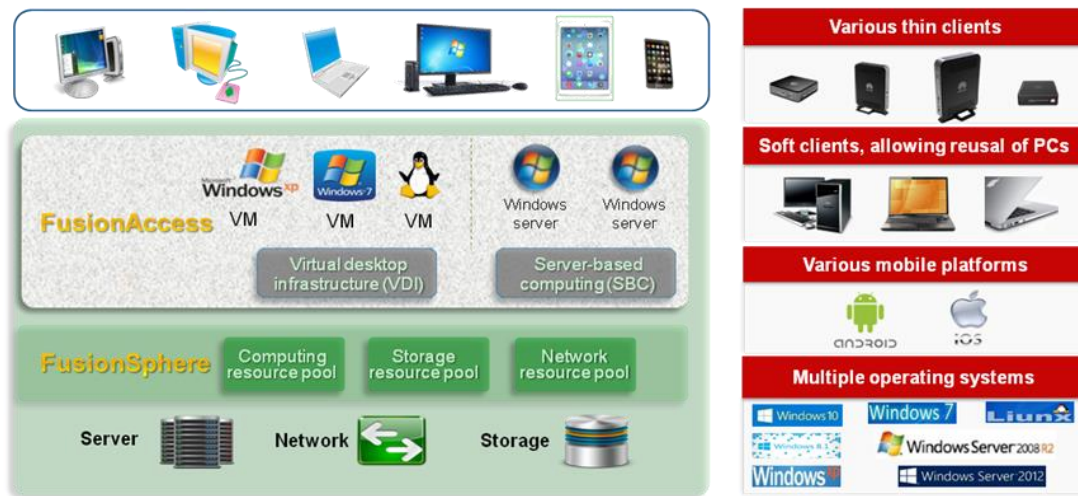


Huawei FusionAccess Desktop Cloud Solution

Cloud Workspace, Smart FusionAccess



The Huawei FusionAccess Desktop Cloud Solution delivers virtual desktop applications by deploying desktop cloud software on the Huawei cloud platform. Users can access cross-platform applications and even the entire desktop by using thin clients (TCs) or any other devices connected to the Internet.

The Huawei FusionAccess Desktop Cloud Solution, an end-to-end solution for customers, covers cloud terminals, cloud hardware, cloud software, network and security, and consulting and integration design services.

The Huawei FusionAccess Desktop Cloud Solution features high security and reliability, superior user experience, and high agility and efficiency. Huawei now has more than 2500 partners worldwide and over 1500 enterprise customers in 100 countries and has deployed the world's largest desktop cloud platform serving 100,000 users. Based on the project implementation experience, the solution is widely adopted in the government, healthcare, finance, education, telecommunications, energy, transportation, media, and manufacturing industries.

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Solution Highlights

SmartLink

SmartLink, Breaking boundaries and enabling office access anytime, anywhere

- Any device: supports smart access from various terminals, such as Windows, Linux, Android, macOS, iOS, and Chrome terminals, providing outstanding user experience.
- Any where: supports smart login from any place in a unified manner. Smart dynamic access and smart nearest access reduce required bandwidth and break office boundaries.
- Any time: intelligently detects network QoS and changes as well as network bandwidth resources and dynamically adjusts video display levels and frame rates to reduce network interference.

SmartView

HDP-based intelligent algorithms, providing optimal user experience

- Intelligent display: Intelligent identification and adaptive compression of texts and images ensure up to 50 dB PSNR and 0.999955 SSIM, delivering the optimal display effect.
- Intelligent video and audio: Industry-leading technologies, such as video acceleration, 4K video editing, and audio and video bypass, provide smooth video experience.
- Intelligent graph: The hybrid GPU resource pool covers passthrough, hardware virtualization, software GPUs, and conventional workstations and meets GPU requirements. vGPU pooling achieves time-specific resource reusing and automatic GPU resource binding and releasing, maximizing resource sharing.
- Intelligent application: Applications are identified and configured using algorithms such as image complexity identification and window sensing, improving the application effect.

SmartProtection

End-to-end security and reliability protection, safeguarding data security

- Security protection: provides a cloud-pipe-device-control security protection system and exclusively supports a variety of security capabilities, such as all-Linux management nodes, separation of roles, and secure deletion of VMs.
- Reliability protection: delivers all-Linux high reliability systems, component redundancy protection, intelligent fault detection, isolation, and rectification, and comprehensive backup and DR solutions, ensuring business continuity and data security.

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Main Feature

Feature	Description	Strength
High Security		
Terminal security	<ul style="list-style-type: none">● TCs are authenticated to prevent unauthorized access.● Terminal port management covers USB ports, serial ports, and parallel ports. Some ports can be disabled. For example, USB read and write can be disabled to prevent unauthorized data copy.● TCs have no hard disk to store data. Data is stored in the data center to prevent data leakage.	Ensures secure client access and control over port data policies.
User access security	<ul style="list-style-type: none">● Fingerprint login authentication is supported.● USB key login authentication is supported.● Dynamic password login authentication is supported.● Binding between TCs and user accounts is supported. Users can access desktops only from specified places.● Third-party authentication system interconnection is supported.● Verification code login authentication is supported.	Offers a variety of access control methods, ensuring maximum data security.
Transmission security	<ul style="list-style-type: none">● Portal over HTTPS is supported. All transmission from the portal is encrypted.● HDP over SSL is supported. Information between clients and servers and between internal components of the desktop cloud system is transmitted over SSL. This ensures information transmission security.● System data, including passwords, keys, and sensitive data (such as domain password) is encrypted for transmission.	Allows information to be encrypted by different methods, making transmission secure.
Network security	<ul style="list-style-type: none">● The internal network is physically isolated from external networks.● Remote access is secure. Employees on business trips can access their enterprise's data and application over SSL-VPN.● Internal and external network isolation prevents data from being transmitted to external networks.● The dual-port cloud client is configured with two physical NICs. This feature, along with dual-screen display, ensures the isolation and display of virtual desktops on two isolated physical networks.	Improves security of the virtual desktop data and enhances user login security and reliability.
Cloud platform security	<ul style="list-style-type: none">● The desktop cloud system is hardened, and the Linux operating system can be customized and hardened.● Security patch delivery and upgrade are centrally managed.● VM live migration is supported to enable seamless handover of services when a VM becomes faulty.● Distributed storage and automatic backup are supported for data. Large files can be fragmented and stored in different physical areas. When a physical storage device is damaged, the data can be restored using the backups stored somewhere else.	Ensures security and reliability of the FusionCloud desktop management system and VM user data.

Feature	Description	Strength
	<ul style="list-style-type: none"> VM snapshots can be provided based on the storage virtualization capability of the computing side. The snapshot function is independent of storage devices. 	
Data security	<ul style="list-style-type: none"> Data is removed from a deleted VM to prevent malicious users from using data recovery software to restore data. Each virtual desktop has its own logically independent VM. VMs are isolated in a way similar to that physical PCs are isolated. Only the authorized user can access the VM. Desktop security watermarks prevent users from photographing virtual desktops. User VMs are compatible with various antivirus software to protect user VMs against virus attacks. 	Prevents user data theft and malicious use.
Management security	<ul style="list-style-type: none"> Security hardening for the management system OS and database Antivirus software is installed on management systems. Management system certificate authentication Management system login Ukey authentication One-click replacement of management system certificates AD Domain username and password authentication Administrator operation log audit Rights- and domain-based management and separation of rights Domain account login to the management portal 	Supports security hardening for the management system and the OS of the management server to ensure security of the entire desktop cloud management system.
High Reliability		
Management node redundancy	Management nodes are deployed in active/standby mode. If a management node VM fails, the VM can be automatically recovered. Memory, CPU, and hard disk status of management nodes can be monitored automatically.	Ensures service continuity.
Security gateway	<ul style="list-style-type: none"> Hardware load balancer: The processing capability of each server is used to balance traffic and improve service reliability. Supports hardware load balancing products, such as SVN/F5/Netscaler. Hardware security gateway: The HDP data streams are encrypted to improve the security of the desktop cloud system. The hardware security gateway F5 is supported. Software implements load balancing. The vLB software supports desktop access load balancing, reducing investment. The software implements the security gateway. The vAG software is used to support desktop security gateways, which reduces investment and is applicable to small-scale sites. 	<ul style="list-style-type: none"> Supports F5 hardware security gateway Supports vAG distributed cluster deployment, providing large-scale networking capabilities.
Automatic backup and quick recovery of management data	<ul style="list-style-type: none"> Management data is automatically backed up. When configuration data is lost or damaged, the backup data can be used to quickly restore the desktop cloud system. 	Ensures service continuity.
VM HA mechanism	The desktop cloud system monitors the VM operating status in real time after HA is enabled. When detecting that a PM is faulty, the system automatically migrates its VMs to a server that is running properly. This HA mechanism ensures quick recovery of the VMs.	Shortens the desktop fault recovery time, ensures service continuity, and improves work efficiency.
Virtual desktop online backup	<ul style="list-style-type: none"> Individual users can manually or periodically back up important data to the backup system. If virtual desktop data is lost due to faults, such as disk damage and 	Provides backup and data recovery options as a key service that

Feature	Description	Strength
	<p>unexpected deletion, users can restore data using the data in the backup system.</p> <ul style="list-style-type: none"> Two backup modes, network attached storage (NAS) backup and eBackup backup, are supported. NAS network disk backup: The AD policy is used to attach NAS web disks to users and use the profile roaming and file redirection technologies of the AD group policy to back up users' personalized data to the NAS web disk. 	preserves user data.
Service DR	Global server load balancing (GLSB)-based DR, TC autonomous DR, and UltraVR DR (data DR) are supported. When the production center is faulty, desktop VMs in the DR center take over services to ensure service continuity.	Shortens service interruptions to improve service system reliability.
Desktop connection reliability	<ul style="list-style-type: none"> Supports automatic desktop reconnection in the event of network failures or other faults. Supports desktop connection interface negotiation and protects desktop agent software from being deleted by mistake. 	Ensures system reliability by minimizing service downtime and limiting the impact of a fault.
BSOD rapid detection	When a VM OS experiences a BSOD fault, FusionManager automatically restarts the VM.	Improves system reliability.
Server performance monitoring	The automatic hardware diagnosis function enables the desktop cloud system to monitor hardware status in real time. When detecting a fault of a hardware component, the system automatically isolates the component, performs a switchover, restarts the component, and reloads software to it.	Shortens service interruptions to improve service system reliability.
Migration of disks on a faulty VM	<ul style="list-style-type: none"> When a VM fails to be started, its disks can be mounted to another VM. The user can log in to the new VM and back up disk data. By default, the temporary VM to which the disk is mounted will be retained for a maximum of seven days. Seven days after the disk migration, the system automatically deletes the temporary VM. The disk retention duration can be set during disk migration. 	Ensures system reliability by minimizing service downtime and limiting the impact of a fault.
Black box	A black box is embedded in the desktop cloud system to collect system logs automatically. When a fault occurs in the system, the black box collects dying gasps in the system.	Provides a record of the system information to assist maintenance personnel in locating and rectifying the problem.
Optimal Experience		
Carrier-class voice quality	<ul style="list-style-type: none"> VM-based SoftClient, SoftClient-split, TC-based SoftClient, and hardphone solutions are supported, providing high voice quality with a low delay. The delay is less than 500 ms and the PESQ can reach 3.8. Mainstream IP call center software, such as CosmoCall Universe™ and Avaya™ are supported. Daily office communication within enterprises is supported, including the Skype audio and video redirection solution and the audio and video bypass solution. 	Provides carrier-class voice quality and helps build a reliable, environmentally-friendly call center system featuring centralized management.
Graphics	GPU passthrough/hardware virtualization solution and GPU pooling function are supported. Graphics workstations can be managed to achieve high-performance 2D/3D graphics processing and compatible with mainstream 2D/3D software. For example: AutoCAD, Revit, 3DS MAX, ProE, Greo etc.	Enables high-performance graphics processing in all scenarios, addressing the difficulties of traditional graphics workstations, such as O&M, information security, and concurrency

Feature	Description	Strength
Video editing	With the Huawei Desktop Protocol (HDP), the GPU passthrough and hardware virtualization solutions support 4K ultra HD video editing.	Meets omnimedia editing requirements. Video rendering and composition editing is supported on cloud workstations. Exclusively supports 4K video editing. The 120 Mbit/s HD video editing capacity leads the industry.
Multimedia playback	<ul style="list-style-type: none"> ● Multimedia redirection, with video decoding capabilities on the client, provides users with smooth playback experience. HD video playback is supported. ● The Video Hardware Acceleration Redirection feature is supported. On Windows 8.1 or Windows Server 2012 R2, videos that were originally accelerated by video hardware can be redirected to the client for decoding, improving the video playback quality. Compared with multimedia redirection, the Video Hardware Acceleration Redirection feature supports more file types and video formats. ● This function allows flash to be redirected to clients for processing, improving the multimedia experience. ● Local 4K video playback ● Support same screen display: The display of a VM can be displayed on the client of another VM through the desktop cloud client. 	Delivers a multimedia experience rivaling that of a local PC.
HD display	<ul style="list-style-type: none"> ● Lossless HD desktop display with the peak signal to noise ratio (PSNR) greater than 50,000 dB and the structural similarity index measurement (SSIM) at 9999.55% ● 4K (3840 x 2160) screen display 	Provides HD display experience.
Server-based computing (SBC)	<ul style="list-style-type: none"> ● SBC-based shared desktop release ● SBC-based remote application release ● Increased peripheral compatibility supports USB port mapping, camera mapping, printer mapping, TWAIN mapping, and smart card mapping (PC/SC). ● Windows Server native gestures improve user experience. ● Support self-service maintenance application: Users can deregister session connections on the client to quickly release server resources and improve user experience. 	Centrally deploys and remotely releases applications to provide quick deployment and centralized O&M and protect data security.
VIP desktop	CPU and memory guarantee and real-time monitoring are provided for VIP desktops so that VIP desktop users can enjoy better desktop experience.	Ensures the use experience of key customers.
Unified printing	Third-party network solutions are integrated to enable unified VM printing.	Reduces resource usage and improves user experience by removing the need for driver installation.
Support for multiple peripheral devices	<ul style="list-style-type: none"> ● Device mapping and port mapping modes can be used to support multiple dedicated peripherals, control virtual desktops, and share local resources. ● More than 500 peripherals are supported, including USB flash drives, USB printers, scanners, USB cameras, USB keys, and fingerprint readers. 	Delivers an experience using multiple peripherals equaling that of a local PC.
Efficient O&M		
Automatic	<ul style="list-style-type: none"> ● Scheduled tasks can be created to create, start, shut down, restart, wake up, or 	Improves maintenance efficiency by

Feature	Description	Strength
desktop management	<p>hibernate VMs in batches.</p> <ul style="list-style-type: none"> Scheduled tasks, periodical tasks, and task policies can be configured. 	automating VM management.
Desktop system monitoring	<p>FusionSphere monitors virtual resource clusters, server hosts, and VMs in real time. Hardware and software resources can be displayed in graphs. FusionAccess monitors VM CPU, memory, and network resource usage, and allows administrators to query VM status, unused VMs, and user login information. Reports can be exported, and northbound APIs are provided to facilitate self-service monitoring.</p>	Improves resource management efficiency by allowing administrators to reclaim idle resources.
Unified Linux deployment	<p>Desktop management components ITA, WI, HDC, DB, and License can be deployed in the Linux OS in a one-click or step-by-step manner.</p>	Improves installation, deployment, and management efficiency by simplifying system configuration.
Wizard-based ITA initial configuration	<p>A wizard guides users through the ITA initial configuration. Initial information such as virtualization environment, domain, desktop component, and alarm component information is automatically configured after proper information is entered based on the wizard.</p>	Simplifies the initial configuration and improves efficiency.
Unified user interface (UI) management	<p>FusionManager integrates desktop cloud service management, virtualization platform O&M, and hardware management functions.</p>	Improves O&M efficiency by using a unified management WebUI.
Template creation tool	<ul style="list-style-type: none"> Wizard-based VM template creation automatically completes desktop agent program installation, system optimization, and parameter configuration. 	Improves template creation efficiency.
Unified management system upgrade	<p>Administrators can upgrade management systems in batches by running the upgrade tool on a PC or laptop without logging in to the server or VM where the management system is installed.</p>	Rapidly upgrades virtual desktops and improves O&M efficiency.
Unified access to desktop pools	<p>Supports the logical grouping of multiple dynamic desktop pool groups in one or more FusionAccess environments through UNS and merges them into a larger unified access desktop pool.</p>	This feature improves the utilization of virtual desktops in multiple dynamic pool desktops, shields the production and DR environments from providing unified desktop group information, and works with the GSLB to implement access affinity.
User experience optimization tool	<p>The user experience optimization tool library provides the following functions: risk check, system optimization, audio optimization, query of historical performance cases, and software compatibility check.</p>	Improves O&M efficiency and reduces costs.
Branch office management	<p>The branch office networking supports local deployment of remote modules. The VMs of branch offices can be provisioned and maintained in a unified manner, including hardware management and monitoring, virtual resource management and monitoring, centralized alarm and operation log management, SSO, and TC management.</p>	Implements centralized virtual desktop O&M and desktop service provisioning in branch offices.
Unified Huawei desktop agent (HDA) software upgrade	<ul style="list-style-type: none"> Supports Automatic upgrade of the Access Agent software The desktop cloud system supports multiple upgrade modes, such as silent upgrade by using the PV driver, AD group policy upgrade, and upgrade by updating the linked clone parent volume. Unified Access Client software update: Supports automatic upgrade of protocol client software. Users can upgrade TCs on the WI. 	Facilitates efficient software updates and management from a central location.
User self-service	<p>Users can use the self-service maintenance console to rectify faults when they fail to log in to</p>	Ensures convenient and quick

Feature	Description	Strength
maintenance console	VMs.	maintenance, reducing system administrator workload.
Recreate VM	For a full copy VM, after the VM template is updated, you can use the VM rebuilding function to update the full copy VM. This feature can also be used for VM fault recovery and VM OS upgrade, for example, from Windows 7 to Windows 10.	Facilitates the quick upgrade of the operating system of the existing VM.
Desktop Manager vDesk	The desktop manager self-service tool consists of the self-service maintenance tool and information collection tool. The self-service maintenance tool includes the connection repair tool and desktop optimization experience tool (including risk check, system optimization, and historical case library). The information collection tool includes the HDP log collection tool, information collection tool, and process collection tool.	This feature facilitates user management and maintenance and improves troubleshooting efficiency.
LiteAD	LiteAD provides lightweight and agile user management and is applicable to scenarios with fewer than 300 users and no Microsoft AD deployed.	Achieves rapid deployment with low costs.
O&M tool	<ul style="list-style-type: none"> • A whole range of tools are provided to collect desktop system planning information. • Log analysis tools are provided to analyze FusionAccess logs. • Health check tools are provided to perform system health checks, display check results, and generate health reports. 	Improves project planning and O&M efficiency.
Lazydesk	<ul style="list-style-type: none"> • Users can use virtual desktops after powering on the TCs. 	Provides the same login experience as PCs.
Monitor automatic energy saving	When a virtual desktop screen is locked, the local monitor is automatically shut down and enters sleep.	Reduces energy consumption without affecting conference or video playback experience.
Linkage shutdown	When a user shuts down a VM, the TC automatically shuts down, simplifying TC management.	Improves TC management efficiency.
Full memory desktop	System disks of VMs reside in the memory so that VM disk read/write operations are converted into memory operations, which improves user experience. VMs can be restored after shutdown.	Improves management efficiency in public places such as schools, training institutions, and hotels. User experience exceeds that of a local physical machine.
Efficient Resource Reuse		
Memory overcommitment	Hypervisor scheduling enables memory overcommitment without affecting user experience.	Allows VMs to use more memory than the space available on the physical host without deteriorating user experience.
Linked clone	A shared read-only parent volume is used to provide the original VM OS, which reduces the system disk space usage and system disk capacity configuration. Linked clones also support unified software upgrades and system restoration.	Reduces deployment and maintenance costs, improving desktop maintenance efficiency.
Storage thin provisioning	Physical storage space can be virtualized into more virtual storage space. The physical storage space is occupied only when data is written into the virtual storage space.	Optimizes storage space usage by allocating space as required.
Smart cache (iCache)	In linked clone virtual desktop scenarios, iCache technology is used to dynamically identify and cache user shared storage resources and parent volume hotspot data in the memory, which greatly improves data access performance.	Improves I/O performance and accelerates batch VM startup.
Dynamic resource	DRS policies define scheduling thresholds and the effective periods in a cluster. In the effective period, if the CPU load of a computing server exceeds the scheduling threshold, the	Ensures CPU load balance among computing servers.

Feature	Description	Strength
scheduling (DRS)	system will migrate some VMs to other computing servers with a low CPU load.	
Dynamic power management	If only a few VMs are used in a cluster, the VMs can be aggregated to a few hosts in the cluster and the other hosts can be stopped. This helps achieve energy conservation and emission reduction. When more VMs are required, the system dynamically powers on hosts to provide sufficient VMs.	Allows the system to be energy-saving and eco-friendly.
Elastic resource reuse	Services use system resources on the cloud platform in different hours to maximize resource usage. For example, a user uses a virtual desktop to deal with office work at daytime and releases the occupied computing resources at night. Then, the system can use the released computing resources to process other services, such as image rendering and supercomputing, at night. After completing these services, the system releases the computing resources again for virtual desktop users to use the next day. Scheduled tasks, along with elastic resource scheduling, enable the reuse of desktop cloud system resources.	Maximizes cloud platform resource usage.
Open Interfaces		
System management interface	With FusionManager northbound interfaces, enterprises can incorporate their desktop cloud system into an upper-layer management system. This facilitates centralized management of the cloud platform and allows for optimal use of cloud platform resources.	Enables third-party upper-layer management systems to centrally manage and maintain the cloud platform.
Service provisioning interface	Users can customize service provisioning portals by using the virtual desktop service provisioning interface provided by FusionAccess.	Enables the desktop cloud system to interconnect with third-party management systems.

Technical Specifications

VM Specifications	
VDI OS (Windows)	<ul style="list-style-type: none"> ● Windows XP 32-bit ● Windows 7 32-bit/64-bit ● Windows 8.1 32-bit/64-bit ● Windows 10 32-bit/64-bit ● Windows Server 2008 R2 64-bit ● Windows Server 2016 64-bit
VDI OS (Linux)	<ul style="list-style-type: none"> ● Red Hat Enterprise Linux 6.6 x86/x64 ● Ubuntu 14.04 LTS Desktop x86/x64 ● NeoKylin 6.0 Update 1 x64
Application server OS	<ul style="list-style-type: none"> ● Windows Server 2012 R2 64-bit ● Windows Server 2016 64bit
Memory size per VM	<ul style="list-style-type: none"> ● 1 GB to 4 GB (32-bit) ● 1 GB to 512 GB (64-bit)
Number of virtual NICs per VM	<ul style="list-style-type: none"> ● 1 to 12
Number of mounted volumes per VM	<ul style="list-style-type: none"> ● 1 to 11: one system volume
System disk capacity per VM	<ul style="list-style-type: none"> ● 5 GB to 2 TB
User disk capacity per VM	<ul style="list-style-type: none"> ● 1 GB to 2 TB
Desktop color depth	<ul style="list-style-type: none"> ● 24-bit/32-bit
Maximum desktop resolution	<ul style="list-style-type: none"> ● 3840 x 2160

VM Specifications	
System Specifications	
Maximum number of VMs supported by a set of FusionAccess	● Appliance: 5000/set
	● Reference architecture: 20000
Maximum number of VMs supported by an HDC	● 5000
Maximum number of clone volumes supported by the linked clone system disk	● 128
Number of desktop groups supported by a set of FusionAccess	● 600
Number of VMs supported by a desktop group	● 600
Maximum number of concurrent VMs supported by an HDC	● 10 per second
Maximum number of VMs supported by a Nvidia Grid K1 in GPU hardware virtualization	● Four pGPUs/32 vGPUs
Maximum number of VMs supported by a Nvidia Grid K2 in GPU hardware virtualization	● Two pGPUs/16 vGPUs
Number of VMs with single GPU hardware virtualization (Nvidia Pascal P40)	● 24 vGPU

Application Cases

Up to now, over 1300 customers across over 100 countries had adopted the Huawei FusionAccess Desktop Cloud Solution. Over 700,000 users in industries such as government and public utilities, education, finance, telecom, energy, transportation, medical care, broadcasting, media, and manufacturing are gaining the benefits this technology delivers.

Typical Application Scenario	Success Story
Government	Public Service Center of Shanghai Pudong, Langfang Planning Bureau, SAT Jinan Municipal Office, African Union Conference Center, Saudi Interior Ministry, Xi'an Railway Administration, and China Electronics Technology Group Corporation
Finance	Banco Santander Brasil SA, Dubai Islamic Bank, Shenzhen Stock Exchange, Industrial Bank, Agricultural Bank of China, and Bank of China, China UnionPay, Chongqing Rural Commercial Bank, Huatai Securities, and Orient Securities
Telecom	China Mobile Zhejiang, China Unicom Shandong, China Mobile Shaanxi, China Unicom Guangdong, China Unicom He'nan China Mobile He'nan, China Telecom Fujian, Hutchison CP Telecom, Cell C South Africa, and Uzbektelecom
Education	Saudi Arabia TVTC, Ethiopia SchoolNet, Huazhong University of Science and Technology, Chongqing University of Posts and Telecommunications, Addis Ababa University in Ethiopia, Asia Pacific College (APC) in the Philippines, Guangdong Qingyuan Polytechnic, and Beijing No. 35 High School
Medical care	UK NHS, Madrid Hospital, Fujian Medical University Union Hospital, Longyan People Hospital, Hebei Qian'an People's Hospital, and China-Japan Friendship Hospital
Media	CCTV, and Phoenix TV, Shenzhen TV, Wuxi Radio & Television Station, He'nan TV, Guangzhou TV, Dunhuang Radio & Television Station, Radio, Film & TV Administration of Guangdong Province, and Guangxi Radio & TV Network
Large-sized enterprise	Hong Kong Airlines, Sinopec, Dagang Oilfield, State Grid, Shenhua Group, Gree Electric Appliances, Codelco, LAOS Skytel, and Chad national backbone network