



Optimizing the Economics and Performance of Online Video

by Tom Carroux, MediaMelon

The economics of distributing videos online is challenging for many publishers. Consumers expect a high quality video experience, especially if the video content is accompanied by advertising or requires some form of payment. Online video publishers typically operate their own origin servers or store their videos with cloud storage services such as Amazon S3, and then use Content Delivery Networks (CDNs) to accelerate delivery of those videos to viewers. Origin servers by themselves offer low delivery costs but face constraints such as server and bandwidth limitations that can result in a poor-quality video experience.

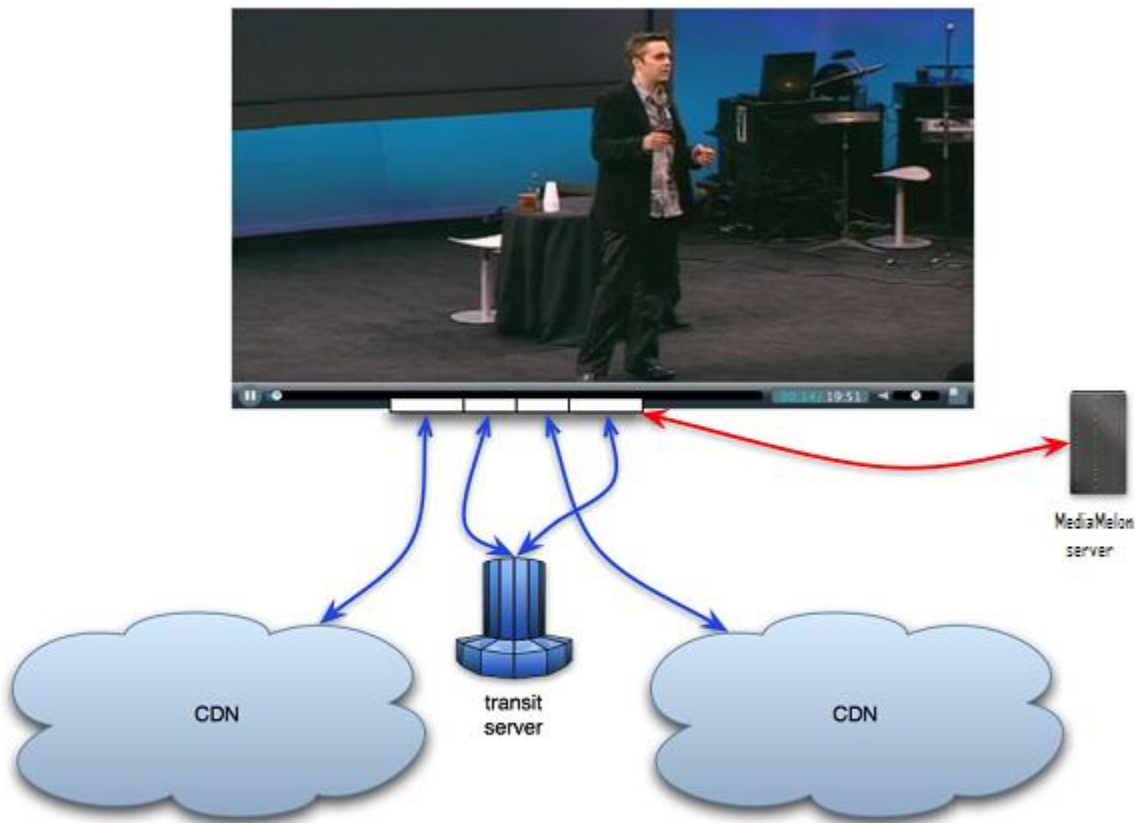
CDNs deploy their own server infrastructure so that publishers do not need to directly make significant investments in Internet-related fixed assets. However, not all CDNs are the same. CDNs vary in terms of their specific service offerings, geographic reach and pricing. Some CDNs use algorithms and negotiate peering relationships to minimize traffic congestion which can result in fast, reliable but expensive delivery of videos. Other CDNs offer to deliver videos inexpensively but may lack quality-of-service guarantees. There is an unmet need in the industry to manage various video delivery sources to maximize performance and minimize cost on behalf of publishers.

MediaMelon, as a software-enabled Video Overlay Network, is focused on serving that need. MediaMelon monitors the performance of every individual video delivery and dynamically sources each segment of the video, as the video is playing, from origin servers, CDNs and other last mile nodes to obtain the best viewing quality at low delivery costs, without changes to a publisher's existing workflow. MediaMelon can be deployed as a hosted service interfacing with a video publisher's existing CDN and delivery system, or alternatively, MediaMelon, via its partnerships with CDNs and Tier-1 backbone networks, can directly deliver videos for publishers.

Multiple Source Adaptive Streaming

When a publisher provides MediaMelon with video titles for online distribution via FTP or HTTP, or provides access to their origin or storage servers, MediaMelon indexes the videos, stores them in MediaMelon's Tier-1 data centers as needed, and makes them available to CDN partners such as Velocix and Edgecast for storage on their servers.

Every time a viewer clicks a link to watch a video online, MediaMelon recognizes the viewer's location and the available bandwidth and then selects from multiple delivery sources the highest quality video that matches the viewer's network connection. This process of sourcing and delivering video is dynamic and works in real-time while the viewer is watching the video. As available bandwidth fluctuates, MediaMelon requests and delivers sections of video at higher or lower bit rates, as necessary. MediaMelon is able to deliver video at bit rates varying from 300 kbps to 5Mbps in the following formats: H.264/FLV, H.264/MP4 or VP6/FLV.

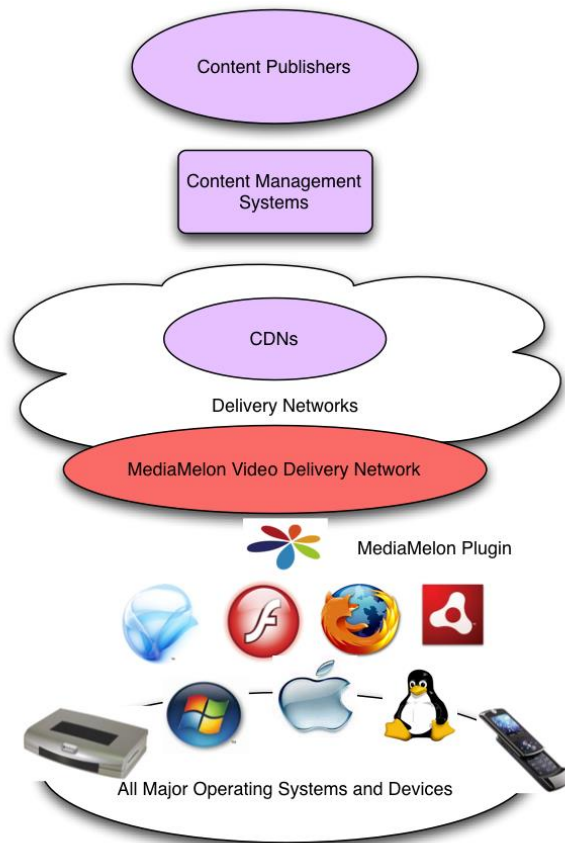


Multiple Source Delivery

Compatible with Flash and Silverlight

The key to MediaMelon's ability to provide multiple source adaptive streaming is the use of SWF files that are compatible with Flash and Silverlight and do not require a consumer to download or install additional software. These SWF files provide real-time data to MediaMelon's servers to help coordinate delivery of a specific video to an individual viewer. MediaMelon's SWF files are based on standard video player frameworks and standard APIs (using ActionScript 2, ActionScript 3 and Flex) and work seamlessly with popular video players such as Flowplayer, JW Player and thePlatform.

Alternatively, a publisher can use a hosted player available from MediaMelon that can be customized with a publisher's logo and brand identity. These MediaMelon players also offer embeddable links for sharing videos to social networks, blogs and third-party web sites.



MediaMelon Integration with Multiple CDNs and Multiple Video Players

Not only is MediaMelon able to deliver video from multiple sources, MediaMelon's Dynamic Content Assembly™ enables a publisher to configure performance and cost parameters to optimize delivery of the highest quality video at the best price.

The following types of videos can be delivered:

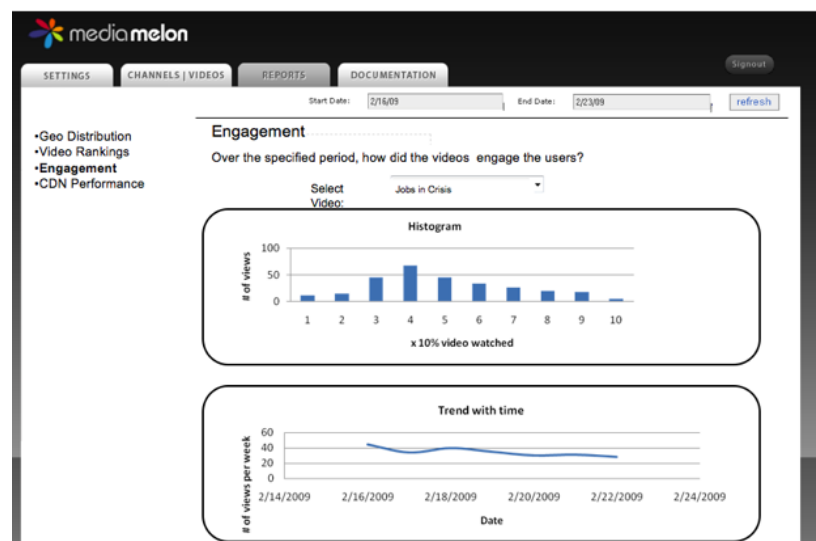
1. Streaming and progressive downloads via HTTP.
2. Live streaming via HTTP, RTP and RTMP.
3. Encrypted downloads that play full-screen even when offline.

Additional Benefits

MediaMelon's Video Overlay Network provides video publishers with significant benefits that improve the online video experience.

- **Performance.** MediaMelon sources video from the CDN node closest to the viewer to accelerate response times and minimize buffering.
- **Reliability.** Multiple CDNs can accommodate unexpected traffic peaks, expand geographic reach and provide redundancy in case one network experiences congestion or outages.

- **Flexibility.** MediaMelon's management platform enables switching from one CDN to another, as well as switching between CDNs, origin servers and last mile nodes.
- **Quality.** MediaMelon automatically recognizes the viewer's available bandwidth and seamlessly streams video, section by section, at the appropriate video bit rate to match the viewer's available bandwidth.
- **Scalable.** MediaMelon works well with both long-form videos and short clips, at high bit rates and low bit rates, for hugely popular live video flash crowds as well as niche, long-tail videos.
- **Viewer Data and Analytics.** MediaMelon accurately and anonymously reports individual viewing behavior to enable advertising, subscription and video-on-demand business models. Note that MediaMelon collects viewing data in sections rather than aggregating the data for the entire video; this level of detail provides analytics that can help make advertising more effective. Data is accessible via a password protected, MediaMelon-supplied, online dashboard. Analytics include:
 - Unique viewers
 - Videos viewed
 - Amount of video viewed
 - Time of viewing
 - Location of viewing
 - Bit rates and bandwidth utilized.



Viewer Engagement Analytics

- **Advertising Networks and DRM.** MediaMelon has integrated with advertising insertion platforms Adap.tv and Panache to access over 30 major advertising networks that offer overlay and pre-roll video advertisements. Subscription and video-on-demand programming is available with log-in passwords and digital rights management technology (that spans Windows, Mac and Linux operating systems) to ensure that video titles are made available to consumers according to the terms of a subscription or video-on-demand plan.

- **High-Definition Downloads.** Predictive Forward Caching™ is a technology developed by MediaMelon that delivers video titles (including high definition videos) over time for DVR-like playback on a consumer hard drive. This is ideal for the distribution of episodic television series, franchise movies and instructional videos where a consumer opts-in and creates an order list or queue of titles to view. Downloaded video titles can be viewed full-screen while off-line, for example, aboard a plane.

Driving Consumer Adoption

MediaMelon's ability to dynamically access and distribute video from multiple sources significantly improves the economics of delivering video online, while enhancements such as adaptive bit rate control, integration with state-of-the-art video players and Predictive Forward Caching™ helps make the online video experience more compelling for consumers. The overall objective of all of these technology initiatives is to enable publishers to more effectively manage their video assets and drive broader consumer adoption of online video.



About MediaMelon, Inc.

MediaMelon is based in San Francisco. Additional information is available at www.mediamelon.com. Tom Carroux can be reached at tom@mediamelon.com.
