



Yangtze Optical Fibre and Cable Joint Stock Limited Company

Stock Code: 601869.SH 06869.HK

ADD: No.9 Optics Valley Avenue, Wuhan, Hubei, China(P.C.: 430073)

Tel: 400-006-6869 Email: 400@yofc.com

en.yofc.com

Facebook: Yangtze Optical Fibre and Cable Joint Stock Limited Company

LinkedIn: Yangtze Optical Fibre and Cable Joint Stock Limited Company

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YOFC FTTD Solution



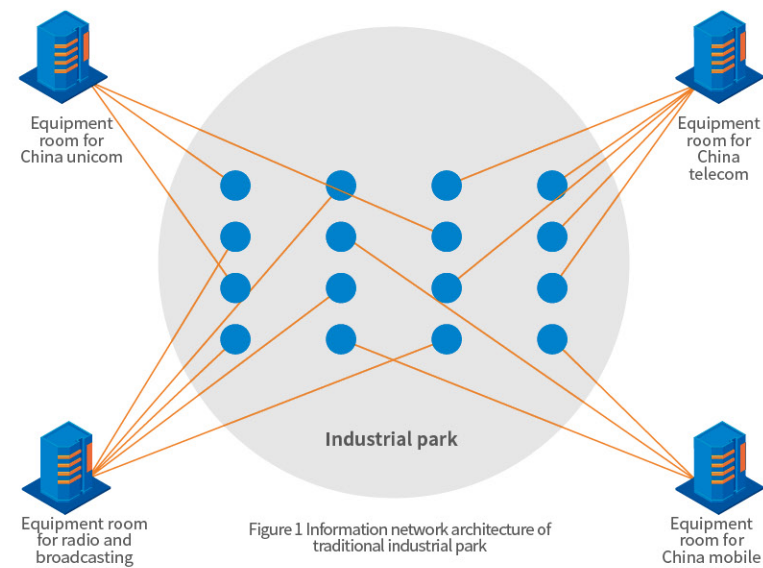
Background of Traditional Industrial Park

There is a serious misunderstanding in the construction of communication facilities in the industrial park.

The communication facilities of the industrial park can be handed over to the telecom operators for construction in accordance with the laws of the market. The guidance and investment of the relevant government department (Industrial Park Management Committee) are unnecessary.

Current status

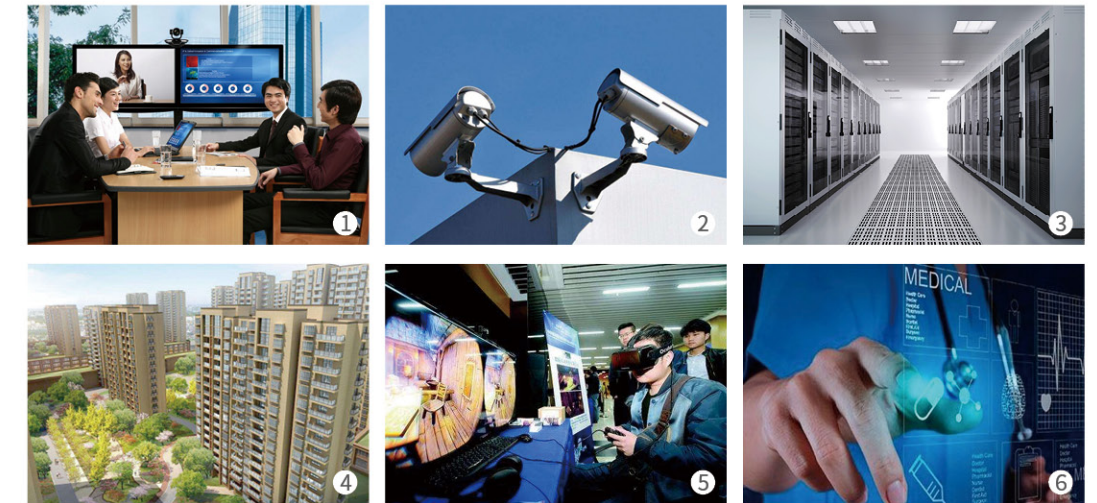
1. High enterprise informationization cost
2. Large investment in informatization construction
3. Platform construction being seriously lagged behind



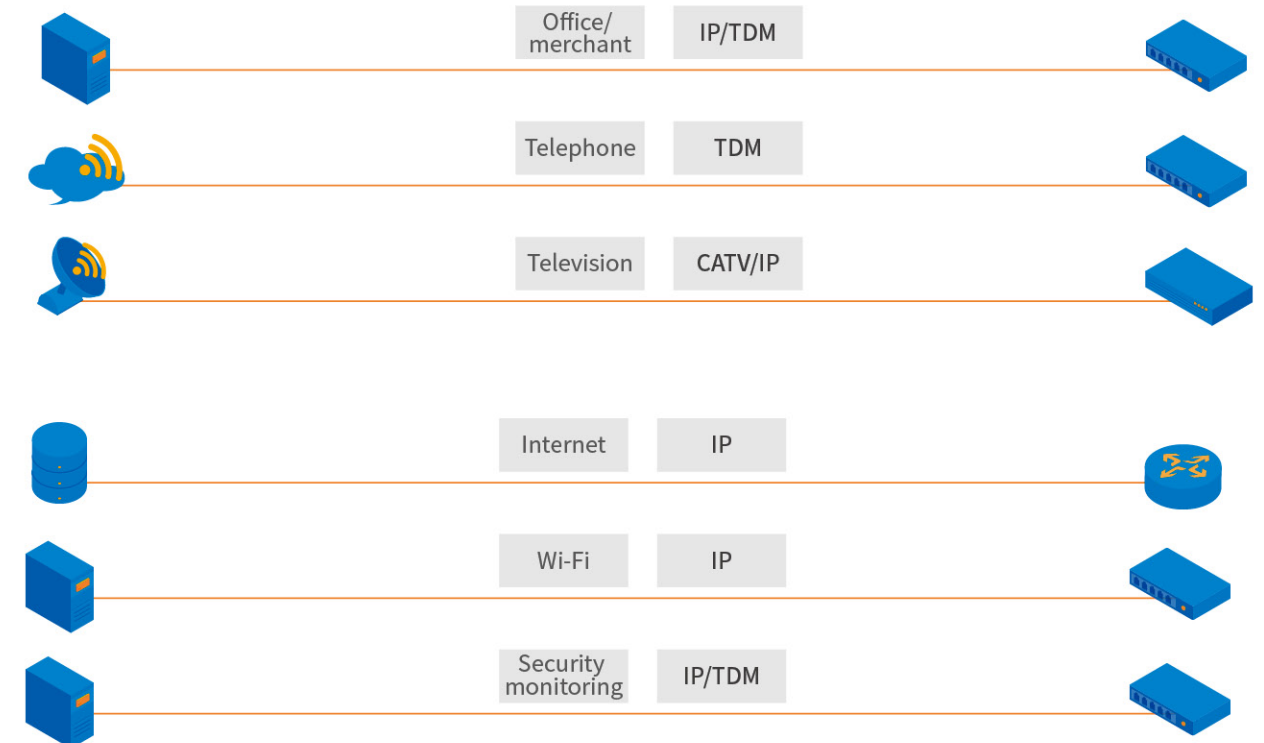
Challenges of Networks for Traditional Industrial Park

Requirements on network performance in respect of broadband and low-delay service

- ① Online video conference
- ② Video monitoring
- ③ Data Center
- ④ Broadband access
- ⑤ Remote VR/AR
- ⑥ IoT application



Traditional Stovepipe Network Resulting in Network Complexity

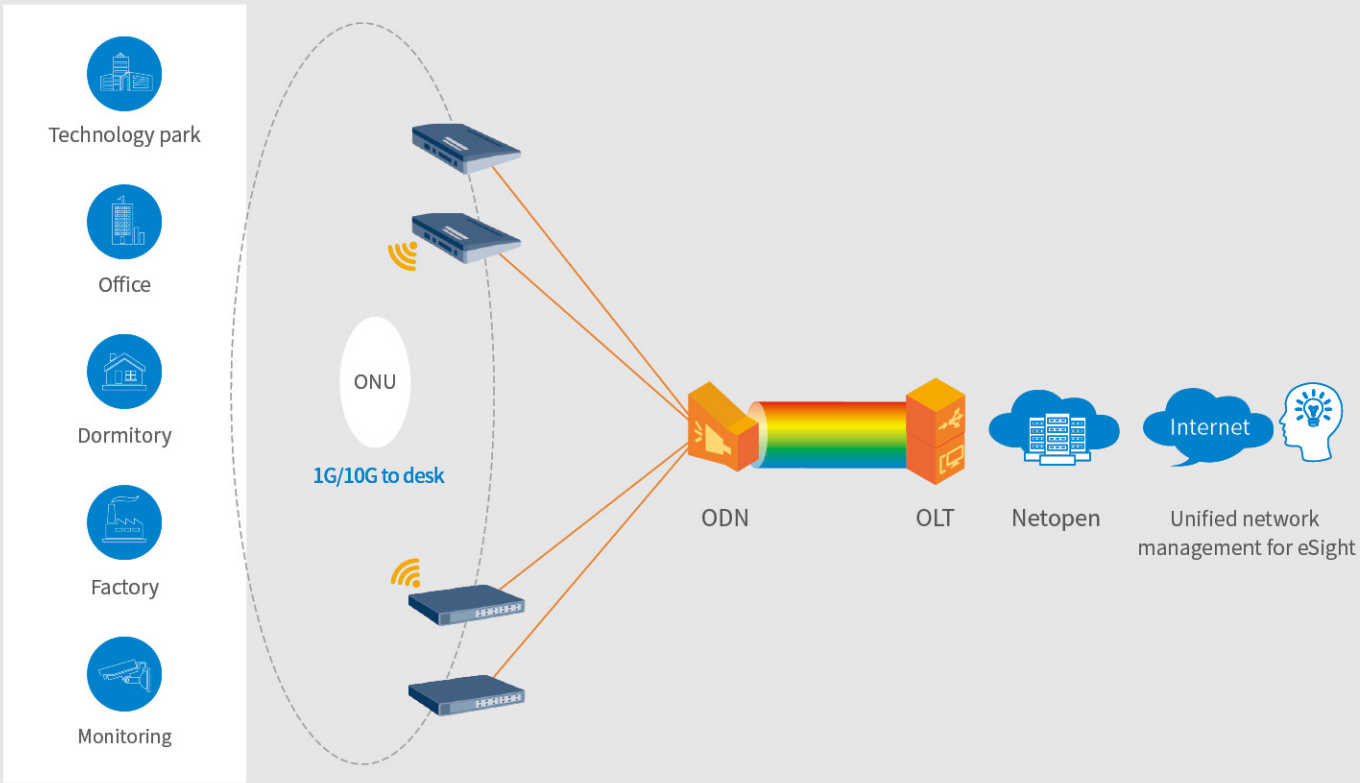
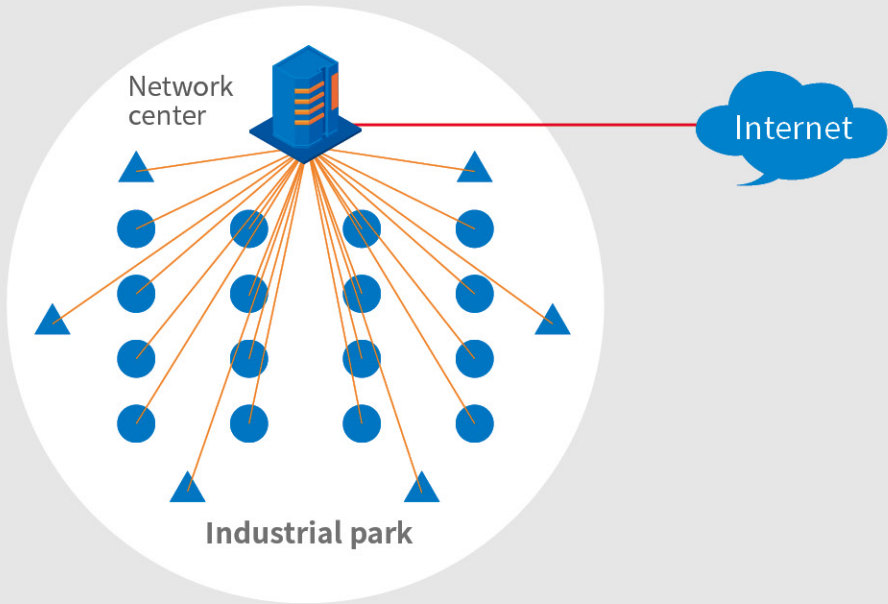


YOFC FTTD Solution

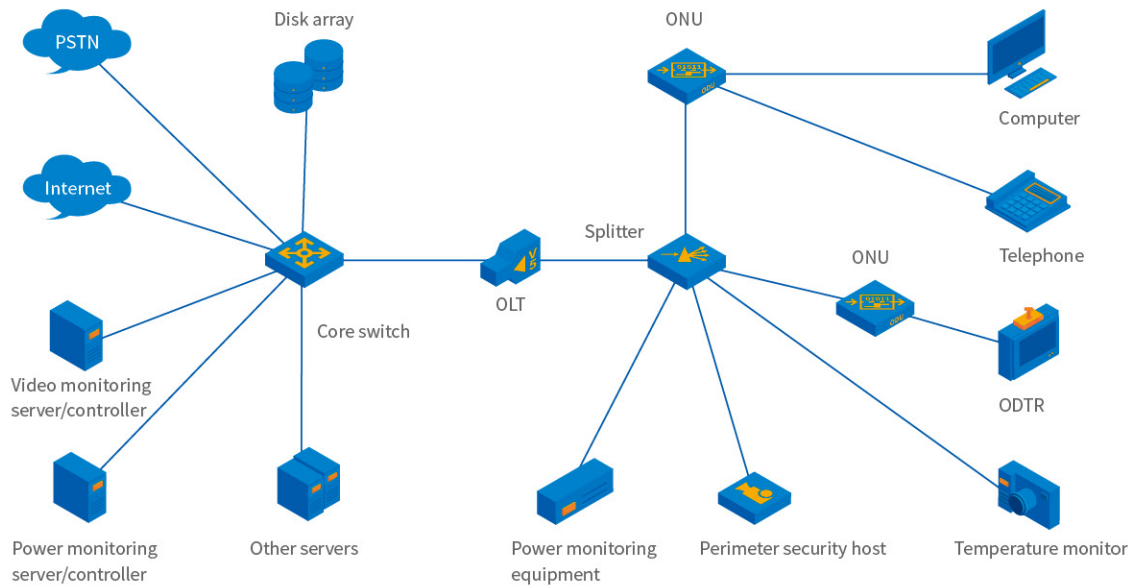
The information points involved in the industrial park management will be directly connected to the network center through the optical fibre links. Therefore, the network center will be responsible for the Internet export of the entire industrial park. All information systems of the park rely on its unified top-level network architecture.

Information network architecture of traditional industrial park

- Enterprise
- ▲ Information point



For the solutions to physical connection and protection of the "fibre" distribution network, the master of optical fibre/cable will be more professional in integrated ODN solutions. It is capable of the integrated solution covering planning, design and implementation, and has strict specifications and standards.



Fibre to the desk (reducing delay)

- Fibre to the desk (the bandwidth smoothly evolving to 10G)
- Two-layer flattened network (reducing delay)
- One fibre providing services such as broadband, telephone and TV to facilitate business expansion

Simplified project deployment and accurate fault locating

- Accurate fault locating to reduce difficulties in maintenance
- All-fibre passive network, reducing 60% equipment, 80% equipment room and 60% power consumption
- Simplified project deployment, reducing horizontal cabling in buildings by 70%

Summary of the Advantages of YOFC FTTD Solution



Saving cost

Reduced work quantities, reduced maintenance, and TCO saved



Security and reliability

Line encryption, user authentication, no electromagnetic interference, and preventing electronic eavesdropping



Simplified management

One network providing all services, covering 20Km



Green and energy saving

Passive ODN, no air conditioner required and power saving



Saving space

Reduced trunk optical cable ducts and space in the equipment room saved

YOFC FTTD Solution

Full range of optical cables and ancillary products

- YOFC has differentiated ODN products, such as MPO sub-units and wiring products for the data center, high-density distribution frames, and ODN products related to micro-tubes and micro-cables.
- Scientific products meeting all standards
 - Environment friendly
 - Fast customization service
 - High quality and low cost
 - Integrated solutions for blowing-type micro-tubes and micro-cables (for industrial park, access network and MAN)
- Solution for connection and protection of large-core micro-cables in manholes in confined spaces
 - Pre-connected FTTD products and fibre modules for G.657 bend-resistant fibres being incorporated
 - Training base for fibre construction
 - Specifications and operation manuals for blowing-type, mechanized and manual placement
 - Customized placement solutions for different park scenarios

• Optical fibres and cables



• ODF, MODF



• Outdoor units



• Indoor units

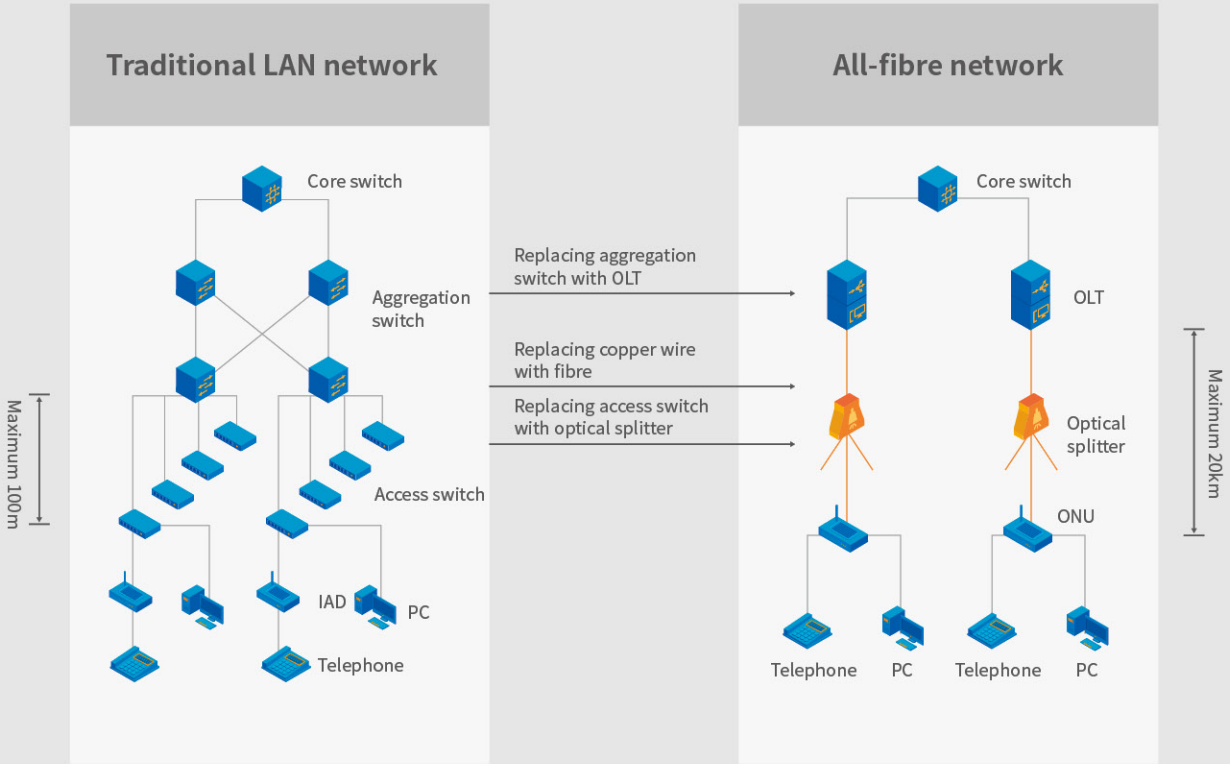


• Household units



YOFC FTTD Solution - Compared with Traditional Solutions

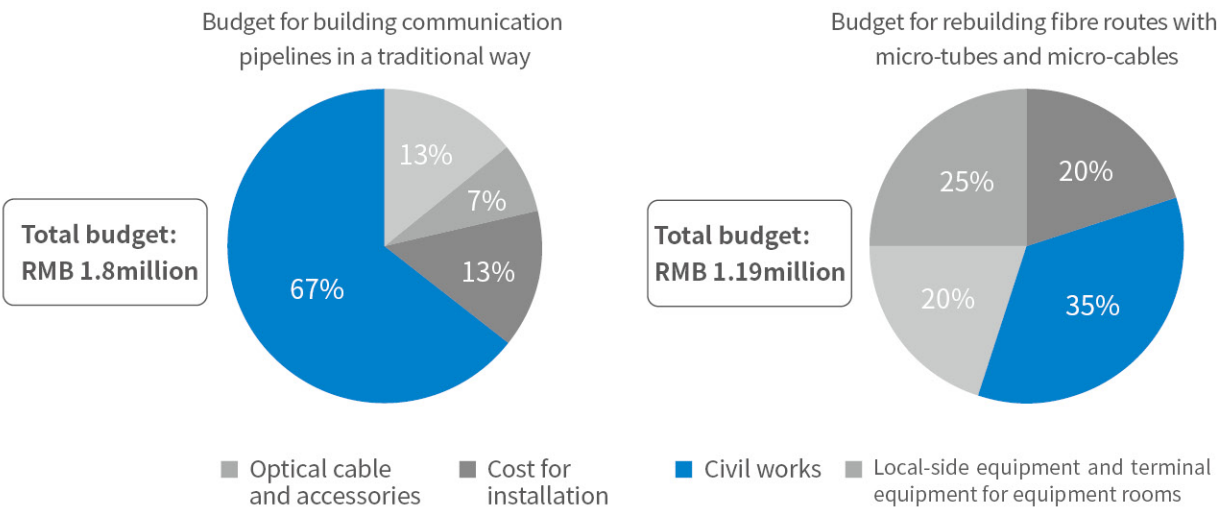
Items	Traditional LAN	All-fibre network
Scope of coverage	100m	20 km
Energy consumption	High	Splitter featuring with no power consumption
Equipment room	Necessary	Unnecessary
Air conditioner	Necessary	Unnecessary
Manual maintenance	Necessary	Unnecessary
Electromagnetic interference	Yes	No
Cabling ladder	Big	Small
Voice service	External IAD	Unnecessary
Line quality maintenance	Oxidizability, 6-8 years of service life	Stable performance, 15+



Placement Methods for Micro-tubes And Micro-cables

• If the all-fibre network is adopted in a technology park, the network construction costs and energy costs will be significantly reduced, and the bandwidth can be smoothly expanded.

Civil construction costs being effectively reduced:



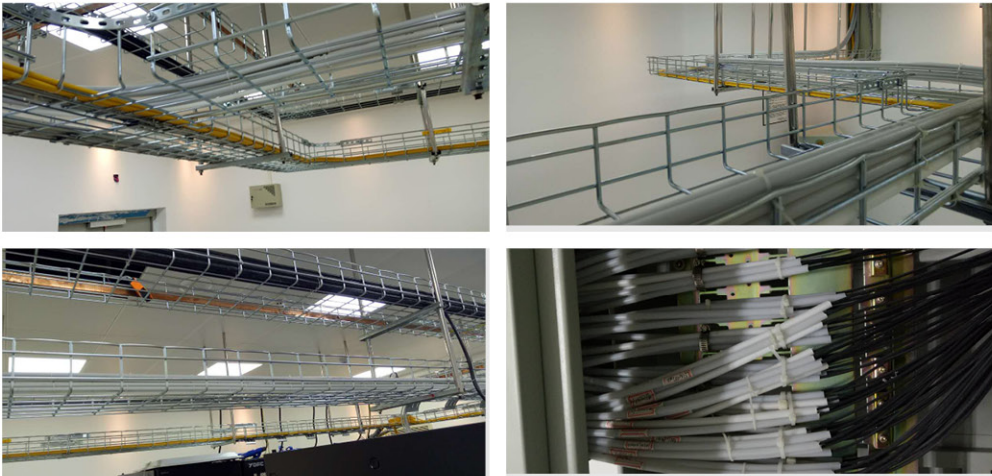
More efficient fibre placement:

Work content		Time	1-5	6-10	10-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50
Construction of micro-tubes and micro-cables	Cable construction											
	Construction of micro-tubes											
	Blowing for micro-cables											
Construction of cat-5 lines	Cable construction											
	Construction of LV cable trays											
	Wiring of cat-5 lines											

YOFC FTTD Solution - Implementation Methods

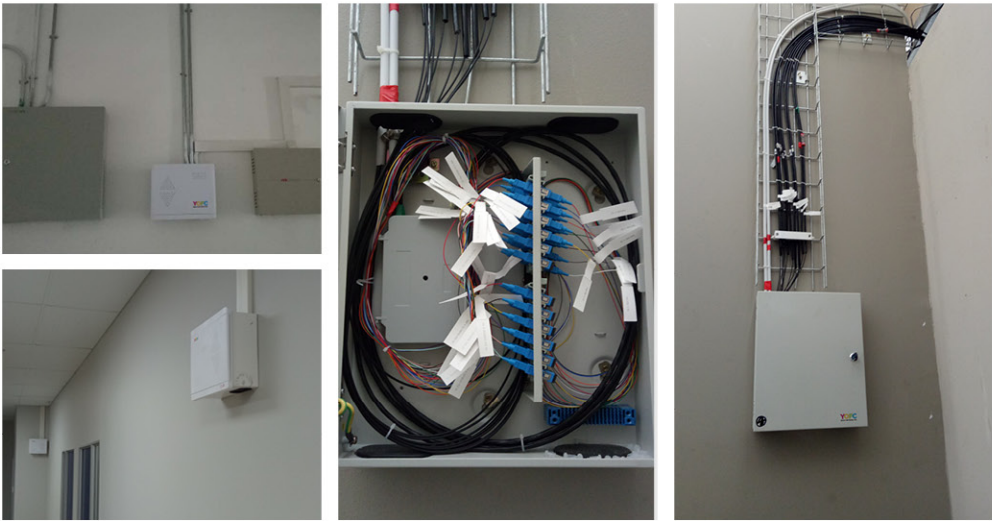
Implementation advantage 1

- Replacing KBG tubes and trunking with flux tubes reduces material costs.
- The requirement on construction skills for placement of microtubes is relatively low. Therefore, the placement can be carried out simultaneously with or after the HV construction.
- Compared with the copper network, the all-fibre network is more energy efficient.



Implementation advantage 2

- There are a lot of wiring scenarios applicable, such as being embedded in the wall, being fixed on the wall, being fixed with other pipelines and being placed on cable trays.



Implementation advantage 3

- It features with high maintainability and expandability in the later stage. Each micro-cable of the blowingtype micro-tubes and micro-cables has a separate micro-tube route. Therefore, the expansion and maintenance in the later stage will not affect the existing fibre network. In addition, with the aid of the blowing machine, the construction efficiency is several times that of the ordinary copper wire network.
- High reproducibility



YOFC FTTD Solution Deployment Cases



Case - An Industrial Technology Park

Overview

This industrial technology park is the first one with circular economy for an industrial product in China, and the largest manufacturing base in the world. It was jointly built by corporations from China, Japan and France as well as the local government, and the Phase I was put into operation in 2016, with total investment of RMB 1,000 million.



Construction planning for all-fibre network

• Public areas

All-fibre networks shall be deployed in public areas such as roads, perimeters, plazas, canteens and parking lots to provide service for LV systems such as security monitoring system, fibre perimeter security (special fibre) system, one-card system, parking management system and patrol system.

• Office areas

The all-fibre network shall be deployed in the office areas to provide service for office OA systems and telephone systems. The all-fibre video network shall be deployed in the production areas.

• Screening and testing areas

The all-fibre network shall be preferentially deployed in the screening and testing areas of the factory to provide service for the intelligent manufacturing system.

• Other production areas

The micro-tubes of the all-fibre network shall be laid in other production areas of the factory to reserve conditions for future use and to lay the foundation for the complete coverage of the all-fibre network in the future.

Advantages

• Simple network structure

Passive network featuring with fewer fault points facilitates maintenance.

• High security

Dual-route protection is safer than the ring network protection, resisting multiple points of failure.

• Low cost for wiring

• High anti-jamming capability

• Space saving

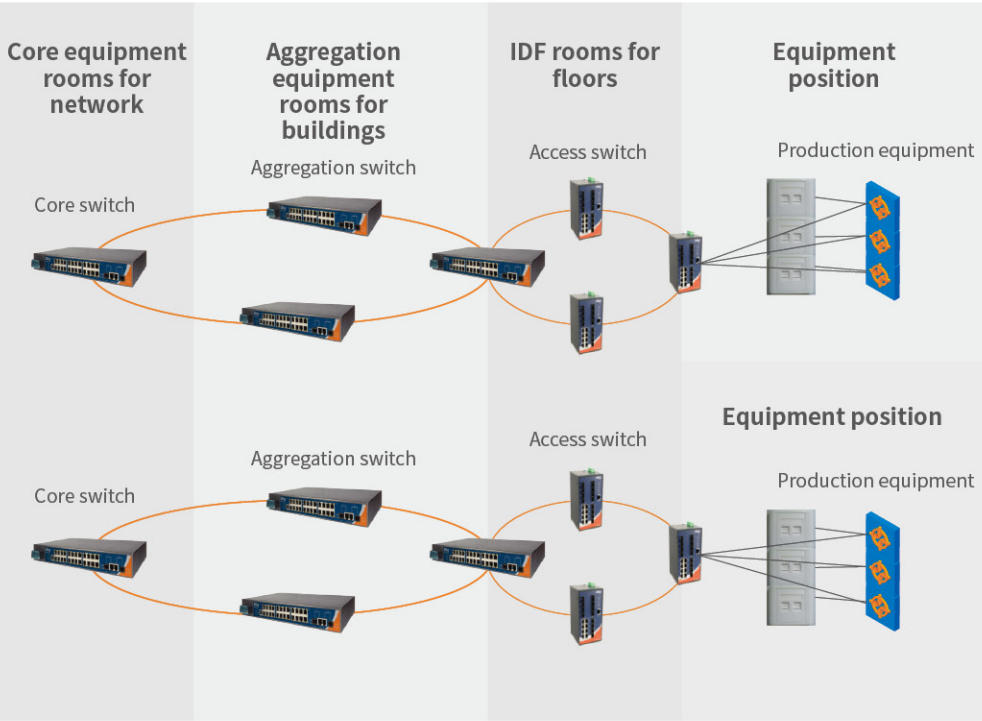
Compared with the network cable, it saves cabling space.

• More convenient in expanding, upgrading and reconstruction

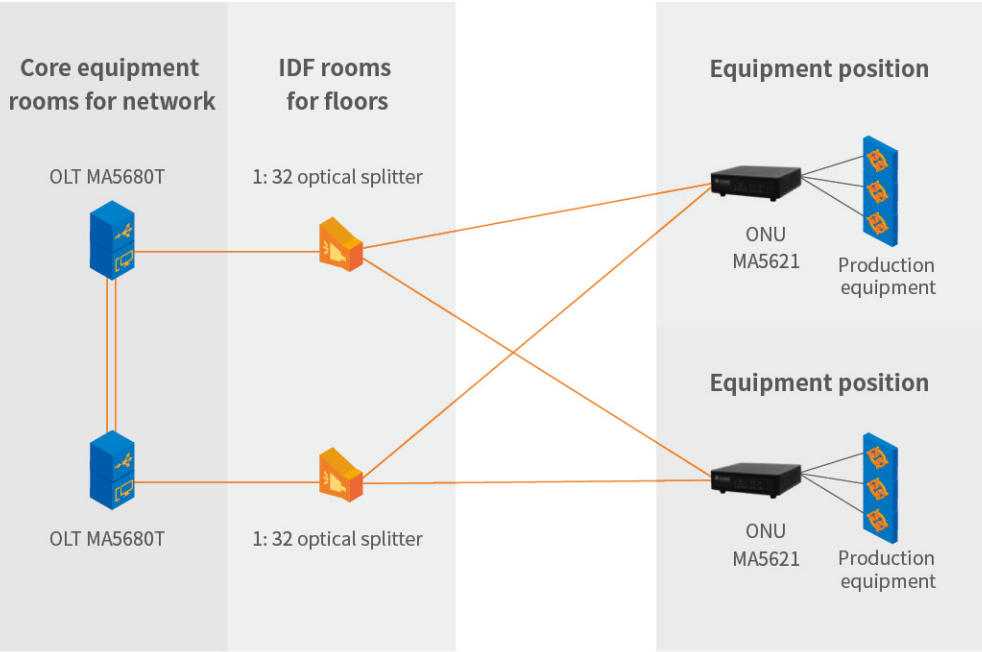
Fault switching time: all-fibre network: < 50ms; ring-type industrial Ethernet: 50-200ms

Industrial ethernet and all-fibre network

The industrial Ethernet is technically compatible with the commercial Ethernet (i.e., IEEE802.3). For the product design, it can meet the requirements of industrial sites in respect of material, product strength, applicability, real-time performance, interoperability, reliability, anti-interference performance and inherent safety. However, there are still some problems such as excessive networking levels, difficulties in maintenance increased and overlong network cables being vulnerable to the industrial EMI.



The all-fibre network can not only fulfill the increasingly high-bandwidth service requirements of the park, but also meet the requirements of the industrial environment. The industrial all-fibre network features with a simple structure, strong capability in anti-electromagnetic interference, and facilitating maintenance, expansion and upgrade in the later stage as well as the improvement and transformation of the office and production areas.



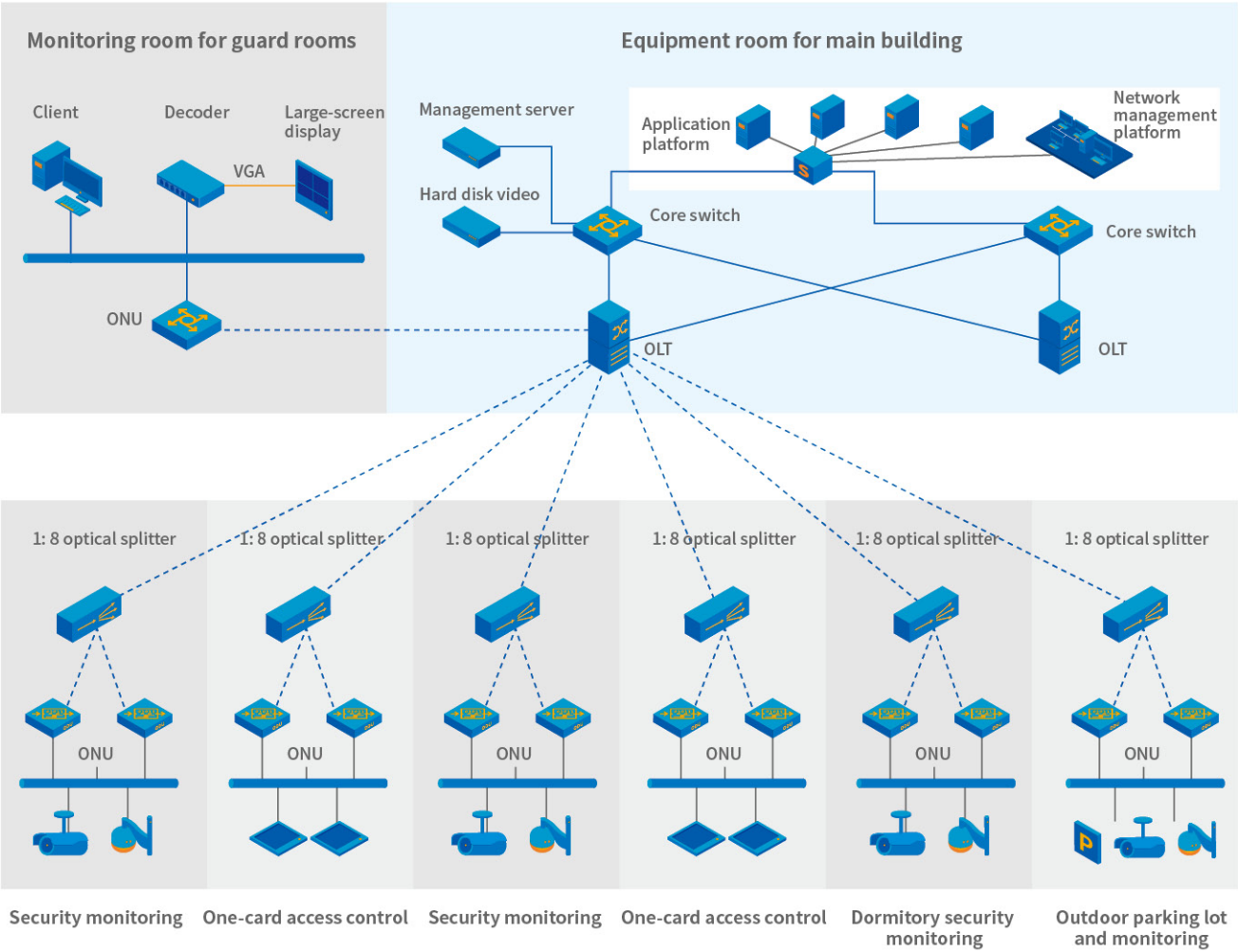
Case - Industrial Park for Headquarters of a Group

Overview

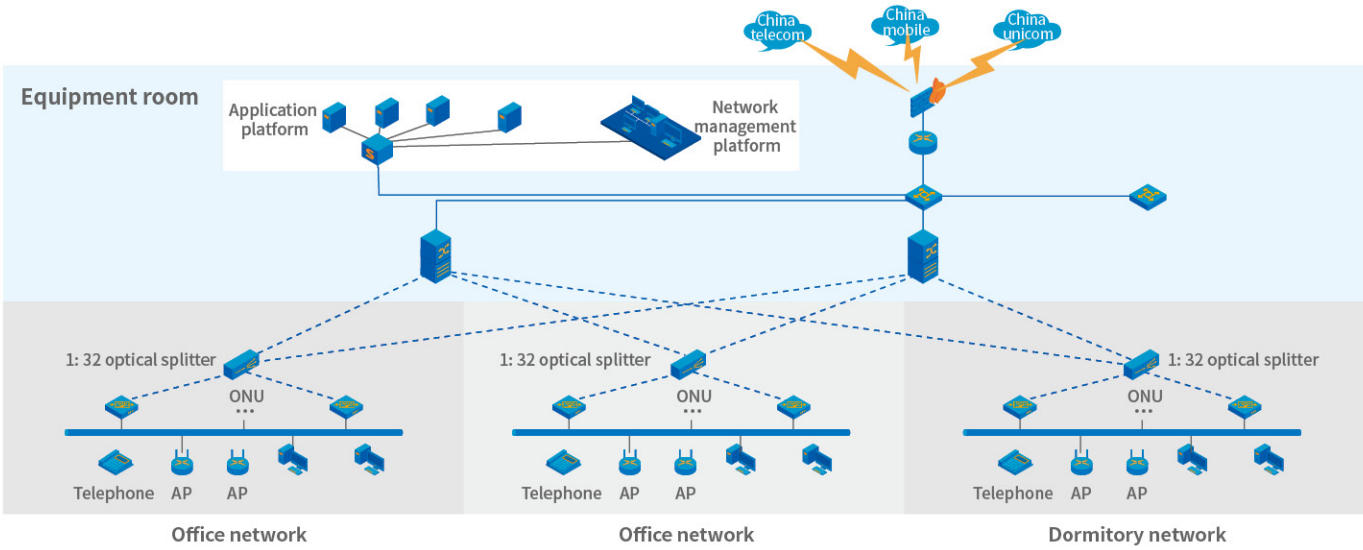
The total investment of the group's industrial park project is more than RMB 100 million. The construction site is located in Bao'an District, Shenzhen, and the gross area is over 6w m².



Services such as access control, monitoring, network communication and telephone are integrated. All surveillance cameras and access control devices are regarded as information points/user terminals. All devices collect information or control through the background server/controller, and the unified fibre network is used to transmit information.

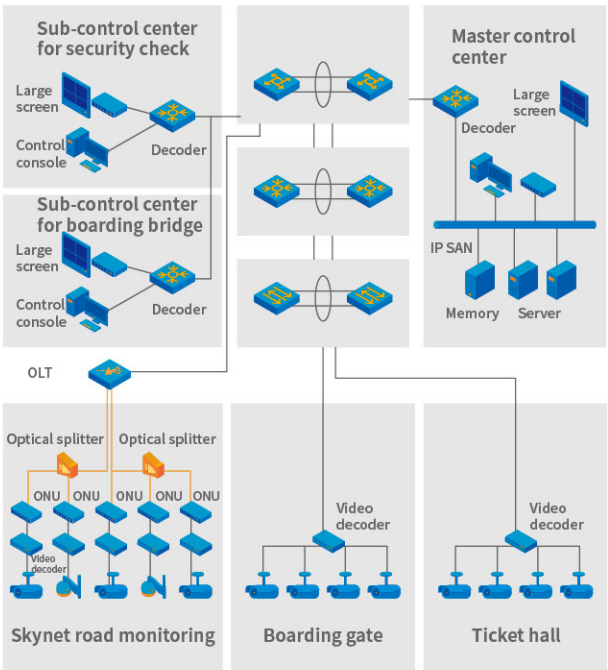


There are more than 3,000 information points in the main buildings of the project, including those for meeting the network requirements of the office and production lines. The FTTD Solution effectively solves the issues concerning the use of large numbers of copper cables in traditional networks.



Customer demands

- The number of bidding videos in T2 Terminal is 176 (maximum 4 real-time pictures per channel).
- The video monitoring encoder is deployed in each security equipment room, and the decoder is deployed in each master control/sub-control center.



Solution

- The skynet road monitoring access network adopts the xPON access solution, and the boarding gate monitoring adopts the LAN access solution.
- Each sub-control center and master control center are connected to the core switch of the video monitoring network through a switch.
- The video monitoring network adopts a standard three-layer network structure, featuring with clear layers and facilitating maintenance.

Customer value

- Standard three-layer network structure, and high network reliability
- Strong expandability, facilitating network expansion, and capabilities of the video monitoring network improved
- PON chain networking to avoid single point failure

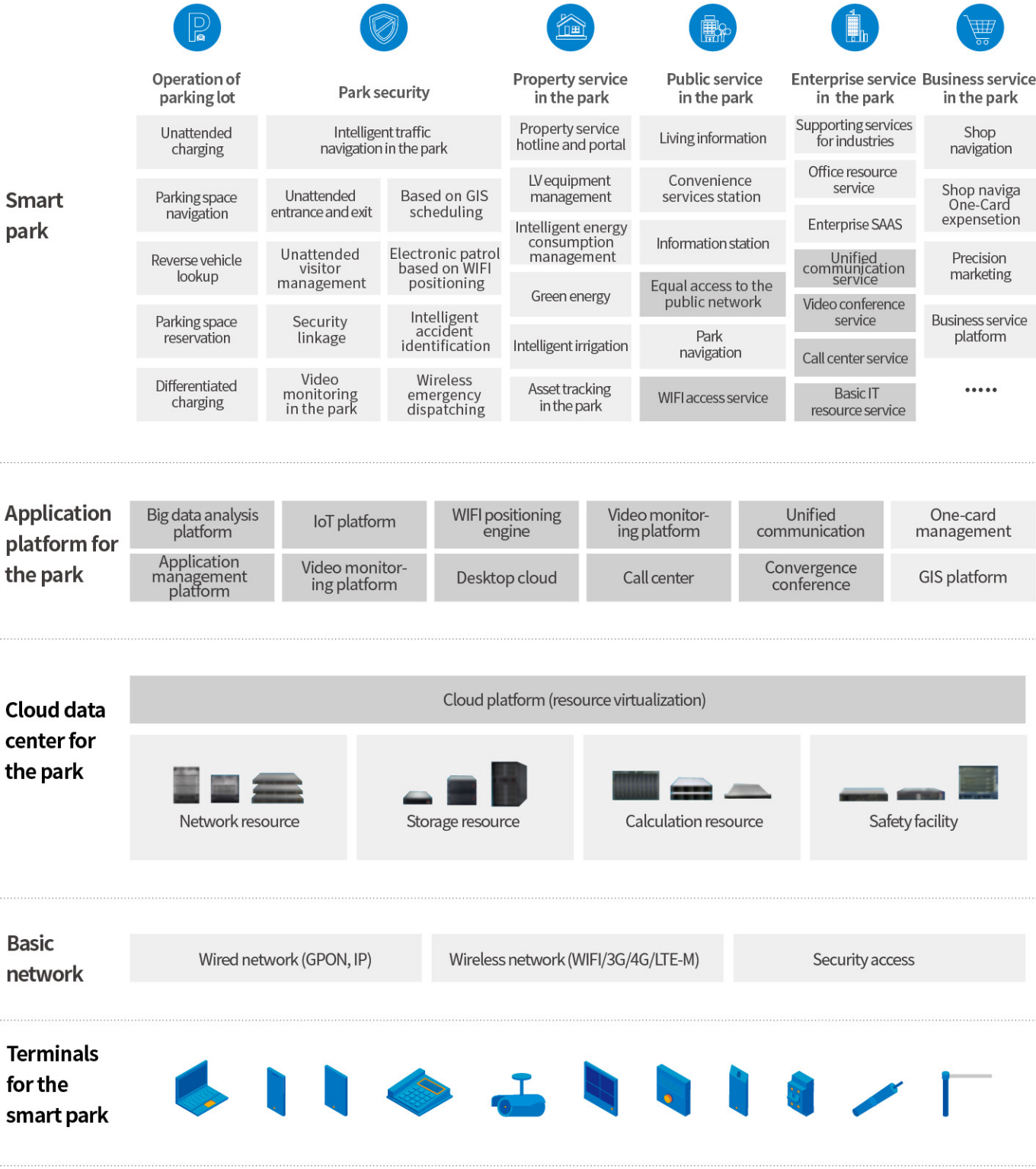
ICT Pattern of the Industrial Park in the Future

At present, the all-fibre network technology has been widely popularized in the community/household broadband market, and the promotion of the all-fibre network technology to the LAN of the park is an important strategic measure of YOFC. YOFC utilizes its advantages in optical cables, optical components optical equipment, and planning design and construction technologies for the all-fibre network to establish a complete set of solutions and standards for all-fibre network, integrate LV terminal equipment and network equipment and lay the foundation for promoting the popularization of the all-fibre network in the LAN of the park.

In the future, the all-fibre network will also be extended to the terminal equipment. The terminal directly provides an optical interface to realize the all-fibre network connection between the data center and the terminal, and the application fields of the full range of optical network products will be developed.

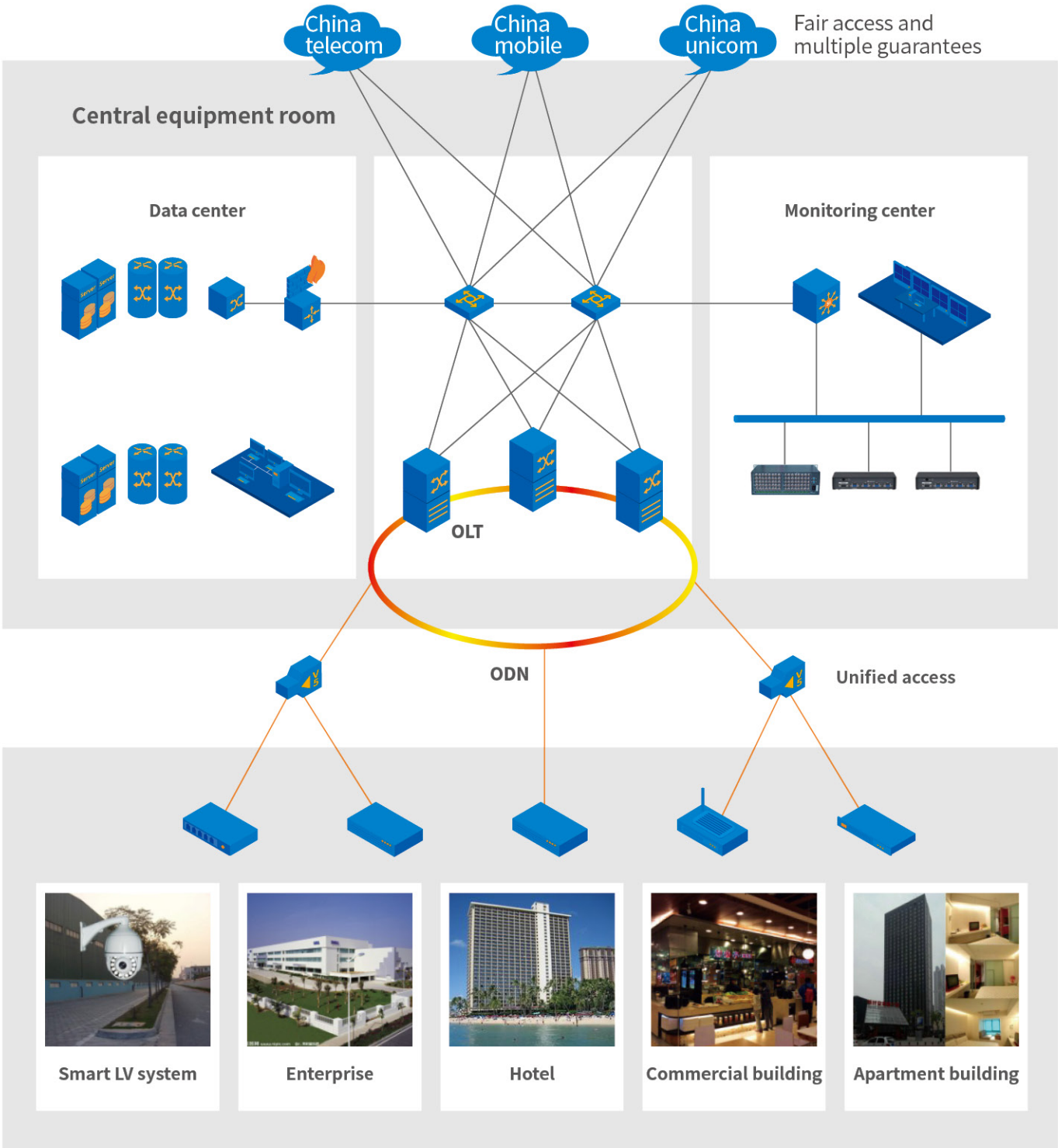


Logic Function Architecture for Smart Park

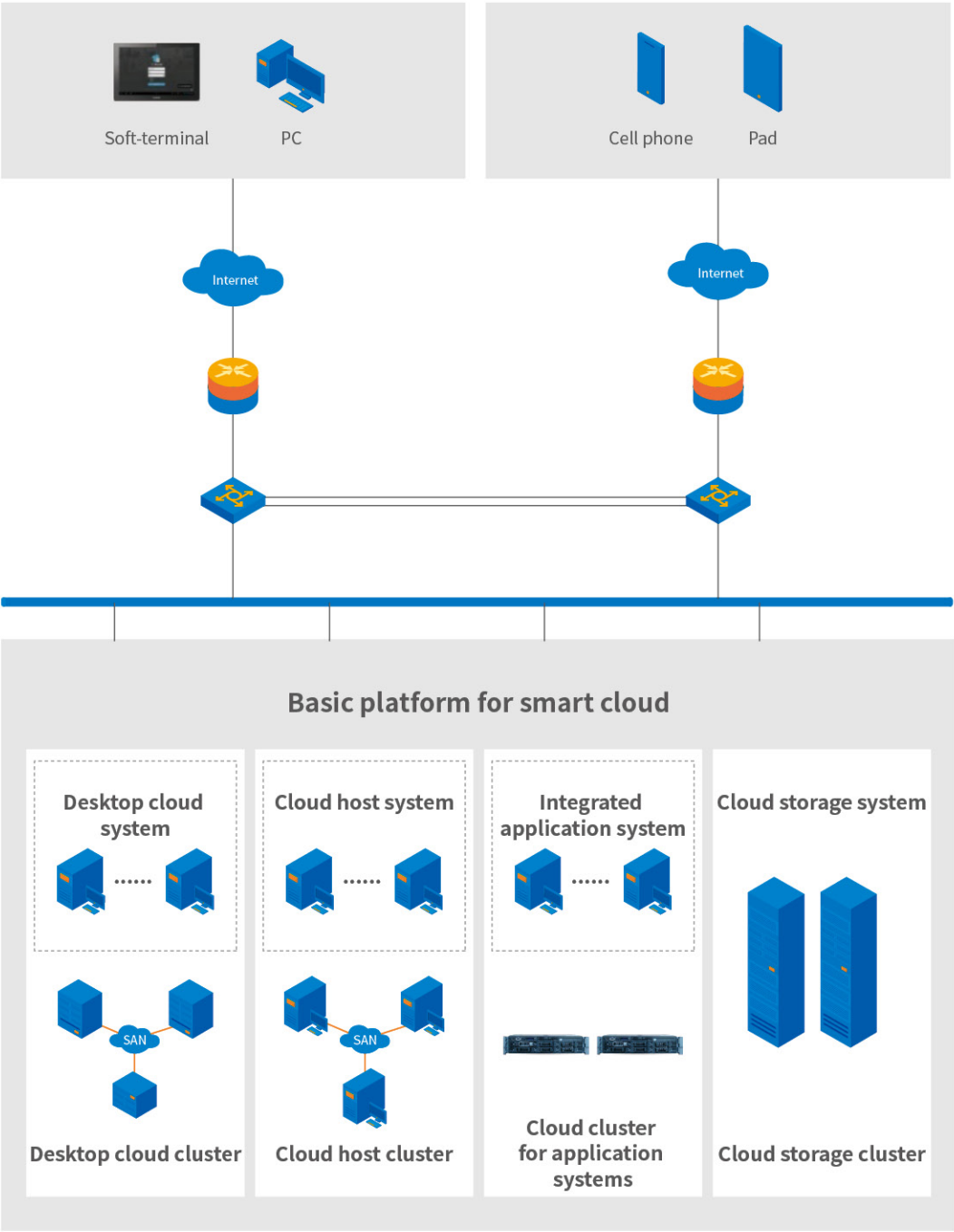


Introduction to YOFC' s Solutions for Smart Park

Network architecture for smart park



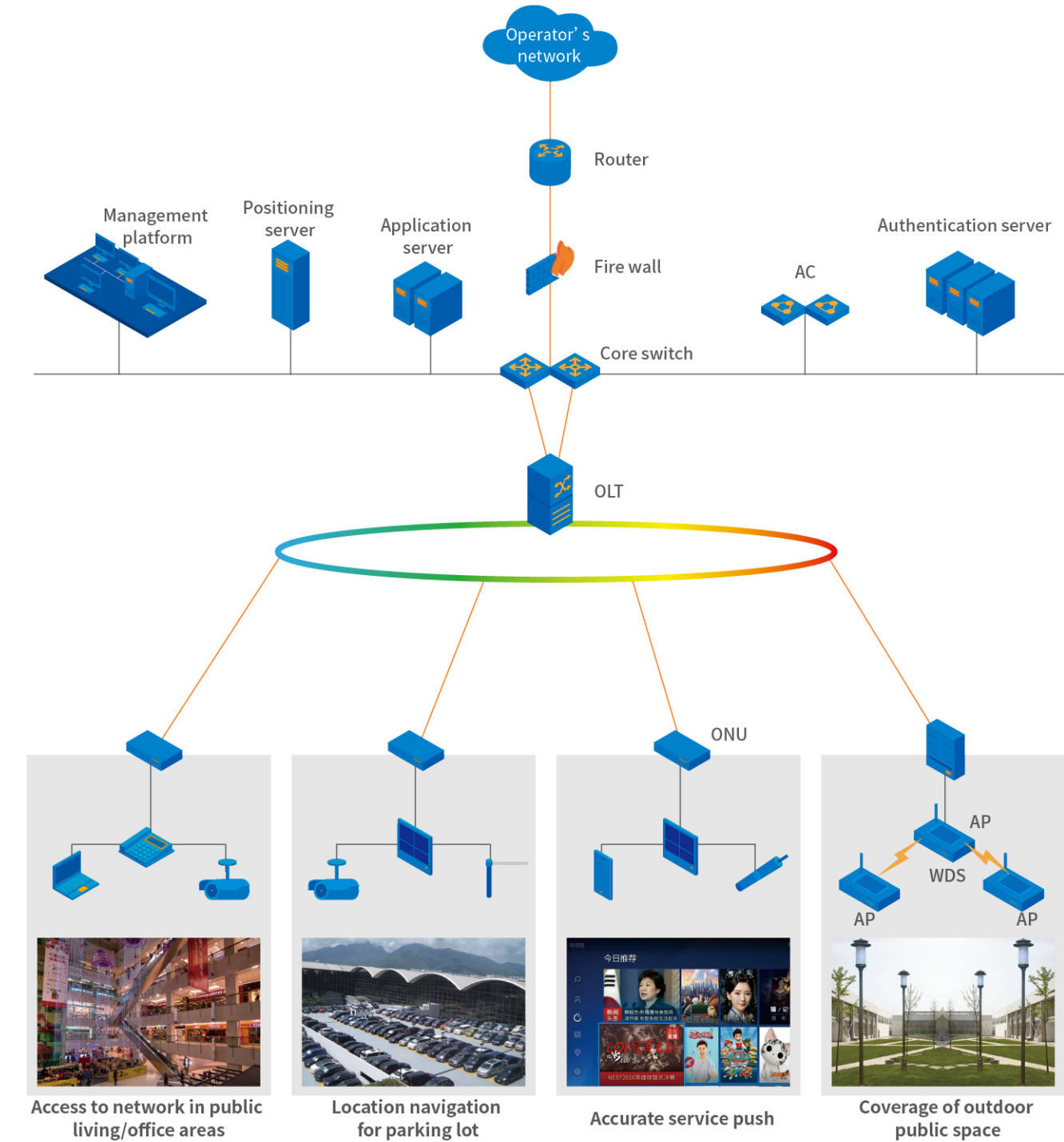
Cloud platform for smart park



- High software/hardware protection level, strong capability in redundant backup, strong capability in disaster tolerance and disaster resistance, and security level well above that of the general equipment rooms for enterprises
- Network isolation is performed according to different functional modules of the cluster, the data center network is divided into multiple service areas, and the logic isolation for network is implemented between service areas through firewalls.

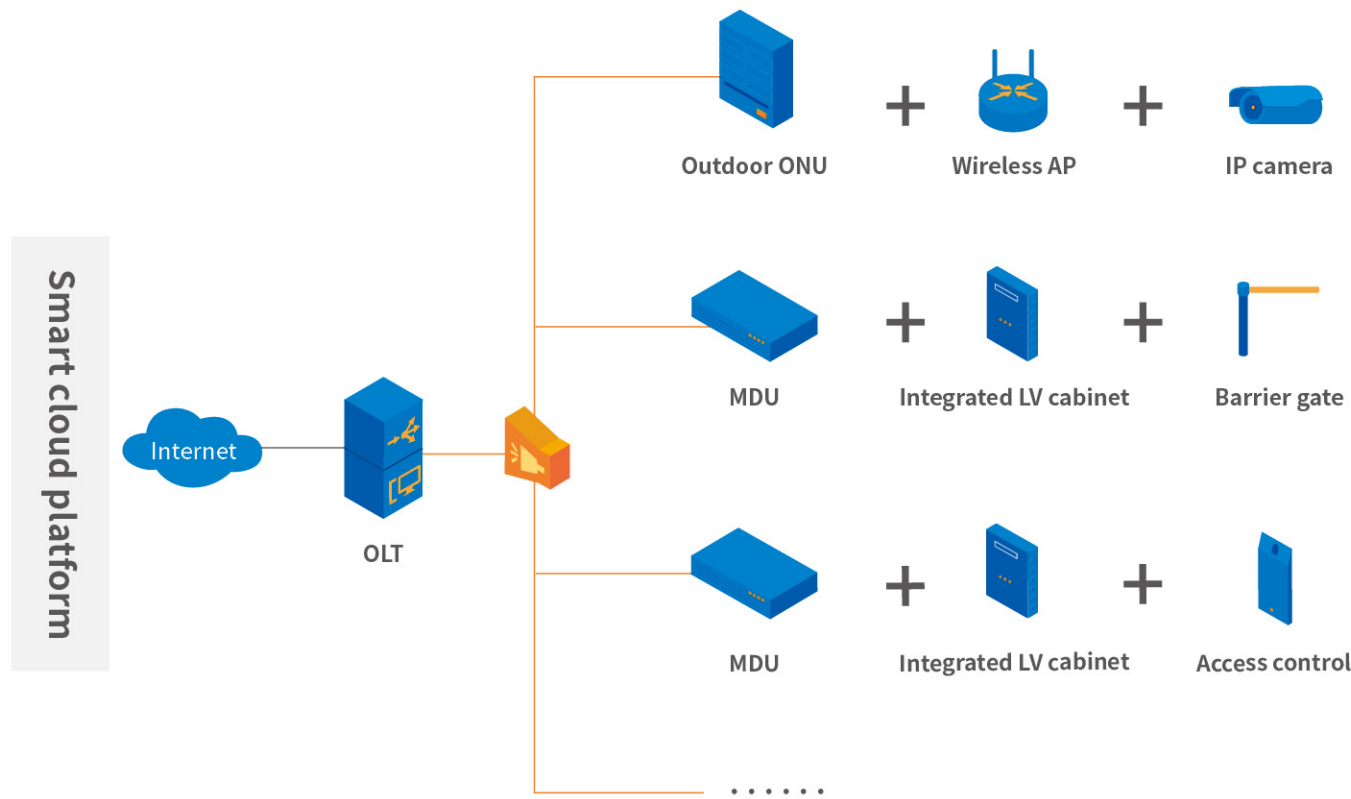
Wireless network coverage for smart park

- Enjoy access anywhere, anytime, in major venues such as living areas, dining areas, entertainment areas and public service areas.
- Employees of property companies, operators or enterprises realize mobile officing in the park.
- Provide design for location-based wireless value-added services such as location navigation, reverse vehicle lookup and accurate service push.



LV system for smart park

- A dedicated LV aggregation OLT is deployed in the central equipment room to ensure the data and LV networks are physically isolated at the access layer to avoid interference. The LV terminals are accessed through MxU, and some non-IP terminals are switched to the IP mode to access the GPON network through the protocol adapter.
- The LV dumb terminal is securely accessed by MAC binding. Different LV subsystems are equipped with different VLANs, and there are 2 isolation layers to avoid access between LV terminals and to ensure the data security.



All-fibre network,
unified bearing

IP-based LV terminals, complete access

Almost all systems can be accessed

			
Fire alarm	Perimeter security	Intelligent broadcast	Intelligent electricity meter