2
Enterprise Solutions

- Campus
- WAN Interconnection
- Enterprise Branch
- Data Center

Huawei Enterprise Campus Solution: Keeping Up with Network Needs

The world of enterprise networking is constantly evolving. Enterprise services are expanding from simple voice services to multimedia services; the infrastructure network has evolved from wireline to hybrid wireline and wireless; and network access is shifting from desktop access to ubiquitous access from multiple terminal types. Simultaneously, with the advent of cloud computing, cloud campus networks are inevitable due to coveted features such as anytime, anywhere and ubiquitous access, high speeds, and unified and intelligent design.
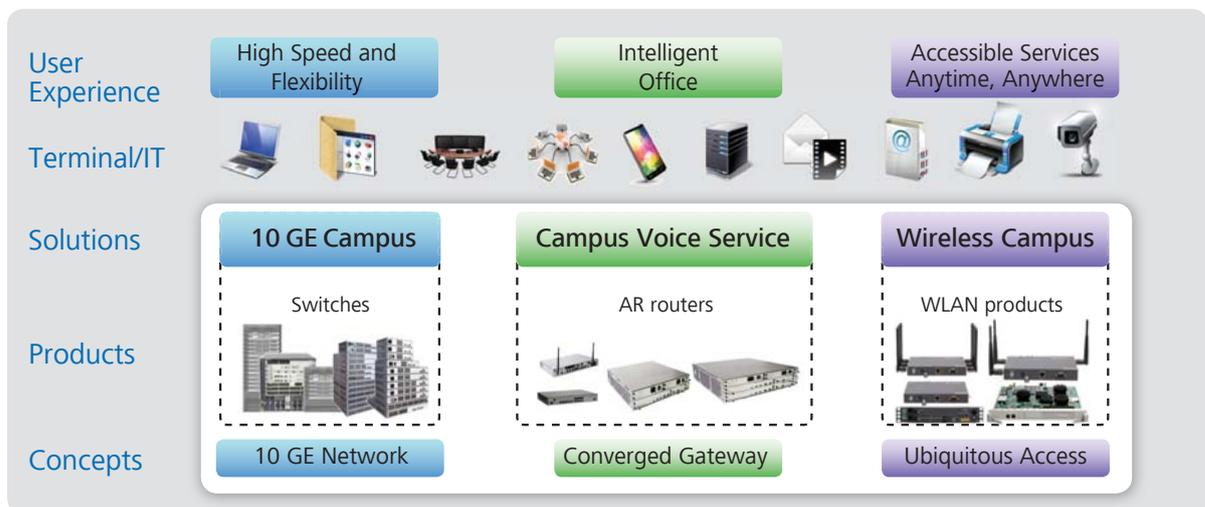
Within the campus network, diversified applications are required. For example, high-speed dense population and terminals access, WLAN mobile office, multimedia service support (including IP telephony, video conferencing and video surveillance), and secure access for external users.

In response to campus network development trends and diversified application requirements, Huawei has released a series of enterprise campus network solutions, including a 10 GE campus solution, a campus voice services solution and a wireless campus solution. These solutions help enterprises build high-speed, intelligent, convergent, energy-conserving and safe campus networks.

## Huawei Enterprise Campus Solution Architecture

Huawei Enterprise Campus Solution Overview

|	Description
10 GE Campus Solution	Based on the core idea of "GE access and 10 GE convergence," this solution helps the customer construct a quality campus network that features higher bandwidth, stronger performance and a more satisfying user experience.
Campus Voice Services Solution	This solution provides end-to-end delivery capabilities that cover voice switching (IP PBX), voice gateways, telephony terminal, value-added services, and network management system (NMS). It is a good choice for campuses of all sizes, and verticals of all types, which require an integrated voice, data, and security network.
Wireless Campus Solution	This solution provides ubiquitous, secure and high-speed wireless services for diversified school campuses, governments, and enterprise campuses. Service scenarios supported by this solution include—but are not limited to—the following: retail, stations, e-class for primary and secondary schools, wireless campus network for colleges, e-Government, wireless cities, hotels, enterprise Office Automation (OA), and ISP reselling.

Large Network 10 GE Campus Solution
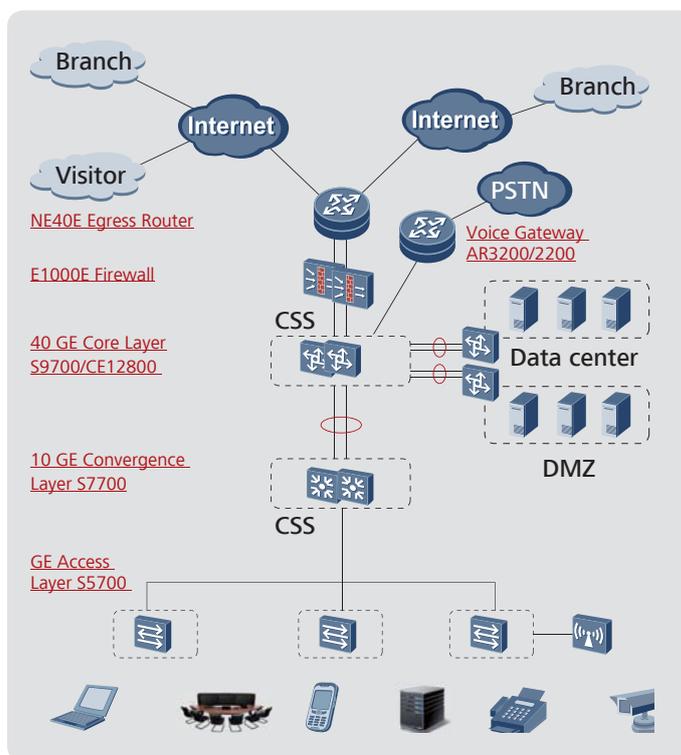
This solution applies to large campus network projects for verticals such as government (education), energy, transportation, finance, and electric power, where the number of end users exceeds 1,000.

Networking topology: three-layer architecture (access, convergence, and core layers)

Selected products:

- Core layer: S9700

- Convergence layer: S7700

- Access layer: S5700LI for L2 to desktop; S5700 EI/S5700 HI (high requirements, such as hardware probes and video support) for L3 to desktop

- Egress: NE40E series and AR3200/2200 (voice gateway)

- WLAN: AC6605 (box-shaped) and S9700/ S7700 (with AC plug-in cards)

  AP: AP6010 series, AP6510DN, AP6610DN and AP6310SN

Small- and Medium-Sized Network 10 GE Campus Solution
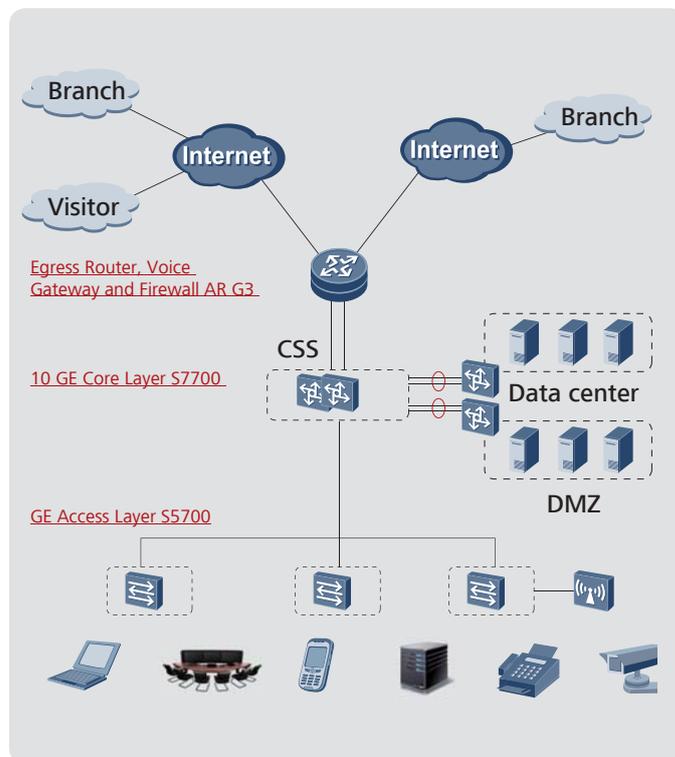
This solution is best suited for the campus Office Automation (OA) networks of small- and medium-sized enterprises (SMEs), where the number of end users is fewer than 1,000.

Networking topology: two-layer architecture (access and core layers)

Selected products:

- Core layer: S7700

- Access layer: S5700LI for L2 to desktop; S5700 EI/S5700 HI (high requirements, such as hardware probes and video support) for L3 to desktop

- Egress: AR3200/AR2200 series (routing and voice gateway)

- WLAN: AC6605 (box-shaped) and S7700 (with AC plug-in card)

  AP: AP6010 series, AP6510DN, AP6610DN and AP6310SN

Solution Highlights: High Capacity, Flexible Access, and Energy Savings

The Huawei 10 GE Campus solution uses a "GE access and 10 GE convergence" design: GE at the access layer, 10 GE at the convergence layer, and 40 GE at the core layer.

This solution offers many advantages, including:

Continued Evolution and Increased Return on Investment (ROI)

- The S9700/S7700 provides a 40 GE switching capacity, which can scale to 100 GE in the future to meet increased bandwidth requirements.

World's Highest-Density 10 GE

- Industry-leading 10 GE cards feature high density and large capacity, helping enterprises build ultra-high-speed services in 10 GE cloud campus networks.

Multiple Access Switch Options for Flexible Access

- A rich set of access switches meet customer requirement for flexible access in different usage scenarios.

Energy Conservation and Cost Reduction

- Multiple energy-conservation technologies, including Huawei's patented entire-system hibernation technology, are used to build energy-efficient campus networks.

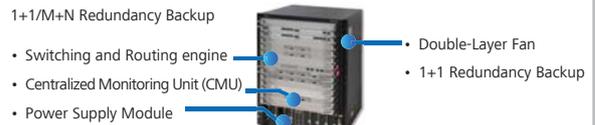# Highlights of Huawei's Switches for 10 GE Campus Networks

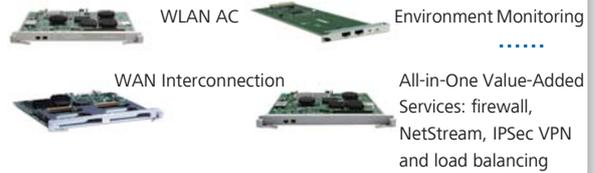**Chassis-Shaped Switches: Large Capacity, Highly Reliable, Multi-service Support and Investment Protection**

Smooth Evolution and 10-Year Life Cycle for Investment Protection

Future-Proof 100 GE Card

Multi-model High-Density 40 GE Card

Multi-model High-Density 10 GE Card

Higher Stability and Reliability; No Service Interruption

1+1/M+N Redundancy Backup

• Switching and Routing engine
• Centralized Monitoring Unit (CMU)
• Power Supply Module

• Double-Layer Fan
• 1+1 Redundancy Backup

Multi-service support

WLAN AC

Environment Monitoring

WAN Interconnection

All-in-One Value-Added Services: firewall, NetStream, IPSec VPN and load balancing

Box-Shaped Switches: Multiple Models, Higher Security and Reliability, and Flexible Access

Numerous Models to Meet Different Usage Scenarios

S5700/10-LI (Compact)   S5700-SI (Standard)   S5700/10-EI (Enhanced)   S5700/10-HI (Advanced)   POE Switch

Multi-level Protection and Higher Security and Reliability

6 kV Surge Protection

Cuts the risk of lightning strike damage to only 1/8th of the industry average.

Hardware-Based ETH OAM/BFD

3.3 ms

SEP

50 ms

Environment Monitoring

Anti-theft   Fireproof   Waterproof

Larger Capacity:

- Huawei's next-generation core switches CE12800 and S9700 meet customers' service demands for the next several years, protecting their investment. The CE12800 supports a maximum switching capacity of 48 Tbps and up to 96*100 GE, 288*40 GE, or 1152*10 GE line-rate interfaces.

Higher Reliability:

- The S9700 supports hardware-based Bidirectional Forwarding Detection (BFD) and hardware-based OAM (unique to Huawei). In addition, the S9700 supports In-Service Software Upgrade (ISSU) technology to ensure hitless upgrades. Key components of the S9700 use redundancy design to prevent service interruption.

Multi-service support:

- The S9700/S7700 is designed with an integrated valued-added service module that provides multiple services, such as IPSec and firewall.

Abundant Models:

- A plentiful selection of box-shaped switches meet customers' diversified requirements from FE to 10 GE. In addition, Power over Ethernet (PoE) switches supporting 15.4 W and 30 W are available to support a wide range of POE devices, including APs, cameras, and IP phones.

Higher Security and Reliability:

- Box-shaped switches use 6 kV surge protection technology to protect against lightning strikes. These switches also adopt hardware-based BFD and flexible Signaling End Point (SEP) ring network protection technologies, which can quickly locate faults and implement service switchover. The environment monitoring interfaces of these switches ensure easy operation and maintenance.

Huawei Enterprise Campus Voice Services Solution

Voice services are required for every campus network. Estimates show that the 2012 global voice market will be worth US$7.4 billion. Huawei can participate in the following campus voice services markets:

Campus Voice Network Reconstruction Market:

- TDM PBXs will be phased out and more value-added services will emerge. Against this backdrop, a converged voice, data, and security network is urgently needed. Huawei AR devices can meet this demand with their all-in-one service capabilities.

New Campus Projects, Including Governments, Verticals and High-Tech Parks:

- Enterprises may rent carriers' VoIP networks or build their own voice networks.

Unified Communications (UC) Infrastructure Market:

- Huawei provides voice infrastructure for UC integrators. Huawei AR devices can integrate with Huawei UC, Microsoft OCS and IBM Sametime systems.

Campus Voice Services Solution
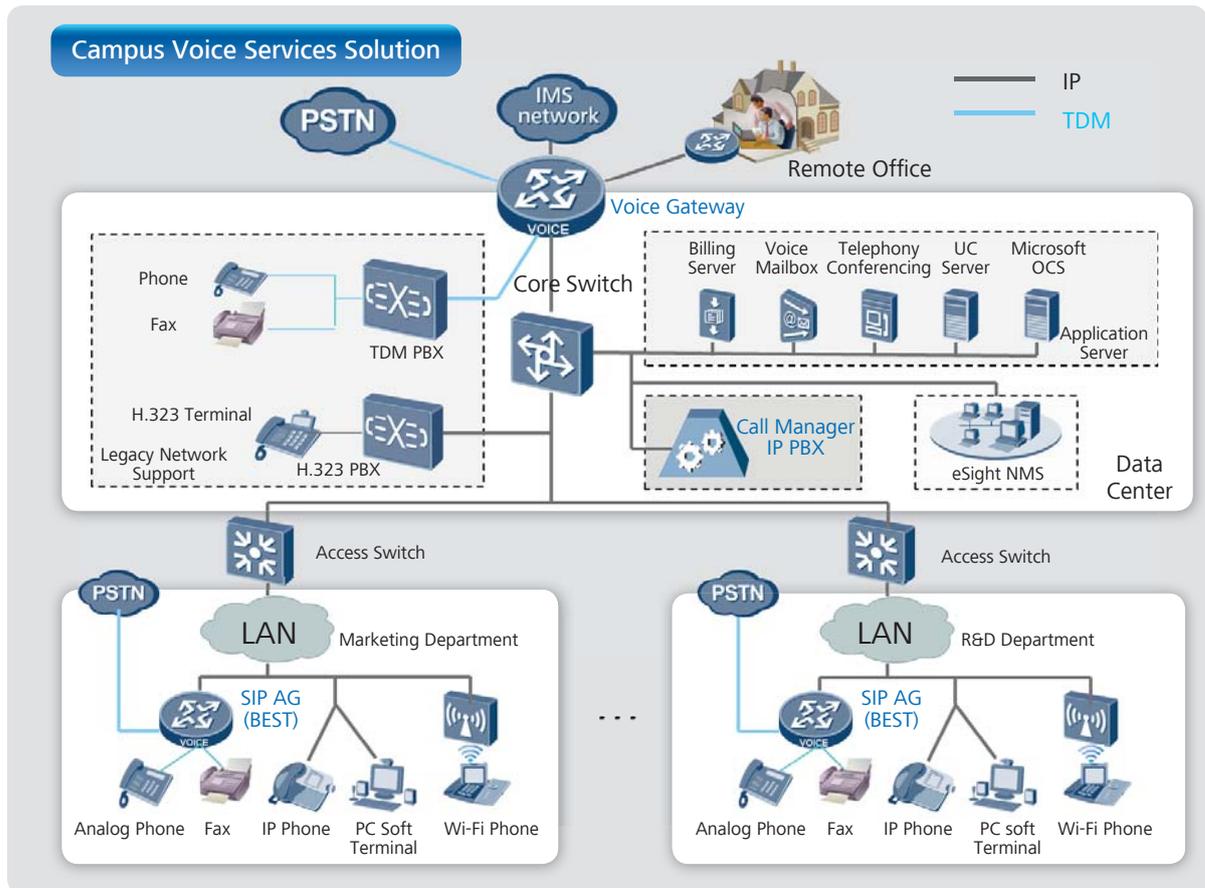
Solution Highlights

Powerful Service Capabilities:

- Huawei AR devices use multi-core processors and provide large-capacity switching capabilities, including PBX and trunk capabilities. These devices include an extensive choice of models and apply to user base sizes from 4 to 10,000 users.

Highly Efficient Convergence Gateway:

- This solution can integrate with Huawei UC, Microsoft OCS and IBM Sametime systems. The X86 card is integrated with a rich set of value-added services, including billing, voice mailbox, and telephony conferencing. In addition, embedded SBC proxy and H.323 gateway/gatekeeper modules are provided, which support internal TDM and H.323 voice networks, interoperate with external networks of carriers and support smooth evolution of campus networks, reducing investment. Additionally, this solution supports the OSP platform and, therefore, can easily integrate with third-party applications and meet customerd' increasingly customized demands.

Intelligent and Unified O&M:

- The eSight NMS uniformly manages campus switches, AR devices, and WLAN devices. This visualized NMS also uniformly manages wireline and wireless network topologies. The wizard-based configuration and network monitoring functions of the eSight improve network deployment and maintenance efficiencies.

Higher Service Security and Reliability:

- Trunk dual-homing, best local survivability and power-off survival functions ensure the flexibility and reliability of voice access.
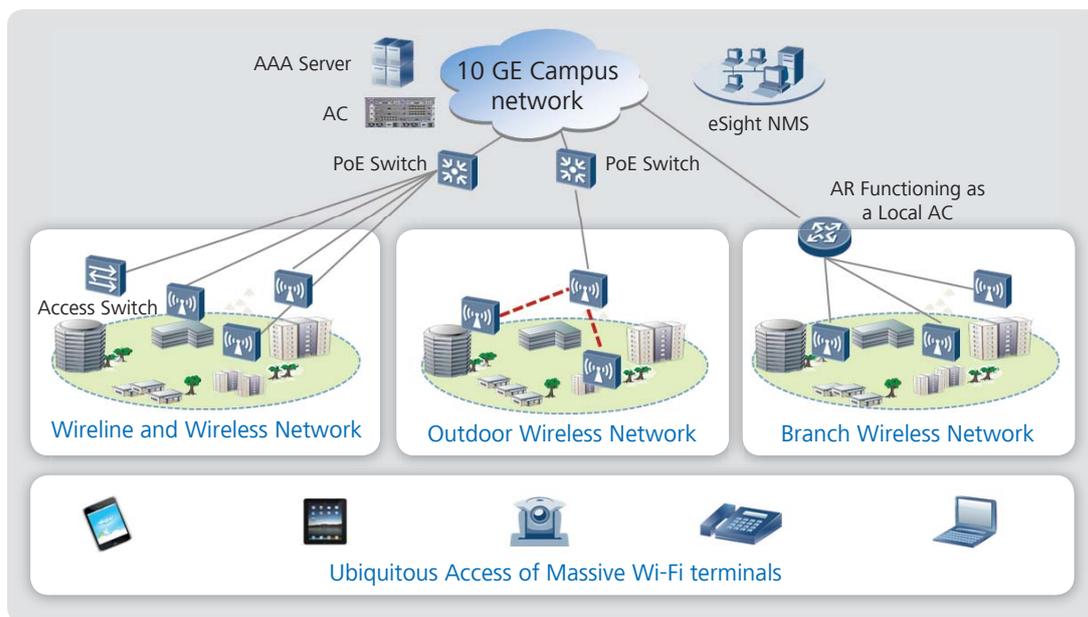
Abundant Terminal Types:

- ISDN terminals, IP phones, Wi-Fi phones, PC/mobile phone soft terminals and high-density FXS analog phones are available to meet different usage scenarios.

Equipment Options

Huawei Enterprise Wireless Campus Solution

Wireline and Wireless Network:

- Provides high-speed, secure and reliable wireless access for users in the campus.
- Supports distributed AP deployments and centralized configuration and management to effectively improve network operation efficiencies.
- Uses a unified NMS for wireline and wireless networks and adopts unified authentication technology to ensure consistent user experience.

Selected Products:

- AP: AP6010SN and AP6010DN
- AC: AC6605 and S9700/S7700 (SPU plug-in card)

Outdoor Wireless Network:

- Provides outdoor wireless coverage and data transmission services for users.
- Supports point-to-point (P2P) and point-to-multi-point (P2MP) data transmission.
- Uses wireless WDS networking and intelligent forwarding technologies.

Selected Products:

- AP: AP6510DN and AP6610DN
- AC: AC6605 and S9700/S7700 (plug-in card)
- Antenna: determined based on the network planning scheme.

Branch Wireless Network:

- Uses AC-capable AR routers and supports local AR management to apply to diversified networks.
- Supports remote VPN access to ensure network data security.

Selected Products:

- AP: AP6010SN and AP6010DN
- AC: AC6605, S9700/S7700 (SPU plug-in card) and AR G3 full-series.

Solution Highlights

Wide Coverage:

- Uses Huawei's unique patented wireless transmission algorithms, achieving superb radio frequency (RF) performance and wide signal coverage.
- Adopts 5 GHz preference technology (users preferentially access 5 GHz links) to improve user experience in high-density scenarios.

Easy O&M:

- Supports geographical topology, visualized RF management, and wizard-based AP configuration to improve deployment efficiency.
- Provides abundant WLAN O&M reports.
- Uses industrial-level components and provides an embedded surge protection module in outdoor APs, effectively reducing deployment costs.

Easy Installation:

- Uses dovetail design and quick hoop iron technology, reducing installation time by up to 70%.
- Provides user-friendly handlers, specifically designed to facilitate installation of components.