

CloudEngine 6870 Series Data Center Switches



CloudEngine 6870 Series Data Center Switches

Product Overview

Huawei CloudEngine 6870 (CE6870 for short) series switches are next-generation 10G Ethernet switches designed for data centers and high-end campus networks, providing high-performance, high-density 10GE ports, and low latency. The CE6870 has an advanced hardware architecture with 100GE uplink ports and the industry's highest density of 10GE access ports. The 4 GB buffer can effectively cope with traffic bursts in video and search services.

Using the Huawei VRP8 software platform, CE6870 switches provide extensive data center service features and high stacking capability. In addition, the airflow direction (front-to-back or back-to-front) can be changed. CE6870 switches can work with CE12800 switches to build an elastic, virtualized, high-quality fabric with end-to-end large buffer, meeting the requirements of cloud-computing data centers.

CE6870 switches provide high-density 10GE access to help enterprises and carriers build a scalable data center network platform in the cloud computing era. They can also be used as aggregation or core switches for enterprise campus networks.

Product Appearance

The CE6870 comes in four models.

CE6870-48T6CQ-EI



48*10GE BASE-T ports, 6*100GE QSFP28 ports or 6*40GE QSFP+ ports

CE6870-48S6CQ-EI



48*10GE SFP+ ports, 6*100GE QSFP28 ports or 6*40GE QSFP+ ports

CE6870-24S6CQ-EI



24*10GE SFP+ ports, 6*100GE QSFP28 ports or 6*40GE QSFP+ ports

CE6875-48S4CQ-EI



48*10GE SFP+ ports, 4*100GE QSFP28 ports or 4*40GE QSFP+ or 16*25GE SFP28 ports

Product Characteristics

Large Buffer, High-Density Access

- High-density 10GE access capability
 - » The CE6870 is the industry's highest-performing 1 U ToR switch. It provides 835 mpps forwarding performance and supports L2/L3 line-rate forwarding.
 - » The CE6870 provides up to 48*10GE ports, the highest 10GE port density among 1U ToR switches, allowing for high-density 10G server access.
 - » The CE6870 provides six 100GE QSFP28 ports. Each QSFP28 port can be used as one 40GE QSFP+ port, four 25GE SFP28 ports, or four 10GE SFP+ ports, providing flexibility in networking. The 100GE uplink ports can be connected to CE12800 switches to build a 100GE fully-connected network platform without oversubscription.
- Super large buffer size
 - » All ports on the CE6870 support ingress distributed buffering to effectively cope with traffic bursts.
 - » The CE6870 provides a 4 GB buffer, which is dynamically shared among all ports. With this large buffer capacity, CE6870 switches can work with CE12800 switches to provide an end-to-end large-buffer network solution to deliver more reliable network services.

Highly Reliable, High-Performance Stacking

- The industry's first 9-member stack system
 - » A stack system of 9 member switches has up to 432*10GE access ports that provide high-density server access in a data center.
 - » Multiple switches in a stack system are virtualized into one logical device, making it possible to build a scalable, easy-to-manage data center network platform.
 - » A stack system separates the control plane from the data plane. This eliminates the risk of single points of failure and greatly improves system reliability.
- Long-distance, highly reliable stacking
 - » The CE6870 can use service ports as stack ports. A stack system can be established with switches in the same rack or different racks, and even over long distances.
 - » Service and stack bandwidths can be allocated based on the network's scale so that network resources can be used more efficiently.

Inter-device Link Aggregation, High Efficiency and Reliability

- The CE6870 supports multichassis link aggregation group (M-LAG), which enables links of multiple switches to aggregate into one to implement device-level link backup.
- Switches in an M-LAG system all work in active state to share traffic and back up each other, enhancing system reliability.
- Switches in an M-LAG system can be upgraded independently. During the upgrade, other switches in the system take over traffic forwarding to ensure uninterrupted services.

- M-LAG supports dual-homing to Ethernet, TRILL, VXLAN, and IP networks, allowing for flexible networking.
- With the industry's most comprehensive inter-device link aggregation technology, the device networking coupling relationship evolves from stacking at the control plane to the use of M-LAG and then finally to coupling-free M-LAG Lite. This achieves active-active server access and zero interruption of services when upgrading switches.

Large-Scale Routing Bridge, On-Demand Scaling

- The CE6870 supports the IETF Transparent Interconnection of Lots of Links (TRILL) protocol. CE6850 switches can establish a large Layer 2 TRILL network with more than 500 nodes, enabling flexible service deployments and large-scale Virtual Machine (VM) migrations.
- The TRILL protocol uses a routing mechanism similar to IS-IS and sets a limited time to live (TTL) value in packets to prevent Layer 2 loops. This significantly improves network stability and speeds up network convergence.
- On a TRILL network, all data flows are forwarded quickly using Shortest Path First (SPF) and Equal-cost Multi-path (ECMP) routing. SPF and ECMP avoid the suboptimal path selection problem in STP and increase link bandwidth efficiency to 100 percent.
- The CE6870 supports TRILL-based Layer 2 equal-cost paths, greatly improving links' load balancing capabilities. The network has a fat-tree architecture that enhances expansion.

Virtualized Gateway Achieves Fast Service Deployment

- The CE6870 can work with a mainstream virtualization platform. As the high-performance, hardware gateway of an overlay network (VXLAN), the CE6870 can support more than 16 million tenants.
- The CE6870 can connect to a cloud platform through an open API to provide unified management of software and hardware networks.
- The hardware gateway deployment enables fast service deployment without changing the customer network, providing investment protection.
- The CE6870 supports Border Gateway Protocol - Ethernet VPN (BGP-EVPN), which can run as the VXLAN control plane to simplify VXLAN configuration within and between data centers.

Converged Enhanced Ethernet, Allowing for Data, Storage, and Computing Traffic on One Network

- CE6870 series switches support Fibre Channel over Ethernet (FCoE), which permits storage, data, and computing services to be transmitted on one network, reducing the costs of network construction and maintenance.
- CE6870 series switches support centralized FCoE/FC gateway deployment, which makes network O&M simpler.
- Various CE6870 series switches support multiple data center features: Priority-based Flow Control (PFC), Enhanced Transmission Selection (ETS) and Data Center Bridging eXchange (DCBX). These features ensure low latency and zero packet loss for FC storage and high-speed computing services.

Full Openness and Programmability, Flexible Customization

- The CE6870 uses the Open Programmability System (OPS) embedded in the VRP8 software platform to provide programmability at the control plane.
- The OPS provides open APIs. APIs can be integrated with mainstream cloud platforms (including commercial and open cloud platforms) and third-party controllers. The OPS enables services to be flexibly customized and provides automatic management.
- Users or third-party developers can use open APIs to develop and deploy specialized network management policies to implement extension of fast service functions, automatic deployment, and intelligent management. The OPS also implements automatic operation and maintenance, and reduces management costs.
- The CE6870 supports CE modules for Ansible, which enables unified provisioning of physical and virtual networks.
- CE6870 switches can seamlessly integrate with systems of F5, an industry-leading application delivery network provider, to build an active-active data center network.
- The OPS provides seamless integration of data center service and network in addition to a service-oriented, software-defined networking (SDN).

Zero Touch Provisioning, Automatic O&M

- The CE6870 supports Zero Touch Provisioning (ZTP). ZTP enables the CE6870 to automatically obtain and load version files from a USB flash drive or file server, freeing network engineers from onsite configuration or deployment. ZTP reduces labor costs and improves device deployment efficiency.
- ZTP provides built-in scripts for users through open APIs. Data center personnel can use the programming language they are familiar with, such as Python, to provide unified configuration of network devices.
- ZTP decouples configuration time of new devices from device quantity and area distribution, which improves service provisioning efficiency.

MACsec Hardware Encryption, High Security and Reliability

- The CE6870 supports MACsec, which provides hop-by-hop data encryption and secure MAC-layer data sending and receiving services including user data encryption, data frame integrity check, and data source verification. The CE6870 is applicable to networks that require high data confidentiality, such as those of government and finance institutions.

Intelligent O&M with the FabricInsight Solution

- The CE6870 provides proactive path detection on the entire network. It periodically checks sample flows to determine connectivity of all paths on the network and locates failure points, enabling you to know the network health in real time.
- The CE6870 supports visualization of all flows and congestion, improving service experience.

Flexible Airflow Design, High Energy Efficiency

- Flexible front-to-back/back-to-front airflow design
 - » The CE6870 uses a front-to-back/back-to-front airflow design that isolates cold air channels from hot air channels. This design meets heat dissipation requirements in data center equipment rooms.

- » Air can flow from front to back, or back to front when different fans and power modules are used.
- » Redundant power modules and fans can be configured to ensure uninterrupted service transmission.
- Energy-saving technology
 - » The CE6870 series switches have energy-saving chips and can measure system power consumption in real time. Fan speed can be adjusted dynamically based on system consumption. These energy-saving technologies reduce O&M costs and contribute to a greener data center.

Clear Indicators, Simple Maintenance

- Clear indicators
 - » Port indicators clearly show port status and port speeds. The 100GE port indicators can show the states of all ports derived from the 100GE ports.
 - » State and stack indicators on both the front and rear panels enable operators to maintain the switch from either side.
 - » CE6870 series switches support remote positioning. Operators can turn on remote positioning indicators on the switches they want to maintain, so that they can find switches easily in an equipment room full of devices.
- Simple maintenance
 - » The management port, fans, and power modules are on the front panel, which facilitates device maintenance.
 - » Data ports are located at the rear, facing servers. This simplifies cabling.

Product Specifications

Item	CE6870-48T6CQ-EI	CE6870-48S6CQ-EI	CE6870-24S6CQ-EI	CE6875-48S4CQ-EI
10GE SFP+ ports	NA	48	24	48
10GE BASE-T	48	NA	NA	NA
100GE QSFP28 ports	6	6	6	4
Switching capacity	2.16 Tbit/s (Switching capacity after stacking: 19.44 Tbit/s)		1.68 Tbit/s (Switching capacity after stacking: 15.12 Tbit/s)	1.76 Tbit/s (Switching capacity after stacking: 15.48 Tbit/s)
Forwarding rate	720 mpps			835 mpps
Airflow design	Front-to-back or back-to-front			
Device virtualization	iStack ¹			
	M-LAG			

¹ For details about the configuration, please see: http://support.huawei.com/online/tools/web/virtual/en/dc/stack_index.html?dcb

Item	CE6870-48T6CQ-EI	CE6870-48S6CQ-EI	CE6870-24S6CQ-EI	CE6875-48S4CQ-EI
Network virtualization	TRILL			
	VXLAN routing and bridging			
	BGP-EVPN			
	QinQ access VXLAN			
SDN	Agile Controller			
	VMware NSX			
Network convergence	FCoE			
	DCBX, PFC, ETS			
Programmability	Programming on the OPS			
	Ansible-based automatic configuration and open-source module release			
Traffic analysis	NetStream			
	sFlow			
VLAN	Adding access, trunk, and hybrid interfaces to VLANs			
	Default VLAN			
	QinQ			
	MUX VLAN			
	GVRP			
ACL	20k (Ingress and Egress shared)			
MAC address table	Maximum:750k			
	Dynamic learning and aging of MAC addresses			
	Static, dynamic, and blackhole MAC address entries			
	Packet filtering based on source MAC addresses			
	MAC address limiting based on ports and VLANs			
ARP	Maximum:750k			
ND	Maximum: 96k			
IPv4 FIB	Maximum:380k			
IP routing	IPv4 routing protocols, such as RIP, OSPF, BGP, and IS-IS			
	IPv6 routing protocols, such as RIPng, OSPFv3, IS-ISv6, and BGP4+			
IPv6 FIB	Maximum:128k			

Item	CE6870-48T6CQ-EI	CE6870-48S6CQ-EI	CE6870-24S6CQ-EI	CE6875-48S4CQ-EI
IPv6	IPv6 Neighbor Discovery (ND)			
	VXLAN over IPv6			
	IPv6 VXLAN over IPv4			
	Path MTU Discovery (PMTU)			
	TCP6, ping IPv6, tracer IPv6, socket IPv6, UDP6, and Raw IP6			
Multicast FIB	Maximum:32k			
Multicast	IGMP, PIM-SM, PIM-DM, MSDP, and MBGP			
	IGMP snooping			
	IGMP proxy			
	Fast leaving of multicast member interfaces			
	Multicast traffic suppression			
	Multicast VLAN			
	Multicast VXLAN			
Reliability	LACP			
	STP, RSTP, VBST, and MSTP			
	BPDU protection, root protection, and loop protection			
	Smart Link and multi-instance			
	DLDP			
	ERPS (G.8032)			
	VRRP, VRRP load balancing, and BFD for VRRP			
	BFD for BGP/IS-IS/OSPF/Static route			
QoS	Traffic classification based on Layer 2 headers, Layer 3 protocols, Layer 4 protocols, and 802.1p priority			
	Actions of ACL, CAR, re-marking, and scheduling			
	Queue scheduling algorithms, including PQ, WRR, DRR, PQ+WRR, and PQ+DRR			
	Congestion avoidance mechanisms, including WRED and tail drop			
	Traffic shaping			

Item	CE6870-48T6CQ-EI	CE6870-48S6CQ-EI	CE6870-24S6CQ-EI	CE6875-48S4CQ-EI
Configuration and maintenance	Console, Telnet, and SSH terminals			
	Network management protocols, such as SNMPv1/v2c/v3			
	File upload and download through FTP and TFTP			
	BootROM upgrade and remote upgrade			
	802.3az Energy Efficient Ethernet (EEE)			
	Hot patches			
	User operation logs			
	ZTP			
Security and management	802.1x authentication			
	MACsec ²			
	Command line authority control based on user levels, preventing unauthorized users from using commands			
	DoS, ARP, and ICMP attack defenses			
	Port isolation, port security, and sticky MAC			
	Binding of the IP address, MAC address, interface number, and VLAN ID			
	Authentication methods, including AAA, RADIUS, and HWTACACS			
Remote Network Monitoring (RMON)				
Dimensions (W x D x H)	442 mm x 420 mm x 43.6 mm	442 mm x 420 mm x 43.6 mm	442 mm x 420 mm x 43.6 mm	442mm x 600mm x 43.6mm
Weight (fully loaded)	9.8 kg (21.6lb)	8.7 kg (19.2lb)	8.5 kg (18.7lb)	9 kg (19.8lb)
Environmental parameters	Operating temperature: 0°C to 40°C (32°F to 104°F) (0 m to 1,800 m) Storage temperature: -40°C to +70°C (-40°F to 158°F) Relative humidity: 5% RH to 95% RH, non-condensing			
Operating voltage	AC: 90 V to 290 V	AC: 90 V to 290 V DC: -38.4 V to -72 V	AC: 90 V to 290 V DC: -38.4 V to -72 V	AC: 90 V to 290 V DC: -38.4 V to -72 V
Maximum power consumption	394W	333 W	258 W	407 W

2 Supported only by the CE6875

Ordering Information

Mainframe

CE6870-EI-F-B00	CE6870-48T6CQ-EI Switch(48-Port 10GE RJ45,6-Port 100GE QSFP28,2*AC Power Module,2*FAN Box,Port-side Exhaust)
CE6870-EI-B-B00	CE6870-48T6CQ-EI Switch(48-Port 10GE RJ45,6-Port 100GE QSFP28,2*AC Power Module,2*FAN Box,Port-side Intake)
CE6870-48T6CQ-EI	CE6870-48T6CQ-EI Switch(48-Port 10GE RJ45,6-Port 100GE QSFP28,Without Fan and Power Module)
CE6870-48S6CQ-EI	CE6870-48S6CQ-EI Switch (48-Port 10GE SFP+, 6-Port 100GE QSFP28, Without Fan and Power Module)
CE6870-EI-F-B0A	CE6870-48S6CQ-EI Switch (48-Port 10GE SFP+, 6-Port 100GE QSFP28, 2*AC Power Module, 2*FAN Box, Port-side Exhaust)
CE6870-EI-B-B0A	CE6870-48S6CQ-EI Switch (48-Port 10GE SFP+, 6-Port 100GE QSFP28, 2*AC Power Module, 2*FAN Box, Port-side Intake)
CE6870-24S6CQ-EI	CE6870-24S6CQ-EI Switch (24-Port 10GE SFP+, 6-Port 100GE QSFP28, Without Fan and Power Module)
CE6870-EI-F-B0B	CE6870-24S6CQ-EI Switch (24-Port 10GE SFP+, 6-Port 100GE QSFP28, 2*AC Power Module, 2*FAN Box, Port-side Exhaust)
CE6870-EI-B-B0B	CE6870-24S6CQ-EI Switch (24-Port 10GE SFP+, 6-Port 100GE QSFP28, 2*AC Power Module, 2*FAN Box, Port-side Intake)
CE6875-48S4CQ-EI	CE6875-48S4CQ-EI Switch (48-Port 10GE SFP+, 4-Port 100GE QSFP28, Without Fan and Power Module)
CE6875-EI-F-B0A	CE6875-48S4CQ-EI Switch (48-Port 10GE SFP+, 4-Port 100GE QSFP28, 2*AC Power Module,2*FAN Box,Port-side Exhaust)
CE6875-EI-B-B0A	CE6875-48S4CQ-EI Switch (48-Port 10GE SFP+, 4-Port 100GE QSFP28, 2*AC Power Module,2*FAN Box,Port-side Intake)

Fan box

Part Number	Product Description	Support Product
FAN-40HA-F	Fan box (HA, Front to Back, FAN panel side intake)	CE6870-48T6CQ-EI,CE6870-48S6CQ-EI, CE6870-24S6CQ-EI
FAN-40HA-B	Fan box(HA, Back to Front, FAN panel side exhaust)	CE6870-48T6CQ-EI,CE6870-48S6CQ-EI, CE6870-24S6CQ-EI
FAN-060A-F	Fan box (F, FAN panel side intake)	CE6875-48S4CQ-EI
FAN-060A-B	Fan box (B, FAN panel side exhaust)	CE6875-48S4CQ-EI

Power

Part Number	Product Description	Support Product
PAC-600WA-F	600W AC Power Module (Front to Back, Power panel side intake)	CE6870-48T6CQ-EI, CE6870-48S6CQ-EI, CE6870-24S6CQ-EI

PAC-600WA-B	600W AC Power Module (Back to Front, Power panel side exhaust)	CE6870-48T6CQ-EI, CE6870-48S6CQ-EI, CE6870-24S6CQ-EI
PAC-600WB-F	600W AC&240V DC Power Module (Front to Back, Power panel side intake)	CE6875-48S4CQ-EI
PAC-600WB-B	600W AC&240V DC Power Module (Back to Front, Power panel side exhaust)	CE6875-48S4CQ-EI
PDC-350WA-F	350W DC Power Module (Front to Back, Power panel side intake)	CE6870-48S6CQ-EI, CE6870-24S6CQ-EI
PDC-350WA-B	350W DC Power Module (Back to Front, Power panel side exhaust)	CE6870-48S6CQ-EI, CE6870-24S6CQ-EI
PDC-1K2WA-B	1200W DC Power Module (Back to Front, Power panel side exhaust)	CE6875-48S4CQ-EI
PDC-1K2WA-F	1200W DC Power Module (Back to Front, Power panel side intake)	CE6875-48S4CQ-EI
PHD-600WA-F	600W HVDC Power Module(Power panel side intake)	CE6875-48S4CQ-EI
PHD-600WA-B	600W HVDC Power Module(Power panel side exhaust)	CE6875-48S4CQ-EI

Software

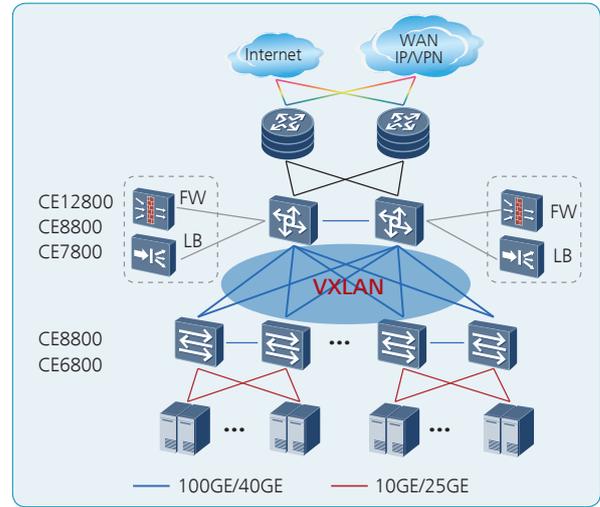
CE68-LIC-VXLAN	CloudEngine 6800 VXLAN Function
CE68-LIC-FCF16	CloudEngine 6800 FCF 16 Ports
CE68-LIC-FCFAL	CloudEngine 6800 FCF All Ports
CE68-LIC-TLM	CE6800 Telemetry Function
CE68-LIC-BASE	CE6800 Basic Software Function
CE68-LIC-MACSEC	CE6800 MACsec Function

Networking and Applications

Data Center Applications

On a typical data center network that requires a large buffer, for example, a data center providing search and video services, CE12800 switches can be used as core switches, whereas CE6870 switches can be used as ToR switches and connect to CE12800 switches using 100GE ports to build a 100GE network with end-to-end large buffer capacity. The CE12800 and CE6870 switches use VXLAN or TRILL to build a non-blocking Layer 2 network, which allows large-scale VM migrations and flexible service deployments.

Note: VXLAN and TRILL technology can be also used on campus networks to support flexible service deployments in different service areas.

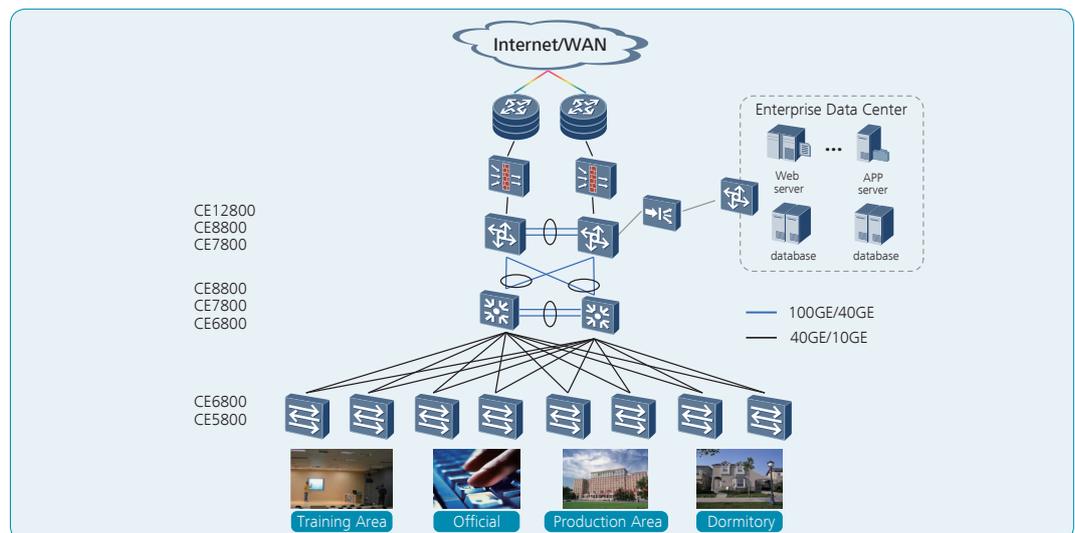


Campus Network Applications

CE6870 switches can be used as aggregation or core switches on a campus network. Their high-density, line-speed 10GE ports and high stacking capability can meet the ever-increasing demand for network bandwidth. CE6800 switches are cost-effective campus network switches, thanks to their extensive service features and innovative energy-saving technologies.

On a typical campus network, multiple CE12800/CE8800/CE7800 switches are virtualized into a logical core switch using CSS or iStack technology. Multiple CE8800/CE7800/CE6800 switches at the aggregation layer form a logical switch using iStack technology. CSS and iStack improve network reliability and simplify network management. At the access layer, CE6800/CE5800 switches are virtualized with CloudFabric technology, such as M-LAG or SVF (vertical virtualization), to provide high-density line-rate ports.

Note: CSS, iStack, SVF, and M-LAG are also widely used in data centers to facilitate network management.



Copyright © Huawei Technologies Co., Ltd. 2018. All rights reserved.

No part of this document may be reproduced or transmitted in any form or by any means without prior written consent of Huawei Technologies Co., Ltd.

Trademark Notice

 HUAWEI, and  are trademarks or registered trademarks of Huawei Technologies Co., Ltd. Other trademarks, product, service and company names mentioned are the property of their respective owners.

General Disclaimer

The information in this document may contain predictive statements including, without limitation, statements regarding the future financial and operating results, future product portfolio, new technology, etc. There are a number of factors that could cause actual results and developments to differ materially from those expressed or implied in the predictive statements. Therefore, such information is provided for reference purpose only and constitutes neither an offer nor an acceptance. Huawei may change the information at any time without notice.

HUAWEI TECHNOLOGIES CO.,LTD.
Huawei Industrial Base
Bantian Longgang
Shenzhen 518129,P.R.China
Tel: +86 755 28780808

www.huawei.com