

**HUAWEI CloudMCU
V600R019C00**

Product Overview

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1 Product Positioning and Features

[1.1 Product Positioning](#)

[1.2 Product Features](#)

1.1 Product Positioning

Huawei CloudMCU is a powerful media convergence platform for enterprise cloud communications. It connects multiple endpoints from room, PC to mobile phones, and integrates a variety of media streams including video, audio and data, achieving seamless unified communication and collaboration.

The CloudMCU is a software-based conference server. It supports virtualized deployment on the VMware virtual machine (VM), Huawei Carrier Grade Platform (CGP), or Huawei Fusion Sphere server to control conference resources in a centralized manner. The CloudMCU supports flexible deployment schemes to meet cloudified deployment requirements of enterprises and service providers (SPs).

1.2 Product Features

Cloud-based Deployment, Easy to Operate and Maintain

- Support for deployment on VMware VM, Huawei CGP, and Huawei Fusion Sphere server
- Support for high-configuration 2288H V5+CGP deployment, the highest can support 54-way 1080P.
- Flexible deployment and fast scalability
- Suitable for On-premise and hosting, seamless integration with IMS
- One key to deploy, signaling track, remote inspection, failure message export, unified upgrade, easy to operate and maintain

Full Media Access, Easy Interoperability

- Advanced interoperability in video, audio, and data conferencing, seamless collaboration
- Converged conference connecting multi-endpoints from room, desktop to mobile; H.323 and SIP mixed networking

- Support data conference via multiple web browsers such as IE, Firefox, and Chrome
- Both AVC and SVC enabled networking, compatible with endpoint with different capabilities
- The CloudMCU functions as the communication gateway between Huawei videoconferencing system and Lync system for exchanging audio, video, and presentation.
- The CloudMCU functions as the WebRTC gateway, using which customers can access Huawei videoconferencing system from a browser.

Intelligent Resource Management

- Centralized license management, license distributed across the globe on the principle following the sun
- Centralized or dispersed networking, multi-layer cascading and shortest-path access, implementing automatic resource dispatching
- Real-time dynamic resource switchover while transmitting video, video and data stream
- Support resource pool deployment, load balancing, hot spare and geographic Redundancy
- Support for switchover of the active and standby SMCs and switchover of the active and standby SIP servers
- CHR to construct the media quality O&M analysis capability
- CCE to trace E2E signaling

Convenient and Abundant Service Experience

- Multiple ways to initiate or join a meeting including VMR, SiteCall*, One button to Join, URI calling.
- Automatic continuous presence enabled, administrator control, endpoint control and IVR control supported.
- H.264 HP technology preserves the image effect in video conferences while reducing 50% bandwidth consumption.
- H.264 SVC and SEC3.0 technology ensures the audio and video conference even during 20% packet loss.
- The CloudLink hardware terminal supports the 4K resolution in data conferences.
- Desktop sharing, annotation on shared desktop, whiteboard annotation, and presentation sharing are supported.

2 Application Scenario

- 2.1 On-Premises Network
- 2.2 SP Hosted Network
- 2.3 IMS Hosted Network
- 2.4 Cascaded Network

2.1 On-Premises Network

Huawei's videoconferencing solution is a comprehensive video conference solution that supports immersive remote conferences, desktop and mobile video access, and enterprise streaming media applications. The solution is developed to serve customers from governments, enterprises of all sizes, and a variety of industries, including transportation, public safety, and finance.

Figure 2-1 shows the enterprise on-premises network.

Figure 2-1 On-premises network

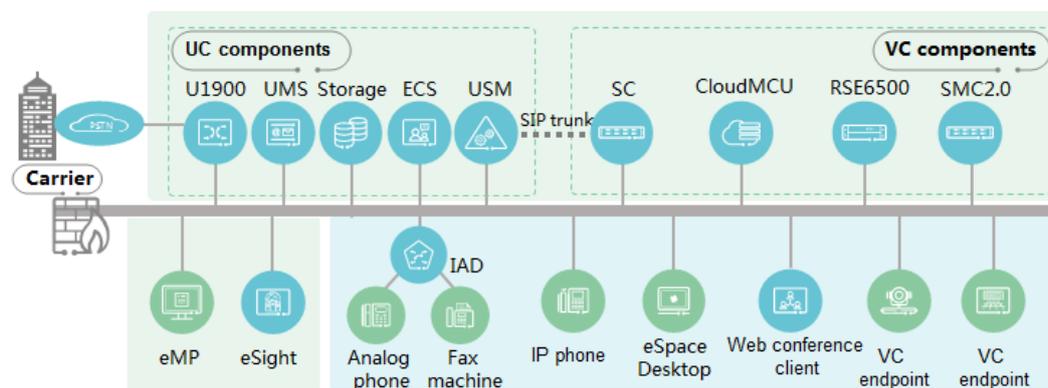
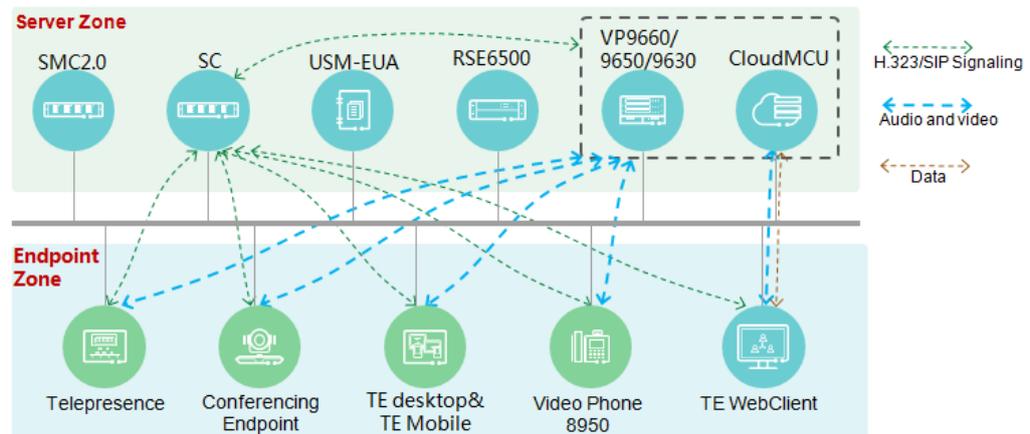


Figure 2-2 shows the enterprise on-premises conference-only network.

Figure 2-2 On-premises network (conference-only)



On an on-premises network, the SMC2.0, MCU (VP9600 series MCU or CloudMCU), videoconferencing endpoints, and IP network are deployed. The MCU functions as the media switching platform in the system.

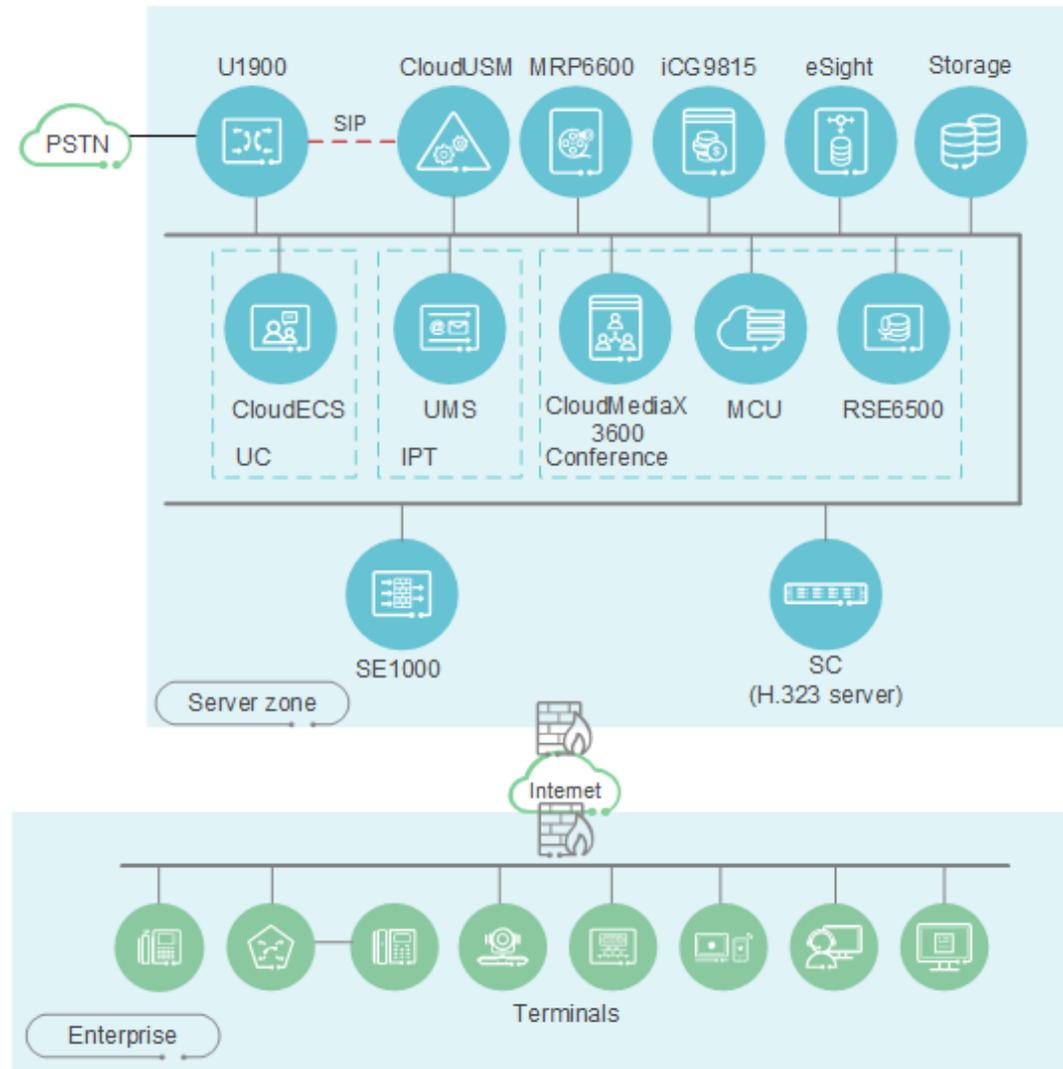
- The CloudMCU is a conference server in the form of software. It integrates voice, video, and data functions, and supports virtual deployments.
- The CloudMCU can be deployed independently or together with VP9600 series MCUs.
- All-IPv4 networking, and IPv4 and IPv6 hybrid networking are supported.
- The CloudMCU locates in the media switching layer to allow access from a variety types of terminals in the lower layer and is managed by the SMC2.0.
- Users can click the link in a conference notification email to start the web conference client, join CloudMCU-based voice, video, and data conferences, and use a web conference client to control the conferences.

2.2 SP Hosted Network

Service providers (SPs) can centrally deploy service resources and leverage the pipeline advantages to lease basic voice, video, conference, and value-added services to enterprises. Enterprises do not need to invest in building their own service resources or maintain their own systems. Instead, they can lease services from SPs to obtain efficient and convenient unified communications experience, reducing investment costs.

Figure 2-3 shows the SP hosted network.

Figure 2-3 SP hosted network



On an SP hosted network, the MediaX, MCU (VP9600 series MCU or CloudMCU), USM, TMS, SBC, eSight, videoconferencing endpoints, and IP network are deployed. The MCU functions as the media switching platform in the system.

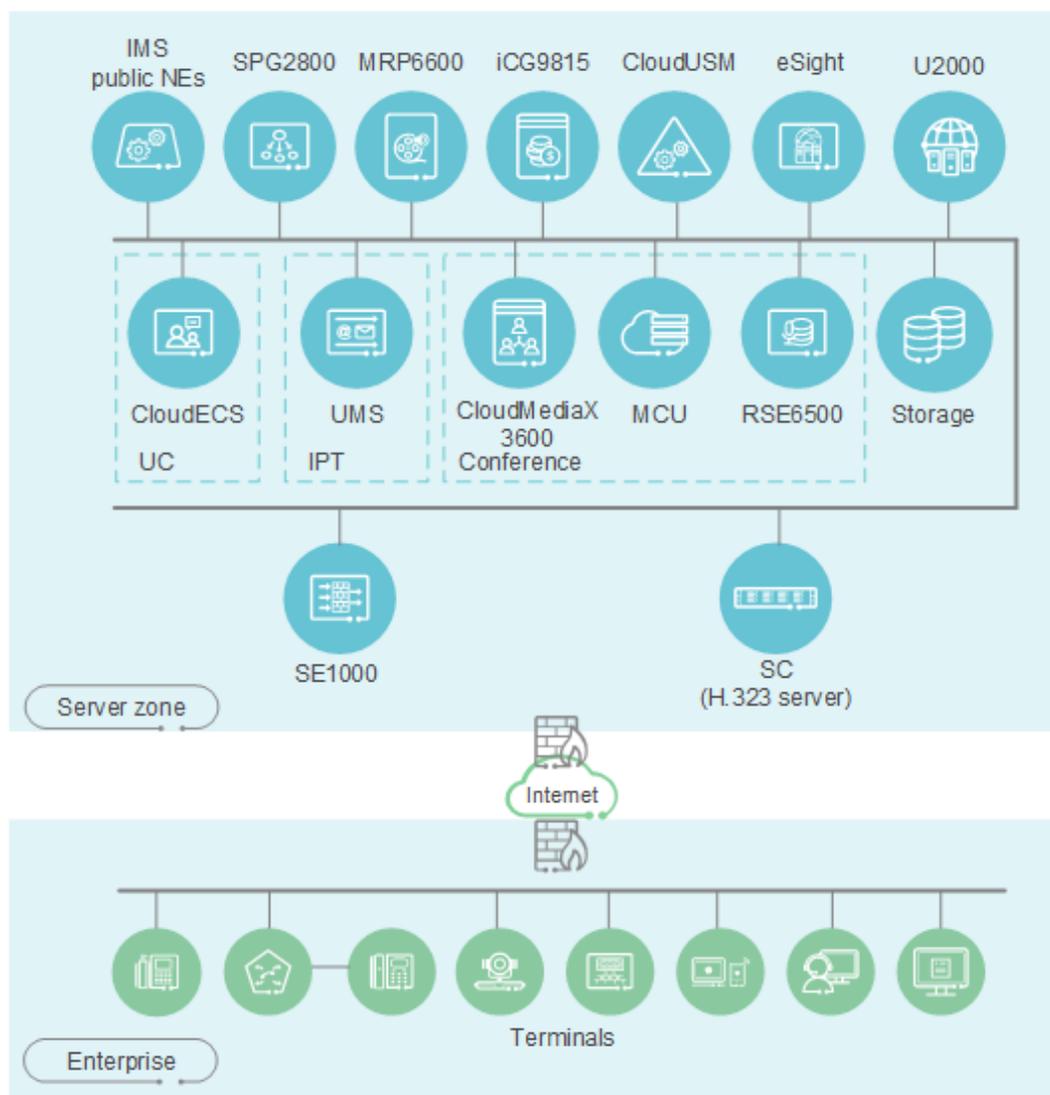
- The CloudMCU is a conference server in the form of software. It integrates voice, video, and data functions, and supports virtual deployments.
- The CloudMCU can be deployed independently or together with VP9600 series MCUs.
- All-IPv4 networking, and IPv4 and IPv6 hybrid networking are supported.
- The CloudMCU locates in the media switching layer to allow access from a variety types of terminals in the lower layer and is managed by the eSight.
- Users can click the link in a conference notification email to start the web conference client, join CloudMCU-based voice, video, and data conferences, and use a web conference client to control the conferences.

2.3 IMS Hosted Network

Carriers can deploy service resources in a unified manner and take advantages of pipes to provide basic voice, video, and value-added services. Carriers can cooperate with service providers (SPs) to develop the industry chain.

Figure 2-4 shows the IMS hosted network.

Figure 2-4 IMS hosted network



On an IMS hosted network, the IMS Core, MediaX, MCU (VP9600 series MCU or CloudMCU), USM, eSight, SBC, U2000, RSE6500, videoconferencing endpoints, and IP network are deployed. The MCU functions as the media switching platform in the system.

- The CloudMCU is a software-based conference server. It integrates audio, video, and data functions, and supports virtualized deployment.
- The CloudMCU can be deployed independently or together with VP9600 series MCUs.

- All-IPv4 networking, and IPv4 and IPv6 hybrid networking are supported.
- The CloudMCU locates in the media switching layer to allow access from a variety types of terminals in the lower layer and is managed by the U2000.
- Users can click the link in a conference notification email to start the web conference client, join CloudMCU-based voice, video, and data conferences, and use a web conference client to control the conferences.

2.4 Cascaded Network

On a cascaded network, MCUs are cascaded.

Cascaded networks are gaining in popularity as videoconferencing technology is advancing and users demand increasingly larger system capacity. Cascading technology breaks the capacity limits of a single MCU and enables MCUs to be distributed in different areas and large-scale videoconferencing networks across regions to be set up.

CloudMCUs on the on-premises and hosted networks can cascade with each other. CloudMCUs can cascade with hardware MCUs.

Figure 2-5 shows the cascaded network in on-premises mode.

Figure 2-5 Cascaded network in on-premises mode

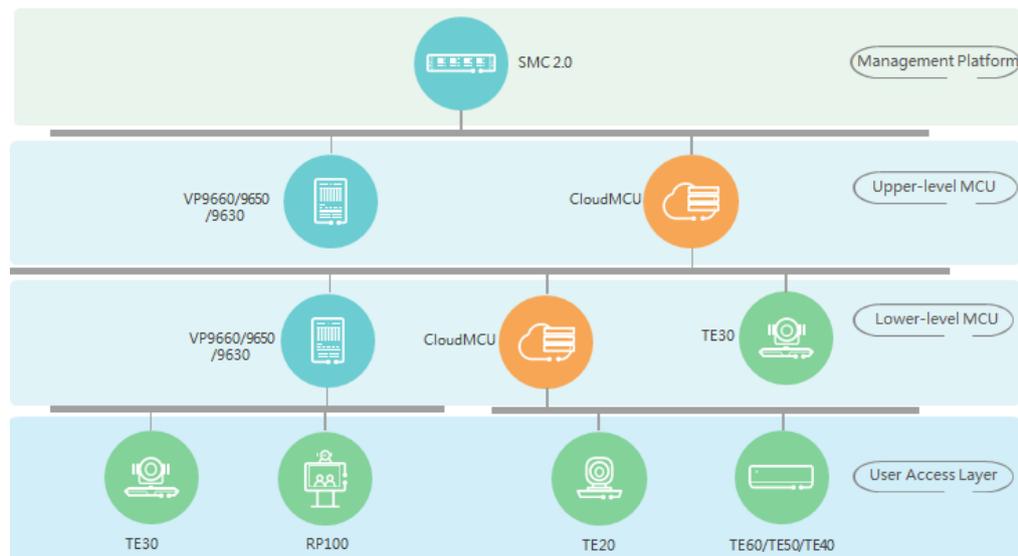
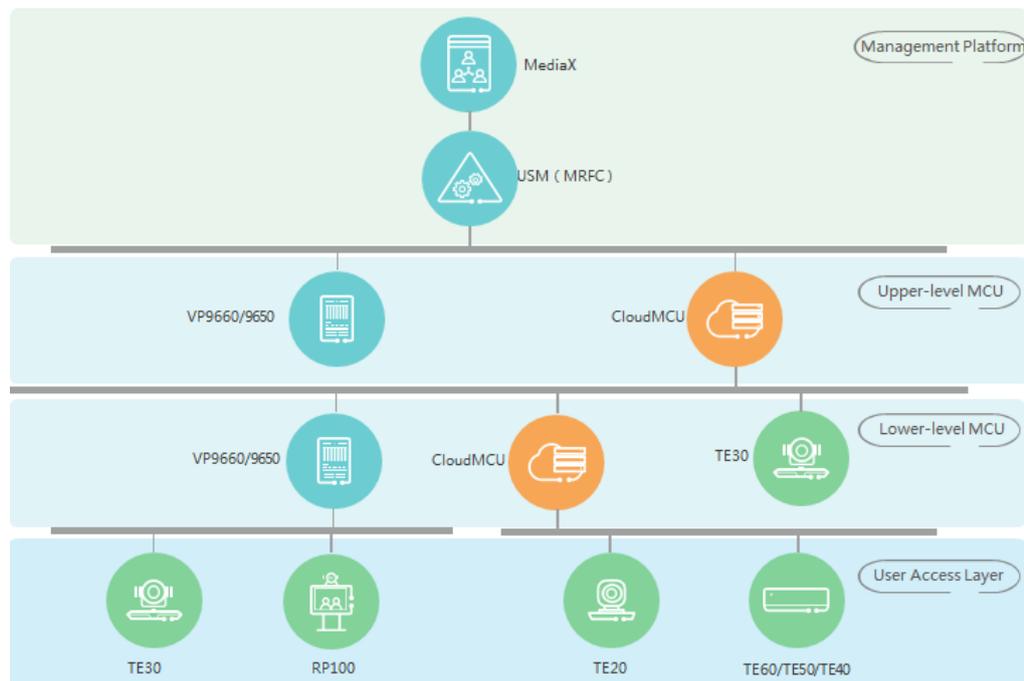


Figure 2-6 shows the cascaded network in hosted mode.

Figure 2-6 Cascaded network in hosted mode



- On an on-premises network, all levels of MCUs are managed by the SMC2.0. On a hosted network, the MediaX sends requests to the USM (MRFC) to invoke corresponding MCUs.
- Channel can be set up between the upper- and lower-level MCUs, and multiple media streams can be transmitted simultaneously. Therefore, the participants can view video from any other site.
- High-bandwidth services are available with transrating capability.
- A CloudMCU can be used as an upper-level MCU or a lower-level MCU.

3 Features and Benefits

- 3.1 Flexible Deployment
- 3.2 Video Features
- 3.3 WebRTC Access
- 3.4 SVC Multi-Streaming and Hybrid Conference
- 3.5 Data Conference Support
- 3.6 VMR Conference
- 3.7 Three-Screen Telepresence Terminal Conference
- 3.8 Unidirectional Live Broadcast Conference
- 3.9 Open and Convergent
- 3.10 Ease of Use
- 3.11 High Network Adaptability and Reliability
- 3.12 Unparalleled Security

3.1 Flexible Deployment

- The CloudMCU can be deployed on Huawei FusionServer RH2288 V3/2288H V5, E9000 and third-party servers.
- The CloudMCU supports virtualized deployment on VMware VMs, Huawei CGP and Huawei FusionSphere servers, featuring comprehensive compatibility with hardware servers of different forms.

Figure 3-1 CloudMCU virtualized deployment



Table 3-1 describes the deployment modes of the CloudMCU in different networking modes.

Table 3-1 CloudMCU deployment modes

On-premises network(Convergent Conference)	<ul style="list-style-type: none"> ● Universal server + VMware VM + CGP ● Universal server + Fusion Sphere/Fusion Compute + CGP ● RH2288 V3/2288H V5 + CGP
On-premises network(for Conferencing Only)	<ul style="list-style-type: none"> ● Universal server + VMware VM ● Universal server + Fusion Sphere ● RH2288 V3/2288H V5 + CGP
SP hosted network	<ul style="list-style-type: none"> ● RH2288 V3/2288H V5 + CGP
IMS hosted network	<ul style="list-style-type: none"> ● RH2288 V3/2288H V5 + CGP ● E9000 + Fusion Sphere

3.2 Video Features

Multiple Continuous Presence Modes

The CloudMCU supports 16 continuous presence layouts, and up to 16 panes in one continuous presence layout.

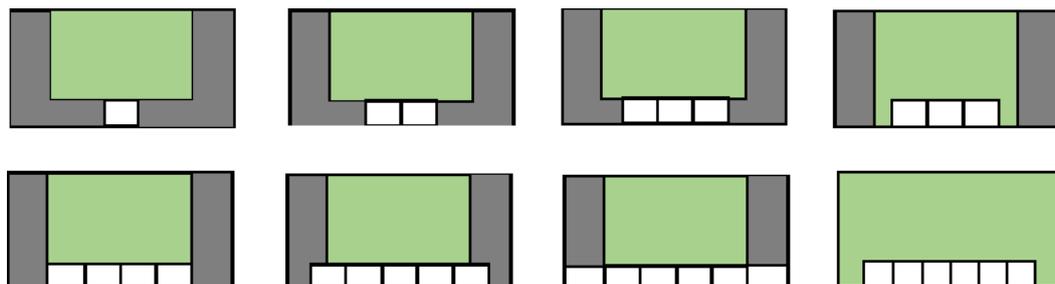
The CloudMCU supports manual configuration of continuous presence layouts, as shown in [Figure 3-2](#). Eight of them support automatic configuration, as shown in [Figure 3-3](#).

The following continuous presence layouts are combined by the CloudMCU. The continuous presence layouts of SVC conferences are determined by endpoints.

Figure 3-2 Manual continuous presence layouts



Figure 3-3 Automatic continuous presence layouts



3.3 WebRTC Access

When the CloudMCU works as the WebRTC gateway, the CloudMCU provides all features available on the WebRTC gateway. Users can join conferences anonymously from the WebRCT client through a browser. This enables users to join conferences anywhere, anytime, and using any devices, facilitating videoconferencing.

The CloudMCU provides real-time audio and video communication and presentation sharing.

WebRTC access in the CloudVC solution provides the following functions:

- The WebRTC client supports Google Chrome (60 - 66) and Firefox (54 - 59) on Windows and supports only Google Chrome (60 - 66) on Mac OS X. The WebRTC client cannot run on mobile devices.
- The WebRTC client can join conferences only as the calling party.
- The WebRTC client is able to join voice and video conferences and supports simple conference control functions.
- 720p-resolution videos are supported.

The enterprise on-premises network, WebRTC deployment network is as follows:

Figure 3-4 Deploying CloudMCU-WebRTC Gateway in the Intranet

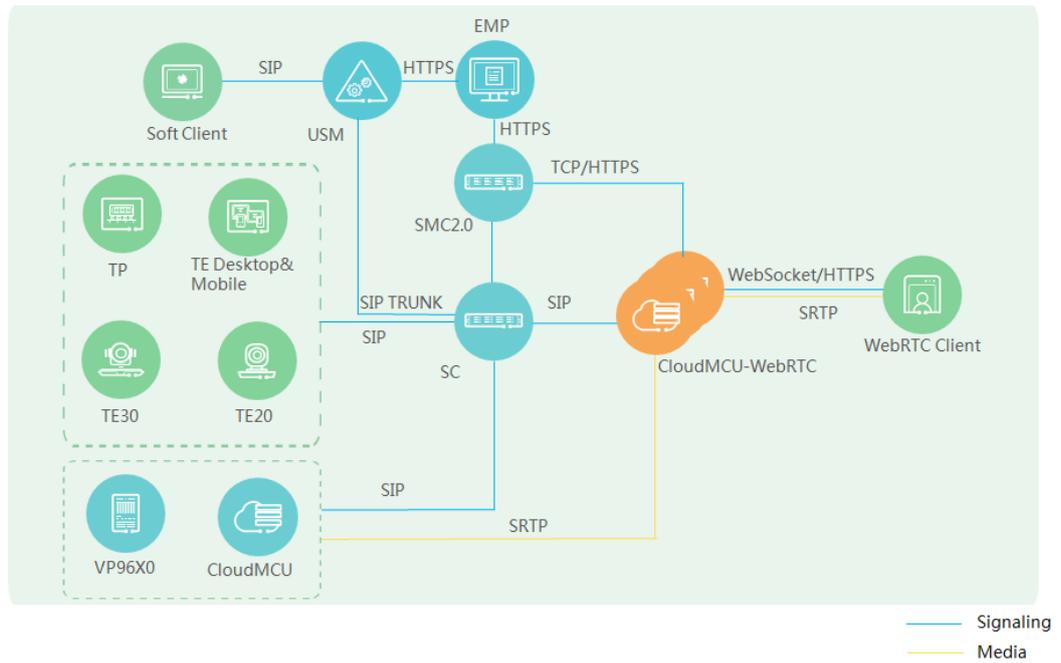


Figure 3-5 Deploying CloudMCU-WebRTC Gateway in the DMZ (SC Functioning as the STUN/TURN Server)

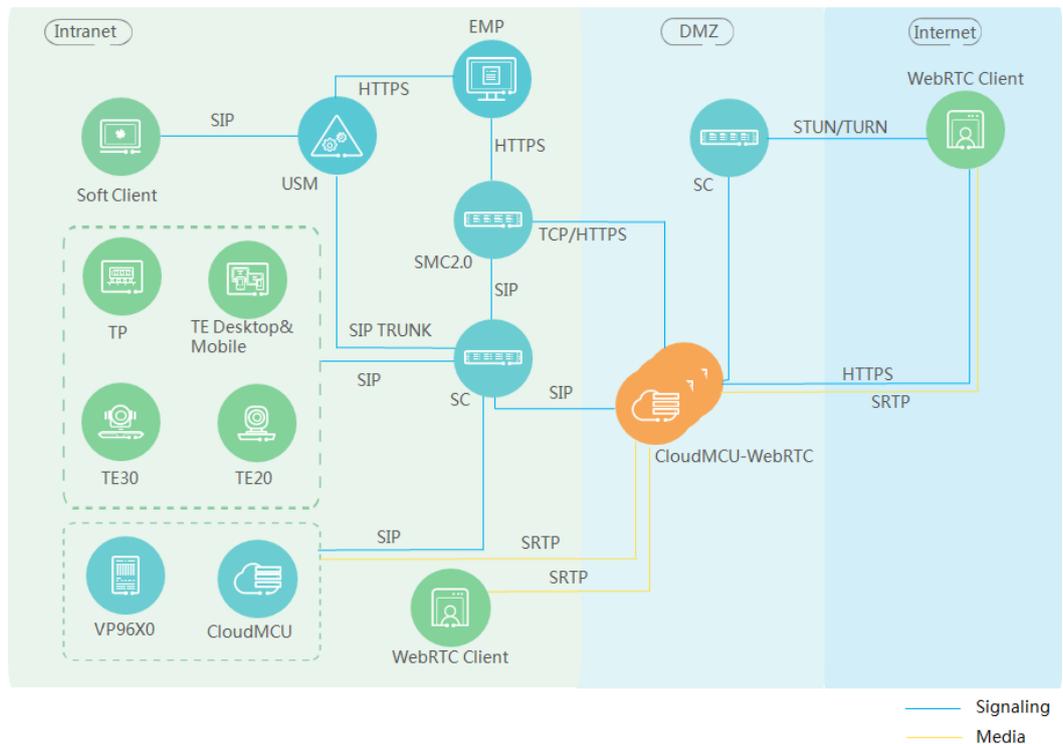
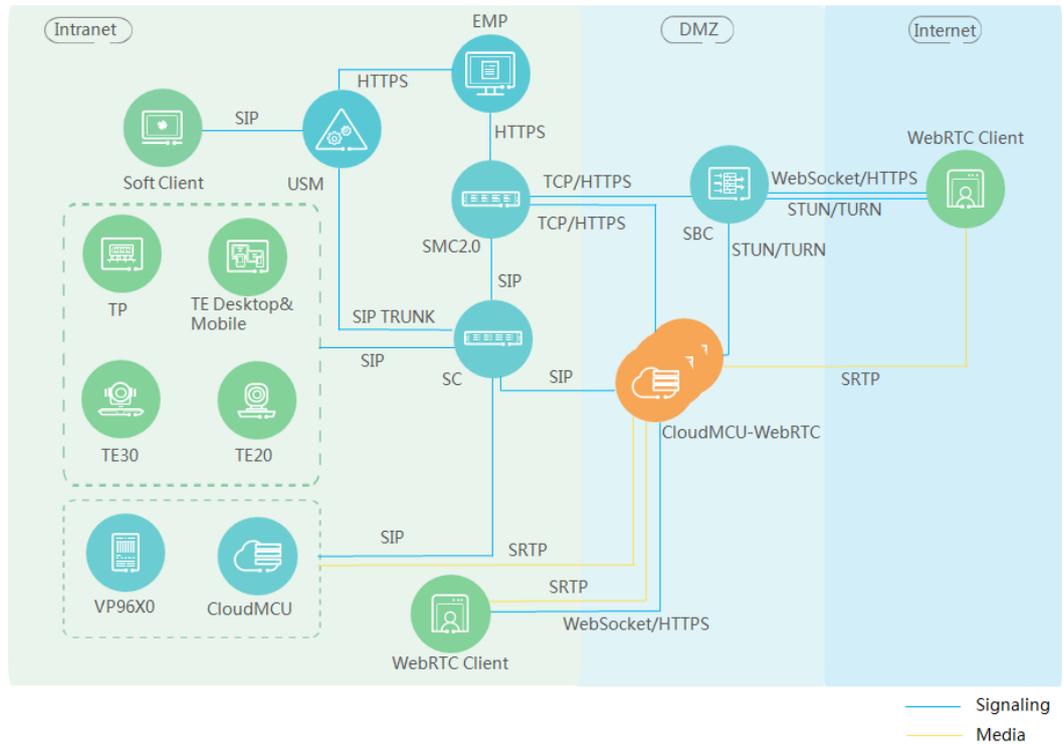


Figure 3-6 Deploying CloudMCU-WebRTC Gateway in the DMZ (SBC Functioning as the STUN/TURN Server)



The enterprise on-premises conference-only network, WebRTC deployment network is as follows:

Figure 3-7 Deploying CloudMCU-WebRTC Gateway in the Intranet

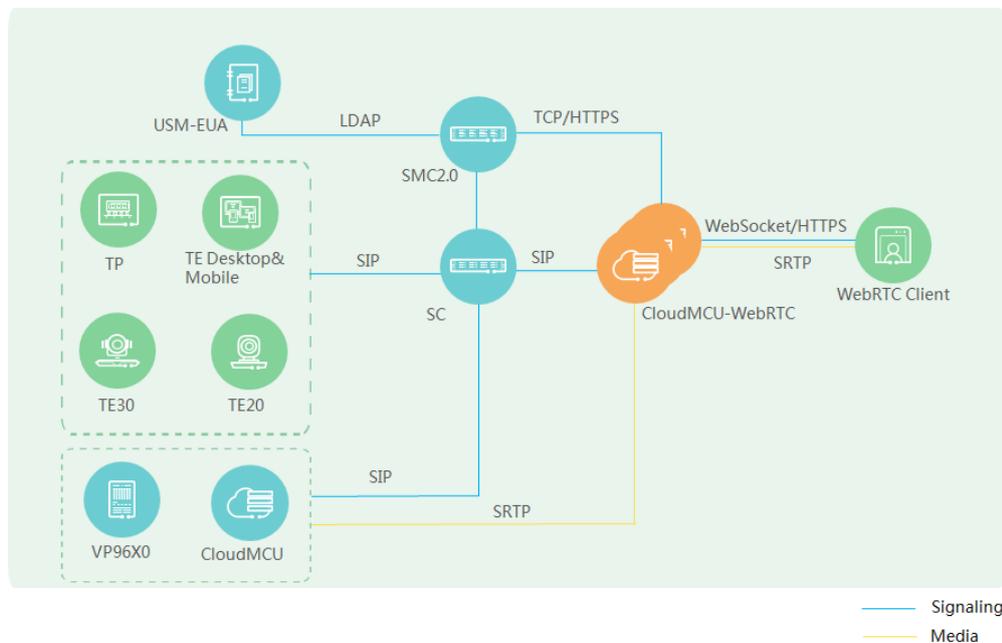


Figure 3-8 Deploying CloudMCU-WebRTC Gateway in the DMZ (SC Functioning as the STUN/TURN Server)

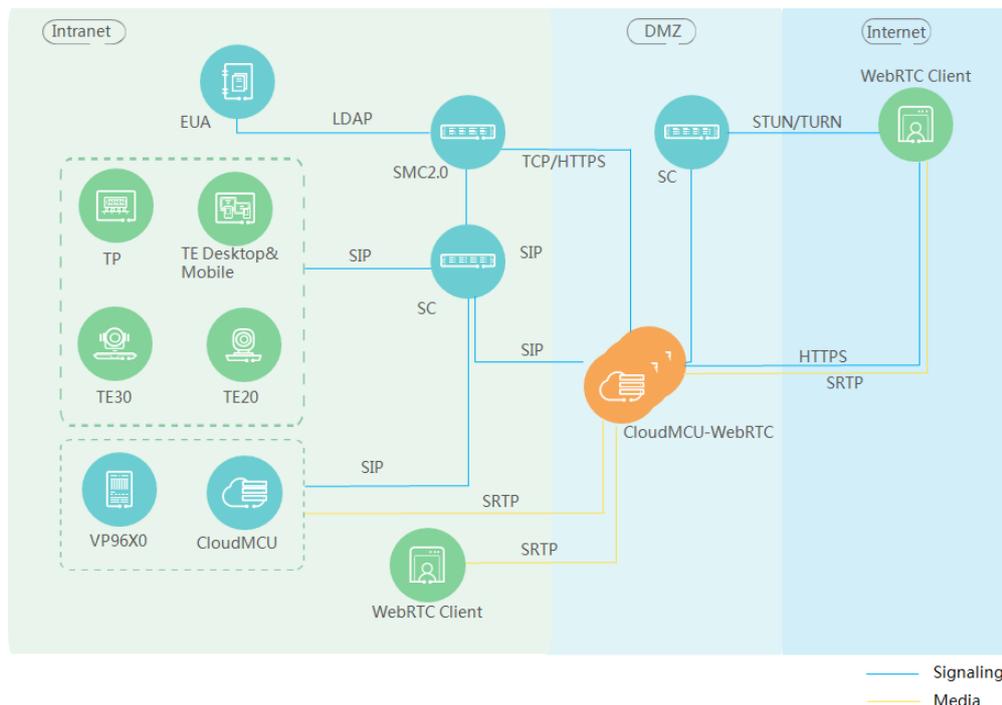
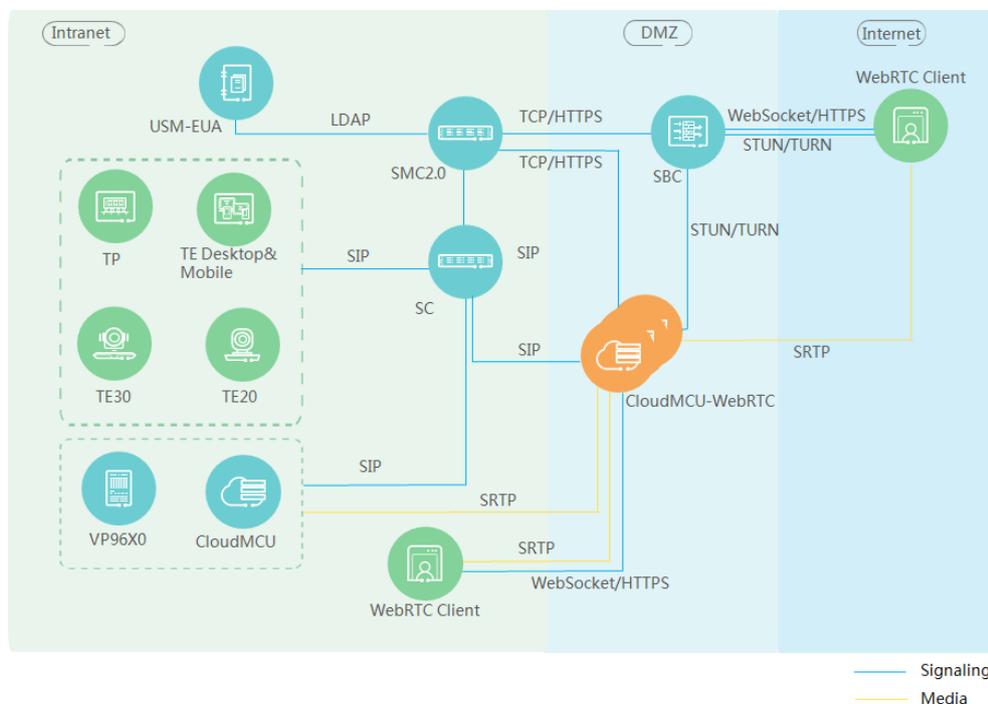


Figure 3-9 Deploying CloudMCU-WebRTC Gateway in the DMZ (SBC Functioning as the STUN/TURN Server)



The CloudMCU, which works as the WebRTC gateway, is deployed in the DMZ. Using the CloudMCU, the WebRTC client on the public network connects to Huawei videoconferencing system through web pages.

The WebRTC client connects to the WebRTC portal through a web browser and initiates an anonymous call after you enter the **Room Number**, **Password**, and **Nickname**.

When the WebRTC gateway is deployed in the DMZ and the SBC is used as the STUN/TURN server, users can join conferences using the conference link in the conference notification email.

 **NOTE**

- Point-to-point interworking between the WebRTC client and VC terminal is not supported.
- The WebRTC client can join a conference without invitation, but cannot be used as a called party. It supports some conference control functions, including turning on or off the camera, muting or unmuting the microphone, and sharing the desktop.

3.4 SVC Multi-Streaming and Hybrid Conference

The CloudMCU supports multi-streaming conferences based on the Scalable Video Coding (SVC) standard. A multi-streaming conference performs video forwarding only on the network side, without video codec conversion. Endpoints perform video codec and continuous presence layout (1 big and multiple small panes).

SVC is the extension of the H.264 Advanced Video Coding (AVC) video compression standard. It uses a variety of efficient algorithm tools of the AVC codec to generate decoded videos with different frame rates, resolutions, or quality levels.

Function Description

- Single and hybrid multi-streaming conferences are supported. Hybrid multi-streaming conferences support the access of SVC and AVC conferencing endpoints.

 **NOTE**

Single multi-streaming conferences are an exception of hybrid multi-streaming conferences, and collectively referred to as hybrid multi-streaming conferences.

- The cascading between hybrid multi-streaming conferences and between hybrid multi-streaming conferences and universal transcoding conferences is supported.
- SVC conferencing endpoints can be CloudLink SoftClient and TE WebClient.

CloudLink SoftClient (Mobile)

On the mobile terminal, the following video modes are available: Picture in Picture (PiP) and equipartition.

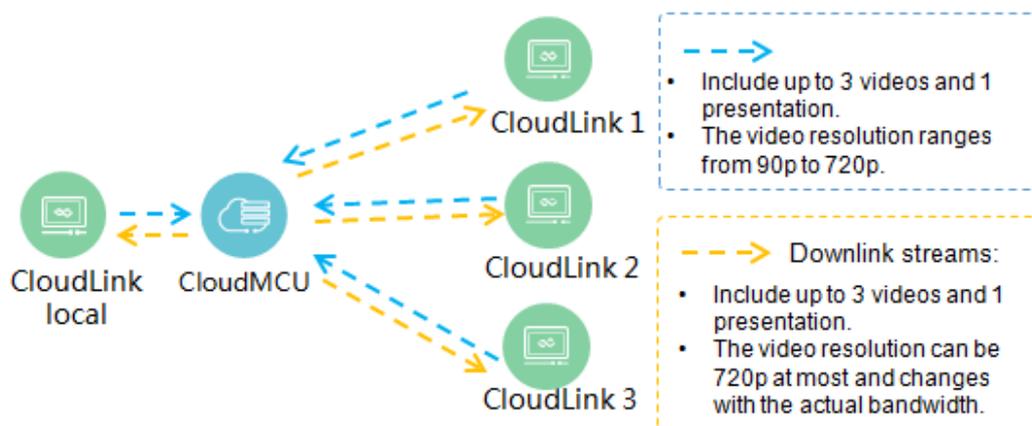
- In PiP mode, users can lock the video status or let the system automatically select the participant video to be displayed. In this mode, the mobile terminal can display two panes (a large pane displaying the video of a remote participant and a small pane displaying the local video). That is, the CloudMCU sends one downlink video stream to the mobile terminal in this mode.
- In equipartition mode, the mobile terminal can display a maximum of four panes (displaying the local video and videos of three other participants) on a single screen. That is, the CloudMCU sends a maximum of three downlink video streams to the mobile terminal in this mode.
- The mobile terminal can send a maximum of three uplink video streams to the CloudMCU. The resolution ranges from 90p to 720p. The resolution of video streams

sent by the CloudMCU to each terminal depends on the actual bandwidth, and the maximum resolution is 720p.

NOTE

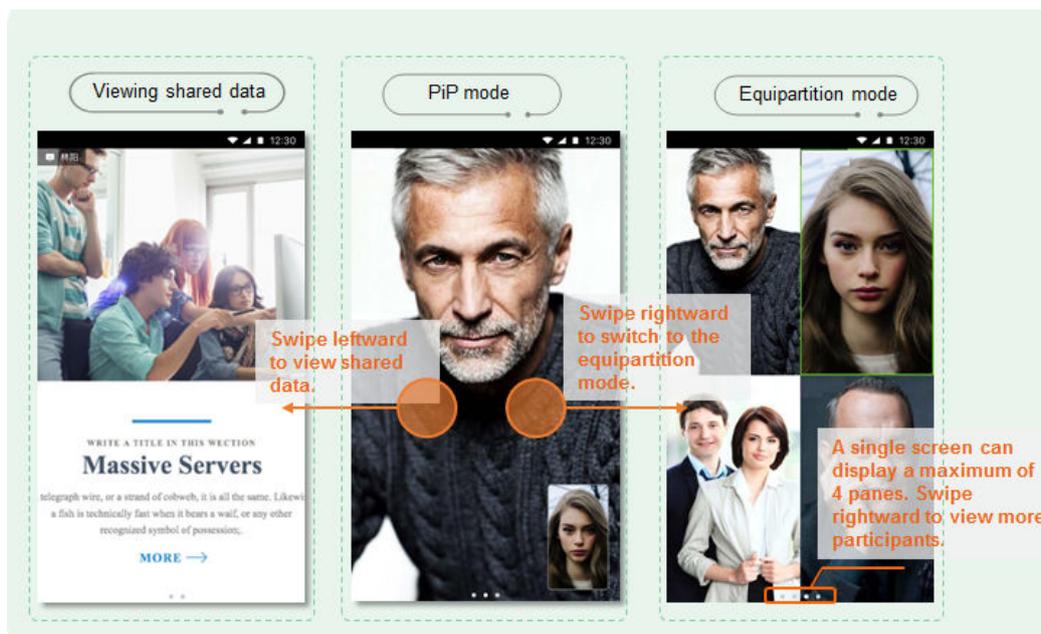
The HME uses hard coding on iOS and Huawei mobile phones and can support at most four video streams and one presentation stream in uplink and at most three video streams and one presentation stream in downlink.

Figure 3-10 Stream transmission of the mobile terminal



For example, five SVC participants join a conference and a participant is sharing the presentation. Each participant's terminal can send multiple streams to the CloudMCU for forwarding. Based on the local continuous presence mode, the local soft client can receive streams of different resolutions from other participants. **Figure 3-11** shows the local video modes and corresponding resolutions.

Figure 3-11 Continuous presence example on the mobile terminal



CloudLink SoftClient (PC)

On the desktop terminal, the following video modes are available: one-large-multiple-small, PiP, and equipartition.

- In one-large-multiple-small mode, users can lock video status or let the system automatically select the video of the speaking participant to be displayed. In this mode, the desktop terminal can display a maximum of eight panes (a large pane displaying the video of a remote participant, six small panes displays the videos of other remote participants, and a small pane displaying the local video). That is, CloudMCU sends a maximum of seven downlink video stream to the desktop terminal in this mode.
- In PiP mode, the desktop terminal can display two panes (a large pane displaying the video of a remote participant and a small pane displaying the local video).
- In equipartition mode, the desktop terminal can display a maximum of 25 panes (displaying the local video and videos of 24 other participants). That is, the CloudMCU sends a maximum of 24 downlink video streams to the desktop terminal in this mode.
- The desktop terminal can send a maximum of four uplink video streams to the CloudMCU. The resolution ranges from 90p to 720p. The resolution of video streams sent by the CloudMCU to each terminal depends on the actual bandwidth, and the maximum resolution is 720p.

Figure 3-12 Stream transmission of the desktop terminal

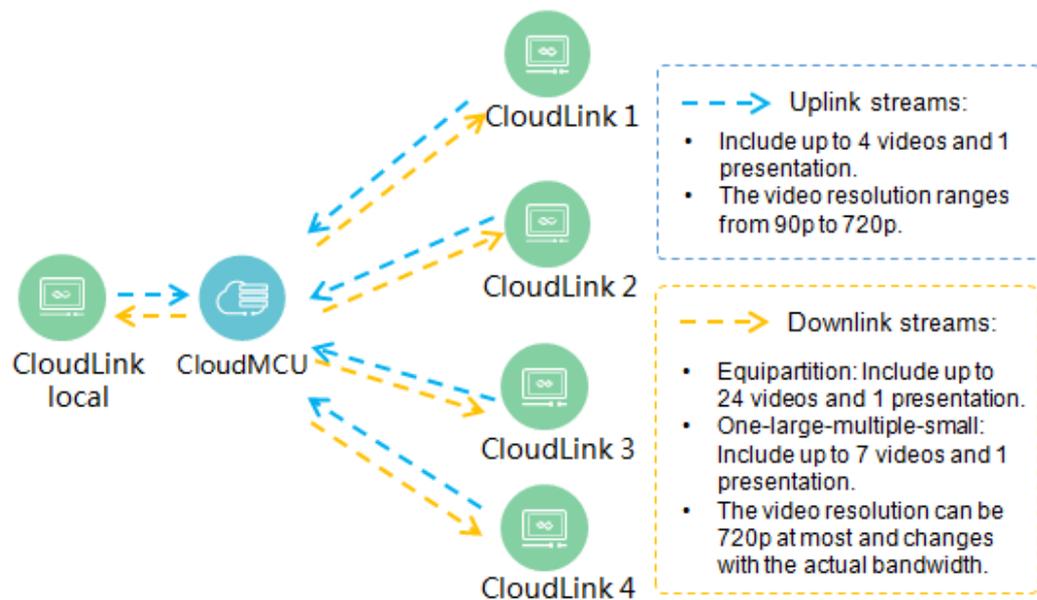
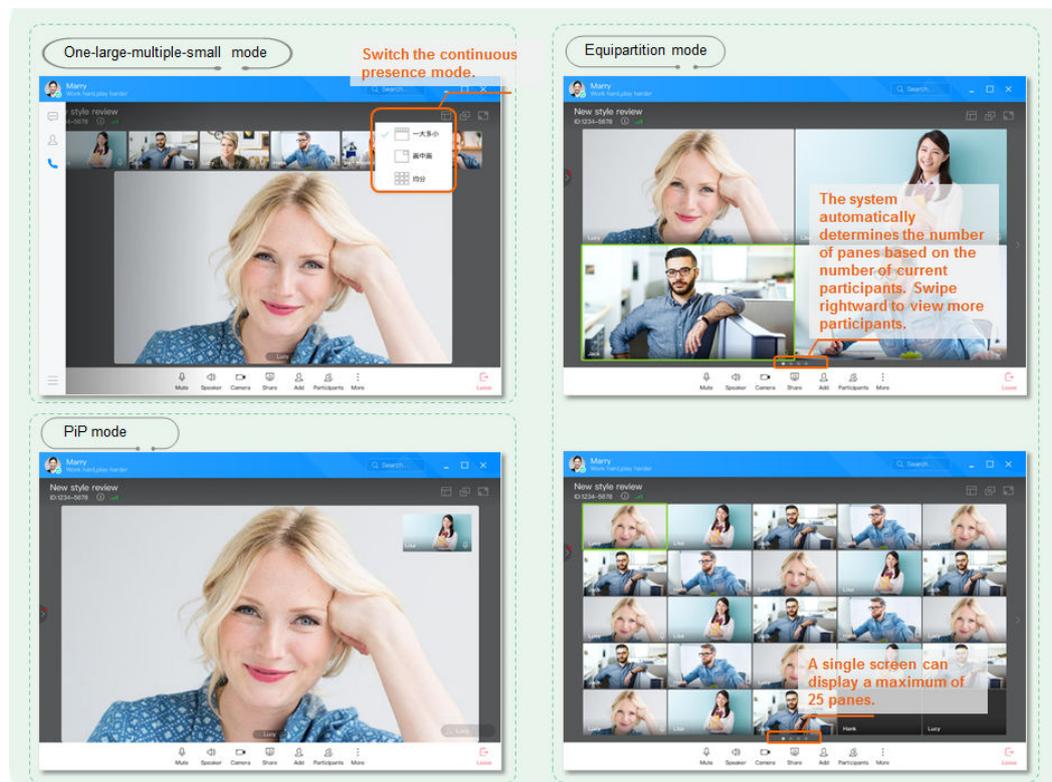


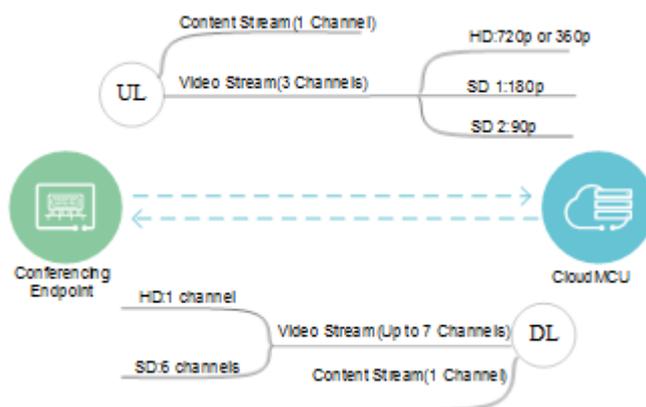
Figure 3-13 Continuous presence example on the desktop terminal



Web Conference Client

Video streams from endpoints to the CloudMCU support three channels of SD and HD videos, and from the CloudMCU to endpoints support seven channels (1 big + 6 small) or four channels (1 big + 3 small). Content streams (presentation) support only one channel of video in both uplink and downlink scenarios. The one-large-multiple-small continuous presence mode is available on the web conference client.

Figure 3-14 SVC endpoints supporting video and content streams in uplink and downlink scenarios



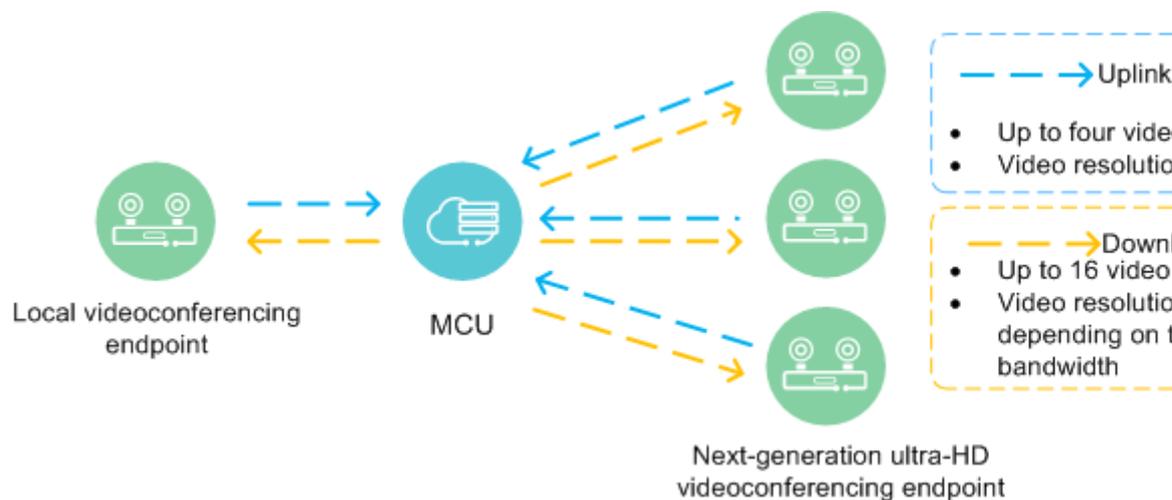
Fixed HD and SD modes are supported from the CloudMCU to SVC conferencing endpoints: 720p HD + 180p SD, or 360p HD + 90p SD. The detailed mode will be determined during signaling negotiation for joining conferences.

HUAWEI Bar 500, Board, and Box Series Next-Generation Ultra-HD Videoconferencing Endpoints

On the HUAWEI Bar 500, Board, and Box series, the following two video modes are available: one-large-multiple-small and equipartition.

- In one-large-multiple-small mode, users can lock video status or let the system automatically select the video of the speaking participant to be displayed. In this mode, the endpoint can display a maximum of seven panes (a large pane displaying the video of a remote participant, five small panes displaying the videos of other remote participants, and one small pane displaying the local video, or all six small panes displaying the videos of remote participants if the local video is disabled). That is, the MCU can send a maximum of seven video streams to the endpoint in this mode.
- In equipartition mode, the endpoint can display a maximum of 16 panes (displaying the local video and videos of 15 other participants by default or all displaying the videos of other participants based on settings). The pane of the speaking participant is highlighted. In this mode, the MCU sends a maximum of 16 downlink video streams to the endpoint. In dual-screen mode, when presentation is available, one screen displays the video and the other displays the presentation. The MCU can forward a maximum of 16 video streams, regardless of the single-screen or dual-screen mode.
- The endpoint can send a maximum of four uplink video streams to the MCU. The resolution ranges from 90p to 720p. The resolution of video streams sent by the MCU to each endpoint depends on the actual bandwidth, and the maximum resolution is 720p.

Figure 3-15 Stream transmission of the HUAWEI BAR500, Board, and Box series



3.5 Data Conference Support

Data conferencing is a type of conferencing service provided by the videoconferencing system. In a data conference, participants can share data with each other through functions such as screen sharing, file transfer, document sharing, media sharing, instant messaging, and voting. These functions enable users to enjoy diversified conference experience. The data conferencing service meets users' conference requirements in different scenarios.

As a key component for data conferencing, the CloudMCU implements data conference service logic and data conference control, and provides media resources for data conferences.

By clicking a link in a conference notification email, a user can start the web conference client to join a data conference on the CloudMCU. The conference can be controlled on the web conference client.

3.6 VMR Conference

The CloudMCU supports personal virtual meeting room (VMR) conferences. Subscribers can use a fixed conference ID and conference attendance URL to join a personal VMR conference any time anywhere without conference scheduling, which improves user experience.

Subscribers can use the User Portal to query, manage, and join their own VMRs.

- Subscribers can enter the conference administrator account and password to log in to the User Portal, and then open the VMR page.
- Subscribers can set the VMR chairperson password on the VMR page.
- Subscribers can send conference invitations on the VMR page using either of the following methods: Select contacts or enter email addresses to send conference invitation emails to subscribers and yourself through the MediaX. Copy the VMR URL and other invitation information on the VMR page to send invitation information using IM or email.
- Subscribers can click the conference attendance button on the VMR page to join a conference in one-click mode.
- Initiate or join a private VMR conference by one click on TE Desktop, TE10, and TE20.
- PC and mobile clients (including TE client and UC client), web client, and TE terminals can be used to join a VMR conference.
- The VMR conference can be locked or unlocked.

3.7 Three-Screen Telepresence Terminal Conference

The CloudMCU supports three-screen telepresence terminal conferences. A three-screen telepresence terminal contains the center screen, left screen, and right screen. It is used in a specially designed telepresence room that accommodates 6 participants for a remote video conference and 10 participants for an onsite roundtable conference.

The three-screen telepresence terminal is a new-generation flagship product in Huawei's telepresence lineup. Augmented by HD, smooth panoramic video and surround sound localization technology, the TP3106-70 significantly improves the end-to-end videoconferencing experience.

Function Description

- Using the touch panel, you can easily hold point-to-point remote conferences, multipoint remote conferences, and dual-stream (video + presentation) conferences and join authentication conferences. Besides, the TP3106-70 provides a wide array of conference control and management functions.
- Provides the 10" touch panel with an easy-to-use GUI, on which you can control conferences through tap and drag operations.
- Allows users to perform operations, such as placing a call, joining a conference, controlling the microphone, with simply a button tap on the touch panel.

- Offers multiple video display control modes and various conference control functions.
Video display control modes include:
 - Continuous presence
 - Different video feeds for different HD displaysConference control functions include:
 - Requesting chair control rights
 - Giving the floor
 - Broadcasting, adding, or deleting sites
 - Voice activation by site or speaker
 - Extending a conference
- Provides a web-based UI for centrally managing, monitoring, and diagnosing the devices within the telepresence room.

3.8 Unidirectional Live Broadcast Conference

A unidirectional live broadcast conference is a special video conference. Users can join the conference as viewers. Viewers can receive audio, video, and presentation but cannot send local audio, video, or presentation. When a viewer is allowed to speak, the viewer becomes a normal participant and can send local audio, video, and presentation.

- Users cannot join voice, dedicated, multistreaming, public, group, or VMR conferences as viewers.
- The SP or enterprise where users are located must subscribe to the CloudMCU; otherwise, unidirectional live broadcast conferences are not supported.
- Only the TE10/TE20 and CloudLink soft clients support unidirectional live broadcast conferences.

3.9 Open and Convergent

Different Protocols for the Same Conference

- The CloudMCU allows endpoints that use H.323 or SIP to join conferences and use conferencing services such as presentation, encryption, dual tone multiple frequency (DTMF), and packet loss concealment (PLC).
- The CloudMCU supports H.323 and SIP endpoints from mainstream vendors.

Audio and Video Protocol Support

- The H.264 BP and H.264 HP are supported for the encoding and decoding of video. The video supports up to 1080p60. Other supported resolutions are 90p, 180p, CIF, 4CIF, 720p, and 1080p. When the resolution is 720p and 1080p, the frame rate can be 30 fps or 60 fps. The other resolutions support only the frame rate of 30 fps. The presentation supports resolutions of 1080p, 720p, 1280*800, 1440*900, 1366*768, 1280*1024, 1024*768, and 800*600. When the resolution is 1080p and 720p, the frame rate can be 30 fps or 60 fps. The other resolutions support only the frame rate of 30 fps.
- The following audio codec protocols are supported: AAC-LD, G722.1, G722.1C, G711a/u, G722, G729A, G729AB, iLBC, Opus.

3.10 Ease of Use

The CloudMCU provides a user-friendly graphical user interface (GUI) with simplified service functions, enabling users to conveniently and efficiently to initiate conferences.

Built-in Web

- The CloudMCU provides a built-in web management system. You are able to connect to the CloudMCU on any computer with a browser installed.
- The CloudMCU web interface provides configuration functions, enabling you to complete configuration as on a network management system.

SMC2.0-based Conference Control

The CloudMCU can be managed by the SMC2.0. In this way, the CloudMCU can be used in the enterprise on-premises solution to provide multipoint conferencing functions.

MediaX-based Conference Control

- The MediaX can create conferences on the CloudMCU.
- On the MediaX network, the iDo interface can be used together with the MediaX to perform conference control.

Dynamic Service Switching

Endpoints in a conference are allowed to enable and disable conference capabilities. For example, a video endpoint can join a conference with only the audio capability and enables the video or presentation function in the conference. It can also disable the video the presentation function in the conference.

Endpoint Audio and Video Capability Adaptation

- The CloudMCU supports universal transcoding of audio streams. It provides an independent channel for each participant to transmit audio streams. Therefore, the sound from each participant connecting to the CloudMCU can be mixed into the conference.
- The CloudMCU supports universal transcoding of video streams. It provides an independent channel for each participant to transmit video streams. Therefore, each participant connecting to the CloudMCU can have customized local continuous presence layouts.

Support for Conferences Integrating Audio, Video, and Data Capabilities

The CloudMCU supports audio, video, and data conference capabilities, enabling users to use these capabilities in the same conference.

SNMP V3 Support

The standard SNMPV3 protocol is supported. Maintenance personnel can use the network management system (NMS) to view the statuses of managed CloudMCUs through SNMP V3.

Easy-to-Use Services

- **Conference Scheduling and Control by Administrators**
Administrators are allowed to create, start, and control conferences to ensure normal holding of conferences.
- **Conference Scheduling and Control by Endpoints**
An endpoint participant is allowed to apply for chair control rights. After being granted the chair control rights, an endpoint participant can control a conference on the endpoint web interfaces.
- **Automatic Continuous Presence**
The system automatically adjusts the continuous presence layout for a participant when the number of videos displayed for the participant changes (for example, a participant joins or leaves a conference). In this way, the participant can always have the optimal continuous presence display effect.
- **Automatic Voice Activation**
When multiple participants in a conference speak, the video of the speaker with the largest volume is automatically broadcast to other participants.
- **Message and Icon Display on Video Screens**
 - When an endpoint joins or leaves a conference or is given floor, the corresponding message and icon are displayed on the video screen.
 - The participant name, participant status, and conference status can be displayed on the single screen of a participant or on a continuous presence layout.
- **Multiple Language IVRs**
 - The video IVRs displayed on an endpoint's web interface are in multiple languages when the endpoint is used to call the unified access number or conference access number to join a conference.
 - The audio IVRs during a conference or when a user dials a number to join a conference are in multiple languages.
- **T.140 Text Support**
The CloudMCU supports sending of T.140 messages to conferences and participants on the SMC2.0 web interface.
- **Far-End Camera Control (FECC)**
The CloudMCU can be used to adjust the focuses and directions of cameras.

3.11 High Network Adaptability and Reliability

The CloudMCU is designed with high network adaptability and reliability. It has strong network adaptability and can stably run without interruption in a long time.

Outstanding Network Adaptability

- **PLC**
Video algorithm super error concealment 3.0 (SEC3.0) and audio algorithms PLC and forward error correction (FEC) are supported. In the "Opus+NetATE" scenario, a maximum of 50% PLC is supported. When the network has packet losses, audio-visual quality is ensured through these algorithms.
- **Anti-jitter**

The audio jitter buffer (AJB) protocol is supported for both audio and video to increase the anti-jitter capability and support a maximum of 1500ms network jitter compensation.

- Intelligent rate control

If the network encounters continuous packet losses, the CloudMCU starts automatic deceleration. When the packet loss rate becomes normal, the system may try intelligent broadband acceleration (IBA) to deliver the optimal audio and video experience.

- Audio 3A

When G.711A, G.711U, G.729, or iLBC is used as the audio protocol, the CloudMCU supports audio 3A (ANS/AGC/AEQ) to perform audio post-processing, improving voice quality. ANS refers to automatic noise suppression, AGC refers to automatic gain control, and AEQ refers to automatic equalizer.

High Reliability

Disaster recovery for the CloudMCU is implemented through resource pools. The CloudMCU supports local and remote disaster recovery. When a VM is abnormal, conferences are automatically transferred to another CloudMCU with lightest load.

3.12 Unparalleled Security

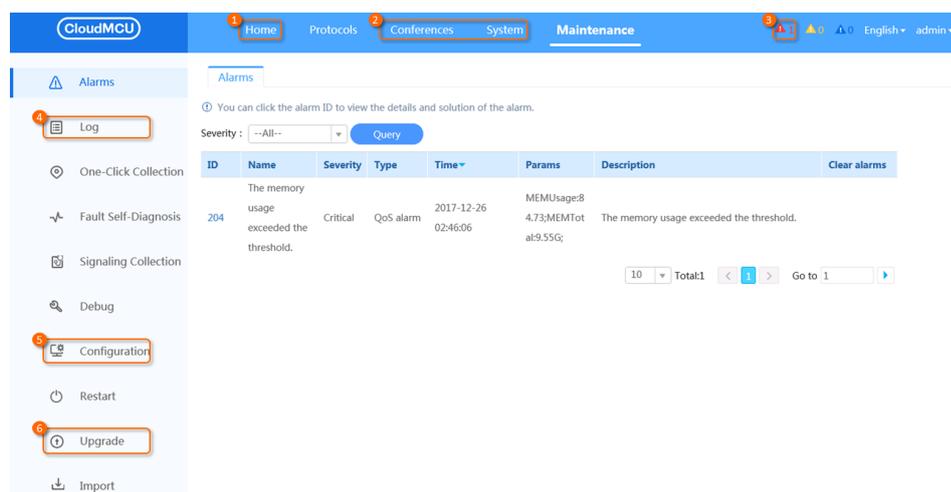
The CloudMCU has comprehensive security mechanisms to ensure information security in conferences.

- The CloudMCU supports H.235-based negotiation and encryption with H.323 endpoints.
- The CloudMCU can communicate with SIP endpoints through SIP over TLS and transmit streams with endpoints through Secure Real-time Transport Protocol (SRTP).
- The processes of different service subsystems are isolated. In this way, effects are minimized when one subsystem is attacked.
 - The memories of processes are isolated from each other. When the memory of one process overflows, the other processes are not affected.
 - After process isolation, different users implement different services. Even when a user obtains permission to operate the operating system, services will not be affected.
 - After process isolation, multiple cores can share the consumption of CPU by attacks.
- By default, the CloudMCU is deployed with its signaling, media, and management planes isolated.
 - Signaling plane (control plane): MRFC, H.323 (RSA, Q.931, H.245, H.460), SIP, T.120, HTTP (Web client), SMC2.0
 - Management plane: SNMP, OMU (MML), web, FTPS
 - Media plane (user plane): BFCP, RTP media code stream and RTP control

4 Operation and Maintenance

CloudMCU has a built-in web interface that allows users to log in to and manage the CloudMCU anytime. **Figure 4-1** shows the CloudMCU web interface.

Figure 4-1 CloudMCU Web



- Support resource statistics
- Support web system specification and conference specification configuration
- Support abnormal alarm
- Support log record
- Support import and export configuration
- Support remote upgrade

5 Technical Specifications

Table 5-1 Technical Specifications

Category	Specifications
Multimedia frame protocols	ITU-T H.323, IETF SIP
Video encoding and decoding protocols	ITU-T H.264, H.264 HP, H.264 SVC, H.263, H.263+
Audio encoding and decoding protocols	AAC-LD, G722.1*, G722.1C*, G711a/u, G722, G729A, G729AB, iLBC, Opus
Dual-stream protocol	ITU-T H.239, BFCP
Data meeting protocol	T.120
Network transmission protocols	IPv6/IPv4, TCP/IP, RTP, RTCP, HTTP/HTTPS, SNMP, DNS/DDNS
Other standards and protocols	H.225, H.235, H.245, H.281, FECC, RFC2833, DTMF, SRTP, TLS, T.140, NTP
Video resolution	Up to 1080p60
Presentation resolution	SVGA (800*600), XGA (1024*768), SXGA (1280*1024), WXGA (1280*800), WXGA+ (1440*900), 1366*768, 720p30, 720p60, 1080p30, 1080p60

Category	Specifications
Functions and Features	<ul style="list-style-type: none"> ● Support for universal transcoding conference, SVC-based conference, or both involved conference ● Video conference, data conference and mixed conference ● Cascading of a maximum of four-level conferences ● Huawei patented Sitecall, Ad hoc, multiple calling modes including URI, IP address, audio and video IVR; unified access number supported ● Unified access number ● Switchover from point-to-point to multi-point meeting ● Automatic Ontable* and Layout*continuous presence, up to 16 panes and 16 modes of continuous presence ● Administrator control, chair assignment, chair control ● Caption overlay, meeting status icon overlay ● Support content stream transcoding ● Video On/Off ● Camera control ● Collaboration features: electronic whiteboard, shared screens, document transmission ● Ability to manage MCU resources ● Support meeting reservation and email notification via Outlook ● Support remote DR: in the on-premises scenario, switchover of the active and standby SMCs and switchover of the active and standby SIP servers
Networking mode	<ul style="list-style-type: none"> ● Support on-premise SMC2.0 networking ● Support Media X Hosting networking ● Support hybrid networking with Huawei Hardware MCU VP96X0 Series

Category	Specifications
Network Adaptability	<ul style="list-style-type: none"> ● Bandwidth of a single channel: 64 kbit/s to 8 Mbit/s ● IPv6/IPv4 Support ● QoS policies such as DiffServ (DSCP), IP Precedence, and ARQ ● SECTTM3.0 super error correction technology ensures smooth video during 20% packet loss ● A maximum of 50% PLC supported by Opus and NetATE ● 1500ms network jitter compensation supported by the AJB protocol for audio and video ● IRCTM intelligent technology manages the bandwidth distribution of video stream for qualified video conferencing ● Supports audio 3A (ANS/AGC/AEQ) to perform audio post-processing, improving voice quality.
Security	H.235 encryption (signaling and media) over H323 networking and TLS/SRTP encryption over SIP networking
Interoperability	<ul style="list-style-type: none"> ● Interoperability with WebRTC ● Standard public and private network traversal enabled by matching with SBC and SC
Management and Maintenance	<ul style="list-style-type: none"> ● Web system specification and conference specification configuration ● Configuration import and export ● Resource statistics ● Abnormal alarms ● Remote upgrades ● Logging records
Language	<ul style="list-style-type: none"> ● Chinese ● English
Operating Environment	<ul style="list-style-type: none"> ● Virtual platform: VMware, CGP, Huawei Fusion Sphere ● Operating system: Suse11 SP3 Linux(Virtual platform-based)