

3 Industry Solutions

- Government
- Transportation
- Electric Power
- Energy
- Finance
- Large Enterprises





Huawei Government Solutions: Enabling OA and Operating Efficiency

Information and Communications Technology (ICT) has become a key investment for governments to promote ICT-based Office Automation (OA) and to improve work efficiency. Huawei provides five major solutions based on the specific needs and purposes of governmental agencies and units: Huawei e-Government Private Network Solution, Huawei Government Campus Network Solution, Huawei e-Education Campus Network Solution, Huawei e-Hospital Network Solution, and Huawei Video Surveillance Bearer Network Solution.



Huawei e-Government
Private Network Solution



Huawei Government Campus
Network Solution



Huawei e-Education
Campus Network Solution



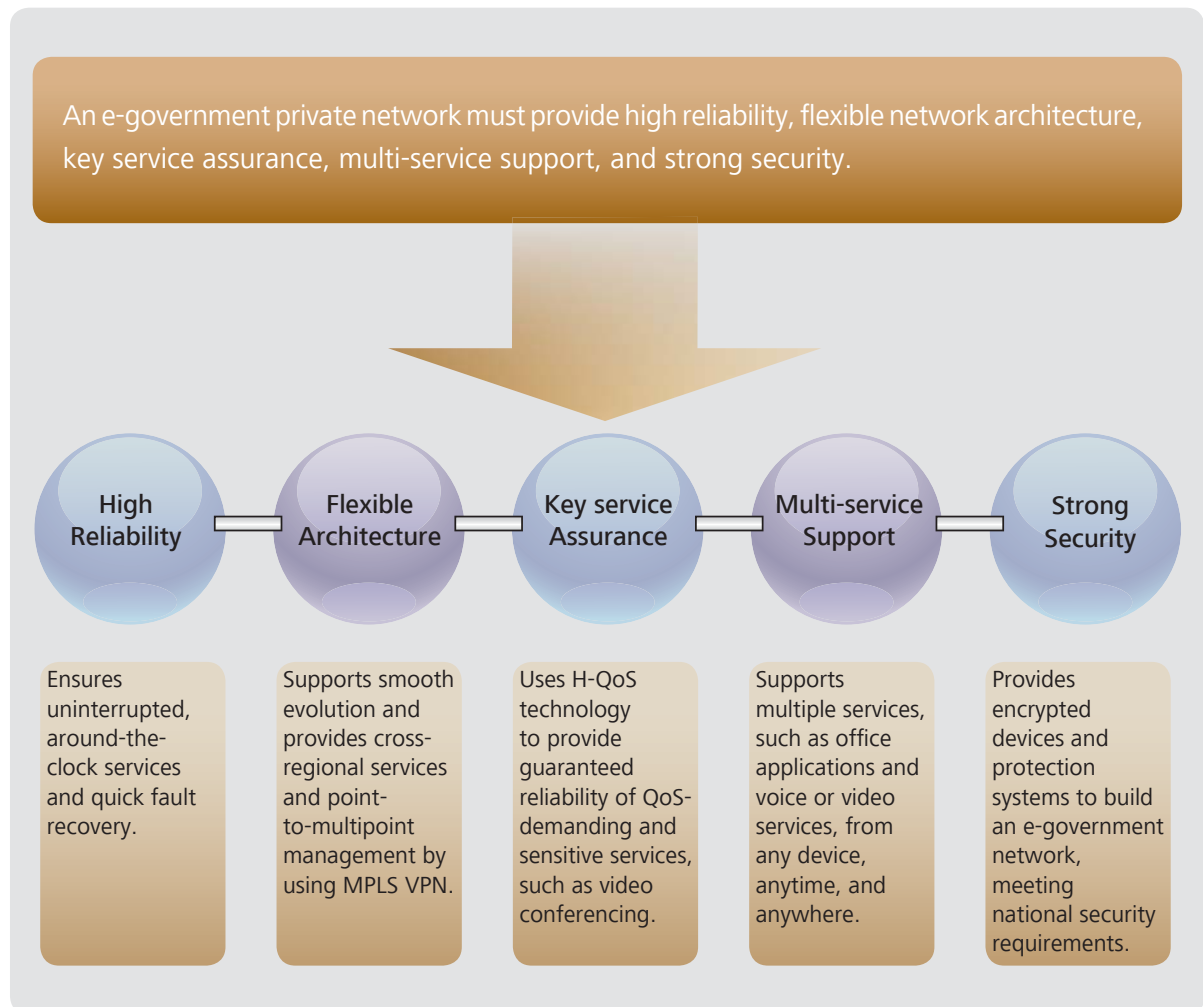
Huawei e-Hospital
Network Solution



Huawei Video Surveillance
Bearer Network Solution

Huawei e-Government Private Network Solution

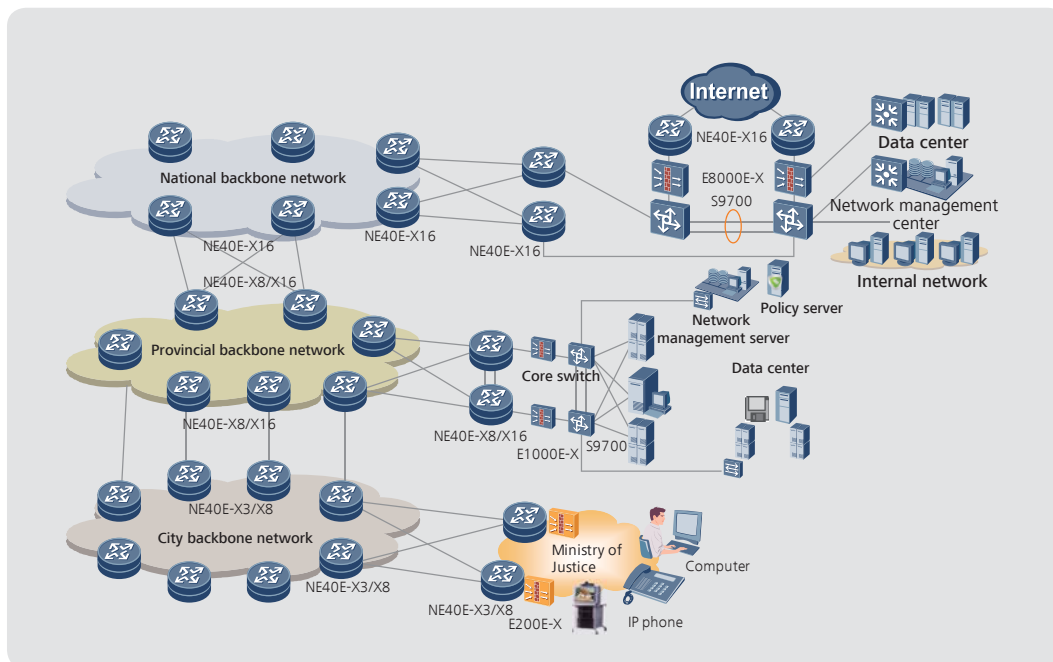
Scenario Introduction



Solution Overview

- The Wide Area Network (WAN) is divided into three layers, based on the size of the governmental unit or agency: Layer-1 network (national backbone network), Layer-2 network (provincial backbone network), and Layer-3 network (city-level backbone network). The three networks are built using backbone routers and consist of the backbone network, Metropolitan Area Network (MAN), and access network for governmental units at the national, provincial and city levels, respectively.
- All the backbone network nodes are configured in High Availability (HA) mode. The services will be quickly switched over to the standby node or link in case of a node or link failure, ensuring uninterrupted services.
- The services of different governmental units are isolated using MPLS VPN, which gives highest priority to real-time VPNs and ensures low latency and zero packet loss.

Typical Network Structure and Selected Equipment

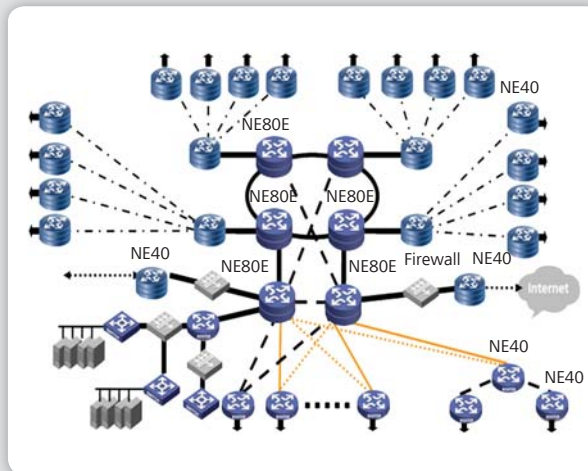


- National backbone network: OSN8800T64, OSN7500, OptiX RTN980 and NE40E-X16
- Provincial backbone network: OSN8800T16, OSN3500, OptiX RTN950 and NE40E-X8
- City backbone network: OSN1800, OSN3500/1500, OptiX RTN910 and NE40E-X8/X3
- Data center: NE40E-X16/X8/X3, S9700 and S7700/5700
- NMS: U2000 and eSight

Huawei e-Government Private Network Solution

Success Stories

e-Government Extranet Project for China



Project Background

- The state e-Government extranet in China was a fundamental facility required to serve the CPC committee, National People's Congress Committee, courts, procuratorates, and other governmental units at all levels.
- The Extranet Project needed to interconnect all the provincial e-Government extranets, including central MAN, WAN bearer network, Internet egress, State Network Management Center, the access network at the provincial and city level, and the access network for central ministries.

Huawei Solution

- Built an extranet, which consisted of a central MAN, a WAN bearer network, Internet egress, a State Network Management Center, an access network at the provincial and city level, and an access network for the central ministries.
- Used high-end routers NE80E/NE40, along with MPLS VPN technology to interconnect the ministries and other provincial governmental units.

Customer Benefits

- A single physical network, supporting various governmental systems using MPLS VPN technology, in addition to system security isolation and access control
- Network access, application support and security assurance, with support for various key businesses, such as fund review, social security and medical insurance for rural areas on the interconnected provincial or city-level e-Government extranets



Huawei Government Campus Network Solution

Scenario Introduction



The campus network for governments mainly covers office buildings, government-invested industrial parks, economic development areas and small- and mid-sized innovation parks. The campus network must support voice, video and data services from any device, anytime, and anywhere. It must provide high network security, QoS, reliability, and simple operation and management.

Huawei Government Campus Network Solution

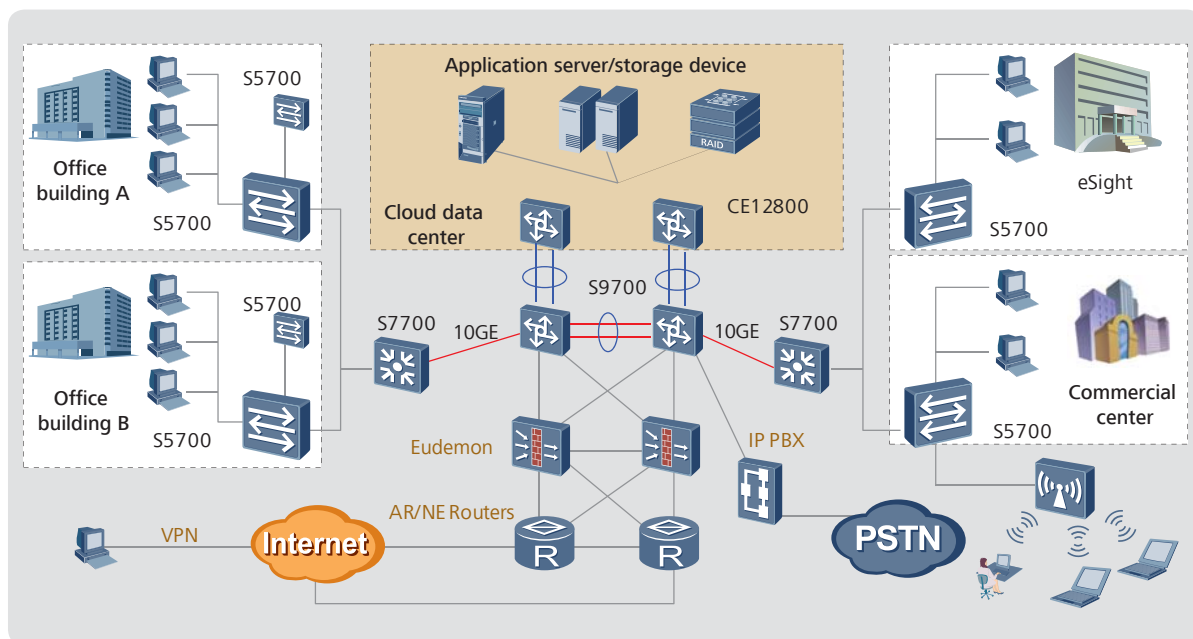
Government Campus Network Development Trends

Convergence	Refined Management	Ease-of-Use
<ul style="list-style-type: none">• Multi-service Convergence• Integrated Access• Network Border Expansion• IPv4-to-IPv6 Evolution	<ul style="list-style-type: none">• Service-oriented QoS provided by a single bearer network• Virtualized campus• User-based security management	<ul style="list-style-type: none">• Unified NMS for multi-vendor equipment management• Service-oriented fault location

Solution Overview

- Egress layer: Deploys two NE40E-X3s/X8s at the egress of a large campus and AR3200 as the voice gateway or deploys two AR3200s at the egress of small- and medium-sized campuses to carry video, voice, and data services.
- Core layer: Uses S9700 clustering technology to support smooth upgrade and higher reliability and provides embedded firewall and NetStream modules to ensure high security.
- Convergence layer: Uses S9700 or S7700 clustering technology to avoid Layer-2 network loops and adopted embedded AC modules to implement integrated wired and wireless control.
- Access layer: Uses S5700/3700/2700 stacking to provide large-capacity ports and deploys Network Access Control (NAC) to ensure high security. The equipment also supports PoE and is easy to deploy and maintain.

Typical Network Structure and Equipment



- Egress layer: NE40E-X3/X8 at the egress of a large campus and AR3200 as the voice gateway or AR3200 at the egress of a small- and mid-sized campus
- Core layer: S9700 and NE40E-X8/X3
- Convergence layer: S7700/S7700 and NE40E-X8/X3
- Access layer: S5700/S3700/S2700, AR G3 router, UA5000 and WLAN
- NMS: eSight

Huawei Government Campus Network Solution

Success Stories

Government Campus Network Project for Province of Overijssel, Netherlands

Project Background

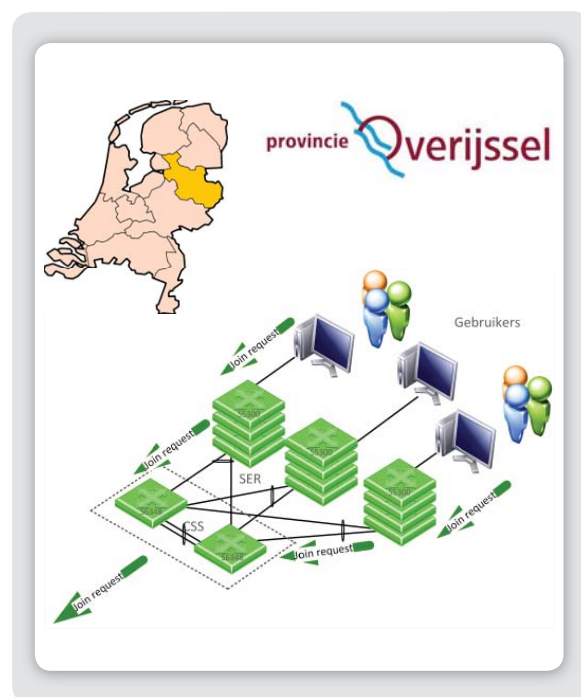
- The government of the Province of Overijssel is a key governmental unit in the Netherlands. It provides information to the public, governmental officials, and other government agencies. With ever-increasing information exchange, it became urgent for the government to provide a high-speed, stable and scalable network.

Huawei Solution

- Partnered with TENICT to provide a complete solution, which covered multiple layers.
- Access layer: Deployed the S5700 switch to support stacking and PoE, in compliance with IEEE802.3af and 802.3at (PoE+).
- Core layer: Deployed the 10 G S6700 switch in long-haul stacking mode between two data centers, which greatly reduced system expansion and maintenance costs.
- Main products: S6700 and S5700 series

Customer Benefits

- Lower system expansion and maintenance costs.



Success Stories

Campus Network Project for the Social Security Office (ZUS) in Poland

Project Background

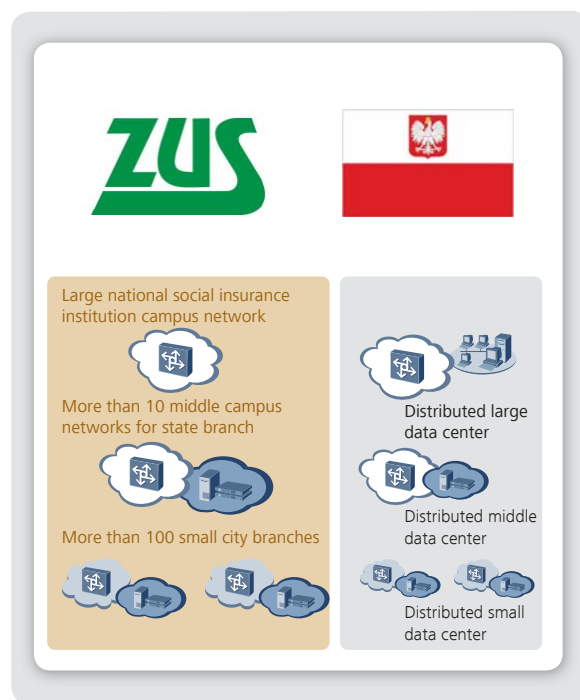
- ZUS networks were outdated and failed to interconnect with each other.
- ZUS needed a highly efficient, convergent network to improve their social security service processing capabilities.

Huawei Solution

- Built an efficient campus network for all the social security institutes across Poland.
- Deployed more than 600 S9700 switches and AR G3 routers.
- Provided reliable services for ZUS's three-layer distributed data center.

Customer Benefits

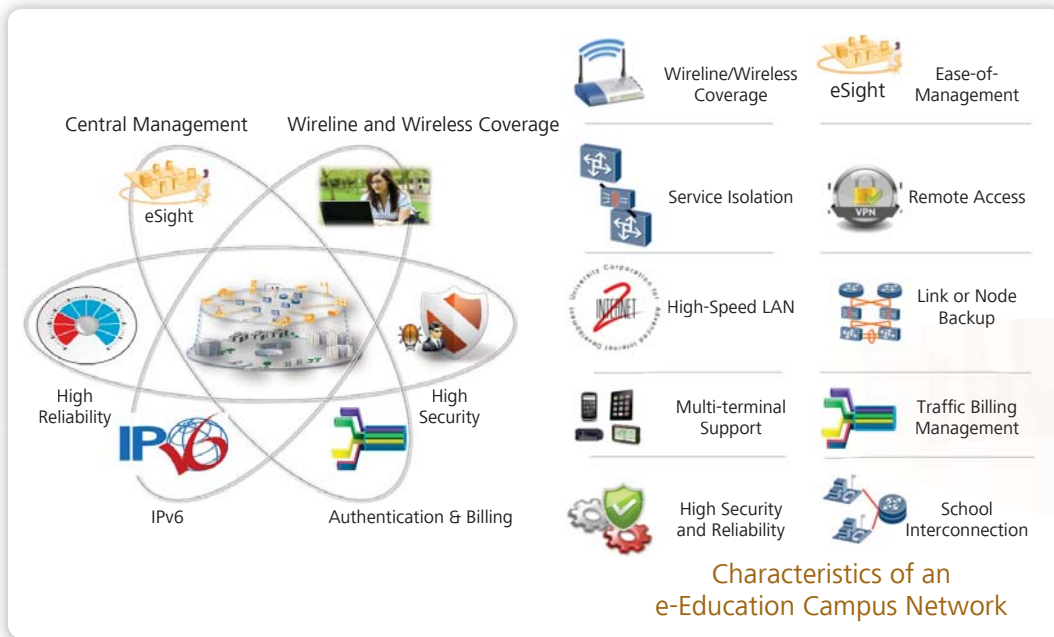
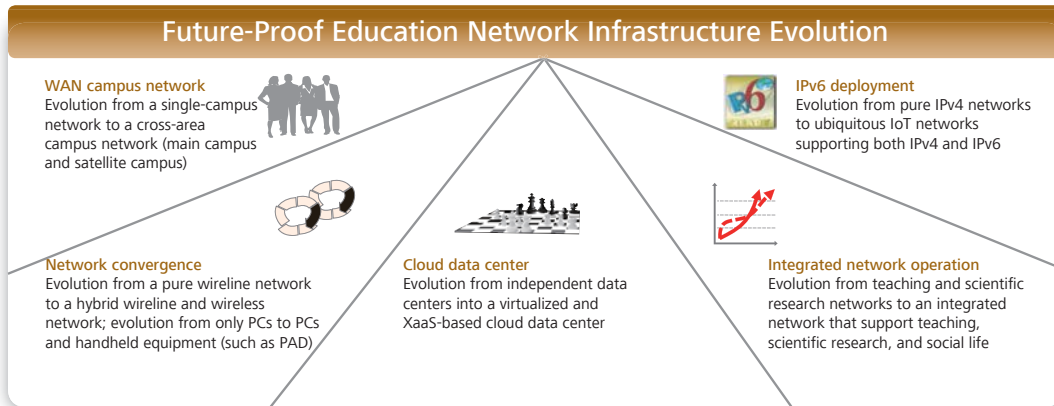
- Implemented an all-IP transformation for the social security network in Poland.
- Improved the work efficiency of social security staff and simplified management.
- Shortened the period of time in processing social security-related applications.



Huawei e-Education Campus Network Solution

Solution Overview

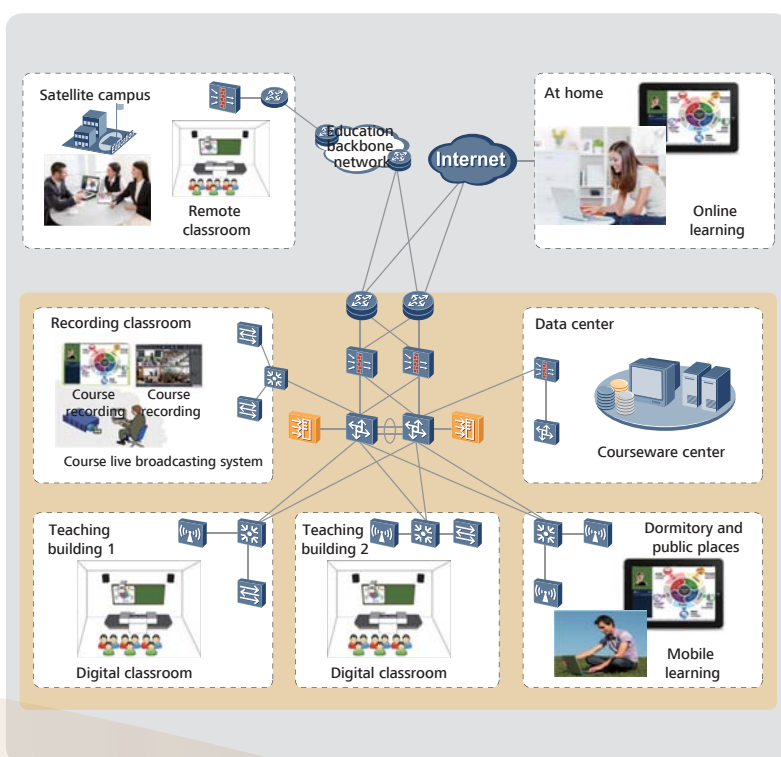
Education projects offer a tremendous number of advantages and opportunities to Huawei and their channel partners. The education industry is a key sector, attracting enormous investments from governments around the world and from the private sector. Generally, decision-making for education projects belongs to a centralized agency, ministry, department or school board, and education projects present clear customer requirements and minimal customization. Huawei solutions for education are easily integrated and ideal for mass sales promotions.



Scenario Introduction

E-education campus networks must support various application systems, including e-classroom, intelligent call recording systems, courseware centers, e-learning, e-schoolbag, office automation, portal, email systems, e-library, safe campus solutions, school-family communication systems, and campus broadcast systems.

- An e-education campus network often uses a layered star structure that is simple, reliable and easy to deploy, maintain, and expand.
- A large number of switches and wireless access points (APs) are used to provide wide coverage, high bandwidth, and large capacity.
- The network must support access of any device.
- The network uses VPN technology to converge multiple types of services.



Customer Benefits

For students

- Become more interested in study and learn proactively.
- Synchronize learning resources with others.
- Learn any time, anywhere.

For teachers

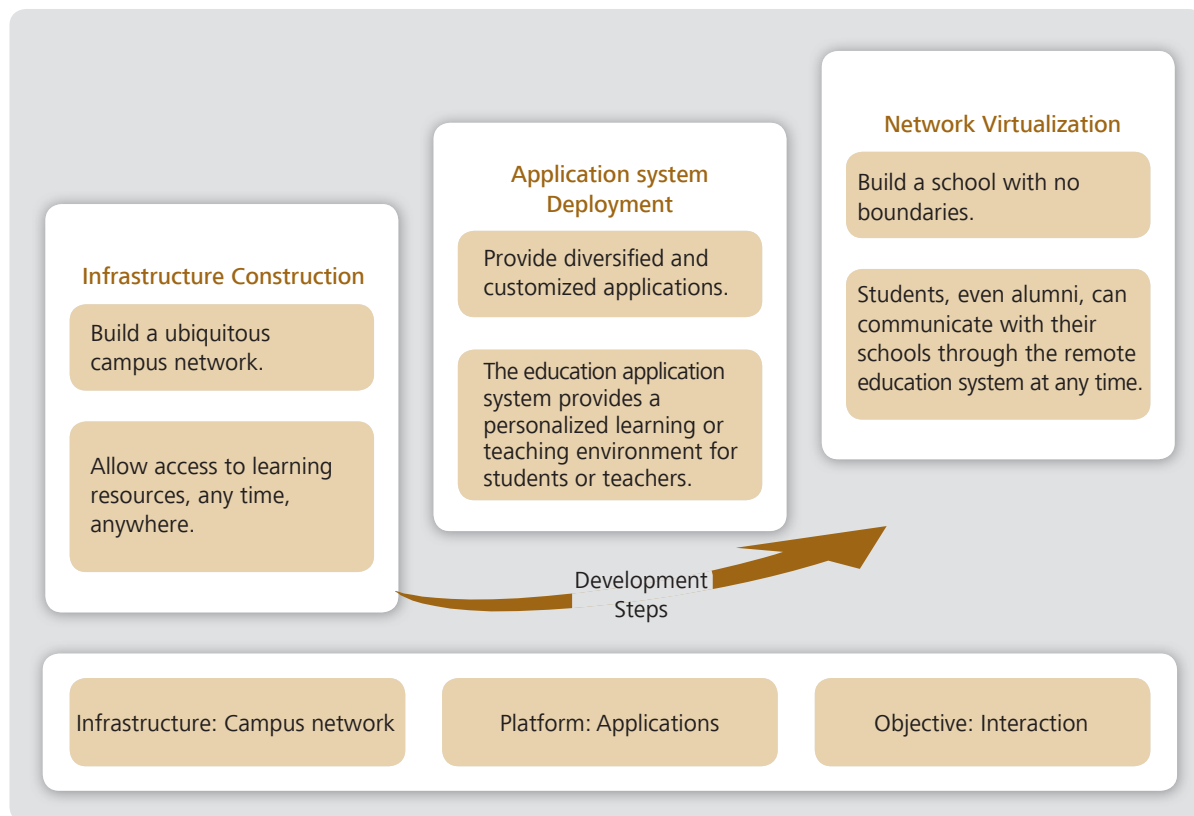
- Make their classes more attractive by using multimedia.
- Reuse e-courseware and reduce repeated work.
- Share resources to improve teaching quality.

For schools or education administrative institutes

- Balance education opportunities in different regions.
- Enhance education quality, cut education costs, and educate more students.

Huawei e-Education Campus Network Solution

e-Education Campus Network Construction Roadmap



Selected Equipment

- Egress layer: NE40E-X3/X8 at the egress of a large campus network or AR3200 at the egress of a small- or mid-sized campus network
- Core layer: S9700 and S7700
- Convergence layer: S7700 and S5700
- Access layer: S5700/S3700/S2700/ and AP6010/AP6610
- NMS: eSight
- Application system: e-classroom, intelligent recording system, courseware center, e-learning, e-schoolbag, office automation, portal, email system, and e-library

Success Stories

Campus Network Project for Stellenbosch University in South Africa

Project Background

- Stellenbosch University in South Africa needed to support e-learning for more than 1,000 students and teachers.

Huawei Solution

- Used the core switch Quidway S9312 to replace legacy equipment on the live network.
- Configured 640 x 10 GE interface cards to improve forwarding capabilities.

Customer Benefits

- Higher network quality and simplified operation and maintenance
- Reduced equipment footprint and lowered electricity costs by 30 percent through compact, energy-efficient equipment.



GARR Education Network Project in Italy

Project Background

- GARR provides network connection and access services for all the universities in Italy.
- As their legacy education network was outdated, GARR needed to build a private network that was able to support multiple types of services for all the universities and educational and academic institutes in Italy.

Huawei Solution

- Deployed a nation-wide transmission network for GARR.
- Deployed 32 Reconfigurable Optical Add-Drop Multiplexer (ROADM) PoP nodes and 49 SLA nodes.
- Improved the bandwidth of the entire network to 80 x 100 G.
- Provided 1+1 network protection and network-wide ASON protection.

Customer Benefits

- Transformed the transmission network.
- Provided better network access services for education institutes, colleges and universities across Italy.



Huawei e-Education Campus Network Solution

Success Stories

Backbone Network Project for CERNET2 in China

Project Background

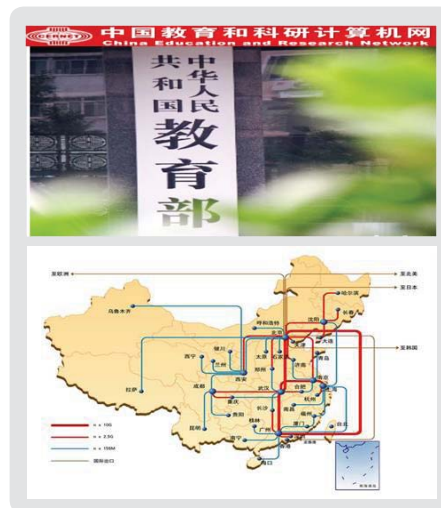
- CERNET2 was the largest non-profit Internet backbone in China.
- CERNET2 was the largest IPv6-only network in the world and one of the network backbones of the China Next Generation Internet project (CNGI).

Huawei Solution

- Provided the core router NE40E-X8 to support nodes in 17 regions.
- Built the MPLS TE network, connected the 10 Gbps PoS board to the DWDM system and provided a high-speed IP link at up to 10 Gbps.

Customer Benefits

- Provided the largest IPv6-only backbone in the world and took a technology lead.
- Promoted the development of CNGI equipment and contributed to improving China's international position in Next Generation Internet technologies.



Huawei e-Hospital Network Solution

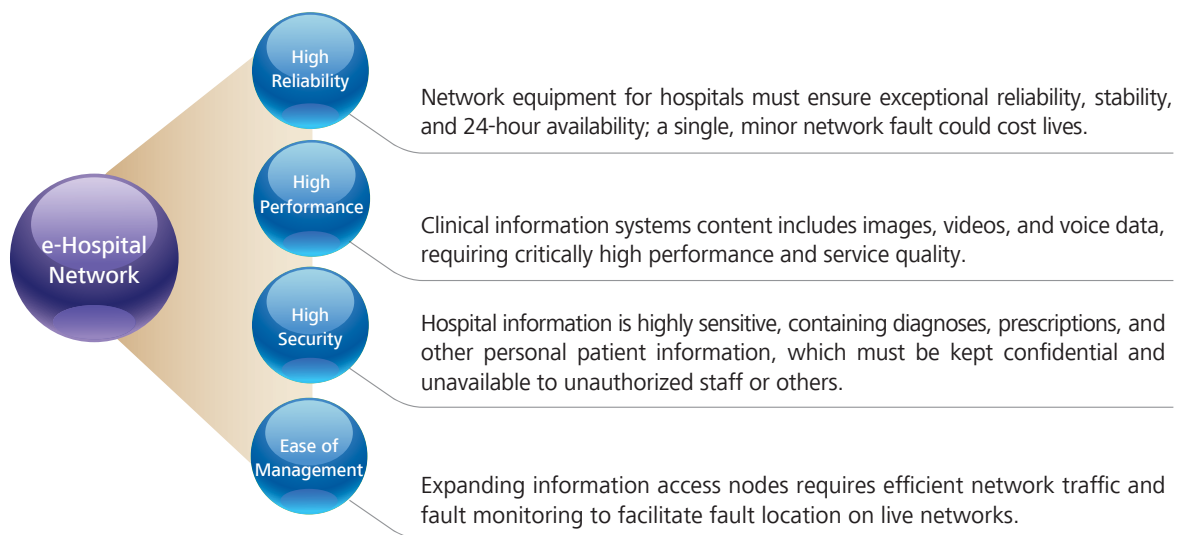
Solution Overview

ICT-based healthcare is in demand, driven by the proliferation of digital information and the increasing demands for healthcare. ICT construction for the healthcare industry requires complex engineering to ensure accurate and speedy information sharing among hospital departments and between hospitals, insurance providers, and administrative organizations. After years of study, Huawei has unveiled the e-Hospital Network Solution, based on the unique characteristics of the healthcare industry, to help customers maximize returns on investment.



Scenario Introduction

An e-hospital is a comprehensive, information-based hospital, consisting of medical equipment, a network platform, and software-based application systems. The e-hospital helps consolidate resources, streamline processes, reduce operational costs, and improve service quality and work efficiency. An e-hospital network has the following features:



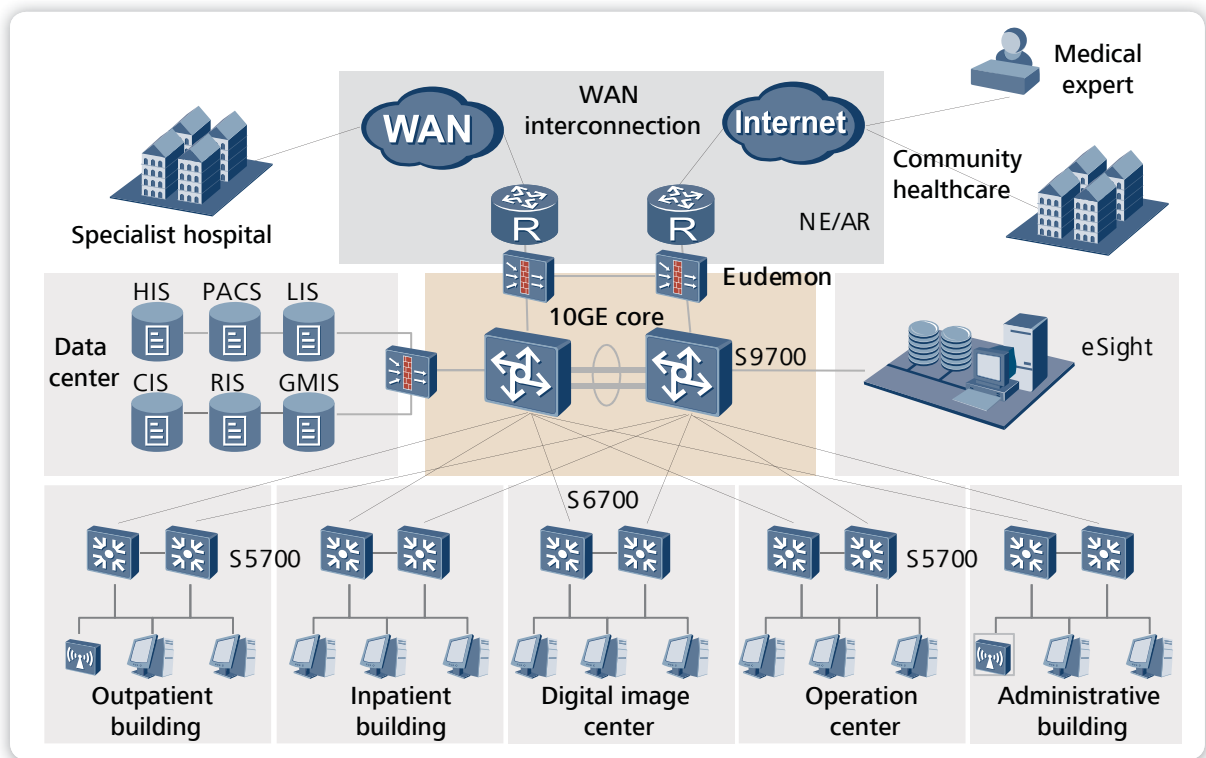
Huawei e-Hospital Network Solution

Solution Overview

The Huawei e-Hospital Network Solution is applicable to hospitals of all sizes.

- **Core layer:** Deploys the NE40X for large- or mid-sized hospitals or AR for small- or mid-sized hospitals at network egress and the S9700 for core switching.
- **Convergence layer:** Deploys the S7700/S6700/S5700 in hospital data centers and buildings to connect the buildings to the central equipment room or data center.
- **Access layer:** Uses the S5700 to meet basic network requirements for medical equipment and personal terminals, such as personal computers.

Typical Network Structure and Equipment



- Core layer: NE40E and S9700
- Convergence layer: S7700/S6700/S5700
- Access layer: S5700, S3700, S2700, AR router and WLAN
- NMS: eSight

Success Stories

BovenIJ Hospital Project in Netherlands

Project Background

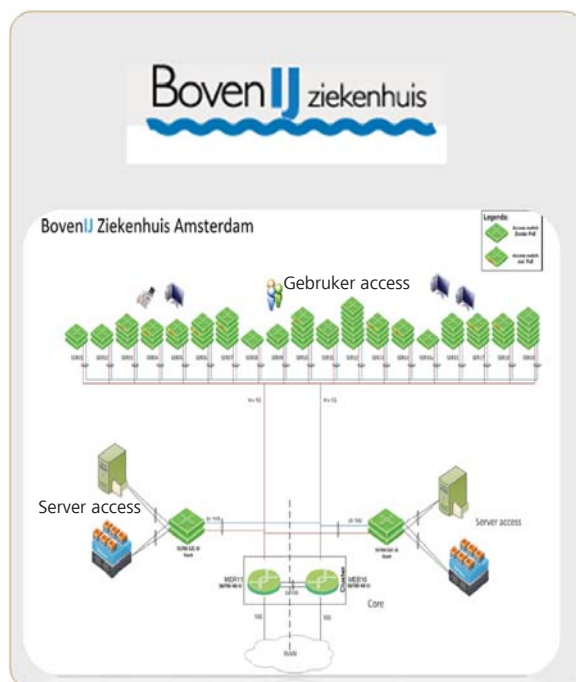
- The live network of the BovenIJ Hospital in Amsterdam used 3COM's datacom equipment to connect to the healthcare WAN. In 2010, the WAN bandwidth increased from GE to 10 GE, and all hospitals had to upgrade their networks accordingly. Meanwhile, the 3COM's 7700 series products often encountered link faults. Because of this, the BovenIJ Hospital planned to replace the legacy equipment with more reliable product.

Huawei Solution

- Partnered with TenITC, in 2011, to design the replacement solution.
- Deployed the S5700TP, which supported PoE and stacking functions as the access switch. The S5700TP complied with IEEE 802.3at and IEEE802.af and supported PoE of up to 30 W.
- Deployed the S6700 of 10 GE interfaces as the core switch. Deployed S6700s to different equipment rooms in long-haul stacking and redundancy mode, reducing rack height from 20 U to 2 U.

Customer Benefits

- Achieved a future-oriented PoE and standard compliance.
- Supported High Availability (HA) through the long-haul stacking function.
- Reduced operational costs by using the unified eSight NMS to manage all equipment.



Huawei e-Hospital Network Solution

Success Stories

NSW Emergency Service Company Project in Australia

Project Background

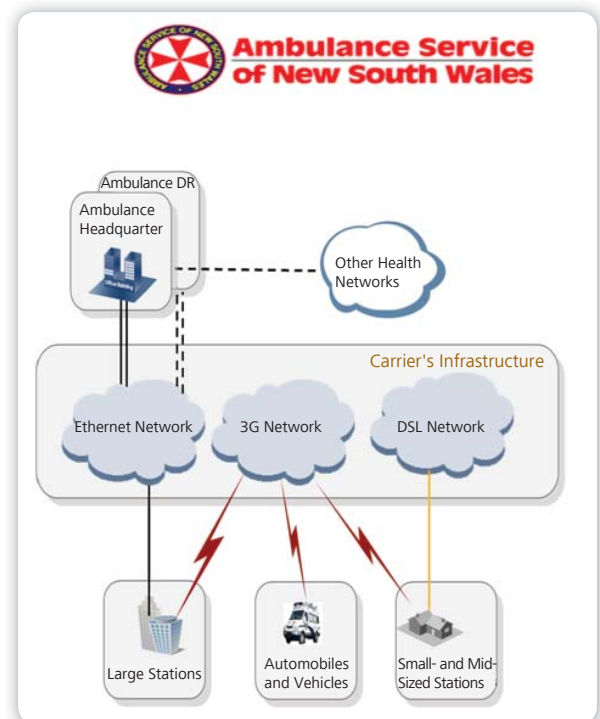
- NSW Emergency Service Company was an Australian company, which provided emergency services for all hospitals and patients in the New South Wales State (NSW).
- The customer required a highly efficient network to accelerate its response to emergency services.

Huawei Solution

- Deployed more than 100 AR G3 routers for the permanent office sites of the NSW Emergency Service Company to build a highly efficient emergency dispatching network.
- Provided highly reliable QoS services to respond to different levels of emergency service.

Customer Benefits

- NSW-wide emergency network better served patients and hospitals.
- Dual-homing architecture ensured high network reliability and QoS.



Huawei Video Surveillance Bearer Network Solution

Scenario Introduction

Video surveillance is now widely used in such places as safe cities, oil pipelines, industrial campuses, and exhibition halls.

The Huawei Video Surveillance Bearer Network Solution provides a highly efficient, open, cost-effective, easy-to-operate, and easy-to-manage IP bearer network for video surveillance.



Key features of a video surveillance bearer network:

- High bandwidth: The network must provide high bandwidth because required bandwidth increases exponentially with the popularity of HD videos.
- Multi-scenario support: The network must be designed with an optimal architecture to ensure the network can address all scenarios.
- Ease-of-deployment: The network must be easy to deploy and cost-effectively manage.

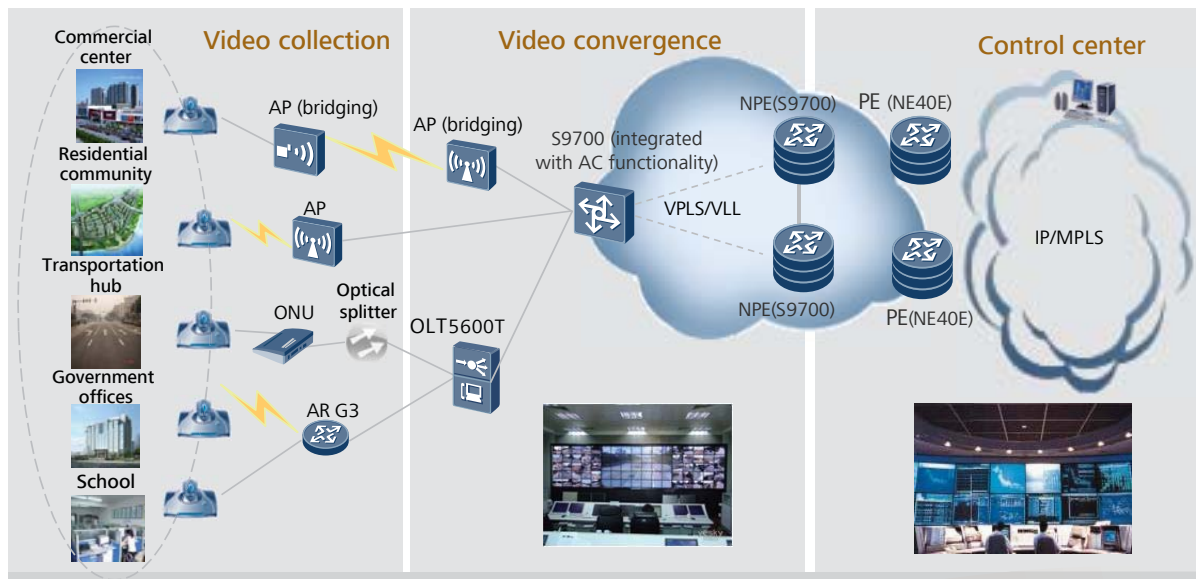
Huawei Video Surveillance Bearer Network Solution

Solution Overview

The Huawei e-Hospital Network Solution network layers are as follows:

- Core layer: Deploys the NE40E-X3/X8 at headquarters to support video, voice, and data services, using WDM to connect to the service backbone network and MPLS VPN to isolate services.
- Convergence layer: Deploys the S9700 at the convergence layer and uses Layer-2 VPN technologies, such as VPLS/VLL, to establish connections, avoiding Layer-2 network loops. This layer uses the S9700 as the Network Processing Engine (NPE) to connect to the core equipment at headquarters and deploy video servers and disk arrays to support video on demand or broadcast services.
- Access layer: Supports various access modes, such as EPON/GPON, wireless AP, AP bridge, and Ethernet to upload video data to the Optical Line Terminal (OLT) or AR.

Typical Network Structure and Equipment



Success Stories

Surveillance Bearer Network Project for Guangdong, China

Project Background

- The Surveillance Bearer Network needed to ensure wide network coverage.
- High bandwidth was required to support multiple types of applications and to monitor population activities.
- The project required high security and strong NMS capability.

Huawei Solution

- Built a surveillance network across 19 cities in Guangdong Province and a surveillance platform with a capacity of 100,000.
- Used Optical Transport Network (OTN) technology for the bearer network to provide high-bandwidth GE transmission and to support diversified services, functions, and applications.
- Provided a convenient, unified, and real-time NMS.

Customer Benefits

- The customer realized reduced crime rates and was able to quickly identify risks.
- Improved the work efficiency of public security bureaus by implementing unified management on distributed monitoring centers.

