



Widevine DRM Proxy Integration

version 2.17

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Revision History

Version	Date	Description
1.6	12/5/2014	<ul style="list-style-type: none"> Expanded available parameters. Clarification on string value types. Added Appendix (License duration, Security levels, HDCP output)
1.7	1/29/2015	<ul style="list-style-type: none"> Additional edits after review.
1.9	10/12/2015	<ul style="list-style-type: none"> Clarification on required / optional fields. key id has max length of 16 bytes. Expanded license response details including message_type, request_type, cert_serial_number.
2.0	4/15/2016	<ul style="list-style-type: none"> Content_id is now optional in the request. Added missing content_key_specs.iv field.
2.1	5/11/2016	<ul style="list-style-type: none"> Rental duration parameter has been deprecated, to be reinstated at a later date.
2.2	6/1/2016	<ul style="list-style-type: none"> Added section on how to protect external content keys. (draft)
2.3	6/9/2016	<ul style="list-style-type: none"> Completed section on how to protect external content keys.
2.4	6/29/2016	<ul style="list-style-type: none"> Added always_include_client_id.
2.5	7/7/2016	<ul style="list-style-type: none"> Clarification on key_id and key value generation.
2.6	12/19/2016	<ul style="list-style-type: none"> Updated renewal document links.
2.7	2/9/2017	<ul style="list-style-type: none"> Corrected CGMS flags syntax. Updated HDCP flags parameters. Updated message_type parameters. Updated allowed_track_type parameters. Updated track_type parameters.
2.8	4/28/2017	<ul style="list-style-type: none"> Updated license workflow with service certificate request. Added service certificate and VMP sections.
2.9	5/9/2017	<ul style="list-style-type: none"> Added Test environment service certificate.
2.10	6/22/2017	<ul style="list-style-type: none"> Added client_id_msg.
2.11	7/24/17	<ul style="list-style-type: none"> Added disable_analog_output to required_output_protection. Added sd_only_for_I3 to license request.
2.12	8/30/17	<ul style="list-style-type: none"> Introduce the Proxy SDK component.
2.13	9/14/17	<ul style="list-style-type: none"> Added srm_version and srm_included to license metadata response.
2.14	1/28/2018	<ul style="list-style-type: none"> Updated license durations (time windows) description, operation and behavior.

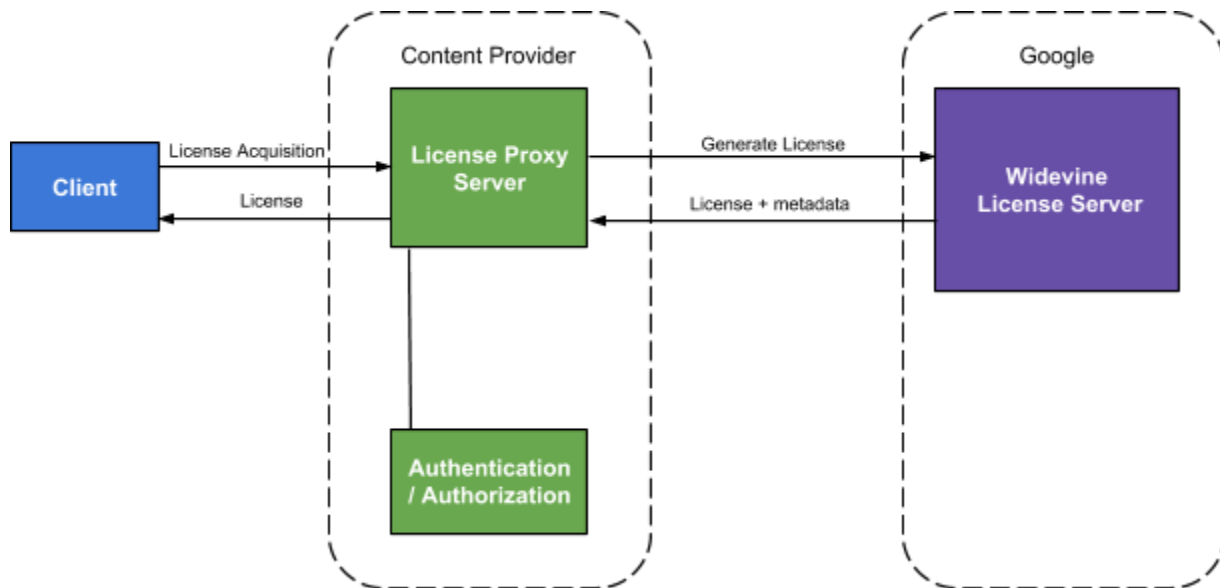
2.15	5/3/2018	<ul style="list-style-type: none">Updated VMP status codes.
2.16	6/6/2018	<ul style="list-style-type: none">Added HDCP table for Chromecast.
2.17	7/27/2018	<ul style="list-style-type: none">Added offline license release.Updated HDCP tables for Android.

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Introduction

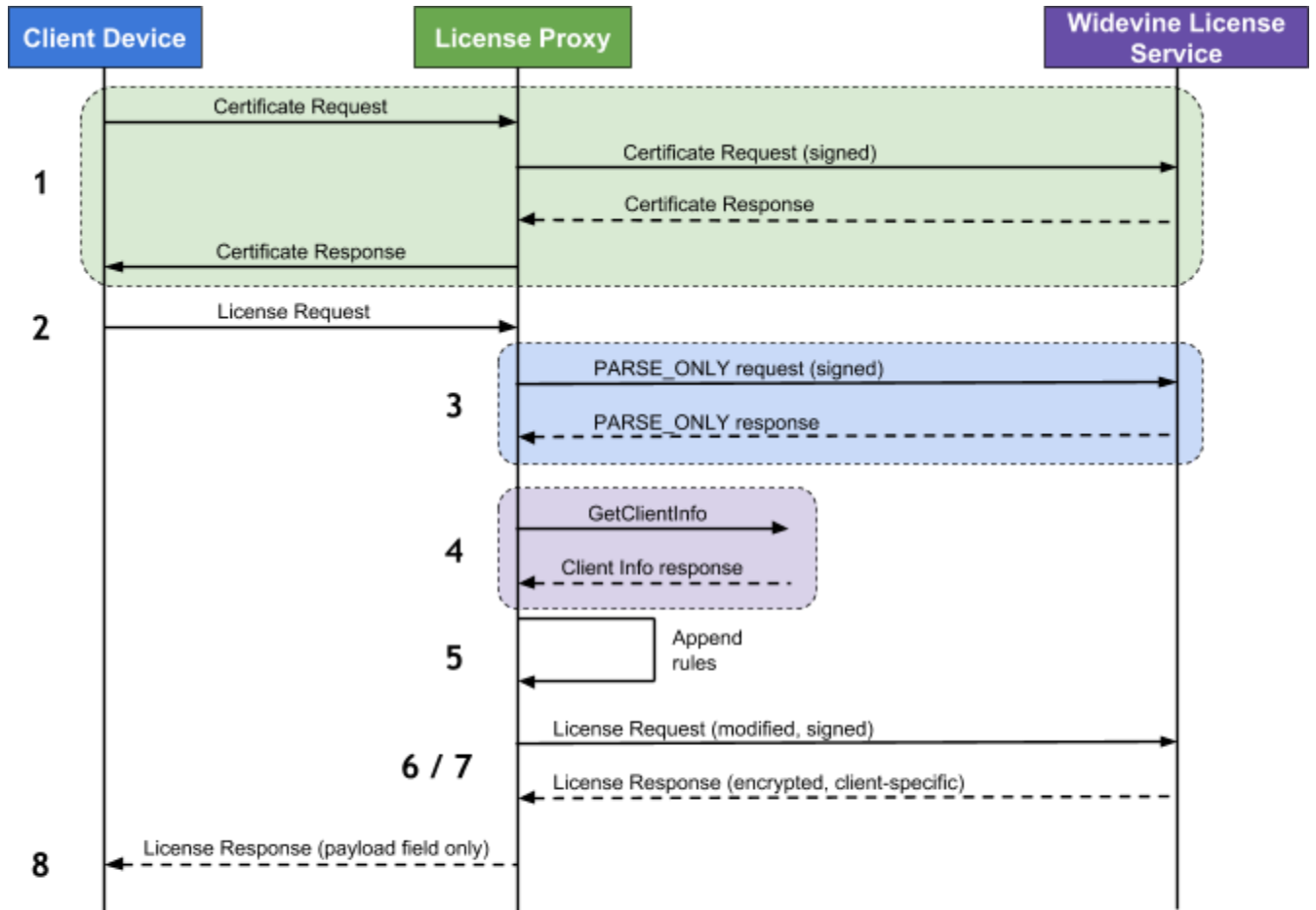
This document describes how external content providers integrate their license proxy component with the Widevine Cloud License Service. This solution is intended for content providers who have their own proxy servers for user authentication and access authorization, but relies on Widevine service for policy and content key management and generating the license.

System Diagram



All communication between client, proxy and license service is via HTTPS.

Workflow



The certificate request workflow is **required** for Chrome 59 and later, iOS and specific use-cases in ChromeOS.

The PARSE_ONLY workflow is **optional**, used to inspect the incoming encrypted request payload, increases latency. Recommend using Proxy SDK instead.

Proxy SDK provides APIs to manage the service certificate request directly and inspect the Widevine license request.

1. A client **may** generate a [service certificate request](#).
 - a. The proxy must sign the certificate request.
2. A client generates a license request and sends it to the license proxy.
 - a. The proxy authenticates the user and authorizes the request.
3. Providers not using the Proxy SDK:
 - a. This **may** include a requirement to view the license request details via a [PARSE_ONLY](#) request.
4. Proxy SDK is used to query the license for information such as device make and model.

5. The proxy determines the desired business rules (if any).
6. The proxy calls GetLicense API using HTTP POST.
7. Widevine License service receives the license request
 - a. obtains content keys
 - b. generates a license
 - c. returns license to the proxy.
8. The proxy inspects GetLicense response status and forwards the license payload blob (as byte-stream) to client.

GetLicense API

This API allows a Content Provider proxy to fetch a Modular DRM license from the Widevine Cloud License Service.

Request

The request is an HTTP POST request to the license URL. The license URL is provided with your service credentials. Please [contact us](#) for more details.

The POST body is JSON formatted data in the following syntax:

```
{
  "request": "<message>",
  "signature": "<signature>"
  "signer" : <signer name>"
}
```

Name	Value	Description
request	Base64 encoded string.	The actual message. This is a serialized JSON message containing the request or the response. The message is in the clear.
signature	Base64 encoded string.	AES CBC encryption of the SHA1 hash of <message> Credentials are provided by Widevine. Please contact us for more details.
signer	String	Identifies the entity sending the message. Credentials are provided by Widevine. Please contact us for more details.

<message> is a JSON formatted string containing the license challenge, policy overrides and license configurations. The syntax is


```

{
  "payload": "<license challenge>",
  "content_id": "<content id>"
  "provider": "<provider>"
  "allowed_track_types": "<types>",
  "content_key_specs": [
    { "track_type": "<track type 1>" },
    { "track_type": "<track type 2>" }, ... ],
  "policy_overrides": {
    "can_play": <can play>,
    "can_persist": <can persist>,
    "can_renew": <can renew>,
    "rental_duration_seconds": <rental duration>,
    "playback_duration_seconds": <playback duration>,
    "license_duration_seconds": <license duration>,
    "renewal_recovery_duration_seconds": <renewal recovery
duration>,
    "renewal_server_url": "<renewal server url>",
    "renewal_delay_seconds": <renewal delay>,
    "renewal_retry_interval_seconds": <renewal retry interval>,
    "renew_with_usage": <renew with usage>
  }
}

```

Fields below are optional unless marked as required.

Name	Value	Description
payload	Base64 encoded String	REQUIRED The license request sent by a client.
provider	String	REQUIRED Used to look up content keys and policies. Credentials are provided by Widevine. Please contact us for more details.
content_id	Base64 encoded string max 36 bytes	This is the content identifier. Used to associate KeyId(s) and Content Key(s) for each content_key_specs.track_type. Note: convert your string to base64.
policy_name (deprecated)	String	Name of a previously registered policy. This field is provided for backwards compatibility with legacy Widevine systems. As a general

		<p>recommendation, all business rules should be specified in the license request according to this document.</p> <p>Do not use this parameter unless you are a Widevine Classic legacy user.</p>
allowed_track_types	<p>Enum, one of:</p> <p>SD_ONLY SD_HD SD_UHD1 SD_UHD2</p>	<p>Controls which content keys should be included in a license.</p> <p>SD_ONLY - returns SD and AUDIO keys only SD_HD - returns SD, HD and AUDIO keys only SD_UHD1 - returns SD, HD, UHD1 and AUDIO keys SD_UHD2 - returns SD, HD, UHD1, UHD2 and AUDIO keys (all)</p>
content_key_specs	<p>Array of JSON structures</p> <p>(see Content Key Spec)</p>	<p>A finer grained control on what content keys to return.</p> <p>See Content Key Spec below for details.</p> <p>Only one of allowed_track_types and content_key_specs can be specified.</p>
use_policy_overrides_exclusively	<p>Boolean.</p> <p>true or false</p>	<p>Use policy attributes specified by policy_overrides and omit all previously stored policy.</p>
policy_overrides	<p>JSON structure</p> <p>(see Policy Overrides)</p>	<p>Policies settings for this license. In the event this asset has a predefined policy, these specified values will be used.</p>
session_init	<p>JSON structure</p> <p>(see Session Initialization)</p>	<p>Optional data passed to license.</p>
parse_only	<p>Boolean.</p> <p>true or false</p>	<p>The license request is parsed but no license is issued. However, values from the license request are returned in the response.</p>
session_key	<p>Base64 encoded string.</p>	<p>If specified, the content keys and IVs specified in ContentKeySpec are encrypted with this key using AES-CBC (PKCS5 padding). The session_key itself is encrypted with the partner's AES key that was provided by Widevine.</p>
session_iv	<p>Base64 encoded string.</p>	<p>REQUIRED if session_key was specified.</p> <p>If specified, the content keys and IVs specified in ContentKeySpec are encrypted with this IV using AES-CBC (PKCS5 padding). The session_iv itself is encrypted with the partner's AES key that was provided by Widevine.</p>

client_id_msg	String of binary bytes	Results from using the Proxy SDK to call <i>GetClientInfoAsString()</i> . The Proxy SDK is a set of API designed to allow easier integration with Widevine DRM licensing. This field would be populated by partners who manage their own service certificate.
sd_only_for_l3	Boolean. true or false	Only return AUDIO and SD keys if this device is Widevine L3. This takes precedence over "allowed_track_types". <i>Default = false.</i>
sd_only_for_remote_attestation	Boolean true or false	Only return AUDIO and SD keys if this device fails remote attestation. <i>Default = false.</i>
sd_only_for_no_srm	Boolean true or false	Only return AUDIO and SD keys if this device is required to have an up-to-date SRM, but the device has an older SRM and the device is not capable of an SRM update.

license_start_time is the time when the license is being requested. Playback is halted when license_start_time + license_duration_seconds is exceeded.

Policy Overrides

Fields below are optional unless marked as required.

Name	Value	Description
policy_overrides. can_play	Boolean. true or false	REQUIRED Indicates that playback of the content is allowed. <i>Default = false.</i>
policy_overrides. can_persist	Boolean. true or false	Indicates that the license may be persisted to non-volatile storage for offline use. <i>Default = false.</i>
policy_overrides. can_renew	Boolean true or false	Indicates that renewal of this license is allowed. If true, the duration of the license can be extended by heartbeat. <i>Default = false.</i>
policy_overrides. license_duration_seconds	Int64	Indicates the time window for this specific license. A value of 0 indicates unlimited. <i>Default = 0.</i> See Appendix .
policy_overrides. rental_duration_seconds	Int64	Indicates the time window while playback is permitted. A value of 0 indicates unlimited. <i>Default = 0.</i> See Appendix .
policy_overrides. playback_duration_seconds	Int64	The viewing window of time once playback starts within the license duration. A value of 0 indicates unlimited. <i>Default = 0.</i> See Appendix .
policy_overrides. renewal_server_url	String	All heartbeat (renewal) requests for this license shall be directed to the specified URL. This field is only used if can_renew is true.

policy_overrides. renewal_delay_seconds	int64	How many seconds after license_start_time, before renewal is first attempted. This field is only used if can_renew is true. <i>Default = 0.</i>
policy_overrides. renewal_retry_interval_seconds	int64	Specifies the delay in seconds between subsequent license renewal requests, in case of failure. This field is only used if can_renew is true. <i>Default = 0.</i>
policy_overrides. renewal_recovery_duration_seconds	int64	The window of time, in which playback is allowed to continue while renewal is attempted, yet unsuccessful due to backend problems with the license server. A value of 0 indicates unlimited. This field is only used if can_renew is true. <i>Default = 0.</i>
policy_overrides. renew_with_usage	Boolean true or false	Indicates that the license shall be sent for renewal when usage is started. This field is only used if can_renew is true. <i>Default = false.</i>
policy_overrides. always_include_client_id	Boolean true or false	Indicates to client that license renewal and release requests must include client identification (client_id). <i>Default = false.</i>

Session Initialization

This structure is used to pass optional data when issuing a license.

Fields below are optional unless marked as required.

<i>Name</i>	<i>Value</i>	<i>Description</i>
provider_client_token	Base64 encoded string	Client token to send back in the license response. If the license request contains a client token, this value is ignored. The client token will persist beyond license sessions. <i>provider_client_token</i> is only supported in the Chrome CDM and <i>persistentState</i> must be enabled by the Application.
override_provider_client_token	Boolean. true or false	If false and the license request contains a client token, use the token from the request even if a client token was specified in this structure. If true, always use the token specified in this structure. <i>Default = false.</i>
session_id	Base64 encoded string	Identifies the session. This value will exist in all subsequent license renewals associated with this license.

Content Key Specs

If a pre-existing policy exists, there is no need to specify any of the values in the Content Key Spec. The pre-existing policy associated with this content will be used to determine the output protection such as HDCP and CGMS. If a pre-existing policy is not registered with the Widevine License Server, the content provider can inject the values into the license request (recommended approach).

Each `content_key_specs` must be specified for all tracks, regardless of the option `use_policy_overrides_exclusively`.

Fields below are optional unless marked as required.

Name	Value	Description
<code>content_key_specs.track_type</code>	String Options: SD HD AUDIO UHD1 UHD2	A track type definition. If content_key_specs is declared in the license request, you must specify all track types explicitly for playback. AUDIO - audio tracks SD - 576p or less HD - 720p, 1080p UHD1 - 4K UHD2 - 8K
<code>content_key_specs.security_level</code>	uint32	Defines client robustness requirements for playback. 1 - Software-based whitebox crypto is required. (SW_SECURE_CRYPT0) 2 - Software crypto and an obfuscated decoder is required. (SW_SECURE_DECODE) 3 - The key material and crypto operations must be performed within a hardware backed trusted execution environment. (HW_SECURE_CRYPT0) 4 - The crypto and decoding of content must be performed within a hardware backed trusted execution environment. (HW_SECURE_DECODE) 5 - The crypto, decoding and all handling of the media (compressed and uncompressed) must be handled within a hardware backed trusted execution environment. (HW_SECURE_ALL) <i>Default = 1.</i>

		See Appendix for more information.
content_key_specs.required_output_protection.hdcp	String - one of: HDCP_NONE, HDCP_V1, HDCP_V2, HDCP_V2_1, HDCP_V2_2, HDCP_NO_DIGITAL_OUTPUT	Indicates whether HDCP is required. <i>Default = HDCP_NONE.</i> Note: These values must be capitalized. See Appendix .
content_key_specs.required_output_protection.cgms_flags	String - one of: CGMS_NONE, COPY_FREE, COPY_ONCE, COPY_NEVER	Indicates whether CGMS is required. <i>Default = CGMS_NONE.</i> Note: Do not specify this parameter for desktop browser platforms. Note: These values must be capitalized.
content_key_specs.required_output_protection.disable_analog_output	Boolean. true or false	Indicates whether analog output is allowed. <i>Default = false.</i>
content_key_specs.required_output_protection.hdcp_srm_rule	String - one of: HDCP_SRM_RULE_NONE, CURRENT_SRM	Use <i>CURRENT_SRM</i> to not allow this key if the device has an older SRM and cannot support SRM updates.
content_key_specs.key	Base64 encoded string	Content key to use for this track. If specified, the track_type OR key_id is required. This option allows the content provider to inject the content key for this track instead of letting Widevine license server generate or lookup a key. Note: convert your key value to binary and base64.
content_key_specs.iv	Base64 encoded string	IV associated with the content key for this track.
content_key_specs.key_id	Base64 encoded string binary, 16 bytes	Unique identifier for the key. Note: convert your string or hex value to binary and base64.

Example of specifying and [protecting](#) content_key_specs

ContentKeySpecs (request)
<pre>[{ "key_id": "MGRmMjVjYzUtOWFkMS01MjhiLTkwZGMtNTYyY2QxODExODNi", "track_type": "SD", "key": "Pv38THb6rTQbIpzg04/qag==", "iv": "REVBREJFRUZERUFEQkVFRg==" }, { "key_id": "NzVlYThiYWMtZjg3Yy01YzMxLWFmYTYtNWY3YmUwNjE1MGU5", "track_type": "HD", "key": "xiE14IkMIRKxSPBQL+HksA==", "iv": "REVBREJFRUZERUFEQkVFRg==" }, { "key_id": "NDczMWNhNzItOWExYy01YjQ1LTJhMTMtMGY4MDJiMDRiMWNj", "track_type": "AUDIO", "key": "y9DDm30ttT07GqXfxKMwdQ==", "iv": "REVBREJFRUZERUFEQkVFRg==" }]</pre>

License Response

The response is in JSON format.

```
{
  "operation_status_code": <status code>,
  "licenses": <license>,
  "license_metadata": [
    {
      "drm_status_code": <drm status code>,
      "asset_id": <asset identifier>,
      "policy": {
        "organization_name": "<organization>",
        "name": "<policy name>",
        "track_policy": [
          {
            "track_type": "<track type>",
            "level": <security level>,
            "output_protection": "<output protection>"
          }
        ]
      }
    }
  ]
}
```

```

    }
    ... ],
}
}
... ]
}

```

Name	Value	Description
status	UInt32	Result of the request. <i>OK = 0;</i> <i>SIGNATURE_FAILED = 1;</i> <i>INVALID_LICENSE_CHALLENGE = 2;</i> <i>INVALID_CONTENT_INFO = 3;</i> <i>POLICY_UNKNOWN = 4;</i> <i>MALFORMED_REQUEST = 5;</i> <i>INTERNAL_ERROR = 6;</i> <i>PROVIDER_MISSING = 7;</i> <i>INVALID_REQUEST = 8;</i> <i>ACCESS_DENIED = 9;</i> <i>SIGNING_KEY_EXPIRED = 10;</i>
license	Base64 encoded string	License response that needs to be passed to the CDM after Base64 decode.
license_metadata	JSON structure (see License_Metadata)	License attributes.
make	String	Manufacturer of the device making the license request.
model	String	Model of the device making the license request.
security_level	UInt32 (see Client Security Level)	Widevine-defined security level as referenced within the EME specification.
drm_cert_serial_number	String	Globally unique serial number of certificate associated with this device. Example: 7f6f3150b373262cbdc3b2dade075dbb
message_type	String - one of: LICENSE_REQUEST, LICENSE, SERVICE_CERTIFICATE_REQUEST, SERVICE_CERTIFICATE, ERROR_RESPONSE	Indicates the type of message contained in the license going back to the CDM. This field may be missing or empty if the server failed to generate a license or certificate.

License_Metadata

Name	Value	Description
content_id	String	content id used to generate the license.
license_type	Uint32	1 - indicates streaming. 2- indicates offline.
request_type	Uint32	1 - indicates NEW license. 2 - indicates RENEWAL license. 3 - indicates RELEASE license.
platform_verification_status	Uint32	See Appendix for values .
srm_version	Uint32	SRM version sent back to the client. This field only exist if the requesting policy sets hdcpc_srm_rule = <i>CURRENT_SRM</i> .
srm_included	Boolean. true or false	Indicates if SRM in included in the license. This field only exist if the requesting policy sets hdcpc_srm_rule = <i>CURRENT_SRM</i> .

Using Service Certificates

Service certificates are required by the Widevine client in the following circumstances:

- Chrome 59 (or later)
- Widevine iOS client
- ChromeOS (Chromebooks) - when `remote_attestation` is enabled.

It is highly recommended that the service certificate workflow is supported in all proxy implementations. The [sample proxy scripts](#) provide code examples on how to support this request.

The certificate request is a 2-byte binary payload which must be fulfilled by the license service. The certificate request must be [signed](#).

Sample request and response certificate payload

```
2017-04-12 17:42:53,085 - proxy - DEBUG - Proxied Request = {"signer":
"widevine_test", "request": "eyJwYXlsb2FkIjogIkNBUT0ifQ==", "signature":
"1TQ71YXPYBsCI/A4tpmzoMOyNqzWboBf3VKvqIQ14is="}
2017-04-12 17:42:53,102 - proxy - DEBUG - response = {
  "status": "OK",
  "license": "CAUSxQUKvwIIAxIQKHA0VMAI9jYYredEPbbEyBiL5/mQBSKOAjCCAQoCggEBALUhErjQ
XQI/zF2V4sJRwcZJtBd82NK+7zVbsGdD3mYePSq8MYK3mUbVX9wI3+1UB4FemmJ0syKix/XgZ7tfCsB
6idRa6pSyUW8HW2bvgR0NJuG5priU8rmFeWKqFxxPZmMNPkxgJxiJf14e+baq9a1Nuip+FBdt8TSh0x
hbWiGKwFpMQfCB7/+Ao6BAxQsJu8dA7tzY8U1nWpGYD5LKfdxkagatrVEB90oOSYzAHwBTK6wheFC9k
F6QkjZwt9/v70JIZ2fzPvYoPU9CVKtyWJOQvuVYCPHWAaGnrDiTwryi901goMDQoJk87wFgRwMzTDY4
E5SGvJ2vJP1noH+a2UMCAwEAAToSc3RhZ2luZy5nb29nbGUuY29tEoADmD4wNSZ19AunFfwkm9rl1Kx
ySaJmZSHkn1Vz1SlyH/iA4KrvxeJ7yYDa6tq/P8OG0ISgLIJTeEjMdT/017ARp9qXeIoA4qprhM19cc
B6SOv2FgLMpaPzIDCnKVww2pFbkdwYubyVk7jei7UPDe3BKTi46eA5zd4Y+oLoG7AyYw/pVdhaVmzhV
DAL9tTBvRjPzjVrKH1lexjOY9Dv1F/FJp6X6rEctWPlVkoYb/SfEJwhAa/K81uDLYiPDZ1Flg4lnoX7
XSTb0s+Cdkxd2b9yfvvpyGH4aTIfat4YkF9Nkvm2mU224R1hx0WjocLsjA89wxu14TJPS3oRa2CYr5
+DU4uSgdZzvgtEJ01ksckKfjAF0K64rPeytvDPD5fs69eFuy3Tq26/LfGcF96njtvOUA4P5xRFtICog
ySKe6WnCUZcYMDtQ0BMMM1LgawFNg4VA+KDCJ8ABHg9bOOTim00sswHrRWSWX1XF15dXolCk65yEqz5
lOfa2/fVomeopkU",
  "supported_tracks": [],
  "internal_status": 139,
  "message_type": "SERVICE_CERTIFICATE",
  "client_info": []}
```

Pre-loading a service certificate

An alternative to executing the certificate request-response is to store the service certificate, prior to any license request. This method removes the overhead of an additional HTTPS round-trip to the license service.

The Widevine Cloud License Service certificate is only valid for use with the appropriate Widevine Cloud License Service:

- license.uat.widevine.com - [Download](#)
 - license.widevine.com - [Download](#)
1. Download the tarball and extract the binary certificate file.
 2. The client application must retrieve it (via HTTP GET) and execute EME's [setServiceCertificate API](#).
 - The certificate can be hosted on your service or proxy.
 3. setServiceCertificate must be executed prior to every playback session to avoid the certificate request.

Verified Media Path (VMP)

The Verified Media Path (VMP) feature is implemented for desktop browser platforms. It describes our method to authenticate the browser software stack that is interfacing with the Widevine CDM.

VMP requires a valid service certificate.

VMP is available on the following platforms:

- Chrome 59 and later.

The Widevine license response will contain a [platform_verification_status](#) flag indicating if the browser framework is trusted.

Value	Description
PLATFORM_UNVERIFIED	Unable to verify VMP path. This is the default value. Do not issue a license for this platform.
PLATFORM_TAMPERED	VMP security path has been altered and modified. Do not issue a license for this platform.
PLATFORM_SOFTWARE_VERIFIED	VMP secured via software. This is equivalent to Widevine security level 3 designation.
PLATFORM_HARDWARE_VERIFIED	VMP secured via hardware. This is equivalent to Widevine security level 1 designation.
PLATFORM_NO_VERIFICATION	VMP platform verification was not performed. Do not issue a license for this platform.
PLATFORM_SECURE_STORAGE_SOFTWARE_VERIFIED	VMP secured via software. Platform and secure storage capability have been verified by means of software. This allows for persistent storage (license and media).

Sample license response metadata with VMP validation

This sample is from a Chromebook platform.

```
"License_metadata":{
  "content_id":"bGxhbWFfd2lkZXZpbmVfdGVzdA==",
  "license_type":"STREAMING",
  "request_type":"NEW"},
  "supported_tracks":[{"type":"SD",
  "key_id":"kijTVq/KWk+aiSI9YVRlxQ=="}, {"type":"AUDIO",
  "key_id":"fQaj7GBJU06FEfRHVTGKYA=="}, {"type":"HD",
  "key_id":"7EDyLmsYXw6Uw4dtQSbELA=="}}],
  "make":"Google",
  "model":"ChromeCDM-ChromeOS-x86",
  "remote_attestation_verified":true,
...truncated...
  "device_whitelist_state":"DEVICE_WHITELISTED",
  "message_type":"LICENSE",
  "platform":"",
  "device_state":"RELEASED",
...truncated...
  "platform_verification_status":"PLATFORM_HARDWARE_VERIFIED"}
```

Rejecting a request

A proxy may reject a license request if, for example, a user is not allowed to watch the video. In this case, a proxy may just return an empty HTTP response with appropriate response code, e.g. 403 Forbidden, or whatever response that the content provider's client application wishes to receive. No license blob is expected by the Widevine client module in this case.

Heartbeat (License Renewal) support

A proxy uses the same GetLicense API to obtain a heartbeat response. There is no need to pass in `allowed_track_types` and `content_key_specs`. A proxy controls whether the playback is allowed to continue by setting `policy.can_play`. The license renewals do not contain content keys, they only extend the duration of keys contained in the initial license.

- Related documentation
 - [License Renewal Overview](#)
 - [Using License Renewal](#)

Protecting proxy specified content keys

If the proxy is specifying content keys to the Widevine license service, it's strongly recommended the proxy encrypts the content keys. The process for the proxy is as follows:

1. Generate a random 16 byte session key and 16 byte session IV.
 - Example session key: 0x8727a40ebd82329e6b3b4e29fa3b004b
 - Example session IV: 0x000102030405060708090a0b0c0d0e0f
2. Encrypt each content key and content IV (AES-CBC, PKCS5 padding) using the session key and session IV. Example of using the following clear content key and iv.
 - Clear content key: 0x2038fa82910c404bee9200e8108baf29
 - Clear content IV: 0x00112233445566778899aabbccddeeff

Encrypting the content key and iv with the session key/iv, results are:

- Encrypted content key:
0x228107d15be6f2b0fc4945a3c7b2b0bac22a9bc0b154c1f19d181916ea008da5
- Encrypted content IV:
0x63a53152184e64f640992b7c6efa90c75890eaffd77200c0aadca51d9eab268a

3. Encrypt the session key and session IV (AES-CBC, PKCS5 padding) using the provider's AES signing key/iv that is registered with Widevine. In this example, we'll use widevine_test signing key:
 - Widevine_Test (32 byte) signing key:
0x1ae8ccd0e7985cc0b6203a55855a1034afc252980e970ca90e5202689f947ab9
 - Widevine_Test IV:
0xd58ce954203b7c9a9a9d467f59839249

Encrypting the session key and IV with the signing key, results are:

- Encrypted session key:
0x2895244b8f656616c2813de6ebe6d3f55b803d5ce2f51ff1f78c2d4365f2aa1f
- Encrypted session IV:
0x1c1f219112972db8adb58e15d4ee95a7f9dbd813c308083798c275be939070ae

4. Specify the Base64 encoded encrypted (binary) session key as the value to "session_key" in the JSON license request.
 - session_key:KJUkS491ZhbCgT3m6+bT9VuAPVzi9R/x94wtQ2Xyqh8=
5. Specify the Base64 encoded encrypted (binary) session IV as the value to "session_iv" in the JSON license request.
 - session_iv:HB8hkRKXLbittY4V106Vp/nb2BPDCAg3mMJ1vpOQcK4=

Status Codes

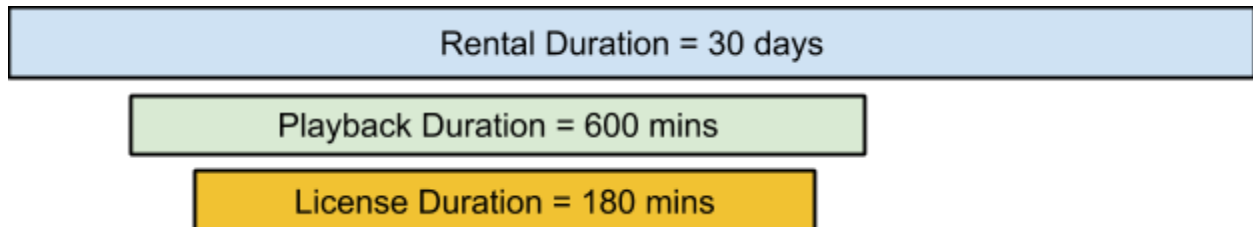
Code	Description
OK	Success.
SIGNATURE_FAILED	The server was unable to authenticate the message. Perhaps: <ul style="list-style-type: none">• The specified <signer> is unknown• The <signature> was not specified, but is required in this case.
INVALID_LICENSE_CHALLENGE	The license challenge blob generated by client is invalid.
INVALID_WIDEVINE_HEADER	The Widevine header embedded in an encrypted asset is invalid.
POLICY_UNKNOWN	The specified <policy> was not found for this <signer>.
MALFORMED_REQUEST	The request is not formatted correctly.
INTERNAL_ERROR	Widevine server internal error.
INVALID_REQUEST	The request is not recognized, or is missing a required field.
CONTENT_ID_MISSING	Missing content_id
TRACK_TYPE_MISSING	Missing track_type
TRACK_TYPE_UNKNOWN	Unknown track_type
ACCESS_DENIED	
INVALID_WIDEVINE_PSSH	
TOO_MANY_CONTENT_SPECIFIERS	
CONTENT_ID_MISMATCH	Mismatched content_id
KEY_ID_MISMATCH	Mismatched key_id

Sample Proxy

A set of Python-based sample proxy scripts is available [here](#). The package contains examples of signing the request, supporting a certificate request and injecting a custom content key.

Appendix

License Durations



- License_Duration ([license_duration_seconds](#)) - Indicates the length of time to allow content playback.
 - This parameter is a hard value. Once this parameter is consumed (duration counts down to 0), no further decryption is permitted.
 - Minimum parameter required to limit content playback within a license.
- Playback_Duration ([playback_duration_seconds](#)) - Indicates the amount of time the license is valid after first (initial) use.
 - This parameter should only be specified in offline or renewal scenarios.
 - If playback duration is **unspecified**, it is unlimited.
- Rental_Duration ([rental_duration_seconds](#)) - Indicates the amount of time the license is valid before it is used.
 - Once use of the license has started, the Rental_Duration is not used or enforced.
 - This parameter should only be specified in offline scenarios.
 - If rental duration is **unspecified**, it is unlimited.

The additional duration parameters provide additional business logic:

- To enable [support of license renewals](#).
 - With each successful renewal, the license duration is extended.
 - With continued successful renewals, the license duration can be extended to encompass the length of the media.
 - A renewal failure would result in premature license expiration.

The examples below illustrates the relationship and hierarchy of the duration parameters.

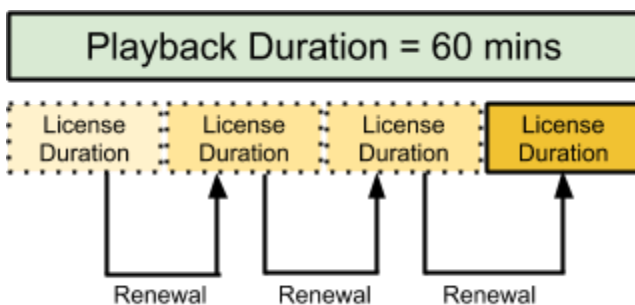
License for streaming content

License Duration = 180 mins

A streaming use-case relies on an always-connected device:

- *Rental_Duration* is not specified.
- *Playback_Duration* is not specified.
- *License_Duration*
 - Set to 180 minutes as specified by proxy parameter.
- *License Expiration*
 - The license will activate (start expiring, counting down to 0) as soon as the license is received by the Widevine client on device.

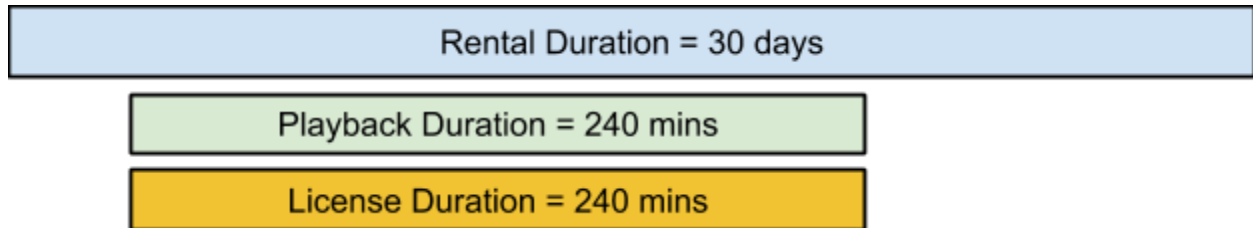
License for streaming content with renewals



Like the above streaming example, *Rental_Duration* is not specified, but *Playback_Duration* is specified.

- *Playback_Duration*
 - Set to 60 minutes by proxy parameter.
- *Renewal_Delay*
 - Set to 15 minutes by proxy parameter.
- *License_Duration*
 - Set to 15 minutes internally by Widevine license server to match the *renewal_delay_interval*.
- *License Expiration*
 - The license will activate (start expiring, counting down to 0) as soon as the license is received by the Widevine client on device.

License for offline playback



In the offline example, *Rental_Duration* and *Playback_Duration* are specified. In this example, the content is 120 minutes in length.

- *Rental_Duration*
 - Set to 43200 minutes (30 days) by proxy parameter.
- *Playback_Duration*
 - Set to 240 minutes by proxy parameter.
- *License_Duration*
 - Set to 240 minutes to allow user to complete viewing with ample time to spare (matches playback duration).
- *License Expiration*
 - The license will start expiring as soon as the license is first used for playback (User hits Play).

Client security level (content_key_specs.security_level)

A license may be issued with a requirement for the minimum client security level.

The table below illustrates the general mapping between the EME security level definitions and Widevine device robustness levels.

Definition	EME Level	Widevine Device Security Level
SW_SECURE_CRYPTO	1	3
SW_SECURE_DECODE	2	3
HW_SECURE_CRYPTO	3	2
HW_SECURE_DECODE	4	1
HW_SECURE_ALL	5	1

Note: For CrOS (Chromebooks), you will need to specify security_level=3 or higher to enable Widevine L1 support. Otherwise, the device will default to Widevine L3.

HDCP Enforcement

HDCP Parameters

HDCP Parameter	(applies to) WV Security Level	Description
HDCP_NONE	3	HDCP not specified
HDCP_V1	1	Enforce HDCP 1.x Playback not allowed if Client does not report HDCP 1.x or better.
HDCP_V2	1	Enforce HDCP 2.0 Playback not allowed if Client does not report HDCP 2.0 or better.
HDCP_V2_1	1	Enforce HDCP 2.1 Playback not allowed if Client does not report HDCP 2.1 or better.
HDCP_V2_2	1	Enforce HDCP 2.2 Playback not allowed if Client does not report HDCP 2.2 or better.
HDCP_NO_DIGITAL_OUTPUT	1	No digital output allowed, including HDCP. Internal display only.

Chrome

The table below is a results matrix for setting output protection HDCP_V1 in the license request. **Error** indicates playback will fail.

HDCP_V1	No External Display	HDCP External Display	Non-HDCP External Display	Analog External Display	ChromeCast	AirPlay
ChromeOS ARM	OK	OK	Error	N/A	Error	N/A
ChromeOS x86	OK	Error	Error	N/A	Error	N/A
Linux	Error	Error	Error	N/A	OK	N/A
Mac	OK	Error	Error	N/A	OK	Error
Windows	OK	OK	Error	N/A	OK	N/A

Chromecast

HDCP V1 Required	WV Security Level	Chromecast	Chromecast 2	NVidia Shield	Philips 32PFS64 02/12
SW_SECURE_CRYPT0 [1]	3	FAIL	OK	FAIL	FAIL
SW_SECURE_DECODE [2]	3	OK	OK	FAIL (OK*)	FAIL (OK*)
HW_SECURE_CRYPT0 [3]	2	OK	OK	OK	OK
HW_SECURE_DECODE [4]	1	OK	OK	FAIL (OK*)	FAIL (OK*)
HW_SECURE_ALL [5]	1	OK	OK	FAIL (OK*)	FAIL (OK*)

Android

Widevine Security Level	HDCP version on Client (in license request)	HDCP version on Server (appended by proxy)	Playback Behavior
3	HDCP_NONE	HDCP version <u>not</u> specified	OK
3	HDCP_NONE	Any HDCP_V* parameter	Fail ¹
1	HDCP_NO_DIGITAL_OUTPUT	HDCP version not specified	OK ²
1	HDCP_NO_DIGITAL_OUTPUT	Any HDCP_V* parameter	OK ²
1	Any HDCP_V* parameter	Any HDCP_V* parameter if it is the same (or less than) as Client HDCP	OK

- Internal display only devices should report HDCP_NO_DIGITAL_OUTPUT.
- Level 3 devices with no HDCP capabilities should report HDCP_NONE.

¹ For Android L3, playback stops if output protection is required. L3 is best-effort and cannot be reliably enforced when specified.

² No output is allowed, therefore all output protection enforcement policies are met.

Sample Request (with signing)

Sending a licensing request to Widevine service:

```
wget -O /tmp/license --post-data
'{"request":
"ewogICJwYXlsb2FkIiA6ICJDQUVTaEFFS1RBZ0FFa2dBQUFBQ0FBQVFXUFhiaHRiL3E0M2YzU2ZlQz
JWUDNxMGplQUVVDVzNlbVFrV24yd1hDWVZPbnZsV1BETnFoOFZWSUI0R2l2Tke4ZVZWRmlnWGtRV0lHT
jBHbGdNS2pwVUVVTEFvcUNoUU1BUklRSklQQ3psMmJWaxlNUUV0eUsvZ3RtUkFCR2hBeU5XWTNPRE16
TVRjeU1tSmpNMkV5R0FFZ3Y1aVFrQVVhSUMzT04xelZnZVYwclA3dzJWbVZMR29ycUNsY01RTzRCZGJ
IUHlrM0dzblkiLAogICJwcm92aWRlciIgOiAid2lkZXZpbmVfdGVzdCIsc3BlY3MiOiBbCiAgICB7I
AiWm10cU0yeHFZVk5rWm1Gc2EzSXphZz09IiwKICAiY29udGVudF9rZXlfc3BlY3MiOiBbCiAgICB7I
CJ0cmFja190eXB1IjogI1NEIiB9LAogICAgeyAidHJhY2tfdHlwZSI6ICJIRCJgfSwKICAgIHsgInRy
YWNrX3R5cGUiOiAiQVVESU8iIH0KICBdCn0K", "signature":
"xPkAbb3tjOY/ybdz0tmJmQ9erH9ILnS5natMZr3QEW8=", "signer": "widevine_test" }'
https://license.uat.widevine.com/cenc/getlicense/widevine_test
```

The signature is generated as follows.

1. Take the raw value of the “request” field. Compute its SHA1 hash:
xu5tN6lK+EEwMGA90tTbsP5upNY=
2. Encrypt the hash with AES CBC. The result is the signature. Convert it to base64 encoding and put it in the “signature” field.

For integration tests, you can use “widevine_test” as the signer. Its AES key is

```
0x1a, 0xe8, 0xcc, 0xd0, 0xe7, 0x98, 0x5c, 0xc0,
0xb6, 0x20, 0x3a, 0x55, 0x85, 0x5a, 0x10, 0x34,
0xaf, 0xc2, 0x52, 0x98, 0x0e, 0x97, 0x0c, 0xa9,
0x0e, 0x52, 0x02, 0x68, 0x9f, 0x94, 0x7a, 0xb9
```

The IV is

```
0xd5, 0x8c, 0xe9, 0x54, 0x20, 0x3b, 0x7c, 0x9a,
0x9a, 0x9d, 0x46, 0x7f, 0x59, 0x83, 0x92, 0x49
```

Expected Response

```
{"status": "OK", "license": "CAIS6AIKKgoQMjVmNzgzMzE3MjJiYzNhMhIQMjVmNzgzMzE3MjJiY
zNhMhoAIAEoABIGCAEQARgBGkYSELuvGfd3Jf2KbY8Gr8wksSREaMnHP8g6Hn4Rdp7yG6F1/Fey5ZzNT
OJ0+G4IBaTQRg7L2HjGMK8CE6kjR4B9weSp7syABGkoKEAKUuVmddV3iu/D9yj+l6rcSEC46Gde9xaQ
N12q/Fgqv250aICR+Q+j0flfRYMdgbgC0js+6RqFdXvvg94h5ZMKdZEUIAIAoARpKChDrZ2q7yzRelr
vPYWYw8aPaEhA2lTBnCeovTeQ5bxydasrqGiDhgFnPjqr5W4S04cwzJaIlwMe0QJaakRZJ461DhIvfv
iACKAEaSgoQY52oDPI7VfO4yrP2TPpd9hIQGmUhfWkwnSgdGJj19P/Lyhog6oKAeGNHF9AjeVJU47ri
qgKZh06qdMurDfKFyUMXUcgAigBIL+YkJAFOAAaIHP6Qy564dbSl+/ORuMlYm5U4CzSdtLBZkbn4W5
V+jTH", "license_metadata": {"content_id": "ZmtqM2xqYVNkZmFsa3Izag==", "license_typ
e": "STREAMING", "request_type": "NEW"}, "supported_tracks": [{"type": "SD", "key_id":
"ApS5WZ11XeK78P3KP6Xqtw=="}, {"type": "HD", "key_id": "62dqu8s0Xpa7z2FmMPGj2g=="}, {
"type": "AUDIO", "key_id": "Y52oDPI7VfO4yrP2TPpd9g=="}], "make": "", "model": "", "inte
rnal_status": 0, "session_state": {"license_id": {"request_id": "MjVmNzgzMzE3MjJiYzNhMg
hMg==", "session_id": "MjVmNzgzMzE3MjJiYzNhMg==", "purchase_id": "", "type": "STREAMI
```

```
NG", "version":0}, "signing_key": "cEeLYQ+ZjldTOEnFy4e66+yhjo4jg6mMniQqpEk0gBo=", "
keybox_system_id":4184, "license_counter":0}, "cert_serial_number":"","device_whi
telist_state":"DEVICE_WHITELISTED", "message_type":"LICENSE", "platform":"","devi
ce_state":"RELEASED", "pssh_data":{"key_id":["JMPCz12bViyMQEtyK/gtmQ=="], "conten
t_id":""}}
```

Sample Request (injecting *clear* content keys)

This example includes content_key_specs. The JSON message before Base64 encoding is:

```
{
  "allowed_track_types": "SD_HD",
  "content_key_specs": [
    {
      "key_id": "MGRmMjVjYzUtOWFkMS01MjhiLTkwZGMtNTYyY2QxODExODNi",
      "track_type": "SD",
      "key": "Pv38THb6rTQbIpzg04/qag=="
    },
    {
      "key_id": "NzVlYThiYWmtZjg3Yy01YzMxLWFmYTYtNWY3YmUwNjE1MGU5",
      "track_type": "HD",
      "key": "xiE14IkMIRKxSPBQL+HksA=="
    },
    {
      "key_id": "NDczMWNhNzItOWExYy01YjQ1LThjMTMtMGY4MDJiMDRiMWNj",
      "track_type": "AUDIO",
      "key": "y9DDm30ttT07GqXfxKMwdQ=="
    }
  ],
  "use_policy_overrides_exclusively": true,
  "provider": "widevine_test",
  "content_id": "WU9VVFVCRTPdD3E3bWVXZWM3MA==",
  "policy_overrides": {
    "license_duration_seconds": 36000,
    "can_play": true
  },
  "payload": "<bytes-intentionally removed>"
}
```

```
wget -O /tmp/license --post-data '{"signer": "widevine_test", "request":
"eyJhbGxvd2VhX3RyYWNrX3R5cGVzIjogIlNEX0hEiIiwgImNvbnRlbnRfa2V5X3NwZWZWNzIjogW3sia2
V5X2lkIjogIk1HUmlNa1ZqWXpVdE9XRmtNUzAxTWpoaUxUa3daR010TlRZeVkyUXhPREV4T0ROaSIiI
CJ0cmFja190eXB1IjogIlNEIiwgImtleSI6ICJQdM4VEhiNnJUUVJjChpnMDQvcWFnPT0ifSwgeyJr
ZXlfaWQiOiAiAitnpWbFlUaGlzV010WmpnM1l5MDFZek14TFdGbVlUWXROV1kzWW1Vd05qRTFNr1U1Iiw
gInRyYWNrX3R5cGUiOiAiSEQiLCAia2V5IjogInhpRTE0SWtNSVJLeFNQQLFMK0hrc0E9PSJ9LCB7Im
tleV9pZCI6ICJORG6TVdOaE56SXRpV0V4WXkwMVlqUTFMVGHqTVRNde1HWTRNREppTURSau1XTmoiL
CAidHJhY2tfdHlwZSI6ICJCVURJTyIsICJrZXkiOiAieTlERG0zMHR0VDA3R3FYZnhLTXdkUT09In1d
LCAidXNlX3BvbGljeV9vdmVycmlkZXNfZXhjbHVzaXZlbHkiOiB0cnVlLCAicHJvdmkzZXIiOiAid2l
kZlZpbmVfdGVzdCI6ICJjb250ZW50X2lkIjogIldvOVZWR1ZDU1RwRGQzRTNiV1ZyWldNM01BPT0iLC
AicG9saWN5X292ZXJyaWRlcyI6IHsibGljZW5zZV9kdXJhdGlvb19zZWVbmRzIjogMzYwMDAsICJjY
W5fcGxheSI6IHRYdWV9LCAicGF5bG9hZCI6ICJQdQUVTEGdzSzR3b01BUkx1Q1FxeEFnZ0NFaE5EYUhK
dmJXVkrSRRTB0VEDsdwRYZ3RlRGcyR05Db2pvNEZJbzRDTU1JQkNnS0NBuUVBNXJiVkkFoYThBbVZLMUI
3OWlPMGkzeU15TFJCMGNIVUJZrZBTT3JtS2NpcWVkbms1ZSsrM3lWeHBvWHR4UzhWTVhIeUpEYUUVKZE
QwV1pVZWl3SzaHJlcXQ0ZpUlcwUEhMbDZCTThXeFdtcW1KbzlmdmNndUt2WVF3dlQyMkF6bGd5L2dnU
```

VN5aUc0MFB0SEU3ZWVcnZESWJ5OVVvWEtWdmQzczJMVXVQ11BOGxtdlRWaktqM0ErYmZXTmtiODZK
NjU3djF0bmxNbmNWNuKxK1FKZnMrcnB2eXRYbEIrNG40c3M0NTRUNE1BMGJmN0dKSHJYeXBJVWZOZER
qeTVRaXU2c2UxV1VJVfJGZlR5ZjBYVTJzU3NyLzJ2VH13N1VCdUp5V0U5V2tpd29tdFdPei9JL0pUU3
g0eVAvWkxnelPLVEVMK2Z6Z2VNdFp6ZFRyMW1OQjBRSURBUUFCS05jZ0VvQUNnUU1xY05MRHBncTEvc
S91Y0t3UmovdFRjc0JyMkNPSmRSMnhJTDVlYXA4Nmo3UXNZemwxRnRJYWZQY11zMKrWTDI4VDJ4SnBa
QUd2VDlMK3kvblFwaEUxNfc2amFIYlQrNW9SNDFZcGtuaUlZbGxqSU5aZU5oVkc4ZzIyTUhNRGg4bjB
tNVZPNmk2bTBFUFU4aTNacUY3U1BveXY0THJSNjdtTzR3NjFMbGFkR1lhejQvdXoyRvdIbDNEVW9sN2
hYT2hCVHNpOWZoc2VNZG5ycC83TFzaOHBTUThEeDFmaGVDZmlQSERzcHArMzlvTXFQcHdFdGdrCmF4M
nNSQ3hDc2ZyMFNhrGZNVmN2aGtIbWhVRTdBm1hmTEhrREJqUmhvs00zMFfXTjEOM1FLei9mWCtxWUFB
OXJvS2xnZEL4TTAxWkNBmFRHZE1GN0pIVkRna1hLS0JxMEJRcXVBZ2dCRWhDRmVOVWs4RUxrMXl4RVp
NTVpnOTRrR0wya2pVNEZJbzRDTU1JQkNnS0NBUUVBNkRXemNocDjwakFrY0U5bWVPT2p0ZmxTNXNPQn
RoZGZKSVI3T21QL1ZzTVAvMzRjL2F5Wwt6Yjh0Tm42TXJqQkZHL1I2VTM0dUlrv00ybGY1S1dHQ3hZT
lVQbVhDc0hXVDdv3lFQkVHR1JuczIzWDREcEt4ODVEajhEcVdrR2VGOHBjQldwa01KaEk0V3dLNkJo
MctJSng2UGJyVstzYjNYUTRqcHBVWm55ci9nWVZRNkRXRmJ5KzFUWXNKN0RsUDBHTWZ0Z0FwTUFSSWt
Qa1N1Y2VwS1BrU01pUGRzS1lvQUVYK21IMGFnWkZBZmkyYjRstThxUmJBd2xrTUxNQ0E4aXdQU0h1Wk
lKtNpIc1E4WDhxMFRkdFF1b3VveXlVRndrdnBPeEtIWUpGaXl6UVF3ZURib0xWVm9JK1ZZN3VyVFdaO
Wd2V2U1eTRQR3phQjFJeDBRSURBUUFCS05jZ0VvQURuYy9nK2JqS1ZjOWcxZG9PZzVScENST0g0ZnNF
M0NyR3BzZ0VBSnA2NFdrVTFsQk9GdXkvQ1YyY1Z4YVVMWlQ3cEJLM2c5NU1qSvG3OG40eGhPwDM5SVR
5a3Juc09WdTNnwFA4Mmo4NkZhV3lzbEJyck5KOHVhZ0xwVGQra3ExbHRZNVzhNk8yV3BFWDNjeXA1aF
dDampDTFUySDaxT3FONWZNWG4zSHByMfdqV05CQmF6cnExYWY3Y3pUbkJ4VEpBUtFzWWVYZEo5cVAwZ
HFDaktCY0FBR2tzczVxWXJZK053Q2hDd1Q2R3REemRmaVVsSlZOWVFIamNSdTLBdEJzRFJUZy9zUVRW
YW9Nc0ZoaVM1c3BYaElonXNd6UTNwdXfSbFNEN01KcHBrc3llbVRwZm0vZmJuOVZ4cGvNc9oemh3aTZ
1Z3c0Qk8wdFN3dWRSdFNANW5SWm5Dd0RmSWgrUHJpWVpCQWfVslpzaajgrMjhpSEJKc1ZNdDkvNUI3TF
N2SkIrSTJUR2FWSGNpdStEZxQ2VWZ1a3VrZXdtanB3eDRUR1B0cVRJLzVaVXV5N0VNNnJRdUxCU1cvN
DB6UWRxWDNuZEhQWVpDdlpUM3Zxd3I2cUZtT0hpTmVRMW1Idk5iemczR1VEWUxxMVVpT0ZBUUNTWHp3
eTJfD3kyUno0NUdoc0tFV0Z5WTJocGRHVmpkSFZ5WlY5dVlXMWxFZ1o0T0RZdE5qUWFGZ29NWTI5dGN
HRnV1Vj1l1WVcxBEVnWkhiMjluYkdVYUz3b0tiVzlrWld4ZmJtRnRaUklKUTJoeWIymWxRMFJOR2hZS0
RYQnNZWFJtYjNkdFgyNWhiV1VTQ1V4cGJuVjRNZ2dJQVJBQkdBRWdBQkpVQ2xJS1BBZ0JFaERsQUg1d
W5jMWF3S1VnTHROMwC0TE5HZzEzYVdSbGrtbHVavjkwWlhome1oR1VSVk5VWDBOUFRsUkZUbFJmU1VS
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"VYLAaktBcg3nAVexs/owBk95mNCs7a9ATVnlu+E2nj8="}

https://license.uat.widevine.com/cenc/getlicense/widevine_test

Expected Response

```
{ "status": "OK", "license": "CAISyAMKKgoQblU/tQ28bin7KjEtlV3wkhIQblU/tQ28bin7KjEtlV3wkhOAIaEoABIKCAEQARgBMKCZAhpMEhAnLYoeF1JERtTGJn3PZ43xG1Auk4wxrzu3jBux9utLoVA2AgxlTskglmzmVxZxqsZ9CgIq24i3DSRJAbLpFscYg4bg1SEAYOCWBCMKsNZ5leVnADRnVH20gfwoj/uc4iz8FSABG14KJDBkZjI1Y2M1LTlhZDEtNTI4Yi05MGRjLTU2MmNkMTgxMTgzYhIQd9H5HL/xbXCSnLbjrsxZ4Rog0b01gbD9Vbfpmk1AQol7oAC1/wZpXNIE/BqJniPehBAGaigBGL4KJDC1ZWE4YmFjLWY4N2MtNWMzMS1hZmE2LTVmN2J1MDYxNTBlORIQcKcPm1X8UpJ1lazb6QAYehogckuIGdK43wCoChZ8qlpXJ+6fsRgnkC0rLg/hx4Kn2oYgAigBG14KJDQ3MzFjYtCYLtlhMWMtNWI0NS04YzEzLTBmODAYYjA0YjFjYxIQmszrg257yeHnZH71T1lg6Rogys15dHsuh8M+H0LpJORM5JLRzQ6Q6t9i+qJDxVfsfjkgAigBIM3kup4FOAAaIG2P7dWmCAY2a59Vu/HGJ8IbLbqA0UQ0YUETDC0VuJIKIoAC019cqV20XIGombAJPLAhelyBDTYXkWuzk3oZX7G3tbbGUgHBBVoVXYMgiqr2ZTPKsc7EfPnofdMhgfdtomKr/ezsQM9TWAeKy8s9X04cBG42/N7CtR2186WxJdwA2E+uipptJKBzEpB9huAKbGpxQLA5onli6tBn3ft7qz3fPAWAr9JkpjiCIcqosXM03A6n1AQP6GvAPXN2S9aiy28JachQCye97OLjAL9yiG9MuTiVEBxdG/cQ5wloOTdK2ICGFq3vEOflfVCqMvgumKQ4QMXZmuH/NUMIRT89Z8Ibq4wHolnFMjyrKFpmkj57Xuh3w7CzCEWnD43rp+IMtN1qQ==", "license_metadata": { "content_id": "WU9VVFVCRTPDd3E3bWVXZWM3MA==", "license_type": "STREAMING", "request_type": "NEW", "supported_tracks": [ { "type": "SD", "key_id": "MGRmMjVjYzUtOWFkMS01MjhiLTkwZGMtNTYyY2QxODExODNi" }, { "type": "HD", "key_id": "NzVlYThiYWmtZjg3Yy01YzmxLWFmYTYtNWY3YmUwNjE1MGU5" }, { "type": "AUDIO", "key_id": "NDczMWNhNzItOWExYy01YjQ1LTlhMTMtMGY4MDJiMDRiMWNj" } ] }, "make": "Google", "model": "ChromeCDM-Linux-x86", "security_level": 3, "internal_status": 0, "session_state": { "license_id": { "request_id": "blU/tQ28bin7KjEtlV3wkg==", "session_id": "blU/tQ28bin7KjEtlV3wkg==", "purchase_id": "", "type": "STREAMING", "version": 0, "signing_key": "9Y+m1Rf4AmqWRT01EpagStZ/zREV4Dz8es611yBiZ5wIo0wEQ4FFLNHwTnq2shN2180lOx3reeR/+R05ltH/wg==", "keybox_system_id": 4183, "license_counter": 0, "cert_serial_number": "NDM20DcyNmY2ZDY1NDM0NDRkMmQ0YzY5NmU3NTc4MmQ3ODM4MzY=", "device_whitelist_state": "DEVICE_WHITELISTED", "message_type": "LICENSE", "platform": "", "device_state": "RELEASED", "pssh_data": { "key_id": [ "5QB+bp3NWsCVIC7TdYOCzQ==" ] }, "content_id": "VEVTVF9DT05URU5UX01EXzE=" }, "client_hdcv_version": "HDCP_NONE" }
```

Offline License

Two types of licenses exist, streaming and offline. A streaming license is used in most cases where the content is streamed to the device and is viewed as it is streamed. This type of license is loaded in memory and is never persisted on the device. Once the session is closed on the device, the license is cleared from the device. The license type (STREAMING or OFFLINE) is specified in the license request on the client.

An offline license is used where the content is stored on the device for later viewing, generally in cases when the device will be offline. This type of license is persisted on the device and can be loaded at a later time without contacting a license server. An offline license remains on the device until it is released.

The license server proxy must indicate that the license can persist on the device by setting `'can_persist=true'` in the license policy. Also, license renewals should not be set to true as shown below.

```
License.Policy playback_policy;
playback_policy.set_can_persist(true);
playback_policy.set_can_renew(false);    // This is the default.
```

Offline License Release

Once a license is persisted on the device and the client wants to remove the license, the application will initiate a license release. This will generate a license request with the request type (NEW, RENEWAL or RELEASE) set to RELEASE.

When handling a license where the request type is set to RELEASE, the policy's `can_play` attribute must be set to false as shown below.

```
License.Policy playback_policy;
playback_policy.set_play(false);
```

The Widevine client will not delete the license from the device until it receives a valid license response indicating the license release was handled by the license server. The proxy must return the license to the client.