



Huawei Smart City Solution

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What is Smart City?

- 1 ICT-enabled solutions, addressing city challenges
- 2 Time-efficient, cost-effective systems
- 3 Advanced intelligence, diversified services, widespread benefits

ICT Blueprints for a Smart City

Smart City is a portfolio of Huawei ICT-enabled solutions for sensing, analyzing, and integrating the key information of a city's core operating systems. Smart City improves quality and intelligence of citizens' livelihood, and enhances environmental protection, public safety, urban services, and business activities.

The fast growth of ICT technologies facilitates urban construction and development. Advanced wireless networks like 4G mobile broadband (MBB) make ubiquitous connectivity possible; cloud computing makes data sharing and integration, data mining and analysis possible; Unified Communications and Collaboration (UC&C) makes cross-sector collaboration possible and increases urban management and emergency response efficiency.

Huawei brings 20 years of ICT industry and a comprehensive set of solutions: Smart Government, Safe City, Smart Hospital, Smart Education, Smart Transport, Smart Grid, Smart Enterprise, and Smart Tourism.



Smart City Architecture

1

Ubiquitous connectivity

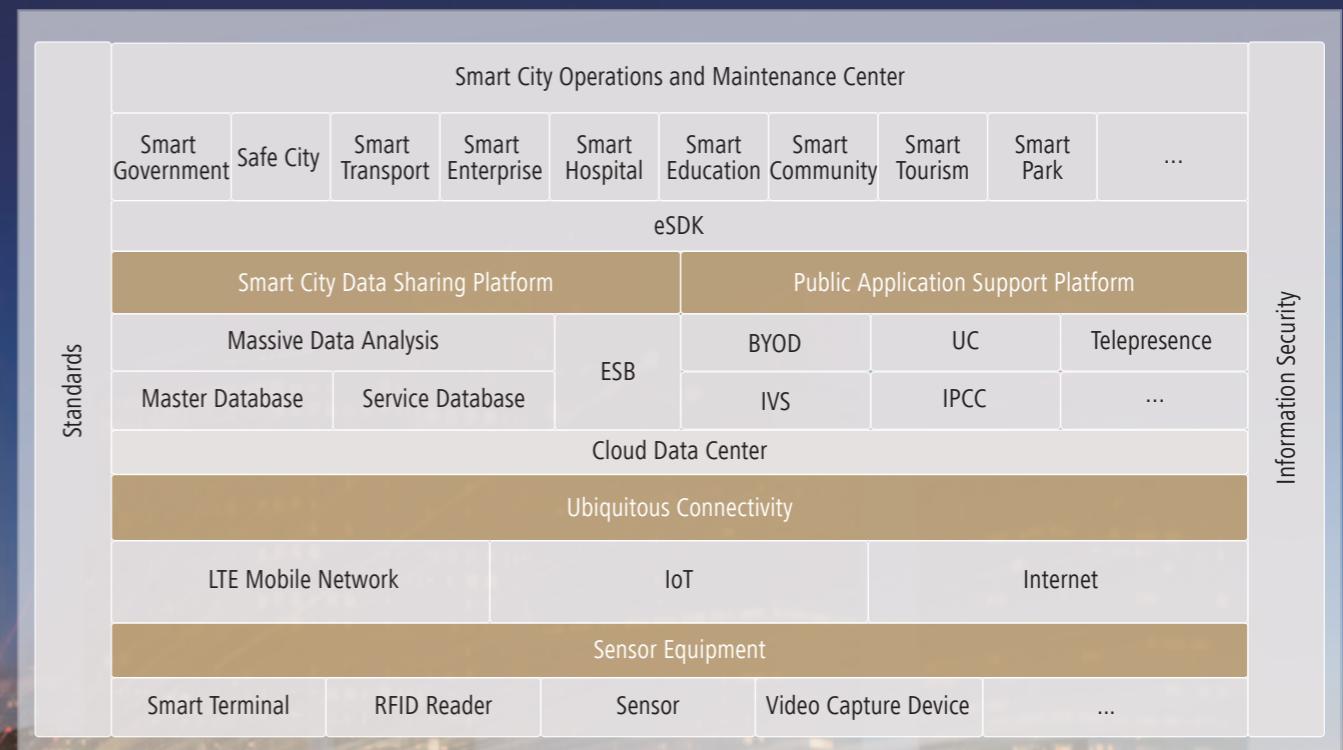
2

Information sharing and integration
Cross-sector collaboration



Smart City Reinvents Urban Architecture

Huawei Smart City Solution features ubiquitous connectivity, information sharing and integration, and cross-sector collaboration. The urban infrastructure network universally connects a city's user equipment and application terminals; the cloud-based urban data center stores, shares, and integrates the entire sector and subsystem data services; the urban information sharing platform carries various smart applications, such as Smart Government, Safe City, Smart Transport, Smart Enterprise, Smart Education, and Smart Hospital.



Smart City Solutions

Huawei Smart City consists of Smart Government, Smart Industry, and Smart Life. It integrates urban management, enterprise development, and people's lifestyle in a ubiquitous ICT-based network by making full use of communications network, cloud computing, and information collaboration. Smart City promotes stable urban development and optimal resource utilization, boosts urban intelligence coverage and increases operational efficiency, sustainability, and citizen satisfaction.

Smart Government

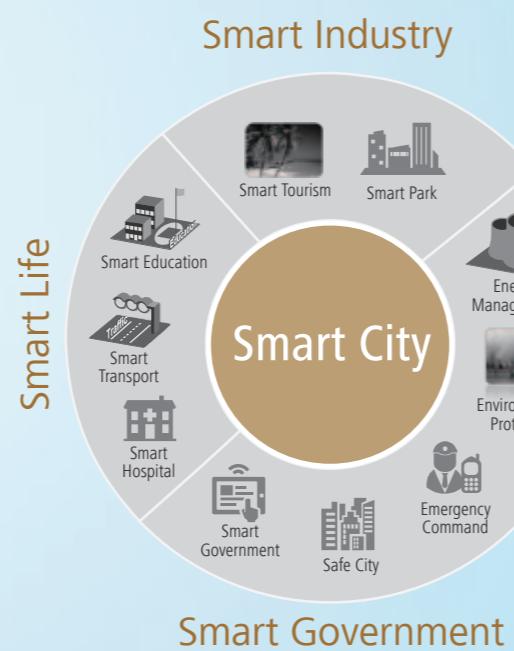
As the core of urban management, a municipal government may face challenges from public safety, urban transport, emergency handling, energy management, and environmental protection. Smart Government uses a cloud-based data center to share and integrate data, and collaborates with different sectors to optimize resource utilization and improve governmental efficiency. Smart Government represents a city's capabilities and competitiveness. It allows for open and transparent government by using a unified database management platform.

Smart Industry

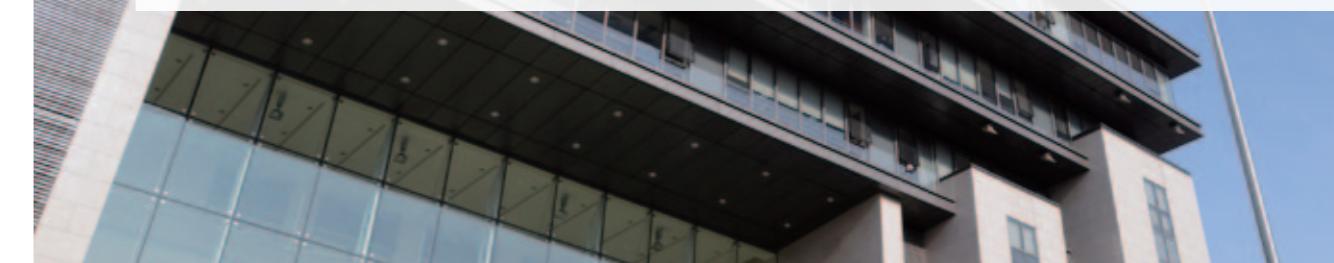
Smart Industry promotes a city's continuous economic growth as well as intelligent and digital innovations to attract strategic investment and sophisticated enterprises to its high-tech parks. Among the Smart Industry solutions, Smart Park provides professional IT services and cloud-based data centers to help enterprises develop businesses and urban economy, and Smart Tourism provides technical support to the whole tourism industry chain, serves the tourism market, and encourages tourism economy in the city.

Smart Life

Smart Life facilitates intelligent inclusion among smart applications and interactive platforms for real-time traffic information, health care, and education. Smart Life improves a city's service level and citizen satisfaction, increasing quality of life.



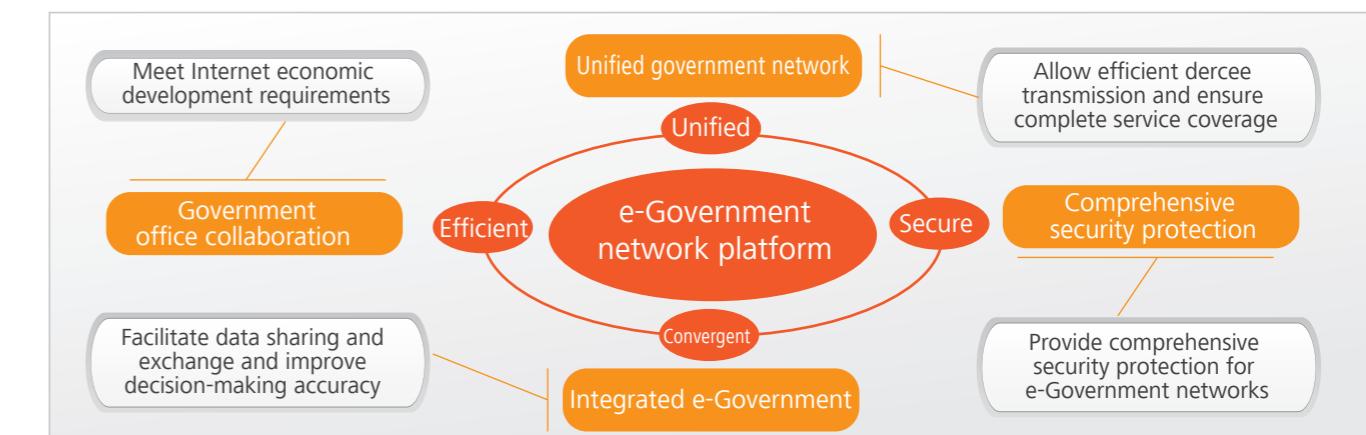
Smart City unifies applications across government sectors, raising the bar for e-Government. Huawei e-Government is an integral platform for government network, cloud, collaborative offices, multi-dimensional security, and operational efficiency.



Smart Government Solution

Huawei used its expertise gained from working with government sectors to develop the e-Government platform. Based on the IP network, the e-Government supports data access and transmission at lower layers and enhances service connection and data processing at higher layers. It provides all-IP, high-bandwidth services, reduces operational risks, and enhances system reliability.

The e-Government covers an interconnected and interoperable government network, a "cloud-pipe-device" multi-dimensional security system, a data-sharing, application-supportive cloud platform, a collaborative government service platform, and a centralized network O&M platform.



Highlights

- One unified government network with multiple interconnected platforms provides secure, reliable, and full-coverage government services.
- A multi-dimensional security system conforms to three levels of security standards and comprehensively safeguards the virtual government.
- An integrated government cloud platform provides secure isolation between government sectors and tenants, supports self-management and self-maintenance, shifts services to a cloud-based platform, and promotes data and information sharing.
- A collaborative office platform adapts to multi-level organizational structures and supports collaboration between government offices.

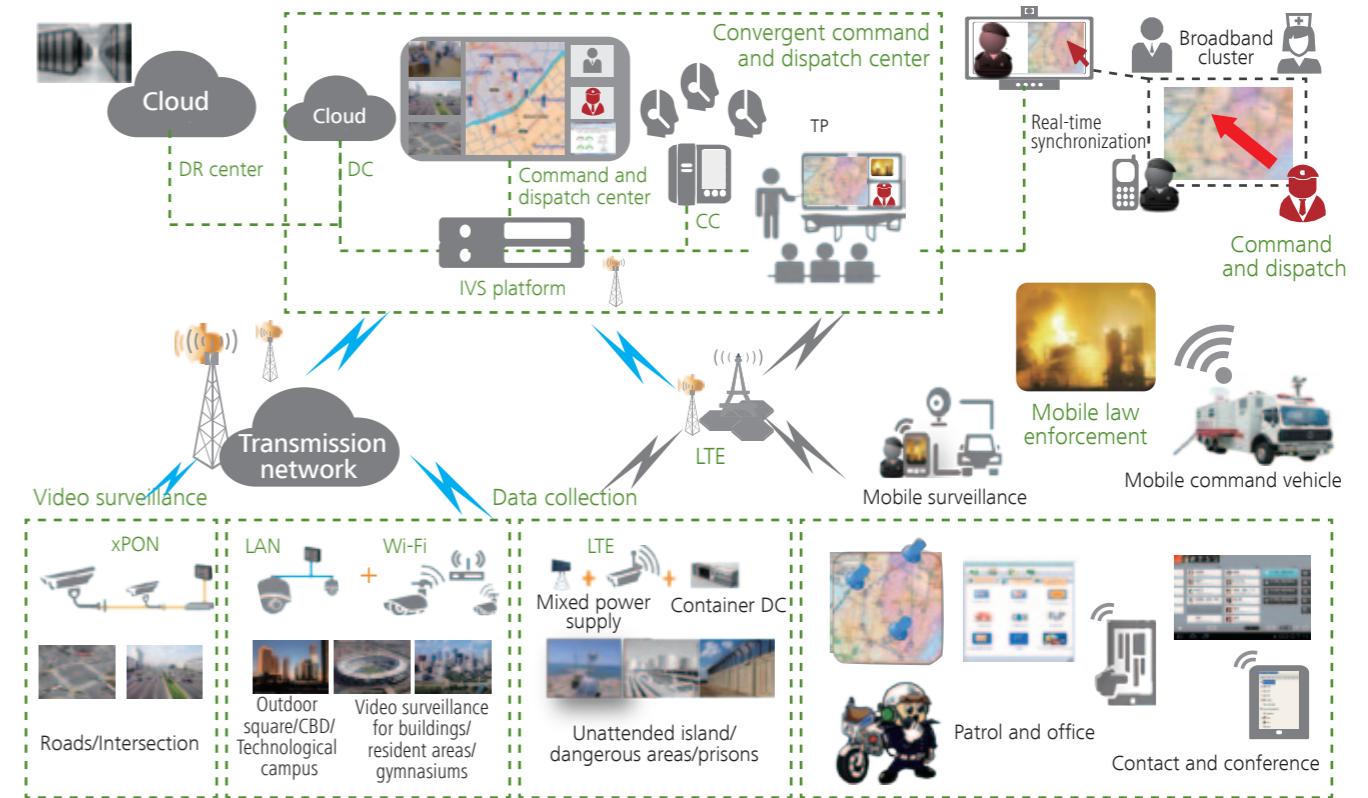




Smart City includes intelligent sensors in every corner of a city, facilitating urban management with intelligent video surveillance (IVS) systems. Video data is integrated through wired and wireless networks, building an urban public safety platform. This takes advantage of cloud computing, storage, and analysis to enable proactive prevention, information updates, quick response, and fast backtracking.

Safe City Solution

Safe City makes full use of integrated data resources throughout a city with a unified management and analysis platform. Safe City enables the government to gain a comprehensive "view" of the city and to take responsive actions or make decisions. Safe City consists of network, video cloud, IVS management platform, video searching, information security management, integrated command center, multimedia trunking, and monitoring and alarm subsystems. It improves the interoperability of different systems, combines various application systems, and builds a comprehensive IVS system for urban public safety.



Highlights

Full-coverage Safety Protection

- Wired and wireless networks support all access modes and cover even the remotest areas of a city.
- Innovative LTE technologies support 3:1 UL/DL peak rates and local forward of eRelay video big data, with a 50% increase in network utilization.

Integrated Dispatch Control

- Fully integrated conferencing and monitoring, visualized dispatching, updated onsite information
- Professional digital trunking and mobile monitoring support efficient multi-sector collaboration, with a more than 50% increase in command efficiency

Highly Efficient Management

- Cloud-based storage and trunking support 100 PB smooth expansion, N+0 redundancy, and 7-level data protection, high reliability, low costs
- Support mobile and online policing, real-time communication, cross-regional, cross-professional interactive policing, with the policing efficiency improved.

Precise Positioning and Searching

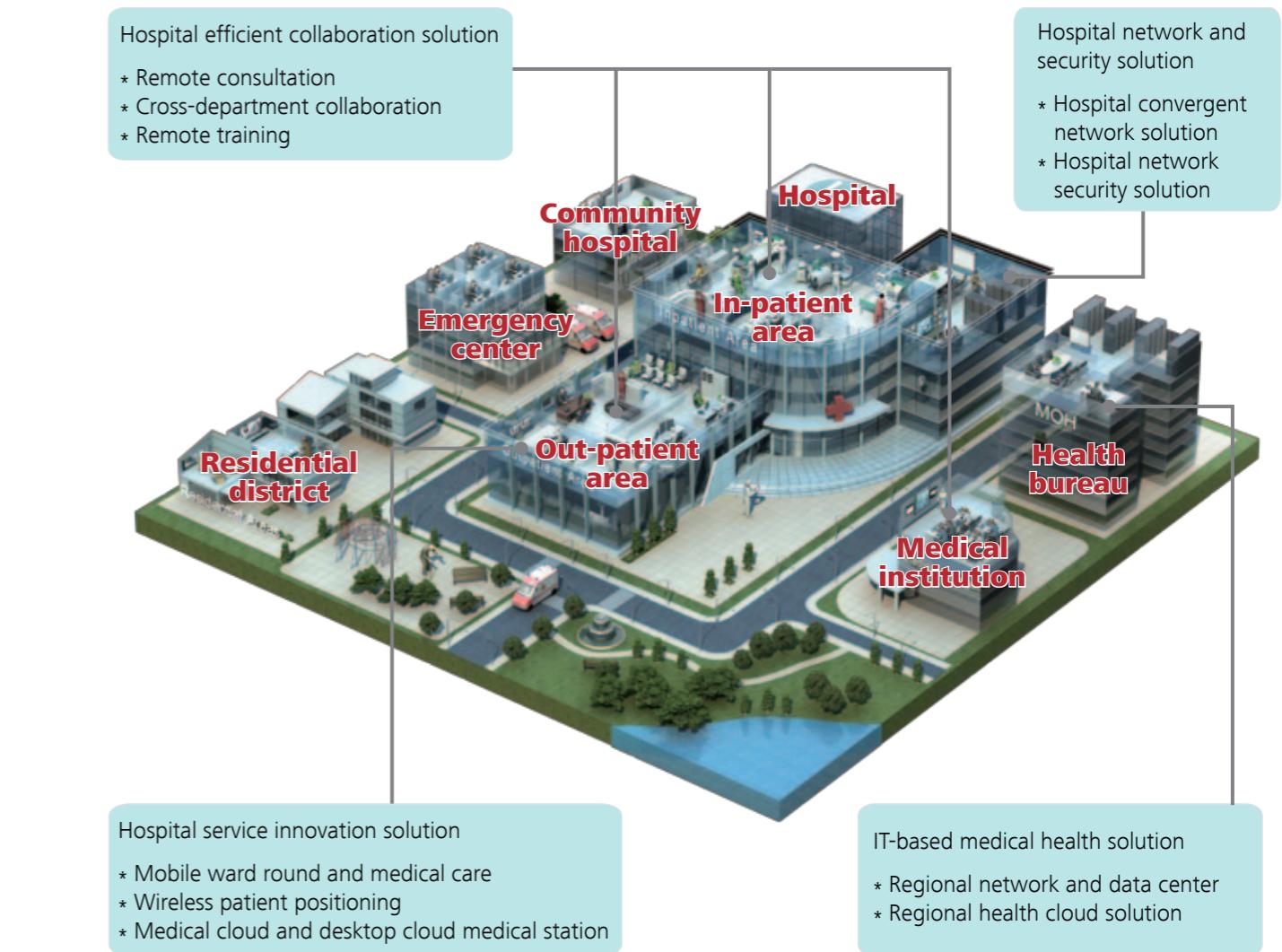
- Long video, short summary, and structural index support precise positioning, with the speed 70% faster.
- Distributed searching supports data capture in seconds and accurate analysis of massive data, and a 50% increase in clearance rate.



With the growing popularity of IoT, cloud computing, mobile Internet, smart terminals, and health IT in the health care industry, Smart Hospital has become an important part of national strategic planning. The government and private sectors focus on developing smart hospitals, which bring enormous social and economic benefits.

Smart Hospital Solution

Huawei Smart Hospital Solution covers everything from the digital systems of hospital management and clinical information to the infrastructure construction of wired and wireless networks and data centers. For different application scenarios, Smart Hospital provides a hospital cloud and IT-based platform for telemedicine, desktop cloud, unified communications, office collaboration, video surveillance, primary care information (PCI), and mobile hospital services. Smart Hospital improves patient services, medical service efficiency and quality, reduces hospital OPEX, and improves hospital management skills.



Highlights

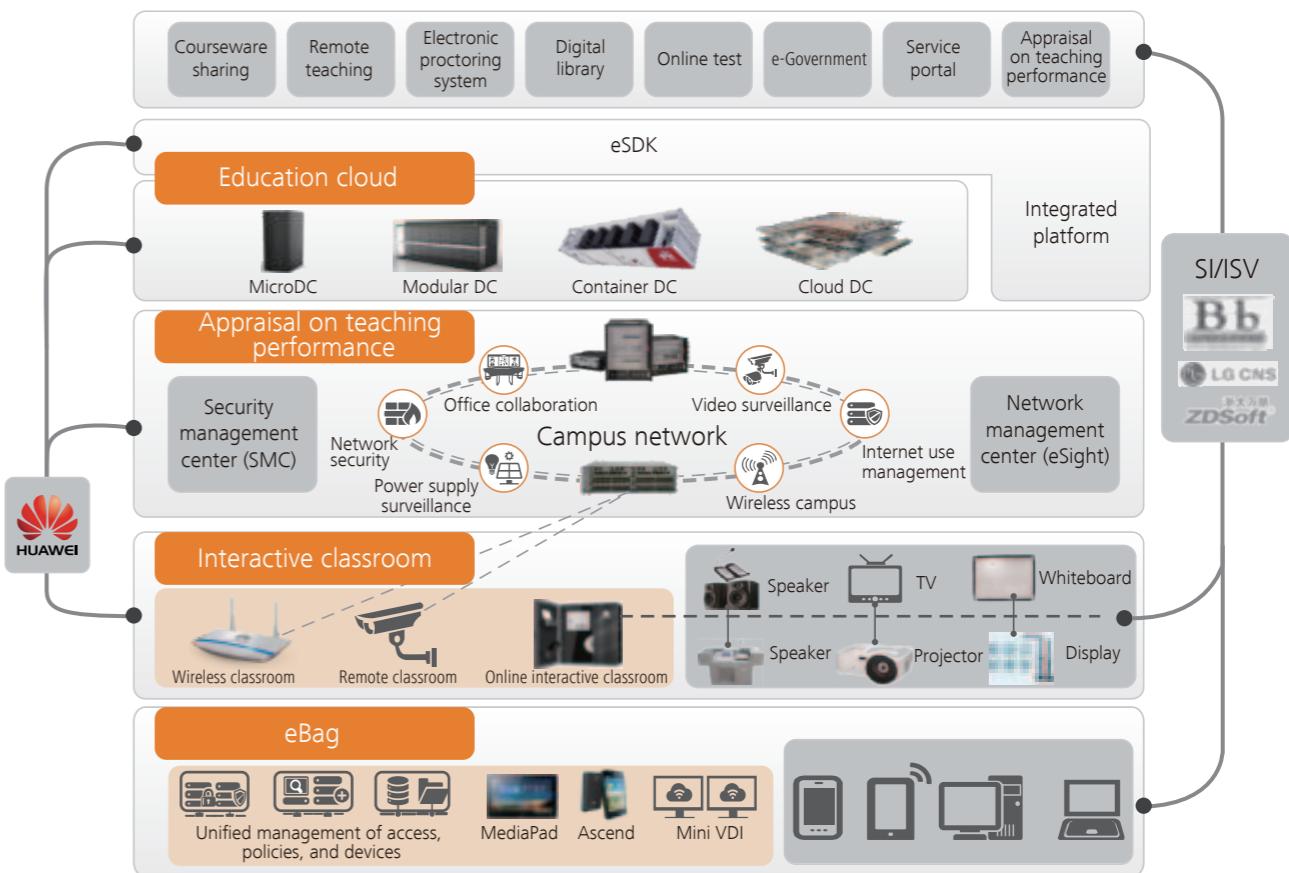
- The industry's first 1080p video and data convergent telemedicine system ensures highly efficient collaboration.
- The industry's first network, data, and application integrated security system guarantees full compliance of hospital information security certification.
- The industry's first commercial use of "hospital cloud" helps construct open, green, and safe digital hospitals.
- The first solution that applies the 3rd generation 802.11n in mobile hospitals provides a high-speed, stable and secure network environment.



Modern cities are more dependent than ever on a knowledge-based economy. Education is of primary importance in urban economies and social services. As an ICT-based education concept, Smart Education improves overall urban education quality and fosters creative and innovative talent.

Smart Education Solution

Huawei is dedicated to partnering with global ICT-based education enterprises to provide e-Education solutions at four levels: education cloud, digital campus, interactive classroom, and e-Bag. Education cloud takes advantage of cloud computing to facilitate educational resource sharing; digital campus is based on an IP network that converges wired, wireless, broadcast, TV, management and life services at reduced construction and O&M costs; interactive classroom is an innovation that provides HD video and interactive communication in teaching and learning; e-Bag is a uniform management tool of terminal devices, which helps build a healthy and convenient learning environment for students.



Solution overview

Highlights

Campus Backbone Network

- Integrated wired and wireless networks
- Flexible authentication and accounting
- Entire network security control
- Delicacy management

Security Control

- Unified data center
- High availability and unified data storage
- Unified disaster recovery and backup

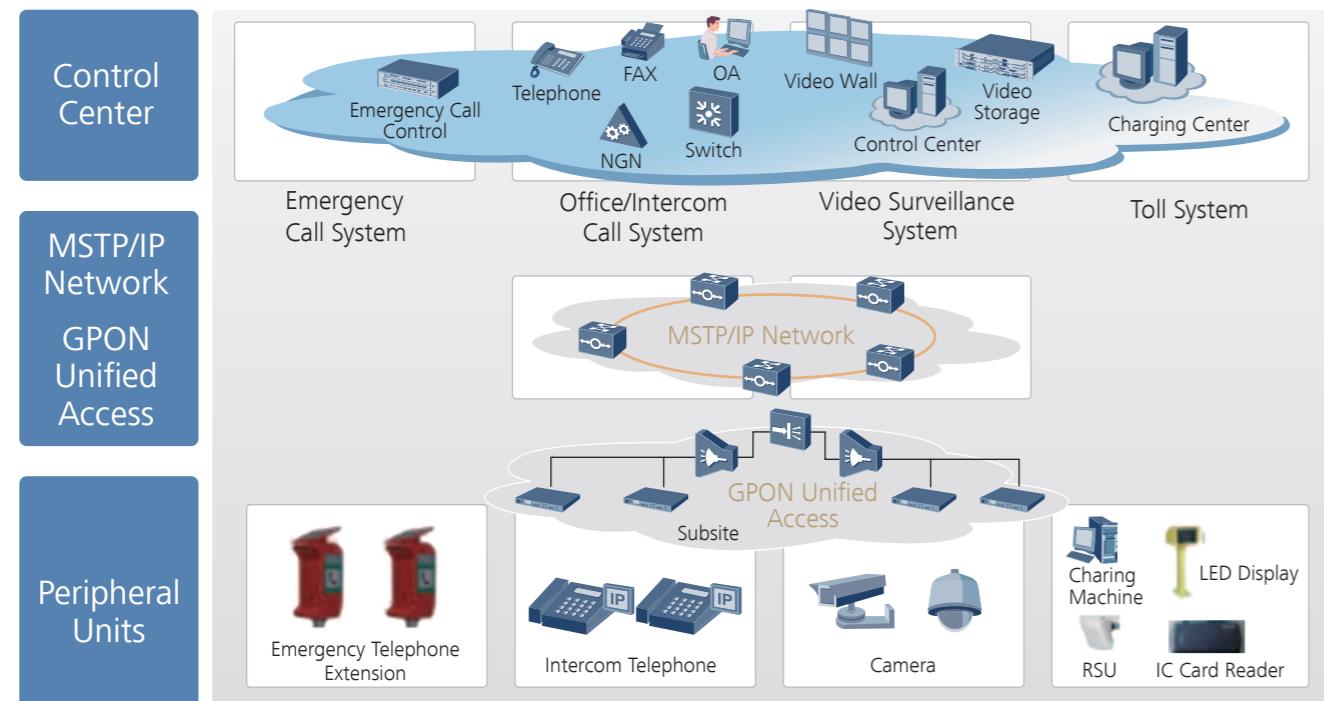
Delicacy Management

- HD video teaching and conferencing
- Safe campus and video surveillance

Highways are critical for national and regional economic growth. Digitizing highways is important for a city's modernization, secure and smooth traffic flows, and increased investment incomes. From highway communication and video surveillance to highway management and road maintenance, from the contact center to the traffic accident and emergency aid center, a digital highway system, like a central nervous system, plays a significant role in economic growth.

Smart Transport Solution

Huawei Smart Transport Solution takes full advantage of "fast, efficient, safe, and convenient" highways with an ICT-based digital highway platform, carrying data, voice, and video services. This provides road monitoring to ensure a secure, reliable, and efficient highway system.



Highlights

- Converged voice services for office, intercom, and emergency telephones
- IP-based video surveillance: enhances quick response and remote command capabilities at all levels for roadside emergency management
- Multi-mode network access: uses the GPON technique because of its high bandwidth, long-distance transmission, and diversified terminal ports; provides comprehensive access for highway tolls, emergency calls, intercom calls, video surveillance, information boards, and weather information.
- Unified service bearer: uniformly carries charging, voice, video, and office services

Smart City Key Technologies

Cloud Computing

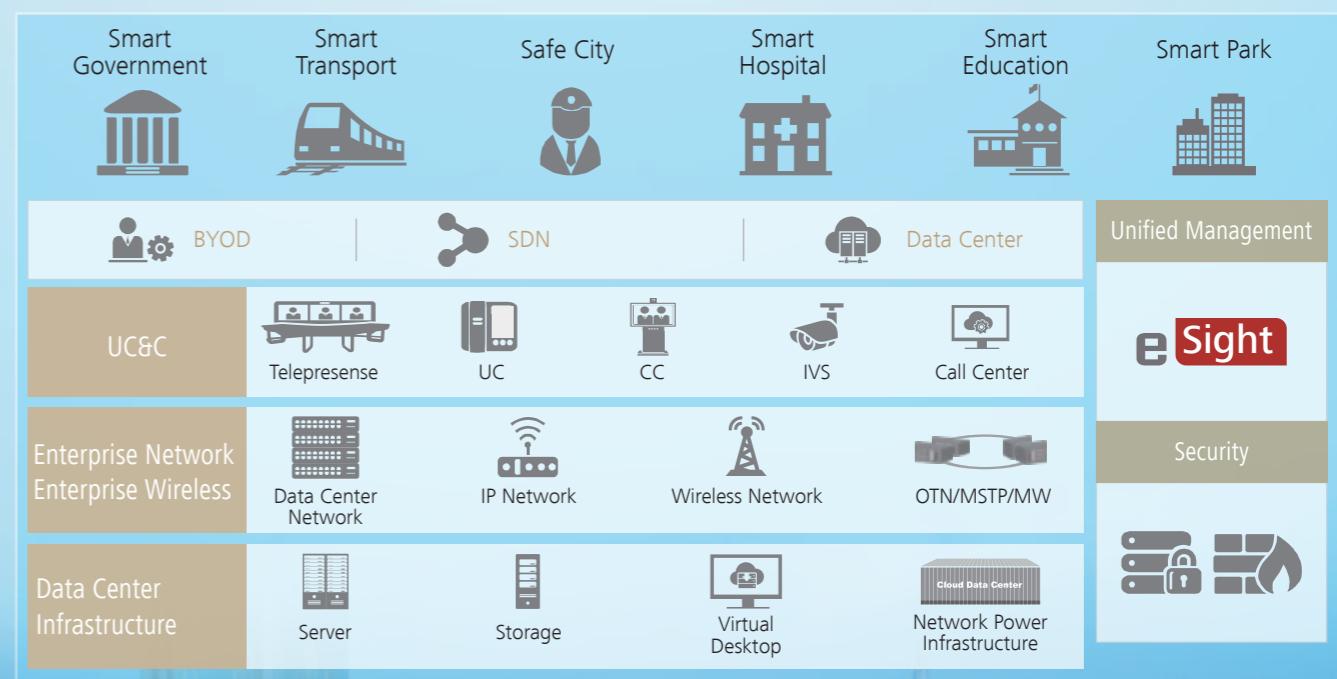
Huawei IT Product Line focuses on IT infrastructure and provides server, storage, cloud computing series products as well as data center solutions. Huawei promotes a "Swift, Smart, Soft, Simple" (4S) concept and contributes to the world's leading network energy solution of site energy and data center infrastructure.

IP Network and LTE

Huawei IP Network Product Line provides a portfolio of routers, switches, WLAN, network security, optical transmission, microwave, PON, and network management products. Huawei also provides enterprise customers with three wireless communication solutions: eLTE broadband trunking, eLTE broadband access, and GSM-R.

UC2.0

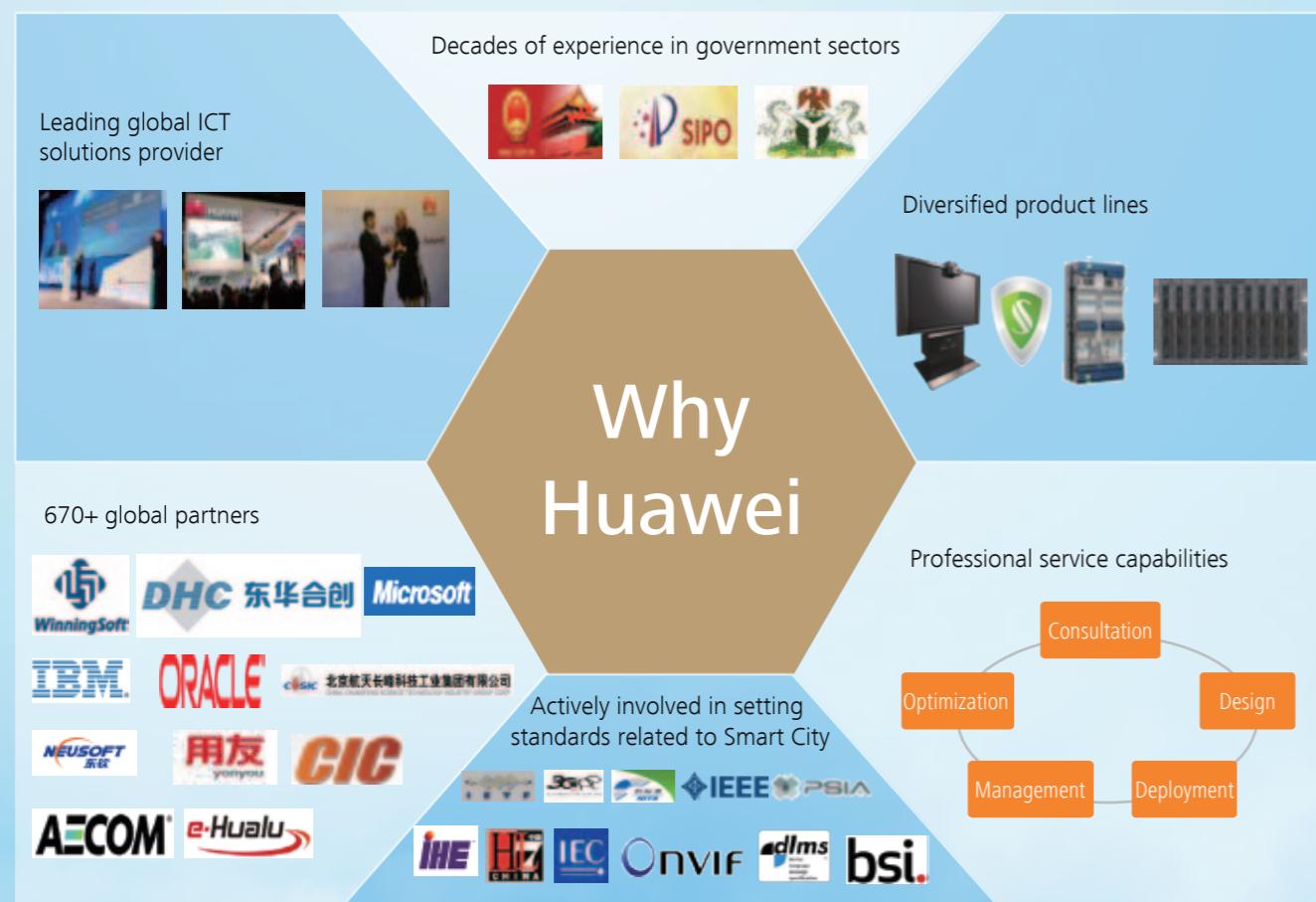
Huawei UC&C Product Line provides five core products for unified communications, contact center, converged conference, telepresence, and video surveillance. The unified communications and collaboration (UC&C) solutions are characterized by mobility, converged video, and cloud collaboration.



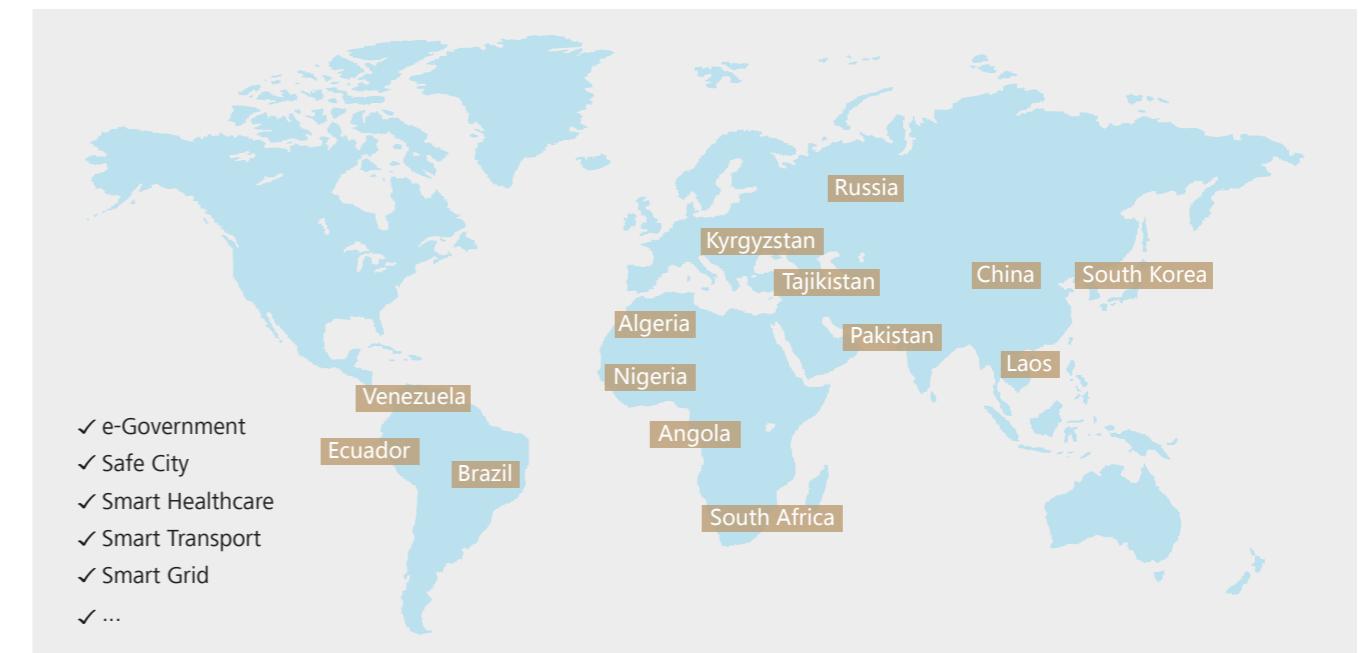
Why Huawei?

Huawei, as a leading global ICT solutions provider, has valuable experience in Smart City solutions. Featuring the most extensive product line in the industry, Huawei has provided Smart City solutions for 60+ cities in 20+ countries and regions. Smart City includes Smart Government, Safe City, Smart Emergency Command, Smart Food Quality Control, Smart Transport, Smart Hospital, Smart Education, Smart Grid, Smart Enterprise, and Smart Tourism.

Our success stories include Karamay's Safe City, Hebei Langfang's Intelligent Transport System (ITS) Project, Zhejiang Ningbo's Smart Hospital Solution, and Nigeria's Emergency Command Center (ECC) Solution. Under the guidance of Chinese ministries, Huawei has actively promoted Smart City concepts in associations and organizations worldwide.



Global practices: Huawei's footprint in 20 safe cities in 20 countries



Smart Liaoyuan: The First Smart City in Northeast China

Challenges

- Liaoyuan's demands for building a high-quality smart city, covering multiple sectors, including city management, emergency command, public security, and health care.
- Unable to connect different functional sectors for lack of a unified information system; without IoT, city management is restricted to manual intervention.



Solutions

- Deploy a comprehensive analysis and command platform to interconnect applications and eradicate information silos
- Deploy application systems, including Smart City management platform, Digital City management platform, Emergency Command platform, Smart Hospital, and Safe City
- Dynamically allocate resources based on IoT and cloud computing

Benefits

- Unified monitoring and optimized camera distribution: enables collaboration and linkage of multiple peripheral units (PUs) and multi-platforms; able to deploy strategically by connecting the system with the public security system
- Improved work efficiency: extensive use of intelligent analysis and 3D module display in urban management increases work efficiency by 40%

Beijing Smart Government: The Lucky Cloud Project

Challenges

- Beijing Smart Government cloud data center is a major demonstration project for cloud computing services under the "Lucky Cloud Project"
- The data centers in 30 departments and offices form "information silos" that make it difficult to share information and resources; scattered Internet egress endangers the system; inefficient 70 member maintenance team



Solutions

- Provides a full series of products, including server, storage device, switch, security device, firewall, and cloud platform. Professional services, such as planning, service transfer using cloud technology, and O&M enable resource integration at multiple levels, unified service egress, and centralized O&M.
- Provides efficient service transfer tools to promote fast and smooth transfer of government cloud platform services.

Benefits

- The smart government cloud platform integrates service data of multiple sectors, enabling all-round resource sharing and information collaboration. The cloud platform solved the problem of "information silos", setting a model for other cloud platform integration.
- The average computing resource usage increased from 16% to 55%. Security threat, such as network and virus attacks, were reduced by 95%. Maintenance team members in 30 data centers went from 70 to 5 individuals.

Karamay: Building the Safest City

Challenges

- The non-smart legacy surveillance platform lacks video processing capability, resulting in unclear images and low work efficiency
- The existing information systems are isolated, making it difficult to centrally manage video surveillance products and achieve multi-platform interconnection and collaboration. As a result, intelligent analysis of massive data and effective data mining are impeded.



Solutions

- Build the safest city service cloud based on the unified safest city platform
- Interconnect with the Police Geographic Information System (PGIS) to implement a wide assortment of smart services, including preventive maintenance of video, behavior analysis, facial recognition, video summary, quick search, image sharpening, and case investigation analysis

Benefits

- Immensely improved application value of massive data
- Improved prewarning and backtracking capabilities through the smart system and cross-platform collaboration help build an all-round smart application platform for a safest city

Longyan Smart Hospital: Secure, Efficient and Green

Challenges

- Aiming to be the model hospital in Fujian province, Longyan People Hospital plans to build a "digital hospital" in its new building, providing mobile ward rounds, desktop cloud, and Hospital Information System (HIS) cloud, as well as service level disaster recovery with the old building
- Need to migrate the existing applications, such as HIS, Laboratory Information System (LIS), Picture Archiving and Communication System (PACS), and resident health system, to the new building to achieve desktop cloud



Solutions

- Deploy two data centers: production data center in the new building and disaster recovery data center in the old building for remote disaster discovery and backup
- Deploy cloud platform, disaster discovery system, and backup system in the two data centers, respectively

Benefits

- Integrated services using cloud computing technology greatly reduces total cost of operation (TCO)
- Improved consultation efficiency due to the digital hospital enabled by virtualization and disaster recovery technologies

Smart Education for East China Normal University (ECNU)

Challenges

- At ECNU, various problems accumulated, such as lack of communication among teachers, inadequacy of interaction between teachers and students, low usage of teaching resources, low level of student involvement in class, insufficient mobile learning and communication
- Built by multiple vendors, the smart education system is very complex, making it difficult to adopt an overall plan; low usage of server resources; PCs in school computer rooms are high energy consumers, making the O&M cost high



Solutions

- Based on the "cloud-pipe-device" architecture design, Huawei provides the Smart Education Cloud Collaboration Solution, including the collaboration cloud platform, collaboration cloud terminal, eClass (a remote interactive teaching platform), and the unified communications (UC) platform

Benefits

- The integration of practice teaching, interactive teaching, and mobile learning effectively promotes pedagogy innovation and teaching efficiency improvement
- The average number of students in one class increases by 75%; internal communication efficiency and teaching resource usage are largely improved with 25 minutes spared each day
- The server resource consumption is reduced by 50% and energy consumption of a single server is reduced by 80%