Web Audio API main topic

Reference: <https://developer.mozilla.org/en-US/docs/Web/API/Web_Audio_API>

The Web Audio API provides a powerful and versatile system for controlling audio on the Web, allowing developers to choose audio sources, add effects to audio, create audio visualizations, apply spatial effects (such as panning) and much more.

Basic audio operations are performed with **audio nodes**, which are linked together to form an **audio routing graph**. Audio nodes are linked into chains and simple webs by their inputs and outputs. They typically start with one or more sources. Sources provide arrays of sound intensities (samples) at very small timeslices, often tens of thousands of them per second.

These could be either computed mathematically (such as [OscillatorNode](https://developer.mozilla.org/en-US/docs/Web/API/OscillatorNode)), or they can be recordings from sound/video files (like [AudioBufferSourceNode](https://developer.mozilla.org/en-US/docs/Web/API/AudioBufferSourceNode) and [MediaElementAudioSourceNode](https://developer.mozilla.org/en-US/docs/Web/API/MediaElementAudioSourceNode)) and audio streams ([MediaStreamAudioSourceNode](https://developer.mozilla.org/en-US/docs/Web/API/MediaStreamAudioSourceNode)).

Outputs of these nodes could be linked to inputs of others, which mix or modify these streams of sound samples into different streams. A common modification is multiplying the samples by a value to make them louder or quieter (as is the case with [GainNode](https://developer.mozilla.org/en-US/docs/Web/API/GainNode)).

Once the sound has been sufficiently processed for the intended effect, it can be linked to the input of a destination ([AudioContext.destination](https://developer.mozilla.org/en-US/docs/Web/API/AudioContext/destination)), which sends the sound to the speakers or headphones.

A simple, typical workflow for web audio would look something like this:

1. Create audio context
2. Inside the context, create sources — such as <audio>, oscillator, stream
3. Create effects nodes, such as reverb, biquad filter, panner, compressor
4. Choose final destination of audio, for example your system speakers
5. Connect the sources up to the effects, and the effects to the destination.

Defining audio sources

[**AudioBufferSourceNode**](https://developer.mozilla.org/en-US/docs/Web/API/AudioBufferSourceNode)

The **AudioBufferSourceNode** interface represents an audio source consisting of in-memory audio data, stored in an [AudioBuffer](https://developer.mozilla.org/en-US/docs/Web/API/AudioBuffer). It is an [AudioNode](https://developer.mozilla.org/en-US/docs/Web/API/AudioNode) that acts as an audio source. Objects of these types are designed to hold small audio snippets, typically less than **45 s**. For longer sounds, objects implementing the [MediaElementAudioSourceNode](https://developer.mozilla.org/en-US/docs/Web/API/MediaElementAudioSourceNode) are more suitable.

[**MediaStreamTrackAudioSourceNode**](https://developer.mozilla.org/en-US/docs/Web/API/MediaStreamTrackAudioSourceNode)

A node of type [MediaStreamTrackAudioSourceNode](https://developer.mozilla.org/en-US/docs/Web/API/MediaStreamTrackAudioSourceNode) represents an audio source whose data comes from a [MediaStreamTrack](https://developer.mozilla.org/en-US/docs/Web/API/MediaStreamTrack). When creating the node using the [createMediaStreamTrackSource()](https://developer.mozilla.org/en-US/docs/Web/API/AudioContext/createMediaStreamTrackSource) method to create the node, you specify which track to use. This provides more control than MediaStreamAudioSourceNode. The **MediaStream** interface represents a stream of media content. A stream consists of several **tracks** such as video or audio tracks. Each track is specified as an instance of [MediaStreamTrack](https://developer.mozilla.org/en-US/docs/Web/API/MediaStreamTrack).

## **Load an audioTrack:**

The MediaElementAudioSourceNode interface represents an audio source consisting of an HTML5 [<audio>](https://developer.mozilla.org/en-US/docs/Web/HTML/Element/audio) or [<video>](https://developer.mozilla.org/en-US/docs/Web/HTML/Element/video) element. It is an [AudioNode](https://developer.mozilla.org/en-US/docs/Web/API/AudioNode) that acts as an audio source.

A **MediaElementSourceNode** has no inputs and exactly one output, and is created using the [AudioContext.createMediaElementSource()](https://developer.mozilla.org/en-US/docs/Web/API/AudioContext/createMediaElementSource) method.

The **HTML <audio> element** is used to embed sound content in documents. It may contain one or more audio sources, represented using the src attribute or the [<source>](https://developer.mozilla.org/en-US/docs/Web/HTML/Element/source) element: the browser will choose the most suitable one. It can also be the destination for streamed media, using a [MediaStream](https://developer.mozilla.org/en-US/docs/Web/API/MediaStream).

Esempio:

<audio id=AudioSurce>

<source src= "*C:\Users\david\Documents\Il\_mio\_mondo\Corsi Università\Magistrale\PrimoSemestrePrimoAnno\Advanced Coding tool and metodologies\La\_La\_Land\_City\_of\_Stars\_Lofi\_Hip\_Hop\_Version" type="audio/mpeg*">

Your browser does not support the audio tag.

</audio>

Defining audio destinations

Once you are done processing your audio, these interfaces define where to output it.

[**AudioDestinationNode**](https://developer.mozilla.org/en-US/docs/Web/API/AudioDestinationNode)

The **AudioDestinationNode** interface represents the end destination of an audio source in a given context — usually the speakers of your device. The AudioDestinationNode of a given AudioContext can be retrieved using the [AudioContext.destination](https://developer.mozilla.org/en-US/docs/Web/API/AudioContext/destination) methods.

[**MediaStreamAudioDestinationNode**](https://developer.mozilla.org/en-US/docs/Web/API/MediaStreamAudioDestinationNode)

The **MediaStreamAudioDestinationNode** interface represents an audio destination consisting of a [WebRTC](https://developer.mozilla.org/en-US/docs/WebRTC) [MediaStream](https://developer.mozilla.org/en-US/docs/Web/API/MediaStream) with a single AudioMediaStreamTrack, which can be used in a similar way to a [MediaStream](https://developer.mozilla.org/en-US/docs/Web/API/MediaStream) obtained from [getUserMedia()](https://developer.mozilla.org/en-US/docs/Web/API/MediaDevices/getUserMedia). It is an [AudioNode](https://developer.mozilla.org/en-US/docs/Web/API/AudioNode) that acts as an audio destination.