ATSC Standard:
A/344:2019 Amendment No. 4, RMP State

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Advanced Television Systems Committee
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Revision History

Version	Date
Amendment approved	19 December 2019

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1. OVERVIEW

1.1 Definition

An Amendment is generated to document an enhancement, an addition or a deletion of functionality to previously agreed technical provisions in an existing ATSC document. Amendments shall be published as attachments to the original ATSC document. Distribution by ATSC of existing documents shall include any approved Amendments.

1.2 Scope

This document clarifies one value and adds new values of RMP `playbackState` as defined in Section 9.14.3 to address encrypted content and possible states resulting from DRM operation.

1.3 Rationale for Changes

The existing defined states are too simplistic when dealing with DRM systems. Three new states are proposed here.

1.4 Compatibility Considerations

This amendment is backwards compatible since the changes are the addition of three new values to an existing field. Existing Receivers will not know about these new states and are unaffected. Existing Broadcaster Applications are expected to take into account the possibility of states they do not understand per the provisions of Section 9.1: "*The Broadcaster Application is expected to gracefully ignore unknown keys and unknown values for existing keys, including unknown enumeration values.*"

2. LIST OF CHANGES

Change instructions are given below in *italics*. Unless otherwise noted, inserted text, tables, and drawings are shown in red (due to base standard text coloring); deletions of existing text are shown in ~~red strikeout~~. The text "[ref]" indicates that a cross reference to a cited referenced document should be inserted.

A/344 maintains a "revision log" of its included APIs from revision to revision by listing the changes in Table 9.1. In addition, each revision includes an Annex which captures the API from the previous edition in unchanged form. By maintaining the previous API definition in the document, implementers may look at the history of each API. When this amendment is finally rolled into the main revision document, Table 9.1 will need to be updated and the original text of the API modified below may be copied into the Annex for the revision.

2.1 Change Instructions

Change section 9.14.3 as follows:

9.14.3 Query RMP Playback State API

A Broadcaster Application may wish to know the playback state of the content being presented or prepared for presentation by RMP. This allows the application to make adjustments in presenting supplemental content based on playback state of the content. For example, the application may

suspend presentation of supplemental content if playback of the presentation is paused due to content buffer underflow ("buffering") or user input or stopped due to reaching the end of a VOD program stream.

The Query RMP Playback State API shall be defined as follows:

method: `"org.atsc.query.rmpPlaybackState"`

params: Omitted

Response:

result: A JSON object containing a `playbackState` key/value pair.

result JSON Schema:

```
{
    "type": "object",
    "properties": {"playbackState": {"type": "integer", "minimum": -10, "maximum":
32}},
    "required": ["playbackState"]
}
```

`playbackState`: This integer value shall indicate one of the following playback states of the RMP:

- -1 if the content is initializing, connecting and the state cannot be determined, for example there is a time window between changing the channel, accessing the SLT, MPD and initializing the channel where the state is unclear;
- 0 if the content is actively playing, and if encrypted, there are necessarily also valid DRM licenses and the CDM is decrypting the content;
- 1 if the playback is paused for any reason and has not ended (e.g. seeking or stalled, paused for user interaction, waiting for user input, stopped due to errors);
- 2 if the playback has ended (e.g. the end of the content is reached);
- 3 if the content is encrypted and not viewable (i.e. there are no valid keys and the CDM is not decrypting the content).

For example, the Broadcaster Application makes a query:

```
--> {
    "jsonrpc": "2.0",
    "method": "org.atsc.query.rmpPlaybackState",
    "id": 63
}
```

And if the RMP is playing back content, the Receiver would respond:

```
--> {
    "jsonrpc": "2.0",
    "result": {"playbackState": 0},
    "id": 63
}
```

Change section 9.14.6 as follows (note the existing error of the "maximum" value):

9.14.6 RMP Playback State Change Notification API

The RMP Playback State Change notification API shall be issued by the Receiver to the currently executing Broadcaster Application if the playback state of the RMP as defined in Query RMP Playback State API in Section 9.14.3 changes from one value to another different value.

The RMP Playback State Change notification API is defined as follows:

method: "`org.atsc.notify`"

params: A JSON object consisting of two key/value pairs.

params JSON Schema:

```
{
    "type": "object",
    "properties": {
        "msgType": {"type": "string", "enum": ["rmpPlaybackStateChange"]},
        "playbackState": {"type": "integer", "minimum": -10, "maximum": 3}
    },
    "required": ["msgType", "playbackState"]
}
```

`playbackState`: This integer value shall indicate the new playback state that is one of the playback states defined in Query Playback State API in Section 9.14.3.

For example, if the user at the Receiver pauses the playback of the time-shift broadcast content, the Receiver notifies the Broadcaster Application the playback state as shown below:

```
--> {
    "jsonrpc": "2.0",
    "method": "org.atsc.notify",
    "params": {
        "msgType": "rmpPlaybackStateChange",
        "playbackState": 1
    }
}
```

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