

# Web Media Programming

## Video/audio in the web browser, Media Stream, Web Audio API, Audio Graph, Nodes, Codecs, Project

A modern user experience requires content in a multitude of formats, including audio and video. As measured by bandwidth, audiovisual media content is the most popular type of content on the web. Media plays a very important when showing products at trade shows, at sales presentations, use of a deployed product, training, support and more. Web application developers need a clear understanding of how media on the web works, how to program against the exposed media APIs, how to choose codecs and how to incorporate media functionality as one (important) part of a larger user-facing web application.

The goal of this wide-ranging course is to help experienced web application developers become web media programmers. Media functionality can be added to new & existing web applications in a number of ways, often with a surprisingly small amount of code (the hard work has already been done inside the browser itself).

This course also covers some of the more recent additions to web media programming, such as the new Web Audio spec, the AV1 codec, and the Media Recorder API; along with the recent evolution of the existing web media specs.

<b>Contents of One-Day Training Course</b>	
<p><b>Target Audience</b> Web application developers who wish to quickly add rich media capabilities to their existing web applications.</p> <p><b>Prerequisites</b> Experienced web application developers with at least a high-level understanding of media concepts from a programming viewpoint.</p> <p>All sample code will be in TypeScript, so attendees need to know how to program in that language.</p>	<p><b>Web Media Ecosystem</b> Overview of media on the web - web servers, web browsers, proxies Importance of CDNs Media and .. RTC, apps, offline, ++</p> <p><b>Protocols for Streaming</b> How server can send media to browser Overview of protocols – RTSP, RTMP, RTP/RTCP and more Security and media</p> <p><b>HTML Element For Media</b> HTML &lt;video&gt; tag and attributes HTML &lt;audio&gt; tag and attributes (autoplay, loop, muted, preload, ..) HTML [Video Audio]Element and their parent, HTMLMediaElement MIME types for media</p> <p><b>MediaStream</b> How media streams work in the browser How tracks work MediaStream interface MediaStreamTrack interface</p> <p><b>Capture</b> Capturing the user's media devices (with permission) The getUserMedia () call Detailed configuration options</p> <p><b>Media Recording API</b> The MediaRecorder object The dataavailable event How to programmatically record audiovisual media streams</p>
	<p><b>Web Audio Overview</b> Purpose and features of Web Audio A very comprehensive audio architecture AudioContext Channels What is an audio graph? Use of nodes for source/filter/compression</p> <p><b>Advanced Web Audio</b> Context options Spatial (PannerNode for 3D positioning) Audio worklets Handling the ended event Splitting and merging Audio generation</p> <p><b>Offline Web Audio</b> OfflineAudioContext and audio buffers Audio in the background</p> <p><b>Codecs</b> Web application developers are unlikely to write their own codec for production use (maybe do it for curiosity) - unless huge effort invested, custom code will not be competitive with mainstream options However, web devs do need high level understanding of codecs usage and choice We focus on <a href="#">AV1</a> video codec and <a href="#">OPUS</a> audio codec, often used together</p> <p><b>Project</b> We create a larger web project with audio and video functionality as one part of a multifaceted experience and investigate how the interaction between the media &amp; non-media sides can best be structured</p>