

Streaming Video in the Fortune 500: WebCaster and Multicast Fusion on the Adobe® Flash® Platform

MediaPlatform worked closely with Adobe Systems and the client, a Fortune 500 company, on the pilot of multicast fusion on the Adobe® Flash® Platform. The challenge was to implement this breakthrough video streaming technology which had previously not been tested in a real world environment.

The Problem

Streaming video inside a corporate network can be challenging, especially when there are multiple remote sites and varying degrees of bandwidth across the enterprise. Our client, a Fortune 500 technology company, was an early adopter of streaming video for corporate communications and training. However, as internal demand grew for more live video, the company realized it wanted to move away from its use of the Real® video format and implement a new solution to stream to all of its locations around the globe. They needed a video streaming solution that would enable greater live streaming capacity without creating an undue burden on the corporate network infrastructure.

Solution Approach

Our client considered several options and decided to see if Adobe's new multicast fusion technology could help them solve their video network problem. The breakthrough of this technology is its ability to leverage both IP (Internet Protocol) multicast *and* application-level (peer-assisted) multicast to reach 100% of the users on a network without the need for a costly and time-consuming network upgrade. The company agreed to serve as the site for the first real world test of the Adobe® Flash® Media Enterprise Server 4 using MediaPlatform's WebCaster enterprise webcasting tool. In the process, we developed the world's first multicast fusion enabled Flash® player. The successful test illustrated how WebCaster and multicast fusion can transform the economics of enterprise video to become a true game changer, with the potential to revolutionize the next generation of corporate rich media. The arrival of this technology couldn't have come at a better time. Just as shifts in worker behaviors are driving increased video traffic on budget-constrained corporate networks, multicast fusion offers a solution that eliminates the usual tradeoffs between video consumption and network investment. On paper, all of the new benefits of multicast fusion sound impressive. However, no one really knew how well it would work until it was implemented in a real-world, global corporate environment.

“We’re a big company, worldwide and complex – but one thing that everyone was super clear on was this: We needed a lot more video capacity without any major disruptions to the existing network infrastructure.”
- Webcast Director

The Test

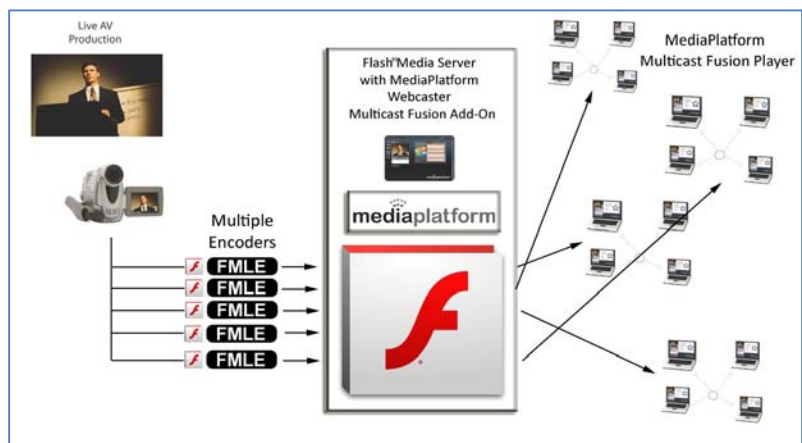
To test multicast fusion, MediaPlatform, an early advocate of Flash® and Flex®-based webcasting applications, worked with Adobe® on the development of the industry's first enterprise-grade multicast fusion streaming player. As part of the player development process, MediaPlatform decided to commit to working within Open Source Media Framework (OSMF) standards. Adobe® founded OSMF as an open software framework for building feature-rich video players and applications based on the Adobe® Flash® Platform.

Stakeholder groups within the client had different needs and expectations for enterprise video that varied with their roles. The line-of-business people MediaPlatform worked with wanted the highest possible video quality wherever possible and a smooth transition from Real® to Flash®. They were most concerned about latency and performance and anything else that could potentially affect the quality of an online event for viewers or executive presenters. In addition to quality concerns, they wanted video to be as pervasive in the organization as possible. The IT department, however, had a different agenda for the test. The most critical issue they wanted to address was the ability for the entire organization to access and watch videos on the Flash® platform using IP multicast without causing network failures. The IT department wanted to make sure the new solution was comparable or better than their current ability to IP multicast using Real® technology. Another challenge of the test was the fact that it occurred during the middle of a major network upgrade project. However, we were able to work around the project so that the test would not cause any adverse network traffic patterns.

Our test solution needed to accommodate three factors that were important to our client:

- **Multicast Flash® streaming comparable to current multicasting of Real® streaming** – moving from Real as a delivery mechanism to Flash while still being cost effective.
- **Primary and backup streams** – The video signal required a backup stream in the event that the primary stream became unavailable.
- **Streaming from multiple studios** – Our client also wanted to be able to originate a video signal anywhere in the world and have it stream easily to any location, without any network performance issues or latency.

Our test solution resembled the high level overview shown in the figure. We started with the original video signal from the live event, which we sent to a battery of Adobe® Flash® Media Live Encoders for encoding in different bitrates. Each encoder could be set up for different language versions of the video, with each language stream encoded with a different audio track. Since this was not a requirement in this case, we did



High level overview of MediaPlatform's approach to testing multicast fusion.

not fully test it. Flash® Media Server, running with MediaPlatform's software, organized the streams appropriately and made them available to viewers using MediaPlatform's OSMF-based multicast player, WebCaster.

With multiple encoded streams hitting the server, the key to making multicast fusion work is to take advantage of MediaPlatform's capacity to make a quick match between each player and the appropriate stream. In a process that is completely invisible to the end user, MediaPlatform's software is able to connect viewers with a Flash® stream that is configured for their language and location. When viewers are invited to participate in the test, they receive a link to a Web page that contains our WebCaster player. The player is set up to transmit the viewer's network location and language preference to the instance of MediaPlatform's software running on top of Flash® Media Server. Using a table of IP addresses and correlated multicasting factors, MediaPlatform's software is able to match each player with the correct type of stream. In the actual test, one language was tested and video was successfully viewed by all participants in Flash® without causing network performance issues.

The multicast fusion test was a success. A high quality video stream was able to efficiently flow through the network with bandwidth usage amazingly and unexpectedly low. Audiences involved in the test were pleased with the quality of the video and the business stakeholders in the media production department were elated that they now had the ability to produce content in Flash®. This test proved that video could now reach the entire internal audience while also be simultaneously usable for the external Web through an alternative to Real® multicast streaming.

About MediaPlatform, Inc.

MediaPlatform, Inc. delivers best-in-class webcasting and media management technology to global enterprises and digital media producers. MediaPlatform's webcasting software enables high-impact presentations for lead generation, corporate communications and training. The company offers organizations the ability to take advantage of scalable cloud-based computing, as well as on-premises deployment, to present and manage rich media. With media management tools built on its platform, the company helps clients derive long term archive value from their investment in media content.

www.mediaplatform.com www.twitter.com/Webcaster

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Technical Detail of the Multicast Fusion Test at the Fortune 100 Corporation

Included in MediaPlatform's Webcaster software is the ability to generate a "Webcast Presentation Page", sometimes referred to as "The Player". This is the web page that audience participants visit in order to view the audio/video and any other associated media/interactivity of an actual live (and on-demand) event. Embedded on this page is a Flash SWF that we call "The MediaPlatform Flash Video Player" (MFVP). The MFVP is written by MediaPlatform and is based on the Open Source Media Framework (OSMF). MFVP extends OSMF by adding:

- 1) A very configurable/manageable multicast fusion plugin. This enables the player to play both ip-multicast and peer-assisted multicast based streaming media.
- 2) Advanced statistic gathering and reporting on a wide variety of measures from how data was received (multicast/unicast) to quality of experience.
- 3) Overlay abilities to show posters and messages.
- 4) Server negotiation to determine which stream to play. This ability can be used to serve different streams to different groups of audience participants based on a wide variety of parameters. For instance, this can be used to define a rule to serve the French Language stream to people from France and the English Language stream to people from the U.S. Another example would be to send different bandwidth streams to different sets of participants.
- 5) Advanced security rules and backend integration. These features enable the player to enforce configurable security rules before playing media from the server.

The tests leveraged Webcaster (and the MFVP) in the following way:

- 1) Webcaster was used to provision the event.
- 2) A Flash Media Server behind the firewall was setup and configured with MediaPlatform's Flash Media Server Applications.
- 3) Rules were configured on the MediaPlatform Flash Media Server-Based Application, which were running on the internal Flash Media Server servers. These rules were set up to detect IP addresses and to use this information to determine whether a unicast or multicast stream should be used. This enabled us to force VPN users to pull a unicast stream in order to protect the VPN concentrator from overloading.
- 4) A diagnostics page was configured and sent all invited audience participants. The tests began with people clicking these links in order to make sure everyone's system was going to be able to participate in the event.

We ran two tests. One test originated from the client's studios and the other from their legacy studios. Audience participants were asked to go to the same page and watch the live event. Those on VPN were automatically pulling a unicast version of the stream. The others became part of a dynamically formed multicast fusion overlay network from which they streamed the live event. While this was going on, MediaPlatform was monitoring the real time statistics of the Flash Media Server servers, the MediaPlatform Webcaster servers, and the MFVP statistics coming back from each audience participant. The IT department was monitoring network statistics (using Wireshark and more) to ensure that there was no negative impact on their network.