

# TeraVM

## Telepresence Endpoint Emulation with TeraVM

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Question	Response	Additional Information
What product is used to emulate Telepresence endpoints?	TeraVM	VIAVI TeraVM is a virtualized IP test solution, which is used to test Telepresence solutions.
Do you support the Telepresence Interoperability Protocol (TIP)?	Yes	VIAVI supports the latest version of TIP and enables concurrent testing with previous revisions.
What version of TIP is used?	Dependent on the management system	Emulated endpoints will auto negotiate the version with the management system or a user can statically assign TIP version.
What Telepresence endpoints are emulated in TeraVM?	Jabber (Movi), Tandberg E, C series, Cisco CTS series	TeraVM is used to emulate both soft clients and hardware based clients. TeraVM supports testing with both client types at the same time.
Will the Telepresence endpoint interact with management systems?	Yes	TeraVM's stateful Telepresence endpoints support full automation facilities including scripts to register the endpoints with the management systems.
Can I join a real or scheduled meeting with an emulated Telepresence endpoint?	Yes	TeraVM's emulated Telepresence endpoints are stateful and can join a live meeting at a fixed time or at a random conference time.
Do you support multi-point or point-to point calls?	Both	Plus TeraVM emulated endpoints can join meetings in which Polycom and Lifesize endpoints are active.
Do you support secure conference calls?	Yes	TeraVM supports Telepresence emulation over secure SSL tunnels.
Do you support calls with an actual Telepresence endpoint?	Yes	Emulated Telepresence endpoints interoperate with real Telepresence codecs with support for custom High Definition (HD) video generation.
Do you support real media in the calls emulated?	Yes	Plus there are additional tools for video capture and playback for custom video.
Do you support performance testing of the signaling and/or media?	Both	See Chapter 2 for dedicated performance measurements. In addition, TeraVM provides performance measurements per emulated Telepresence endpoint.
Do you provide quality scoring for the media content?	Yes	TeraVM provides real time analysis on both the video and audio content, with subjective Mean Opinion Scoring (MOS) per video and audio stream.
What Telepresence specific performance metrics are available in the product?	See Chapter 2	TeraVM provides per flow analysis on a per emulated Telepresence endpoint basis and on each and every available media stream.
What else can TeraVM be used for?	Network and Application Performance Testing	TeraVM is used to analyze the performance limitations and capabilities of a wide variety of security and networking devices including VPN/Firewall, vSwitch, DPI or IPS/IDS, vLoad Balancer and video infrastructure.

## Configurable TeraVM Telepresence endpoint parameters

Question	Response
What Telepresence endpoints are supported?	Soft clients such as Jabber (Movi) and hardware based endpoints such as Tandberg E, EX, C series and Cisco CTS series.
What Telepresence endpoints do you support point to point calls with?	Polycom (HDX7000), Lifesize Room
How many Telepresence endpoints can be emulated?	TeraVM is a virtual solution which is highly scalable and will support emulation of hundreds of participants per conference call.
What video codecs are supported?	JPEG, MPEG, H.261, H.263, H.263+, H.264, MPEG-4, use custom fields to add other codec types.
What audio codecs are supported?	Cisco E20-C20 H.264, Cisco E20-C20 MP4A, G.711a (PCMA), G.711u (PCM), GSM, G.723 5.3 kbits/s (MP-MLQ), G.723 6.3 kbits/s (MP-MLQ), G.722 (ACELP), G.728, G.729, iLBC 13.33 kbits/s, iLBC 15.2 kbits/s, use custom fields to add other codec types.
Is there pre-populated call media?	Yes, including media support of SD and HD content with varying quality rates 1080p, 720p, etc.
Can I capture media from a live meeting for use at a later time?	Yes, media can be captured from an existing conference meeting and used for further testing through the replay functionality.
Do you support video/audio with varying frame rates?	Yes, plus add custom media which includes video/audio pcaps with configurable bit rate and frame rate variables.
Is each emulated endpoint independently configured i.e. test using various codecs per endpoint?	Yes, emulated Telepresence endpoints are configured independently, enabling concurrent testing with multiple codecs.
How are auxiliary meeting feeds managed?	TeraVM's Auxiliary Feed Controller enables each emulated endpoint to present real room activity such as a user plugging in and out of auxiliary inputs per individual emulated endpoint with a pre-configured duration of time.
Can I add my own presentation files?	Yes, users can configure auxiliary input material such as power-point presentations.
Do you impersonate a speaker with varied loudness?	Yes, each and every emulated Telepresence endpoint can be uniquely set for a level of loudness or the test may use TeraVM's VAD (Voice Activity Detection) Controller. The VAD controller enables each emulated endpoint to present the loudest audio for a period of time.
How do you emulate round-table discussions?	TeraVM's VAD (Voice Activity Detection) Controller can be used to cycle through each of the emulated Telepresence endpoints allocating a duration of speaking time to each endpoint.
Do you support call hold/resume?	Yes, users specify the time when a call goes on hold and the duration of a hold, in addition users can emulate a Telepresence participant cycling through a number of hold durations.
How is call mute handled?	Call mute may be applied when first defining the test or during live tests it's possible to right click on the emulated Telepresence endpoint and mute or unmute the emulated participant.
Can emulated participants be set to miss the start of the meeting or join late?	Each emulated Telepresence endpoint can be set to start and stop independently enabling the effect of staggered participants joining and leaving the meeting.
What protocols are used for secure login?	Each emulated Telepresence endpoint can be configured with unique user and password details, with support for MD-5 and AKA authentication.
Do the emulated Telepresence endpoints support NAT?	TeraVM can be configured to use STUN and ICE for NAT traversal.
What support is available for SIP Trunking?	Telepresence may use SIP Trunks, in addition an emulated Telepresence endpoint can be configured to act as the trunk.
Is there support for network congestion management?	TIP supports enhanced flow control, the management system may request endpoints to down speed (use lower quality video), in addition TeraVM emulated Telepresence endpoints may detect quality issues and down speed independently.

## Telepresence performance metrics

Telepresence Metric	Description
In service	Client active as part of test
Registrations Attempted	The number of registrations attempted by this end-point
Registrations Successful	The number of successful registrations by this end-point
Registrations Rejected	The number of registrations rejected by this end-point
Registrations Errored	The number of registrations erred by this end-point
Out Calls Attempted/s	The number of calls out attempted by this end-point
Out Calls Established/s	The number of calls established by this end-point
Out Calls Rejected	The number of calls rejected by this end-point
In Calls Attempted/s	The number of calls in received by this end-point
In Calls Established/s	The number of calls in established by this end-point
In Calls Rejected	The number of calls in rejected with this end-point
SIP Out Messages	The number of outbound messages
SIP Messages Resent	The number of messages resent
SIP In Messages	The number of messages received
Calls Errored	The number of calls corrupted
In RTCP Packets	The number of RTCP packets received in by this end-point
Out RTCP Packets	The number of RTCP packets sent out by this end-point
Mean time to RTP packet ms	Average time to RTP packet
Max time to RTP packet ms	Max time to RTP packet
Min time to RTP packet ms	Min time to RTP packet
Calls Received RTP packet	RTP packet count
Calls Received Ringing	Number of calls
Mean time to Ringing ms	Average time ringing
Max time to Ringing ms	Max time ringing
Min time to Ringing ms	Min time ringing
RTP Video Frame Jitter Max ms	Max Jitter per ms
RTP Video Frame Jitter Mean ms	Average Jitter per ms
RTP Video Frame Count	The number of RTP packets received by this end-point
RTP Duplicate Packets	The number of duplicate RTP packets received by this end-point
RTP Dropped Packets	The number of RTP packets dropped by this end-point
RTP Out of Sequence Packets	The number of out of sequence RTP packets received by this end-point
RTP Receive SSRC	Receiving source identifier
In RTP Packet/s	Number of RTP packets/second sent by this end-point
Out RTP Bit/s	Number of RTP bits/second sent by this end-point
QMVideo MOS	Incoming Video quality score
QMAudio MOS	Incoming Audio quality score
QMVideo Underrun Discarded Packets	The number of video packets discarded due to underrun for the stream being analysed
QMVideo Overrun Discarded Packets	The number of video packets discarded due to overrun for the stream being analysed



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