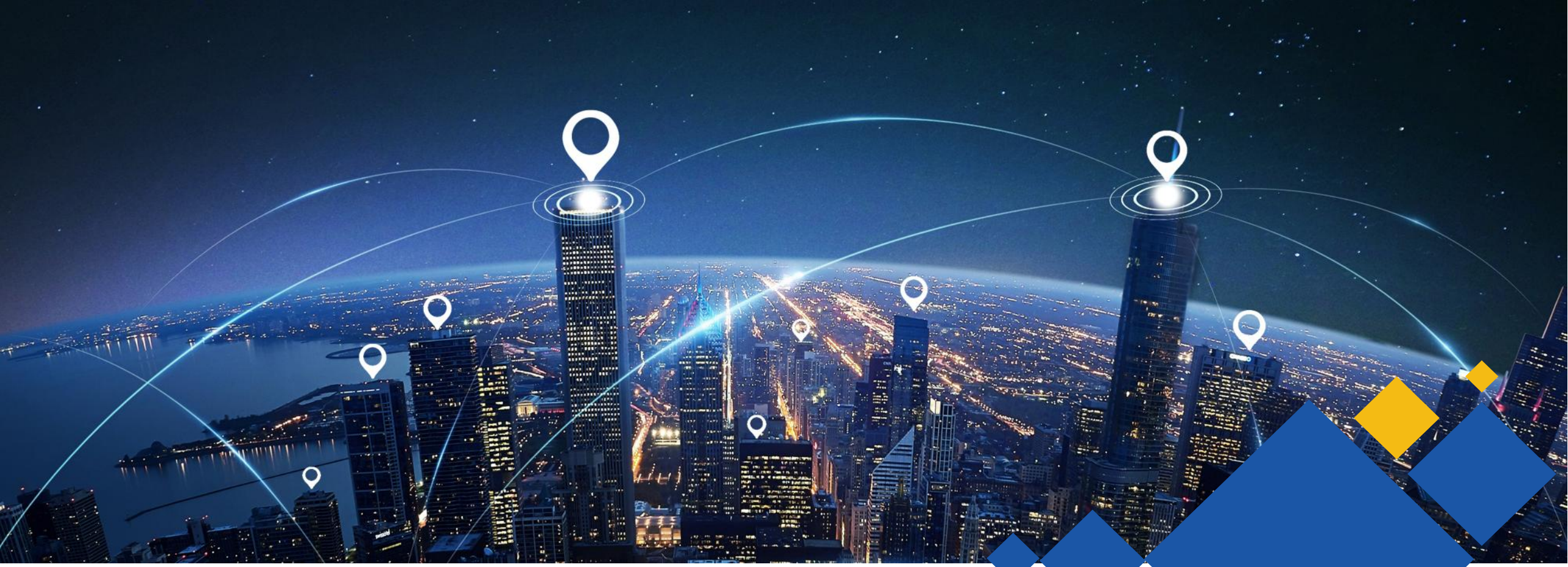
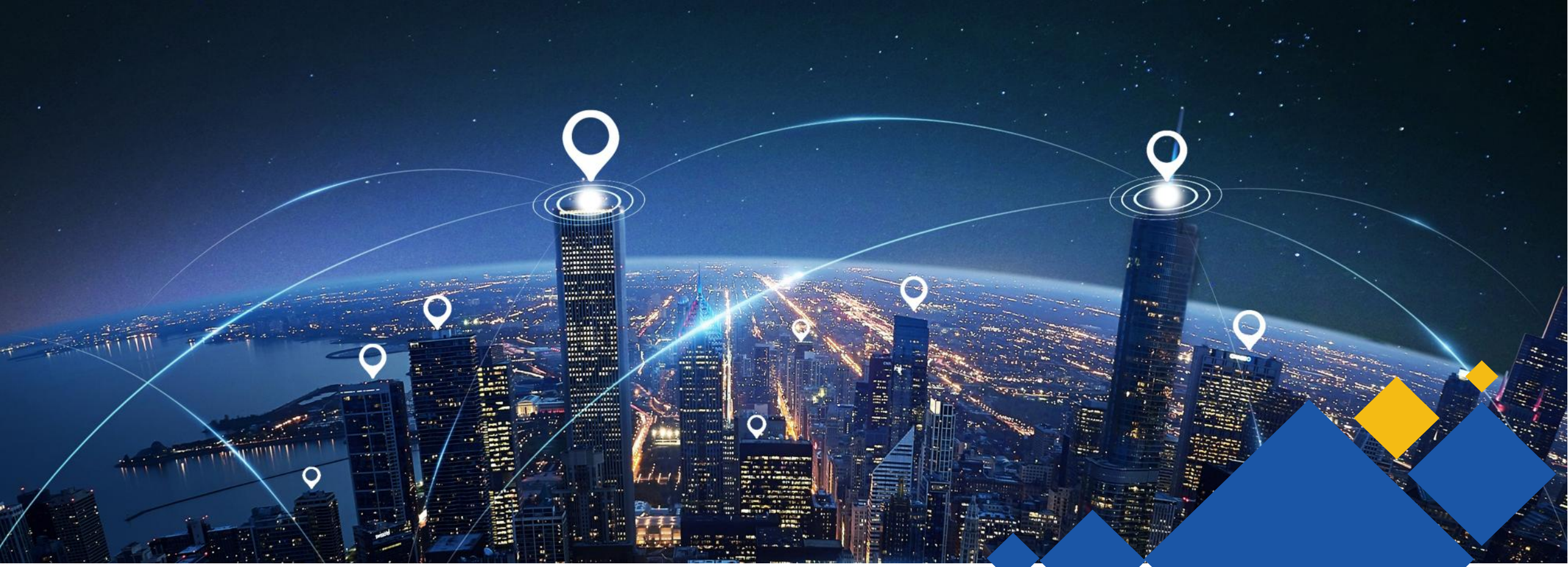


WOXU INTRODUCTION

沃旭通讯
WOXU WIRELESS

The world-leading IoT solution provider of positioning service



WOXU INTRODUCTION

沃旭通讯
WOXU WIRELESS

The world's leading location-based digital solutions provider

CONTENT

01. About Ultra Wideband

02. About Woxu Wirless

03. Product & Solution

04. Context of Use

01

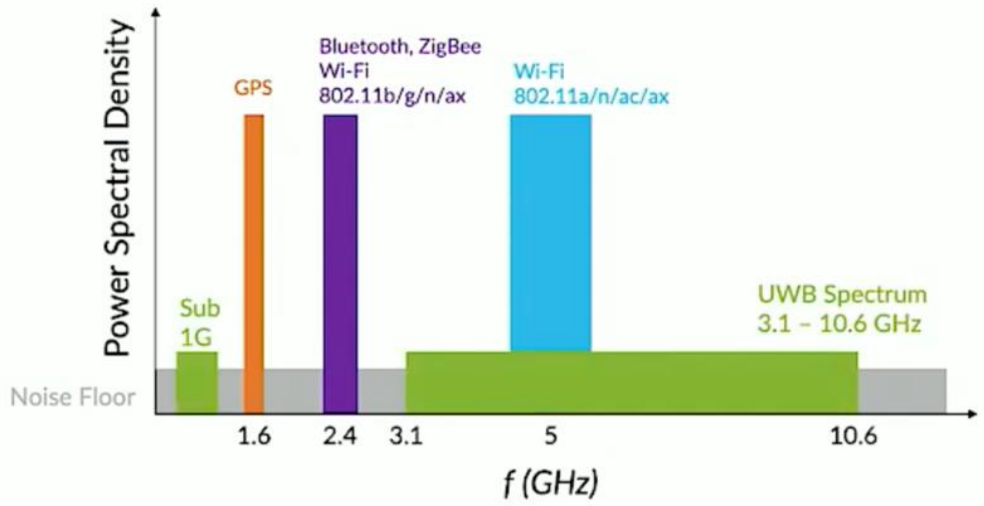
About Ultra Wideband(UWB)

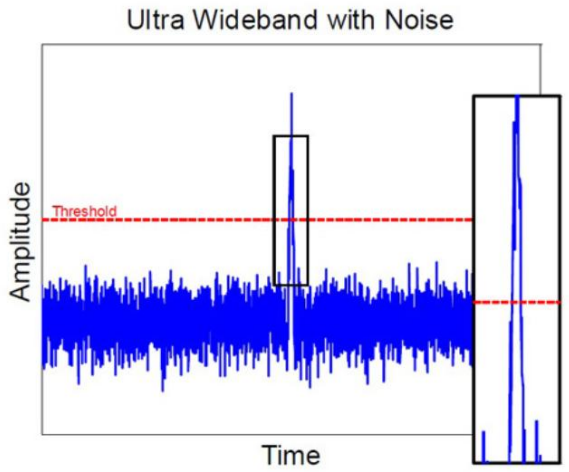
UWB(Ultra Wideband), High-precision positioning technology

- **UWB**，also known as UWB, ultra-wide band and ultraband) is a short-range wireless communication protocol.

- Data transmission is achieved by very narrow pulses in the nanosecond range, using a bandwidth of **500 MHz** or more.

- Ultra Wideband is a **fast, secure and low power** radio protocol used to determine location with accuracy unmatched by any other wireless technology.





What's the difference between UWB, BLE, Wi-Fi,Zigbee and RFID?

1st generation

RFID



- Existential Perception，Only in and out identification
- Unable to achieve two-dimensional position
- Short communication distance, low security, and High rate of errors and omissions

2nd generation

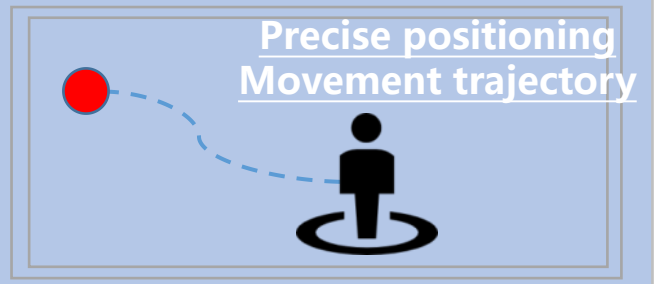
WiFi、BLE、Zigbee



- Regional perception, positioning error 5~30m
- Only locate an area of about a few dozen meters
- Low security，High rate of errors and omissions

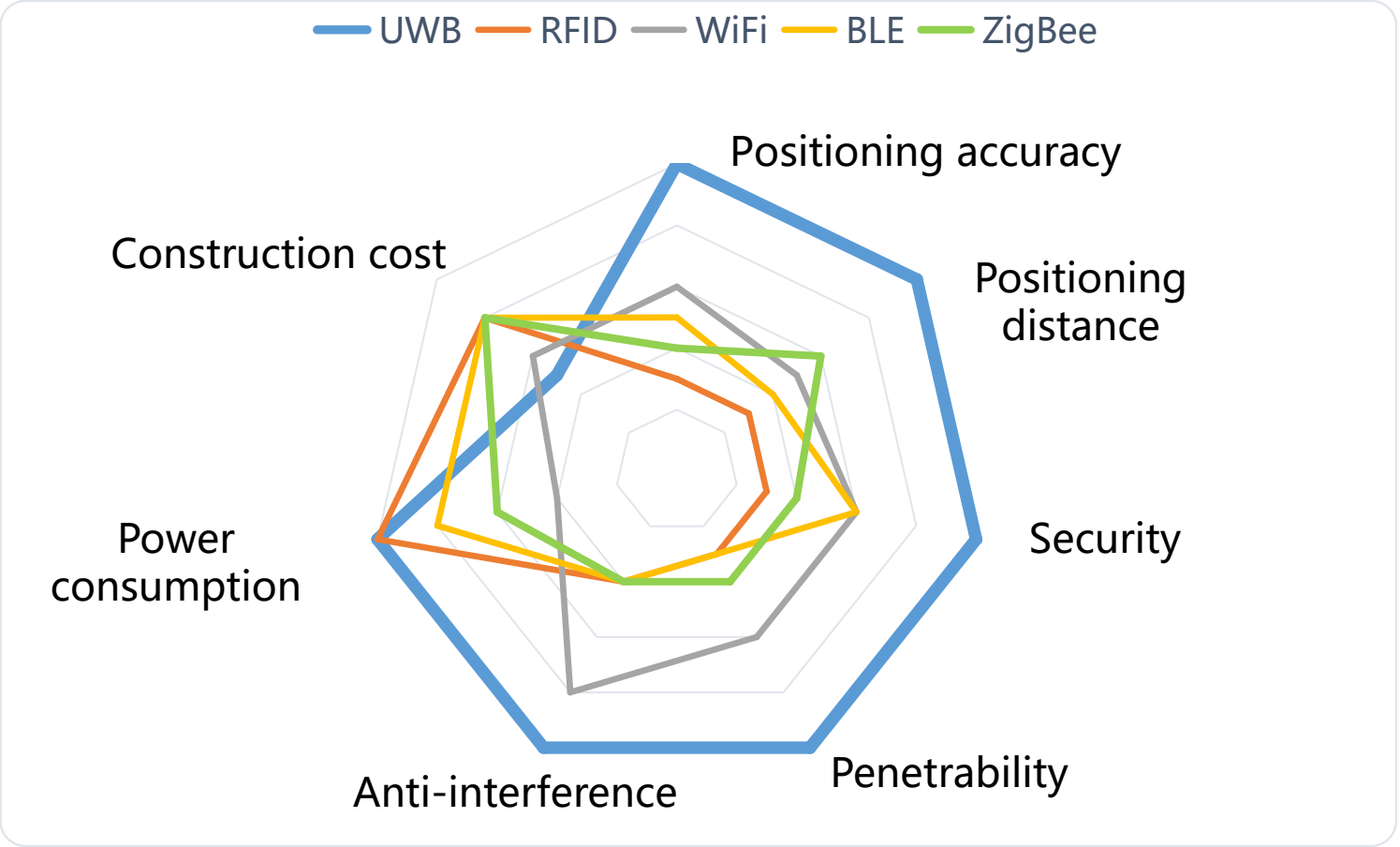
3rd generation

UWB



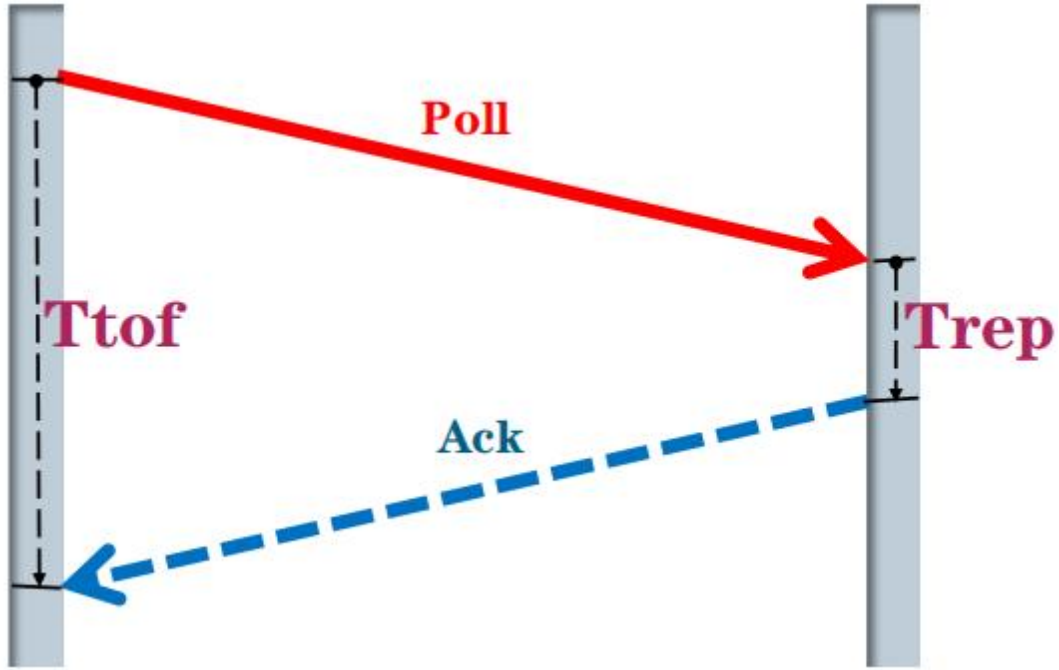
- Accurate real-time positioning, accuracy up to 30cm
- Long communication distance, high security, no errors or omissions

UWB has obvious advantages in positioning accuracy, safety, anti-interference, and delay



UWB positioning principle

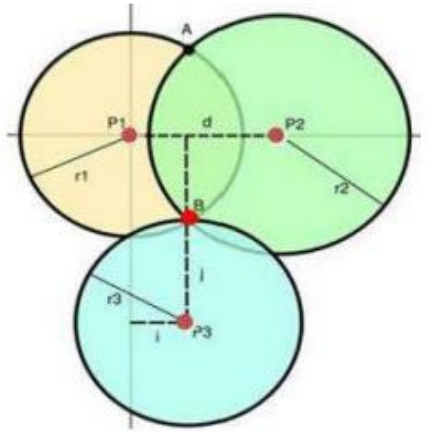
Ranging



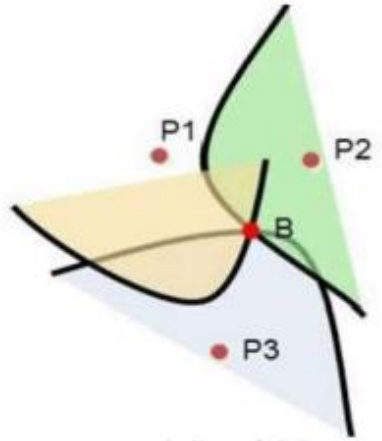
Two-way flight time method: The distance is calculated by measuring the flight time of the UWB signal between the anchor and the tag.

Positioning

TOF (Time of flight)

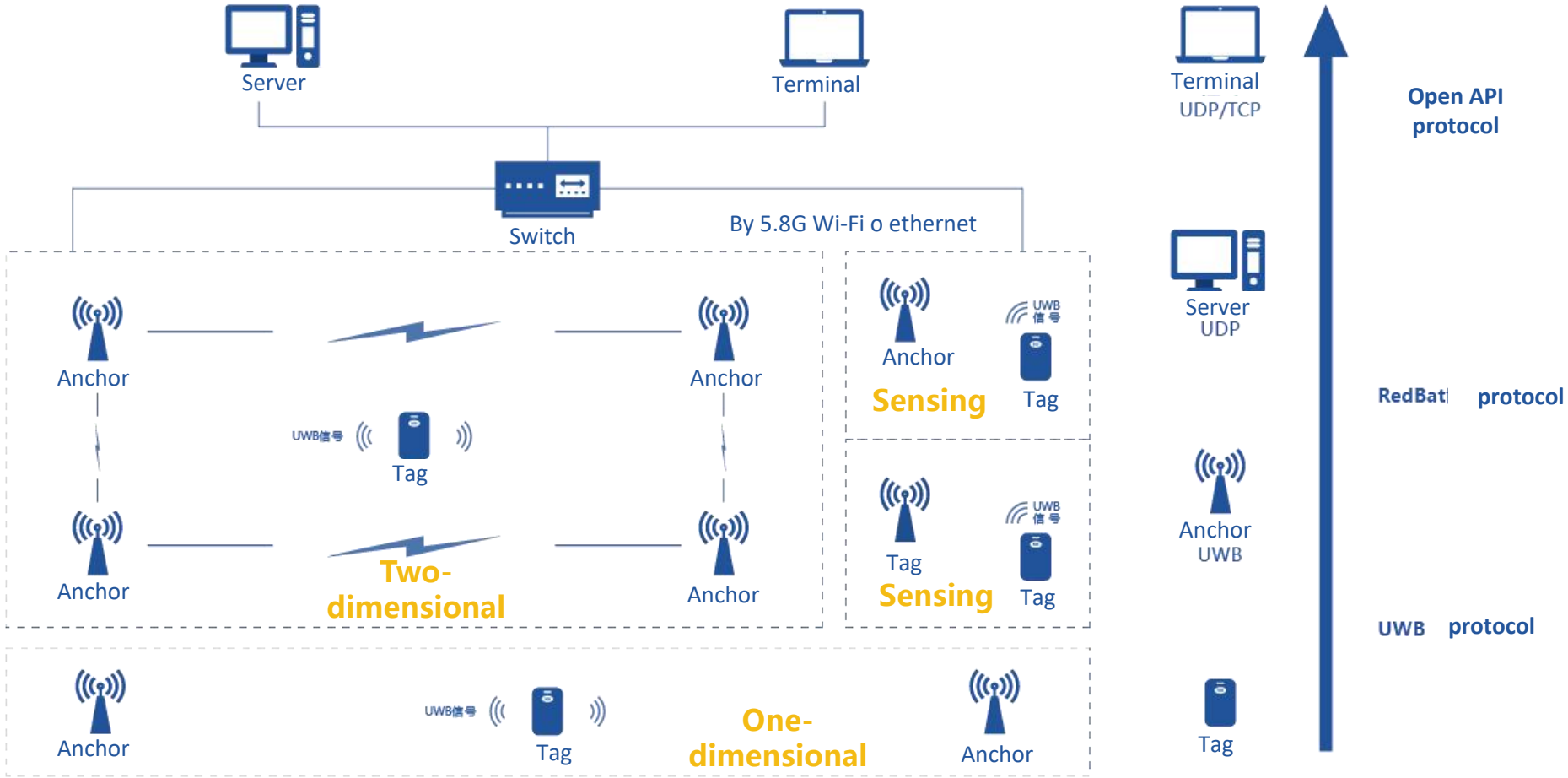


TDOA (Time Difference of Arrival)



After measuring the distance or distance difference between the object (location tag) and several known positions of the reference point (location anchor), the location of the tag can be calculated.

The Architecture is simple ,the mode is flexible

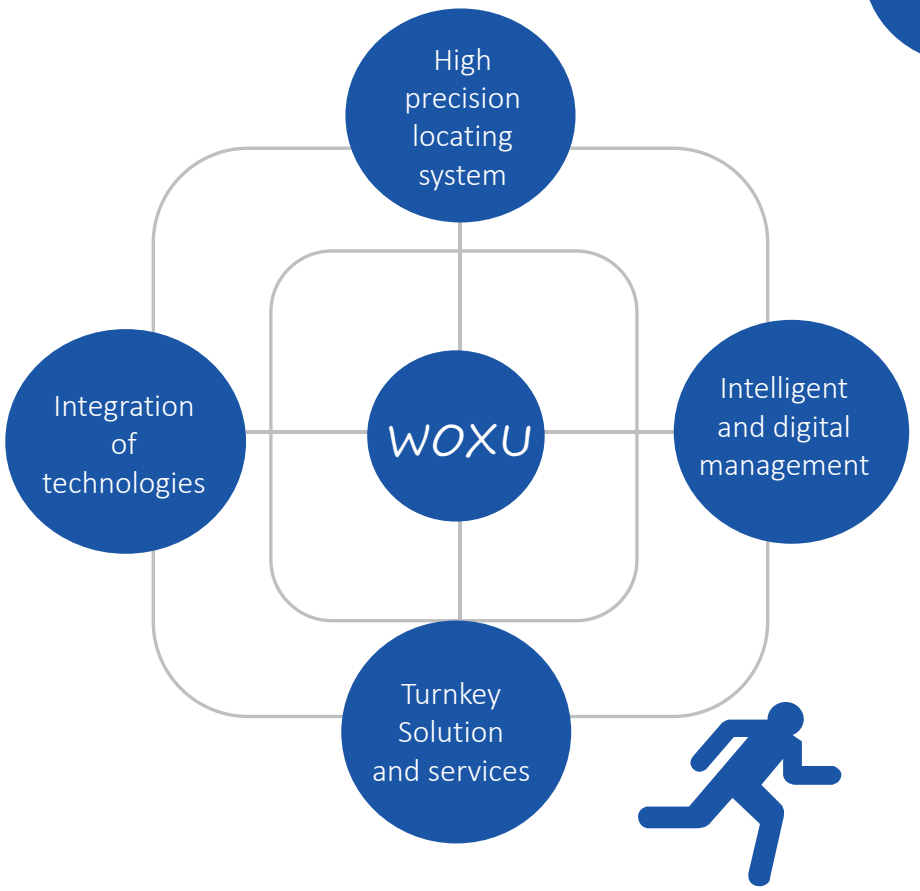


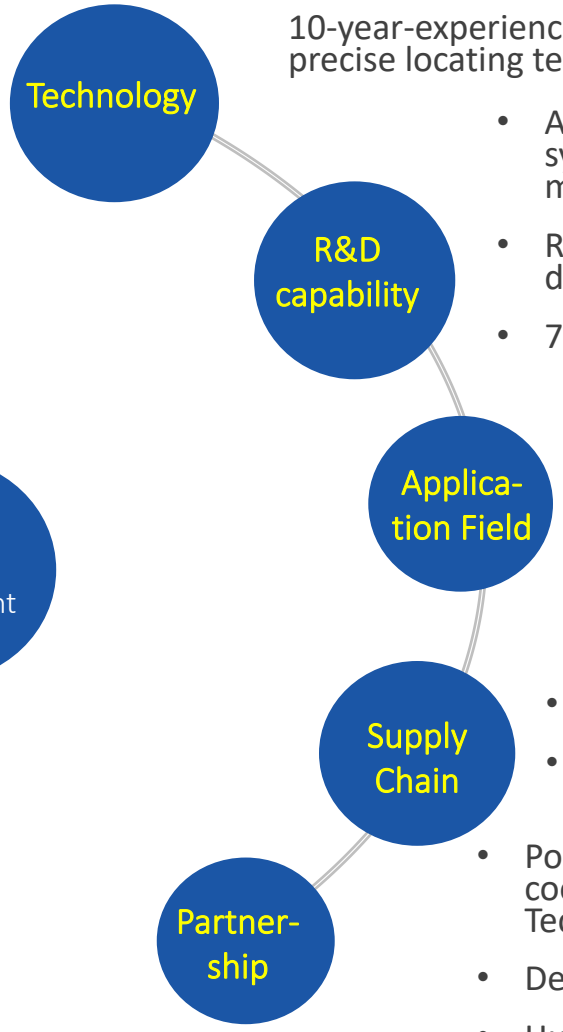
02

About Woxu Wirelss

WHO WE ARE?

We provide turn-key IOT solutions and high-precision locating services worldwide.





10-year-experience in the development of the most precise locating technology UWB

- Algorithm capability: accuracy, stability, applicability, system capacity, switching of multiple positioning methods
- RF development & testing capabilities: coverage distance, filter, FEM/w Filter
- 70+ team members and 50+ IP

- Intelligent and digital management in Industry 4.0
- Turn-key soltuions for your business
- UWB modules for automotive&IOT&undergroud mining,etc.

- Partnership with Inventec
- Competitive supply chain capabilities

- Positioning technology provider for China-Germany cooperation between the Ministry of Science and Technology (Bosch)
- Decawave's official partner
- Huawei's "WLAN dual-network integration" smart campus solution partner

HIGH-QUALITY AND QUICK DEVELOPMENT

2012~2014

- **Company established in 2012;**
- The **first Decawave partner** in China
- The first generation of product;

2016

- Complete **Pre-A** round of financing;;
- Open up the markets of Industry 4.0, power plants, chemicals and sports;
- First generation of ex-proof products come out;

2017

- Enter **mining, tunnel, hospital, new retail** and other markets;
- Passed "National High-tech Enterprise" certification;
- **"Sino-German Intergovernmental Technology Innovation Cooperation" was approved;**

2018

- Enter **the logistics and warehousing, public security, judicial, and pavilion** markets;
- Selected as a technology entrepreneur training program;;

2019

- Approved by credit management system demonstration enterprise;
- Become a **HUAWEI partner;**
- Successfully **entered 50 overseas country markets;**

2020

- The first practice of **5G+UWB Solution** in power plants and factories;
- We have achieved **1200+ cases** successfully landed in storage and logistics, industrial manufacturing, power and energy, construction sites, mines and mines, etc.

WOXU'S HONORS

10 years
Core team R&D experience

70+
Core Intellectual Property(IP)

50+
Countries and regions

1200+
Success Stories













Including **SRRC、CE、FCC、ROHS、WEEE** and other certifications

IN 6 VIATAL AREAS，SERVING OVER 50 COUNTRIES

Continuous manufacturing plant

Industrial 4.0



Discrete manufacturing plan

Power plant

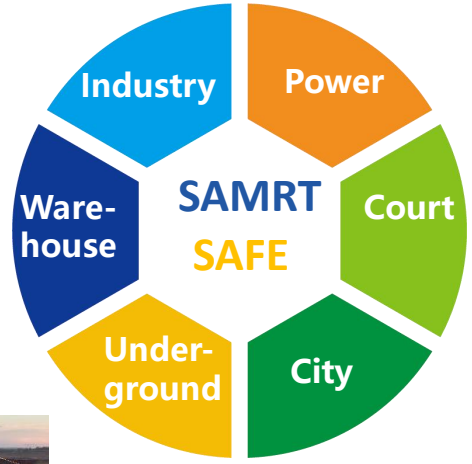


Chemical



Warehousing
Logistic





Court



Prison

Construction



Tunnel
Mining





Pipe gallery



Pavilion



Hospital
Home



Bank

Cases in...

- China
- Korea
- Singapore
- Thailand
- Malaysia
- India
- United States
- Turkey
- Germany
- United Kingdom
- France
- Czech Republic
- Spain
- Denmark
- Brazil
- ……

BUSINESS PARTNERS OF WOXU

Industrial Manufacture

Chemical & Power PLant

Underground Space

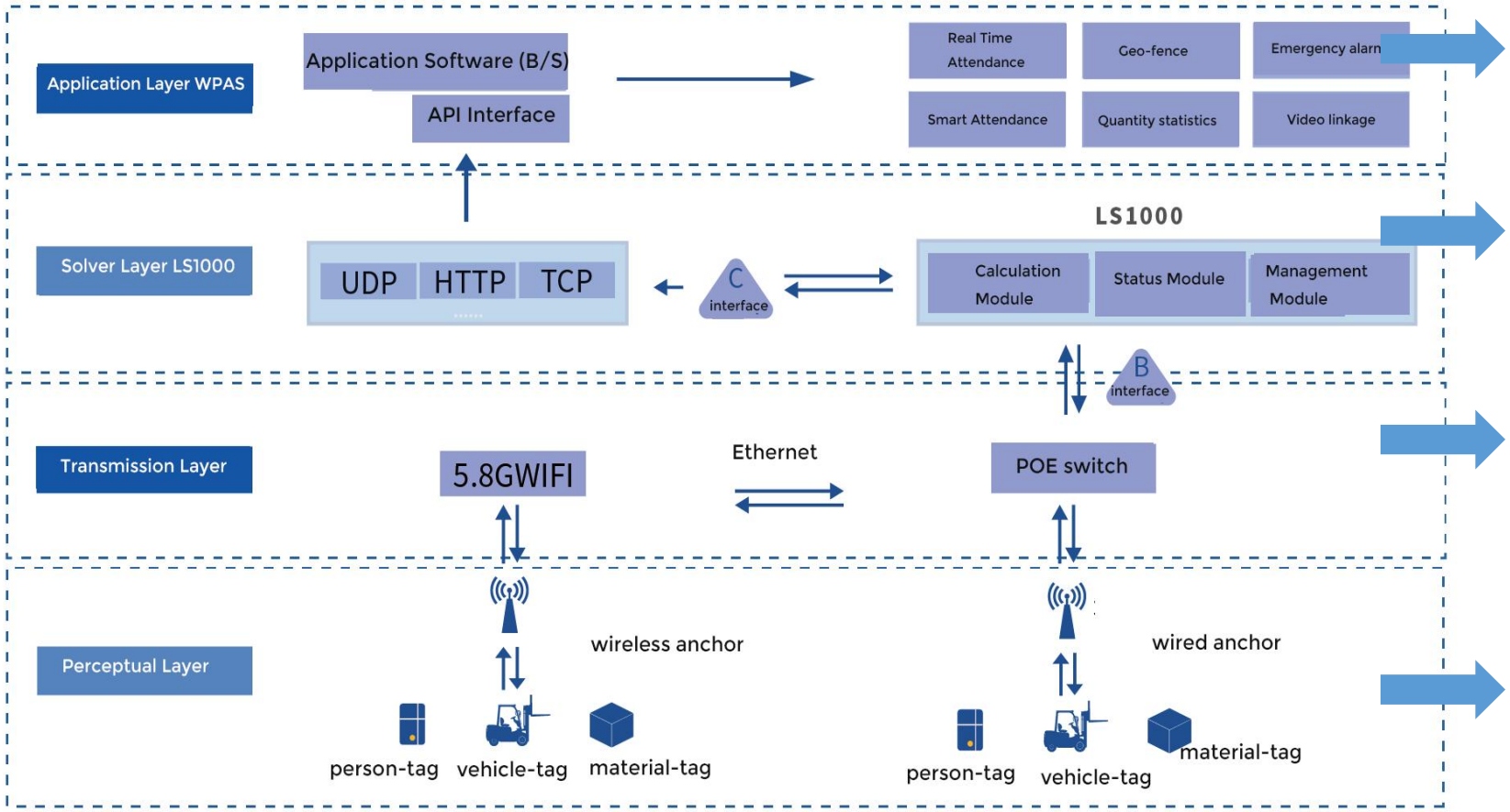
Others

Chip markers

03

Woxu's products and solutions

Conventional UWB positioning solution



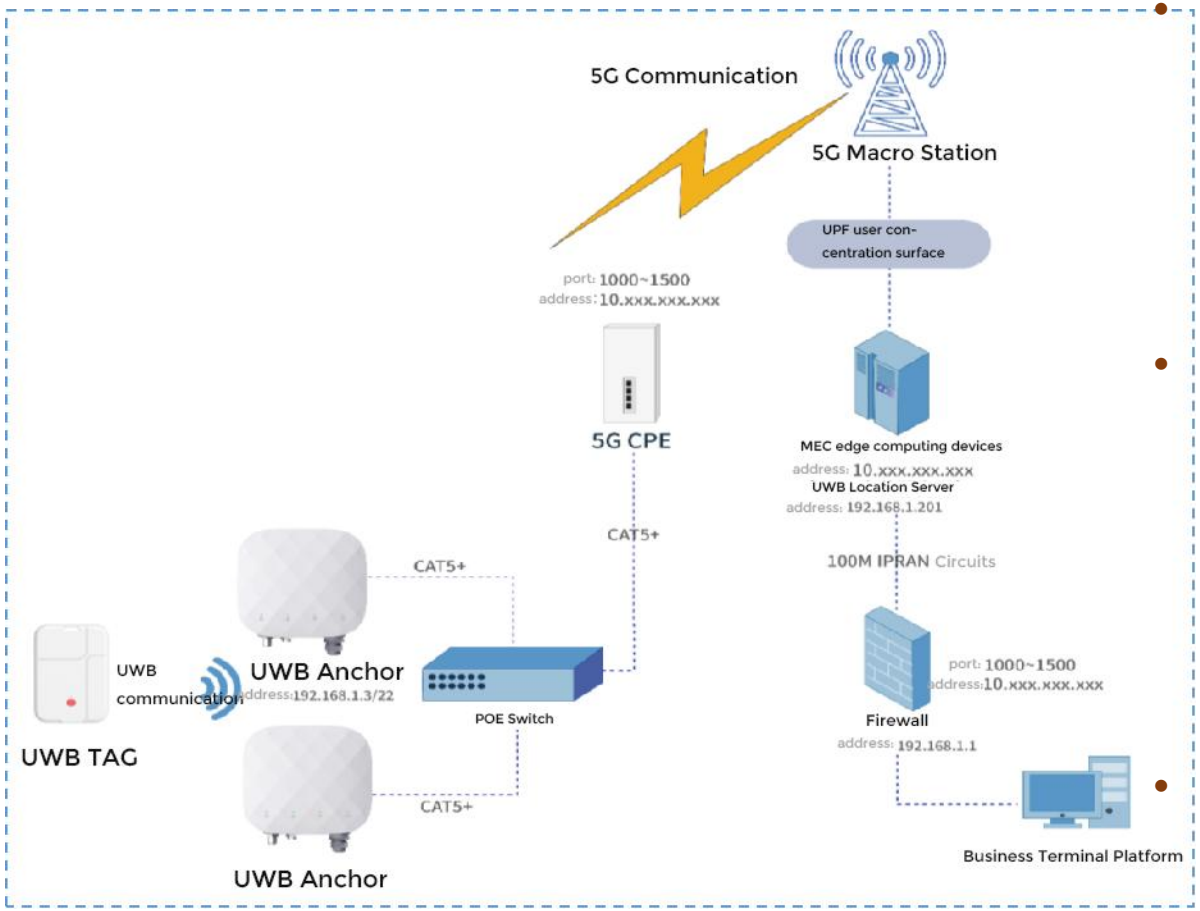
Realize basic functions such as real-time location display, track playback, and business development functions such as geo-fence, intelligent inspections, attendance statistics, and video linkage.

The UWB positioning engine realizes the calculation of positioning data and obtains the coordinates of the positioning tag.

The positioning data is transmitted back via FE/5.8G Wi-Fi.

It is composed of a positioning tag and a positioning anchor. The anchor collects UWB positioning data transmitted by the tag.

“5G+UWB” fusion positioning solution



Description

- The anchor is locally aggregated through the switch and uses a private IP address
- The 5G CPE sends the data of each switch back to the user center through the 5G network

Advantages

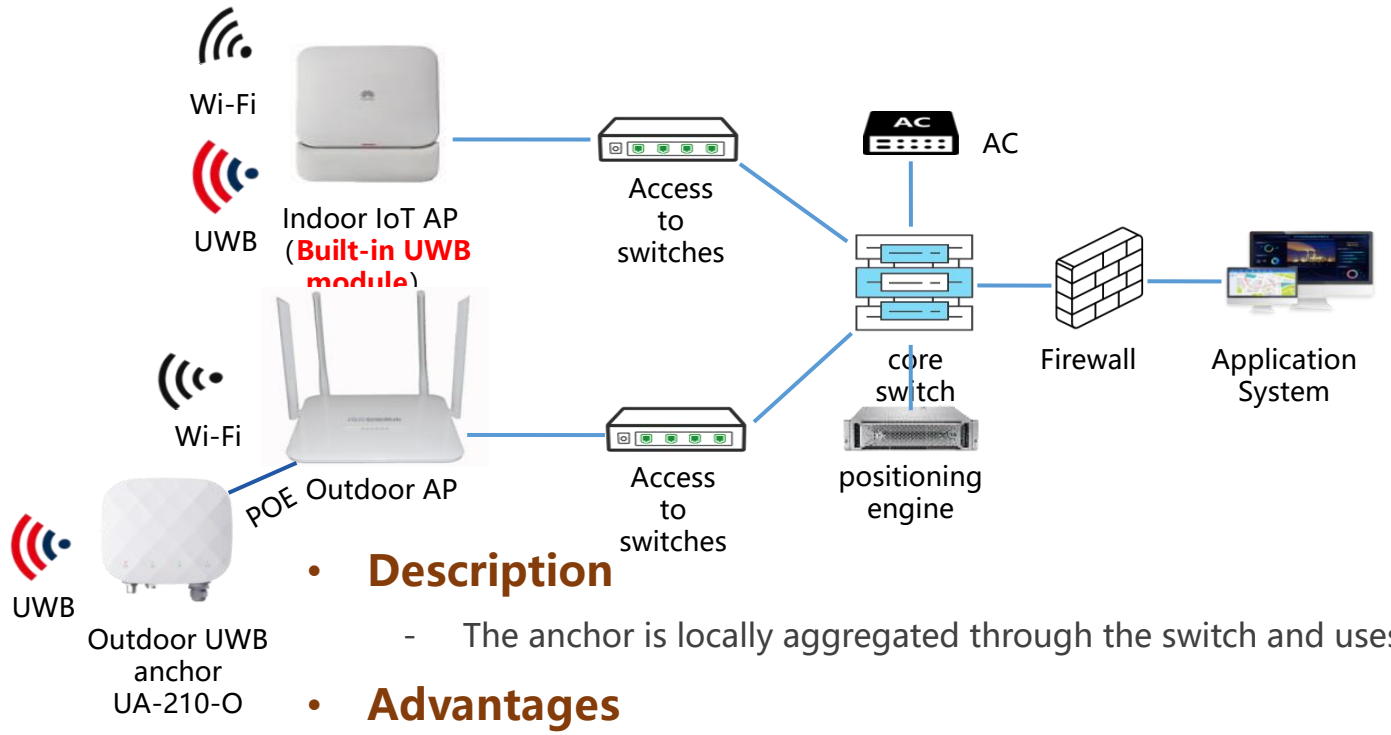
- Greatly reduce the complexity of convergent line design
- Save a lot of fiber optic lines and equipment investment and maintenance costs
- Reduce the difficulty of overall system maintenance
- Effectively shorten the construction period of the project

Context of use

- Smart factories, smart power plants, smart steel, smart ports, smart mines, etc.

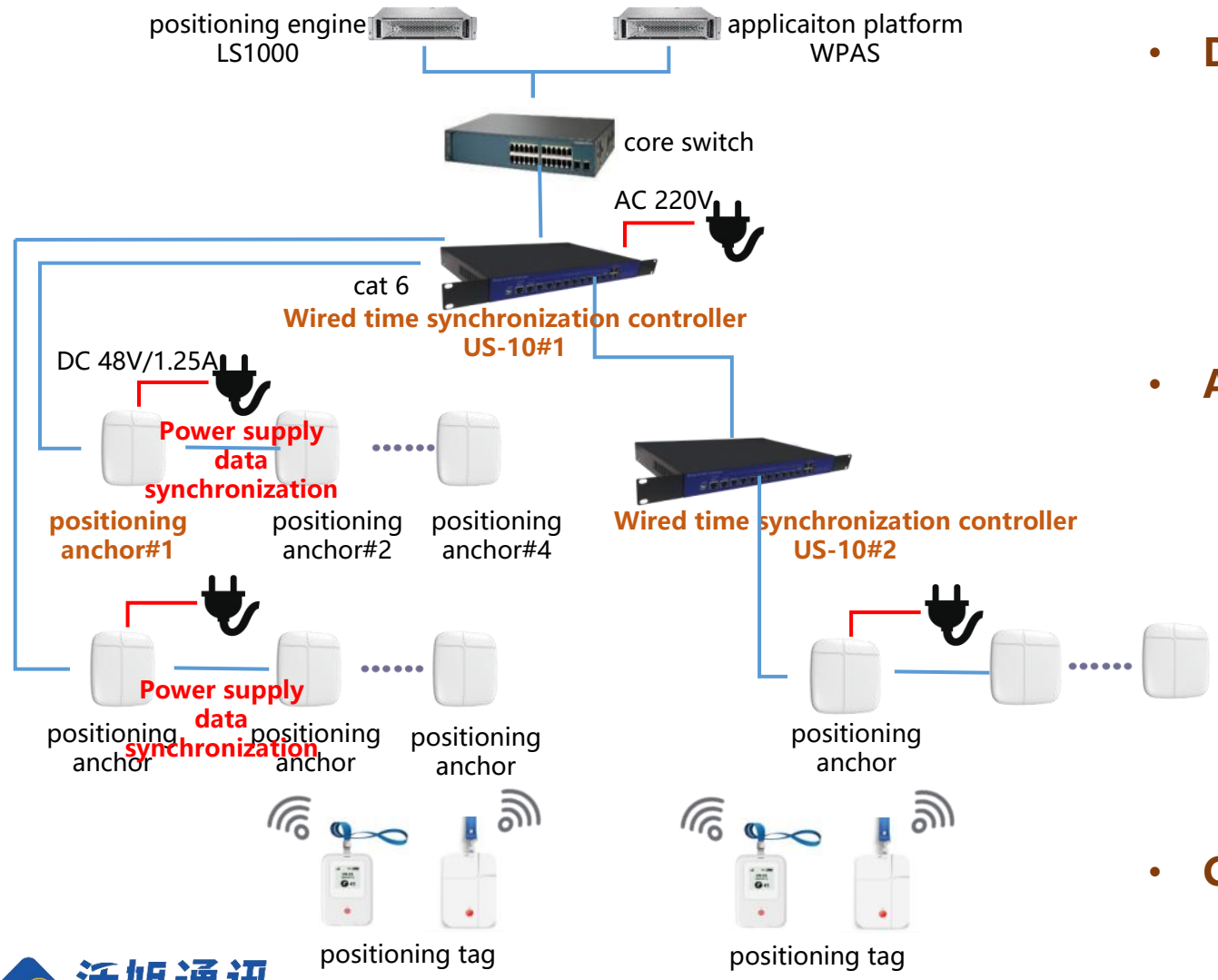
“Wi-Fi + UWB" dual-network integration solution





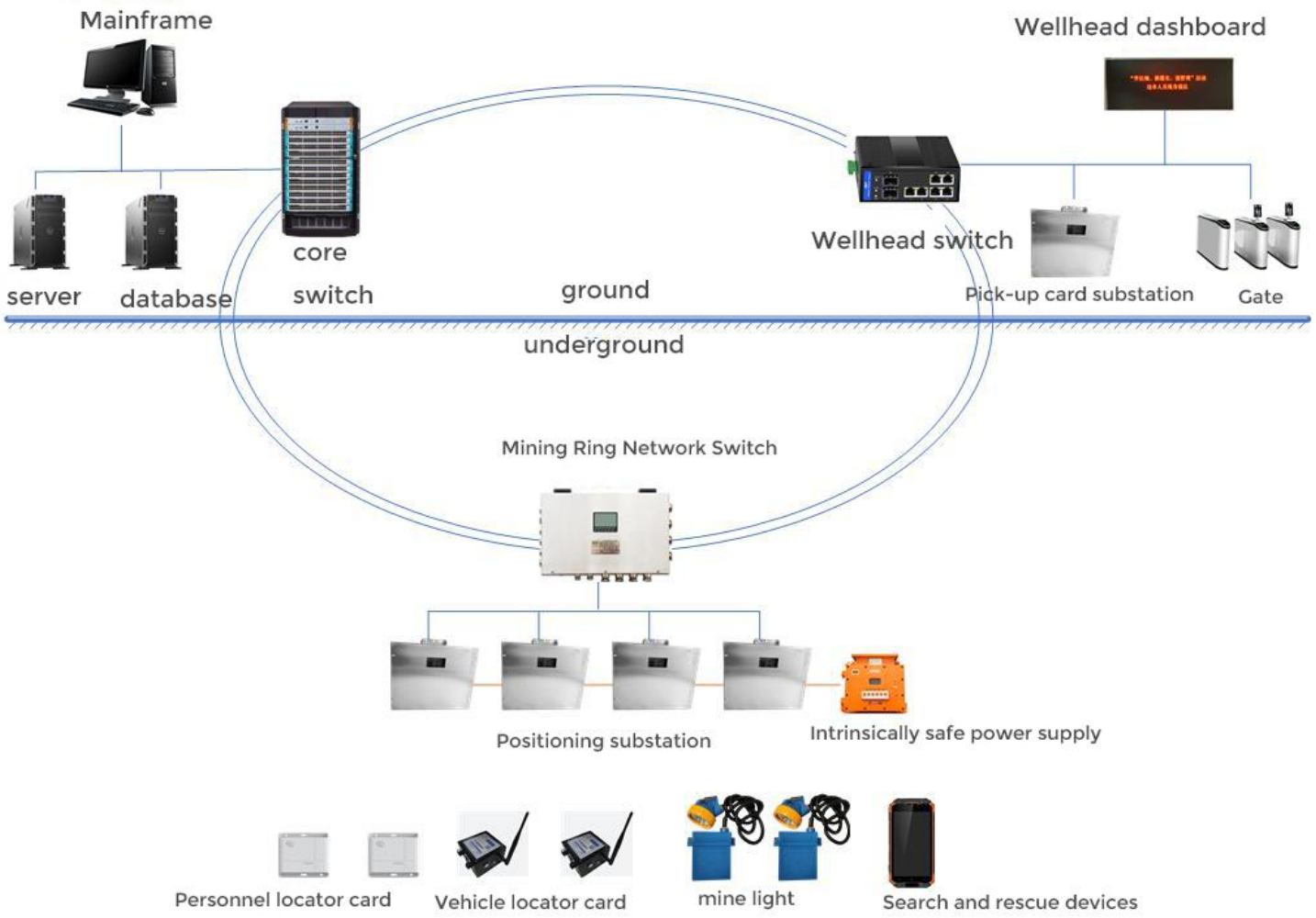
- **Description**
  - The anchor is locally aggregated through the switch and uses a private IP address
- **Advantages**
  - The Wi-Fi wireless data transmission network and the UWB high-precision wireless positioning network are installed and deployed in a unified manner, and the power supply network is unified, reducing network nodes and reducing TCO by 50%
- **Context of use**
  - Smart park, smart manufacturing, warehousing and logistics, public inspection and justice, smart new retail, etc.

Wired clock synchronization solutions greatly enhance the stability and positioning accuracy



- **Description**
  - UA-221 anchor is used in conjunction with the wired clock synchronization controller US-10 to achieve precise synchronization of the positioning network, solve the synchronization error among the anchors, and ensure that all devices work under the same clock source.
- **Advantages**
  - The positioning accuracy is high (10cm), and the system capacity is increased by 5%.
  - The system has good stability, and the synchronization network will not be affected by changes in the wireless environment and surrounding structural layout.
  - The construction is simple and the wiring is convenient.
  - The efficiency of system debugging is increased by 30%-50%.
  - Full band support.
- **Context of use**
  - Industry 4.0

High-precision positioning solutions of mine personnel



- **Description**
  - Real-time personnel/vehicle location and activity track
  - Attendance management for access to wells.
  - Statistics on the number of people underground.
  - Hazardous area warning and control.
  - Emergency rescue.
  - Vehicle dispatching.
  - SOS emergency assistance
- **Advantages**
  - Positioning accuracy up to 30 cm.
  - Base station coverage radius up to 600 meters or more (line-of-sight).
  - Single area tag concurrency up to 400 person tags + 12 vehicle tags.
  - Low power consumption, average power consumption of human tags is less than 400uA.
- **Context of use**
  - coal mine

Collision avoidance systems for vehicles, people and vehicles to avoid safety accidents

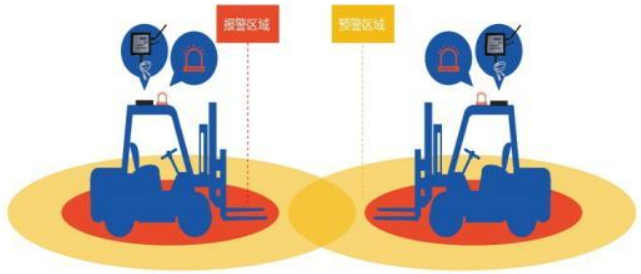
Human-Vehicle Collision Avoidance

- The forklift is equipped with a ranging anchor and sound and light alarms, and personnel wear ranging tags
- When the distance between the personnel and the forklift is less than the set alarm distance, the alarm and the tag will alarm at the same time.
- The warning area (the alarm flashes), **the alarm area** (the alarm sound and light prompt) and **the non-alarm** area can be flexibly set.



Vehicle-Vehicle Collision Avoidance

- All forklifts are equipped with ranging anchors and sound and light alarms.
- When the vehicle-to-vehicle distance is less than the set alarm distance, the vehicle will automatically alarm.



Collision avoidance in blind spots such as corners

- Ranging base stations and sound and light alarms are installed on forklifts and corners, and personnel wear ranging tags.
- When the car reaches the corner, **the car and the corner alarm** will give a sound and light warning to remind the other side of the line of sight.



Serialized products to meet the business needs of different scenarios

Anchor



Ceiling anchor
UA-231



Indoor anchor
UA-210



Outdoor anchor
UA-210-O



Explosion-proof anchor
UAB-100M



High-power anchor
UA-180DHO



Bluetooth anchor
BA-10



AP+UWB anchor

Tag



card-type
UT-241-C



E-ink screen
UT-241-E



smart watch
UT-221



Wristband
UT-206-H



helmet-type
UT-206-H



material tag
UT-230



marterial tag
UT-226-E4



Vehicle tag
UG-230

Module

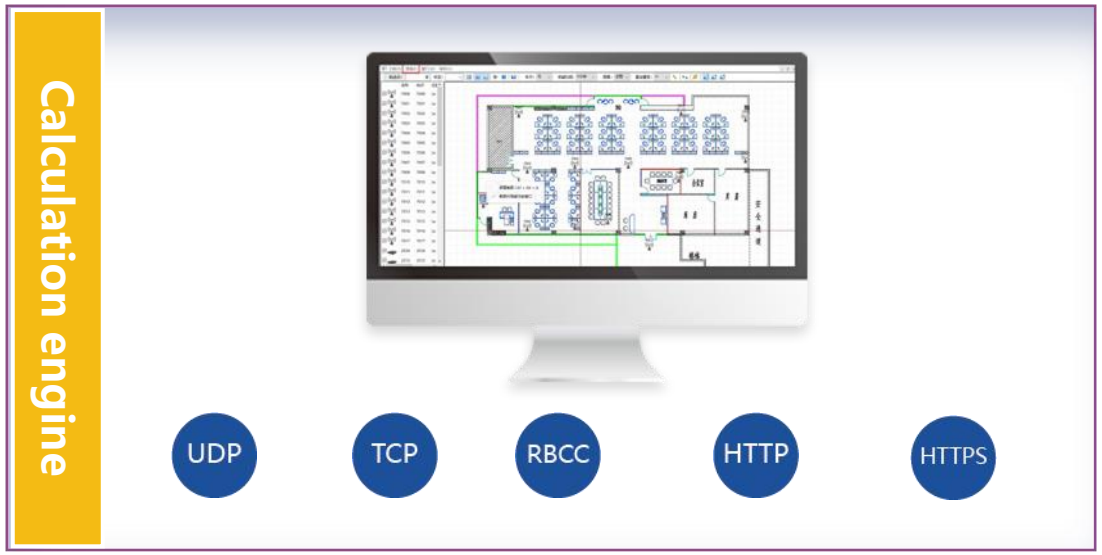


Module for anchor
UM-209H



Module for tag
UM-221

Flexible business platform to meet the diversified management of customers





- Provide API interface, user-friendly for secondary development.
- Windows series operating system, 64-bit, including: Win10, Server 2008 R2, Server 2012, Server 2016, etc.;
- Local deployment, free installation.

- It supports interfaces such as HTTP and Webservice, which facilitates the docking and integration with higher-level intelligent systems such as MES, WMS, and ERP.
- CentOS8（64bit），Windows Server 2012/2016/2019（64bit）；
- Local deployment; support private cloud.

Ten years of development,achieve great success



High-precise

- The positioning accuracy can reach an average of 30cm



Large coverage

- Normal: 50m,
- Enhanced mode: over 300m



Large capacity (signal area)

TOF 200Hz/
TDOA 950Hz



Strong anti-interference

Direct pulse technology



Multi-technology integration

- Can be used in conjunction with 5G, AP, BLE, GPS and other technologies



Multiple positioning methods

- Support TOF and TDOA
- Wired time synchronization system



Easy to secondary Development

Provide API interface to facilitate secondary development



Many mature cases

Over 1000 cases;
Applied all around the world

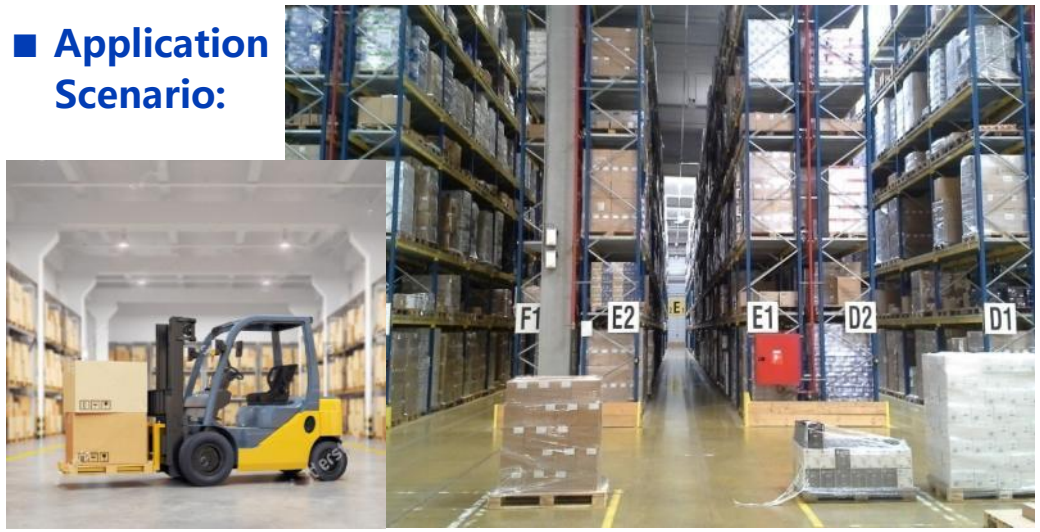
04

Context of use

Focus On Lean Management

SMART WAREHOUSING（Factory warehousing/logistics company）

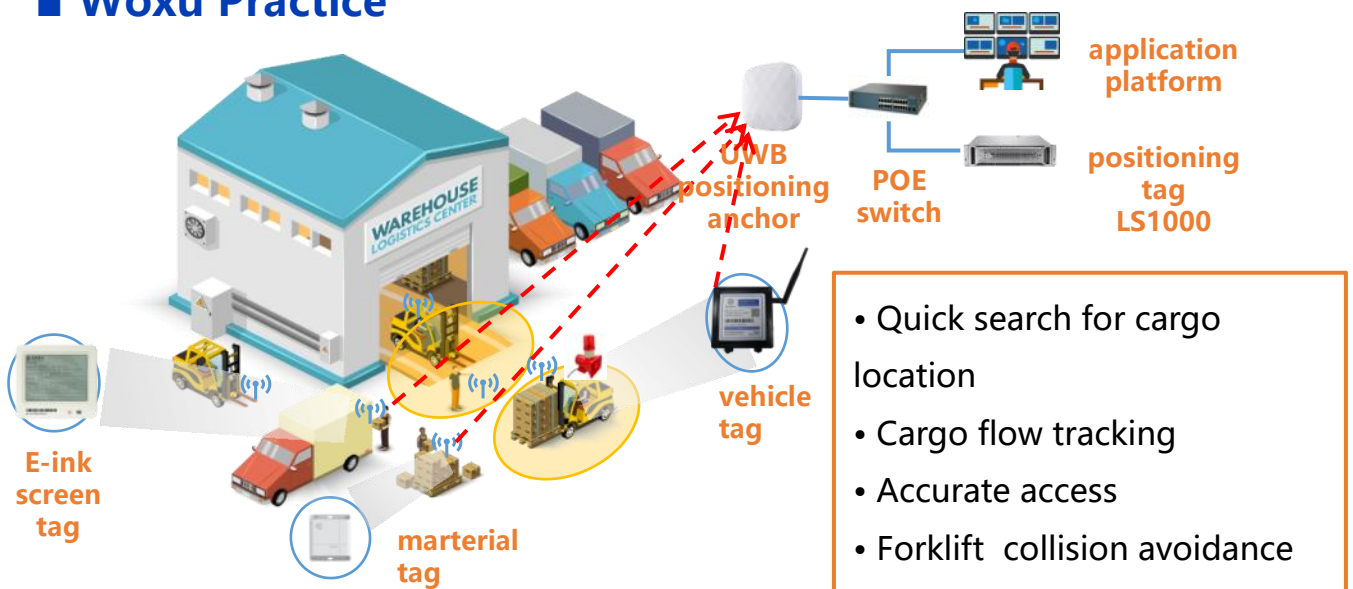
■ **Application Scenario:**



■ Demands

- The warehouse has rich categories, fast inventory turnover, and high frequency of in and out of the warehouse. The existing management methods have lost goods and found goods, which led to logistics delays.
- As a warehousing tool, forklifts pose great safety hazards due to blind spots

■ Woxu Practice



- Quick search for cargo location
- Cargo flow tracking
- Accurate access
- Forklift collision avoidance
- Traveling crane accurate positioning

■ Partners

- China Storage and Transportation Warehouse
- Multiple Deppon Transfer Yards
- An airport base of SF Express
- Cainiao
- Everbright Energy Silo
- OUZHI Warehouse
- DHL
- JD Asia One

Focus On Lean Management

INDUSTRIAL MANUFACTURING （Discrete enterprises such as home appliance, auto parts ）

■ Application Scenario:





■ Demands

- It is difficult to quantify the on-the-job working hours of on-the-job employees
- The lack of digital traceable information in the production process makes it difficult to guarantee the quality of production.
- There are no strict regulations on the management of materials, equipment, job responsibilities, etc.

■ Woxu Practice





▶ Intelligent management of in-service personnel

•Location distribution of on-site personnel

• Statistics on working hours

• Beat efficiency optimization

▶ Production process management

• The whole production process is visible

• Optimization of production line process efficiency

• Abnormal process warning prompt

▶ Material/equipment management

• Material flow tracking

• Out put in storage management

•Improve equipment utilization

• Paperless management

■ Partners

- Unilever
- Bosch
- Bosch Rexroth
- Raleigh Factory
- E-ink
- Volkswagen
- Chinese banknote ink
- P&G-Gillette
- Midea
- YUTONG BUS
- Zhengzhou Nissan Automobile

Dedicated to Security control

INDUSTRIAL MANUFACTURING （Cement, steel and other process-oriented manufacturing enterprises ）

■ Application Scenario:





■ Demands

- The production environment is complex, the safety risk factor is high, and there are blind spots in the management of traditional supervision.
- The inspection routes are intricate and complex, with missed inspections and wrong pickups occurring from time to time, and historical records are difficult to track and query.

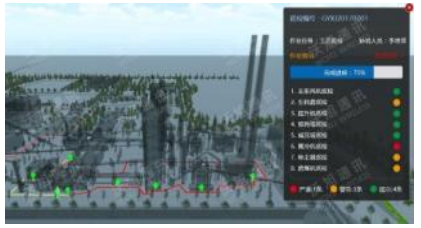
■ Woxu Practice






Multi-system integration | Position Sensors | 3D Visualization | Camera | Access Control System

On-the-job man-agement	Real-time location and track tracking	Personnel on board management	Regional Headcount Statistics
Intelligent security control	Regional Rights Management	Dangerous area no-entry alarm	Emergency Alarm


■ Partners

- Conch Cement
- Yong Gang Group
- Bao Gang Group

Dedicated to Security control

——ELECTRICITY & ENERGY(hydroelectricity, thermal power, energy storage plants, wind power)/substation)

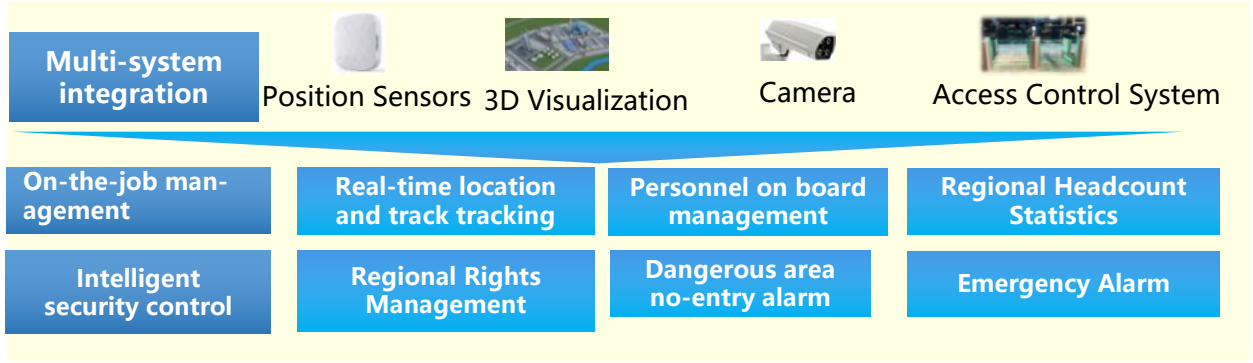
■ Application Scenario:



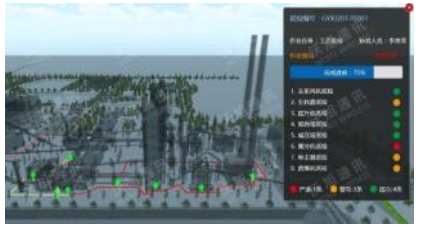
■ Demands

- The production environment is complex, the safety risk factor is high, and there are blind spots in the management of traditional supervision.
- The inspection routes are intricate and complex, with missed inspections and wrong pickups occurring from time to time, and historical records are difficult to track and query.

■ Woxu Practice









■ Partners

- Datang multiple power plants
- Huaneng multiple power plants
- A power plant of Guoxin
- A pumped storage power plant in Sichuan
- National energy multiple power plants
- A power plant of Jingneng
- Multiple power plants of Guodian
- Multiple substations of State Grid

Dedicated to Security control

——CONSTRUCTION SITES (building sites, tunnels, underpasses, tube corridors)

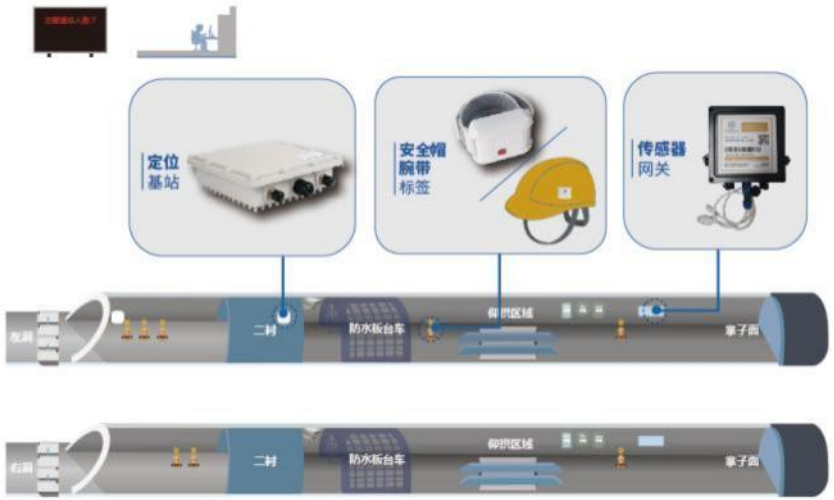
■ Application Scenario:



■ Demands

- Inability to accurately confirm the actual location and number of operators
- when personnel encounter an emergency, they can only call for help through the emergency phone.
- Single early warning function, the traditional warning method is to notify by broadcasting.

■ Woxu Practice



- Real-time location of people and vehicles
- Regional staffing statistics
- Intelligent time and attendance
- Quick roll call in the concentration area
- Upload/Download Alerts
- Safety step warning alerts
- Multi-gas sensing data interfacing
- Camera linkage
- Large screen display

■ Partners

- China Railway
- China Communications Construction
- China Railway Construction

Dedicated to Security control

MINE (coal, non-coal)

■ Application Scenario:

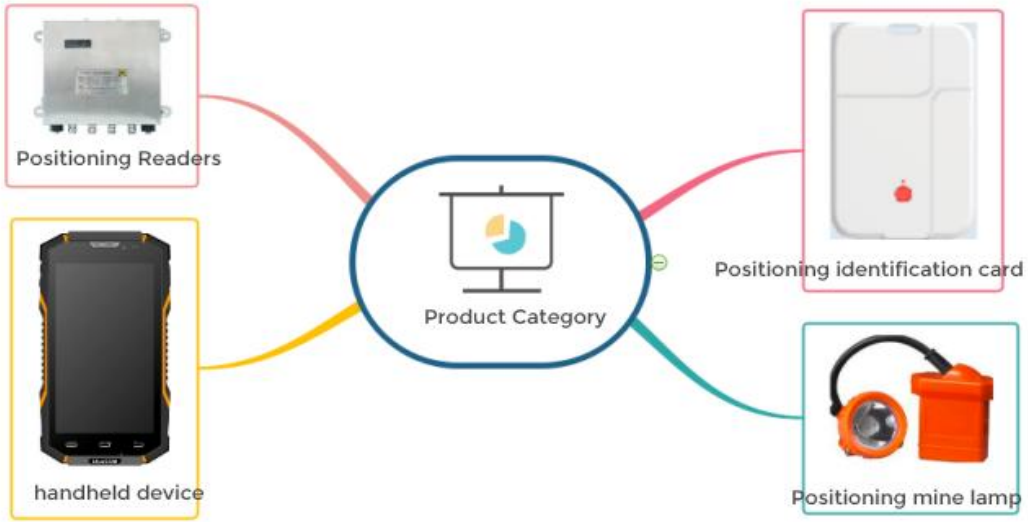




■ Demands

- Underground workers lack awareness of self-safety protection and safety cannot be guaranteed.
- In the process of mine car operations, the poor environment affects the field of vision, there is a large visual blind spot, and it is very easy to occur safety hazards.

■ Woxu Practice



- **High accuracy**: Positioning accuracy up to 30cm
- **High concurrency:** 400 concurrent people and 15 vehicles
- **Ultra-low power consumption:** average operating current of human tag <400uA
- **High flexibility:** Customized services are available
- **Ultra-long distance:** visual coverage distance up to 600m or more



THANKS!

For more information, please follow

Website: https:// www.woxuwireless.com (domestic) https://uwb.woxuwireless.com (foreign)

Hotline: 4008507771 (domestic) / +86-25-83206362 (foreign)

E-mail: sales@woxuwireless.com

Address: 4/F, Building 9, Xuzhuang Software Industry Base, No. 699-8 Xuanwu Avenue, Nanjing, Jiangsu, China

沃旭通讯
WOXU WIRELESS

The world's leading location-based digital solutions provider