



Compira Labs

Boosting Quality of Experience for Cloud-based Video Conferencing

Over-the-top (OTT) IP-based video conferencing has been growing steadily for business use, and now with the global Covid-19 pandemic, it has entered the mainstream. Now that social distancing policies are the norm, people are sheltering at home but still need to work, schools and universities are adopting distance learning to keep their students on track, and religious institutions are seeking to reassure and maintain a sense of normalcy and community in these trying times. The enabler in all these cases is web-based video conferencing. Unlike early video conferencing, which required dedicated devices and even videoconferencing rooms, web-based video conferencing can be done from any web-enabled device, including TV, smartphone, PC or tablet, and in any location.

Quality of Experience (QoE) is key for video conferencing users, since videoconferencing is seen as a substitute for face-to-face meetings or telephone calls. Delays in sound or video are interpreted as poor quality, and with many providers to choose from and low switching costs, users are quick to change to a different provider if the quality of their video conferencing provider is not sufficient. Some video conferencing providers have a freemium business model, in which case quality is crucial for enticing free users to convert to paid.

QoE challenges in cloud-based video conferencing

High quality video conferencing experience requires low delivery latency and jitter for audio, and stable, medium-to-high bandwidth for video.

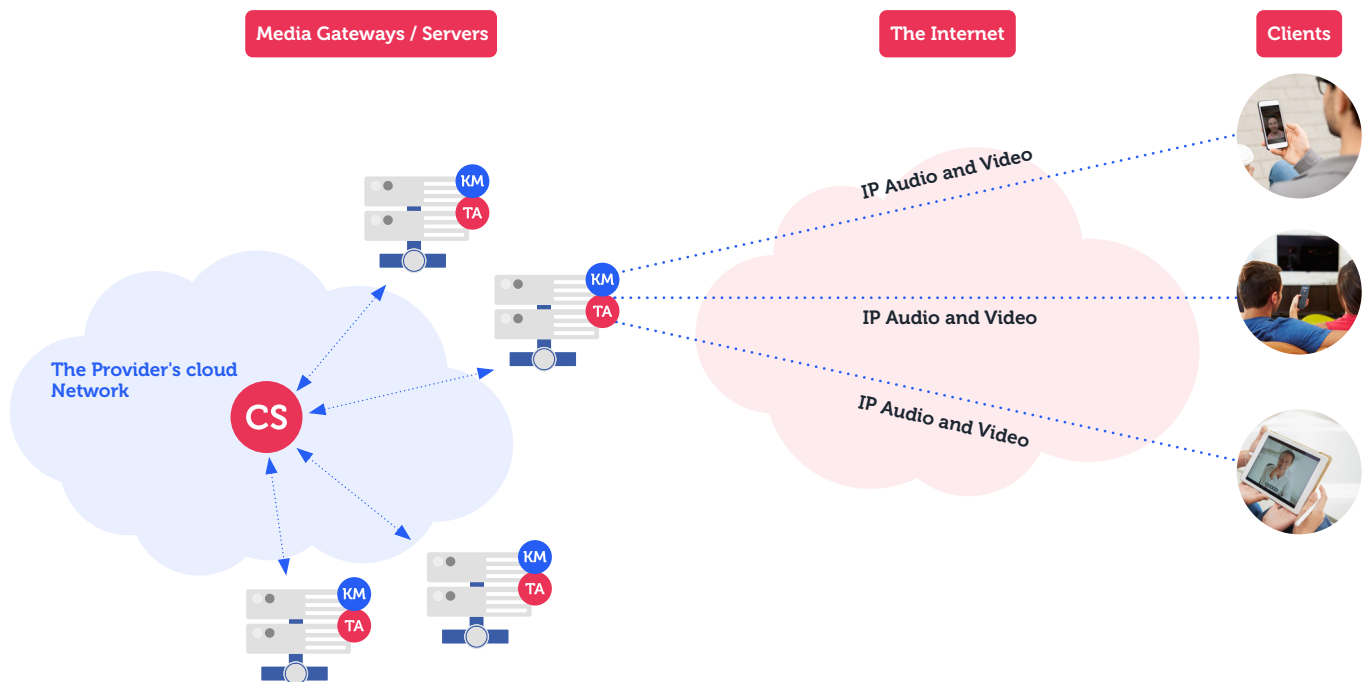
A video conference is frequently implemented using a media-gateway/mixer entity running on a cloud server. A single server of this type connects a large number of participants with audio and video over the Internet. The audio and video datagrams sent by the server to the participants traverse the Internet just like any other traffic (browsing, video streaming, gaming, etc.). This implies significant challenges for attaining high quality:

- › Video conference participants connect from different networks. Some may connect from a corporate network, some from home and others using ad-hoc network connectivity such as from hotels or coffee shops. These network connections may be congested, and can greatly differ in terms of available bandwidth, stability, delay and jitter.
- › Participants connecting through mobile devices introduce a particular challenge as cellular networks are notorious for bad VoIP and video quality due to the frequent changes in network bandwidth and latency. This is further aggravated for participants who are mobile during the video conference session.
- › Corporate networks very frequently block UDP traffic due to IT security best-practices, forcing IP video conferencing to use TCP, which is known to be problematic for real-time services.

Our solution

Compira Labs provides a software solution that dramatically improves QoE for cloud-based video conferencing. By upgrading the network stack at the media-gateway nodes, Compira's next-generation congestion-control technology optimizes media delivery rates and reduces latency.

There is no need for any change on the client side. Data collection and analytics engines provide visibility into performance metrics across the network, and machine learning-based intelligence enables continuous performance optimization.



Solution components

- > **Kernel Module (KM)** – Loadable Linux kernel module providing real-time transmission rate optimization via next-generation congestion-control framework.
- > **Thin Agent (TA)** – Installable user-space agent for data-collection and remote kernel-module configuration.
- > **Compira Stream (CS)** – A central web application that activates, configures, and collects data from all agents and modules. Provides performance analytics and non-real-time optimization.

Benefits

- > **Better QoE metrics** – Higher and more stable throughput combined with lower delivery latency and jitter lead to much better audio and video experience.
- > **Visibility** – Gain real-time and historical performance data, at node, subnet and IP address granularity.
- > **Seamless upgrade** – Transparent to client apps and devices, video-conferencing applications, and the provider's network.
- > **Customizable** – Compira Labs' algorithmic framework is fully customizable for different deployment scenarios and QoE goals.