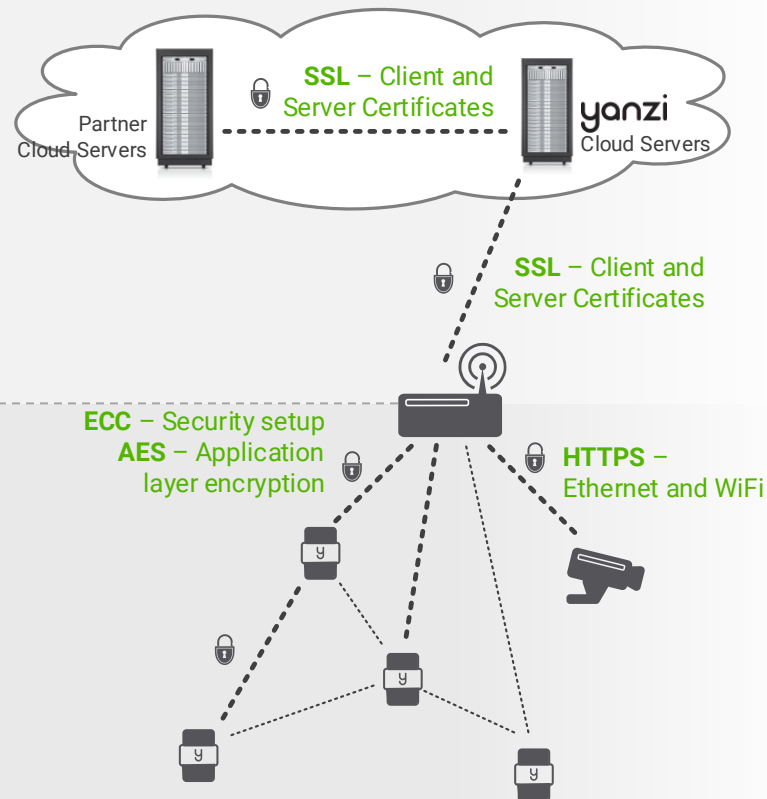
Distributed IoT devices requires high security on all links

High security SSL encrypted channels from Open Cloud API to Cloud to Gateway

- Authentication by client and server certificates
- JSON over SSL over web sockets

Automatic security provisioning of sensors provides for quick installation

- Automatic key management using public-key cryptography, specifically elliptic curve cryptography, ECC (Vendor, Owner, and Location keys)
- Dual layer encryption support
- Application layer encryption of user data and management data including firmware updates using AES encryption
- Layer 2 encryption when applicable by the standard (currently Wi-Fi, IEEE 802.15.4 and IEEE 802.15.4g)
- Individual security keys per device with revoke capability

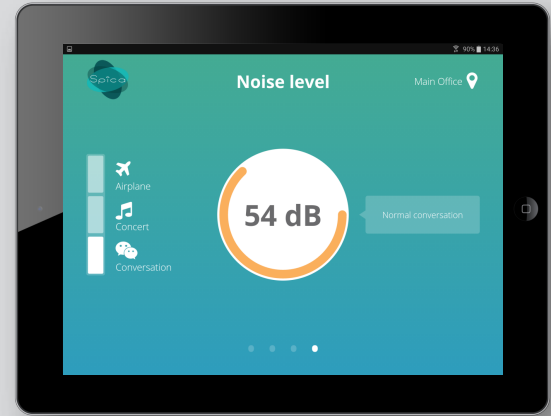




END USER APPLICATIONS



Live occupancy view of work desks and restrooms



Visualize selected data for tenants



Generate reports on meeting rooms and occupancy



Live view of occupancy often displayed in reception



Easily build custom dashboards



Display historical data with flexible output views

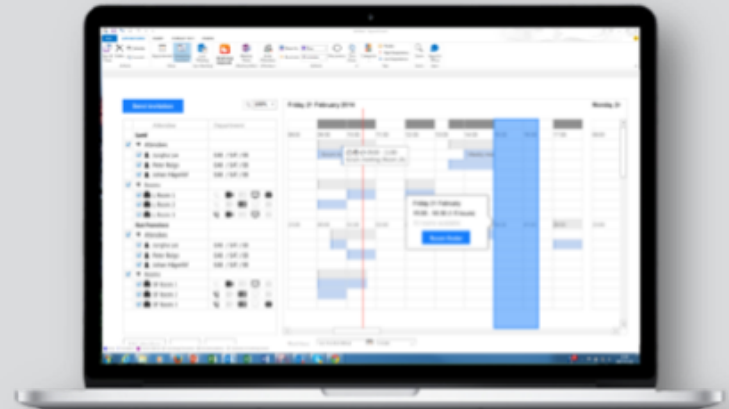
YANZI DASHBOARD PARTNER



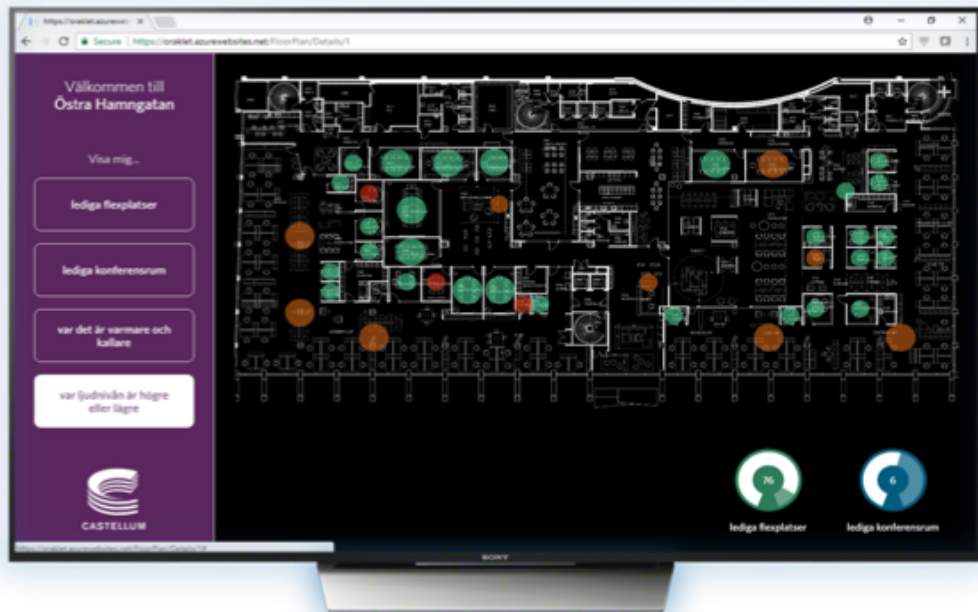
Live view of room activity



Multi-floor views and possibility to book rooms



Seamless integration with Outlook



Live view of ambient noise per room/area



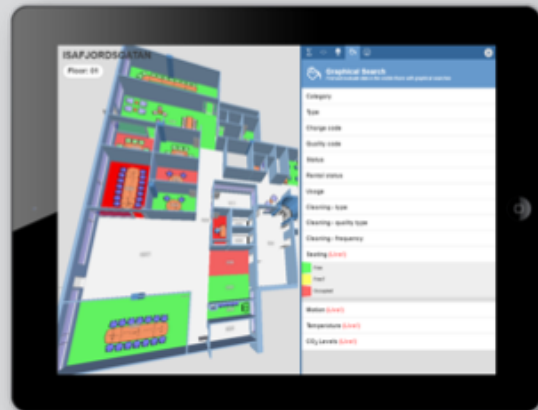
Live view of occupied conference rooms



Heat map of temperature in work areas and conference rooms



Live view of sensor data and analytics



Display space utilization data live on a floor



Display overview of all installations per customer



QUESTIONS?

Thank you!

WE ARE HIRING!

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