

IoT Network Applications & Solutions

Lecture 1

IoT Security

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Foreword

- With the development of Internet of Things (IoT) technology, its impact has penetrated into every aspect of society. IoT technology is applied everywhere, from smart home to smart city.
- This slide analyzes existing problems in five IoT industry scenarios: smart city, smart campus, AMI, IoV & DRIS, and industrial Internet. It also describes solutions provided by IoT technologies and success stories. Finally, it introduces the development trends of intelligent connection of everything based on other emerging technologies.

Objectives

After completing this course, you will be able to understand:

- Common problems in smart cities and corresponding solution
- Pain points of smart campus management and corresponding solutions
- Requirements for reducing the power consumption of the smart grid and corresponding solutions
- Driving forces of IoV development and the corresponding solutions
- Requirements and challenges of industrial IoT and the corresponding solution
- Technologies such as 5IABCDE and the development trends of intelligent connection of everything

Common Problems – Traffic Management

Frequent traffic congestion and accidents



Congestion is a pressing issue. Accidents occur frequently due to drivers disregarding traffic laws.

Increased travel time



Heavy traffic significantly increases travel time and lowers commute satisfaction.

Increased pollution



Low driving speeds caused by congestion result in low energy use efficiency, which results in more pollution.

Common Problems – Parking Management

Parking management



Imbalance

- Lack of resource integration and sharing
- Severe tidal effects



Inconvenient charging

- Low labor efficiency and high costs
- Frequent payment evasion



Difficult inspection

- Low efficiency
- Difficulty confirming paid fees



Increasing congestion

- Time wasted locating parking spaces
- Lack of guidance and reservation services

Parking experience



Difficulty finding parking spaces

- Difficulty locating empty parking spaces
- Lack of parking guidance facilities



Difficulty finding vehicles

- Difficulty locating parked vehicles
- Difficulty navigating complex environments



Difficulty entering and leaving parking lots

- Inconvenient parking, card collection and payment
- Congestion at parking lot entrances and exits during peak hours



Outdated payment systems

- Congestion due to manual charging
- Lack of charging modes

Common Problems – Street Lamp Management

Reliable lighting

Provides reliable lighting for urban roads, which is the core responsibility of the Street Lamp Administration.

Emergency lighting

Starts the emergency lighting in bad weather or special weather during daytime.

Simplified O&M

Promptly detects and repairs faulty street lamps. Considers the employment impact when applying advanced technologies.

Asset management

Protects street lamps from being damaged or stolen.

Energy conservation

Turns off lights on time after daybreak. Reduces illumination in the middle of the night. Lowers brightness when there are no pedestrians or vehicles.

Revenue growth

Rents lamp poles to advertisement companies and tower companies for profit. (It is difficult to obtain commercial benefits with current systems.)



Common Problems – Firefighting Management

- Nine small public areas are vulnerable in urban fire safety.
- Fire risks: chaotic environment, group rentals, random stacking of flammable things, and electricity piracy
- Weak firefighting facilities: no firefighting facilities or outdated firefighting equipment
- Delayed fire warning: delayed fire detection and insufficient fire information due to the time-consuming manual inspection



Firefighting facility issues



Flammable material stacking

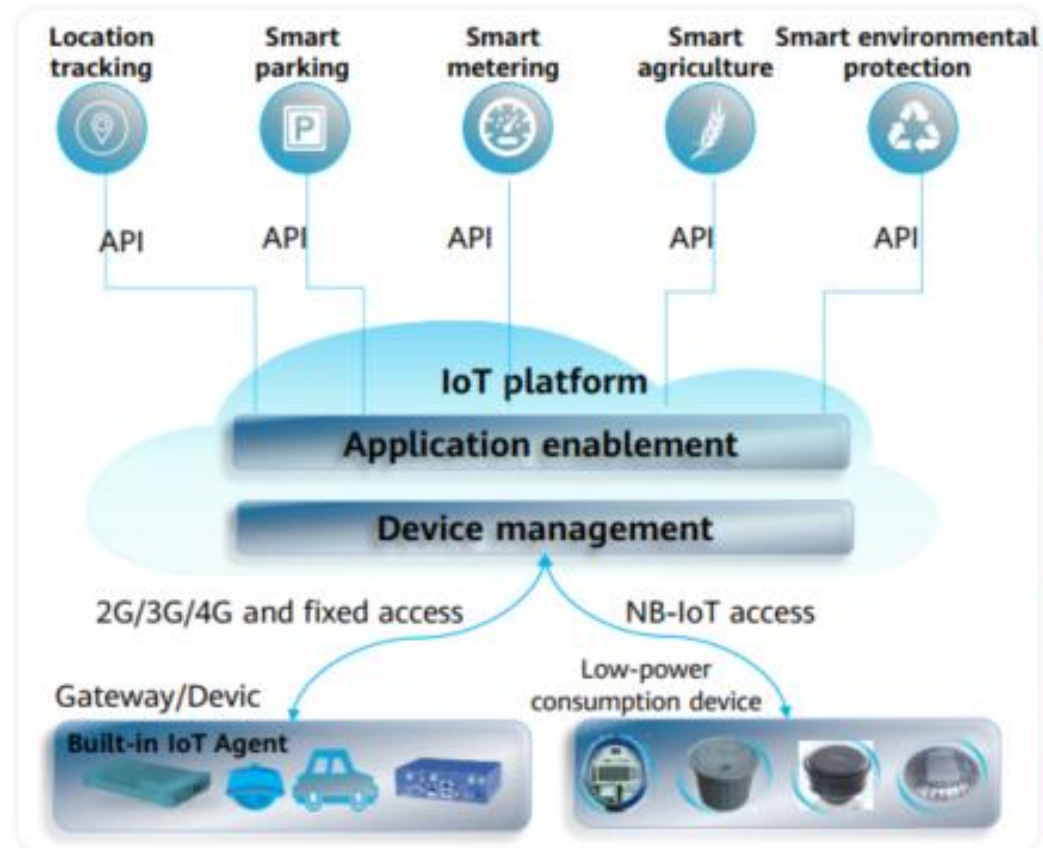


Old cables

Chapter

01

Smart City Solution



Simplifies development of IoT applications.
Incubates and enables an urban IoT ecosystem.

Aggregates real-time urban IoT data to provide real-time decision-making support for the comprehensive city management system.

Provides unified access standards for IoT applications and devices to prevent fragmented IoT application access.

Common Problems – Security Management



No alarms are triggered when intruders break into access control systems.



No alarms or linkage policies are triggered when thieves burst into campuses.



Air conditioners do not stop working even when a fire occurs. Verification, evacuation, and police reporting are executed manually.

Common Problems for IoV



- Delayed detection of vehicle status faults
- Impact of faulty vehicles on safety of other vehicles
- Influence of natural weather changes on safe driving



- Traffic citations for speeding
- Traffic congestion caused by road repairs
- Inconvenient use of in-vehicle multimedia devices
- Inefficient traffic lights

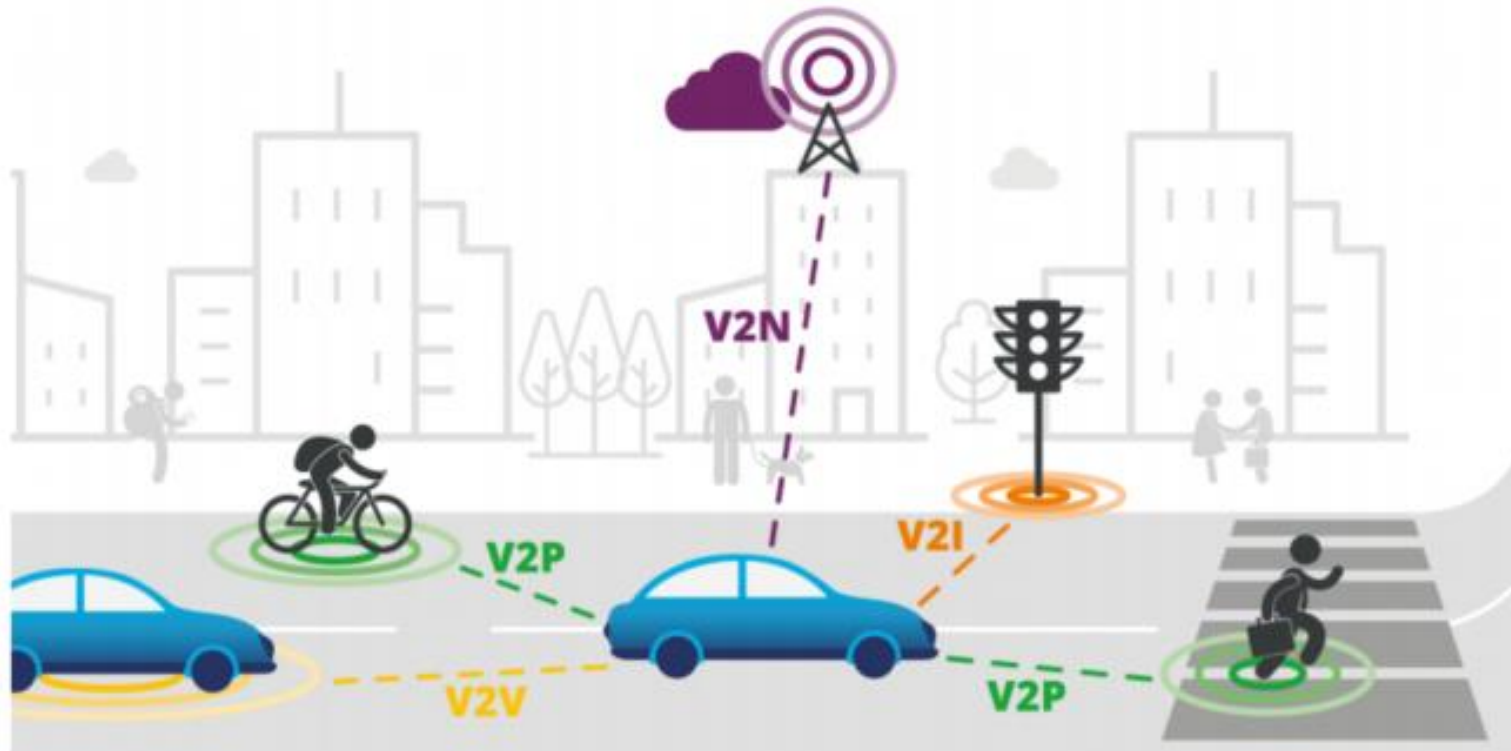


- No obvious differentiation of insurance rates
- Private use of company vehicles
- Difficult fleet management
- ETC, parking fee recharging, etc.

What is IoV?

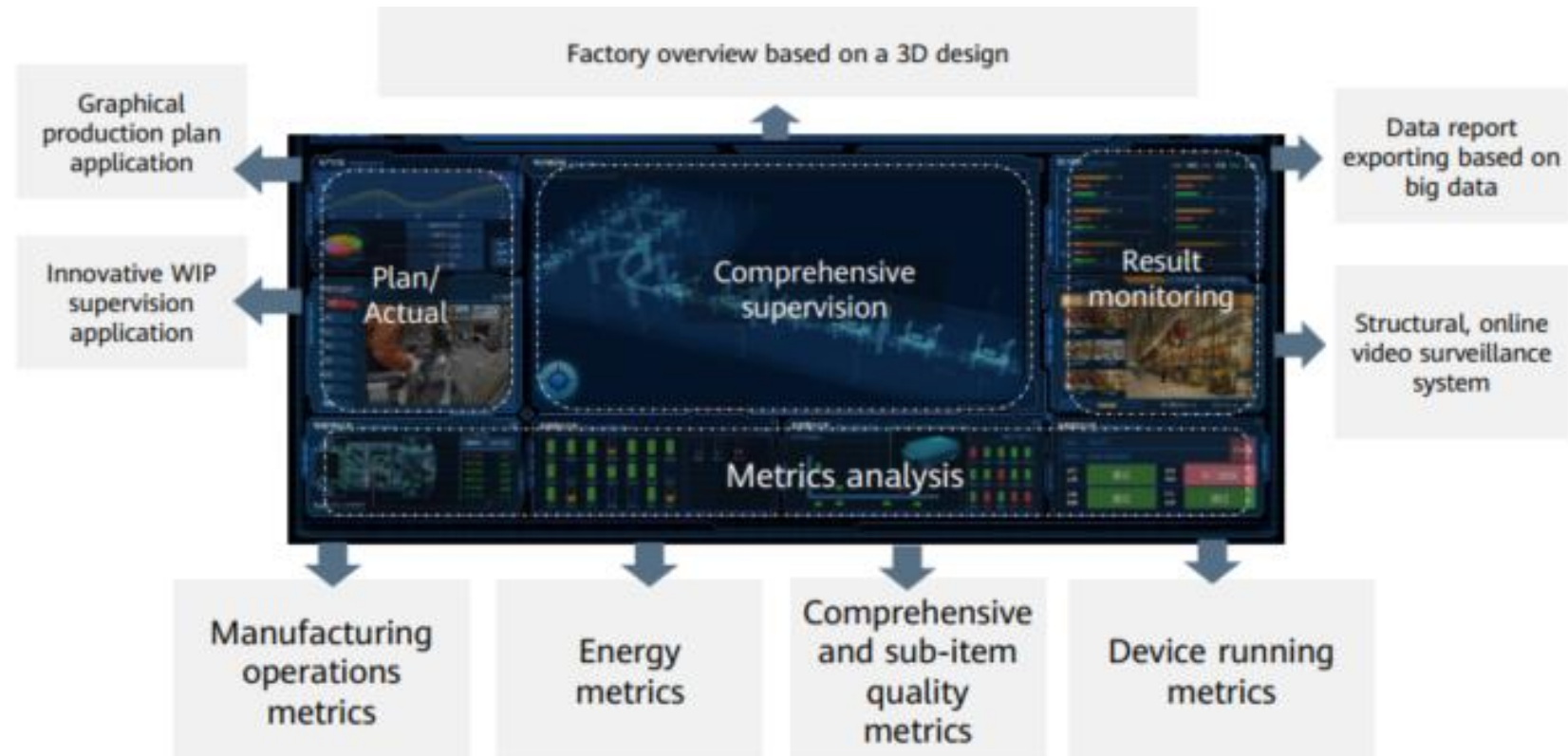
- Internet of Vehicles (IoV) means that **in-vehicle devices** on vehicles use **wireless communication technologies** to make full use of all dynamic vehicle information on **the information network platform** and **provide various functions** and services during vehicle running.
- ❖ **IoV has the following characteristics:**
 - It provides assurance of the distance between vehicles to reduce vehicle collisions.
 - It provides real-time navigation for drivers and communicates with other drivers and network systems to improve traffic efficiency.

V2X



Chapter
01

Integrated Intelligent Factory Production Management Platform



IoT Key Events: Evolution of NB-IoT Standards

The IoT has multiple eyes, noses, tongues, ears, and skins for sensing. Big data is sensory information obtained by various sensing organs. Cloud computing provides memory and storage. AI is cognition and decision-making. The essence of information technology (IT) and data technology (DT) development is personalization and intelligence. The intelligent era is inevitable.





Thank You