

Huawei FusionAccess Desktop Cloud Solution 6.2 FAQs



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1 Market and General Knowledge

1.1 What Is a Desktop?

A desktop is a mature cloud computing application, integrating computing and storage resources that scatter on terminals (PCs) into a data center, and implementing virtualization and central management. Users access their desktops by using cloud terminals such as thin clients (TCs) and software clients (SCs). The purpose of the desktop is to enable users to access and use data and applications in the data center by using any terminal or from any network.

1.2 What Benefits Can the Desktop Bring to Customers?

The desktop can bring the following benefits to customers:

- **Improved information security:**
The desktop centrally manages data scattered on PCs in the data center, and takes security protection measures for a terminal (TC), such as simplification and read/write control, which reduces information security threat.
- **Higher management efficiency:**
An administrator can rapidly provision desktops to users and reclaim the desktops from the users by unifying operating system templates, which improves the management efficiency. Especially, the desktop can rapidly provision Windows 7 operating system to users, addressing out-of-market of the Windows XP.
- **On-demand cloud computing services:**
Based on the cloud computing platform, the cloud computing can implement flexible resource scaling and scheduling, improve resource utilization of IT facilities, and provide on-demand cloud computing services.
- **Mobile offices:**
The desktop enables users to their desktops rapidly and conveniently by using any terminal at any time from anywhere, which significantly improves working efficiency.

1.3 What Are the Technology Types of the Desktop?

In the development history of the desktop, the terminal service is proposed at first, and then applications or desktop can be shared by using the server based computer (SBC), which is supported by the Citrix XenApp. With the development of server virtualization, desktops based on the virtual desktop infrastructure (VDI) become the mainstream, including Citrix XenDesktop, VMware view (finalized as the brand horizon in 2013), and Red Hat. Huawei desktop supports VDI and application virtualization SBC solutions.

1.4 Which Scenarios and Industries Is the Desktop Applied To?

The desktop is mainly applied to common offices with medium and small-sized operation load. In place of the mid-range and low-end PCs, the desktop implements centralized and efficient management, and makes full use of resources. The desktop also provides solutions for scenarios with concurrence high-performance operation demands, such as centralized charting and high-definition video editing, but costs of the solutions are relatively high.

The desktop is applicable to all industries. To better meet customer requirements, the following points should be focused on:

- Requirements for the development of the cloud computing: reconstructing and developing IT infrastructures using the cloud computing, and starting from the most mature desktop application.
- Security requirements: involving governments, military projects, and security-related enterprises.
- Efficiency requirements: involving education sectors and large enterprises with the need to improving O&M and resource utilization.
- Experience requirements: involving the industries that call for mobile offices.

1.5 Which Roles Are Involved in the Desktop Market?

The desktop industry chain can be divided into original manufacturers and integrators.

Original manufacturers: Research, develop and sell desktop software that includes desktop applications and virtualization, without delivering hardware and project integration. Typical manufacturers include Citrix, VMware, Microsoft, and Red Hat.

Integrators: Integrate software of original manufacturers to offer the salable solution. Typical integrators include HP, DELL, Cisco, and Digital China. Integration promotes sales of hardware, and some desktop software depends on original manufacturers. This type of integrator generally has weak capabilities of customizing and developing software.

Huawei FusionAccess Desktop Cloud Solution is a whole set of solutions covering self-developed software and hardware, and can be sold in the following ways: software + TCs, standard architecture solution, or FusionCube solution.

1.6 What Are Development Trends of the Desktop?

There are two development trends for Huawei FusionAccess Desktop Cloud Solution: the terminal side is evolved into the mobile office mode; the cloud is evolved from a private cloud in the enterprise into a public cloud, which provides IT resource hosting and desktop lease services for medium and small-sized enterprises and individual customers.

- Replacing PCs with desktop and mobile offices.

The Desktop is used to replace enterprise PC, and can meet the requirements for rapid centralized deployment of the new-generation office applications of Software as a Service (SaaS) in the enterprises, and data coordination and sharing. In addition, performance and security of the mobile terminal (Tablet) are improved, and therefore, mobile offices become an inevitable trend.

- IT resource hosting and desktop lease services development based on the public cloud.

With the development of the public cloud, more enterprises offices evolve from the enterprise-constructing mode into the public cloud hosting or lease manner. Huawei FusionAccess Desktop Cloud Solution supports the transformation of the original enterprise office mode into the IT resource hosting and Desktop as Service (DaaS) mode.

2 Sales Guide

2.1 What Is the Orientation of the Desktop in the IT Products and Solution?

The desktop is generally considered as the first step of the enterprise IT infrastructure cloudification strategy. Similar to the PC, due to wide use of customers, the desktop is easy to understand and easily accepted by customers. Once the customers prone to use the desktop, the desktop is hardly replaced by other products. Therefore, the desktop is a control point in the office platform of the customers.

Huawei FusionAccess Desktop Cloud Solution remarkably promotes sales of IT infrastructures such as servers, storage devices, and data centers.

2.2 Which Industries and Scenarios does the Huawei Desktop Focus On?

According to the Huawei IT solution "Focus on the market" strategy, the desktop focuses on the centralized office scenarios in which VIPs in the important industries are gathered. The industries include: government and public sectors, finance, large-sized enterprises, education, and public transport.

In terms of finance, the desktop is applied to banks, insurance, securities, R&D centers, or call centers.

In terms of large-sized enterprises, the desktop is applied to energy, high-tech R&D customers, and telecommunication carriers.

In terms of education, the desktop is applied to various schools, and basic education jointly constructed by many schools.

2.3 To Which Scenarios Is Desktop Deployment Not Applicable?

With the development of technologies, the desktop has been applicable to the majority of scenarios. The desktop can provide solutions for common offices, secure offices, personalized video processing, and high-performance image processing.

The FusionAccess Desktop and ordinary PC almost have the same performance, for example, in Microsoft Office application and OA system. For program compilation scenarios, a similar effect can be obtained by increasing memories of the desktop VMs. For high-definition video playback, the effect of the common PC is better than that of the desktop, and high-definition video playback on the desktop needs to meet specific configuration conditions such as a TC, a player, and corresponding protocol configurations. For details, see *FusionAccess Desktop Solution Video Playback Technical White Paper*.

In a high-performance image processing scenario, it is suggested to perform point of control (POC) tests to verify whether actual demands of customers are met. For details, see *White Paper for the Huawei High-Performance Graphics*.

Technical white papers can be obtained at the Huawei official website, or obtained from the Huawei product manager or the contact of the headquarters support.

2.4 What Is the Integrated Policy for the Huawei Desktop?

Huawei FusionAccess Desktop Cloud Solution persists in "Integrated Policy" for channel agents. The solution can be sold in the following ways: software +TC, standard architecture solution of whole software and hardware, or FusionCube, which can also be flexibly combined by channel agents for sales.

In addition, for VIPs in the important areas or industries, Huawei sets an example among industries depending on Hi-Touch projects and other quality projects, and promotes the integrators (SI/ISV) to join the alliance.

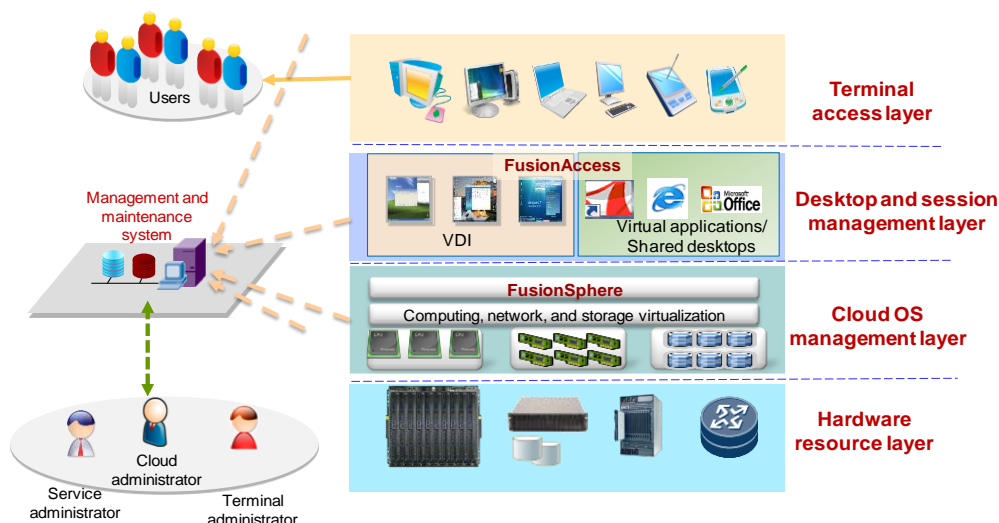
2.5 What Are the Selling Points and Advantages of the Huawei Desktop?

The cloud computing brand is put forward, and security, experience, efficiency, and punctual delivery are emphasized.

Policy	Sales Opportunity
Putting forward the cloud computing brand	<p>The desktop is considered as the first step of the enterprise IT infrastructure cloudification strategy. Compared with other complex cloudification applications, the desktop is more mature, secure and intuitive, and more easily accepted by customers who have various requirements.</p> <p>The cloud computing platform provides flexible resource extension, scaling, linked clone, and other features, supports efficient resource utilization of desktop applications, and presents benefits of on-demand cloud computing services.</p>

Policy	Sales Opportunity
Emphasizing security	The enterprise data security solution is characterized by cloud-channel-terminal systematization design, which offers optimal practices and reliability assurance.
Emphasizing experience	The desktop core protocol is available, to improve user experience and optimize the end-to-end solution. As a result, the protocol can offer optimal experience among the industries.
Emphasizing efficiency	The desktop is simple in installation and flexible in deployment, and it is an expert in maintenance, management, and flexible resource extension. It enables users to perform efficient maintenance.
Emphasizing punctual delivery	With 20 years of experience in telecommunication great objects design and delivery, and in-depth master of the cloud computing software and hardware technologies, Huawei has achieved efficient delivery and stable O&M of the greatest desktop project (130, 000 desktops in Huawei) in the industry, and keeps a record of successfully delivering approximately 300 desktop projects worldwide.

2.6 What Are the Components of Huawei FusionAccess Desktop Cloud Solution?



The Huawei desktop end-to-end solution includes:

Terminal access layer: TCs, a management system, PCs, Tablets, smartphones, and software client modules that run on the terminals.

Desktop and session management layer: The virtual desktop management software FusionAccess has functions of access control and desktop and session management control, and provides the desktop control protocol, an IT resource management adaption interface, and IT basic resources such as AD, DNS, and DHCP.

Cloud OS management layer: The virtual platform FusionSphere includes the virtual basic engine FusionCompute and the cloud management platform FusionManager.

Hardware resource layer: Servers, storage devices, networks, and data centers.

2.7 What Are Sales Modes of Huawei FusionAccess Desktop Cloud Solution?

Huawei FusionAccess Desktop Cloud Solution supports four flexible sales modes:

- 1 Standard desktop: Reference Architecture (RA), FusionAccess + TC + universal x86 server + external storage (SAN or NAS) + services.
- 2 FusionCube desktop: FusionAccess + TC + FusionCube 6000/9000 + services.
- 3 Compact VDI: One or two servers are used to implement Huawei FusionAccess Desktop Cloud Solution, which includes servers, software, TCs, and services.
- 4 Desktop software + TC: FusionAccess + TC + services (software SA&S and hardware maintenance, and consulting practices).

2.8 What Are Services of Huawei Desktop Solution?

The desktop software license includes SA&S, which is the professional upgrade service. During effective period, users can be authorized to download, install, and upgrade the latest patches and versions of the same sales version level, and enjoy full-day services. The SA&S effective period starts from the day when users activate License on a day basis.

The services contain maintenance services, integration services, project services, professional upgrade services, transport protection services, and training services. For details, consult the Huawei product manager or the contact of the headquarters support.

2.9 What Is the Business Comparison Between the Desktop and PCs?

You can calculate the costs of the desktop solution and PCs using the TCO analyzer.

http://3ms.huawei.com/mm/docMaintain/mmMaintain.do?method=showMMDetail&f_id=B M13091314320052

2.10 How to Perform Configuration Quotation on Huawei FusionAccess Desktop Cloud Solution?

Analyze customer requirements first, match scenarios with technical solutions, and select a version. After the overall technical solution is determined, start to perform configuration quotation.

Configuration quotation includes eDesigner (configuration solution design) and eCFG (configuration quotation export).

For details of eDesigner, refer to Huawei official website:

<http://app.huawei.com/unistar/edesigner/solutionAction!showSolutionHome.action?groupId=1>

For details of eCFG, consult the Huawei product manager or the contact of the headquarters support.

2.11 How to Obtain Marketing Materials and Headquarters Visit Resources?

Channel sellers and agents can refer to the Huawei enterprise official website:

http://enterprise.huawei.com/ilink/cnenterprise/partners/partners-zone/channel-data-tool/products-info/it-applications/cloud-computing/Desktop_Cloud/index.htm

Huawei employees can refer to the 3ms website for marketing materials:

<http://3ms.huawei.com/hi/IT/MKTYJSIndex.html>

For application for Huawei visit communication resources, refer to the following website:

<http://w3.huawei.com/info/en/doc/viewDoc.do?did=583141>

VIP hotline e-mail: IT_VIPHOTLINE@huawei.com

3 Technical Question Selection

3.1 What Is Key Technologies of Huawei FusionAccess Desktop Cloud Solution?

- 1 Cloud platform technology: based on Huawei cloud platform FusionSphere, Huawei FusionAccess Desktop Cloud Solution provides a virtual desktop by means of the cloud platform server virtualization technology, to support flexible resource scheduling and scaling. The solution also provides a feature such as linked clone by means of the storage virtualization technology.
- 2 Desktop protocol technology: Huawei desktop protocol (HDP) has high-performance, high security, and high experience capabilities.

3.2 What Is the Desktop Protocol? What Are Major Manufacturers of the Desktop Protocol in the Industry?

By using the desktop protocol, users can implement remote connection between a terminal and virtual desktops on the cloud platform. Images on the desktops can be projected onto a remote display effectively, and peripheral devices on the remote display can be mapped to the virtual desktops according to various policies, to implement enjoyable experience of user virtual desktops. Desktop protocol capabilities substantially affect user experience of virtual desktops. Desktop protocols in the industry include ICA/HDX (Citrix), PCoIP (VMware), RDP (Microsoft), and SPICE (Red Hat). The desktop protocol used by Huawei is Huawei desktop protocol (HDP).

For details of protocol capabilities and test comparison data, see *White Paper of Protocol Technologies*. (The white paper can be obtained from the Huawei product manager or the contact of the headquarters support; Huawei employees can obtain the white paper at the 3ms website.)

3.3 What Are Product Capabilities and Market Policies for Virtualization Solution (SBC) Applications?

What is SBC?

Server-based computing (SBC) is: running most processing tasks of applications on a server, transferring images displayed on a screen to a client using a compression algorithm, to display the images. Users can use an application or some applications.

Scenarios to which SBC is applicable and suggestions

SBC is applied to scenarios with a single software requirement, simple peripheral device requirements, and low personalized requirements. An advantage of SBC is that the quantity of servers can be reduced, while disadvantages are that software and hardware compatibilities are poor relative to VDI scenarios, and personalized settings are insufficient. Therefore, you are advised not to apply SBC in complex scenarios.

Sales scenarios suggested by Huawei: simple offices, security network access, centralized application deployment and management of branches, and access of mobile terminals. For details, see *Sales Guide to Application Virtualization*.

3.4 Which Terminals Are Supported by Huawei FusionAccess Desktop Cloud Solution?

Huawei FusionAccess Desktop Cloud Solution supports TCs such as CT3100, CT3200, CT3200L, CT5100, CT6100, ZT3200, ST5110, and ST6110.

Huawei FusionAccess Desktop Cloud Solution also supports TCs of vendors that are familiar to users in the industry. TC types authenticated by Huawei Ready can be learnt at the Huawei support website:

<http://support.huawei.com/onlinetool/datums/FusionAccess/comptool/index.jsp>

3.5 Apart From TCs, What Remote Access Manners does a Virtual Desktop Support?

- 1 Using a software terminal on a PC to access a remote desktop.
- 2 Supporting terminals such as 3G mobile phones, iPads, and tablet computers, and accessing a remote desktop after installing a client.

3.6 Which Virtualization Platforms Are Supported by Huawei FusionAccess Desktop Cloud Solution?

FusionAccess recommends the cloud platform (FusionSphere) having higher performance and more functions. In addition, FusionAccess can manage VMs on other platforms (for example, vSphere) but some advanced functions of VMs may be disabled, for example, power supply management and a self-maintenance console function.

3.7 Which Important Features Are Provided by the Cloud Platform?

Huawei cloud platform provides VM dynamic scheduling and flexible resource multiplexing capabilities, which are applied to the desktop.

VM dynamic scheduling includes load balancing scheduling and dynamic energy-saving scheduling.

The KVM architecture does not support the following scheduling policies.

1 Load balancing scheduling

VM load balancing scheduling can be performed only in a same resource cluster, and the cluster has at least two computing servers.

In a load balancing scheduling policy, a scheduling threshold and a time period during which the policy is effective can be set. Within the time period during which the policy is effective, if a CPU load threshold of a computing server exceeds the scheduling threshold, the system will automatically migrate some VMs to other computing servers whose CPU load is low. In this way, CPU load of computing servers is balanced.

2 Dynamic energy-saving scheduling

VM dynamic energy-saving scheduling can be performed only in a same resource cluster, and the cluster has at least three computing servers.

In a dynamic energy-saving scheduling, a percentage of reserved resources and a time period during which the policy is effective can be set. The time period during which the policy is effective is at least two hours. Within the time period during which the policy is effective, if a CPU idle rate (100%-CPU load ratio) of computing server resources exceeds the percentage of reserved resources, dynamic energy-saving scheduling can be triggered. The system automatically performs migration integration on VMs in computing servers, and then powers off servers that are not in use, to save resources.

The Flexible resource multiplexing feature is that system resources on the cloud computing platform are used for services in different time domains, to maximize usage of cloud platform resources.

In most scenarios, resource multiplexing and dynamic scheduling need to be used in combination. Users use virtual desktops to work in the daytime, and release computing resources at night. The system can use the computing resources to run other services (such as image rendering and supercomputing), and releases computing resources after service running is complete. The users can continue using the virtual desktops at working time. In this way, resource multiplexing is improved.

With respect to application scenarios to which system resource multiplexing is applied, Huawei FusionAccess Desktop Cloud Solution uses the current scheduled task function. In the solution, various scheduled tasks (enabling, disabling, hibernation, and wake-up) are created to automatically scale VDI service resources, which coordinate with the flexible resource scheduling feature of the cloud management, to implement resource multiplexing of Huawei FusionAccess Desktop Cloud Solution.

3.8 What Is Linked Clone?

Linked clone, provided by the Huawei cloud platform, is a capability that multiple VMs shares one read-only base volume which provides original VM OS and provides personalized private data space for multiple VMs, to reduce space actually occupied by a user system disk, and reduce capacity configurations.

A linked clone desktop pool provides desktop maintenance functions such as unified software update and system restoration, which can significantly reduce maintenance costs and improve desktop maintenance efficiency.

3.9 What Is the Full Memory Desktop?

In memory deduplication compression and multiplexing technologies, system disks of VMs are put in the memory, to convert disk read and write operations of the VMs to memory operations, which is superior to a physical machine and can significantly improve user experience.

3.10 What Are Principles of Load Balancing and SSL Encryption in Huawei FusionAccess Desktop Cloud Solution?

Multiple web interfaces (WIs) can be deployed in the desktop system. In a TC, a domain to which a user logs in is an address of a load balancer, which is generally deployed beside a core switch in bypass mode. The load balancer selects a WI to provide services for the TC according to WI load situations.

An SSL path is established between a protocol client (embedded in TC and SC modules) and a security gateway, and a certificate (including a public key) is stored on the TC and SC in a remote server end manner. Decryption is performed between the security gateway and the protocol client (TC and SC). The certificate and a private key are generated and published on a CA server in the security gateway.

3.11 Does Huawei FusionAccess Desktop Set Restrictions on Servers and Storage Devices?

Huawei desktop can use servers and storage devices as long as they are compatible with the Huawei cloud platform. The Huawei cloud platform can be compatible with most mainstream hardware devices. For details, see the compatible list.

In view of cost performance ratio, Huawei recommends the following optimal practices: in terms of server, E9000 or RH2288H is recommended; in terms of storage devices, OceanStor V3 5500/5300 SAN is recommended, or NAS can also be used as storage for virtual desktop data disks.

3.12 Since Centralized Management Is Implemented on Virtual Desktops, Whether Other Desktop Resources Are Affected Once a Virtual Desktop Is Infected by Viruses?

The foregoing problem can be avoided by means of virtualization isolation. Hypervisor can implement resource isolation between VMs in a same physical machine. In this way, data stealing or malicious attack between VMs can be avoided, and usage of VM resources is not affected by other VMs.

By taking measures such as network security protection and security domain division, Huawei FusionAccess Desktop Cloud Solution can prevent viruses on an external network entering an intranet network, to avoid virus infection.

3.13 How to Implement Network Isolation Between Desktop Service Fields?

For desktop service fields, physical isolation can be implemented by using a cluster, or logical isolation can be implemented within a same cluster by using a VLAN. A user access policy is set on a core switch according to an ACL policy.

3.14 How to Resolve the Boot Storm Problem for Many Virtual Desktop Users?

In a virtual desktop linked clone scenario based on IP SAN storage virtualization, the iCache smart cache technology is used to dynamically identify storage resources shared by users, and temporarily store the storage resources on a memory. As a result, performance of a user read operation can be significantly improved, and boot speeds can be increased especially when large quantities of virtual desktops are booted. Hotspot data of a base volume of a linked clone VM is temporarily stored on a read cache. In this way, a disk read speed of the linked clone VM increases greatly, improving IO performance of the linked clone VM. As a result, impact of the VM boot storm on IOPS that is locally stored on the server decreases.

In addition, hibernation and boot in batches in a specific time period can be set for virtual desktops by using features such as scheduled power-on and power-off of the cloud platform, to avoid a boot peak in a time period. This is a flexible and feasible engineering method.

3.15 What Is the Basic Bandwidth Requirements of Each Huawei Desktop User?

The network bandwidth is closely related to user behavior and types.

The following table lists the bandwidths required by typical applications.

Scenario Type	Scenario	Bandwidth Reference Value	Percentage (Variable)
Silence	No application running	4 kbit/s	30%
	Microsoft Office running without document editing	20 kbit/s	25%
Office applications	Word	45 kbit/s	20%
	PPT	589 kbit/s	4%
Video playback	Standard definition (480p)	6.85 Mbit/s	0.8%
	High definition (1080p)	13.7 Mbit/s	0.2%
GPU graphics desktop	GPU graphics desktop	20 Mbit/s	0%
Other applications	PDF	265 kbit/s	5%
	Internet Explorer	150 kbit/s	10%
	Picture browsing	123 kbit/s	5%



NOTE

30% in the scenario where no application is running indicates that there are 30% of users whose applications are not running. Assume that the network bandwidth usage is 80%, bandwidth required in each application scenario is calculated as follows:

Example:

1. Assume that there are 100 users in a common OA scenario, the average bandwidth per user is calculated as follows:

Average bandwidth per user = [4 kbit/s x 30% (no application running) + 20 kbit/s x 25% (Microsoft Office running without document editing) + 45 kbit/s x 20% (Word) + 589 kbit/s x 4% (PowerPoint) + 6.85 Mbit/s x 1024 x 0.8% (SD video) + 13.7 Mbit/s x 1024 x 0.2% (HD video) + 265 kbit/s x 5% (PDF) + 150 kbit/s x 10% (Internet Explorer) + 123 kbit/s x 5% (picture browsing)]/80% = 197 kbit/s

2. Assume that there are 100 users in an R&D OA scenario, the average bandwidth per user is calculated as follows:

Average bandwidth per user = [4 kbit/s x 15% (no application running) + 20 kbit/s x 5% (Microsoft Office running without document editing) + 45 kbit/s x 30% (Word) + 589 kbit/s x 20% (PowerPoint) + 6.85 Mbit/s x 1024 x 0.5% (SD video) + 265 kbit/s x 15% (PDF) + 150 kbit/s x 10% (Internet Explorer) + 123 kbit/s x 4.5% (picture browsing)]/80% = 285 kbit/s

 **NOTE**

1. The preceding bandwidth values are average values. In an actual scenario, the desktop bandwidth is closely related to user operations. For example, bandwidth peaks occur during operations such as window zooming and file opening. To ensure smooth desktop usage, the calculation method for total bandwidth (Total bandwidth = Average bandwidth in the scenario x Number of users) can be used only in scenarios that involve more than 100 users.
2. If the number of users is smaller than 100 and the scenario is a common OA scenario, the bandwidth requirements are as follows:
 - a) Total bandwidth for 1 to 5 users (customer service center, branch office, or common OA): at least 2 Mbit/s
 - b) Average bandwidth for 5 to 20 users (branch office or common OA): 350 kbit/s
 - c) Average bandwidth for 20 to 50 users (common OA): 300 kbit/s
 - d) Average bandwidth for 50 to 100 users (common OA): 250 kbit/s
 - e) Average bandwidth for more than 100 users (common OA): 200 kbit/s

For more information about the desktop network, see Chapter 5 "Desktop Transport Protocol Performance" of *Huawei FusionAccess Desktop Cloud Solution 6.2 Performance Technical White Paper (Internal Version)*.

3.16 What Are the Requirements of Huawei FusionAccess Desktop Cloud Solution for Network Quality?

The following table lists the QoS indicator requirements and user experience.

Network Quality Level	QoS Indicator	User Experience
Excellent	Packet loss rate \leq 0.01% Round-trip delay \leq 30 ms Jitter \leq 10 ms	The basic office experience is good, with no feeling of slowness; online high-definition video playback in full-screen mode is good, about 22 fps; the 720P local video playback effect is good, about 26 fps; peripheral devices are well supported (USB flash drives are used smoothly) Application scenario: routine office, a small number of multimedia entertainment requirements
Good	Packet loss rate \leq 0.1% Round-trip delay \leq 50 ms Jitter \leq 10 ms	The office experience is good. When you fast drag the scroll bar, the mouse slightly drifts. The online high-definition video is obviously paused, and the 480P video can be fluently played. Peripheral devices are supported not so well. Identification is slow; USB devices are not used smoothly, and the copy speed is low. Application scenario: routine office (peripheral devices are not used frequently; not applicable in entertainment scenarios.)

Network Quality Level	QoS Indicator	User Experience
Poor	Packet loss rate \leq 0.3% Round-trip delay \leq 100 ms Jitter \leq 40 ms	The office experience is poor. The responses to mouse and keyboard operations have obvious delay. Screen turning and scrolling have obvious delay. The video playback pauses obviously. Peripheral identification is difficult, operations are paused obviously. Application scenarios: temporary Internet and mobile office access, not suitable for routine office
Very poor	Packet loss rate $>$ 0.3% Round-trip delay $>$ 100 ms Jitter $>$ 40 ms	Not suitable for the FusionAccess Desktop Solution

For more information about the desktop network, see Chapter 5 "Desktop Transport Protocol Performance" of *Huawei FusionAccess Desktop Cloud Solution 6.2 Performance Technical White Paper (Internal Version)*.

3.17 How to Obtain Detailed Product Instruction Documents?

Visit the Huawei official website for the detailed product instruction documents:

<http://E.huawei.com/cloudhelp>

4 Technical Question Collection

4.1 Basic Concepts

4.1.1 Does the Huawei FusionAccess Desktop Support the Linux or Unix Desktop? What OS does the Huawei FusionAccess Desktop Support?

Currently, OSs which Huawei FusionAccess Desktop Cloud Solution supports are as follows:

Windows:

Windows XP 32-bit

Windows 7 32-bit/64-bit

Windows 8.1 32-bit/64-bit

Windows Server 2008 R2 standard version, enterprise version, and data center version (commercial use under control)

Windows Server 2012 R2 standard version and data center version (commercial use under control)

Windows Server 2016 standard version and Windows Server 2016 data center version (commercial use under control)

Windows 10 32-bit/64-bit standard version, enterprise version, and education version

Linux (commercial use under control):

Red Hat Enterprise Linux 6.6(RHEL) 32-bit/64-bit

Ubuntu 14.04 LTS Desktop 32-bit/64-bit

NeoKylin Desktop 6.0 Update 1 64-bit

Note: Windows XP OS is not recommended because Microsoft has announced that Windows XP OS does not support technical support after April in 2014.

4.1.2 What Are the Differences Between the Desktop and the Diskless Workstation?

Similarities:

- Front-end devices do not provide data storage.
- The architecture reduces the workload of system administrators.

Differences:

The diskless workstation requires that the front-end PC has powerful computing capability, while the virtual desktop has few requirements for the performance of the front-end thin client (TC).

The TC and diskless workstation have the following advantages and disadvantages:

1 Management

- The diskless workstation has poor scalability because it requires the front-end hardware have uniform models and configurations. On the contrary, the TC accesses virtual desktops by using uniform architecture and protocols, which poses no requirements for the brands and models of the TC and back-end server.
- The diskless workstation has most disadvantages of a PC, for example, complex in terminal management, costly, and vulnerable. The TC is a real-time client that features low hardware costs, transient power-on, and security.

2 Security

- The only difference between the diskless workstation and the traditional PC is that the diskless workstation has the local hard disk removed, but the user data remains in the memory and is easily stolen. The computed data of the virtual desktop remains in a server in the data center, which ensures data and application security.
- In diskless workstation mode, data can still be stolen over traditional printing and mobile media. The front-end TC for the virtual desktop does not store any data locally and provides an advanced security function option.
- The diskless server does not have enterprise-level key functions such as high availability and disaster recovery. In the event of server power failure or network interruption, front-end user sessions and data will be lost. The back-end server for the virtual desktop implements enterprise-level key features, such as high availability, online migration, and real-time disaster recovery. Even if the front-end TC is damaged or disconnected from the network, all user operations and data is stored on a server in the data center.

3 Reliability

- The diskless workstation mode poses high requirements for clients and servers. When the number of diskless workstations reaches a certain value, the speed becomes slow, and the entire system is less reliable, which causes high maintenance costs.
- The diskless workstation communicates with the diskless server by broadcast protocols, which poses high requirements on the network. In addition, this causes great interference on other application systems in the network.
- The TC features small size, ultra-low power consumption, and flexible deployment.
- The TC is less expensive than the diskless workstation. More importantly, the TC ensures long-term cost saving thanks to its small size and ultra-low power consumption. The size of a TC is only 1/15 of the size of a standard diskless workstation, which facilitates deployment and reduces the footprint. Due to

ultra-low power consumption, TCs have the minimum power costs in the whole lifecycle. Working 8 hours per day and 240 days per year, a TC (about 23 W or less) saves 340 kWh electric energy or reduces 500 RMB electricity costs a year, compared with a standard diskless workstation (about 200 W).

- The TC has a long service life and high reliability, which significantly reduces the operation and maintenance (O&M).

The virtual desktop solution fully considers enterprise user requirements in the full lifecycle such as deployment, O&M management, and upgrade, and helps control front-end system running in the system lifecycle of up to ten years. Thanks to low pressure on servers and standard industrial embedded design, the TC boasts high reliability. The mean time between failures (MTBF) of a TC doubles that of a diskless workstation, which greatly reduces maintenance costs. In addition, the TC is highly efficient in software management. It always provides system administrators with timely system information and management services. This facilitates quick deployment and ensures routine maintenance and management.

Comparison of operation scenarios:

Operation Scenario	Diskless Workstation	Virtual Desktop
New computer environment preparation	Complex cable connections and server configuration	Simple cable connections
Client power failure or breakdown	User data and operation loss	The operation page disappears, but the user session is still running on the back-end server. All you need to do is to set up the connection again.
Network interruption	User data and operation loss	The same as above
User leaving the seat	Shutdown, preventing others from operating the client such as querying information	The session is disconnected, and the page disappears. The applications can be resumed from the breakpoint after re-login.
User operation errors	The administrator goes to the user's seat to resolve the problem.	The administrator remotely resolves the problem.
Switching between working scenarios	Start client applications, and perform operations again.	Switch the original page after login.

Conclusion:

- The TC + Virtual desktop solution is a mainstream solution for replacing PCs. It provides high security and reduces desktop management costs.
- The virtual desktop solution is fully compatible with the software system of the existing diskless workstation. It can provide the same or even higher hardware configurations and completely replace the diskless workstation without changing software and hardware settings of the existing core system, achieving the purpose of riskless quick deployment.

- The diskless workstation is applicable only to environments that have very low reliability and security requirements (such as Internet cafes and school equipment rooms). It does not support remote access, fast service switching, and disaster recovery.

Node Name	Number of vCPUs	Memory (GB)	Disk Size (GB)	Remarks
UVP	2	3.5	50	Install the UVP on each host.
VRM01	2	3	80	The VRM is a VM that can be created by importing templates.
AD/DNS/DHCP/ITA/	4	4	60	System disk: 40 GB
GaussDB/WI/HD C/License/VNC	4	8	30	System disk: 30 GB
Minimum configurations for physical servers	2 x 4C CPU, 2.4 GHz or more, hyper-threading supported	48	600	600 GB after local storage RAID creation

Node Name	Number of vCPUs	Memory (GB)	Disk Size (GB)	Remarks
UVP	2	3.5	50	Install the UVP on each host.
VRM01	2	3	80	The VRM is a VM that can be created by importing templates.
AD/DNS/DHCP	2	2	50	System disk: 30 GB
ITA	4	4	30	System disk: 30 GB
GaussDB/WI/HD C/License/VNC	4	8	30	System disk: 30 GB
Minimum configurations for physical servers	2 x 6C CPU, 2.4 GHz or more, hyper-threading supported	64	750	750 GB after local storage RAID creation

Node Name	Number of vCPUs	Memory (GB)	Disk Size (GB)	Remarks
UVP	2	3.5	50	Install the UVP on each host.
VRM01	2	3	80	
FM01	8	16	280	FM single-node deployment (optional)
AD/DNS/DHCP	2	2	50	System disk: 30 GB
GaussDB/WI/HD C/License	4	8	30	
ITA	4	4	30	
TCM/Loggetter	2	2	50	Optional.
VNC-GATE	4	4	30	VNC-GATE recommended deployment
Minimum configurations for physical servers	2 x 8C CPU, 2.4 GHz or more, hyper-threading supported	96	1500	1500 GB after local storage RAID creation

4.2 License Policy

4.2.1 Does Huawei FusionAccess Desktop Cloud Solution Include the VM OS License?

No. The VM operating system (OS) license should be purchased by users.

4.2.2 Does the Desktop License Support Concurrent Mode?

The concurrent mode is supported. You can purchase the FusionAccess Desktop license based on the maximum number of concurrent FusionAccess Desktop users or concurrent terminals.

4.2.3 Is There Any Information of the Windows License in Virtual Desktop Environments?

For details, visit the following website:

http://3ms.huawei.com/mm/docMaintain/mmMaintain.do?method=showMMDetail&f_id=DC14031126080070

4.2.4 Can the Concurrent License and Common License be Used in the Same Environment?

Yes. In the same environment, two types of licenses can be imported to a license server at the same time. However, two sets of HDC need to be deployed, with each HDC supporting one type of license.

It is recommended that two WIs be deployed. Each WI corresponds to one type of HDC (license). Otherwise, some licenses may be rendered invalid. For example, if 30 concurrent licenses and 100 common licenses are purchased. If only one WI is deployed, the system may display a message indicating that the number of licenses is insufficient when the number of users reaches 61.

4.3 Compatibility

4.3.1 Is Huawei FusionAccess Desktop Cloud Solution Compatible with Non-Huawei Virtualization Platforms?

Huawei FusionAccess Desktop only supports the Huawei FusionSphere virtualization platform and is not compatible with third-party virtualization platforms. There is no roadmap.

4.3.2 Are Third-Party TCs Supported?

All TCs in the compatibility list are supported. However, if the TCs are not provided by Huawei, the TC management (TCM) capabilities may be different and subject to the vendor.

4.3.3 What Are the Differences Between Windows TCs and Linux TCs?

The hardware is the same. The differences are:

- Preinstalled OS: Linux or WES7
- Price: WES7 requires purchase of the Microsoft copyright, which is slightly pricier.
- Huawei Desktop protocol (HDP) client version

4.3.4 Can Huawei FusionAccess Desktop Cloud Solution and the Service Private Cloud Be Co-deployed?

Yes. However, in commercial projects, the desktop and service private cloud must have different clusters and storage pools. Otherwise, resources may be preempted and desktop experience cannot be ensured.

4.3.5 What Are the Software Versions and TC Types Supported by the Desktop USB Key?

If a smart card is used to log in to the FusionAccess Desktop, the smart card driver must be installed on the TC and VM. If the smart card is used only to log in to the VM, the smart card driver may not need to be installed on the Linux TC. Whether to install the driver depends on test results.

Upon a peripheral compatibility test, the following table lists the smart card models related to Huawei FusionAccess Desktop Cloud Solution R5/R6 or later in PC/SC mapping mode.

Smart Card Vendor	Model	Remarks
Feitian	Huawei-customized ePass3000	Chinese vendor. The smart card can be used with Huawei FusionAccess Desktop Cloud Solution V100R002C01, V100R002C02, V100R003, V100R005, or V100R006. The driver used on Windows TCs and VMs and the driver used on Linux TCs can be provided. The smart card can be used in USB redirection mode only in desktops.
SafeNet	eToken Pro 72k	Foreign vendor. This key passes the Citrix Ready authentication and is compatible with Huawei FusionAccess V100R002C01, V100R002C02, V100R003, or V100R005. The driver used on Linux TCs (x86 platform), Windows TCs, and Windows VMs can be provided currently. However, the key can enter the VM only in PCSC mode on the Linux TC. The key cannot enter the VM in USB redirection mode on the Linux TC; therefore, the key cannot be used on the Linux TC in R5.

The following table lists the mapping between the smart card and the TC.

Feature Closely Associated with TCs	Feature Description	X86 Linux TC		ARM Linux TC	WES7 TC		Remarks
		CT5000	CT6000	CT3000	CT5000	CT6000	
USBKey	Single-node login: WI and VM login	Supported	Supported	Not supported	Supported	Supported	SafeNet and Feitian ePass3000 (Huawei customized)
	Non-single-node login: In the login to the WI or VM, enter the PIN code.	Not supported	Not supported	Not supported	Supported	Supported	Feitian ePass3000 (Huawei customized) The Linux TC does not support non-single login of the smart card

4.3.6 Does Huawei FusionAccess Desktop Cloud Solution Support No-AD Authentication? Is LDAP Authentication Supported?

Huawei FusionAccess Desktop supports the desktop system solution that LiteAD is used to replace Microsoft AD, and does not support LDAP authentication.

4.3.7 What Are the Marketing Strategy for Optical Port TCs?

If the customer needs to purchase optical port TCs, two delivery modes are available:

- 1 Deliver the TCs purchased from partners (currently, Centerm C35). Process: The frontline personnel communicate with the customer about whether the product meets requirements and determine product specifications (should optical modules be provided? What are the types of optical modules, single-mode or multi-mode? What is the OS type?) --> If the product meets requirements, apply for a temporary code to place orders. ---> After obtaining code, obtain catalog prices from Fang Fang (employee ID: 00274651) in the Business Model Dept.
- 2 If Huawei Logo is used, there are also two methods:
 - a. Use Centerm, but with the logo replaced by Huawei logo. The increased expense is low. The delivery period is 15 days (planned) or 30 days (unplanned).
 - b. Replace the Centerm fiber TC with CT6000, and perform a new round of 3C certification, rear plate opening, and testing. The increased expense is more than 70,000 RMB. The development takes one month, and the authentication takes two months.

The frontline personnel choose the procurement method based on project requirements and then communicate with the customer about whether the product meets requirements and determine the specifications. --> If the product meets requirements, apply for a temporary code to place orders. ---> Obtain catalog prices from Fang Fang (employee ID: 00274651) in the Business Model Dept.

We assist the frontline personnel in applying for: 06170177, TC-Intel D2550 1.86 GHz, dual-core-2 GB DDR3-8 GB, SATA-1000 optical fiber (SFP), and multi-mode optical module in kilomega-DVI-WES7 SP1.

4.3.8 Is NetScaler Supported? Any Substitute?

NetScaler is not supported. Huawei can support the solution similar to Citrix NetScaler. The solution is more flexible in access manners.

Main functions of Citrix NetScaler are as follows:

- 1 Load balancing: When the desktop users log in to the WI page, NetScaler implements access by selecting a usable WI according to service load.
- 2 Access gateway: Implementing intranet and extranet isolation between the desktop user VM address and the TC/SC IP address, and security encryption functions.

Solution 1: Providing the software load balancing function (vLB) and the software access gateway function (vAG), which can completely replace Citrix NetScaler and are simple for deployment. In addition, the solution is available for customers for free. If customers require that isolation of the intranet and extranet should be implemented by using hardware devices,

universal firewall devices in the industry can be used. The method is also the solution widely used in the industry (the solution is currently used for VMWARE).

Solution: If the customers have purchased Citrix NetScaler (the access gateway only supports the ICA protocol of Citrix, but does not support other desktop protocol), Citrix NetScaler can be used together with the Huawei software access gateway (vAG) for load balancing.

Solution 3: Similar to Citrix NetScaler, the solution is used together with the security access gateway device SVN in the security product line, to provide load balancing, the access gateway function, intranet and extranet isolation, and the SSL encryption capability. The desktop has started the solution compatibility test between the desktop and SVN. However, SVN performance faces some problems at present, and the desktop PDT is dedicated to the security product line to resolve the problems.

Solution 1 is recommended preferably due to its simple deployment and low costs.

4.3.9 Is Related Confidentiality Authentication Successful for the Huawei Desktop System?

The Huawei FusionAccess Desktop Cloud Solution and related components have obtained the sales license issued by Ministry of Public Security (including FusionSphere and FusionAccess), the military information security product certificate issued by the evaluation center of People's Liberation Army of China (Huawei FusionAccess Desktop Cloud Solution), and EAL 3+ authentication issued by China Information Technology Security Evaluation Center (the cloud platform FusionSphere).

Note: Evaluation authentication is issued by the evaluation center of People's Liberation Army of China, and the evaluated grade is military B. In view of confidentiality, the certificate will not be published. If it is required for the project, the frontline personnel need to contact the Government System dept.

With respect to authentication of National Administration for Protection of State Secrets, the cascade protection standard for the desktop is being formulated. Before issuance of the standard, National Administration for Protection of State Secrets does not perform evaluation for any vendor nor provide the product authentication.

4.3.10 Has the Desktop System Passed the Security Certification?

Huawei virtualization has passed the security authentication, but the desktop has not (2018/03/02). FusionSphere OEM is provided to dealers, who apply for certification and receives the certificates. If you have any project requirements, contact Wang Fei (employee ID: 00398311).

4.3.11 Does the Desktop Solution Support M10 GPUs?

No. Currently, only M60 graphics cards are supported.

According to the information provided by Nvidia, M10/M60 is expected to be out of production in 2018. Therefore, it is planned that Huawei virtualization will use the next generation P series graphics cards of Nvidia in 2018 Q3.

4.3.12 Does the Desktop Solution Support GPU Pass-through on Linux Desktops?

No. The lack of support for the Linux GPU pass-through is because:

- Ecosystem: Windows has better ecosystem than Linux, with more commercial software and peripherals capabilities. The Linux OS is subject to many restrictions.
- O&M management: Linux has higher skill requirements for enterprise employees/IT administrators. Customers selecting open-source Linux cannot enjoy reliable after-sale services.
- User experience: Desktop protocols in the industry are far more mature than Linux. Windows is better than Linux in terms of desktop experience smoothness and bandwidth consumption.

4.3.13 How to Enable a Printer with USB Port to be Visible to Both VM and PC Simultaneously?

The PC/SC mapping is used, allowing the printer to be visible to VMs and PCs at the same time. If the port mapping is used, the local PC cannot view the printer, which can only be viewed on the VM.

4.4 Terminal

4.4.1 What Are the Mainstream TC Platforms in the Market? What Are Their Advantages and Disadvantages?

Mainstream TC platforms in the market are x86 and ARM, which are provided by all mainstream TC vendors.

The advantage of the x86 platform is that it has high compatibility on peripheral devices, on software and hardware. However, the X86 platform has higher power consumption than the ARM platform: The power consumption of x86 is 7–11 W, while the power consumption of ARM is 4–8 W.

Featuring low price and low power consumption, the ARM TC platform is mainly oriented at the consumer market.

4.4.2 Does the TC Support Dual-DVI Output (Dual-Screen)? What About More Screens?

Yes. The CT5000 and CT6000 support dual-screen output. The CT5000/CT6000 provides one DIV-I port, which can be expanded into one DVI-D port and one VGA port by using a transfer cable.

Because the number of TC ports is limited, more than two screens are not supported.

4.4.3 Is the Zero Client Supported?

Not supported.

4.4.4 How Does Huawei FusionAccess Desktop Cloud Solution Use the TC to Watch DVD?

The ports on the TC are scalable. You can use the DVD and other devices by connecting the USB port to the CD-ROM drive or printer.

4.4.5 Huawei TCs Do Not Have CD-ROM Drives. How Can the User Install Software by using the CD-ROM?

One method is to map a drive to the VM, and the other method is to convert the CD-ROM into ISO files and then mount the files to the VM.

4.4.6 Can One TC Simultaneously Log In to Multiple VMs and Be Displayed on Different Screens?

One TC can simultaneously log in to multiple VMs. One monitor can display a VM interface at one time point, and you can switch among multiple VM interfaces. Multiple VMs can be displayed on different monitors of one TC at the same time.

4.4.7 Does the TC Support Wi-Fi Connections? What Is the Ambient Temperature Range for the TC?

Huawei can provide TCs (ST5110/ST6110) that support Wi-Fi connections. However, you are advised not to use Wi-Fi connections because the stability of wireless networks greatly affects user experience of Huawei FusionAccess Desktop Cloud Solution. TCs work properly at an ambient temperature of 0–40°C.

4.4.8 Is the Logo on the Sunniwell Client that of Huawei or Sunniwell?

The client has a "Huawei Ready" logo and a Sunniwell logo.



4.4.9 How to Support 2K Display?

2K resolution is a generic term for a display with a resolution of 2000 pixels or its content. The Digital Cinema Initiatives (DCI) defines 2K resolution as 2560 x 1440, and 2048×1556 is the threshold for entering 2K (film production).

Format	Resolution	Display Aspect Ratio	Pixels
DCI 2K (native resolution)	2048 x 1080	1.90:1 (256:135, ~17:9)	2,211,840
DCI 2K (flat cropped)	1998 x 1080	1.85:1	2,157,840
DCI 2K (CinemaScope cropped)	2048 x 858	2.39:1	1,755,136
PC 2K (1080p)	1920 x 1080	1.7:1 (16:9)	2,073,600

Occasionally, 1920 x 1080 (16:9) of 1080p has been included into the 2K resolution definition. Although 1080p has the same vertical resolution as DCI 2K resolutions (1080 pixels), it has a smaller horizontal resolution below the range of 2K resolution formats. Most manufacturers define 1920 x 1080 as 1080p according to old specifications. (The DCI industry standards do not recognize 1080p as a 2K resolution.)

2K display requires supporting displays and TCs. Currently, Huawei TCs ST5110 and ST6110 (maximum resolution: 2560 x 1600) support 2K display.

4.5 Security

4.5.1 Is VM Encryption (Including Data Disk Encryption) Supported?

The Beta test is supported. Commercial use is not supported. Commercial use is supported in R6 (corresponding to platform FS 5.0). Currently, only data disk encryption is supported.

VM disk encryption is to deploy the VM disk encryption and decryption agent on the user VM and use AES-128 encryption instructions of the Intel CPU to implement hardware acceleration. All data is dynamically encrypted when the data is written into the disk (volume) and is dynamically decrypted when the data is read from the virtual disk (volume). The data stored in virtual disk files is in cipher text, and will not be disclosed even if the physical disk or volume files and snapshot files are stolen.

Prototype test: About 10% of overall performance is affected.

4.5.2 Can the USB Device Be Made Read-Only? How Can the USB Flash Drives and USB Hard Disks Be Disabled When the USB Key Is Uncontrolled?

The USB device can be made read-only by performing settings in **USB Storage Device Management** with the TSM USB registration feature. In the HDC server strategy settings, enable or disable unidirectional or bidirectional USB control, and set Read-only.

- There are two methods to disable USB flash drives and USB hard disks when the USB Key is uncontrolled: Enable or disable user access to USB devices based on the access control policies preset by the administrator, and record logs about user access to USB devices.
- Perform customized deployment on the TC. The TC identifies USB types and determines whether to permit the access of the USB devices.

4.5.3 Does Huawei FusionAccess Desktop Cloud Solution Support Agent-free Virtualization Antivirus Deployment?

The FusionSphere virtualization platform is used together with the Huawei FusionAccess Desktop Cloud Solution. The agent-free virtualization antivirus supports Xen architecture but not KVM architecture. It can be configured separately in FusionSphere Outsourcing.

The Huawei and KingsoftSecurity V8 antivirus systems support installation of the lite cloud antivirus client on user VMs.

What Advantages and Disadvantages Does Agent-free Virtualization Antivirus Have?

Advantages:

- 1 Prevents antivirus storms.
- 2 Shares scan results and improves system efficiency.

Disadvantages:

- 1 (VMware and Trend Micro solutions) Only file viruses are removable, and memory viruses are irremovable. Trend Micro does not have a plan currently to improve the current situation.
- 2 User experience deteriorates, and manual virus removal is not supported. (After agent-free antivirus is used, no antivirus information exists on customer VMs.)

4.5.4 What Suggestions Do Huawei Have to Prevent Antivirus Storms and Improve Antivirus Efficiency?

You are advised to use Symantec SEP12.1 (or later versions), which optimizes the virtualization platform in terms of the following two items.

- 1 Prevents antivirus storms.
A control center schedules antivirus tasks in a unified manner, and the automatic virus removal time and antivirus database update time had better be set during low traffic hours.
- 2 Shares scan results and improves system efficiency.
The HASH value in the scan result file about a VM is sent to the control center, and then the control center sends the value to other VMs. Other VM antivirus software will store a HASH value list locally.

4.5.5 What Are the Security Hardening Measures Taken for the OSs Used by the FusionAccess Desktop Platform?

On the Huawei FusionAccess Desktop platform, the virtualization software is based on the SUSE Linux system. Huawei provides the following security hardening measures for the SUSE Linux and Windows Server 2012 systems respectively:

In the SUSE Linux system, the score of the CIS scan reaches 75. The following security hardening measures are taken in the SUSE Linux system:

- Disabling unnecessary services: For example, the Telnet service and FTP service are disabled.
- Controlling the authority of accessing files and directories.
- Managing user passwords.

4.5.6 What Are the Security Hardening Measures Taken for the VM OS? How Are Attacks, such as External Viruses, Prevented?

System vulnerabilities, insecure accounts or passwords, inappropriate configuration or operations, and enabling of insecure services may be exploited by viruses, hackers, worms, and Trojan horses to compromise system security. To mitigate the threats due to the preceding factors, security configuration needs to be performed. The results of the surveys conducted by the Center for Internet Security (CIS) show that 80% to 90% of known vulnerabilities can be

eliminated using basic security configuration. In addition, security hardening can achieve effects that cannot be achieved by using antivirus software and installing patches.

Huawei has formulated a series of development and test security specifications for OSs, databases, and Web applications. In addition, Huawei has independently developed system security customization and check tools to meet the benchmark requirements for best security practices in the industry.

4.5.7 Does Huawei FusionAccess Desktop Cloud Solution Have Impact on the Existing Security Audit?

FusionAccess Desktop administrator operations are all recorded in logs. The logs can be used for security auditing.

4.5.8 After the Desktop Is Interconnected with the AD of a Customer, If I Change the Password on the Virtual Desktop, Can the New Password Be Synchronized to the AD?

Yes.

4.5.9 How to Sell the Data Transmission Systems in the On-cloud & Off-cloud Isolation Solution?

Huawei has a data transmission system for demonstration. It provides demo capabilities and can be provided to users free-of-charge for development and maintenance (without after-sales or technical support).

<http://support.huawei.com/huaweiconnect/enterprise/zh/thread-355699-1-1.html>

If there are requirements in actual projects, use the data transmission management tools from other vendors. For example:

<http://www.leagsoft.com/cpyfa/product/shujuanquan/p/1029>

4.6 O&M

4.6.1 What Are the Impacts of Cloud Computing on IT System Operation and Maintenance? What Are the Recommended Solutions?

The O&M mode will be revolutionized from longitudinal operation and maintenance to horizontal operation and maintenance. Each O&M engineer focuses on his or her duties, instead of paying attention to the entire service system including network security, storage devices, servers, OSs, and middleware in the traditional chimney construction mode. For example, business navigation O&M personnel need to pay attention to the service only on the cloud platform and server maintenance personnel focus on server states, for example, checking whether any fault occurs and whether the overall utilization is abnormal. Responsibilities are clearly divided among the maintenance personnel. This facilitates training of professional O&M teams.

Personnel structure changes: Due to changes in the construction and O&M modes, the requirements on the personnel structure and technical skills change. Therefore, a cloud platform supplier must provide carriers with detailed and personalized training services.

Benefits: Investments need to be made to construct a service application cloud platform. The entire return on investment (ROI) needs to be analyzed in detail. According to the analysis of the projects implemented at early stages, if application services are constructed using a cloud platform and existing service systems are migrated to the cloud platform gradually, the total cost of ownership (TCO) can be reduced by 48%. In addition, the service deployment speed increases by more than 80%, providing telecom operators with opportunities of quickly deploying new services to bring about incalculable benefits.

4.6.2 What Are the Requirements of Cloud Computing Implementation on the Planning and Construction Mode of the IT System Infrastructure?

Planning of the IT system infrastructure:

The existing service platforms (software and hardware) and service systems of carriers are diverse and complex. Evolution from existing service platforms to a cloud computing platform will be a long process, possibly taking five years to 10 years. However, once the strategy for building a unified cloud computing platform in the future is determined, planning needs to be started to guide the use of the cloud computing platform for service systems meeting the conditions during new construction, expansion, and reconstruction, making investments in the future. You are advised to build and reconstruct the cloud computing platform for service systems by performing the following steps:

- Step 1** Perform trials on a large scale to explore rules and accumulate experience. Arrange two to three provincial branches to use mostly service systems on X86 servers for large-scale trials.
- Step 2** Accumulate rules. After large-scale trials are completed successfully, clearly define the roadmap and principles of new construction and the evolution from the service platform on the live network to a cloud computing platform.
- Step 3** Popularize the rules so that the cloud computing platform improves the service support ability, reduces costs, improves the maintenance efficiency, and facilitates centralized and large-scale maintenance scheduling.

When the technologies become mature and abundant experiences are accumulated for new flow construction, you can consider gradually integrating the IT resources of different departments of the enterprise to form a cloud computing platform shared by the entire enterprise, improving the level of overall IT resource sharing, and obtaining more benefits.

Construction mode:

In traditional chimney construction mode, all the service systems are planned independently. In cloud platform construction mode, the construction mode needs to be planned and designed as a whole. Based on the overall resource pool utilization and subsequent overall service development conditions, personnel responsible for resource purchase and construction uniformly plan and purchase resources, including servers, storage devices, and networks.

----End

4.7 Reliability

4.7.1 Does Any Single Point of Failure Exist in the FusionAccess Desktop System? What Is the Service Level Agreement (SLA)?

Huawei FusionAccess Desktop Cloud Solution uses an all-round redundancy solution, adopting technologies such as network dual plane, storage multi-path, storage dual controller, Redundant Array of Independent Disks (RAID), hot spare disk, power supply redundancy, fan redundancy, blade redundancy, and VM live migration. These technologies guarantee high availability for the Huawei FusionAccess Desktop system. The SLA of Huawei FusionAccess Desktop hardware security reaches 99.999%. The SLA of the entire solution (hardware and software) reaches 99.95%.

4.7.2 What Is the Overall Goal of Huawei FusionAccess Reliability?

Cloud computing is a hot technology and field of the current ICT field. As ICT integration intensifies, the boundary between the IT and CT fields becomes more indistinct. This trend is convincingly demonstrated by cloud computing. Cloud computing can be used in the IT field (for example, an NC application scenario) and CT field (for example, an SDC application scenario) or the Virtual Private Server (VPS) field (IDC application scenario) and provides vigorous reliability guarantee. In this way, the Huawei FusionAccess Solution can meet the reliability requirements of the IT and CT fields.

The Huawei FusionAccess Solution guarantees reliability at four layers:

- **Service layer:** Implements functions, such as geographic redundancy on the solution architecture, computing/storage resource HA, computing/storage snapshots and recovery, and elastic IP
- **Platform layer:** Implements functions, such as node HA, fault management, load balancing, flow control, data consistency, dynamic resource scheduling and hotspot elimination, storage multi-path access, and distributed transaction mechanism
- **Hardware layer:** Implements functions, such as server power supply, fan redundancy backup, soft failure of memory, network dual plane, pre-warning of hard disk faults, and hot swapping

Management layer: Implements functions, such as alarm management, log management, configuration management, in-service upgrade, and in-service lossless expansion

The preceding function features are performed to ensure that the FusionAccess Solution reliability meets the reliability requirements of the CT and IT fields:

IT field: The main reliability reference model is the Availability Level Pyramid model. This model measures reliability by using two indexes: Recover Time Object (RPO) and Recover Point Object (RTO). The measurement is divided into five grades: AL0 to AL4. AL4 has the strictest reliability requirement: RPO = 0, RTO = 0. RTO refers to the duration of fault recovery after service interruption occurs. RPO refers to the recentness of data recovery. Therefore, AL4 requires both RPO and RTO to be zero hours. This means that the cloud computing solution requires zero service interruptions. In addition, 100% component failure tolerance must be achieved to ensure that no data is lost.

CT field: According to the definition of carrier-class reliability specified by SCOPE, the main reliability requirements are as follows:

- **High availability:** Availability at 99.999% is required. That is, services are interrupted for no more than five minutes during one year.
- **Minimum impacts:** The system must support effective fault isolation to minimize the impacts of faults.
- **Service continuity:** When a system fault occurs, running services remain unaffected.
- **In-service upgrade:** Running services remain uninterrupted during system upgrade and expansion.
- **Fast fault location:** When a system fault occurs, the faulty module and board are located automatically and quickly, allowing the administrator to rectify the fault quickly.

The Huawei FusionAccess Solution needs to adapt to the application scenarios in the IT and CT fields. Therefore, in principle, the solution needs to meet the reliability requirements of both fields.

4.7.3 How Is Server Reliability and Stability Ensured if the FusionAccess Desktop Is Deployed on a Large Scale?

Large-scale deployment requires high performance and reliability, which is just the advantages of Huawei. For an integrated solution, reliability and availability should be considered comprehensively, ranging from terminal management, network, server, storage, and security devices, to O&M. In large-scale deployment, servers are much better than PCs in terms of hardware RAS features. In addition, the technologies in the cloud computing environment such as on-demand resource allocation, thin provisioning, elastic scheduling, high availability, and hot migration provide higher pressure endurance, availability, and reliability than those of PCs.

4.8 Performance

4.8.1 What Are the Differences Between the FusionAccess Desktop and the Ordinary PC in Terms of Performance?

The FusionAccess Desktop and ordinary PC almost have the same performance, for example, in Microsoft Office application and OA system. For program compilation, VM memory can be increased to obtain a similar effect; for high-definition video playback, ordinary PCs have a better effect (for the performance specifications, see the sales guide); for 3D graphics processing, PCs having an independent graphics card (for example, GT440) have the same effect as the FusionAccess Desktop using the GPU sharing technology (for details, see the following section).

4.8.2 How to Ensure Video Quality in the Office Application Scenario?

- 1 Two methods: Use ordinary TC terminals, and each terminal has 2 Mbit/s to 10 Mbit/s network bandwidth (depending on the video definition).
- 2 Use TC terminals that support 3D and video decoding, such as CT6000. This reduces network traffic while achieving the required video effect.

4.8.3 Can the FusionAccess Desktop Solution Be Used for Development, Graphic Computing, and Multimedia Application?

Yes. Thanks to high security, the FusionAccess Desktop Solution has more advantages in technology development; the Solution is widely used in the multimedia sector due to GPU resource multiplexing and HDP efficient compression; with the distributed application model, the Solution can be used in high-performance computing scenarios (such as render farm).

In the scenario involving 3D graphics processing, you are advised to use the GPU passthrough feature or GPU virtualization solution. In 3D graphics processing scenarios, you are advised to perform POC tests to check whether customer requirements are met.

4.8.4 Why is the 2667 CPU Used in the Desktop GPU Scenario? Can It Be Replaced?

The graphics editing content in the GPU scenario is complex, with high computing and rendering requirements. CPUs with high frequency, such as 2667 CPUs, are recommended.

If you need to use other CPUs, the frequency must be greater than or equal to 2.8, and a proof of concept (PoC) test must be performed to verify the frequency.

4.8.5 Will the Video Experience Be Affected on a Virtualization Host and Thin Client?

Yes. In video playback scenarios, the VM density on a single server must be reduced to ensure good user experience. The performance and decoding capability of TCs also affect video playback smoothness. For details, see the *Huawei FusionAccess Desktop Cloud Solution 6.2 Video Playback Technical White Paper (Internal)*.

http://3ms.huawei.com/mm/docMaintain/mmMaintain.do?method=showMMDetail&f_id=CCBD170925140213309

4.9 Scalability

4.9.1 How Is the Dynamic Adjustment Feature of the Cloud Reflected in Huawei FusionAccess Desktop Cloud Solution?

- The Huawei FusionAccess Desktop supports: Dynamic adjustment of the numbers of CPUs
- Memory modules
- Storage devices
- NICs
- Memory overcommitment (memory overcommitment can achieve a maximum of 150% physical memory using technologies such as intelligent memory overcommitment policies such as memory ballooning, memory switching, and memory sharing)
- Small-scale storage allocation (small storage space is allocated at first and the storage space is increased dynamically based on subsequent application growth)

4.9.2 Can VM Configurations (CPU/Memory/Hard Disk/NIC) Be Modified Online?

CPU and memory specifications can be modified online, but the modification takes effect only after restart.

Virtual disks (only data disks, excluding system disks) can be installed on or removed from a VM in offline mode. This feature satisfies user requirements for multi-NICs by adding or removing virtual NICs for a VM.

In cloud service scenarios, the online adjustment capability is the same as the cloud host in the FusionAccess solution.

4.9.3 Does the Cluster Support Online Capacity Expansion and Recycling (Servers, Storage Devices, Networks)?

Yes.

4.9.4 Does the VM System Disk (such as Drive C) Support Capacity Expansion?

Yes. (The Workspace scenario provides the same capabilities as the cloud host.)

4.10 Disaster Recovery

4.10.1 What Disaster Recovery Solutions does Huawei FusionAccess Desktop Cloud Solution Support?

Huawei FusionAccess Desktop Cloud Solution supports the following disaster recovery solutions. For details, see the *Huawei FusionAccess Desktop Cloud Solution Disaster Recovery Technical White Paper*.

- 1 GSLB service disaster recovery
Based on load balancer GSLB mechanism, the system enables users to log in to the desktop system by using a standby site, to implement service disaster recovery of virtual desktops.
The GSLB service disaster recovery supports F5 or a NetScaler load balancing device.
- 2 TC client automatic disaster recovery
Based on the service disaster recovery solution of TC client automatic production detection and standby disaster discovery site status, the TC client automatically selects a standby disaster recovery site of a normal state for access when a production site is faulty. If disaster recovery needs to be performed on data disks, the NAS remote replication function needs to be used. It does not provide program and data disaster recovery for a system disk. The TC client automatic disaster recovery does not need GSLB.
- 3 UltraVR array replication disaster recovery (The roadmap for the array replication DR solution for the KVM architecture is planned to be released in October 2018.)
The UltraVR array replication disaster recovery solution provided by the Huawei FusionAccess desktop is based on FusionSphere. FusionAccess UltraVR replicates VM data in the production site to the disaster recovery site using the asynchronous remote

replication function of Huawei storage. UltraVR replicates VM specifications and manages disaster recovery plans. When a disaster occurs, a disaster recovery switchover is automatically implemented based on the disaster recovery plan.

4 HyperMetro metropolitan disaster recovery

The metropolitan active-active disaster recovery solution means two sites within 100 km are both running services properly simultaneously, which improves the service capability and resource utilization. The two sites share resources. If one site is faulty, services are automatically switched over to the other site, which reduces service interruption duration to minutes and ensures zero data loss. The metropolitan active-active disaster recovery solution is implemented based on OceanStor V3 storage, which serves as production storage.

In the solution, multiple OceanStor V3 nodes in the same OceanStor V3 cluster are deployed in active-active mode at the local and remote sites. Cluster shared volumes and HyperMetro mirroring technologies work together to enable both the local and remote OceanStor V3 nodes to provide storage access services at the same time and implement seamless storage service switchover after a disaster recovery switchover. In addition, hosts in the same cluster on the cloud platform are also deployed in active-active mode at local and remote sites, thereby implementing automatic disaster recovery switchover based on the VM HA function. The DRS function allows VM HA to be implemented within the local site if only some VMs become faulty.

4.11 Backup

4.11.1 What Backup Solutions does Huawei FusionAccess Desktop Cloud Solution Support?

Huawei FusionAccess Desktop Cloud Solution supports NAS network disk data backup and eBackup VM backup.

1 First manner: NAS network disk data backup

The NAS backup solution includes NAS backup server and NAS high availability disk solutions.

Two backup solutions are available for virtual desktop users with respect to virtual desktops on which data backup needs to be performed.

- **Data backup to a NAS server**

- Data backup process

Desktop client users periodically or manually back up important files on a virtual desktop to the NAS server by using a network shared disk.

Backup operation manners are as follows:

- (1) Users manually copy files or directory on a virtual desktop to a NAS shared directory.
- (2) Users periodically copy files or directory on a virtual desktop to a NAS shared directory by setting scheduled tasks.
- (3) Users periodically copy files or directory on a virtual desktop to a NAS shared directory by using the backup recovery mechanism in the virtual desktop Windows OS.

- Data recovery process

The data recovery manners are corresponding to the data backup manners.

- (1) If backup is performed manually or by means of automatic file copy, backup files need to be copied from the NAS shared directory to the virtual desktop for data recovery.
- (2) If backup is performed by using the backup recovery function in the Windows system, the backup recovery function also needs to be used for data recovery.

- **NAS as a high reliability data disk for VMs**

Two NAS servers are disposed. The active NAS server allocates a personal directory, which is mapped on to the virtual desktop by using a network disk and then used as a high reliability data disk for a user virtual desktop.

Data synchronization is implemented between the active and standby NAS servers. When the active NAS server fails, the standby NAS server is switched, to avoid data loss.

- Data backup process

VM users specially use the NAS high reliability data disk as an important data repository.

The active NAS server performs data synchronization with the standby NAS server.

- Data recovery process

When the active NAS server fails, the administrator switch the standby NAS server to an active state, and the NAS high reliability data disk can continue to be accessed on the virtual desktop.

- 2 Second manner: eBackup VM backup (As of March 2018, KVM-based eBackup is not supported.)

It is a VM data backup solution implemented by using a Huawei eBackup device and based on FusionCompute snapshot backup functions. In coordination with FusionCompute, the eBackup implement designated VM backup or designated volume backup according to designated policies. When VM data loss occurs or the VM fails, the data can be recovered by using backup data. A destination end for data backup is a virtual disk mounted to the eBackup VM or a peripheral NFS/CIFS shared file system storage device.

4.12 FusionAccess Desktop Services

4.12.1 What Are the Versions of FusionAccess for the Desktop Solution? Are There any Differences?

The Desktop Solution can be used with FusionAccess 2.06, FusionAccess 6.1, and FusionAccess 6.3. The FusionAccess 2.x and FusionAccess 6.x have completely different implementing methods:

FusionAccess 2.x is implemented through management. A user applies for standard cloud hosts on the ManageOne SC page, and manages the cloud hosts on the FusionAccess management page.

FusionAccess 6.x is provisioned as a service. After resource administrators create basic VDC service configurations (such as the AD system), VMs can be provisioned for users. After the provisioning is complete, the login links, accounts, and passwords can be sent to users' mailboxes. For details, see the feature description of the corresponding FusionAccess version.

4.12.2 Do Desktop Services Support GPU Pooling?

FusionAccess 6.x supports GPU desktops but not GPU pooling.