

XR Media & 3D Scenes

MPEG (ISO/IEC)

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About the project

Composing, positioning, and temporally synchronizing dynamic 3D visual and audio objects for XR

ISO/IEC 23090-14

MPEG standard

MPEG-I Scene Description: extensions to glTF 2.0 that enable the inclusion of timed media in a scene description.

ISO/IEC 12113

Khronos glTF 2.0

An open interoperable 3D asset format with a JSON scene description, which the MPEG-I Scene Description extensions build on.

3GPP TS 26.119

Technical Specification

Device media capabilities for AR services (MeCAR): device categories and the capabilities each supports, aligned with the OpenXR runtime API.

[FIND OUT MORE](#)

Technical Analysis

Specifications

Reference Tools

The scene description: ISO/IEC 23090-14

Overview and architecture of ISO/IEC 23090-14



Timed media in a scene

Features that describe how to get the timed media, and how a rendering process expects the data once it is decoded.

Extensions to glTF

The features are defined as extensions to the glTF format defined in ISO/IEC 12113.

Two interfaces

The MAF API and the Buffer API decouple the Presentation Engine from the Media Access Function.

Dynamic scenes

The scene description itself may change over time; the document defines how a change is signalled.

Carriage

Storage and delivery consistent with MPEG formats, using ISO/IEC 14496-12 and its derived specifications.

Advanced features

AR anchoring, interactivity, avatars and lighting; haptics and V3C objects.

Features

The extensions of ISO/IEC 23090-14 to glTF 2.0

Timed framework external and timed media

MPEG_media

MPEG_accessor_timed

MPEG_buffer_circular

Dynamic and temporal media media and timing

MPEG_texture_video

MPEG_audio_spatial

MPEG_mesh_linking

MPEG_scene_dynamic

MPEG_viewport_recommended

MPEG_animation_timing

Real-time immersive and interactive media real-world and interactive scenes

MPEG_anchor

MPEG_scene_interactivity

MPEG_node_interactivity

MPEG_node_avatar

MPEG_lights_texture_based

MPEG_light_punctual

MPEG_haptic

MPEG_primitive_V3C

MPEG_sampler_YCbCr

Declare the source

→

Bind into the scene

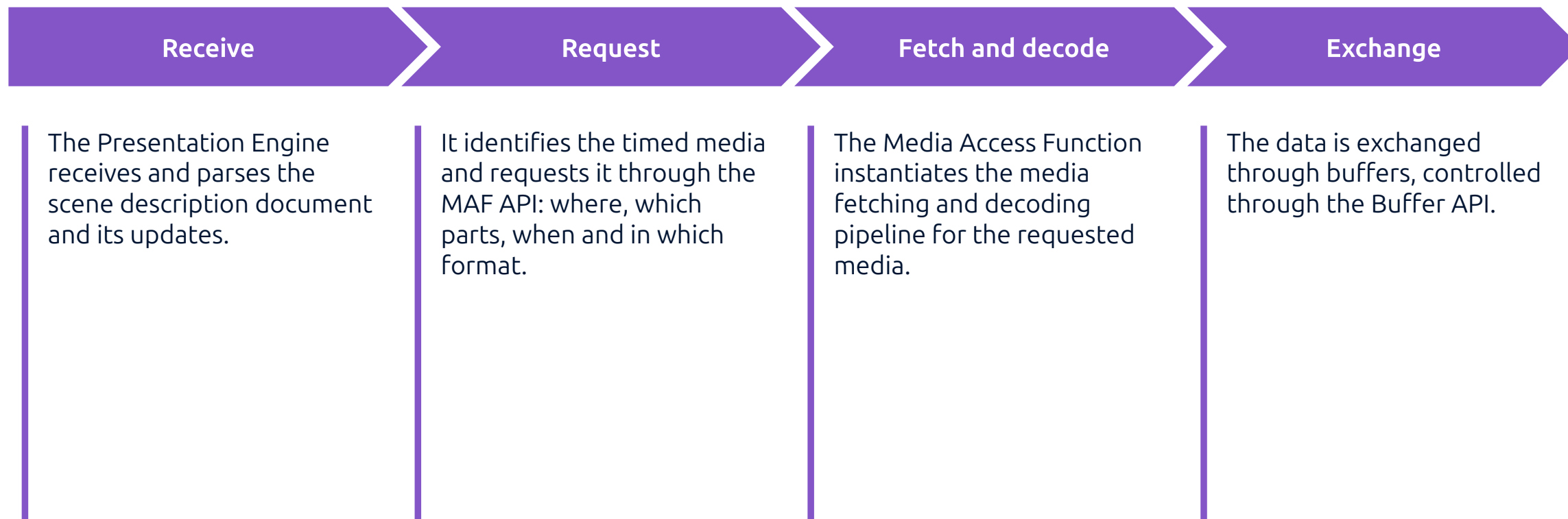
→

Timed accessors, circular buffers

Timed media reaches the renderer in three steps; the Presentation Engine never needs to know the transport or codec of a media object.

Architecture

Scene description reference architecture of ISO/IEC 23090-14



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Repositories

What each repository covers, from its README; six public repositories

REPOSITORY	WHAT IT IS	COVERS	LATEST RELEASE
rt-xr-unity-player	an XR-capable glTF scene viewer in Unity3D for the MPEG-I Scene Description extensions	Presentation Engine Extensions	v1.1.0 27 Feb 2025 GitHub
rt-xr-glTFast	a glTFast fork that parses the MPEG-I Scene Description extensions	Extensions	none yet GitHub
rt-xr-maf-native	the Media Access Function API, its C# bindings and media pipeline plugins	Media Access Function	none yet GitHub
rt-xr-maf-plugin	a Unity3D package of the build artifacts of rt-xr-maf-native	Media Access Function	none yet GitHub
rt-xr-content	reference scenes and media for testing and demos with the XR Player	Reference scenes	none yet GitHub
rt-xr-blender-exporter	a Blender add-on that adds the MPEG_* extensions to the glTF exporter	Authoring	v1.1.0 16 Apr 2025 GitHub

FIND OUT MORE

Technical Analysis

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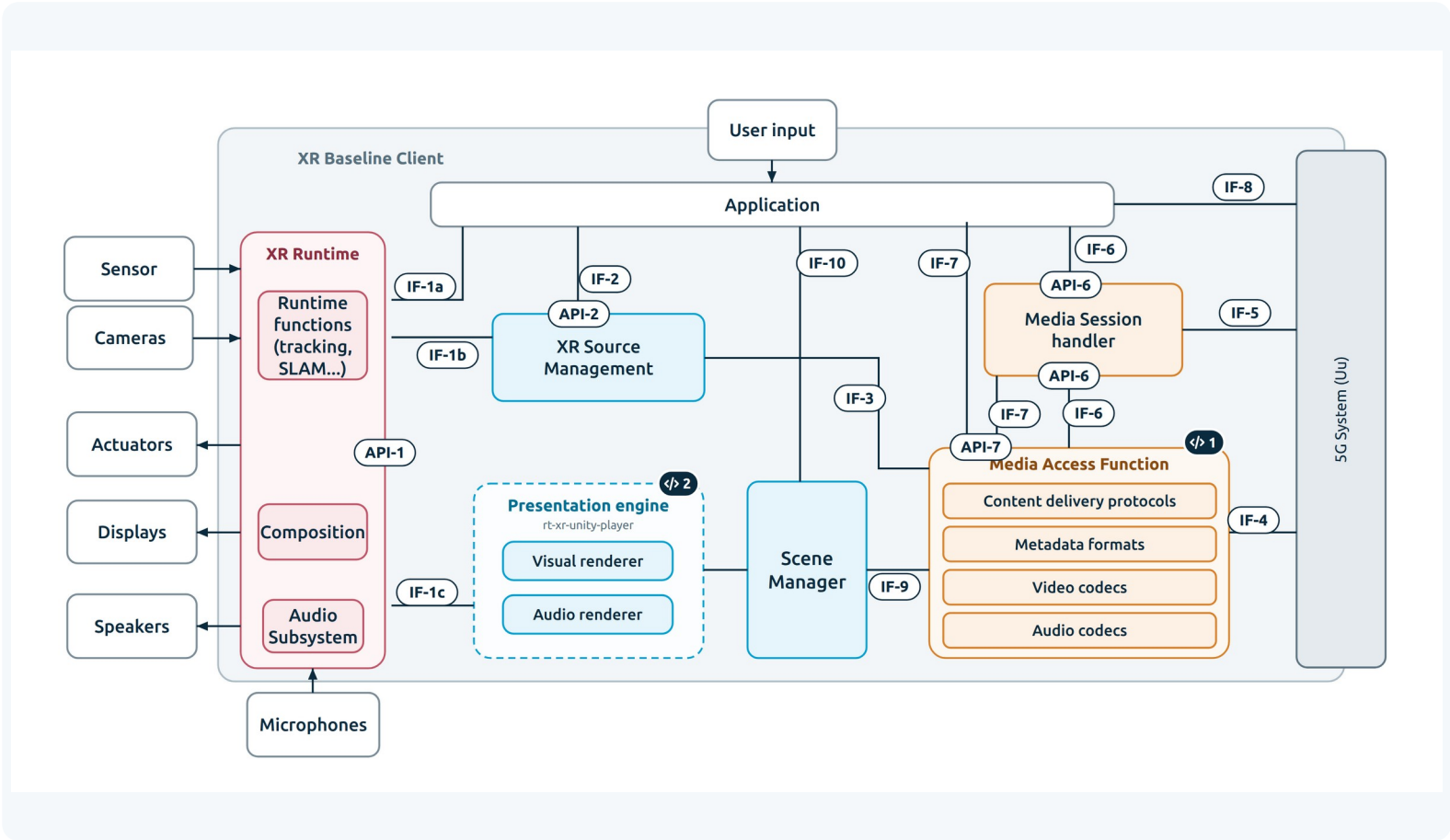
released

no release yet

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Repositories in the architecture

The Reference Tools on the specification figure, as the figure generator draws them



PROVIDED BY THE REFERENCE TOOLS

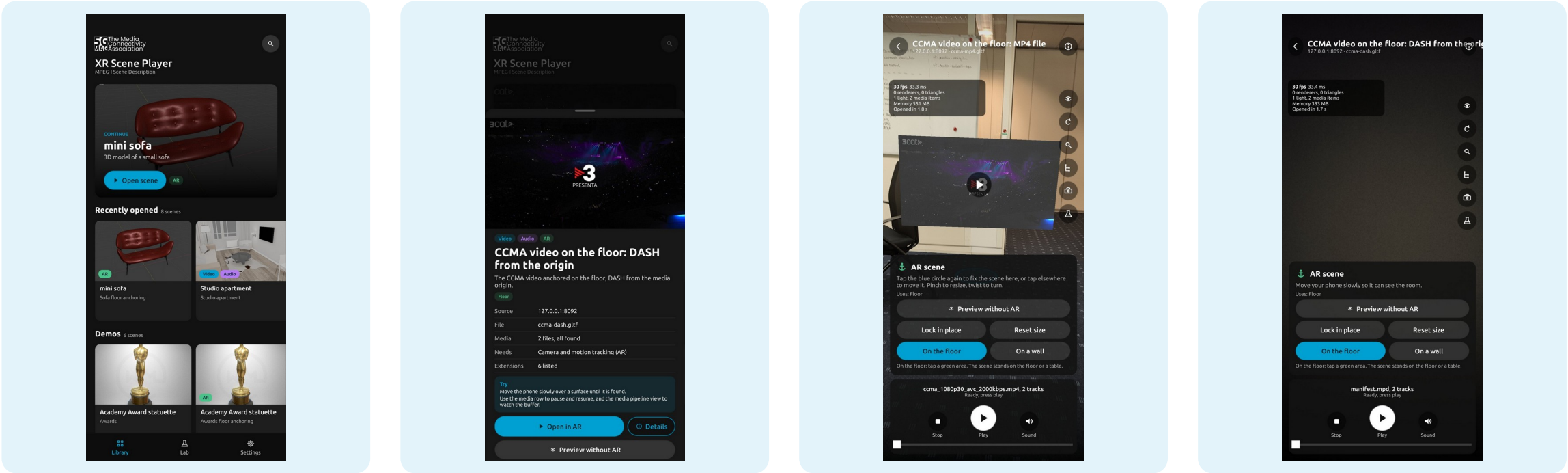
- 1 rt-xr-maf-native
- 2 rt-xr-unity-player
- 3 rt-xr-gITFast
dependency, used by 2

Boxes without a badge are not mapped to a repository.

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See it and try it

The XR Scene Player on an Android phone: pick a scene, open it in AR, control the media



Library

Scene details

A video scene on the floor

AR and media controls

CONTRIBUTORS

 **MOTION SPELL**

 **interdigital.**

 **Fraunhofer FOKUS**



Latest updates and roadmap

Status on 19 October 2026



MERGED SINCE V1.1.0 23 pull requests in 5 repositories

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