

Product Overview

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1 Product Positioning and Highlights

1.1 Positioning

HUAWEI Cloud Recording & Streaming Engine (CloudRSE) is Huawei's next-generation platform. Supporting 1080p60 HD live streaming and video on demand (VOD), as well as mobile viewing, making it one of the most easy-to-use, reliable, full HD products available in the market.

1.2 Highlights

Mobile or Web Playback via HTML5

- VOD and live programs are available on laptops or smartphones simply using a browser, without the need to install a plug-in
- Both HD and SD are available

1080p Dual-Stream for Recording and Streaming

Powerful encoding and decoding capabilities, providing 1080p60 recording for single- and dual-stream video conferences (video image and conference data sharing)

State of Art Reliability

- 1+1 hot standby power modules, ensuring recording continuity and reliability
- Hard disks in RAID 1, ensuring reliable storage of recorded files
- Resource pool management, backup between CloudRSEs in a resource pool, and backup between CloudRSE resource pools, delivering a reliable recording&streaming experience

IT Application Innovation

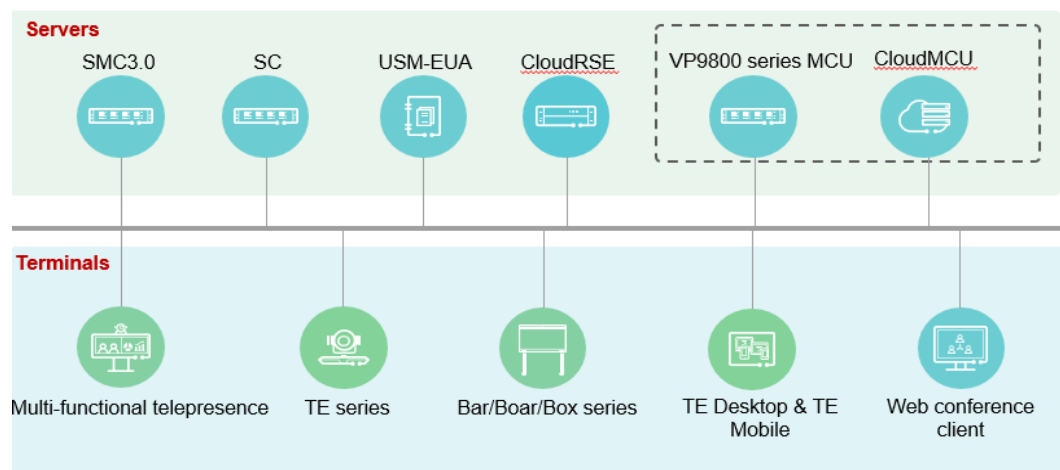
- Innovation of E2E core hardware and software technologies with Huawei's in-house Kunpeng processor, EulerOS, and GaussDB

- Proprietary technologies with independently held intellectual property, including multi-channel conference stream processing and video recording optimization
- Conference security with HTTPS session encryption and TLS/SRTP signaling and media encryption

2 Networking

The CloudRSE is applicable to the SMC-based video conferencing solution. [Figure 2-1](#) shows the networking.

Figure 2-1 Video conferencing solution (SMC networking)



In this networking scheme:

- The CloudRSE exchanges media streams with the MCU to simultaneously record video, audio, and conference content.
- Real-time recording of multipoint conferences is supported.
- Users can view live and VOD conference videos using computers, and smartphones.

3 Structure

The CloudRSE consists of an integrated chassis.

Overall Structure

The CloudRSE supports 1+1 backup of AC power modules. [Figure 3-1](#) shows the appearance.

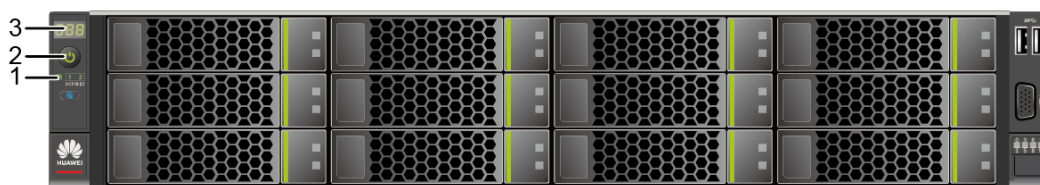
Figure 3-1 Appearance



Front Panel

[Figure 3-2](#) shows the front panel of the CloudRSE.

Figure 3-2 Front panel



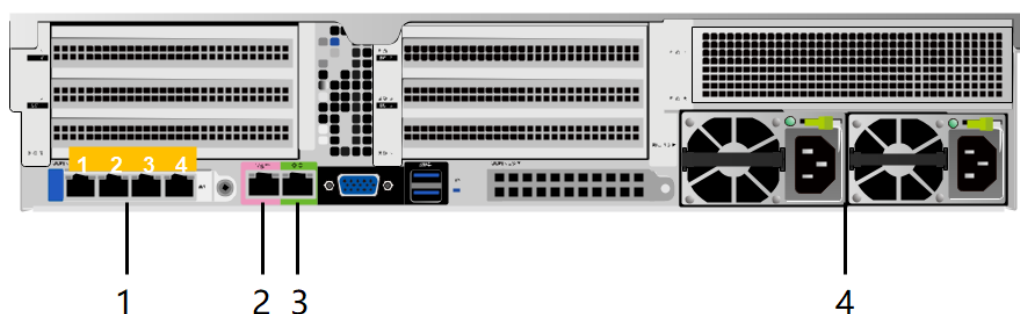
[Table 3-1](#) describes the indicators on the front panel.

Table 3-1 Indicators

Indicator	Description
1: health indicator	<ul style="list-style-type: none">Steady green: normal operationBlinking red at 1 Hz: major alarm generatedBlinking red at 5 Hz: critical alarm generated
2: power button/ indicator	<p>Power indicator:</p> <ul style="list-style-type: none">Steady yellow: standby stateSteady green: device powered onBlinking yellow: booting of iBMCOff: device powered off <p>Power button:</p> <ul style="list-style-type: none">Press this button to shut down the operating system when the device is powered onPress and hold down this button for 6s to forcibly power the device offPress this button to power the device on when it is ready to power on
3: fault diagnosis LED	<ul style="list-style-type: none">---: normal operationError code: component fault

Rear Panel

Figure 3-3 and **Table 3-2** show the rear panel of the CloudRSE.

Figure 3-3 Rear panel**Table 3-2** Rear panel description

Item	Description
1: network adapter	4 x GE electrical port network adapters, providing external 1000 Mbit/s Ethernet ports. Ports 1 and 2 work in active/standby mode, while ports 3 and 4 are reserved for later use.

Item	Description
2: management port	The 1000 Mbit/s Ethernet port is used to manage the device.
3: serial port	Default system serial port for debugging and locating.
4: PSU	1+1 backup of power supplies is supported.

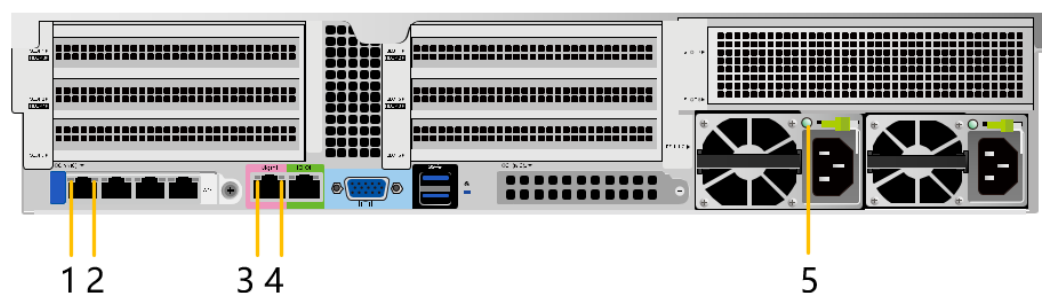
Figure 3-4 Indicators on the rear panel

Table 3-3 describes the indicators on the rear panel.

Table 3-3 Rear panel indicators

Indicator	Description
1: data transmission status indicator for the GE electrical port	<ul style="list-style-type: none">Blinking yellow: data being transmittedOff: no data being transmitted
2: connection status indicator for the GE electrical port	<ul style="list-style-type: none">Steady green: normal network connectionOff: disconnected network
3: data transmission status indicator for the management port	<ul style="list-style-type: none">Blinking yellow: data being transmittedOff: no data being transmitted
4: connection status indicator for the management port	<ul style="list-style-type: none">Steady green: normal network connectionOff: disconnected network

Indicator	Description
5: PSU indicator	<ul style="list-style-type: none">• Steady green: normal power input and output• Steady orange: normal input, but no power output due to overheat protection, overcurrent protection, short circuit protection, output overvoltage protection, or failure of some components• Blinking green at 1 Hz:<ul style="list-style-type: none">– normal input and the device in standby state– input overvoltage or undervoltage• Blinking green at 4 Hz: online PSU firmware upgrade• Off: no AC power input

4 Features and Functions

4.1 Multipoint Recording

The CloudRSE supports single- and multi-stream recording in a multipoint video conference. Specifically, after a SIP call is set up between the CloudRSE and MCU, the MCU sends Real-Time Transport Protocol (RTP) streams to the CloudRSE, and then the CloudRSE converts the RTP streams into live and VOD videos. After the MCU invites the CloudRSE to join a multipoint conference, the CloudRSE records the conference based on MCU's video switching policies, or records a specified participant or continuous presence.

Recording and Streaming Control

Users can schedule or hold a recording conference on the SMC.

During conference recording, the conference administrator can control recording operations on the SMC, including pausing, resuming, or stopping recording. The conference recording status can also be viewed in real time on the CloudRSE web interface.

The CloudRSE automatically records content by segment when the recorded file reaches a specified size.

Audio and Video Formats

The CloudRSE supports the following audio and video formats:

- Video formats:
4CIF, 720p 30 fps, 1080p 30 fps, and 1080p 60 fps
- Audio formats:
G.711A, G.711u, G.722.1C, G729A/AB, Opus, AAC-LC, and AAC-LD

Audio IVR Prompt

During a conference, the MCU prompts IVR messages for starting or pausing recording. Users can also customize IVR prompts so that they can learn about the

recording status in real time. During the recording, the latest recording status icon is displayed on the video conferencing endpoint interface.

4.2 Live Streaming and VOD via Web

The CloudRSE supports VOD and live programs via web. The MP4 video files generated during conference recording can be played using HTTPS, and the ongoing live streamed conferences can be viewed using HTTP Live Streaming (HLS).

Multiple Display Layouts

The CloudRSE enables videos and conference content to be displayed in layouts such as full-screen and Picture in Picture (PiP), meeting diversified video experience requirements.

- One-click layout switching: When playing a dual-stream video, you can switch the layouts of the video and presentation.
- Dual-bitrate live streaming and VOD: Both the HD and SD video formats are supported. On the playback page, you can choose to view an HD or SD video.
- Playback control: During the playback of a VOD program, you can perform operations such as pause and drag.

Figure 1 Video layout switching



Multiple Platforms, Free of Plug-ins

Users can view live and VOD programs on the CloudRSE on multiple platforms without using plug-ins.

- Users can view live and VOD video conferences on PCs and mobile phones using Windows and Android 7+.
- Users can visit the CloudRSE web interface using mainstream browsers to view conference videos smoothly without installing additional plug-ins.
 - Browsers supported on PCs: Internet Explorer 11, Firefox, Edge, and Chrome
 - Browsers supported on mobiles: Huawei, Xiaomi, and UC browsers

4.3 Video Management

The CloudRSE offers the following functions: video clipping, release, and download, as well as network storage.

Video Clipping

The CloudRSE provides multiple entries for clipping videos. Users can add information such as the video cover image, video name, or presenter in the video so that they can quickly search for videos. Additionally, you are able to set whether the videos are publicly visible.

Video Release

Live and VOD videos stored in the CloudRSE are classified into two types: to-be-released and released. Recorded and live videos are to be released by default, but can be also configured to be automatically released.

- To-be-released: indicates that a video feed has been stored in the CloudRSE but has not been released yet. In this case, visitors and common users cannot view the video after login. Administrators with the release permission can release this video.
- Released: indicates that a video feed has been released by the administrator. In this case, visitors and common users can view the video feed after login if they have the right. The administrator can also edit the basic video information and release the video again, or bring the video offline. After the video is brought offline, it is automatically saved as a to-be-released video.

Video Download

Users can download MP4 videos they like online. If a presentation is attached to the video, you can download the presentation, too.

4.4 Permission Management

The CloudRSE enables you to flexibly manage users by using user groups and roles.

Role

The CloudRSE provides the following roles: system administrator, media administrator, common user, and visitor. Each role has different operation rights.

Table 4-1 Roles and operation permissions

Role	Operation Permission
System administrator	Has all the permissions, including: <ul style="list-style-type: none">• Configuring the system• Viewing system information• Performing maintenance and management• Managing users• Managing videos: releasing, editing, deleting, or controlling videos• Managing recording tasks• Viewing and downloading videos
Media administrator	<ul style="list-style-type: none">• Managing videos: releasing, editing, deleting, or controlling videos• Managing recording tasks• Viewing and downloading videos
Common user	Viewing and downloading videos
Visitor	Only viewing videos that are publically visible

User Group

The CloudRSE supports user group management. Each user belongs to a user group. By default, the system has three user groups: system administrator, media administrator, and common user groups. Users in these groups are centrally managed by the system administrator. The system administrator can view details about users in each group.

4.5 Resource Management

The CloudRSE uses floating licenses that are centrally managed by Huawei SMC. Recording resources provided by the license can be shared among devices and allocated based on customer requirements.

4.6 Reliability

The CloudRSE has passed tests for network adaptability and operational reliability, ensuring smooth recording and running continuity.

- Network adaptability
Super Error Concealment 3.0 (SEC3.0) for video and Packet Loss Concealment (PLC) for audio, ensuring smooth video recording even at a network packet loss rate of 20%.
- 1+1 hot standby for power modules

The CloudRSE has two power modules that back up each other. If the active power module is faulty, the standby power module automatically starts to work, ensuring upper-layer service continuity.

- Video and audio codec chip backup

If an audio or video encoding or decoding chip is faulty, the system immediately assigns an idle chip to create a codec to ensure audio and video continuity of a live conference.

- Storage reliability

Two disks are configured as a RAID 1 group to ensure security and reliability of video files.

4.7 Security

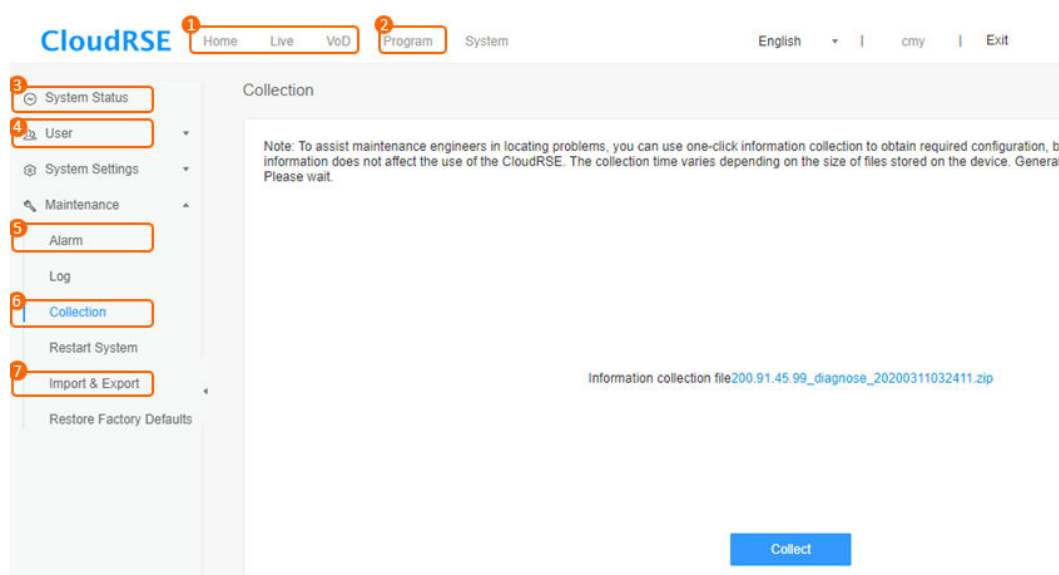
For security purposes, the CloudRSE:

- Requires users to change the password at their first logins and checks password complexity.
- Enables users to change the interval for changing the login password of the web administrator **admin**.
- Provides the whitelist for the web interface, MCU/endpoint, and SSH/Telnet.
- Complies with the Transport Layer Security (TLS) for communication with SIP devices and transmits data streams based on the Secure Real-time Transport Protocol (SRTP).
- Provides the Hypertext Transfer Protocol Secure (HTTPS) to enhance transmission security. Forcibly uses HTTPS for functions with high security requirements. For example, HTTPS is used during password changes to prevent the current and new passwords from being transmitted in plaintext.

5 Operations and Maintenance

The CloudRSE provides an easy-to-use WebUI with a clear and proper layout, as shown in [Figure 5-1](#). You can log in to the CloudRSE at any time.

Figure 5-1 CloudRSE web management platform



On the web management platform, you can:

- View live and VOD videos.
- Manage videos.
- Perform resource statistics on online users, CPU usage, and memory usage.
- Manage users.
- View alarms.
- Collect and export required data including configuration, black box, alarm, and log with one click.
- Configure import and export, and replace a certificate.

6 Technical Specifications

6.1 Physical Specifications

Table 6-1 describes the physical specifications of the CloudRSE.

Table 6-1 Physical specifications

Category	Item	Description
Physical specifications	Dimensions (H x W x D)	86.1 mm (2 U) x 447 mm x 790 mm (3.39 in. x 17.60 in. x 31.10 in.)
	Weight	< 30 kg
Environment adaptability	Operating temperature	<ul style="list-style-type: none">Operating temperature: 5°C to 40°C (41°F to 104°F) (compliant with ASHRAE Class A2/A3)Storage temperature: -40°C to +65°C (-40°F to +149°F)Long-term storage temperature: 21°C to 27°C (69.8°F to 80.6°F)Temperature change: < 20°C (36°F)/h
	Relative humidity (RH, no-condensing)	<ul style="list-style-type: none">Operating humidity: 8% to 90%Storage humidity: 5% to 95%Long-term storage humidity: 30% to 69%Maximum change rate: 20%/h
	Rated operating atmospheric pressure	63–106 kPa
Electricity supply requirements	Rated operating voltage	AC voltage range: 100V AC to 240V AC

Category	Item	Description
	Power consumption	< 900 W
	Electromagnetic environment	The following requirements must be met: Low-frequency magnetic field: 50 Hz to 20,000 Hz 0.025 RMS to 10 RMS Amplitude modulation RF electric field: 0.009 MHz to 18,000 MHz < 3 RMS Pulse modulation RF electric field: 1 GHz to 18 GHz < 3V/m (peak)
Mean time between failures (MTBF)	-	> 200,000 hours
Mean time to repair (MTTR)	-	< 1 hour

6.2 Performance and Capacity

Table 6-2 describes the performance and capacity specifications of the CloudRSE.

Table 6-2 CloudRSE performance and capacity specifications

Item	Specification
Maximum number of simultaneously recorded conferences	<ul style="list-style-type: none">• Dual-stream: 10-channel 1080p30• Single-stream: 20-channel 1080p30
Maximum Number of audio-only recorded files	300 channels
Maximum number of live TV or VOD program viewers	<ul style="list-style-type: none">• 750 4CIF single-stream participants at 512 kbit/s• 500 720p30 single-stream participants at 768 kbit/s• 350 1080p30 single-stream participants at 1 Mbit/s• 170 1080p60 single-stream participants at 2 Mbit/s

Item	Specification
Maximum number of online users (including registered users and guests)	750
Built-in disk capacity	2.4 TB. After RAID 1 is configured, the disk capacity is 1.2 TB.

6.3 Protocols and Standards

Table 6-3 describes the protocols and standards with which the CloudRSE complies.

Table 6-3 Protocols and standards

Type	Description
Communication s framework protocols	IETF SIP, and ITU-T H.323
Video protocols	H.263, H.264 HP and H.264 BP
Audio protocols	G711A/U, G722, G722.1C, G729A/AB, OPUS, AAC-LC, and AAC-LD
Dual-stream protocols	BFCP, and H.239
Protocols	IPv4, TCP/IP, FTP/FTPS, HLS/RTP, RTCP, HTTP/HTTPS, DNS/DDNS
Encryption protocols	TLS, SRTP, and HTTPS
Other standards and protocols	RAID 1, NTP
Video resolutions	1080p60, 1080p30, 720p30, and 4CIF

7 Acronyms

Acronym	Full Name
CPU	Central Processing Unit
CloudRSE	Cloud Recording & Streaming Engine
SC	Switch Center
HTTP	Hypertext Transfer Protocol
HTTPS	Hypertext Transfer Protocol Secure
HLS	HTTP Live Streaming
IVR	Interactive Voice Response
MCU	Multipoint Control Unit
SIP	Session Initiation Protocol
SMC	Service Management Center
SOAP	Simple Object Access Protocol
RTP	Real-Time Transport Protocol
XML	Extensible Markup Language