ATSC Standard: A/344:2020 Amendment No. 1, "Launch App"

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Advanced Television Systems Committee
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Revision History

Version	Date
Amendment approved	12 October 2020

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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 adds a new API that terminates the current Broadcaster Application and starts a new one from the HELD. See related contribution: S33-345r3-WD-A331-AMDx-MultipleAppFixes, which includes the schema files.

1.3 Rationale for Changes

The HELD was designed to signal multiple Broadcaster Applications in potentially different Application Contexts. It is not currently possible to select which Broadcaster Application is activated or switch from one to another.

1.4 Compatibility Considerations

The changes described in this document are backward-compatible relative to the currently published version of the standard to which this Amendment pertains and any previously approved Amendments for that standard. Existing Receivers will not have this API and new Broadcaster Applications that make use of it will fail and should, as always, be prepared for incomplete API support.

2. CHANGE INSTRUCTIONS

Change instructions are given below in *italics*. Unless otherwise noted, inserted text, tables, and drawings are shown in blue; 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.

Change Normative Reference 1 (A/331) as follows:

[1] ATSC: "ATSC Standard: Signaling, Delivery, Synchronization, and Error Protection (A/331) with Amendment No. 1," Doc. A/331:2020, Advanced Television Systems Committee, 16 January 2020, Amendment No. 1 dated 27 October 2020.

Add a new Section 9.7.6 as follows (all text in the following section is new but not highlighted blue for readability):

9.7.6 Launch Broadcaster Application API

The HELD is capable of signaling multiple Broadcaster Applications in the same or different Application Contexts. This API enables the currently executing Broadcaster Application to start a new Broadcaster Application from the HELD. The calling Broadcaster Application is terminated,

i.e. the calling Broadcaster Application and new Broadcaster Application do not execute concurrently.

The @appId string of the calling Broadcaster Application is included as a parameter on the entry point call. See Section 8.2.

The Launch Broadcaster Application shall be defined as follows:

method: "`org.atsc.launchApp`"
params JSON Schema:

```
{
   "type": "object",
   "properties": {
      "appId": {"type": "string", "format": "uri"}
   },
   "required": ["appId"]
}
```

`appId` – This required string is the appId as defined in A/331 [1] (with Amendment 1) Section 7.1.8.

Response:

result: There is no return from this API if it is successful.

error: The following error code may be returned:

- -23: appId not found

In the following example, the Broadcaster Application launches another Broadcaster Application:

```
--> {
    "jsonrpc": "2.0",
    "method": "org.atsc.launchApp",
    "params": {
        "appId": "pbs.org/kids/1",
    },
    "id": 42
}
```

Upon success, the Receiver is not expected to respond. Upon failure, the Receiver is expected to respond with an error.

Change Section 8.2 as follows:

8.2 Interface Binding

Since the APIs described here utilize a WebSocket interface, the Broadcaster Application can rely on standard browser functionality to open the connection and no specific functionality needs to be present in the Broadcaster Application.

In order to communicate with the WebSocket server provided by the Receiver, the Broadcaster Application needs to know the URL of the WebSocket server. The WebSocket server location may

be different depending on the network topology (e.g., integrated vs. distributed architecture), or it may be different depending on the Receiver implementation. ~~In order to~~To hide these differences from the Broadcaster Application, the Broadcaster Application Entry Page URL is launched with a query term parameter providing information regarding the location of the Receiver WebSocket Server.

When an Entry Page of a Broadcast Application is loaded on the User Agent, the URL shall include a query term providing the Base URI of the ATSC 3.0 WebSocket Server Interface supported by receivers. Similarly, the Receiver shall report the current version of the supported WebSocket APIs by providing another query term containing the release date of this standard. An additional optional query term is `callerIdQuery`. This term shall be present when the Broadcaster Application is started by another Broadcaster Application.

Using the ABNF syntax, the query component shall be as defined below:

```
query = ((wsQuery "&" revQuery) / (revQuery "&" wsQuery))
                        [callerIdQuery]
                wsQuery = "wsURL=" ws-url
                revQuery = "rev=" yyyymmdd
            callerIdQuery = "&callerId=" appId
```

The `ws-url` is the base WebSocket URI and shall be as defined in RFC 6455 [20]. The `yyyymmdd` value shall contain the year (`yyyy`), month (`mm`) and day (`dd`) when the present standard was released. For example, the first release of this standard was 18 December 2017. That value is represented as `'20171218'`. The date used for any given release shall be taken from the corresponding entry in the 'Date' column of the Revision History table at the beginning of this document. The `appId` shall be the **`HELD`**`@appId` (see A/331 [1]) of the Broadcaster Application that called the Launch Broadcaster Application API (see Section 9.7.7).

The following shows an example of how such a query string is used to launch the Broadcaster Application. In this example, if the Entry Page URL is:

```
http://localhost/xbc.org/x.y.z/home.html,
```

~~and~~ the WebSocket APIs are based on the revision of the standard as released on 20 July 2018 and the Broadcaster Application was launched by the previous Broadcaster Application with `appID="pbs.org/kids/1"`, the Broadcaster Application is launched as follows:

```
http://localhost/xbc.org/x.y.z/home.html?wsURL=wss://localhost2:8000
                        &rev=20180720
                    &callerId=pbs.org/kids/1
```

The `wsURL` and `rev` query parameters are added to load an entry page URL of a broadcast-delivered application. It is expected that a broadband web server would ignore a `wsURL` query parameter in the URL of an HTTP request if it were to appear. The `rev` query term is applicable to launching Broadcaster Applications from both broadcast and broadband.

Add a new entry to Table 8.2 as follows:

Table 8.2 JSON-RPC ATSC Error Codes

Code	Message	Meaning
-1	Unauthorized	Request cannot be honored due to domain restrictions.
-2	Not enough resources	No resources available to honor the request.
-3	System in standby	System is in standby. Request cannot be honored.
-4	Content not found	Requested content cannot be found. For example, invalid URL.
-5	No broadband connection	No broadband connection available to honor the request.
-6	Service not found	The requested Service cannot be located.
-7	Service not authorized	The requested Service was acquired but is not authorized for viewing due to conditional access restrictions.
-8	Video scaling/position failed	The request to scale and/or position the video did not succeed.
-9	XLink cannot be resolved	The request to resolve an XLink has failed.
-10	Track cannot be selected	The media track identified in the Media Track Selection API cannot be found or selected.
-11	The indicated MPD cannot be accessed	In response to the Set RMP URL API, the MPD referenced in the URL provided cannot be accessed.
-12	The content cannot be played	In response to the Set RMP URL API, the requested content cannot be played.
-13	The requested MPD Anchor cannot be reached	In response to the Set RMP URL API, the MPD Anchor indicated cannot be reached (e.g. beyond the end of the file).
-14	Unsupported Content Protection System	The specified content protection system is not supported by the Receiver.
-15	Illegal URL Format	The URL format specified in `sourceURL` or `targetURL` of the request is illegal.
-16	Illegal URL Format	The URL format specified in one or more URLs in the requested list is illegal.
-17	Malformed DASH Period	The format of the MPEG DASH fragment specified in the Period is illegal.
-18	MPD not found	The referenced MPD file cannot be found.
-19	The synchronization specified by rmpSyncTime cannot be achieved	In response to the Set RMP URL API with rmpSyncTime, the synchronization indicated by rmpSyncTime cannot be achieved.
-20	Request Canceled	The Broadcaster Application issued the cancel request command (Section 8.3.1) with the ID corresponding to this request.
-21	Changing RMP playback from the current source is not supported	In response to the Set RMP URL API, the Receiver does not support changing playback from the current source to an alternate source (e.g., broadband or locally cached content).
-22	dialogEnhancement failed	The request to set or receive Dialog Enhancement data failed.
-23	appId not found	The requested Broadcaster Application appId was not in the HELD.
-100	EME TypeError	See EME Section 6.5 [24]
-101	EME NotSupportedError	See EME Section 6.5 [24]
-102	EME InvalidStateError	See EME Section 6.5 [24]
-103	EME QuotaExceededError	See EME Section 6.5 [24]

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