HUAWEI TE40 Videoconferencing Endpoint V100R001

Product Overview

Contents

1 Product Positioning and Features

1.1 Product Positioning

The HUAWEI TE40 videoconferencing endpoint (TE40 for short) supports 1080p60 video, H.264 SVC, H.264 HP, IPv6, and Wi-Fi, and it is an ideal choice for small-and medium-sized conference rooms or executives' offices to participant in video conferences.

Figure 1-1 and Figure 1-2 show the TE40:

Figure 1-1 TE40 front view

📖 NOTE

Currently the PSTN port can be used in China only.

Figure 1-2 TE40 rear view

1.2 Product Features

1.2.1 Voice Dialing

TE40 supports advanced speech recognition in Chinese and English. Users can place a point-to-point call, or initiate a multi-point conference through conference template. TE40 can recognize the site name, conference name or pre-defined conference name users said, and automatically call a site from the site list , join an ongoing conference or schedule a conference through SiteCall. Its easy-to-use functionalities improves the user experience.

Figure 1-3 Voice Dialing
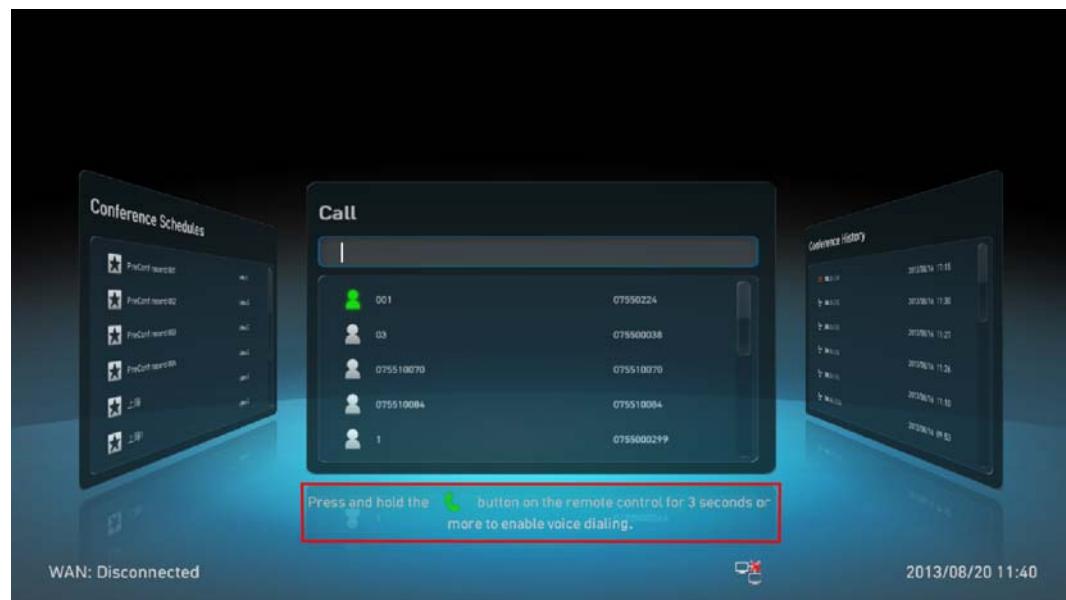
If there is only one site shown in the list after voice dialing is made, then a call is initiated automatically.

If there are two more sites displayed in the list, users can choose one to make a call as shown in Figure 1-4.

Figure 1-4 Voice Dialing List

1.2.2 VGA Bypass

When TE40 is powered off, VGA images can be input from VGA input port, and output from VGA output port through endpoint bypass. That means the image input and output is on the single VGA cable.

There are several scenarios during a conference:

- Connect VGA output port of PC to VGA input port of a projector.
- Connect VGA output port of PC to VGA input port of an endpoint.

In the above scenarios, VGA output port of PC has to switch between projector and endpoint, which is not very convenient. Endpoints support VGA bypass by connecting VGA output port of PC to the VGA input port of endpoint, and using additional VGA cable to connect the VGA output of endpoint to VGA input of projector. This avoids the annoyance of repetitive switch. Even when TE40 is powered off, a projector is used to hold a conference without plugging and unplugging cables, which facilitates operation.

1.2.3 Wireless Access

The TE40 has a built-in Wi-Fi module to support Wi-Fi communication. Users can control the TE40 by using an optional touch panel connected to the TE40 through Wi-Fi. The TE40 also supports visual communication on Wi-Fi networks.

A Wi-Fi client is enabled to support auto scanning and wireless connection, dynamic capturing and static setting of IP address of client. It can be connected to Internet through wireless router when the wired network deployment is not convenient.

As a server client, users can directly connect to VPM220W wireless microphone array through Wi-Fi, avoiding cable connection limitations.

The Wi-Fi networking is shown as Figure 1-5.

Figure 1-5 Wi-Fi networking

1.2.4 Air Content Sharing

When users want to share PC desktop as presentation, they share data through air content sharing client without using VGA cable to connect PC and endpoint. This avoids using traditional video cables, facilitating deployment of conference room and enhancing user experience.

Log on the built-in Web interface in PC, and download air content sharing client as shown in Figure 1-6.

Figure 1-6 Download air content sharing client
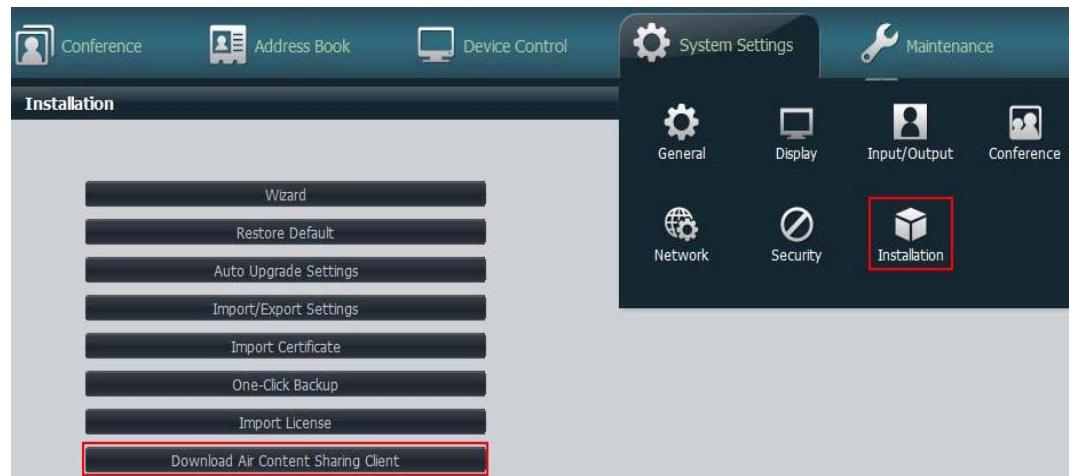
Air content sharing client is enabled to search the endpoints in the current network, as shown in Figure1-7.

Figure 1-7 Auto search and connect endpoint

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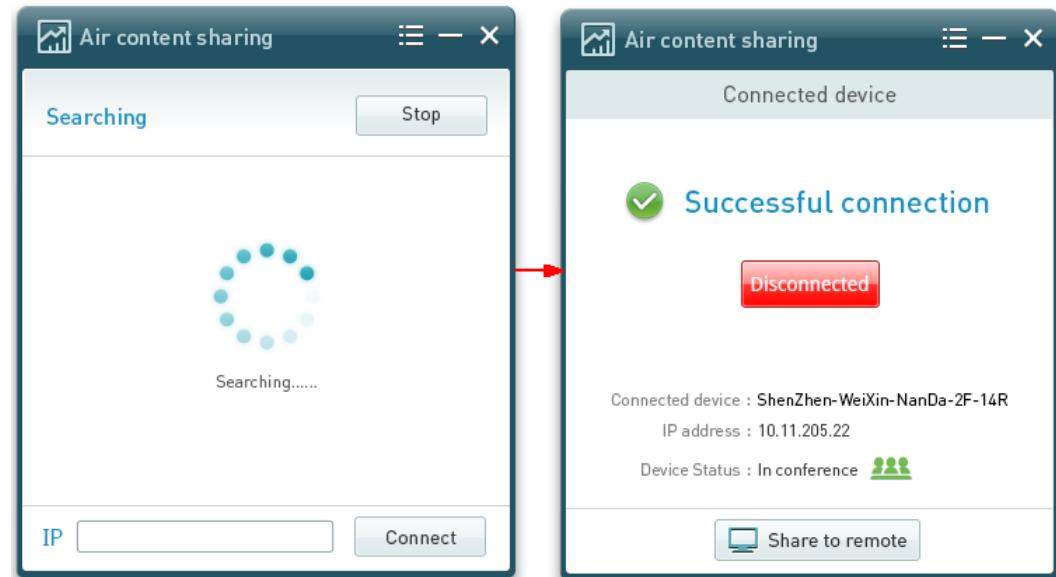
Run the air content sharing client software on PC desktop, and share the PC desktop as presentation to the endpoint over IP network. It can be used for presentation sharing and viewing, shown as figure 1-7.

Two authentication modes to connect to endpoints:

- Input authentication password which is configured on the endpoint side.
- When there is connection request, the remote control operation interface or Web interface automatically pops up prompt box, and click "Yes".

1.2.5 Multi-View

Two channels of local video input are combined into one video channel to form a combined image, which is sent to the remote endpoint. The combined image can be composed of the images captured from camera inputs and computer desktop. It supports dynamic configuration, that is, modes and parameters can be configured during the conference and are effective immediately.

Multi-view can be displayed in PiP (sub-pictures can be displayed in the top left corner, top right corner, bottom left corner and bottom right corner), and two-pane mode. The images from any physical input ports (1 Main-IN or 2 PC-IN) can be chosen as sub-picture source, and the input images can be the same, but the images from the remote site can't be chosen.

1.2.6 Initialization Configuration

USB flash drive with configuration files can be obtained from agents or operators for the first time. When the configuration file is imported to the endpoint from the USB flash drive, setup wizard configuration is completed automatically. Users can easily set the configurations without any professional knowledge, which greatly improves the configuration efficiency.

1.2.7 Superb HD Experience over Low Bandwidth

The TE40 supports a maximum conference rate of 8 Mbit/s and provides industry- leading video quality. The 720p30 video can be maintained even when the bandwidth available is only 384 kbit/s, the 1080p30 video can be delivered when the bandwidth is 512 kbit/s, and the 1080p60 video can be delivered when the bandwidth is 1 Mbit/s.

The TE40 supports multiple video encoding and decoding protocols including H.264 SVC, H.264 HP, H.264 BP, H.263, H.263+, and H.261. The TE40 also supports multiple HD video formats including 720p30, 720p60, 1080i50/60, 1080p30, 1080p60, and SD video formats such as 4CIF and CIF. Compared with 720p images, 1080p images have a more than twice the definition, sharper edges, and more delicate details.

The TE40 uses Huawei's new proprietary Video Motion Enhancement (VME) technology to enhance pre- and post-processing of video, noise reduction, contrast, edges, and illuminance. This enhancement enables the TE40 to provide sharper and clearer video when compared with similar systems in the same lighting and camera conditions. Using latest hardware processing chip, and enhanced H.264 encoding and decoding technology, the TE40's video compression ratio is increased, allowing crisper, smoother and more vivid video to be delivered using the same network bandwidth as competing systems.

1.2.8 Secure and Stable Videoconferencing System

The TE40 uses multiple security encryption measurements, such as the media stream and signaling encryption using H.235, Security Real-time Transport Protocol (SRTP), transport

layer security (TLS), and Hypertext Transfer Protocol Secure (HTTPS), adapts network resources to the maximum, and ensures that the conference system runs securely and stably.

1.2.9 High Network Adaptability

- SEC

  On an IP network, packet loss easily occurs during data transmission. This affects the conference quality. The TE40 uses the proprietary Super Error Concealment (SEC) technology, adjusting the quality of service (QoS) automatically and selecting a proper audio-visual processing policy based on the transmission performance of the bearer IP network. SEC technology improves the audio and video quality in a poor network environment, ensuring that a conference can be held smoothly even when the packet loss rate reaches 20%. In terms of network jitter, delay, and packet error, the TE40 performs better than relevant international standards and other videoconferencing products that do not use SEC technology.

- Auto reduction of transmission rate on IP network

  The TE40 provides the function to reduce the transmission rate on the bearer IP network. In other words, when the packet loss on the network reaches a critical level, the real-time transmission rate of data streams is reduced appropriately using certain technologies and policies, to adapt to actual network conditions. When network conditions improve, the transmission rate is increased automatically and the normal network bandwidth is recovered. Therefore, network resources are used to the maximum to achieve the best audio-visual quality.

- Firewall Traversal

  TE40 supports three modes of firewall traversal which users can choose based on actual situations.

  Static NAT: For endpoints on private networks, static NAT, that is, one-to-one mappings between public and private IP addresses can be implemented for packet transmission between public and private networks.

  Proprietary SNP: Huawei's proprietary Super Network Passport (SNP) technology allows endpoints on public and private networks to register with the GK on the public network. When GK receives a call request from a public endpoint, and determines whether the call request is sent to a private endpoint. If yes, the endpoint on the private network will call that on the public network as per GK's request. This well solves the problem of placing a call from public network to private network.

  H.460: **H.460** is the latest firewall traversal standard that accompanies the H.323 set of ITU standards for multimedia communication. Through traversal server (Huawei realizes H.460 firewall traversal using SMC on the management layer), calling, control signaling traversal, media stream traversal and multiplexing can be complemented on the proxy public network.

1.2.10 Interoperability

- Interworking: The TE40 can interwork with Microsoft OCS/Lync systems and endpoints.
- Interworking: The TE40 can interwork with Cisco TelePresence systems.
- Seamless integration with the IP multimedia subsystem (IMS): The TE40 can access and register with an IMS network using SIP, and join or initiate an HD video conference on the IMS network.

1.2.11 Extensive Functions

The TE40 also supports the following services to enrich the videoconferencing experience:

- One-press conference control: Users can control conferences with the remote control as easily as controlling a TV.
- URI calling.
- Camera control: Users can control the local and remote HD cameras and camera presets. Users can also configure camera presets.
- HD and SD: The TE40 supports both 16:9 and 4:3 aspect ratios. It is compatible with, and can automatically adapt to, different display devices, facilitating its use in diverse real-world situations and maximizing return on investment.
- Text input: Proprietary text input technology on the remote control enables users to define conferences.
- Easy maintenance: The TE40 displays its assigned IP address and number on the front panel, and can be maintained locally (using the network diagnostics function or system logs) or remotely (after being logged in to using Telnet, Secure Shell, or the web interface).
- Rich application programming interfaces (APIs): The TE40 provides rich APIs for a third party to facilitate system integration and customization.

2 Network and Application

2.1 IP Network
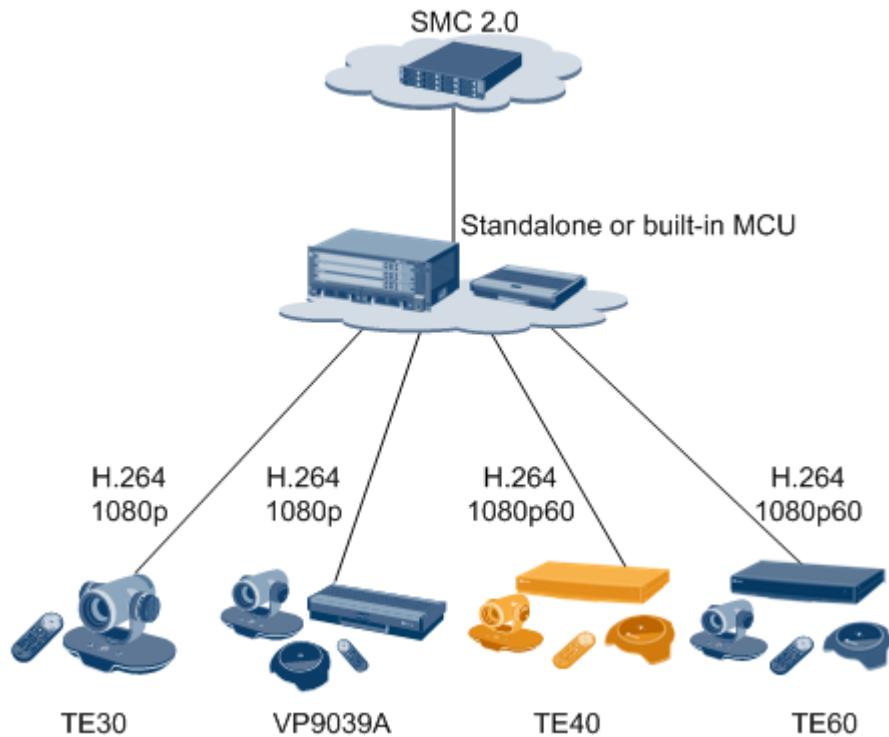
Figure 2-1 IP network

The network description is as follows:

- The TE40 can work with a stand-alone MCU or the built-in MCU of an endpoint to establish an IP-only network and initiate multipoint HD conferences using the standard H.323 or SIP protocols.

- The TE40 can deliver 1080p60 video and AAC-LD high-fidelity stereo audio even when the available bandwidth is only 1 Mbit/s, providing superb HD conference quality.

- The 720p full-frame video is provided with a transmission rate of 512 kbit/s. Even on a low-bandwidth network, the TE40 can provide high-quality video.

- SD and HD video endpoints using different resolutions can join the same conference at different bandwidths. All sites can be displayed in continuous presence.
- The TE40 provides strong network adaptability, ensuring video quality across the network and providing an advanced and reliable network.

2.2 Hybrid Networking of HD and PSTN Endpoints
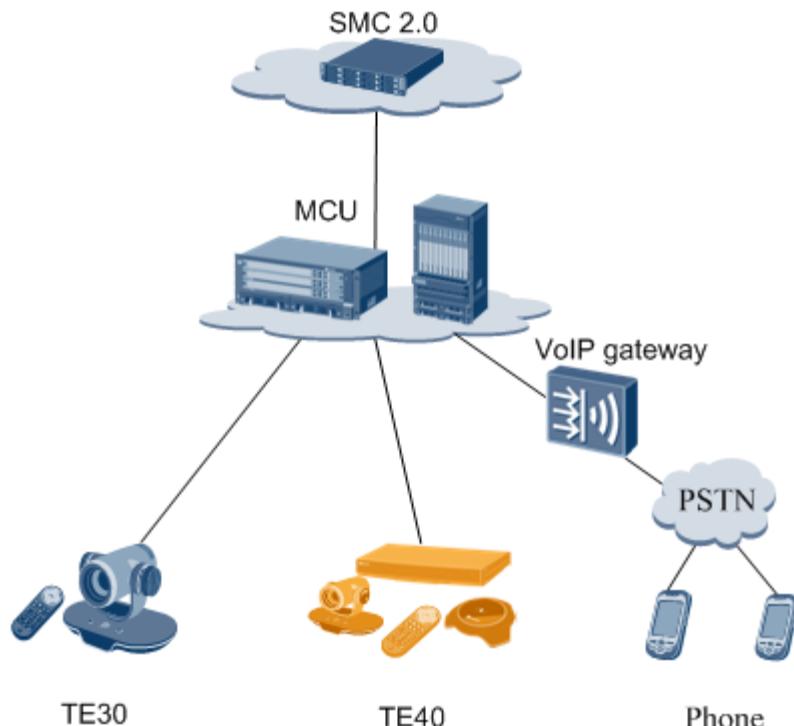
Figure 2-2 Hybrid networking of HD and PSTN endpoints

The network description is as follows:

- The TE40 can work with the public switched telephone network (PSTN) and HD endpoints to establish hybrid networks, enabling all the devices to interwork with each other.
- The TE40 provides AAC-LD high-fidelity stereo audio and super HD conference quality.
- In conjunction with the MCU, the TE40 can interconnect with PSTN phones. Users of normal PSTN phones can hear voice from the TE40 site.

2.3 MSUC Convergence Network
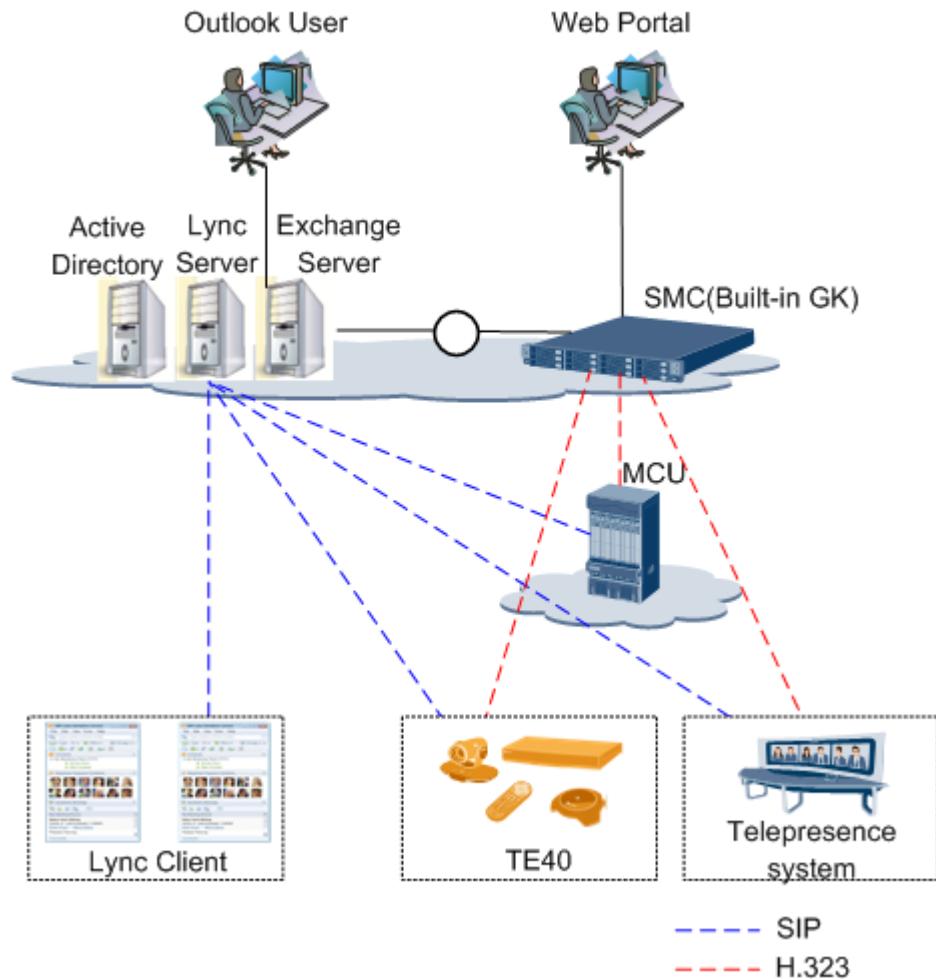
Figure 2-3 MSUC convergence network

The network description is as follows:

- Using SIP, the TE40 registers with the Lync server and implements audio and video interworking with the Lync client. In other words, the TE40 and the Lync client can see and hear each other.
- The TE40 can call the Lync client:
    - The TE40 supports the Lightweight Directory Access Protocol (LDAP) address book. Users can search Lync client users on the network and add the users found to the local address book of the TE40.
    - Users can place a video call to contacts in the local address book.
    - Users can enter the SIP URI or number of the called party and initiate a call.
    - The status (online, busy, or offline) of each other (the calling party and called party) is displayed in the address book.
- The Lync client can call the TE40:

- Users can search for the desired contact from the contact list and place a video call to the contact.
- Users can enter the SIP URI or number of the called party and initiate a call.
- If a call is initiated from the contact list or by entering the SIP URI, the status (online, busy, or offline) of each other (the calling party and called party) is displayed.

2.4 Huawei IMS Convergence Network
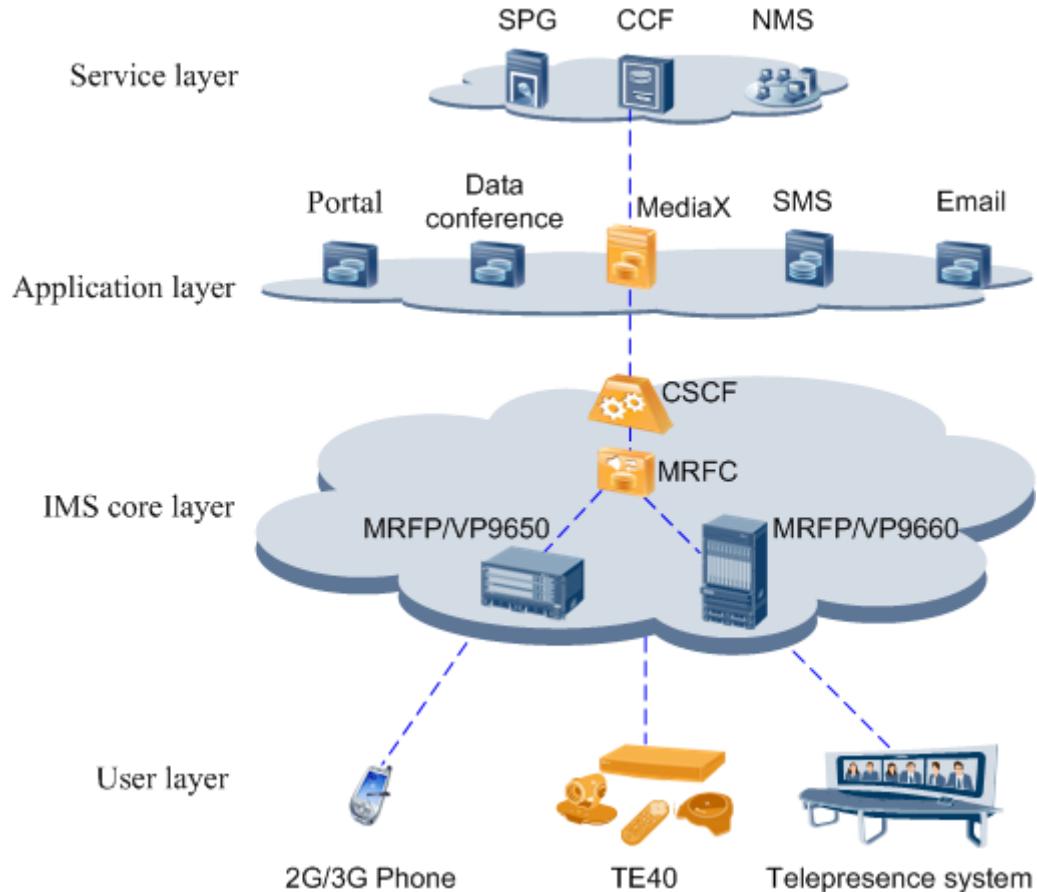
Figure 2-4 IMS convergence network

Born of the standard IP protocol, IMS uses voice over IP (VoIP) applications based on the 3rd Generation Partnership Project (3GPP) standard SIP applications to provide fixed and mobile multimedia services for operators. MCUs are integrated to enhance the functionality of the Huawei IMS videoconferencing solution.

The network description is as follows:

- The TE40 accesses and registers with an IMS network using SIP and joins or initiates an HD video conference on the IMS network.
- The TE40 supports two video inputs and displays the video and presentation at the same time. The TE40 combines still images of presentation materials with moving pictures of people to provide an in-meeting experience.

After joining the IMS convergence conference, the TE40 interworks with different client devices to provide users with more convenient and diversified video and audio communications services.

2.5 Networking with Client Software

The TE40 can work with the client software VC100 in two modes shown in Figure 2-5 and Figure 2-6.
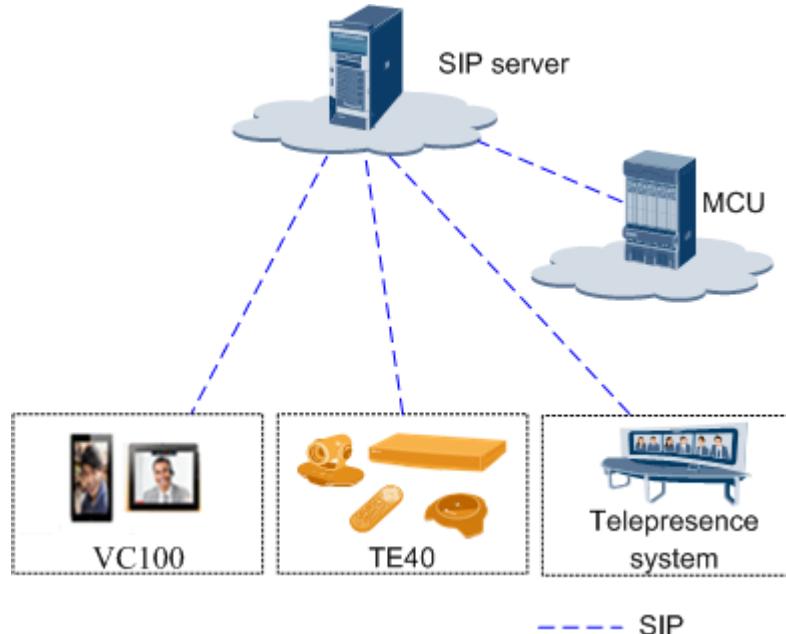
Figure 2-5 All endpoints registered with a SIP server

The network description is as follows:

- The MCU can invite devices to join the same conference using SIP.
- The VC100s can directly communicate with endpoints using SIP.
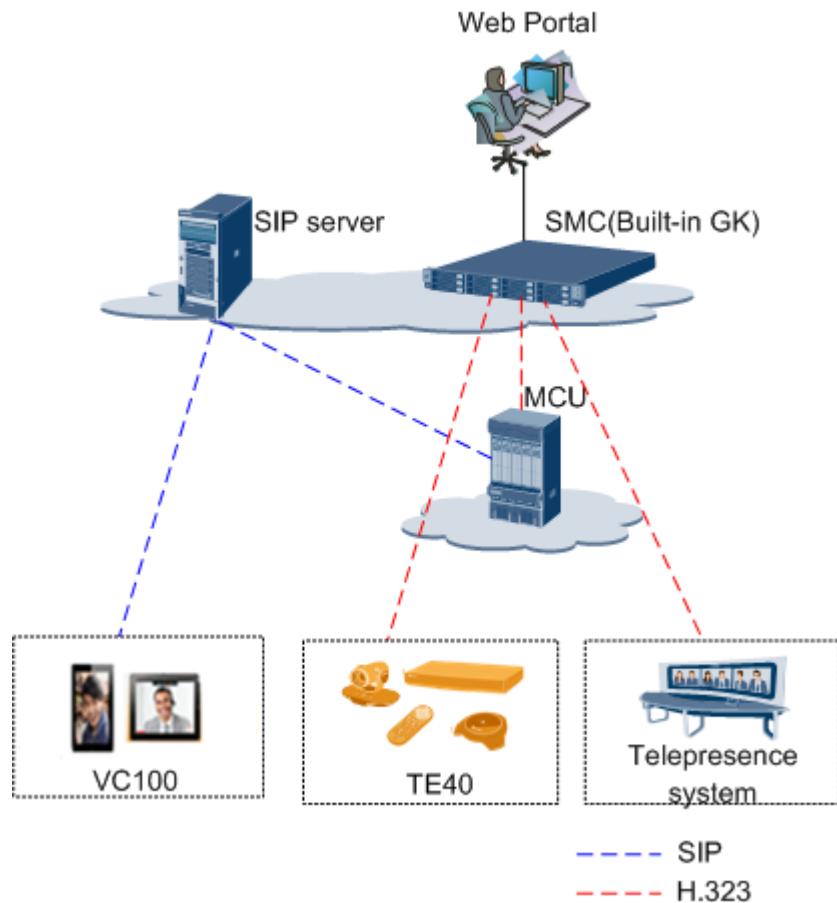
Figure 2-6 MCU registered with both a SIP server and GK

The network description is as follows:

- The MCU registers with a SIP server and H.323 GK at the same time.
- The MCU calls the VC100s using SIP and endpoints using H.323, inviting them to join the same conference. This allows communication to be established between VC100s and endpoints.

3 Technical Specifications

3.1 Port Parameters

Port	Description and Quantity	Standards and Protocols Compliance	Network Supported	Remarks
Video input	1 x HD-VI/DVI	DVI1.0 VESA	-	HD-VI port for VPC600/VPC620
	1 x HDMI/DVI (audio input supported)	HDMI 1.3	-	-
	1 x VGA/YPbPr	-		
Video output	2 x HDMI/DVI (audio output supported)	-	-	-
	1 x VGA/YPbPr			
Audio input	1 x XLR	-	-	-
	2 x RCA	-	-	-
	1 x HD-AI	-	-	-
	1 x HDMI	-		-
Audio output	4 x RCA	-	-	-
	2 x HDMI	-	-	-
USB port	2 x USB 2.0	USB 2.0	-	-
Network port	2 x 10/100/1000M LAN	-	-	-
	1 x Wi-Fi (built-in)			
	1 x PSTN (only available in China)			

Port	Description and Quantity	Standards and Protocols Compliance	Network Supported	Remarks
Serial port	2 x RS232	-	-	-

Table 3-1 Interfaces and parameters

3.2 Device Specifications

Category	Item	Specifications
Protocol compliance	Multimedia frame protocols	ITU-T H.323 and IETF SIP
	Video encoding and decoding protocols	H.264 SVC, H.264 HP, H.264 BP, H.263, and H.263+, H.261
	Audio encoding and decoding protocols	AAC-LD, G.711A, G.711U, G.719, G.722, G.728, G.722.1, G.729A, HWA-LD, and G.722.1C
	Dual-stream standard	ITU-T H.239 and BFCP
	Other communications protocols	H.221, H.225, H.231, H.233, H.234, H.235, H.241, H.242, H.243, H.245, H.281, H.283, H.350, H.460, and T.140
	Network transmission protocols	TCP/IP, FTP, DHCP, SNMP, Telnet, HTTP, SSH, HTTPS, PPPoE, RTP, RTCP, and SNTP
	H.323 remote camera control	H.281 and H.224
	Call bandwidth (IP)	64 kbit/s to 8 Mbit/s
	Video resolutions	• 1080p60 with a minimum bandwidth of 1 Mbit/s (optional) • 1080p30 with a minimum bandwidth of 512 kbit/s (optional) • 720p60 with a minimum bandwidth of 512 kbit/s • 720p30 with a minimum bandwidth of 384 kbit/s • 4SIF/4CIF with a minimum bandwidth of 128 kbit/s • SIF/CIF with a minimum bandwidth of 64 kbit/s • SQSIF/SQCIF/QSIF/QCIF with a

Category	Item	Specifications
		minimum bandwidth of 64 kbit/s
	Presentation resolutions	Input: 1920 x 1200 60fps, 1080p 60fps, 1680 x 1050 60fps, 1600 x 1200 60fps, 1600 x 900 60fps, 1400 x 1050 60fps, 1440 x 900 60fps, 1366 x 768 60fps, 1360 x 768 60fps, 1280 x 1024 60/75/85fps, 1280 x 960 60/75/85fps, 1280 x 800 60/75/85fps, 1280 x 768 60/75/85fps, 1280 x 600 60fps, 1152 x 864 60/75/85fps, 720p 60/75/85fps, 1024 x 768 60/70/75/85fps, 800 x 600 56/60/72/75/85fps, 640 x 480 60/72/75/85fps
		Output: 1600 x 1200, 1920 x 1200, 1920 x 1080, 1280 x 1024, 1280 x 720, 1024 x 768, 800 x 600
		Coding/Decoding resolution: 1600 x 1200, 1920 x 1200, 1920 x 1080, 1280 x 1024, 1280 x 720, 1024 x 768, 800 x 600, 4CIF, CIF
	Other video features	• dual 1080p60 • Video Motion Enhancement • VideoIntensifier • ViewProcessing • Facial Recognition
	Media stream encryption protocol	AES and DES
	Protocol for signaling and media stream encryption	H.235, SRTP, and TLS
Peripherals	VPC600 and VPC620 HD cameras	
	The endpoint supports up to 30 and 16 camera presets for the local site and remote site respectively.	
	Endpoint control using IR capable cameras	
	VPM220 and VPM220W microphone arrays	
Electricity supply requirements	Operating voltage	100 V AC–240 V AC; 50 Hz–60 Hz;
	Power consumption	Maximum: 60 W
Environmental requirements	**Operating state**	
	Ambient temperature	0°C to 40°C (32°F to 104°F)
	Relative humidity	10% to 80%
	Ambient noise	< 46 dBA SPL
	Minimum illuminance	7 lux

Category	Item	Specifications
	Recommended illuminance	> 300 lux
	Non-operating state	
	Ambient temperature	–40°C to +85°C
	Relative humidity	0% to 95%
Physical specifications	Codec dimensions (H x W x D)	72.5 mm x 435 mm x 265.5 mm (2.85 in. x 17.13 in. x 10.45 in)
	Weight	Weight 3.9 kg Package Weight 5.8 kg
Infrared remote control port	Infrared remote control signal encoding	NEC

Table 3-2 Parameters of the entire device

A Acronyms and Abbreviations

Table A-1

A	
AE	Automatic Exposure
AEC	Automatic Echo Cancellation
AF	Automatic Focus
AGC	Automatic Gain Control
ANS	Automatic Noise Suppression
API	Application Programming Interface
AWB	Automatic White Balance
C	
CCD	Charge Coupled Device
CIF	Common Intermediate Format
CTS	Cisco TelePresence System
CVBS	Composite Video Base Signal
E	
EMC	Electromagnetic Compatibility
H	
HD-AI	High Definition Audio Interface
HTTPS	Hypertext Transfer Protocol Secure
I	

A	
IMS	IP multimedia subsystem
ITU	International Telecommunications Union
L	
LCD	Liquid Crystal Display
LDAP	Lightweight Directory Access Protocol
M	
MCU	Multipoint Control Unit
N	
NAT	Network Address Translation
P	
PiP	Picture in Picture
PSTN	Public Switched Telephone Network
S	
SEC	Super Error Concealment
SIP	Session Initiation Protocol
SRTP	Security Real-time Transport Protocol
T	
TLS	Transport Layer Security
U	
UCD	User-Centered Design
V	
VME	Video Motion Enhancement