Video on Demand

Best Practices

Issue 01

Date 2024-01-25

HUAWEI CLOUD COMPUTING TECHNOLOGIES CO., LTD.

Trademarks and Permissions

and other Huawei trademarks are the property of Huawei Technologies Co., Ltd.
All other trademarks and trade names mentioned in this document are the property of their respective holders.

Notice

The purchased products, services and features are stipulated by the contract made between Huawei Cloud and the customer. All or part of the products, services and features described in this document may not be within the purchase scope or the usage scope. Unless otherwise specified in the contract, all statements, information, and recommendations in this document are provided "AS IS" without warranties, guarantees or representations of any kind, either express or implied.

The information in this document is subject to change without notice. Every effort has been made in the preparation of this document to ensure accuracy of the contents, but all statements, information, and recommendations in this document do not constitute a warranty of any kind, express or implied.

Huawei Cloud Computing Technologies Co., Ltd.

Address: Huawei Cloud Data Center Jiaoxinggong Road
Qianzhong Avenue
Gui'an New District
Gui Zhou 550029
People's Republic of China

Website: https://www.huaweicloud.com/intl/en-us/

Contents

1 Uploading a Media File to VOD

Scenario Description

With the popularization of video services, a large number of media files need to be processed and distributed on a platform. Huawei Cloud Video on Demand (VOD) is a one-stop media service that implements video upload, automatic transcoding, media file management, and distribution acceleration. Before using the media file processing functions of VOD, you need to upload media files to VOD. Huawei Cloud VOD provides diverse upload methods for source files of different storage modes.

Upload Methods

Table 1-1 describes the media file upload methods supported by VOD.

Table 1-1 Upload methods

Upload Method	Application Scenario
Local Upload	This method is used to migrate media files stored on local disks to VOD.
Replicating Media Files from OBS to VOD	This method is used to replicate media file copies from OBS buckets to VOD.
Pull from URLs	This method is used to pull and store online media files to VOD.

Local Upload

Media files can be uploaded in batches to VOD. You can log in to the console on a browser to upload media files.

The local upload function provided by VOD has the following restrictions:

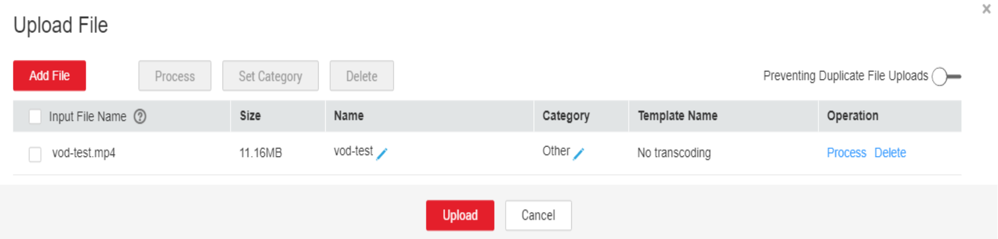
- Due to security policies, the logout from the console will result in the failure of large file upload that takes a long time. When uploading a large number of files, you need to perform operations on the console to prevent automatic logout.

- The following formats are supported:
  - Video files: MP4, TS, MOV, MXF, MPG, FLV, WMV, AVI, M4V, F4V, MPEG, 3GP, ASF, and MKV
  - Audio files: MP3, OGG, WAV, WMA, APE, FLAC, AAC, AC3, MMF, AMR, M4A, M4R, WV, and MP2

Local upload from the console

1. Log in to the VOD console.
2. In the navigation pane, choose **Audio and Video Uploads** > **Upload File**.
3. Click **Add File** to add media files stored on the local host.

   You can select a transcoding template or workflow in **Process**. After the media files are uploaded, the system automatically processes the uploaded files.



Input File Name	Size	Name	Category	Template Name	Operation
vod-test.mp4	11.16MB	vod-test	Other	No transcoding	Process Delete

4. Click **Upload**.

   How long the upload takes depends on the file size and network conditions.

Local upload using APIs

- If the media file to be uploaded is less than 20 MB, you do not need to segment the file before uploading it. For details, see **Uploading a Media File Less Than 20 MB**.
- If the media file to be uploaded is greater than 20 MB, you need to segment the file. The size of each part must be less than 20 MB. Then, upload each part. For details, see **Uploading a Media File Greater Than 20 MB**.

Replicating Media Files from OBS to VOD

If you have stored a large number of media files in an OBS bucket before subscribing to VOD and want to use the transcoding and snapshot capturing functions of VOD to process the media files, you can use this function to replicate the media file copies from the OBS bucket to VOD and then use the functions of VOD.

The function of replicating data from OBS to VOD has the following restrictions:

- Cross-region data replication is not supported. For example, media files stored in an OBS bucket of CN North-Beijing4 can only be replicated to the VOD in CN North-Beijing4.
- When you use data replication, media files in an OBS bucket are copied to VOD. If the media files in the OBS bucket are not deleted, you will be billed for the storage in both OBS and VOD.
- The following formats are supported:
  - Video files: MP4, TS, MOV, MXF, MPG, FLV, WMV, AVI, M4V, F4V, MPEG, 3GP, ASF, and MKV

  - Audio files: MP3, OGG, WAV, WMA, APE, FLAC, AAC, AC3, MMF, AMR, M4A, M4R, WV, and MP2

You can only replicate data from OBS to VOD by calling the API for **Replicating Media Files from OBS to VOD**.

Pull from URLs

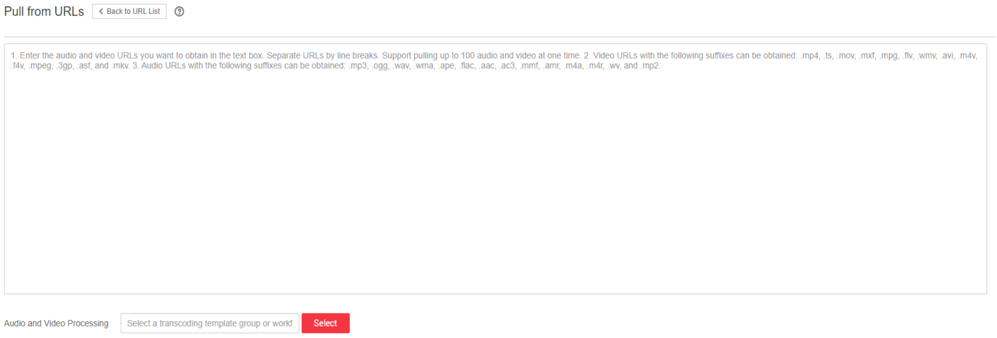
Online media files can be pulled and uploaded to VOD. The URL extraction function provided by VOD has the following restrictions:

- A maximum of 100 media files can be pulled at a time on the console, and a maximum of 16 media files can be pulled at a time using APIs.
- The URL to be pulled must directly point to media files and cannot be a page URL of a website. The following URL suffixes are supported:
  - Video files: MP4, TS, MOV, MXF, MPG, FLV, WMV, AVI, M4V, F4V, MPEG, 3GP, ASF, and MKV
  - Audio files: MP3, OGG, WAV, WMA, APE, FLAC, AAC, AC3, MMF, AMR, M4A, M4R, WV, and MP2
- Currently, only HTTPS and HTTP are supported. HTTP has security risks. HTTPS is recommended.
- A new media file ID is generated for the media file obtained from other cloud service providers. The original media file ID cannot be inherited.

File pull and upload on the console

1. Log in to the VOD console.
2. In the navigation pane, choose **Audio and Video Uploads** > **Pull from URLs**.
3. Click **Pull from URLs** and enter media file URLs.

   You can select a transcoding template or workflow in **Process**. After the media file is pulled, the system automatically processes the file.


Pull from URLs
Back to URL List
Audio and Video Processing
Select a transcoding template group or workf
Select

1. Enter the audio and video URLs you want to obtain in the text box. Separate URLs by line breaks. Support pulling up to 100 audio and video at one time. 2. Video URLs with the following suffixes can be obtained: .mp4, .ts, .mov, .mxf, .mpg, .flv, .wmv, .avi, .m4v, .f4v, .mpeg, .3gp, .asf, and .mkv. 3. Audio URLs with the following suffixes can be obtained: .mp3, .ogg, .wav, .wma, .ape, .flac, .aac, .ac3, .mmf, .amr, .m4a, .m4r, .wv, and .mp2.

4. Click **OK**. You can view the task status in the URL pull list.

File pull and upload using APIs

1. Obtain the user token for API calling. For details, see **Constructing a Request**.
2. Call the API for **Pulling Media Files from URLs** and configure the parameters for batch pulling media files from URLs and media file processing in the request parameters.
3. Call the API for **querying media files** to view the pull result.

Wait for one or two minutes (depending on the size of the video file) and then query the pull result.

2 Setting a Video Thumbnail

Scenario Description

Video thumbnails not only look nicer but also help you search for the desired file if you have lots of video files in VOD. A thumbnail address is generated for the uploaded video thumbnail. The thumbnail and video file can be directly referenced to the web page.

When a video is uploaded, VOD captures the first frame of the video as the thumbnail by default. You can also upload a custom image or use a captured snapshot as the video thumbnail.

- If you want an image that says what the video is about as the thumbnail, then upload a custom image. Before the upload, design a JPG or PNG thumbnail.
- If you want one frame of the video as the thumbnail, then use a captured snapshot. You do not need to prepare anything. You can directly use snapshot capturing to create snapshots.

Set a video thumbnail in one of the following ways:

- **Set a Video Thumbnail on the VOD Console**
- **Set a Video Thumbnail by Calling a VOD API**

Set a Video Thumbnail on the VOD Console

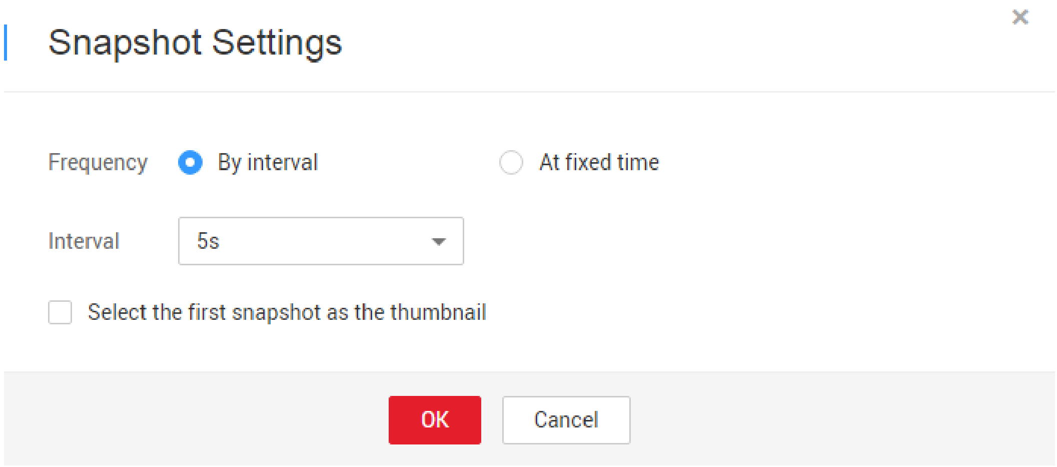
Procedure

1. Log in to the VOD console. In the navigation pane, choose **Audio and Video Management**.
2. Click **Details** in the row containing the target video file. On the **Basic Information** tab page, click **Edit**.
3. Click the plus sign to upload a custom video thumbnail from an image on your device. Confirm your thumbnail selection and click **OK**. Then, click **Save**.

You can also take snapshots of the video and select a snapshot as the thumbnail. Snapshots in FLV, MP4, TS, MOV, MXF, MPG, WMV, AVI, M4V, F4V, or MPEG format are supported.

1. Log in to the VOD console. In the navigation pane, choose **Video Processing** > **Snapshots**.

2. Select the video for which you want to take a snapshot and click **Create Snapshot Task**. In the dialog box displayed, set snapshot parameters.



Snapshot Settings

Frequency ● By interval ○ At fixed time

Interval 5s

□ Select the first snapshot as the thumbnail

   - By interval: The system takes snapshots at regular intervals from the first frame to the last frame. The interval cannot exceed 12 seconds. You can choose whether to use the first frame of the video as the thumbnail.
   - At fixed time: Snapshots are taken at specified time points. You can specify a maximum of 10 time points and determine whether to use a snapshot as the video thumbnail.

3. Click **OK**.
4. Click **Details** and select a snapshot as the video thumbnail.

Set a Video Thumbnail by Calling a VOD API

You can call media upload APIs, API for updating a media file, or API for processing a media file to set a video thumbnail.

- Set the thumbnail when uploading a video.

  You can directly upload media files to VOD, replicate media files from OBS to VOD, or pull media files to VOD from URLs. If you use direct upload, you can set a custom image or snapshot as the thumbnail. If you use one of other two methods, you can only set a snapshot as the thumbnail. The details are as follows:

  - Directly upload media files to VOD.

    Call the API for **Uploading Media Files to VOD**. Send the request parameters including **cover_type** and obtain **cover_upload_url** from the response parameters. Then upload a custom thumbnail via **cover_upload_url**.

    Call the API for **Uploading Media Files to VOD**. Set **thumbnail** in the request parameters, including snapshot parameters and which snapshot serves as the thumbnail.

  - Replicate media files from OBS to VOD, or pull media files to VOD from URLs.

    Call the API for **Dumping Media Assets to OBS** or the API for **Pulling Media Files from URLs**. Configure **thumbnail** in the request parameters, set the snapshot type, and specify a snapshot as the thumbnail.

- Set the thumbnail when updating a video.

  Call the API for **Updating a Media File**. Send the request parameters including **cover_type** and obtain **cover_upload_url** from the response parameters. Then upload a custom thumbnail via **cover_upload_url**.

- Set the thumbnail when processing a video.

  Call the API for **Processing a Media File** to generate snapshots and specify which snapshot as the thumbnail. If you need to change the thumbnail, call the API for querying file details to obtain the thumbnail URL, and then call the API for **Setting a Thumbnail**.

3 Configuring Hotlink Protection to Control Who Can Play Media

Scenario Description

VOD provides hotlink protection to control who can play the distributed audio and video. With hotlink protection enabled, CDN verifies key information carried in playback requests. Only the requests that pass the verification are responded. For other illegitimate requests, a status code 403 is returned. Hotlink protection is implemented by referer validation or URL validation.

Referer validation allows you to control access sources based on the referer field carried in an HTTP request. CDN filters requests based on the configured blacklist or whitelist. Referer validation is easy to configure, requires no extra development, and takes effect quickly. It is used for scenarios where audios and videos are mainly referenced on the web pages.

Because the HTTP header content can be forged, referer validation can only achieve the most basic protection, and the security is low. In this case, you can configure URL validation to safeguard your VOD assets. The key value for authentication is time-sensitive. Therefore, URL validation is used for scenarios that have high requirements on media security.

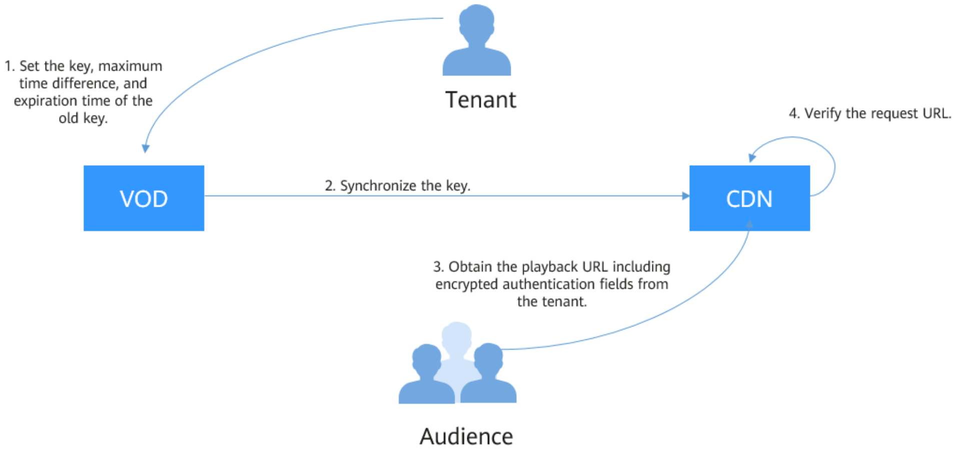
In this example, referer validation is enabled. Only domain names in the whitelist are allowed to access video files. Then configure URL validation to create authentication playback URLs.

Implementation

Referer validation works in a simple way. After a blacklist or whitelist is configured on the VOD console, VOD distributes the blacklist or whitelist to CDN. When receiving a request, CDN checks whether the request is valid based on the list. If the request is valid, CDN accesses the requested resource. If the request is invalid, CDN rejects the request and returns a status code 403.

URL validation is implemented by VOD edge nodes and origin server in VOD. It is a more secure and reliable anti-piracy solution than referer validation. **Figure 3-1** shows how URL validation works.

Figure 3-1 URL validation working principles


1. Set the key, maximum time difference, and expiration time of the old key.
Tenant
4. Verify the request URL.
VOD
2. Synchronize the key.
CDN
3. Obtain the playback URL including encrypted authentication fields from the tenant.
Audience

The process is as follows:

1. You enable URL validation on the VOD console and configure the allowed time difference and algorithm.
2. VOD delivers the configured key value to CDN nodes.
3. You obtain the authentication URL of a VOD media file.
4. Viewers request CDN to play a video through the authentication playback URL.
5. CDN verifies the request based on authentication information carried in the playback URL. Only requests that pass the verification are allowed.

Configuring Referer Validation

Configure referer validation to limit access for basic security of VOD resources.

NOTE

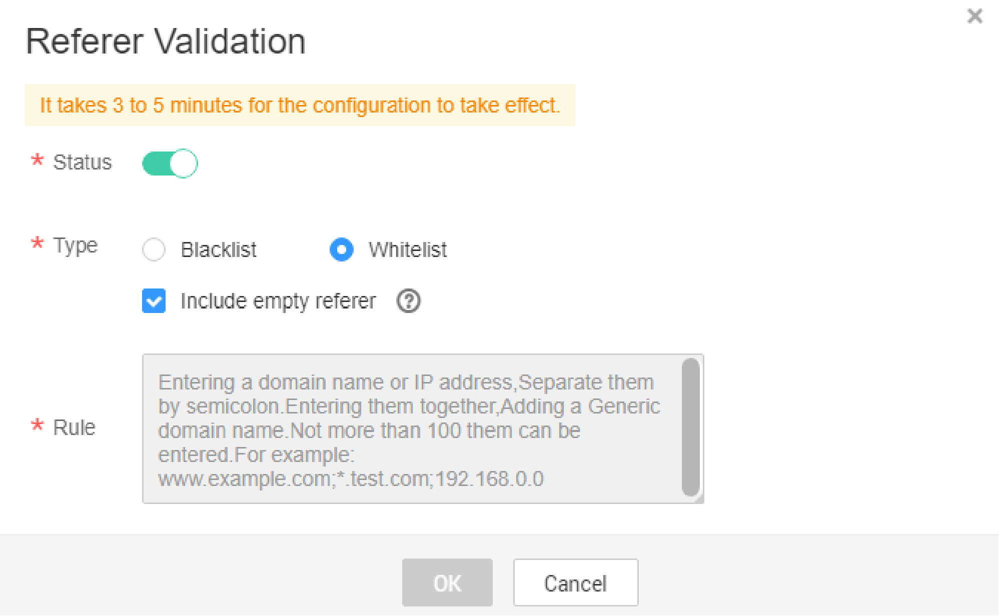
Domain names with ports cannot be added to referer whitelists/blacklists.

Step 1 Log in to the VOD console.

Step 2 In the navigation pane, choose **Domain Name Management**.

Step 3 Click **Settings** in the row containing the domain name. On the **Hotlink Protection Settings** tab page, click **Referer Validation**.

Step 4 In the dialog box displayed, switch on the function and set related parameters.



Referer Validation

It takes 3 to 5 minutes for the configuration to take effect.

* Status: on

* Type: ○ Blacklist ● Whitelist

☑ Include empty referer

* Rule: Entering a domain name or IP address,Separate them by semicolon.Entering them together,Adding a Generic domain name.Not more than 100 them can be entered.For example: www.example.com;*.test.com;192.168.0.0

- **Type**: **Blacklist** or **Whitelist**
  - **Blacklist**: Domain names in this list are not allowed to access VOD resources. If **Include empty referer** is also selected, requests whose referer field in the HTTP header is empty are not allowed.
  - **Whitelist**: Domain names in this list are allowed to access VOD resources. If **Include empty referer** is also selected, requests whose referer field in the HTTP header is empty are allowed.
- **Rule**: List details. You can enter a maximum of 100 domain names of four levels. Separate them with semicolons (;). Domain names and IP addresses can be entered together. Wildcard domain names are supported. A domain name cannot start with a protocol name (http:// or https://).

  Example: www.example.com;*.test.com;192.168.0.0

Step 5 Click **OK**.

It takes about 3 to 5 minutes for the referer validation to take effect.

----End

Configuring URL Validation

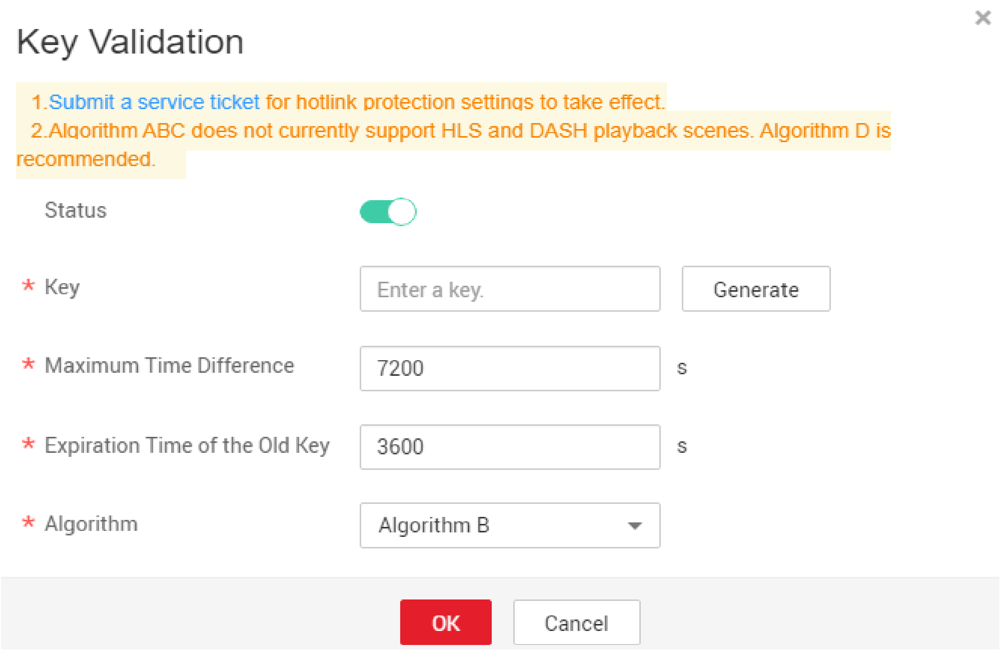
Configure URL validation to further enhance the security of VOD resources.

Step 1 Log in to the VOD console.

Step 2 In the navigation pane, choose **Domain Name Management**.

Step 3 Click **Settings** in the row containing the domain name. On the **Hotlink Protection Settings** tab page, click **URL Validation**.

Step 4 In the dialog box displayed, switch on the function and set related parameters.



Key Validation

1.Submit a service ticket for hotlink protection settings to take effect.
2.Algorithm ABC does not currently support HLS and DASH playback scenes. Algorithm D is recommended.

Status

* Key: Enter a key.

* Maximum Time Difference: 7200 s

* Expiration Time of the Old Key: 3600 s

* Algorithm: Algorithm B

Table 3-1 Parameter description

Parameter	Description
Key	Click **Generate** to generate a key value.
Maximum Time Difference	How long an authentication URL remains valid. The default value is 120 minutes. For example, if the authentication URL generation time is 1573806090 (Nov. 15, 2019 16:21:30 GMT+08:00) and the allowed time difference is 120 minutes, the authentication URL expires at Nov. 15, 2019 18:21:30 GMT+08:00.
Expiration Time of the Old Key	By default, the old key expires 60 minutes later since the new key takes effect. For example, if the effective time of the new key is Nov. 15, 2019 16:21:30 GMT+08:00 and **Expiration Time of the Old Key** is 60 minutes, the old authentication URL expires at Nov. 15, 2019 17:21:30 GMT+08:00.
Algorithm	Encryption algorithm. There are algorithms A, B, C, or D. The default value is **Algorithm D**. The generated authentication URL varies depending on the selected algorithm. For details about how to create an authentication URL, see **URL Validation**. **NOTE** Algorithms A, B, and C do not support HLS and DASH playback. Algorithm D is recommended.

Step 5 Click **OK**.

Step 6 **Submit a service ticket** for the settings to take effect. The submitted information must contain the configured domain name and information in **Table 3-1**.

URL validation settings take effect once your request is approved. If you changed URL validation settings, you also need to **submit a service ticket** for approval.

----End

Verify Whether Hotlink Protection Settings Have Taken Effect

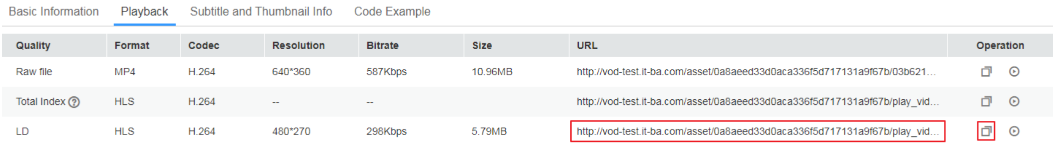
- Verify whether referer validation settings have taken effect.

  Add **www.huaweicloud.com** to the whitelist and deselect **Exclude empty referer**. Reference the video file in VOD **https://1280.cdn-vod.huaweicloud.com/input/1.mp4** on the **http://www.example.com/test/test.html** web page, access the web page, and play the video. If the playback fails, referer validation settings have taken effect.

- Verify whether URL validation settings have taken effect.

  a. Log in to the VOD console. In the navigation pane, choose **Audio and Video Management**.

  b. Click **Details** in the row containing a media file and click the **Playback** tab to obtain the playback URL.



Quality	Format	Codec	Resolution	Bitrate	Size	URL	Operation
Raw file	MP4	H.264	640*360	587Kbps	10.96MB	http://vod-test.it-ba.com/asset/0a8aeed33d0aca336f5d717131a9f67b/03b621...	❐ ⊙
Total Index ⓘ	HLS	H.264	--	--		http://vod-test.it-ba.com/asset/0a8aeed33d0aca336f5d717131a9f67b/play_vid...	❐ ⊙
LD	HLS	H.264	480*270	298Kbps	5.79MB	http://vod-test.it-ba.com/asset/0a8aeed33d0aca336f5d717131a9f67b/play_vid...	❐ ⊙

  URL is the original playback URL. Click ❐ to obtain the authentication playback URL.

  c. Play the original playback URL and authentication playback URL on the player. If the original playback URL fails to be played but the authentication playback URL can be played, URL validation settings have taken effect.

4 Protecting Videos with HLS Encryption

Environment Preparation

You have **downloaded the SDK**.

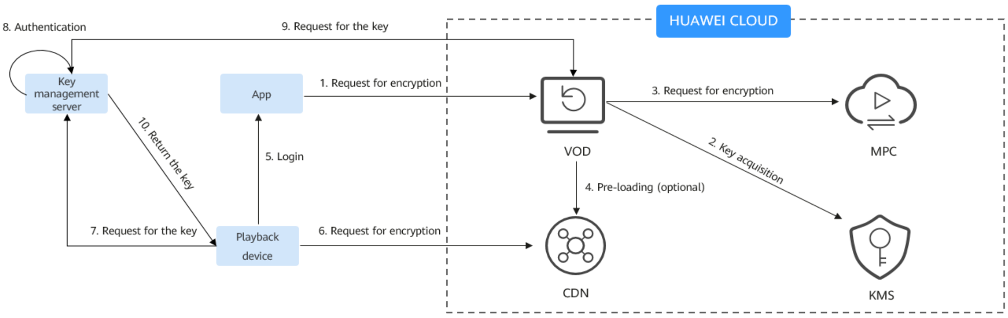
Scenario Description

Hotlink protection prevents unauthorized users from downloading or playing VOD content. However, this cannot prevent malicious paid users from downloading the content to their local PCs for secondary distribution.

To address this issue, Huawei Cloud VOD provides HLS encryption. With HLS encryption enabled, encrypted videos cannot be distributed to others even if they are downloaded by malicious users. HLS encryption requires the key service and token generation service. Therefore, this solution is suitable for those who can deploy authentication and key management servers by themselves.

Implementation

HLS encryption provided by Huawei Cloud VOD uses the AES-128 encryption algorithm to encrypt each TS file. The generated M3U8 file describes how the player decrypts the TS file. All HLS players are supported.



In this solution, VOD integrates Huawei Cloud Key Management Service (KMS) to provide keys for HLS encryption.

- Encryption
  a. You upload a video to VOD and request HLS encryption.

b. VOD requests the encryption key from KMS and stores the obtained key ID and key ciphertext.

c. VOD sends an HLS encryption request to Media Processing Center (MPC). MPC encrypts the video during transcoding.

   The M3U8 file generated after transcoding contains the **#EXT-X-KEY** tag, which contains the **METHOD** and **URI** attributes. **URI** is the address of your key management server.

   NOTE

   > If the streaming URL used after encryption is HTTPS, the KMS URL must also be HTTPS. Otherwise, the playback cannot be previewed on the VOD console.

   ```
   #EXTM3U
   #EXT-X-VERSION:3
   #EXT-X-TARGETDURATION:6
   #EXT-X-MEDIA-SEQUENCE:0
   #EXT-X-KEY:METHOD=AES-128,URI="https://domain-sample/encrypt/get-key?
   asset_id=6aee80009c4ca6970f508d6334194794",IV=0x80a3ff24ccd788042ca7f2237e74c59d
   #EXTINF:5.000000,  6aee80009c4ca6970f508d6334194794_1_1920X1080_3000_0_0.ts
   #EXTINF:5.000000,  6aee80009c4ca6970f508d6334194794_1_1920X1080_3000_0_1.ts
   #EXT-X-ENDLIST
   ```

d. VOD uses CDN to accelerate the distribution of encrypted HLS video files.

- Encryption

  a. When an end user logs in to a player, your server verifies user identity. If the verification succeeds, your server allocates a token and returns the playback URL containing the token to the player.

     For example, if the video playback URL is **https://1280.cdn-vod.huaweicloud.com/input/test.m3u8**, the playback URL returned to the player is **https://1280.cdn-vod.huaweicloud.com/input/test.m3u8?token=**{*token*}.

  b. The player sends a playback request containing the obtained playback URL to CDN. The token is dynamic. Therefore, after receiving the request, CDN directly retrieves the content from VOD. VOD writes the token in the request URL to the **URI** of the M3U8 file.

     The M3U8 file returned by VOD to CDN contains the token value of the player. The following is an example:

     ```
     #EXTM3U
     #EXT-X-VERSION:3
     #EXT-X-TARGETDURATION:6
     #EXT-X-MEDIA-SEQUENCE:0
     #EXT-X-KEY:METHOD=AES-128,URI="https://domain-sample/encrypt/get-key?
     asset_id=6aee80009c4ca6970f508d6334194794&token={token}",IV=0x80a3ff24ccd788042ca7f22
     37e74c59d
     #EXTINF:5.000000,  6aee80009c4ca6970f508d6334194794_1_1920X1080_3000_0_0.ts
     #EXTINF:5.000000,  6aee80009c4ca6970f508d6334194794_1_1920X1080_3000_0_1.ts
     #EXT-X-ENDLIST
     ```

  c. The player parses the M3U8 file to obtain the **URI** in the **EXT-X-KEY** tag and requests the key.

  d. Your key management server verifies the token. If the token is valid, the server calls the **key query API**.

     Your server can cache the key locally. If another playback device requests the key, it can directly return the key without obtaining the key from VOD.

  e. Your server returns the key to the player. The player uses the key to decrypt the M3U8 file and start playing the media.

Building Related Services

To use HLS encryption, you need to deploy the key management server and token generation service.

- The key management server needs to have the following functions. See **Sample Code**.
  - Identity authentication. As described in **Implementation**, your key management server verifies whether the token is valid upon receiving a key request.
  - Key acquisition from VOD. Keys are stored in VOD. Therefore, your key management server needs to call a VOD API to obtain the key.
  - Key acquisition from cache. Your key management server should have the cache function to cache the obtained key to avoid frequent access to VOD.
- Token generation service. When an end user logs in to your playback device, your server verifies the identity, generates a token, and returns the playback URL containing the token to the playback device. For details about the sample code for generating a token, see **Sample Code**.

  The generated token must contain uppercase letters, lowercase letters, and digits. The length can be customized. A unique token is allocated for each login and the token has a validity period. Comply with the least privilege principle. It is recommended that the token be used only for HLS-encrypted videos.

Video Encryption

Step 1 Upload the video file to be encrypted.

If the video to be encrypted has not been uploaded, you can upload the video to VOD on the **console**.

Step 2 Configure the key URL.

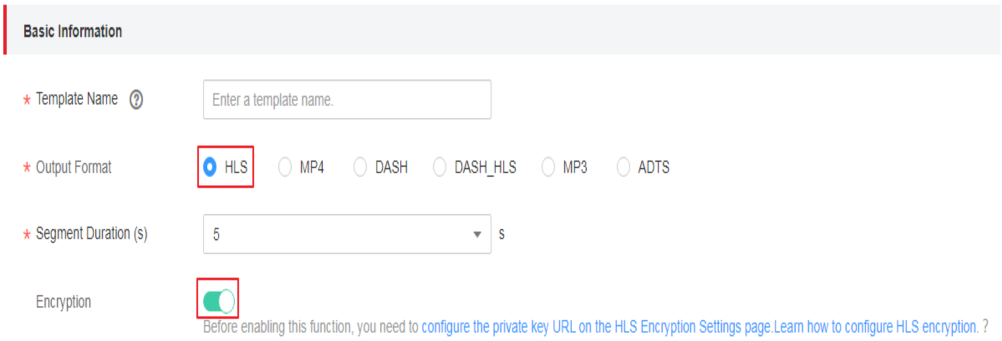
Before encryption, add the address of the key management server built in **Building Related Services** to VOD. During encryption, the address is written to the generated M3U8 file.

1. Log in to the VOD console. In the navigation pane, choose **Global Settings** > **Security**.
2. Click **HLS Encryption Settings**. In the dialog box displayed, enter the URL of your key management server, for example, **https://domain-sample/encrypt/get-key**.
3. Click **OK**.

Step 3 Create a transcoding template.

HLS encryption is implemented during transcoding. Therefore, before transcoding, you need to create a transcoding template with encryption enabled.

1. In the navigation pane, choose **Global Settings** > **Transcoding Templates**.
2. Click **Create Custom Template Group**. On the displayed page, configure related parameters.



Basic Information

* Template Name: Enter a template name.

* Output Format: ● HLS ○ MP4 ○ DASH ○ DASH_HLS ○ MP3 ○ ADTS

* Segment Duration (s): 5 s

Encryption: ●

Before enabling this function, you need to configure the private key URL on the HLS Encryption Settings page.Learn how to configure HLS encryption. ?

In the **Basic Information** area, set **Output Format** to **HLS**, enable encryption, and set other parameters based on your needs. For details, see **Transcoding Settings**.

3. Click **OK**.

Step 4 Encrypt the video.

1. In the navigation pane, choose **Audio and Video Management**.
2. Select the video that requires HLS encryption and click **Transcode**.
3. In the dialog box displayed, select the transcoding template created in **step 3** and click **OK**.

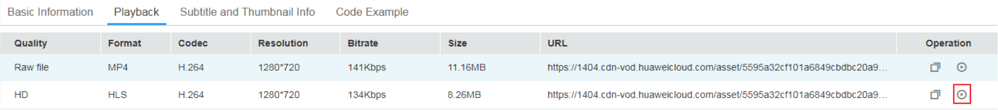
   The system starts transcoding the video. If **Transcoding Status** in the **Status** column becomes **Completed**, the transcoding succeeds and the video has been encrypted.

----End

Video Playback

This solution uses the HLS standard for encryption. All players that support HLS can decrypt and play content.

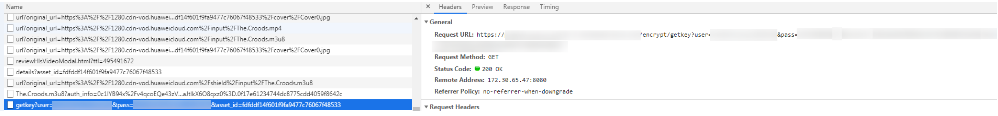
1. Log in to the VOD console. In the navigation pane, choose **Audio and Video Management**.
2. Click **Details** in the row contains the encrypted video and then click the **Playback** tab.
3. Click ▶ to play the video.



Basic Information | Playback | Subtitle and Thumbnail Info | Code Example

Quality	Format	Codec	Resolution	Bitrate	Size	URL	Operation
Raw file	MP4	H.264	1280*720	141Kbps	11.16MB	https://1404.cdn-vod.huaweicloud.com/asset/5595a32cf101a6849cbdbc20a9...	⧉ ▶
HD	HLS	H.264	1280*720	134Kbps	8.26MB	https://1404.cdn-vod.huaweicloud.com/asset/5595a32cf101a6849cbdbc20a9...	⧉ ▶

4. Enable developer mode in your browser. You can see that the console requests the key using the configured URL and decrypts the video for playback.



Name
- url?original_url=https%3A%2F%2F1280.cdn-vod.huawei...df14f601f9fa9477c76067f48533%2Fcover%2FCover0.jpg
- url?original_url=https%3A%2F%2F1280.cdn-vod.huaweicloud.com%2Finput%2FThe.Croods.mp4
- url?original_url=https%3A%2F%2F1280.cdn-vod.huaweicloud.com%2Finput%2FThe.Croods.m3u8
- url?original_url=https%3A%2F%2F1280.cdn-vod.huawei...df14f601f9fa9477c76067f48533%2Fcover%2FCover0.jpg
- reviewHlsVideoModal.html?ttl=495491672
- details?asset_id=fdfddf14f601f9fa9477c76067f48533
- url?original_url=https%3A%2F%2F1280.cdn-vod.huaweicloud.com%2Fshield%2Finput%2FThe.Croods.m3u8
- The.Croods.m3u8?auth_info=0c1lYB94x%2Fv4qcoEQe43zV...aJtlkX6O8qxz0%3D.0f17e61234744dc8775cdd4059f8642c
- getkey?user=[redacted]&pass=[redacted]&asset_id=fdfddf14f601f9fa9477c76067f48533

Headers | Preview | Response | Timing

General

Request URL: https://[redacted]/encrypt/getkey?user=[redacted]&pass=[redacted]

Request Method: GET

Status Code: ● 200 OK

Remote Address: 172.30.65.47:8080

Referrer Policy: no-referrer-when-downgrade

Request Headers

Sample Code

- Sample code for key management server

In this example, a Universally Unique Identifier (UUID) is used to generate a token. You can also select a generation method. The sample code does not include validity check for login users, which you can do on your own if necessary.

When your key management server receives a key request, it checks whether the decryption key is stored in the cache. If not, the server calls the server SDK to query the key.

```
import java.util.Base64;
import java.util.UUID;

import javax.servlet.http.HttpServletResponse;

import org.apache.commons.lang3.StringUtils;
import org.springframework.web.bind.annotation.GetMapping;
import org.springframework.web.bind.annotation.RequestParam;
import org.springframework.web.bind.annotation.RestController;

import com.huawei.kms.initvodclient.VodClientFactory;
import com.huawei.kms.util.CacheUtils;
import com.huaweicloud.sdk.vod.v1.model.ShowAssetCipherRequest;

import retrofit2.http.Header;

@RestController
public class KeyManagerController {
    /**
     * Assign a token to a legitimate user and return the playback URL with the token.
     *
     * @param accessToken Authentication information carried with the user. Verify the identity.
     * @param playUrl      Playback URL
      * @return Return the playback URL with the token.
     */
    @GetMapping("/get-url")
    public String getTokenPlayUrl(@Header("access-token") String accessToken,
            @RequestParam(value = "play_url", required = true) String playUrl) {
         // Assign a token to a valid terminal. ***** needs to be generated by the code on the customer
side.
        String token = "*****";
         // Construct the playback URL with the token included and return it. http://{domain}/asset/
{asset_id}/play_video/index.m3u8?token={token}
        return playUrl.substring(0, playUrl.lastIndexOf("/") + 1) +
                playUrl.substring(playUrl.lastIndexOf("/") + 1) + "?token=" + token;
    }



    /**
      * @param asset_id Media ID
     * @param token     Token assigned to the user, where you need to check whether the token is valid.
Return the key to those who pass the verification.
     * @param response
     * @return Return the key of the byte array type.
     */
    @GetMapping(value = "/get-key",headers = "Accept=application/octet-stream")
    public byte[] getKey(@RequestParam(value = "asset_id", required = true) String asset_id,
            @RequestParam(value = "token", required = true) String token, HttpServletResponse
response) {
        // Get the key from the cache. If it is not in the cache, obtain it from VOD. In this example,
suppose you store the key in the cache database.
        String key = CacheUtils.getCipherFromCache(asset_id);
        if (StringUtils.isEmpty(key)) {
            ShowAssetCipherRequest request = new ShowAssetCipherRequest();
            request.withAssetId(asset_id);
            key = VodClientFactory.getClient().showAssetCipher(request).getDk();
            // Cross-domain. Enter the actual site or fill in *.
            response.setHeader("Access-Control-Allow-Origin", "*");
            response.setHeader("Content-Length", "16");
            // Set the data type of the key.
            response.setHeader("Content-Type", "application/octet-stream");
            // Update the cache.
            CacheUtils.updateCipherFromCache(asset_id, key);
        }
        return Base64.getDecoder().decode(key);
    }
}
```

- Obtaining the VodClient Sample Code

```
import com.huaweicloud.sdk.core.auth.BasicCredentials;
import com.huaweicloud.sdk.core.auth.ICredential;
import com.huaweicloud.sdk.vod.v1.VodClient;
import com.huaweicloud.sdk.vod.v1.region.VodRegion;

public class VodClientFactory {

    private final static String AK = System.getenv("CLOUD_SDK_AK");
    private final static String SK = System.getenv("CLOUD_SDK_SK");
    private final static String REGION="cn-north-4"; // Actual service node, for example, cn-north-1
and cn-east-2

    private static volatile VodClient vodClient = null;

    public static VodClient getClient() {
        if (vodClient == null) {
            synchronized (VodClient.class) {
                if (vodClient == null) {
                    ICredential auth = new BasicCredentials()
                                .withAk(AK)
                                .withSk(SK);
                    vodClient = VodClient.newBuilder().withCredential(auth)
                                .withRegion(VodRegion.valueOf(REGION))
                                .build();
                 }
             }
         }
         return vodClient;
    }
}
```

- Sample code for caching

  After your key management server obtains the decryption key from VOD, it needs to cache the key to avoid repeated requests for the same media from VOD. In this example, suppose you cache the key on your local PC. You can also cache it in the database.

```
import com.google.common.cache.Cache;
import com.google.common.cache.CacheBuilder;

import java.util.concurrent.TimeUnit;

public class CacheUtils {

    private static Cache<String, String> cipherCache = CacheBuilder.newBuilder()
            .maximumSize(100) // Set the maximum cache size.
            .expireAfterWrite(10, TimeUnit.MINUTES) // Set the cache to be invalid one minute after data
is written.
            .concurrencyLevel(10) // Set the concurrency level to 10.
            .recordStats() // Enable cache statistics.
            .build();

    public static String getCipherFromCache(String key) {
        return cipherCache.getIfPresent(key);
    }

    public static void updateCipherFromCache(String key, String value) {
        cipherCache.put(key, value);
    }
}
```

- The Maven dependency required by the preceding sample code is as follows:

  Note: The following JAR package versions are not fixed. Use the actual versions of the Java project and JAR packages.

```
<parent>
    <groupId>org.springframework.boot</groupId>
    <artifactId>spring-boot-starter-parent</artifactId>
    <version>2.3.12.RELEASE</version>
    <relativePath/>
</parent>
<dependencies>
    <dependency>
        <groupId>org.springframework.boot</groupId>
        <artifactId>spring-boot-starter-web</artifactId>
    </dependency>
    <dependency>
        <groupId>org.apache.commons</groupId>
        <artifactId>commons-lang3</artifactId>
        <version>3.7</version>
    </dependency>
    <dependency>
        <groupId>com.huaweicloud.sdk</groupId>
        <artifactId>huaweicloud-sdk-vod</artifactId>
        <version>3.1.72</version>
    </dependency>
    <dependency>
        <groupId>com.squareup.retrofit2</groupId>
        <artifactId>retrofit</artifactId>
        <version>2.5.0</version>
    </dependency>
    <dependency>
        <groupId>com.google.guava</groupId>
        <artifactId>guava</artifactId>
        <version>27.0.1-jre</version>
    </dependency>
</dependencies>
```

5 Change History

Released On	Change Description
2020-08-30	This issue is the second official release. ● Added the section "Uploading a Media File to VOD".
2019-03-30	This issue is the first official release.