LIMELIGHT MMD LIVE: LOWERING LATENCY FOR LIVE ONLINE STREAMING VIDEO

EXECUTIVE SUMMARY
While online streaming video once meant video-on-demand, today’s organizations and their audiences are increasingly leveraging the excitement and engagement of live video in multiple ways. Yet as organizations seek to adopt live video for time-critical use cases, latency has emerged as a significant challenge. Limelight Multi-Media Delivery Live (MMD Live) provides small chunk streaming for HLS/DASH—allowing you to configure the latency that makes the most sense for your use case.

ONLINE STREAMING VIDEO ADOPTION GROWS
Online streaming video is a force to be reckoned with. From 2016 to 2017, the number of users watching more than 10 hours of online videos per week increased from 9.8 to 17 percent. Over the same period, those watching only one to two hours of video per week fell from 49 to 29.1 percent, according to the Limelight “State of Online Video 2017” report.¹

While streaming video was once relegated to video-on-demand, live online streaming video is gaining traction. According to a survey by Brandlive,² 44 percent of businesses have already attempted live video streaming in the past 12 months and 20 percent are planning to get into the action in the months ahead.

The incentive is clear: The vast majority (80 percent) of audiences prefer to watch live video from a brand than read a blog post while more than one in five Facebook videos is live. These videos are watched three times longer than on-demand videos. Watching live online video, viewers are more likely to feel excitement, immediacy and connection as they stay informed on the latest news and events.

THE LATENCY CHALLENGE
Many live online streaming video services deliver viewing experiences over the Internet (via Over the Top (OTT) streaming services) that are nearly as good and predictable as those from traditional TV broadcasters. But a big frustration with online viewing for some use cases, is that live video streams typically delay delivery by 40 seconds or more compared to TV broadcasts. This delay is called “latency.”

Latency is the time between when the camera captures the video until it is played back on another device. For internet streaming applications, latency is added by all the components in the streaming workflow: the camera/encoder, upstream network, streaming server, downstream network, and video player on the viewer side.

Increasing the complexity, latency needs to be minimized across all devices on which the live streaming video will be viewed. These include more types of devices than ever:

- Smart TV with streaming devices such as Google Chromecast, Amazon Fire TV, Apple TV, Roku, and set-top boxes
- Mobile devices such as smartphones and tablets
- Laptops
- Game consoles
WHEN LATENCY MATTERS

Latency is not a problem for every online live streaming application. Think about the last live concert you watched on TV. Would it have really made a difference if there was a one-minute delay? On the other hand, the following are examples of use cases where timing is critical—even a matter of life and death.

- **Sports and news**—When you’re watching a live online stream of a sports event on your smartphone, the last thing you want is to get a chat from a friend watching the same event on TV saying, “What a great play!!!” before you’ve seen it on your mobile device.

- **Online gaming**—When you’re playing online poker and cards are dealt, a one-minute delay means that the dealer must wait to deal the next round until all players see their cards. High latency reduces the number of rounds, which in turn cuts the house’s revenues from the game.

- **Live auctions**—Some live auctions now stream live to online bidders. Online auction attendees can bid on items via a two-way channel. To make bids in a timely manner, the online video must be delivered to bidders in realtime.

AN END TO END WORKFLOW SOLUTION WITH MMD LIVE

Limelight Multi-Device Media Delivery Live (MMD Live) is designed to take the headaches and hassles out of delivering live online streaming video to a variety of devices, including smart TVs, desktops, mobile screens and set-top boxes. It comes complete with a number of capabilities specifically to minimize latency.

MMD Live functions include:

- Ingesting RTMP (Real Time Messaging Protocol) directly from encoders
- Cloud-based transcoding and transmuxing a single RTMP ingest stream into other bitrates and formats, such as the popular HTTP chunked streaming formats HLS and DASH, as well as Flash.
- Video delivery and security

OPTIONS FOR LOW LATENCY STREAMING WITH MMD LIVE

Limelight MMD Live offers latency-reduction capabilities via small-chunk streaming for HLS and DASH.

OPTIMIZE HLS/DASH

As mentioned previously, HLS and DASH are the dominant and most widely supported formats for delivering video over the Web. HLS/DASH work by steaming chunks of video and the default HLS/DASH chunk size is 10 seconds with three chunks created before delivery begins. Overall total delivery latency exceeds 45 seconds when CDN ingesting, transcoding, distance between source and viewer, and delivery are factored in. An obvious way to reduce latency then is to reduce the chunk size. That’s exactly what Limelight has done. To provide deployment flexibility, Limelight offers two small chunk size solutions.
**MMD LIVE SMALL CHUNK STREAMING**

Many organizations rely on Limelight to handle transcoding for them. Our transcoding service ingests RTMP live streams, transcodes them to HLS/DASH with one second size chunks and delivers them over the Limelight CDN to users with total latency of around six seconds.

These chunk size reductions reduce latency, regardless of whether video is delivered to tablets, phones, desktops or other devices, since most modern devices have the processing power and memory to handle low chunk size streaming.

**One note of caution:**

The lowest optimal chunk size for your particular use case will depend on your audience’s internet connection. If you have a broad base of users in areas with poor connection quality, it may not be possible to reduce chunk size to one second because of the potentially high rate of packet loss. It’s important to have a way to measure your end user’s experience so you can experiment with different chunk sizes. A good tool to monitor video quality is YouBora from Nice People At Work.

**VIDEO ACCELERATION**

Limelight’s Video Acceleration solution is for organizations that prefer to do their own transcoding and use the Limelight CDN to deliver their live online video streaming content to their end users.

**Live Stream Delivery**

- Content owner does transcoding/packaging
- Chunk size: as low as 1 second
- Results in as low as 4 seconds latency depending on ingest chunk size
- Available today
Video Acceleration is a configuration option in the Limelight Content Delivery Service that is designed to accelerate the delivery of very small video chunks and dynamic manifest files. In this case, small chunk size HLS or DASH is ingested into the CDN and zipped across the network in milliseconds. This capability reduces the live streaming latency down to about three seconds, a significant improvement over existing HLS/DASH live streaming delivery solutions.

CONCLUSION
The real impact of low latency live online streaming will be the new use cases and business models that are enabled that are not possible with broadcast TV, a key advantage being that internet streaming can deliver video streams anywhere in the world. To find out more about how MMD Live can reduce latency for your online live video delivery application, contact us at: info@limelight.com.

ABOUT LIMELIGHT NETWORKS

Limelight Networks Inc., (NASDAQ: LLNW), a leading provider of digital content delivery, video, cloud security, and edge computing services, empowers customers to provide exceptional digital experiences. Limelight’s edge services platform includes a unique combination of global private infrastructure, intelligent software, and expert support services that enable current and future workflows. For more information, visit www.limelight.com, follow us on Twitter, Facebook, and LinkedIn.

1 https://www.limelight.com/resources/white-paper/state-of-online-video-2017/
2 http://tubularinsights.com/live-streaming-vs-video-on-demand/