Huawei Telepresence and Videoconferencing MCU
MCU Portfolio

**Large Corporation & Carrier Class VP9660**
- Max capacity: 1024 HD ports.
- For carrier network.
- 20U, 19 inch, rack mountable.

**Medium Sized Enterprise VP9650**
- Max capacity: 384 HD ports.
- For carrier network and large enterprise.
- 20U, 19 inch, rack mountable.

**Entry Level VP9630**
- Max capacity: 144 HD ports.
- For medium sized enterprise.
- 5U, 19 inch, rack mountable.

**Carrier Class VP8660**
- Max capacity: 1024 HD ports.
- For carrier network.
- 20U, 19 inch, rack mountable.

**Large Corporation VP8650**
- Max capacity: 256 HD ports.
- For large sized corporation.
- 5U, 19 inch, rack mountable.

**Entry Level VP8650C**
- Max capacity: 24 HD ports.
- For small sized corporation.
- 1U, 19 inch.

Universal transcoding
Universal transcoding MCU VP9660 Specifications

- **Capacity:**
  - 96 ports at 1080p60 / 192 ports at 1080p30 / 384 ports at 720p / 768 SD ports
  - Scalable from 8 ports at 1080p30
  - Flexible ports
- **Protocols:** H.323, H.320(ISDN/E1), SIP, TIP
- **Bandwidth:** IP, 64Kbps ~ 8Mbps per port
- **Video protocol:** H.261, H.263, H.263+, H.264
- **Video resolution:** 1080p60, 1080p30, 720p60, 720p30, 4CIF, 2CIF, QVGA, CIF, QCIF
- **Audio protocol:** G.711a/u, G.722, G.728, AAC-LD/LC, G.719, G.722.1*, G.722.1C*
- **Content:** H.239, 1920*1080
- **Encryption:** H.235, AES, DES
- **Content sharing don't occupy MCU ports**
- **Telepresence server**
- **High Definition Personal Continuous Presence**
- **Universal transcoding:** video, audio, content, bandwidth, coding rate
- **ISDN access through PRI:** 64 PRI or 256 3BRI

*: G.722.1/G.722.1C, licensed from Polycom®
Universal transcoding MCU VP9650 Specifications

- **Capacity**:
  - 36 ports at 1080p60 / 72 ports at 1080p30 / 144 ports at 720p / 288 SD ports
  - Scalable from 8 ports at 1080p30
  - Flexible ports
- **Protocols**: H.323, H.320(ISDN/E1), SIP, TIP
- **Bandwidth**: IP, 64Kbps ~ 8Mbps per port
- **Video protocol**: H.261, H.263, H.263+, H.264
- **Video resolution**: 1080p60, 1080p30, 720p60, 720p30, 4CIF, 2CIF, QVGA, CIF, QCIF
- **Audio protocol**: G.711a/u, G.722, G.728, AAC-LD/LC, G.719, G.722.1*, G.722.1C*
- **Content**: H.239, 1920*1080
- **Encryption**: H.235, AES, DES
- **Content sharing don't occupy MCU ports**
- **Telepresence server**
- **High Definition Personal Continuous Presence**
- **Universal transcoding**: video, audio, content, bandwidth, coding rate
- **Web-based UI and Embedded Gatekeeper**
- **ISDN access through PRI**: 64 PRI or 192 BRI

*: G.722.1/G.722.1C, licensed from Polycom®
Universal transcoding MCU VP9630 Specifications

- **Capacity:**
  - 12 ports at 1080p60 / 24 ports at 1080p30 / 48 ports at 720p / 96 SD ports
  - Scalable from 8 ports at 1080p30
  - Flexible ports

- **Protocols:** H.323, SIP, TIP

- **Bandwidth:** IP, 64Kbps ~ 8Mbps per port

- **Video protocol:** H.261, H.263, H.263+, H.264

- **Video resolution:** 1080p60, 1080p30, 720p60, 720p30, 4CIF, 2CIF, QVGA, CIF, QCIF

- **Audio protocol:** G.711a/u, G.722, G.728, AAC-LD/LC, G.719, G.722.1*, G.722.1C*

- **Content:** H.239, 1920*1080

- **Encryption:** H.235, AES, DES

- **Content sharing don’t occupy MCU ports**

- **Telepresence server**

- **High Definition Personal Continuous Presence**

- **Universal transcoding:** video, audio, content, bandwidth, coding rate

- **Web-based UI and Embedded Gatekeeper**

*: G.722.1/G.722.1C, licensed from Polycom®
Hardware Module Layout

- **Central control & media board**
  - Central control board with media processing
  - Media processing: 24 screens at 1080p 30

- **Media board**
  - Media processing: 24 screens at 1080p 30

- **Central control board backup**
  - Optional
  - Central control board without media processing

- **ISDN board**
  - Optional
  - 256 ISDN or 64 PRI access
New Generation MCUs VP96 Series Highlights

- Large Capacity
- Support symmetric 1080p60 universal transcoding
- Content sharing don’t occupy MCU ports
- Personal continuous presence
- Flexible ports
- Support ISDN
- Embedded web-based management UI and Gatekeeper (VP9650&VP9630)
- Multichannel and multilevel cascading
- Ad-hoc and on-demand conferencing
- Audio and video IVR
- Auto CP layout
- Interoperable with other vendors
- Automatic capacity determination
- DTMF control from the endpoint
- Tiered permission levels
- DNS Translation
- Support H.460 Transversal
- IMS ready
Key Feature: 1080p60 Universal Transcoding

- Industry’s first 1080p 60 universal transcoding MCU
- Smoother and clearer image at 60 fps
  - Removes aliasing
  - Reduces incoherence
  - Reduces jitter
  - Clearer motion image
- Symmetric 1080p60 fps (Both decoding and coding are 1080p60)
- Continuous presence on each port
- Universal transcoding for telepresence
Key Feature: Universal Transcoding & Personal CP

- Industry’s first 1080p 60 universal transcoding MCU
- Smoother and clearer image at 60 fps
  - Removes aliasing
  - Reduces incoherence
  - Reduces jitter
  - Clearer motion image
- Symmetric 1080p60 fps (Both decoding and coding are 1080p60)
- Continuous presence on each port
- Universal transcoding for telepresence
Key Feature: Flexible Ports

Flexible assignment of resources:
8×1080p 30 = 4×1080p 60 = 16×720p 30 = 4×1080p 30+8×720p 30

- Make full use of resources
- Schedule conferences in different formats
- Enable different formats in the same conference
- Increase Return on Investment (ROI)
Key Feature: Save Bandwidth at H.264 HP

- Optimize algorithm to achieve better images
- Save bandwidth by at least 50% (VP96+TEx0)
- Guarantee good conference experience at lower bandwidth
- Save OPEX

<table>
<thead>
<tr>
<th>Video format</th>
<th>Minimum requirements</th>
<th>Recommended</th>
<th>Required for ordinary MCUs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1080p 60</td>
<td>1 M</td>
<td>3 M</td>
<td>Not support</td>
</tr>
<tr>
<td>1080p 30</td>
<td>512 k</td>
<td>1.5 M</td>
<td>4 M</td>
</tr>
<tr>
<td>720p 60</td>
<td>512 k</td>
<td>1.5 M</td>
<td>3 M</td>
</tr>
<tr>
<td>720p 30</td>
<td>384 k</td>
<td>1 M</td>
<td>3 M</td>
</tr>
<tr>
<td>4CIF</td>
<td>128 k</td>
<td>512 k</td>
<td>1 M</td>
</tr>
</tbody>
</table>

Save bandwidth by at least 50%
Key Feature: Intelligent Content sharing transcoding

- Protocol/bandwidth/resolution transcoding
- Content sharing via main stream
- Content sharing in CP
- Transcode two formats of content and output three formats content at the same time
Key Feature: Multichannel, Multilevel Cascading

- 1 MCU supports up to 768 sites with universal transcoding
- Multichannel cascading, pane-to-pane view for telepresence conferences
- Upper-level sites can choose to view lower-level conference sites
Key Feature: Embedded Web/GK

- Integrates multiple functions for conference control
- B/S structure is easy to deploy, use, and maintain
- Embedded GK reduces equipment investment and saves costs
- Frog-style UI provides excellent user experience
Key Feature: Multiple Conference Scheduling Options

- Schedule a conference via SMC2.0
- Schedule a conference through the Web
- Join a conference via universal access number
- Ad-hoc
- Use Huawei’s proprietary SiteCall to join a conference
- One touch to join a conference
Key Feature: High Network Adaptability

Intelligent Rate Control (IRC)

- **Intelligent Rate Control**
  - Dynamically detects available bandwidth
  - Reduces coding rate with insufficient bandwidth
  - Increases coding rate with sufficient bandwidth

- **Powerful SEC capability**
  - SEC3.0+H.264 SVC+ARQ
  - Videoconference can continue with packet loss up to 20%

- **Prevents network jitter**
  - Max: 1000 ms

- **Reconnect on Disconnect (ROD)**

SEC3.0+SVC when packet loss is 20%

Common packet loss concealment when packet loss is 20%
Three Level Encryption

- Signal encryption
  - H.235, SRTP/TLS
  - HTTPS, FTPS, SSH, HMAC
- Media stream encryption
  - AES128/192/256, DES
- Line encryption
  - Third-party encryption box

Conference site A

Conference site B

Host site

- Encrypted media stream
- Encrypted signaling stream
- Line encryption
- Network encryptor
Key Feature: Six Level Hot Spare

- 6-level hot spare
  - MCU (MCU virtual resource pool)
  - Power
  - Central control board
  - Media board
  - Chip
  - Network interface

- Power 2+2 hot spare
- Chip N+1 hot spare
- Central control board 1+1 hot spare
- Media process board 1+1 hot spare
- Network interface 1+1 hot spare
MCU virtual resource pool

- **Virtual resource pool backup**: MCU backup inside the pool, backup between pools.
- **Port load balancing**: Select the MCU with most available ports to initiate a conference.
- **Maximum utilization of ports**: If one MCU has insufficient port resources, two MCUs that possess the most resources will be selected to schedule meetings by MCU cascading.

MCU resource pool is an aggregation of virtualized port resources from multiple MCUs. It implements resource sharing among MCUs in different regions to make better use of the overall port resources.
Key Feature: Interoperability with other VC Environments
### VP96 series Competitive Overview

<table>
<thead>
<tr>
<th>Comparison item</th>
<th>VP9630</th>
<th>VP9650</th>
<th>VP9660</th>
<th>MSE 8000</th>
<th>TS 7010</th>
<th>Codian 5300</th>
<th>Codian450 0</th>
<th>RMX 4000</th>
<th>RMX 2000</th>
<th>RMX 1500</th>
<th>Elite 6000</th>
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<tbody>
<tr>
<td>Capacity-1080p 30 CP(symmetric)</td>
<td>24 screens</td>
<td>72 screens</td>
<td>192 screens</td>
<td>135 screens</td>
<td>16 screens</td>
<td>10 screens</td>
<td>20 screens</td>
<td>128 screens</td>
<td>64 screens</td>
<td>15 screens</td>
<td>5/10/20/40</td>
</tr>
<tr>
<td>Maximum video capability</td>
<td>1080p 60</td>
<td>1080p 60</td>
<td>1080p 60</td>
<td>1080p 30</td>
<td>1080p 30</td>
<td>1080p 30</td>
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<td>1080p 30/1080p60 asymmetric</td>
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<td>Flexible port</td>
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<td>×</td>
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<td>✔</td>
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<td>Maximum content capability</td>
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<td>1080p</td>
<td>1080p</td>
<td>1080p</td>
<td>1920*1080</td>
</tr>
<tr>
<td>Redundancy mechanism</td>
<td>4-level redundancy</td>
<td>5-level redundancy</td>
<td>6-level redundancy</td>
<td>Power redundancy only</td>
<td>×</td>
<td>×</td>
<td>×</td>
<td>Power redundancy only</td>
<td>×</td>
<td>×</td>
<td>Power (only Elite 6140)</td>
</tr>
<tr>
<td>H.264 HP</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>×</td>
<td>×</td>
<td>×</td>
<td>×</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Maximum packet loss concealment</td>
<td>20%</td>
<td>20%</td>
<td>20%</td>
<td>&lt;3%</td>
<td>&lt;3%</td>
<td>&lt;3%</td>
<td>&lt;3%</td>
<td>10%</td>
<td>10%</td>
<td>10%</td>
<td>20%</td>
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<tr>
<td>Cascading</td>
<td>Multichannel</td>
<td>Multichannel</td>
<td>Multichannel</td>
<td>Single channel</td>
<td>Single channel</td>
<td>Single channel</td>
<td>Single channel</td>
<td>Multichannel (only TP mode)</td>
<td>Multichannel (only TP mode)</td>
<td>Multichannel (only TP mode)</td>
<td>Single channel</td>
</tr>
<tr>
<td>Embedded GK/Web</td>
<td>✔</td>
<td>✔</td>
<td>×</td>
<td>✔</td>
<td>Web</td>
<td>Web</td>
<td>✔</td>
<td>Web</td>
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<td>web</td>
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<tr>
<td>Minimum bandwidth for HD display</td>
<td>384 Kb</td>
<td>384 Kb</td>
<td>384 Kb</td>
<td>768 Kb</td>
<td>768 Kb</td>
<td>768 Kb</td>
<td>768 Kb</td>
<td>512 k</td>
<td>512 k</td>
<td>512 k</td>
<td></td>
</tr>
</tbody>
</table>
**MCU Portfolio-VP86xx**

- **Large Corporation & Carrier Class VP9660**
  - Max capacity: 336 HD ports.
  - For carrier network and large enterprise.
  - 20U, 19 inch, rack mountable.

- **Medium Sized Enterprise VP9650**
  - Max capacity: 144 HD ports.
  - For medium sized enterprise.
  - 5U, 19 inch, rack mountable.

- **Entry Level VP9630**
  - Max capacity: 48 HD ports.
  - For small to medium sized enterprise network.
  - 2U, 19 inch, rack mountable.

- **Carrier Class VP8660**
  - Max capacity: 1024 HD ports.
  - For carrier network.
  - 20U, 19 inch, rack mountable.

- **Large Corporation VP8650**
  - Max capacity: 256 HD ports.
  - For large sized corporation.
  - 5U, 19 inch, rack mountable.

- **Entry Level VP8650C**
  - Max capacity: 24 HD ports.
  - For small sized corporation.
  - 1U, 19 inch.
VP8660 MCU – Specifications

- H.323/SIP/H.320
- Up to 1000 HD ports, scalable
- ISDN access through PRI: up to 64 PRI/256 3BRI
- Up to 4920 audio ports include PSTN and VOIP(SIP/H.323)
- Support IP, E1
- HD video: H.264, 720p/1080p
- Wideband audio: AAC-LD, 22KHz
- Load sharing design
- Hot-swappable boards
- MCU, power, main control board, service board, codec chip, line and network interface hot spare
- Active-standby main control board
- AES/DES media encryption
- The hardware system of the 8660 MCU consists of an integrated cabinet, power modules, fan modules, and the system board.
- 10 board slots: two main control slots and eight service slots
VP8660 MCU Overview

Summary (advantages of MCU VP8660):

• Large capacity
• Supported 1080P 30fps & 720P 60fps transcoding conference
• Supported H.263 and H.264 content share and dual live stream
• High reliability: MCU, power, main control board, service board, codec chip, line and network interface hot spare
• Supported automatically MCU cascaded: max 5 levels cascaded and max 32 channels cascaded
• Supported Telepresence conference site
• Supported ISDN, PSTN, Large audio capacity(support up to 4920 audio sites)
Summary (advantages of MCU VP8650):

- Large capacity
- Supported 1080P 30fps & 720P 60fps transcoding conference
- Supported H.263 and H.264 content share and dual live stream
- High reliability: MCU, power, service board, codec chip, line and network interface hot spare
- Supported automatically MCU cascaded: max 5 levels cascaded and max 32 channels cascaded
- Supported Telepresence conference site
- Supported ISDN, PSTN, Large audio capacity (support up to 1500 audio sites)
VP8650 MCU – Specifications

- H.323 / SIP / H.320
- Up to 256 HD ports, scalable
- ISDN access through PRI: up to 64PRI/256 3BRI
- Up to 1500 audio ports include PSTN and VOIP(SIP/H.323)
- Support IP, E1
- HD video: H.264, 720p/1080p
- Wideband audio: AAC-LD, 22KHz
- Load sharing design
- Hot-swappable boards
- MCU, power, service board, codec chip, line and network interface hot spare
- AES/DES media encryption
- Three board slots: one main control slot (GCCA) and two service slots (GPUA)
VP8650C MCU – Specifications

- H.323
- HD video: H.264, 720p/1080p
- Wideband audio: AAC-LD, 22KHz
- MCU, codec chip and network interface hot spare
- AES/DES media encryption
- Four fix models

<table>
<thead>
<tr>
<th>Model</th>
<th>Capacity</th>
<th>Continuous presence (Asymmetric)</th>
<th>Transcoding capacity</th>
<th>Voice port</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viewpoint 8650C-12</td>
<td>12-port 2M</td>
<td>4-pane (CIF)</td>
<td>2-port CIF</td>
<td>12-port</td>
</tr>
<tr>
<td>Viewpoint 8650C-24</td>
<td>24-port 2M</td>
<td>4-pane (CIF)</td>
<td>2-port CIF</td>
<td>24-port</td>
</tr>
<tr>
<td>Viewpoint 8650C-12XD</td>
<td>12-port 8M</td>
<td>12-pane (1080P)</td>
<td>4-port 1080P</td>
<td>12-port</td>
</tr>
<tr>
<td>Viewpoint 8650C-24XD</td>
<td>24-port 8M</td>
<td>24-pane (1080P)</td>
<td>4-port 1080P</td>
<td>24-port</td>
</tr>
</tbody>
</table>
User dials a pre-defined Conference Service Number (factory default: 168). Dialing this number, an endpoint can join an on-going conference for which it is scheduled to participate in. Ensuring an simple and easy way to access a conference.
VP8660 MCU is able to automatically negotiate best-possible connection and AV quality for each site based on capacity exchange among codecs connected.

<table>
<thead>
<tr>
<th>Video</th>
<th>Minimum Bandwidth</th>
<th>Recommended Bandwidth</th>
</tr>
</thead>
<tbody>
<tr>
<td>720P 30</td>
<td>512Kpbs</td>
<td>768Kpbs</td>
</tr>
<tr>
<td>1080P 30</td>
<td>1M</td>
<td>1.5M</td>
</tr>
<tr>
<td>1080P 60</td>
<td>2M</td>
<td>3M</td>
</tr>
</tbody>
</table>
Key Feature: Firewall & NAT Traversal

Private Network A
- H.460 Endpoint
- Endpoint with static NAT

Internet
- DMZ
- Gatekeeper
- H.460

Private Network B
- FW and H.323 ALG

Key Feature: Firewall & NAT Traversal
Point to Point conference, three screens display the remote site’s three imagines. Local site not shown to provide most natural Telepresence experiences.

Point to Point Conference providing local camera view (PiP) of all 3 local screens.
Conference Experience Options – MP Continuous Presence

- Multipoint Conference using the On-table CP functionality to show to remote site appearance to remote TP participants
Conference Experience Options – MP Continuous Presence

- Multipoint conference, the MCU’s Continuous Presence functionality provides the multiple layout options such as shown.
- Each MCU simultaneously displays a maximum of 24 sites.
We can provide 6 models for customer choice, and customer can choose one of these to fit for their requirement. In our products price book, there is detailed description about all of these models.

Actually, the resource of VP8650 is from 8 ports to 256 ports(@2Mbps) by 4 ports at intervals, and it is the same with VP8660, but max capacity is 1024 ports(@2Mbps). It means if the customer’s requirement can not be fit for by these 6 models, we can provide the customer quotation by following information:

- The required Ports (@bandwidth)
- The required Continuous Presence(@resolution)
- The required Transcoding(@resolution)

To upgrade MCU, just provide the same information for customer quotation.

<table>
<thead>
<tr>
<th>Model</th>
<th>Ports of 720p30</th>
<th>Ports of 1080p30</th>
<th>CP*</th>
<th>Transcoding</th>
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</thead>
<tbody>
<tr>
<td>VP8650-48</td>
<td>48</td>
<td>24</td>
<td>16</td>
<td>2-way</td>
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<td></td>
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<td>16</td>
<td>(@1080P)</td>
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<td>(@1080P)</td>
</tr>
<tr>
<td>VP8650-72</td>
<td>72</td>
<td>36</td>
<td>16</td>
<td>2-way</td>
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<td></td>
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<td></td>
<td>16</td>
<td>(@1080P)</td>
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<td>(@1080P)</td>
</tr>
<tr>
<td>VP8650-96</td>
<td>96</td>
<td>48</td>
<td>16</td>
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<td>VP8660-128</td>
<td>128</td>
<td>64</td>
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<td>4-way</td>
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<td>128</td>
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<td>28</td>
<td>(@1080P)</td>
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<td>VP8660-512</td>
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<td>256</td>
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## All of MCU Models Review

<table>
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<th>Feature</th>
<th>VP8660</th>
<th>VP8650</th>
<th>VP8650C</th>
<th>VP9660</th>
<th>VP9650</th>
<th>VP9630</th>
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<tbody>
<tr>
<td>Universal transcoding</td>
<td>✗</td>
<td>✗</td>
<td>✗</td>
<td>√</td>
<td>√</td>
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<td>256</td>
<td>12 or 24</td>
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<td>72 (1080p)</td>
<td>24 (1080p)</td>
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<td>Scalable</td>
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<td>√</td>
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<td>√</td>
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<td>Video capability</td>
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<td>1080p 30</td>
<td>1080p 30</td>
<td>1080p 60</td>
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<tr>
<td>Content resolution</td>
<td>Standard resolution from VGA to 1080p</td>
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<td>Telpresence supported</td>
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<td>H.264 high profile</td>
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<td>✗</td>
<td>✗</td>
<td>√</td>
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<tr>
<td>Hot spare</td>
<td>MCU + power + central control board + media board + chip + line + network interfaces</td>
<td>MCU + power + media board + chip + line + network interfaces</td>
<td>MCU + chip + network interfaces</td>
<td>MCU + Power + central control board + media board + chip + network interfaces</td>
<td>MCU + Power + media board + chip + network interfaces</td>
<td>MCU + Power + chip + network interfaces</td>
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<tr>
<td>Packet loss concealment</td>
<td>8%</td>
<td>8%</td>
<td>8%</td>
<td>20%</td>
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<tr>
<td>ISDN/PRI</td>
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<tr>
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<tr>
<td>Large-capacity audio access</td>
<td>4920/VQE/VQM</td>
<td>1500/VQE/VQM</td>
<td>√</td>
<td>✗</td>
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<td>Extra audio-only port</td>
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<tr>
<td>TV wall</td>
<td>48 SD or 32 HD screens</td>
<td>24 SD or 16 HD screens</td>
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<td>Embedded GK/Web</td>
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