

HTTP Live Streaming for Adobe Primetime Workflows

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Adobe Media Server enables the Digital Program Insertion, Push to Origin, and Trick Play features for streams ingested as RTMP and packaged as HLS streams. These are enabled through an Adobe Primetime agreement. Contact [Adobe Sales](#) for information about licensing.

Digital Program Insertion

AMS supports the following Digital Program Insertion modes to insert either advertisement or program content in a stream. This in-stream messaging mechanism is defined to signal splicing and insertion.

- **Simple:** In this mode, the pod ad replacement is achieved using a single splice out signal that contains the pod duration. To facilitate ad-decision making, other metadata about the pod is provided. A return signal is not required.
- **SCTE-35:** This mode supports the complete SCTE-35 cue set defined in SCTE35 (PDF) specifications. This mode supports splice signals and segmentation signals provided by SCTE-35. The duration of a splice or segment is not known in advance, unlike in the Simple Mode. Instead, the semantics of the SCTE-35 definition of splices and the various segment types like programs, chapters, placement opportunities, and so on, are taken into account to manage the entry and exit point of a splice or segment.

The detailed specifications of the above modes are available at [Primetime Digital Program Insertion Signaling Specification 1.1](#) (PDF).

Push to Origin server

AMS supports pushing packaged assets to an Origin Server using HTTP PUT requests. In a vanilla implementation, the assets are sent to any Origin server having permissions to receive PUT request. Use `HttpPush/TargetURL` parameters to configure the relevant path. For details of the parameters, see the [Server-side configurations](#).

The target server uses the value of the Content-Type header included in the HTTP PUT request to save the contents of the request.

Trick play

Trick Mode or Trick Play functionality enabled for live streams allow users to take advantage of DVR-like trick mode capabilities, such as, fast-forward and reverse playback operations. The packager generates keyframe-only streams, using I-frames.

Server-side configurations

The following server-side configurations enable the broadcast workflows.

ActionScript configuration

The prerelease build ships a sample application titled `ptlivepkgr` with all the relevant code to start live packaging to enable the feature. The application is located at `[AMS5Root]\applications\ptlivepkgr`.

To load `libpkgr ase` library, the `main.asc` file of the `ptlivepkgr` application makes the call `load("libpkgr ase");`

Start the packaging by calling `Stream.get` method with the type `ptlive` followed by the stream name. The following is a sample snippet for the same. You can uncomment the various parameters to suit your use case.

```
application.onPublish = function(clientObj, streamObj)
{
  var s = Stream.get("ptlive:" + streamObj.name);
  if (s == undefined )
    return;
  s.record();
}
```

For more details, see the `Stream.get()` API reference [here](#). In addition, you can set the 'liveEvent' property for your stream object to the appropriate live event configured at the server-side.

Event.xml configuration

The configurations for the stream are available in the Event.xml file with an event ID the stream is configured to use. The following is a sample snippet for Event.xml that configures the target stream to be packaged.

```
<Event>
  <EventID>liveevent</EventID>
  <Recording>
    <!-- The duration of the output fragments in milliseconds. -->
    <FragmentDuration>4000</FragmentDuration>
    <!-- The TargetDuration should be specified for HLS and greater than
the
        maximum fragment duration in milliseconds. -->
    <TargetDuration>6000</TargetDuration>
    <!-- (Optional) The maximum size of the queue that is used to process
targets
        configured in the Output. Once this number has been exceeded, the
oldest
        of the pending jobs in the queue will be dropped and a message
logged.
        Default to 5. -->
    <MaxQueueSize>5</MaxQueueSize>
  <Output>
    <!-- Supported output type is HLS -->
    <!--<OutputType>HLS</OutputType> -->
    <!-- Uncomment to append stream type to stream name, e.g., Normal
HLS and keyframe -->
    <!--<ID>HLS_1</ID>-->
```

```

    <!-- Uncomment to generates an audio only output stream. Requires
an input stream
        that contains both Video and Audio. -->
    <!-- <IsAudioOnly>true</IsAudioOnly> -->
    <!-- The duration of the content window (in decimal fractions of
hours).
        Fragments will be removed as they roll out of the window. A
value of 0.0
        disables disk management. -->
    <DiskManagementDuration>1.0</DiskManagementDuration>
    <!-- Uncomment to create a key frame only stream for trick play. --
>
    <!-- <KeyFrameOnly>true</KeyFrameOnly> -->
    <!-- If <SkipBadFragments> is true, and an error such as a
discontinuity
        is found in the input transport stream, the entire current
fragment will
        be discarded, and a gap inserted in the bootstrap -->
    <SkipBadFragments>false</SkipBadFragments>

    <!-- Cue Info Mode used for cue information. Supported modes are
PT_1_0,
        DPISimple and DPIScte35 -->
    <CueMode>DPIScte35</CueMode>
    <!-- Interval in milliseconds at which the current SMPTE Time code
value is
        injected into the stream-level manifest. Default is 30s
(30000). -->
    <SMPTETimecodeMapInterval>30000</SMPTETimecodeMapInterval>
    <!-- For FAXS4 setup, please refer to
http://www.adobe.com/support/adobeaccess/pdfs/server/AdobeAccess\_4\_QuickStart.pdf
        for detail. -->
    <!--
    <ContentProtection>
        <FAXS4>
            <ContentID>_default_</ContentID>
            <LicenseServerURL>license-server-url</LicenseServerURL>

```

```

Certificate>      <LicenseServerCertificate>license_server.der</LicenseServer
Certificate>

                  <LicenseServerCredential>license_server.pfx</LicenseServerC
redential>

                  <LicenseServerCredentialPassword>????</LicenseServerCredent
ialPassword>

                  <PackagerCredential>packager.pfx</PackagerCredential>

                  <PackagerCredentialPassword>????</PackagerCredentialPasswor
d>

                  <TransportCertificate>transport.der</TransportCertificate>

                  <CommonKey>common-key.bin</CommonKey>

                  <PolicyFile>policy.pol</PolicyFile>

                  <RecipientCertificates>recipient-certificate-
path</RecipientCertificates>

                  </FAXS4>

                  </ContentProtection>

                  -->

                  <Destination>

```

<!-- This indicates a path within the local file system where the assets will be created.

The folder should have relevant permissions for packager process to write the assets.

By default, the assets will be created on the local path as specified by:

```

                  <ContentPath>root_install/applications/ptlivepkgr/strea
ms/application_instance/<Stream-name>_<Output-type>_<Output-
ID></ContentPath>

```

If the OutputID is not specified above, the assets will be created by default at:

```

                  <ContentPath>root_install/applications/ptlivepkgr/strea
ms/_definst_/stream1_HLS</ContentPath>

```

To disable creation of assets in local folder, set <LocalOrigin enabled = "false"/> -->

```

                  <LocalOrigin enabled="true">

```

```

                  </LocalOrigin>

```

<!-- Uncomment <HttpPush> element to enable the output target where content will be

```

                  pushed to an upstream server. -->

```

```

        <!-- <UseSecurityToken> element adds an encrypted security
token to the outgoing

        HTTP request. By default its value is false. -->

        <!-- <SecurityTokenKey> element: AES-128 bit key to be used for
encrypting the PUT

        token. This value shall be a string of 32 hexadecimal
digits. If UseSecurityToken

        is set as true then this param must be provided. -->

        <!-- <MaxConcurrentPushCount> implies maximum number of
fragments that can be

        dispatched in parallel. Default is 1. -->

        <!--

        <HttpPush>

                <UseSecurityToken>true</UseSecurityToken>
                <SecurityTokenKey>4ff4756ed68239d34d482dbc88819abc</Securit
yTokenKey>

                <MaxConcurrentPushCount>1</MaxConcurrentPushCount>
                <TargetURL>http://[remote_origin_server_URL]:8090/_default_
/_stream_</TargetURL>
                </HttpPush>
        -->
        </Destination>
    </Output>
    </Recording>
</Event>

```

Apache configuration and subscription URL

When a default configuration of Apache server is used, the subscription URL is `http://[hostname:port]/hls-ptlive/[application]/[app-instance]/[stream-name]/livestream.m3u8`.

The following changes are made in `httpd.conf` for enabling serving of assets.

```

AliasMatch hls-ptlive/([^\/*]+)/([^\/*]+)/(.+)
../applications/$1/streams/$2/HLS/$3
...
<Directory "../applications">
AllowOverride None
Order allow,deny
</Directory>
<Directory ~ "../applications/([^\/*]+)/streams">
AllowOverride None
Order deny,allow
</Directory>

```

Configuration parameters

The various configuration parameters relevant to HLS packaging for Primetime workflows are listed in this section. For more information on the configuration parameters, see [HTTP streaming](#)

[configuration file reference](#) and [Configure HTTP Dynamic Streaming and HTTP Live Streaming using AMS](#).

Generic configuration parameters

| Generic configuration parameters | Description |
|--|---|
| Event/Recording/FragmentDuration | The fragment duration to use for packaging. |
| Event/Recording/TargetDuration | The TargetDuration is specified for HLS and is greater than the maximum fragment duration in milliseconds. |
| Event/Recording/MaxQueueSize | (Optional) The maximum size of the queue that is used to process the targets configured in the output. The default value is 5. When this number exceeds, the server removes the earliest pending jobs from the queue and logs an appropriate message. |
| Event/Recording/Output/DiskManagementDuration | The duration of the content window in decimal fractions of hours. The fragments and cues are removed as they roll out of the window. The default value is 3.0 hours. Use 0.0 to disable disk management. |
| Event/Recording/ContainsVideo | Set to False if the stream does not contain a video. The default value is True and the fragments start with a keyframe. |
| Event/Recording/Output/ID | A unique ID of a given Output Pipeline. It can be any alphanumeric string. It is a mandatory parameter if you configure more than one Output Pipeline of the same output type. Each Output Pipeline defines this parameter. |
| Event/Recording/Output/OutputType | HLS is the supported output type. HLS is the default value if an Output Pipeline is not configured. |
| Event/Recording/Output/Destination/LocalOrigin | <p>This parameter indicates a local file system path where the assets are created. Provide the relevant permissions to the Packager process to write the assets at this path. The default value is <code>application_instance\HLS\<Stream name></ContentPath></code>. Some examples are:</p> <ul style="list-style-type: none"> In the default <code>ptlivepkgr</code> application, for a stream named 'stream1' <code>_definst_\HLS\stream1</code> If the OutputID configured as 'id1', the assets are created at the following location:
<code>_definst_\HLS\stream1_id1</code> To disable creation of assets in a local folder, configure the attribute using <code><LocalOrigin enabled="false"/></code> |

| | |
|--|--|
| Event/Recording/Output/Destination/
LocalOrigin/ContentPath | Content Path is used to specify the custom LocalOrigin path. |
|--|--|

Content protection parameter

| Content protection parameter | Description |
|--|---|
| Event/Recording/
Output/
ContentProtection | <ul style="list-style-type: none"> To configure content protection for a FAXS4 setup, see the Adobe Access Quick Start guide (PDF). To configure content protection in the Event.xml file, use the following configuration: <pre> <ContentProtection> <FAXS4> <ContentID>_default_</ContentID> <LicenseServerURL>license-server- url</LicenseServerURL> <LicenseServerCertificate>license_server.der </LicenseServerCertificate> <LicenseServerCredential>license_server.pfx </LicenseServerCredential> <LicenseServerCredentialPassword>????</LicenseServerCredentialPassword> <PackagerCredential>packager.pfx</PackagerCredential> <PackagerCredentialPassword>????</PackagerCredentialPassword> <TransportCertificate>transport.der</TransportCertificate> <CommonKey>common-key.bin</CommonKey> <PolicyFile>policy.pol</PolicyFile> <RecipientCertificates>recipient-certificate- path</RecipientCertificates> </FAXS4> </ContentProtection> </pre> |

Push to Origin configuration parameters

| Push to Origin configuration parameters | Description |
|---|---|
| Event/Recording/Output/Destination/HttpPush | Defines an output target where content is pushed to an upstream server. |
| Event/Recording/Output/Destination/ | The URL for HTTP PUT to which the file name is |

| | |
|--|---|
| HttpPush/TargetURL | appended. |
| Event/Recording/Output/Destination/HttpPush/UseSecurityToken | Make this parameter active to add an encrypted security token to the outgoing HTTP request. The default value is False. |
| Event/Recording/Output/Destination/HttpPush/SecurityTokenKey | A string of 32 hexadecimal digits forms the AES-128 bit key that is used to encrypt the PUT token. Provide a value for this parameter, if UseSecurityToken is set as True. |
| Event/Recording/Output/Destination/HttpPush/MaxConcurrentPushCount | The maximum number of fragments that can be dispatched in parallel. The default value 1 implies that the fragments are pushed by the Packager to a remote Origin Server serially. To push large fragments of high bitrate over high latency network concurrently, set the value to more than 1. |

Ad Cues configuration parameter

| Ad Cues configuration parameters | Description |
|----------------------------------|---|
| Event/Recording/Output/CueMode | Use the Cue Info Mode to add the cue information to m3u8. The allowed values are DPISimple and DPIScte35. It is not a mandatory configuration and the default value is DPIScte35. |

Trick Play configuration parameter

| Trick Play parameter | Description |
|-------------------------------------|---|
| Event/Recording/Output/KeyFrameOnly | <p>Generates a keyframe-only output stream for Trick Play Support.</p> <p>If the path for LocalOrigin tag is not configured or if the OutputID is not specified, by default, the assets for keyframe only streams are generated at streams\application_instance\HLS\<Stream name>_KeyFrame.</p> |

Further References

[Adobe Media Server Help](#)

[Adobe Media Server Developer's Guide](#)