Akamai Licensed Multicast Solution

Last mile network savings, high-quality and reliability for high-audience live events

As pay TV services transition from "legacy" models to HTTP-based delivery over high speed broadband, service quality and reliability are top-of-mind for both broadcasters and pay TV providers. However, the possibility that "last mile" networks may be incapable of sustaining service levels during high-audience live simulcasted events is a concern. Also of concern, as 4K high-dynamic range (HDR), augmented and virtual reality, and other high-bitrate content becomes more prevalent for live programming, is that networks may be taxed even further.

To address these concerns, operators have the option of increasing network capacity through expensive network build-outs and/or router upgrades. But these so-called "forklift upgrades" can be complex and expensive. Managing existing resources more efficiently is a far simpler and more cost-effective option.

Akamai Licensed Multicast Solution (LMS) is designed to help control network costs by creating greater network efficiency, most specifically for high-audience events, such as sports or breaking news. As compared with unicast delivery (one stream for each viewer), LMS uses multicast-assisted adaptive bitrate (M-ABR) delivery (one stream for many viewers). This significantly reduces the network resources needed to consistently deliver high-audience live-streamed video.

Optimize Last Mile Delivery Without Adding Infrastructure

Akamai LMS is a software solution that streams M-ABR video content to pay TV subscribers. Owned and operated by pay TV operators, the software is available either as a standalone solution or as an optional component of Akamai Aura Licensed CDN (LCDN).

This key video delivery ecosystem component offers an important capability for evolving pay TV services. With Akamai LMS, multicast-assisted delivery can be configured for channels that feature bursty, high-audience live content, while programming that generates more consistent traffic flows can continue leveraging unicast delivery. The result is an optimized network capable of handling a wide variety of high-quality content, without the need to add capacity to last mile network infrastructure.

BENEFITS

- **Bring peak traffic growth** back in line with average traffic growth to "fix" cost-model challenges around scaling high-audience assisted adaptive bitrate delivery
- **Meet broadcast-scale delivery needs** for live video content
- **Optimize video quality** and reduce "hand wave" latency for higher QoE for viewers

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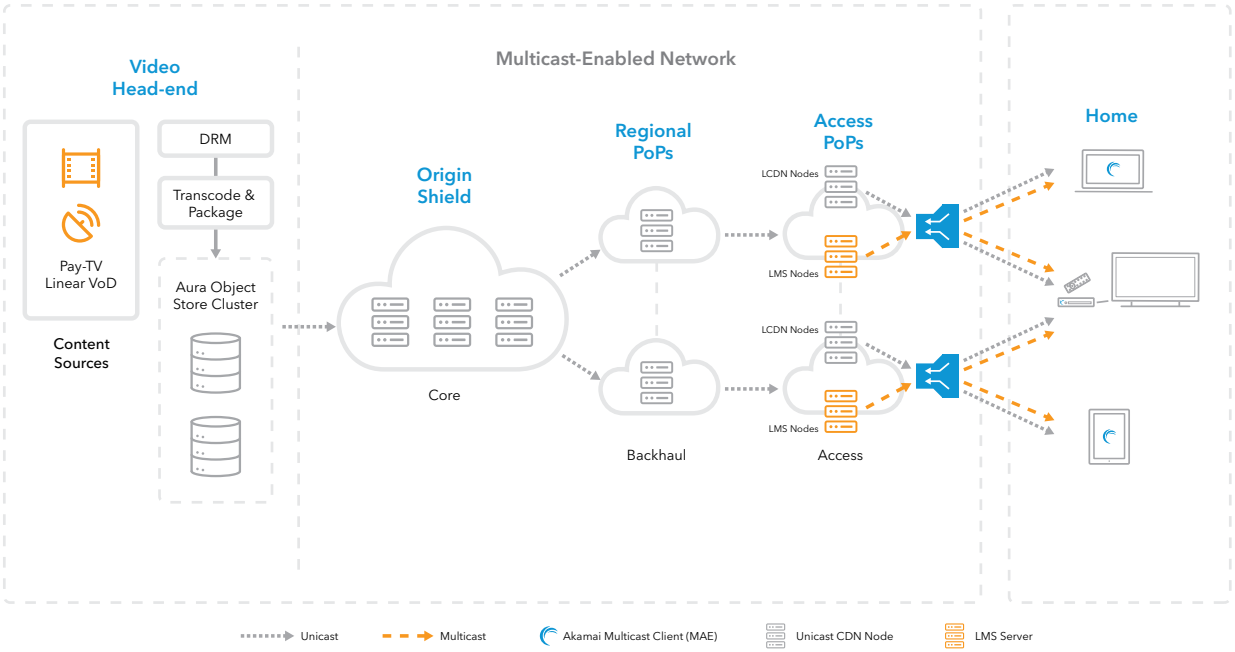
How It Works

Akamai LMS is a complete solution consisting of multicast-enabled server- and client-side components, plus Akamai Aura Management Center (AMC) – Akamai's management suite for our licensed software portfolio. As a standalone solution, Akamai LMS is deployed on dedicated, commercial off-the-shelf hardware or in virtualized environments. The solution can be configured to operate in conjunction with unicast-based CDNs from Akamai or third parties.

As an Aura LCDN component, Akamai LMS operates alongside, and in conjunction with, the LCDN. This is shown in the diagram below.

Akamai LMS Topology



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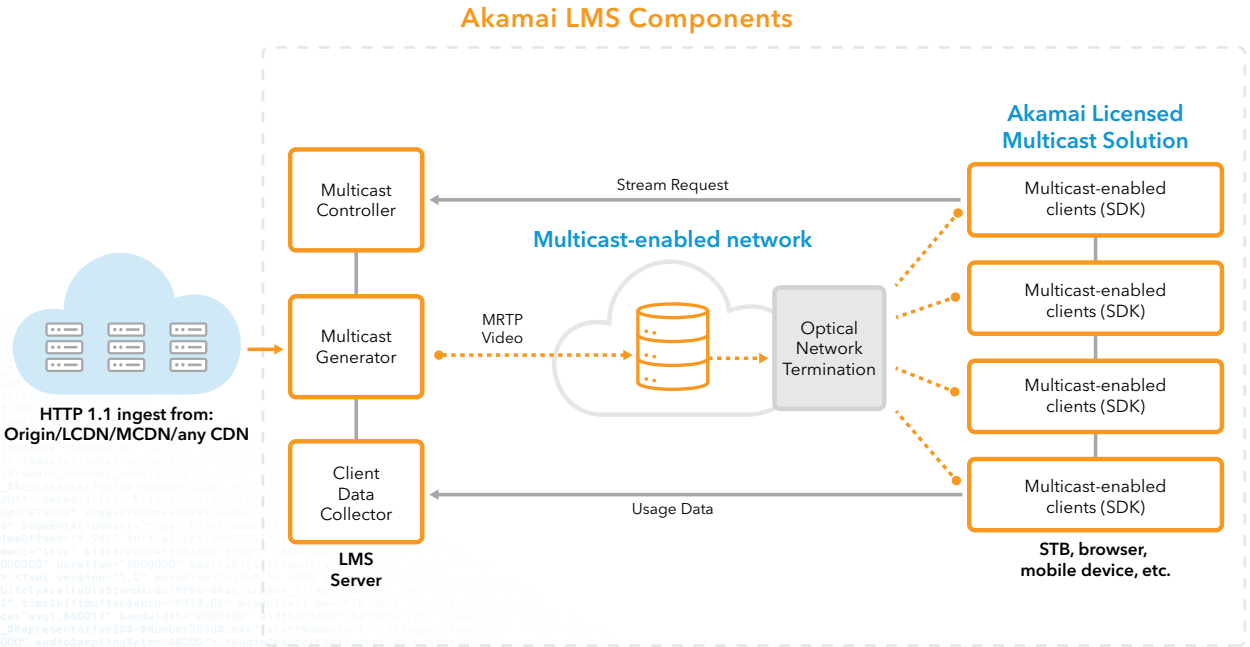
As shown in the diagram below, LMS server-side software consists of three elements:

- MULTICAST CONTROLLER (MC) – The MC provides LMS resource allocation and control functions; it creates stream maps based on client requests to "join" multicast-assisted streams and provides addressing and other information to the Multicast Generator

- MULTICAST GENERATOR (MG) – The MG ingests video from an origin or CDN and delivers it to the client via a multicast-enabled network, packing and encapsulating the video segments according to information received from the MC

- CLIENT DATA COLLECTOR (CDC) – The CDC is responsible for collecting usage and other data from multicast clients and serving the aggregated data to AAS, billing systems, and other operational and business support systems

The LMS client-side software consists of a software development kit (SDK) that integrates with the media player and is installed on the end device (set-top box, etc.). To "join" multicast-assisted streams, households or businesses whose end devices are configured with LMS client software simply select a multicast-delivery-enabled channel.



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Key Capabilities

- STANDARDS-BASED – Uses industry-standard IGMPv3 multicast protocols
- FLEXIBLE AND OPEN – Can be added to any unicast CDN (may require third-party business agreements) or used as an optional component of Aura LCDN.
- LOW-LATENCY DELIVERY – Deeply deployed nodes convert unicast streams to multicast
- VERSATILE CLIENT – Easy-to-implement client SDK for operator-managed set-top boxes
- SEAMLESS NETWORK INTEGRATION – Uses existing multicast-enabled access network routing infrastructure
- NFV-READY – Deployable as a virtualized network function (VNF) on virtualized infrastructure
- MANAGEMENT – Uses AMC and AAS
- ANALYTICS – LMS operator uses AAS to aggregate and display usage data from LMS clients — critical for performance measurement and resource planning

Advantages

- UNIQUE SOLUTION TO COMMON SCALING/COST PROBLEM

  When last mile network capacity becomes an issue, a common response is to increase capacity by adding hardware to customer-facing edge routers. While doing so is certainly one solution, router upgrades or new build-outs can be costly. Applying proven IP multicast technology to emerging use cases is a practical and cost-effective way to get the most from existing network resources.

- DOES NOT REQUIRE MULTICAST MANAGEMENT IN NETWORK CORE

  Configuring and managing an end-to-end multicast network requires significant planning and effort, including the reconfiguration of servers, routers, and other first mile and mid mile resources. With Akamai LMS, only the last mile network requires multicast configuration and management; the LMS server ingests unicast streams and converts them to M-ABR. This greatly simplifies end-to-end workflow in addition to preserving valuable last mile resources.

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- **SUPPORTS OFF-NET DELIVERY**

  Like all of Akamai's dedicated video delivery solutions, Akamai LMS is capable of re-mapping video content to the global Akamai Intelligent Edge Platform. This is ideal for scenarios in which subscribers request content from outside their home service provider's footprint, or in scenarios where additional CDN resources may be needed to ensure guaranteed delivery.

- **COMMON MANAGEMENT FRAMEWORK WITH AURA LCDN**

  For video services currently based on unicast delivery via Akamai Aura LCDN, adding multicast delivery via Akamai LMS represents a relatively seamless management integration; AMC manages both solutions. This not only reduces time-to-deploy, it also eases learning curves and impacts on OpEx.

- **OPTIONAL AURA LCDN COMPONENT, UNICAST CDN-COMPATIBLE**

  Because not all content requires M-ABR, operators can continue to leverage existing unicast CDNs for delivery of most content, adding Akamai LMS specifically for channels used to broadcast high-audience live content such as sporting events, breaking news, or highly anticipated episodes of popular television series (i.e., season premieres and finales). The option to use Akamai LMS within the framework of an Aura LCDN deployment adds OpEx savings through common management, analytics, and user interface.