

RUcore Feature Request: Use AAC Audio Coding for Sound Objects, for HTML5 support

Web Browsers are taking action to discourage the use of Adobe Flash in Web Content, requiring that we implement MP3's successor format to leverage HTML5 technologies

Summary

This request is to make a change in RUcore sound playback functions to favor the use of HTML5-compliant Advanced Audio Coding (AAC) as our playback method for audio objects, by default. AAC is the successor format to MP3 – the current format used by RUcore – which is incompatible with the updated streaming method we would need to use to play back audio.

Statement of Problem

Recent changes to the major web browsers, including Mozilla Firefox, Google Chrome, Apple's Safari Desktop browser, and Microsoft's Edge web browser (successor to Internet Explorer, which has been discontinued by Microsoft) have eliminated the default setting that allows video and audio to play in Adobe Flash. These browser changes were based on security concerns surrounding the use of web plugins (in particular, Adobe Flash).¹

Starting with versions of web browsers released in late 2016, most patrons using a desktop computer must take extra steps to view or listen to video and audio objects. Most users are unaware of these steps and experience a failure of the video or audio object to play. Further, Adobe itself has announced an end-of-support date for Flash, at the close of the year 2020.² We presently make use of Adobe Flash for streaming media content in RUcore to desktop browsers.

Outcome

Switching to HTML5 as our default playback method will allow the user experience to improve. However, completing the switchover to modern HTML5 standards requires that we migrate away from using MP3 for audio content, in favor of AAC.

Migrating to HTML5

Enabling HTML5 playback requires that we update our JWPlayer system to the latest version of this software, in order to leverage its updated abilities to prefer newer technologies over Flash. This update also requires that the content we present for streaming to patrons is formatted to modern standards.

In developing our current repository software, we have already taken the first step towards modernizing media playback: video content is played using MPEG 4 H.264 streaming protocols. This was enabled to better serve users of mobile devices such as smartphones and

¹ Boyd, E (2016). "HTML5 by Default – The Deprecation of Flash in Major Browsers." JWPlayer Solutions Blog. Retrieved July 28, 2017 from <https://www.jwplayer.com/blog/deprecation-flash/>

² Adobe Corporate Communications (2017). "Flash & the future of interactive content." Adobe News Blog, July 25, 2017. Retrieved July 28, 2017 from <https://blogs.adobe.com/conversations/2017/07/adobe-flash-update.html>

tablets, most of which never supported Flash-based web content. At least for video, a switch to favoring HTML5 web standards can readily be achieved, as careful digital curation efforts ensured that our presentation files have been ready for the transition for several years.

However, in testing for the JWPlayer update, developers ran across a stumbling block: our audio resources have presentation files that are encoded in the MP3 format. MP3 has been ubiquitous and widely-used for audio files for 24 years. Its design, however, was as a stand-alone file format, and streaming of MP3 music, while possible, has required the use of workarounds and older technologies. The new HTML5-based JWPlayer solution instead requires that the audio be streamed in the newer AAC format, and does not stream MP3 files.

AAC Format: Specifications and Benefits

Advanced Audio Coding is a standardized ([ISO/IEC 13818-7](#), [ISO/IEC 14496-3](#)) audio format intended to improve upon MP3 and older audio file types. It is a more efficient method for encoding audio, and was designed with a consideration for web-based streaming to portable devices. As a result, many mobile devices and newer computers are designed with AAC playback capabilities built into the hardware, and AAC becomes a commonly used audio streaming format.

In migrating our audio streaming to AAC, patrons will see the following benefits:

- **Quicker streaming times, less data usage:** AAC will allow more efficient sound files to be created, files that take up less space and can be streamed over slower data connections.
- **Potentially better sound quality:** With some care, repository software can be configured to use more advanced sound encoding methods that yield a better sound playback.
- **Quicker availability of resources:** AAC encoders are much faster at creating sound files than the older MP3 encoder we currently use. Preliminary testing indicates that a large WAV audio file can be encoded into an AAC file in one-third the time it takes to create a comparable-quality MP3 file. The AAC files also take up half the storage space of the MP3.

Next Steps

Implementing this change will require some development, and some specific tasks are necessary:

- Install updated software libraries on repository servers, in order to create AAC sound files from uploaded WAV content
- Configure the Workflow Management System (WMS) to accept user-created AAC files, in addition to making use of the new encoding software
- Generate AAC sound files for existing sound objects in RUCore (267 as of this writing) from their archival preservation streams, to permit their playback with the updated JWPlayer software.
- Update the JWPlayer software to the current version; create updated disseminators to accommodate the format change.

Isaiah Beard 2017-07-28