# ADM-OSC Specification

# Overview

Building upon the initial mapping structure proposed by L-Acoustic, a little more structure has been added along with a few additional concepts with the goal of not overly complicating a bi-directional translation between the two formats. In keeping with this philosophy, the overall structure and parameters have been split into two groups, core and extended. The core group is comprised of parameters that act directly upon objects, controlling dynamic parameters such as position, the group also contains all of the parameters from the original proposal. The extended group brings in parameters that further expand capabilities beyond the core live music use case while still retaining a flattened data model that can be easily traversed.

OSC has a flat tree/branch address structure that does not support symbolic referencing of other methods in an address space outside of the current branch. Because of this, unlike ADM (Audio Definition Model), the sharing of bed and object definitions across more than one programme branch is not possible. This can add some definition overhead due to components (such as a bed) being defined in each of the programmes it is used in rather than being referenced.

To keep the model simple, several key ADM parameters from different logical areas are collated together under a higher-level parent parameter group. A way to conceptualize how this will function is to think of the mapped ADM parameters conveyed via OSC as variables that then populate an existing ADM template that (if need be) is updated in real-time. The device receiving ADM-OSC is aware of what ADM template to use as it is also conveyed as part of the overall ADM-OSC metadata payload.

ADM-OSC is not intended to replace existing real-time methods such as S-ADM. It has been developed for use cases where the overhead of incorporating transport layers such ST 2116 and ST 2110 is not possible due to hardware limitations or complexity issues. The underlying protocol of ADM-OSC has several attractive benefits, it is widely deployed, has many openly available implementations, and is relatively simple to implement. The initial design supports a critical mass of music and broadcast related features. Where necessary, it has been aligned with the technical requirements detailed in the ITU AdvSS Emission Profile.

A comprehensive overview of ADM is available on the EBU website located at <https://adm.ebu.io/>

**Usage Example – Live Music Event**

One use case for ADM-OSC is illustrated in the diagram below. A secondary output from the console that is producing the live venue mix contains various audio elements that are passed along to a dedicated broadcast mixer. These elements could include a sub-mix and/or other key essential audio feeds required to recreate artistic intent. In addition to the essence, ADM-OSC describes the topology of what is being sent plus any additional live performance metadata, such as that created on-stage. The combination of essence and metadata to the broadcast mixer enables an opportunity to create a version of the live event that can been optimized for reproduction on devices found in the home.

# Graphical user interface, diagram Description automatically generated

# Technical Details

The following diagram pictorially represents the overall structure of the ADM-OSC address tree and how parameters map to ADM.

In the following diagrams and tables, the color scheme is:

* Blue - Parameters are core to that particular set
* Green - Optional parameters based upon the template being used



## OSC Element Structures + ADM/S-ADM/B-WAV

### ****ADM-OSC Parameter Mapping****

**Table-1 Parameter definitions**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| OSC Information | | | | | ADM Information | | | General | |
| Group | Path | Param | Type | Default | Element | Sub-element | Attribute | Notes |
| ****Object**** | ../obj/n/ | w | f | 0.0 | audioBlockFormat | width | - | When mapped to ADM, companion sub-elements depth and height are also included but set to 0.0 |
| x | f | 0.0 | position | X | Only be present if cartesian = 1 |
| y | f | 0.0 | Y |
| z | f | 0.0 | Z |
| xyz | fff |  | X, Y, Z |
| azim | f | 0.0 | position | azimuth | Only be present if cartesian = 0 |
| elev | f | 0.0 | elevation |
| dist | f | 0.0 | distance |
| aed | fff |  | Azimuth, elevation, distance |
| ../config/obj/n/ | chan | i | 1 | transportTrackFormat\* | audioTrack\* | trackID\* | For file-based ADM workflows the chan value is mapped to the wavefile chna data chunk. For real-time S-ADM applications the chan value is mapped to the listed elements and attributes. For use cases that use the shorthand method the chan parameter for each object is equal to the object index value, see Example-1: O3 |
| cartesian | i | 0 | audioBlockFormat | cartesian | - |  |
| name | s | 'Content\_n' | audioContent | - | audioContentName | Where ‘n’ is the object index value |
| lang | s | ‘und’ | - | audioContentLanguge |  |
| type | s | ‘O’ | dialogue | dialogueContentKind | Element and attribute values defined in Table-9 |
| gain | f | 0.0 | audioBlockFormat | gain | gainUnit="dB" | Depending upon the template being used, gain is mapped to either an individual audio channel or a higher-level object (which could reference a number of audio channels) |
| audioObject |
| ../config/obj/n/virt | bypass | i | 1 | audioBlockFormat | headLocked | - |  |
| drr | s | 130.0 | headphoneVirtualize | DRR |  |
| hlock | i | 0 | headLocked | Bypass |  |
| Bed | ../config/bed/n/ | chan | i | 1 |  |  |  | Start channel of bed |
| name | s | ‘Bed\_n’ | audioContent | - | audioContentName | Where ‘n’ is the bed index value |
| layout | i | 3 | audioObject | audioPackFormatIDRef | - | Value corresponds to the lower 8 bits of a common definition audioPackFormat, see Table-8 |
| gain | f | 0.0 | audioObject | gain | gainUnit="dB" |  |
| - | - | 2 | audioContent | dialogue | - | Mixed content |
|  | 0 | dialogueContentKind | Undefined content specifics |
| Template | adm/config/template/ | name | s |  | - | - | - | The template applies to all metadata compositions in the current preset path |
|  |  | version | s (x.x.x) |  |
|  |  | level | i |  |
| Version | adm/config/ | version | s (x.x.x) |  | - | - | - | The specification version that the ADM-OSC is compliant with |
| ShortConfig | adm/config/ | dprst | i | 1 | - | - | - | Shorthand mode specifies base preset |
|  |  | dprog | i | 1 | Shorthand mode specifies base programme |
| Programme | prog/n/config/ | name | s | ‘Programme\_n’ | audioProgramme | - | audioProgrammeName | Where n is the programme index value |
| lang | s | ‘und’ | audioProgrammeLanguage |
| prog/n/config/label/n/ | name | s |  | audioProgrammeLabel | - | Used for local language labeling |
| lang | s |  | language |

## Templates

Templates are placeholder XML based ADM compositions that contain boilerplate elements and attributes, each use case will comprise of one or more unique templates. Templates can either be predefined (already stored on the receiving device) or dynamically created following the receipt of an ADM-OSC payload that specifies the desired metadata topology. Specific element and attribute values are subsequently updated using the incoming mapped parameters conveyed by ADM-OSC metadata.

### Naming Syntax

The template name is used to describe the metadata topology. All the currently targeted use cases are combinations of individual objects, a single audio bed, or a single audio bed with one or more objects.

A string defines the metadata topology and is encoded as follows:

template\_name = <bed\_descriptor>+<object\_descriptor>

The '+' delimiter separates the left side bed\_descriptor and the right side object\_descriptor. If no delimiter is present, the composition can only contain a single bed\_descriptor or a single object\_descriptor, spaces are ignored.

**Table-2 Template name  encoding**

|  |  |  |
| --- | --- | --- |
| **Parameter** | **Value** | **Notes** |
| bed\_descriptor | 2.0 |  |
|  | 3.0 |  |
|  | 5.0 |  |
|  | 5.1 |  |
|  | 5.1.2 |  |
|  | 5.1.4 |  |
|  | 7.1.4 |  |
| object\_descriptor | O | Non-dialogue object, primarily used for music use cases |
|  | D | Dialogue object containing the main storyline |
|  | AD | Dialogue object (Audio description) containing a description of the video scene |
|  | SS | Dialogue object (Spoken Subtitle) |
|  | VO | Dialogue object (Voiceover) |

An accompanying integer value is required for each object\_descriptor that defines the quantity of that particular object type.

**Examples:**

O16: 16 non-dialogue objects

2.0: Stereo bed that could also contain premixed dialogue

5.1+D1: 5.1 clean bed (M&E) and one dialogue object, one language

5.1.4+D3+AD1: 5.1.4 clean bed (M&E) plus four dialogue objects, three languages plus audio description (linked to language one)

**Fixed Mix Bus Channel Order**

To keep things simple, for each template there is a fixed channel assignment that starts from an index of 1 in a contiguous block for conveying PCM essence. The channels are arranged in a specific order depending upon the template characteristics.

**Object Only Templates**

The first object is on channel index 1, subsequent objects are assigned to the next available channel.

**Bed Only Templates**

The first channel of the bed is on channel index 1.

**Bed + Object Templates**

The first channel of the bed is on channel index 1, objects are assigned to the next available channel following the bed.

**Bed Channel Order**

The channel names in the assignment column are the same as those defined in recommendation ITU-R BS.2051.

**Table-3 Bed channel configuration mapping**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **7.1.4 (layout = 0x17)** | | **5.1.4 (layout = 0x5)** | | **5.1.2 (layout = 0x13)** | | **5.1 (layout = 0x3)** | | **5.0 (layout = 0xc)** | | **3.0 (layout = 0xa)** | | **2.0 (layout = 0x2)** | |
| **Ch** | **Assignment** | **Ch** | **Assignment** | **Ch** | **Assignment** | **Ch** | **Assignment** | **Ch** | **Assignment** | **Ch** | **Assignment** | **Ch** | **Assignment** |
| 1 | Left | 1 | Left | 1 | Left | 1 | Left | 1 | Left | 1 | Left | 1 | Left |
| 2 | Right | 2 | Right | 2 | Right | 2 | Right | 2 | Right | 2 | Right | 2 | Right |
| 3 | Center | 3 | Center | 3 | Center | 3 | Center | 3 | Center | 3 | Center |  |  |
| 4 | \*LFE | 4 | \*LFE | 4 | \*LFE | 4 | \*LFE | 4 | Left Surround |  |  |  |  |
| 5 | Left Side Surround | 5 | Left Surround | 5 | Left Surround | 5 | Left Surround | 5 | Right Surround |  |  |  |  |
| 6 | Right Side Surround | 6 | Right Surround | 6 | Right Surround | 6 | Right Surround |  |  |  |  |  |  |
| 7 | Left Rear Surround | 7 | Left Top Front | 7 | Top Side Left |  |  |  |  |  |  |  |  |
| 8 | Right Rear Surround | 8 | Right Top Front | 8 | Top Side Right |  |  |  |  |  |  |  |  |
| 9 | Left Top Front | 9 | Left Top Rear |  |  |  |  |  |  |  |  |  |  |
| 10 | Right Top Front | 10 | Right Top Rear |  |  |  |  |  |  |  |  |  |  |
| 11 | Left Top Back |  |  |  |  |  |  |  |  |  |  |  |  |
| 12 | Right Top Back |  |  |  |  |  |  |  |  |  |  |  |  |

#### \*LFE = Low Frequency Effects

#### Object Channels

Objects of specific types have a fixed order in the channel map. If an object of a lower order is not present in the composition, then the order ripples down to fill the gap.

**Table-4 Object hierarchy**

|  |  |  |
| --- | --- | --- |
| **Order** | **Type** | **Position** |
| 1 | O | Follows bed (if present) |
| 2 | D | Follows O (if present) |
| 3 | AD | Follows D (if present) |
| 4 | SS | Follows AD (if present) |
| 5 | VO | Follows SS (if present) |

**Channel Order Examples**

**Example-1: No bed, five non-dialogue objects:**

**Table-5 Channel ordering O5**

|  |  |  |  |
| --- | --- | --- | --- |
| **Ch** | **Element** | **Signal** | **Object Order** |
| 1 | Objects | Object-1 | 1st |
| 2 | Object-2 |
| 3 | Object-3 |
| 4 | Object-4 |
| 5 | Object-5 |

**Example-2: 5.1 bed, one non-dialogue object, four various dialogue type objects:**

**Table-6 Channel ordering 5.1+O1+D1+AD1+SS1+VO1**

|  |  |  |  |
| --- | --- | --- | --- |
| **Ch** | **Element** | **Signal** | **Object Order** |
| 1 | Bed | Left | - |
| 2 | Right |
| 3 | Center |
| 4 | LFE |
| 5 | Left Surround |
| 6 | Right Surround |
| 7 | Objects | Non-dialogue object | 1st |
| 8 | Dialogue | 2nd |
| 9 | Audio description/VDS | 3rd |
| 10 | Spoken Subtitles | 4th |
| 11 | Voiceover | 5th |

**Example-3: 5.1 bed, two various dialogue type objects:**

**Table-7 Channel ordering 5.1+D1+SS1**

|  |  |  |  |
| --- | --- | --- | --- |
| **Ch** | **Element** | **Signal** | **Object Order** |
| 1 | Bed | Left | - |
| 2 | Right |
| 3 | Center |
| 4 | LFE |
| 5 | Left Surround |
| 6 | Right Surround |
| 7 | Objects | Dialogue | 1st |
| 8 | Spoken Subtitles | 2nd |

**Table-8 Bed configuration to ADM-OSC layout (decimal) parameter mapping**

|  |  |
| --- | --- |
| **Bed Config** | **layout** |
| 2.0 | 2 |
| 3.0 | 10 |
| 5.0 | 12 |
| 5.1 | 3 |
| 5.1.2 | 19 |
| 5.1.4 | 5 |
| 7.1.4 | 23 |

**Table-9 OSC object type to ADM dialogue content kind attribute mapping**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type** | **dialogue** | **attribute** | **attribute value** | **Notes** |
| O | 2 | nonDialogueContentKind | 0 | Undefined |
| D | 1 | dialogueContentKind | 1 | Dialogue |
| AD | 1 | dialogueContentKind | 4 | Audio description |
| SS | 1 | dialogueContentKind | 3 | Spoken subtitle |
| VO | 1 | dialogueContentKind | 2 | Voiceover |

**ADM-OSC Structure**

**Terminology**

[counter]: Sub-path index counter, always commences from 1 and is continuous and contiguous

ADM-OSC is organized as a tree, the root of the address space is **preset** which contains a single **config** (configuration) path and one or more sub-paths identified by **[counter]**, each of which contains all the information and structure required for a particular metadata composition plus any other associated session information.

preset/**config**/

preset/1/

preset/2/

preset/n/

The **config**/ path contains two parameters, **dprst** and **dprog**. Both are used in the simplified shorthand version of ADM-OSC and substitute certain **[counter]** index values that are not conveyed as part of the ADM-OSC payload.

**dprst** specifies which **preset**/**[counter]**/ path to traverse

**dprog** specifies which **adm**/prog/**[counter]**/ path to traverse

preset/config/**dprst** 1

preset/config/**dprog** 1

Within **preset**/**[counter]**/ there can be any number of additional address paths such as channel routing or other system setup information, however all audio metadata is contained within the **adm** path.

preset/n/**adm**/

preset/n/foo/

preset/n/bar/

The **adm**/ path contains a **config** path plus one or more programme sub-paths identified by **prog**/**[counter]**containing all of the audio metadata required for rendering.

preset/n/adm/**config**/

preset/n/adm/**prog**/n/

**The config path contains a single parameter version and three sub-paths, template, obj, and bed.**

preset/n/adm/config/**version**

preset/n/adm/config/**template**

preset/n/adm/config/**obj**

preset/n/adm/config/**bed**

**version signals the specification version that the overall AMD-OSC payload conforms to.**

preset/n/adm/config/**version/** 1.0.2

**template**/ contains three parameters, **name**, **version**, and **level**.

**name** is an encoded string that specifies the topology of the metadata composition and how it maps into ADM

**version** specifies the version of the template that the metadata is compliant with

**level** specifies the complexity model of the metadata once it maps into ADM

preset/n/adm/template/**name** 5.1+D2

preset/n/adm/template/**version** 1

preset/n/adm/template/**level** 1

**prog**/**n**/ contains a single sub-path, **config** that contains two parameters, **name** and **lang**, and up to three sub-paths, **bed**/**[**counter**]**/, **obj**/**[**counter**]**/ (both part of the core parameter set), and **label**/**[**counter**]**/ (part of the extension parameter set). All contain non time critical setup (or static) metadata.

**name** top level production name of the programme

**lang** language of the audio essence

preset/n/adm/prog/n/config/**name** Cup Final

preset/n/adm/prog/n/config/**lang** eng

preset/n/adm/prog/n/config/**label**/n/

preset/n/adm/prog/n/config/**bed**/n/

preset/n/adm/prog/n/config/**obj**/n/

**label**/**n**/ contains one or more local language descriptors consisting of two parameters.

**name** local language text

**lang** local language of the text descriptor

preset/n/adm/prog/n/config/label/n/**name** Cup Final

preset/n/adm/prog/n/config/label/n/**lang** eng

preset/n/adm/prog/n/config/label/n/**name** Finale de Coupe

preset/n/adm/prog/n/config/label/n/**lang** fre

**bed**/**n**/ contains four parameters, **chan**, **name**, **layout**, and **gain**

**chan**  channel index of the first channel of the bed

**name** descriptive name of the bed

**layout** bed channel configuration, see Table-3

**gain** gain value (in dB) to be applied to all bed channels during rendering

preset/n/adm/prog/n/config/bed/n/**name**Ambience

preset/n/adm/prog/n/config/bed/n/**layout** 3

preset/n/adm/prog/n/config/bed/n/**gain** 0.0

**obj**/**n**/ contains a single sub-path **virt** and a variable number of parameters depending upon use case specifics.

**chan**  channel index of the source mix bus

**name** descriptive name for the object

**lang** language (if any) associated with the object

**type** is it a generic non-dialogue object or a specific type of dialogue (see Table-9)

**absdistance** absolute distance of the object

**cartesian** the coordinate system in use

**gain** gain value (in dB) to be applied during rendering

preset/n/adm/prog/n/config/obj/n/**chan** 7

preset/n/adm/prog/n/config/obj/n/**name** German Commentary

preset/n/adm/prog/n/config/obj/n/**lang** ger

preset/n/adm/prog/n/config/obj/n/**type** D

preset/n/adm/prog/n/config/obj/n/**absdistance** 2.2

preset/n/adm/prog/n/config/obj/n/**cartesian** 1

preset/n/adm/prog/n/config/obj/n/**gain** 1.3

**virt**/ contains additional headphone virtualization metadata specific to a particular object.

**bypass** the object is not to be processed by a virtualizer during rendering

**drr** direct to reverberant ratio (similar to wet/dry)

**hlock is the object locked to head position**

preset/n/adm/prog/n/config/obj/n/virt/**bypass**0

preset/n/adm/prog/n/config/obj/n/virt/**drr** 130.0

preset/n/adm/prog/n/config/obj/n/virt/**hlock**0

**Shorthand path adm/obj/n**/, longhand path **preset**/**n**/**adm**/**obj**/**n**, and multi-programme path **preset**/**n**/**adm**/**prog**/**n**/**obj**/**n** contain time-varying object parameters that reside outside of those in the config path.

Depending upon the coordinate system in use, only one set of position coordinates can be present (shown in **green** and **blue**).

Core parameter set:

**w** width, horizontal spread of object energy to be applied during rendering

**azim** azimuth

**elev** elevation

**dist** distance

**x** X axis

**y** Y axis

**z** Z axis

In addition, compound positional parameters are also available for both coordinate systems to increase efficiency:

**aed** azimuth elevation distance

**xyz** X Y Z

Cartesian:

preset/n/adm/prog/n/obj/n/**w** 0.0

preset/n/adm/prog/n/obj/n/**x**-1.0

preset/n/adm/prog/n/obj/n/**y**1.0

preset/n/adm/prog/n/obj/n/**z**0.0

Or

preset/n/adm/prog/n/obj/n/**xyz** -1.0 1.0 0.0

Polar:

preset/n/adm/prog/n/obj/n/**w** 0.0

preset/n/adm/prog/n/obj/n/**azim**-30.0

preset/n/adm/prog/n/obj/n/**elev**0.0

preset/n/adm/prog/n/obj/n/**dist**1.0

Or

preset/n/adm/prog/n/obj/n/**aed** -30.0 0.0 1.0

### Example-1: O3

This use case contains three non-dialogue objects which are all present in a single ADM-OSC programme. As the composition is one dimensional, the shorthand version of ADM-OSC can be used to greatly simplify the metadata structure.

When using the shorthand method, the following rules applies:

**dprst** and **dprog** must be set to point to the correct substitute paths

There is a one-to-one mapping of the object index to the channel index containing the essence

**Table-10** Audio element to ADM audio programme mapping

|  |  |  |  |
| --- | --- | --- | --- |
| **Ch** | **Element** | **Signal** | **Programme-1** |
| 1 | Objects | Object-1 | Checkmark with solid fill |
| 2 | Object-2 | Checkmark with solid fill |
| 3 | Object-3 | Checkmark with solid fill |

**Shorthand ADM-OSC**

<!—ADM-OSC info-->

adm/config/version/ 1.2.3

<!--Template info-->

adm/config/template/name O3

adm/config/template/ver 1

adm/config/template/level 1

<!--Shorthand paths to traverse-->

adm/config/dprst/1

adm/config/dprog/2

<!--Static metadata-->

adm/config/obj/1/cartesian 1

adm/config/obj/2/cartesian 1

adm/config/obj/3/cartesian 1

<!--Dynamic metadata-->

adm/obj/1/xyz -1.0 1.0 0.0

adm/obj/2/xyz 1.0 1.0 0.0

adm/obj/3/xyz 0.0 1.0 0.0

**Equivalent ADM-OSC**

<!--Template info-->

preset/1/adm/config/template/name O3

preset/1/adm/config/template/version 1.0.0

preset/1/adm/config/template/level 1

<!--Static metadata-->

preset/1/adm/prog/2/config/obj/1/cartesian 1

preset/1/adm/prog/2/config/obj/1/chan 1

preset/1/adm/prog/2/config/obj/2/cartesian 1

preset/1/adm/prog/2/config/obj/2/chan 2

preset/1/adm/prog/2/config/obj/3/cartesian 1

preset/1/adm/prog/2/config/obj/3/chan 3

<!--Dynamic metadata-->

preset/1/adm/prog/2/obj/1/xyz -1.0 1.0 0.0

preset/1/adm/prog/2/obj/2/xyz 1.0 1.0 0.0

preset/1/adm/prog/2/obj/3/xyz 0.0 1.0 0.0

Mapped parameters from ADM-OSC are shown as inline comments identifying the source

**O3 Template Based upon AdVSS draft**  Expand source

<?xml version="1.0" encoding="UTF-8"?>

<!--S-ADM frame encapsulation of ADM-->

<frame>

<frameHeader>

<frameFormat frameFormatID="FF\_00000001" type="full" start="00:00:00.00000S48000" duration="00:00:00.00960S48000" flowID="b52b1102-418d-4b3e-8437-482ef0490db0" timeReference="local"></frameFormat>

<!--Physical to logical track mapping-->

<transportTrackFormat transportID="TP\_0001" transportName="SDI" numIDs="3" numTracks="3">

<audioTrack trackID="1" formatLabel="0001" formatDefinition="PCM">

<audioTrackUIDRef>ATU\_00000001</audioTrackUIDRef>

</audioTrack>

<audioTrack trackID="2" formatLabel="0001" formatDefinition="PCM">

<audioTrackUIDRef>ATU\_00000002</audioTrackUIDRef>

</audioTrack>

<audioTrack trackID="3" formatLabel="0001" formatDefinition="PCM">

<audioTrackUIDRef>ATU\_00000003</audioTrackUIDRef>

</audioTrack>

</transportTrackFormat>

<profileList>

<profile profileName="AdvSS Emission ADM and S-ADM Profile" profileVersion="1" profileLevel="1">ITU-R BS.[ADM-NGA-Emission]-0</profile>

</profileList>

</frameHeader>

<!--ADM composition-->

<audioFormatExtended version="ITU-R\_BS.2076-3">

<profileList>

<profile profileName="AdvSS Emission ADM and S-ADM Profile" profileVersion="1" profileLevel="1">ITU-R BS.[ADM-NGA-Emission]-0</profile>

</profileList>

<!--Single audio programme referencing three audio content buckets-->

<audioProgramme audioProgrammeID="APR\_1001" audioProgrammeName="<!-- preset/1/adm/prog/2/config/name-->" audioProgrammeLanguage="<!--preset/1/adm/prog/2/config/lang-->">

<audioContentIDRef>ACO\_1001</audioContentIDRef>

<audioContentIDRef>ACO\_1002</audioContentIDRef>

<audioContentIDRef>ACO\_1003</audioContentIDRef>

<loudnessMetadata>

<integratedLoudness>-28.75</integratedLoudness>

</loudnessMetadata>

</audioProgramme>

<!--Three audio content buckets, each referencing a single audio object-->

<audioContent audioContentID="ACO\_1001" audioContentName="<!--preset/1/adm/prog/2/obj/1/config/name-->" audioContentLanguage="<!--preset/1/adm/prog/2/obj/1/config/lang-->">

<audioObjectIDRef>AO\_1001</audioObjectIDRef>

<loudnessMetadata>

<integratedLoudness>-30.50</integratedLoudness>

</loudnessMetadata>

<!—Element and attribute values are sourced from the object type conversion lookup table 9 -->

<dialogue <!--preset/1/adm/prog/2/obj/1/config/type-->="<!--preset/1/adm/prog/2/obj/1/config/type-->"><!--preset/1/adm/prog/2/obj/1/config/type--></dialogue>

</audioContent>

<audioContent audioContentID="ACO\_1002" audioContentName="<!--preset/1/adm/prog/2/obj/2/config/name-->" audioContentLanguage="<!--preset/1/adm/prog/2/obj/2/config/lang-->">

<audioObjectIDRef>AO\_1002</audioObjectIDRef>

<loudnessMetadata loudnessMethod="ITU-R BS.1770">

<integratedLoudness>-32.50</integratedLoudness>

</loudnessMetadata>

<!—Element and attribute values are sourced from the object type conversion lookup table 9 -->

<dialogue <!--preset/1/adm/prog/2/obj/2/config/type-->="<!--preset/1/adm/prog/2/obj/2/config/type-->"><!--preset/1/adm/prog/2/obj/2/config/type--></dialogue>

</audioContent>

<audioContent audioContentID="ACO\_1003" audioContentName="<!--preset/1/adm/prog/2/obj/3/config/name-->" audioContentLanguage="<!--preset/1/adm/prog/2/obj/3/config/lang-->">

<audioObjectIDRef>AO\_1003</audioObjectIDRef>

<loudnessMetadata>

<integratedLoudness>-33.50</integratedLoudness>

</loudnessMetadata>

<!—Element and attribute values are sourced from the object type conversion lookup table 9 -->

<dialogue <!--preset/1/adm/prog/2/obj/3/config/type-->="<!--preset/1/adm/prog/2/obj/3/config/type-->"><!--preset/1/adm/prog/2/obj/3/config/type--></dialogue>

</audioContent>

<!--Three audio objects, each referencing a single audio pack format and virtual track-->

<audioObject audioObjectID="AO\_1001" audioObjectName="<!--preset/1/adm/prog/2/obj/1/config/name-->" interact="0">

<audioPackFormatIDRef>AP\_00031001</audioPackFormatIDRef>

<audioTrackUIDRef>ATU\_00000001</audioTrackUIDRef>

</audioObject>

<audioObject audioObjectID="AO\_1002" audioObjectName="<!--preset/1/adm/prog/2/obj/2/config/name-->" interact="0">

<audioPackFormatIDRef>AP\_00031002</audioPackFormatIDRef>

<audioTrackUIDRef>ATU\_00000002</audioTrackUIDRef>

</audioObject>

<audioObject audioObjectID="AO\_1003" audioObjectName="<!--preset/1/adm/prog/2/obj/3/config/name-->" interact="0">

<audioPackFormatIDRef>AP\_00031003</audioPackFormatIDRef>

<audioTrackUIDRef>ATU\_00000003</audioTrackUIDRef>

</audioObject>

<!--Three audio pack formats, each referencing one audio channel format-->

<audioPackFormat audioPackFormatID="AP\_00031001" audioPackFormatName="audioPackFormat\_1" typeLabel="0003" typeDefinition="Objects">

<audioChannelFormatIDRef>AC\_00031001</audioChannelFormatIDRef>

</audioPackFormat>

<audioPackFormat audioPackFormatID="AP\_00031002" audioPackFormatName="audioPackFormat\_2" typeLabel="0003" typeDefinition="Objects">

<audioChannelFormatIDRef>AC\_00031002</audioChannelFormatIDRef>

</audioPackFormat>

<audioPackFormat audioPackFormatID="AP\_00031003" audioPackFormatName="audioPackFormat\_3" typeLabel="0003" typeDefinition="Objects">

<audioChannelFormatIDRef>AC\_00031003</audioChannelFormatIDRef>

</audioPackFormat>

<!--Three audio channel formats containing audio blocks that convey time-varying metadata-->

<audioChannelFormat audioChannelFormatID="AC\_00031001" audioChannelFormatName="audioChannelFormat\_1" typeLabel="0003" typeDefinition="Objects">

<audioBlockFormat audioBlockFormatID="AB\_00031001\_00000001" lstart="00:00:00.00000S48000" lduration="00:00:00.00960S48000">

<cartesian><!--preset/1/adm/prog/2/obj/1/config/cartesian--></cartesian>

<gain gainUnit="dB"><!--preset/1/adm/prog/2/obj/1/gain--></gain>

<position coordinate="X"><!--preset/1/adm/prog/2/obj/1/x--></position>

<position coordinate="Y"><!--preset/1/adm/prog/2/obj/1/y--></position>

<position coordinate="Z"><!--preset/1/adm/prog/2/obj/1/z--></position>

<width><!--preset/1/adm/prog/2/obj/1/w--></width>

<depth><!--preset/1/adm/prog/2/obj/1/w--></depth>

<height><!--preset/1/adm/prog/2/obj/1/w--></height>

</audioBlockFormat>

</audioChannelFormat>

<audioChannelFormat audioChannelFormatID="AC\_00031002" audioChannelFormatName="audioChannelFormat\_2" typeLabel="0003" typeDefinition="Objects">

<audioBlockFormat audioBlockFormatID="AB\_00031002\_00000001" lstart="00:00:00.00000S48000" lduration="00:00:00.00960S48000">

<cartesian><!--preset/1/adm/prog/2/obj/2/config/cartesian--></cartesian>

<gain gainUnit="dB"><!--preset/1/adm/prog/2/obj/2/gain--></gain>

<position coordinate="X"><!--preset/1/adm/prog/2/obj/2/x--></position>

<position coordinate="Y"><!--preset/1/adm/prog/2/obj/2/y--></position>

<position coordinate="Z"><!--preset/1/adm/prog/2/obj/2/z--></position>

<width><!--preset/1/adm/prog/2/obj/2/w--></width>

<depth><!--preset/1/adm/prog/2/obj/2/w--></depth>

<height><!--preset/1/adm/prog/2/obj/2/w--></height>

</audioBlockFormat>

</audioChannelFormat>

<audioChannelFormat audioChannelFormatID="AC\_00031003" audioChannelFormatName="audioChannelFormat\_3" typeLabel="0003" typeDefinition="Objects">

<audioBlockFormat audioBlockFormatID="AB\_00031003\_00000001" lstart="00:00:00.00000S48000" lduration="00:00:00.00960S48000">

<cartesian><!--preset/1/adm/prog/2/obj/3/config/cartesian--></cartesian>

<gain gainUnit="dB"><!--preset/1/adm/prog/2/obj/3/gain--></gain>

<position coordinate="X"><!--preset/1/adm/prog/2/obj/3/x--></position>

<position coordinate="Y"><!--preset/1/adm/prog/2/obj/3/y--></position>

<position coordinate="Z"><!--preset/1/adm/prog/2/obj/3/z--></position>

<width><!--preset/1/adm/prog/2/obj/3/w--></width>

<depth><!--preset/1/adm/prog/2/obj/3/w--></depth>

<height><!--preset/1/adm/prog/2/obj/3/w--></height>

</audioBlockFormat>

</audioChannelFormat>

<!--Three virtual audio tracks, each referencing one audio channel format and corresponding audio pack format-->

<audioTrackUID UID="ATU\_00000001">

<audioPackFormatIDRef>AP\_00031001</audioPackFormatIDRef>

<audioChannelFormatIDRef>AC\_00031001</audioChannelFormatIDRef>

</audioTrackUID>

<audioTrackUID UID="ATU\_00000002">

<audioPackFormatIDRef>AP\_00031002</audioPackFormatIDRef>

<audioChannelFormatIDRef>AC\_00031002</audioChannelFormatIDRef>

</audioTrackUID>

<audioTrackUID UID="ATU\_00000003">

<audioPackFormatIDRef>AP\_00031003</audioPackFormatIDRef>

<audioChannelFormatIDRef>AC\_00031003</audioChannelFormatIDRef>

</audioTrackUID>

</audioFormatExtended>

</frame>

**Example-2: 5.1+D2**

A simple broadcast use case containing a clean 5.1 audio bed (M&E) and two dialogue objects, each in a different language.

**Table-11** Audio element to ADM audio programme mapping

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Ch** | **Element** | **Signal** | **Programme-1** | **Programme-2** |
| 1 | Bed | Left | Checkmark with solid fill | Checkmark with solid fill |
| 2 | Right |
| 3 | Center |
| 4 | LFE |
| 5 | Left Surround |
| 6 | Right Surround |
| 7 | Objects | Dialogue language 1 | Checkmark with solid fill |  |
| 8 | Dialogue language 2 |  | Checkmark with solid fill |

**ADM-OSC**

<!—ADM-OSC info-->

Preset/1/adm/config/version/ 1.2.3

<!--Template info-->

preset/1/adm/config/template/name 5.1+D2

preset/1/adm/config/template/ver 1

preset/1/adm/config/template/level 1

<!—Programme level-->

preset/1/adm/prog/1/config/name English

preset/1/adm/prog/1/config/lang eng

preset/1/adm/prog/2/config/name German

preset/1/adm/prog/2/config/lang ger

<!--Static metadata-->

<!--5.1 bed-->

preset/1/adm/prog/1/config/bed/1/chan 1

preset/1/adm/prog/1/config/bed/1/name Ambience

preset/1/adm/prog/1/config/bed/1/layout 3

preset/1/adm/prog/2/config/bed/1/chan 1

preset/1/adm/prog/2/config/bed/1/name Ambience

preset/1/adm/prog/2/config/bed/1/layout 3

<!--Dialogue objects-->

preset/1/adm/prog/1/config/obj/1/chan 7

preset/1/adm/prog/1/config/obj/1/cartesian 1

preset/1/adm/prog/1/config/obj/1/name English commentary

preset/1/adm/prog/1/config/obj/1/lang eng

preset/1/adm/prog/1/config/obj/1/type D

preset/1/adm/prog/2/config/obj/1/chan 8

preset/1/adm/prog/2/config/obj/1/cartesian 1

preset/1/adm/prog/2/config/obj/1/name German commentary

preset/1/adm/prog/2/config/obj/1/lang ger

preset/1/adm/prog/2/config/obj/1/type D

<!--Could be time-varying positional metadata, but in broadcast use cases-->

<!--dialogue position is typically static-->

preset/1/adm/prog/1/obj/1/xyz -1.0 1.0 0.0

preset/1/adm/prog/2/obj/2/xyz 1.0 1.0 0.0

**Example-3: 5.1+D2+AD1+SS1**

Complex broadcast use case containing a clean 5.1 audio bed (M&E), two multi-language main dialogues, one AD dialogue, and a spoken subtitle track.

**Table-12** Audio element to ADM audio programme mapping

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Ch** | **Element** | **Signal** | **Programme-1** | **Programme-2** | **Programme-3** | **Programme-4** |
| 1 | Bed | Left | Checkmark with solid fill | Checkmark with solid fill | Checkmark with solid fill | Checkmark with solid fill |
| 2 | Right |
| 3 | Center |
| 4 | LFE |
| 5 | Left Surround |
| 6 | Right Surround |
| 7 | Objects | Dialogue language 1 | Checkmark with solid fill |  | Checkmark with solid fill |  |
| 8 |  | Dialogue language 2 |  | Checkmark with solid fill |  |  |
| 11 |  | AD language 1 |  |  | Checkmark with solid fill | Checkmark with solid fill |
| 13 |  | SS language 1 |  |  |  | Checkmark with solid fill |

**ADM-OSC**

<!—ADM-OSC info-->

Preset/1/adm/config/version/ 1.2.3

<!--Template info-->

preset/1/adm/config/template/name 5.1+D2+AD1+SS1

preset/1/adm/config/template/ver 1

preset/1/adm/config/template/level 1

<!—Programme level-->

preset/1/adm/prog/1/config/name English

preset/1/adm/prog/1/config/lang eng

preset/1/adm/prog/2/config/name German

preset/1/adm/prog/2/config/lang ger

preset/1/adm/prog/3/config/name English AD

preset/1/adm/prog/3/config/lang end

preset/1/adm/prog/4/config/name English AD+SS

preset/1/adm/prog/4/config/lang ger

<!--Static metadata-->

<!--5.1 bed-->

preset/1/adm/prog/1/config/bed/1/chan 1

preset/1/adm/prog/1/config/bed/1/name Ambience

preset/1/adm/prog/1/config/bed/1/layout3

preset/1/adm/prog/2/config/bed/1/chan 1

preset/1/adm/prog/2/config/bed/1/name Ambience

preset/1/adm/prog/2/config/bed/1/layout 3

preset/1/adm/prog/3/config/bed/1/chan 1

preset/1/adm/prog/3/config/bed/1/name Ambience

preset/1/adm/prog/3/config/bed/1/layout 3

preset/1/adm/prog/4/config/bed/1/chan 1

preset/1/adm/prog/4/config/bed/1/name Ambience

preset/1/adm/prog/4/config/bed/1/layout 3

<!--Dialogue objects-->

preset/1/adm/prog/1/config/obj/1/chan 7

preset/1/adm/prog/1/config/obj/1/cartesian 1

preset/1/adm/prog/1/config/obj/1/name English commentary

preset/1/adm/prog/1/config/obj/1/lang eng

preset/1/adm/prog/1/config/obj/1/type D

preset/1/adm/prog/2/config/obj/1/chan 8

preset/1/adm/prog/2/config/obj/1/cartesian 1

preset/1/adm/prog/2/config/obj/1/name German commentary

preset/1/adm/prog/2/config/obj/1/lang ger

preset/1/adm/prog/2/config/obj/1/type D

preset/1/adm/prog/3/config/obj/1/chan 7

preset/1/adm/prog/3/config/obj/1/cartesian 1

preset/1/adm/prog/3/config/obj/1/name English commentary

preset/1/adm/prog/3/config/obj/1/lang eng

preset/1/adm/prog/3/config/obj/1/type D

preset/1/adm/prog/3/config/obj/2/chan 9

preset/1/adm/prog/3/config/obj/2/cartesian 1

preset/1/adm/prog/3/config/obj/2/name English AD

preset/1/adm/prog/3/config/obj/2/lang eng

preset/1/adm/prog/3/config/obj/2/type AD

preset/1/adm/prog/4/config/obj/1/chan 9

preset/1/adm/prog/4/config/obj/1/cartesian 1

preset/1/adm/prog/4/config/obj/1/name English AD

preset/1/adm/prog/4/config/obj/1/lang eng

preset/1/adm/prog/4/config/obj/1/type AD

preset/1/adm/prog/4/config/obj/2/chan 10

preset/1/adm/prog/4/config/obj/2/cartesian 1

preset/1/adm/prog/4/config/obj/2/name English SS

preset/1/adm/prog/4/config/obj/2/lang eng

preset/1/adm/prog/4/config/obj/2/type AD

<!--Could be time-varying positional metadata, but in broadcast use cases-->

<!--dialogue position is typically static-->

preset/1/adm/prog/1/obj/1/xyz 0.0 1.0 0.0

preset/1/adm/prog/2/obj/1/xyz 0.0 1.0 0.0

preset/1/adm/prog/3/obj/1/xyz 0.0 1.0 0.0

preset/1/adm/prog/3/obj/2/xyz 0.0 1.0 0.0

preset/1/adm/prog/4/obj/1/xyz -0.5 1.0 0.0

preset/1/adm/prog/4/obj/2/xyz 0.5 1.0 0.0

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