EZDRM
Digital Rights Management. Simplified.

EZDRM Shaka Packager DRM Keys Guide

Table of Contents

Version 2 / Updated January 2021

Shaka Packager – Overview for Raw Key Format

This document outlines the raw key format for Shaka Packager and generating DRM keys with EZDRM. For more details visit: https://google.github.io/shaka-packager/html/tutorials/raw_key.html

To download Shaka-Packager visit: https://github.com/google/shaka-packager/releases

Universal DRM (Widevine & PlayReady)

EZDRM Universal DRM is a combination of Google Widevine Modular with Microsoft PlayReady; both using linked CENC keys over DASH streaming. This enables a content owner to encrypt the media once with CENC keys and deliver either a PlayReady License or a Widevine License depending on the player and platform calling for a license.

Generating Keys

To request the DRM keys from EZDRM to package the media, there are two options, you can call the EZDRM web service in a browser, or you can script this process with curl or other web service calls.

Option 1: Request DRM keys using EZDRM CPIX Web Service

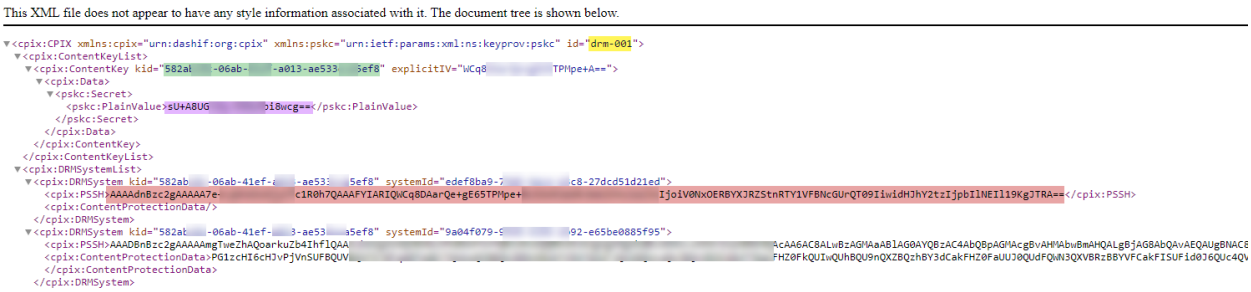
1. Call the EZDRM web service in a browser: http://cpix.ezdrm.com/keygenerator/cpix.aspx?**k=kid**&**u=username**&**p=password**&**c=resourcename**

   The parameters are as follows:

Parameter	Description
k	kid or Key ID value (client generated) in GUID format*
u	EZDRM username
p	EZDRM password
c	Content ID – generic resource name/identifier (client generated) – passed into **id** field

   * To generate a GUID for the k value, you can use a GUID generator like the one found here: http://guid-convert.appspot.com.

2. The response from EZDRM will look like this:



- **id** – c value returned, generic resource name/identifier (client generated)
- **kid** – Key ID in GUID format (client generated)*
- **pskc:Secret key**– the Secret Content Encryption Key in Base 64 generated by EZDRM and returned as a plain value.

* To generate a GUID for the k value, you can use a GUID generator like the one found here: http://guid-convert.appspot.com.

Here Is the example XML return:

```
<cpix:CPIX xmlns:cpix="urn:dashif:org:cpix" xmlns:pskc="urn:ietf:params:xml:ns:keyprov:pskc" id="drm-001">
<cpix:ContentKeyList>
<cpix:ContentKey kid="582aXXXX-XXXX-41ef-XXX-ae533ccaXXXX" explicitIV="WCq8DAXXXXXXE65TPMpe+A==">
<cpix:Data>
<pskc:Secret>
<pskc:PlainValue>sU+XXXXXXqvSN0aXbXXXXX==</pskc:PlainValue>
</pskc:Secret>
</cpix:Data>
</cpix:ContentKey>
</cpix:ContentKeyList>
<cpix:DRMSystemList>
<cpix:DRMSystem kid="582aXXXX-XXXX-41ef-XXX-ae533ccaXXXX" systemId="edefXXXX-79d6-XXXX-a3c8-27dcd5XXXXXd">
<cpix:PSSH>AAAAdnBzc2gAAAAA7e+XXXXXXXXXXXXXXXXXXXXAAFYIARIQWCq8DAarQe+gE65TPMpe+BoIbW92aWRvbmUiMnsia2lkIjo
iV0NxOERBYXJRZStnRTY1VFBNcGUrQT09IXXXXHJhY2tzIjpbIlNEIl19KgJTRA==</cpix:PSSH>
<cpix:ContentProtectionData/>
</cpix:DRMSystem>
```

Option 2: Request DRM keys with curl

The second option to request DRM keys from EZDRM is to script the process with curl or another web service call.

Using EZDRM's web service, the curl script below retrieves the DRM values from the web service.

```
curl -v http://cpix.ezdrm.com/keygenerator/cpix.aspx?k=kid&u=username&p=password&c=drm-001
```

Universal DRM – Key Value Definitions

Widevine

- **key_id:** The **kid** used for encryption (also known as KID); Base 64 encoded with no dashes.

- **key:** The DRM content encryption key (128 bit key); Base 64 encoded.

  For the **key** value use the **pskc:Secret key** value and decode the Plain Value tag from Base 64 to HEX format in lowercase (no dashes). An example decoder can be found at:
  http://guid-convert.appspot.com

pskc:Secret key (Base 64) = sU+A8UXXXXvSN0aXXXXwcg==

(KeyHEX) = b14fXXXX41b77XXXX2374XXXXe2f30XX

PlayReady

- **key_id:** This value is the same as the Widevine **kid** above, used for encryption (also known as KID); Base 64 encoded with no dashes.

- **key:** This value is the same as the Widevine **Key** above, because the DRM is using common encryption with a shared key base; Base 64 encoded.

Universal DRM – Raw Key Format

The example raw key format for Universal DRM (Widevine & PlayReady):

```
packager-win.exe
in=BigBuckBunny_320x180_Frag.mp4,stream=audio,output=audio.mp4,drm_label=AUDIO
in=BigBuckBunny_320x180_Frag.mp4,stream=video,output=h264_360p.mp4,drm_label=SD
--enable_raw_key_encryption
--keys label=AUDIO:key_id=582aXXXXXXXX41efXXXae533ccaXXXX:key=b14fXXXX41b77XXXX2374XXXXe2f30XX,label=SD:ke
y_id=582aXXXXXXXX41efXXXae533ccaXXXX:key=b14fXXXX41b77XXXX2374XXXXe2f30XX
--protection_systems Widevine,PlayReady
--mpd_output h264.mpd
```

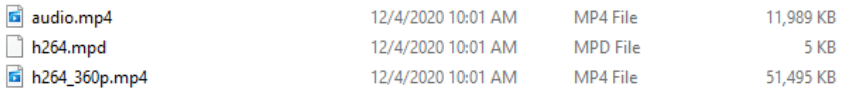
```
C:\Users\TEST01\Downloads>
C:\Users\TEST01\Downloads>packager-win.exe in=BigBuckBunny_320x180_Frag.mp4,stream=audio,output=audio.mp4,drm_label=AUDIO
 in=BigBuckBunny_320x180_Frag.mp4,stream=video,output=h264_360p.mp4,drm_label=SD --enable_raw_key_encryption --keys label
=AUDIO:key_id=582ab                                  ca5ef8:key=b14f8                                  072,label=SD:key_id=582ab
      a5ef8:key=b14f8                                  3072 --protection_systems Widevine,PlayReady --mpd_output h264.mpd
[1217/080723:INFO:demuxer.cc(88)] Demuxer::Run() on file 'BigBuckBunny_320x180_Frag.mp4'.
[1217/080723:INFO:demuxer.cc(160)] Initialize Demuxer for file 'BigBuckBunny_320x180_Frag.mp4'.
[1217/080725:INFO:single_segment_segmenter.cc(107)] Update media header (moov) and rewrite the file to 'h264_360p.mp4'.
[1217/080726:INFO:mp4_muxer.cc(177)] MP4 file 'h264_360p.mp4' finalized.
[1217/080726:INFO:single_segment_segmenter.cc(107)] Update media header (moov) and rewrite the file to 'audio.mp4'.
[1217/080726:INFO:mp4_muxer.cc(177)] MP4 file 'audio.mp4' finalized.
Packaging completed successfully.
```

The example raw key format for Widevine only:

```
packager-win.exe
in=BigBuckBunny_320x180_Frag.mp4,stream=audio,output=audio.mp4,drm_label=AUDIO
in=BigBuckBunny_320x180_Frag.mp4,stream=video,output=h264_360p.mp4,drm_label=SD
--enable_raw_key_encryption
--keys label=AUDIO:key_id=582aXXXXXXXX41efXXXae533ccaXXXX:key=b14fXXXX41b77XXXX2374XXXXe2f30XX,label=SD:ke
y_id=582aXXXXXXXX41efXXXae533ccaXXXX:key=b14fXXXX41b77XXXX2374XXXXe2f30XX
--mpd_output h264.mpd
```

Note – for Widevine only remove "--protection_systems widevine, PlayReady"

Output example:



Apple FairPlay Streaming

EZDRM Apple FairPlay DRM is a hosted Apple FairPlay Streaming (DRM). This enables a content owner to encrypt the media with Apple FPS DRM keys and deliver content Apple devices with native support MAC Safari browser via HTML 5 player or iOS via native App or Safari 11.3.

The packaging process encrypts the media. This is accomplished via a secure web call to the EZDRM Key Servers API. The Key Server API will return an XML response with the DRM key structure.

Generating Keys

Option 1: Request DRM keys using EZDRM CPIX Web Service

3. Call the EZDRM web service in a browser:
   http://cpix.ezdrm.com/keygenerator/cpix.aspx?**k=kid**&**u=username**&**p=password**&**c=resourcename**

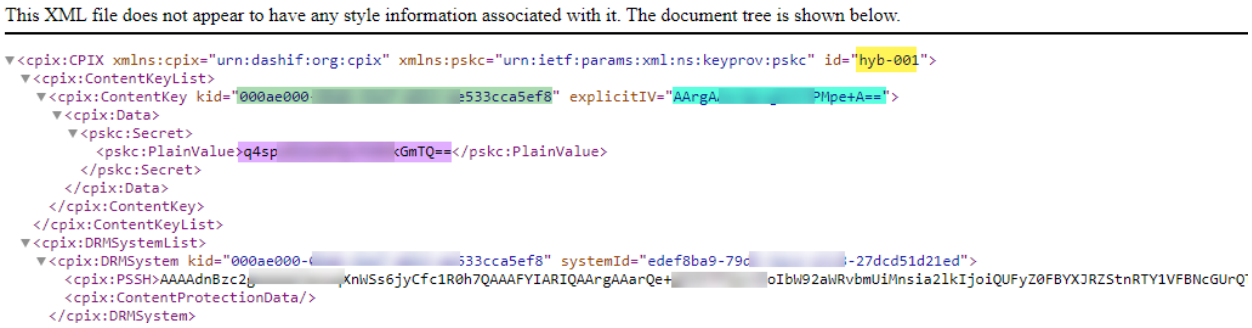
   The parameters are as follows:

Parameter	Description
k	kid or Key ID value (client generated) in GUID format*
u	EZDRM username
p	EZDRM password
c	Content ID – generic resource name/identifier (client generated) – passed into **id** field

   * To generate a GUID for the k value, you can use a GUID generator like the one found here: http://guid-convert.appspot.com.

Key Value Definitions

Here are the descriptions of the key values returned by EZDRM:



- **id** – c value returned, generic resource name/identifier (client generated)
- **kid** – Key ID in GUID format (client generated)*
- **pskc:Secret key**– the Secret Content Encryption Key in Base 64 generated by EZDRM and returned as a plain value
- **explicitIV** – the Apple FairPlay explicit IV value

* To generate a GUID for the k value, you can use a GUID generator like the one found here: http://guid-convert.appspot.com.

Here Is the example XML return:

```
<cpix:CPIX xmlns:cpix="urn:dashif:org:cpix" xmlns:pskc="urn:ietf:params:xml:ns:keyprov:pskc" id="hyb-001">
<cpix:ContentKeyList>
<cpix:ContentKey kid="582de60c-XXXX-XXXX-a013-XXX33cca5ef8" explicitIV="WCXXXXXXXX+gE65TXXXe+A==">
<cpix:Data>
<pskc:Secret>
<pskc:PlainValue>sU+A8XXXXXXXXXaXbi8wcg==</pskc:PlainValue>
</pskc:Secret>
</cpix:Data>
</cpix:ContentKey>
</cpix:ContentKeyList>
```

Option 2: Request DRM keys with curl

The second option to request DRM keys from EZDRM is to script the process with curl or another web service call.

Using EZDRM's web service, the curl script below retrieves the DRM values from the web service.

```
curl -v http://cpix.ezdrm.com/keygenerator/cpix.aspx?k=kid&u=username&p=password&c=hyb-001
```

Apple FairPlay Streaming – Key Value Definitions

Here are the descriptions of the key values returned:

- **key_id:** The **kid** used for encryption (also known as KID); Base 64 encoded with no dashes (-).

- **key:** The DRM content encryption key (128 bit key); Base 64 encoded.

  For the **key** value use the **pskc:Secret key** value and decode the Plain Value tag from Base 64 to HEX format in lowercase (no dashes). An example decoder can be found at:
  http://guid-convert.appspot.com

  pskc:Secret key (Base 64) = sU+A8UXXXXvSN0aXXXXwcg==

  (KeyHEX) = b14fXXXX41b77XXXX2374XXXXe2f30XX

- **iv: explicitIV** decoded from Base 64 to HEX) combined.

  Decode the **explicitIV** Plain Value Base 64 to HEX format. An example decoder can be found at: http://guid-convert.appspot.com/

  explicitIV (Base 64) = WCq8DXXXXX+gE65TXXXX+A==

iv (HEX no dashes) = 582aXXXXXXXX41efXXXae533ccaXXXX

- **KeyURI** - Use the command line option **--encryption-key-uri** to specify the license URL for encryption. Build by appending the **kid** value to base URL "skd://fps.ezdrm.com/;" for example: skd://fps.ezdrm.com/;582de60c-XXXX-XXXX-a013-XXX33cca5ef8

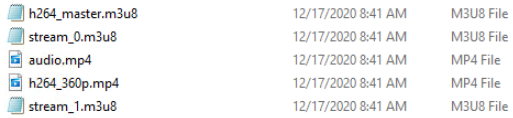
Apple FairPlay Streaming – Raw Key Format

The example raw key format for Apple HLS:

```
packager-win.exe
in=BigBuckBunny_320x180.mp4,stream=audio,output=audio.mp4,drm_label=AUDIO
in=BigBuckBunny_320x180.mp4,stream=video,output=h264_360p.mp4,drm_label=SD
--protection_scheme cbcs
--enable_raw_key_encryption
--keys label=AUDIO:key_id=582de60cXXXXXXXXa013XXX33cca5ef8:key=b14fXXXX41b77XXXX2374XXXXe2f30XX,
label=SD:key_id=582de60cXXXXXXXXa013XXX33cca5ef8:key=b14fXXXX41b77XXXX2374XXXXe2f30XX
--protection_systems FairPlay
--iv 582aXXXXXXXX41efXXXae533ccaXXXX
--hls_master_playlist_output h264_master.m3u8
--hls_key_uri skd://fps.ezdrm.com/;582de60c-XXXX-XXXX-a013-XXX33cca5ef8
```

```
C:\Users\TEST01\Downloads>packager-win.exe in=BigBuckBunny_320x180.mp4,stream=audio,output=audio.mp4,drm_label=AUDIO in=BigBuckBunny_320x180.mp4,str
eam=video,output=h264_360p.mp4,drm_label=SD --protection_scheme cbcs --enable_raw_key_encryption --keys label=AUDIO:key_id=582abc
cca5ef8:key=b14f8
f3072,label=SD:key_id=582abc
a5ef8:key=b14f80f1
f3072 --protection_syst
ems FairPlay --iv 582abc0c06a
a5ef8 --hls_master_playlist_output h264_master.m3u8 --hls_key_uri skd://fps.ezdrm.com/;582
ef-
ca5ef8
[1204/101944:INFO:demuxer.cc(88)] Demuxer::Run() on file 'BigBuckBunny_320x180.mp4'.
[1204/101944:INFO:demuxer.cc(160)] Initialize Demuxer for file 'BigBuckBunny_320x180.mp4'.
[1204/101945:INFO:single_segment_segmenter.cc(107)] Update media header (moov) and rewrite the file to 'h264_360p.mp4'.
[1204/101946:INFO:mp4_muxer.cc(177)] MP4 file 'h264_360p.mp4' finalized.
[1204/101946:INFO:single_segment_segmenter.cc(107)] Update media header (moov) and rewrite the file to 'audio.mp4'.
[1204/101946:INFO:mp4_muxer.cc(177)] MP4 file 'audio.mp4' finalized.
Packaging completed successfully.
```

Output example:



Additional Information

For additional questions and comments please contact: simplify@ezdrm.com