Video on Demand

User Guide

Issue 01

Date 2025-09-04

HUAWEI CLOUD COMPUTING TECHNOLOGIES CO., LTD.

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1 Prerequisites

1. Register an account on the **Registration** page.
2. Complete real-name authentication by referring to **Individual Real-Name Authentication**.
3. Top up your account (≥ $0.15 USD) on this **page** to subscribe to and use VOD.
4. Log in to the **VOD console** and subscribe to VOD as prompted.

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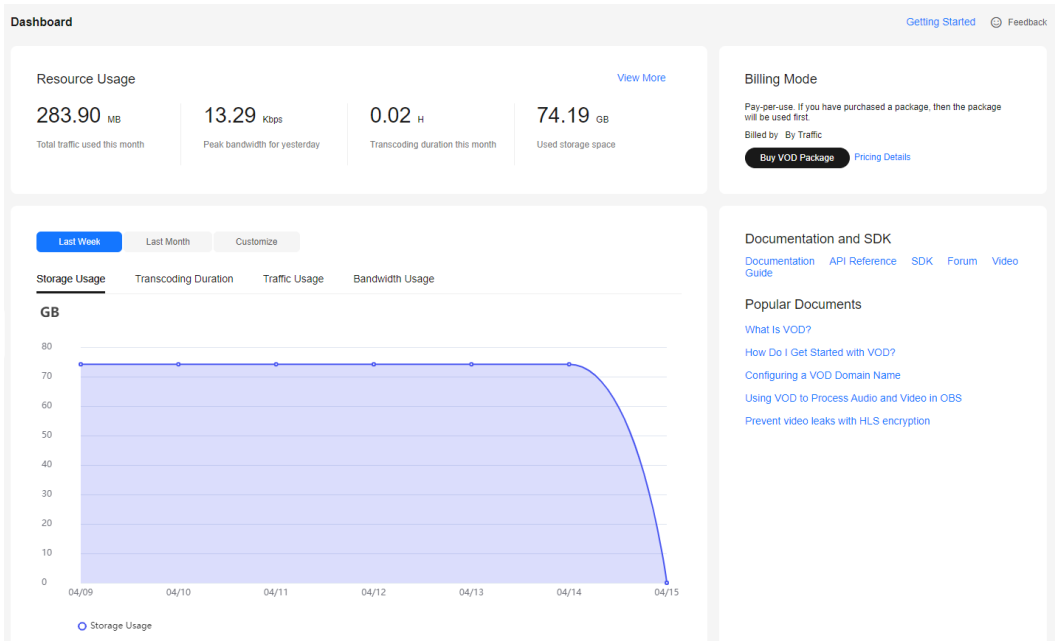
2 Functions

The VOD console provides functions such as audio/video upload and management and video processing. You can view real-time monitoring information such as VOD resource usage and popular media assets on the console.

Dashboard

Log in to the VOD console. The **Dashboard** page is displayed. You can view the VOD service usage or click **Getting Started** in the upper right corner for quick operation.

Figure 2-1 Dashboard



- You can view VOD resource usage in trend charts.

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Table 2-1 Statistics

Item	Description
Storage Usage	Storage space occupied by all media files, including input audio/video files, images, subtitles, and output media files. **NOTICE** There is a delay of at least one hour for obtaining storage space data. Example: • If the current Beijing time is 9:50, data from 7:00 to 8:00 can be obtained. • If the current Beijing time is 10:00, data from 8:00 to 9:00 can be obtained.
Transcoding Duration	Total duration of the transcoded video (LD). If the output resolution is 4K, 2K, HD, or SD, the value will be converted into the duration of an LD video at 12 : 6 : 3 : 1.5 : 1 (4K : 2K : HD : SD : LD).
Traffic Usage	Total traffic used for VOD acceleration.
Bandwidth Usage	Peak bandwidth (by day) generated when VOD is used to accelerate content distribution.

- **Billing Mode** shows the current CDN billing mode. You can click **Change** to change the CDN billing mode.

Function List

You can configure or use the functions in the navigation pane of the VOD console.

Table 2-2 Console function overview

Function	Description
Domain Name Management	Add and manage your own domain names, and configure HTTPS and hotlink protection for domain names.
Audio/Video Upload	You can upload audio/video files from the local PC, or pull audio/video files from their URLs.
Audio/Video Management	You can perform operations on uploaded audio/video files, including transcoding, real-time container format conversion, pre-loading and updating media asset information on CDN, canceling transcoding, restoring archived files, changing the storage class, categorizing media assets, extracting audio, exporting media asset information, deleting media assets, viewing basic information of media assets, and obtaining media asset streaming URLs.
Video Processing	You can perform operations on video files, such as snapshot capturing and workflow creation.

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Function	Description
Global Settings	You can configure transcoding templates, watermark templates, HLS encryption, tenant-level media asset cold storage, categories, event notifications, and workflows.
Audio/Video Review	Audios, images, and files can be automatically or manually reviewed to block inappropriate content. **NOTE** This function is not available in AP-Bangkok.
Usage Query	You can view the traffic and peak bandwidth statistics on CDN, as well as the storage space and transcoding duration used on the VOD origin server.
Data Analysis	You can view data such as the traffic, bandwidth, and traffic hit ratio on CDN, as well as the number of playback times and ranking (by playback times) of audio/video files by domain name.

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3 Permissions Management

3.1 Creating a User and Assigning VOD Permissions

This section describes how to use **IAM** to implement fine-grained permissions management on your VOD resources. With IAM, you can:

- Create IAM users for employees from different departments of your organization. In this way, each IAM user has a unique security credential to use VOD resources.
- Assign users only the permissions required to perform a given task based on their job responsibilities.
- Entrust a Huawei Cloud account or cloud service to perform efficient O&M on your VOD resources.

If your Huawei Cloud account does not require individual IAM users, skip this section.

This section describes the process of assigning permissions (see **Figure 3-1**).

Prerequisites

Learn about the permissions (see **Permissions Management**) supported by VOD and choose policies or roles according to your requirements.

Notes

From December 30, 2024 on, policies will be the only way for VOD permissions management. Policies are easy to configure and allow flexible permission settings, meeting your requirements for IAM user permissions management in different scenarios.

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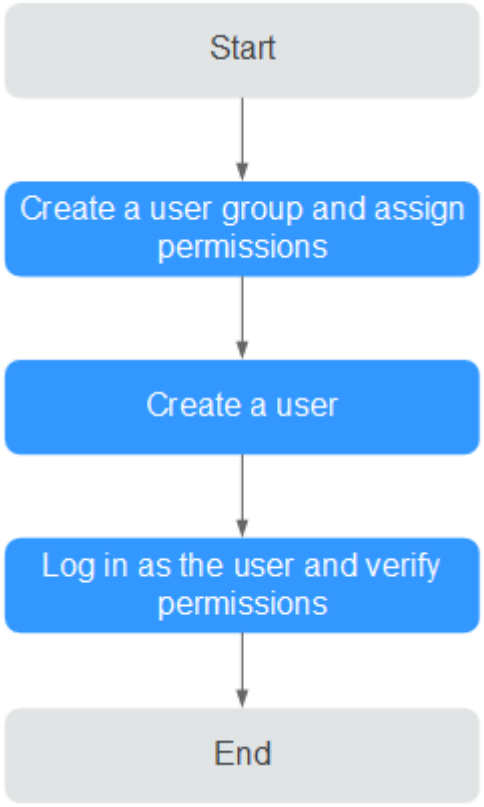
NOTICE

If you enabled VOD before December 30, 2024 and are using both roles and policies for VOD permissions management, you can continue with the role + policy approach. For details, see **Creating a User and Granting VOD Permissions**.

If you want to switch to the policy-only approach for VOD permissions management, **submit a service ticket**.

Process Flow

Figure 3-1 Process of assigning VOD read-only permissions



1. **Create a user group and assign permissions**.

   Create a user group on the IAM console and attach the **VOD ReadOnlyAccess** policy to the group.

2. **Create an IAM user and add them to the user group**.

   Create a user on the IAM console and add them to the group created in **1**.

3. **Log in** and verify permissions.

   In the authorized region, perform the following operations:

   - Choose **Service List** > **Video on Demand**. The VOD console is displayed. If a message is displayed indicating insufficient permissions for performing the operation, the **ReadOnlyAccess** policy has already taken effect.

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- Choose any other service in **Service List**. If a message is displayed indicating insufficient permissions for the service, the **VOD ReadOnlyAccess** policy has already taken effect.

Creating a User with Media Asset Isolation

VOD uses only policies for permissions management. Policies are easy to configure and allow flexible permission settings, meeting your requirements for IAM user **permissions management** in different scenarios.

If you want to isolate media assets for IAM users, you can assign the **VOD Group Administrator** role and use specified policies to manage the permissions on the media assets in the group where the IAM users are.

NOTICE

- You need to assign the role only when media asset isolation is required for IAM users.
- If you enabled VOD before December 30, 2024 and are using both roles and policies for VOD permissions and media asset management, you can continue with the role + policy approach. For details, see **Creating a User and Granting VOD Permissions**.

  If you want to switch to the policy-only approach for VOD permissions management, **submit a service ticket**.

Procedure:

Step 1 Create a user group, for example, **test**.

For details, see **Creating a User Group and Assigning Permissions**.

Step 2 Create a user, for example, **test**, and add the user to the created user group **test**.

For details, see **Creating an IAM User and Adding Them to the User Group**.

Step 3 Access the VOD console as the **test** user.

Step 4 In the navigation pane, choose **Management** > **Audio and Video Management**.

If media asset isolation is not performed, the **test** user can view the list of media assets created by all users under the current Huawei Cloud account on the current page.

Step 5 Assign the **test** user group the **VOD Group Administrator** role and configure a policy.

For details, see **Creating a User Group and Assigning Permissions**.

Step 6 Refresh the **Management** > **Audio and Video Management** page on the VOD console.

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After media asset isolation is complete, if the user is assigned only the **VOD Group Administrator** role, the user can view only the media assets they created, not the media assets created by other users under the current account.

----End

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4 Domain Name Management

4.1 Configuring Domain Names

You can use your own domain names to accelerate media file distribution.

Notes

- If you have **enabled** the enterprise project management service, you can categorize domain names by enterprise project when adding domain names. The default enterprise project is **default**. You can add enterprise project types by referring to **Creating an Enterprise Project**.
- The system automatically checks all domain names under your name and deletes domain names that have been idle for a long time. The details are as follows:
  - Disabling a domain name: If no downstream traffic is generated for a domain name within one month, the domain name will be disabled and in the **Disabled** status on the VOD console.
  - Deleting a domain name: If no downstream traffic is generated for a domain name within two months, the domain name will be deleted.
- After a domain name is disabled or deleted, the domain name cannot be used to distribute or play media files, but can be used to upload or process media files.

  If a domain name is in an abnormal status such as being disabled and media files are deleted, the CDN cache cannot be cleared. After the domain name works again, the user triggers the operation of clearing the media file cache again.
- Restoring a domain name: If a domain name is disabled, you can manually enable it on the **Domain Name Management** page of the VOD console. If the domain name has been deleted, you need to add the domain name again and configure the CNAME so that the domain name can be used again. The acceleration domain name allocated by the system (all domain names have been allocated) when VOD is subscribed cannot be restored after being deleted.

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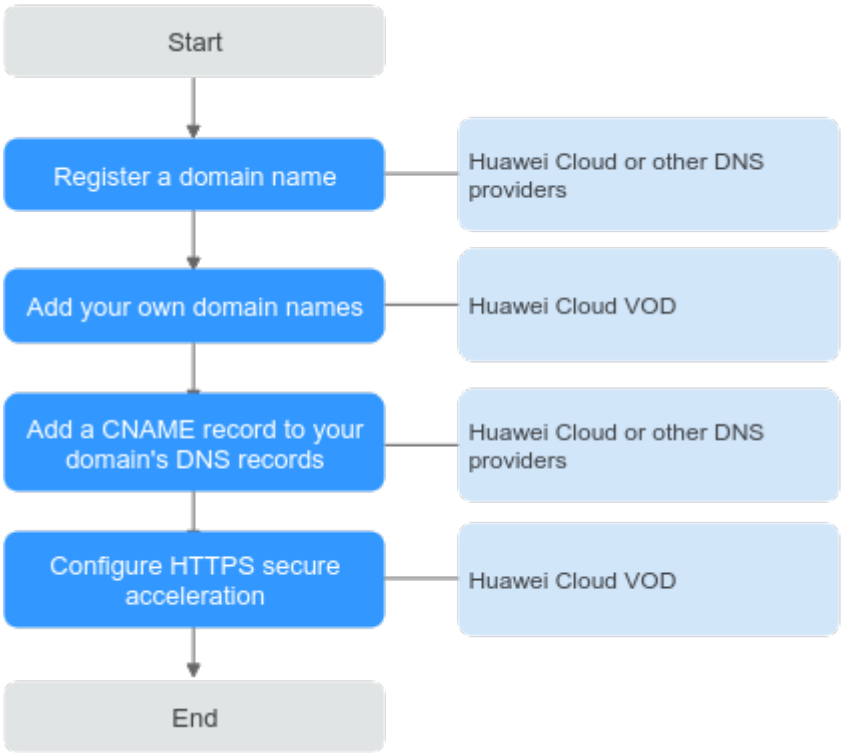
- If a domain name has not been used for more than half a year, an error will be reported when you delete the domain name. In this case, **submit a service ticket**.

Domain Admission Process

Figure 4-1 shows the process of using your own domain names for VOD acceleration.

Figure 4-1 Domain admission process



1. Register a domain name: If you do not have a domain name, you can purchase or register a domain name at the cloud service provider.
2. Add your own domain names. You can add a maximum of five domain names to the VOD service. For details, see **Adding Domain Names**.
3. Add a CNAME record to your domain's DNS records. For details, see **CNAME Resolution**.
4. Configure HTTPS secure acceleration. The default streaming URL of VOD content is based on HTTPS. If you do not upload the HTTPS certificate of the added domain name, the uploaded media files cannot be played. For details, see **Configuring HTTPS Secure Acceleration**.

NOTE

After your domain name is added, VOD will review the content on your site. If your site violates related laws and regulations, for example, pornography, gambling, and drug abuse–related content are found, domain resolution will be terminated.

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Adding Domain Names

Step 1 Log in to the **VOD console**.

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

Step 3 Click **Add Domain Name**. The **Add Domain Name** page is displayed.

Table 4-1 describes the required parameters.

Table 4-1 Adding a domain name

Parameter	Description
Domain Name	Enter a licensed domain name. • You can add a maximum of five domain names. Wildcard domains such as ***.example.com** are not allowed. • You are advised to use a domain name higher than second level, for example, **example.yourdomain.com**.
Enterprise Project	If you have **enabled** the enterprise project function, you need to select **Enterprise Project** to categorize new domain names.
Service Scope	Service scope of the current domain name. The options are as follows: • **Chinese mainland**: Only users in the Chinese mainland can access the VOD content of the current domain name. • **Outside China**: Only users outside the Chinese mainland can access the VOD content of the current domain name. • **Global**: Global users can access the VOD content of the current domain name. **NOTICE** If the **Service Scope** you select involves cross-border data transfer, you shall be responsible for such transfer. For details, see section 2.3 "Processing Your Content Data" of **Service Agreement**.

Step 4 Click **OK**.

A domain name whose **Status** is **Configuring** is displayed in the domain name list. If **Status** becomes **Enabled** in 3 to 5 minutes, the domain name has been added.

After a domain name is added, the system assigns a CNAME value to the domain name.

Step 5 Add a CNAME record to your domain's DNS records by referring to **CNAME Resolution** and verify whether the CNAME record has taken effect.

If the CNAME has not been configured and the domain name is enabled by default after it is added, media files in VOD may fail to be played and the thumbnail may fail to be displayed.

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Step 6 Click **Set as Default** next to an added domain name to set the domain name to the default one.

Each account can only have one default domain in the **Enabled** state. You need to enable **HTTPS secure acceleration** for the domain name and upload the HTTPS certificate so that the domain name can be used to provide the VOD functions.

----End

Managing Domain Names

After a self-owned domain name is added, you can view basic information about the domain name on the **Domain Name Management** page. You can also disable, enable, or delete the domain name. If you have **enabled** the enterprise project management service, you can also view the name of the enterprise project to which a domain name belongs.

Step 1 Log in to the **VOD console**.

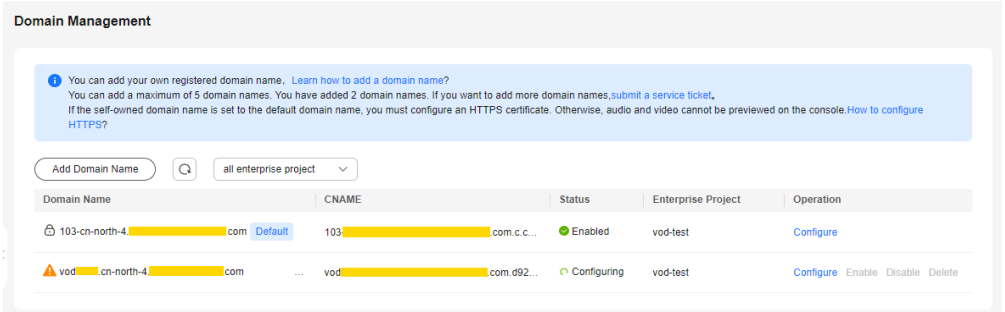
Step 2 In the navigation pane, choose **Domain Name Management**.

Step 3 You can perform the following operations as required:

- Viewing domain information

  In the domain name list, you can view the CNAME value and status of the added domain name.

  Figure 4-2 Domain information

  Click **Configure** in the **Operation** column on the right to view the basic configuration of the target domain name. You can also configure **HTTPS secure acceleration** and **Referer validation** for the domain name.

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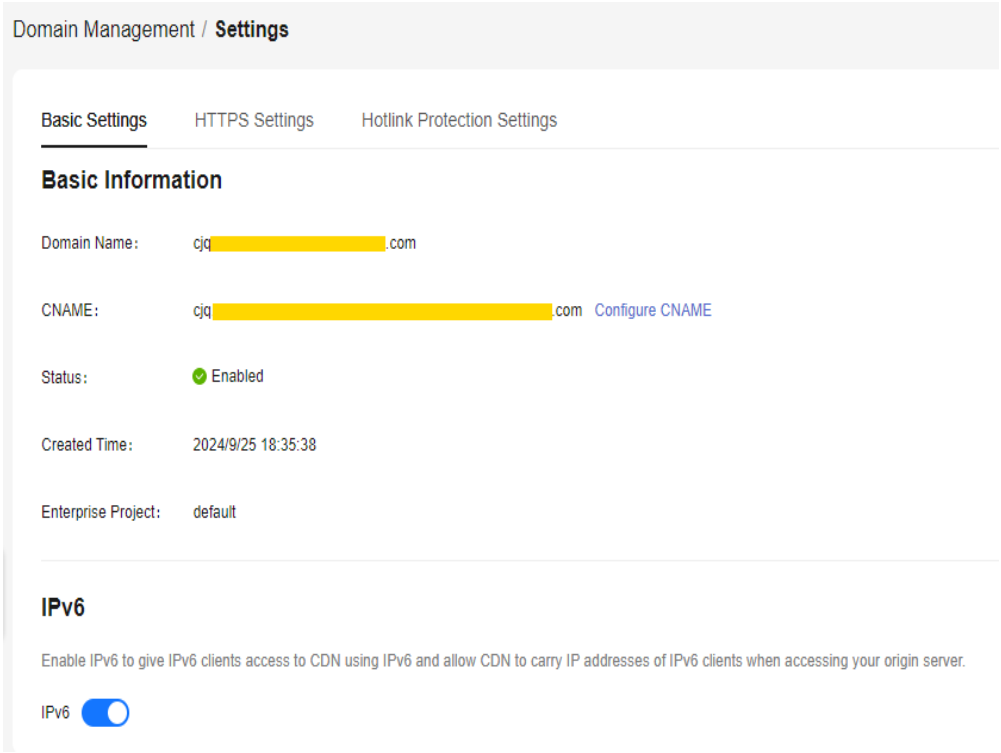
Figure 4-3 Domain name security configuration



- Disabling a domain name

  To disable a domain name, click **Disable** in the row that contains the target domain name. If the **Status** changes to **Disabled**, the domain name has been disabled.

  NOTE

  Ensure that the default domain name has been enabled. Otherwise, media file playback will fail.

- Enabling a domain name

  To enable a disabled domain name, click **Enable** in the **Operation** column. If the **Status** changes to **Enabled**, the domain name has been enabled.

- Deleting a domain name

  Only a domain name in the **Disabled** status can be deleted. After disabling a domain name, click **Delete** in the row containing the domain name to delete it.

  If a domain name has not been used for more than half a year, an error will be reported when you delete the domain name. In this case, **submit a service ticket**.

----End

Follow-up Operations

After the domain name is added, you can configure the domain name on the VOD console. The details are as follows:

- **Configure HTTPS secure acceleration** to ensure that VOD media files are encrypted during transmission.

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- **Configure referer validation** to identify the request source by the referer field carried in a playback request and filter out unauthorized requests.
- **Configure URL validation** to prevent resources uploaded by subscribers to the VOD service from being stolen.

4.2 CNAME Resolution

After a domain name is added, the system automatically assigns a CNAME value to the domain name. You need to add the CNAME record to your domain's DNS records. Acceleration is enabled once the configuration takes effect.

Notes

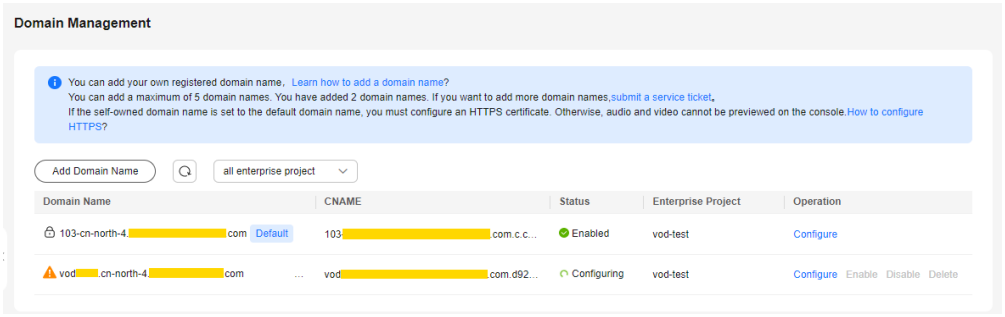
- If your domain name is not registered on the Huawei Cloud Domain Registration Service, configure the CNAME record following the guidance provided by your DNS service provider.

Procedure

Step 1 Obtain the CNAME record.

1. Log in to the **VOD console**.
2. In the navigation pane on the left, choose **Domain Management**.
3. Obtain the corresponding CNAME record in the **CNAME** column.

Figure 4-4 Domain information

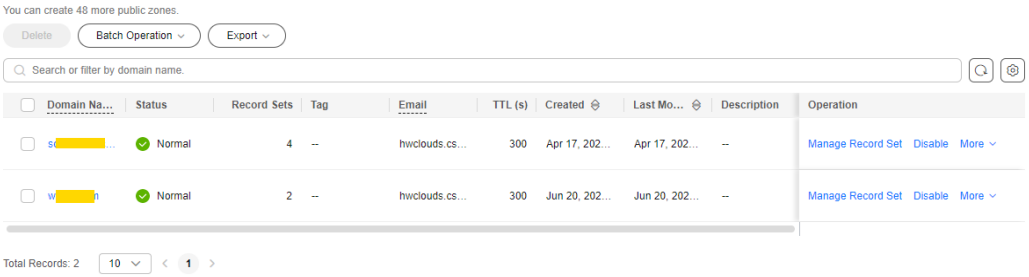


Step 2 Log in to the **Domain Name Service (DNS)** console.

Step 3 In the navigation pane on the left, choose **Public Zones**.

Step 4 Click the target domain name in the **Domain Name** column, as shown in **Figure 4-5**.

Figure 4-5 Domain name list



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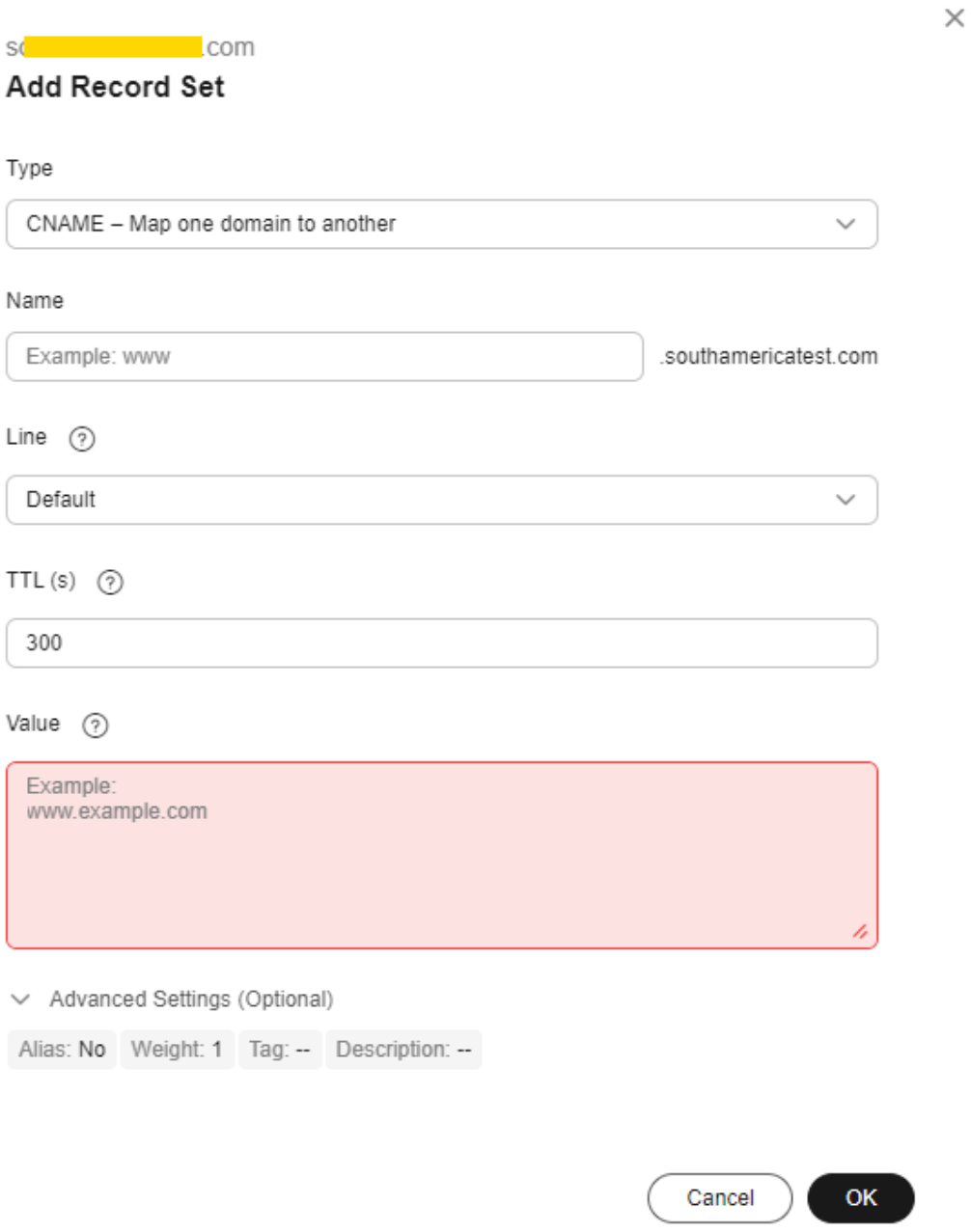
Step 5 Click **Add Record Set** in the upper right corner.

Figure 4-6 Adding a record set



Configure the parameters by referring to **Table 4-2**.

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Table 4-2 Parameters

Parameter	Description
Type	Type of the record set. Select **CNAME – Map one domain to another** here.
Name	Enter the second-level domain name. You do not need to enter the suffix. For example, if the streaming domain name is **play-test.example.com**, enter **play-test**.
Line	Used when the DNS server is resolving a domain name. It returns the IP address of the server according to the visitor source. For details, see **Resolution Lines**. This parameter is available only for public domain names. Select **Default**.
TTL (s)	Cache duration of the record set on a local DNS server, in seconds. The smaller the value is, the quicker the record takes effective. The default value is 300 seconds. You can retain the default value.
Value	Domain name to be pointed to, that is, the CNAME record obtained in step 1 of this section. For example, if the streaming domain name is **play-test.example.com**, enter **play-test.example.com.c.cdnhwc3.com**.
Alias	Whether to associate the record set with a cloud resource. • Enabled: The record set will be associated with a cloud resource. • Disabled: The record set will not be associated with a cloud resource. Toggle off the switch, that is, disable this function.
Weight	(Optional) Weight of a record set. The value ranges from **0** to **1000** and defaults to **1**. This parameter is available only for public domain names. If a resolution line in a zone contains multiple record sets of the same type, you can **configure weighted routing** for each record set. Set this parameter to **1**.
Tag	(Optional) Identifier of a record set. Each tag contains a key and a value. You can add up to 10 tags to a record set. For details about how to name a key and a value, see **Adding a CNAME Record Set**. Examples: • example_key1 • example_value1

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Parameter	Description
Description	(Optional) Describes a domain name. The description can contain a maximum of 255 characters.

Step 6 Click **OK**.

The record set you added is displayed in the list. If the status of the record set is **Normal**, the record set has been added.

----End

Verifying that the CNAME Has Taken Effect

Open the command line interface that comes with Windows and run the following command:

```
nslookup -qt=cname Acceleration domain name
```

If the CNAME is displayed, the CNAME has taken effect. A typical command output is shown in **Figure 4-7**.

Figure 4-7 Command output

4.3 Configuring IPv6 Access

After IPv6 is enabled, the IPv6-compatible client can access the VOD service using the IPv6 protocol.

Notes

After IPv6 is enabled, if IPv6 is used to access VOD but the optimal node does not support IPv6, VOD can still be accessed using IPv4.

Procedure

Step 1 Log in to the **VOD console**.

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

Step 3 In the **Operation** column of the desired domain name, click **Configure**.

Step 4 In the **IPv6** area, enable **IPv6**, as shown in **Figure 4-8**.

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Figure 4-8 IPv6

----End

4.4 Configuring HTTPS Secure Acceleration

4.4.1 SCM Authorization

If your certificate has been uploaded to **Cloud Certificate Manager (CCM)** of Huawei Cloud, you can enable SCM authorization so that you can directly obtain the certificate content when configuring certificates on VOD.

Constraints

1. IAM users can enable SCM authorization only when they have the following permissions.

Associated Cloud Service	Permission
IAM	• iam:roles:listRoles • iam:roles:createRole • iam:agencies:listAgencies • iam:agencies:createAgency • iam:permissions:checkRoleForAgency • iam:permissions:grantRoleToAgency

2. After creating an agency, IAM users can configure certificates for domain names when they have the following permissions:
   - vod:domain:modifyHttpsSetting
   - vod:domain:getHttpsSetting
   - vod:domain:list

Enabling SCM Authorization

Step 1 Log in to the **VOD console**.

Step 2 In the navigation pane, choose **Domains**.

Step 3 In the upper right corner of the page, click **Enable SCM Authorization**.

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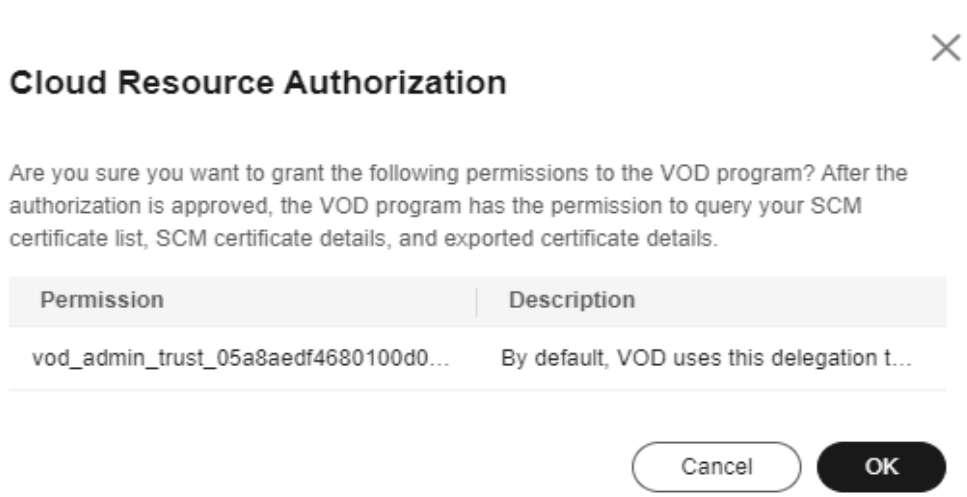
Figure 4-9 Cloud resource authorization



Step 4 Click **OK**. An agency named **vod_admin_trust_*{domainID}*** is created for you on the **IAM console**. VOD now has the permission to list your SCM certificates and export certificate details.

NOTE

Do not delete this agency. Otherwise, VOD cannot obtain certificate content when you configure an HTTPS certificate.

----End

4.4.2 Configuration Methods

You can configure HTTPS secure acceleration to protect your VOD resources. HTTPS is enabled for the domain name allocated for VOD by default. If you use your own domain name for VOD acceleration, you must enable HTTPS. Otherwise, you cannot preview and play media files on the VOD console.

Background

Forcible direction to HTTPS: If a user initiates an HTTP request, the server returns a 302 status code, and the user is redirected to HTTPS.

HTTP/2: The HTTP/2 specification was published as RFC 7540 in May 2015. The standardization effort was supported by Chrome, Opera, Firefox, Internet Explorer 11, Safari, Amazon Silk, and Edge browsers.

HTTPS has the following advantages over HTTP:

- HTTPS is a network protocol constructed based on SSL and HTTP for encrypted transmission and identity authentication. It is more secure than HTTP and prevents data from being stolen or tampered with during transmission, ensuring data integrity.
- Key user information is encrypted to prevent session IDs or cookies from being captured by attackers.

HTTP/2 has the following advantages:

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- Multiplexing: Multiple HTTP requests can be sent and responses can be received asynchronously via a single TCP connection.
- Binary framing: All HTTP/2 communication is split into smaller messages and frames, each of which is encoded in binary format to replace plaintext transmission in HTTP/1.x.
- Server push: A server can actively push responses into client caches, speeding up web page loading.
- Header compression: HTTP/2 uses the HPACK algorithm designed for header compression. It compresses the message header and creates an index table for the message header. For the same message header, only the index number is sent, reducing the transmission of header data.

Prerequisites

- A domain name has been configured. For details, see **Configuring Domain Names**.
- The HTTPS certificate has been prepared. If no HTTPS certificate is available, go to the **SSL Certificate Manager** to buy an HTTPS certificate.
- The HTTPS certificate format must meet the **requirements**. If your certificate is not in PEM format, **convert the certificate** to the PEM format.

Enabling HTTPS

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 your domain name and then click the **HTTPS Settings** tab.

Step 4 Enable **HTTPS Acceleration** and set HTTPS parameters. See **Figure 1**.

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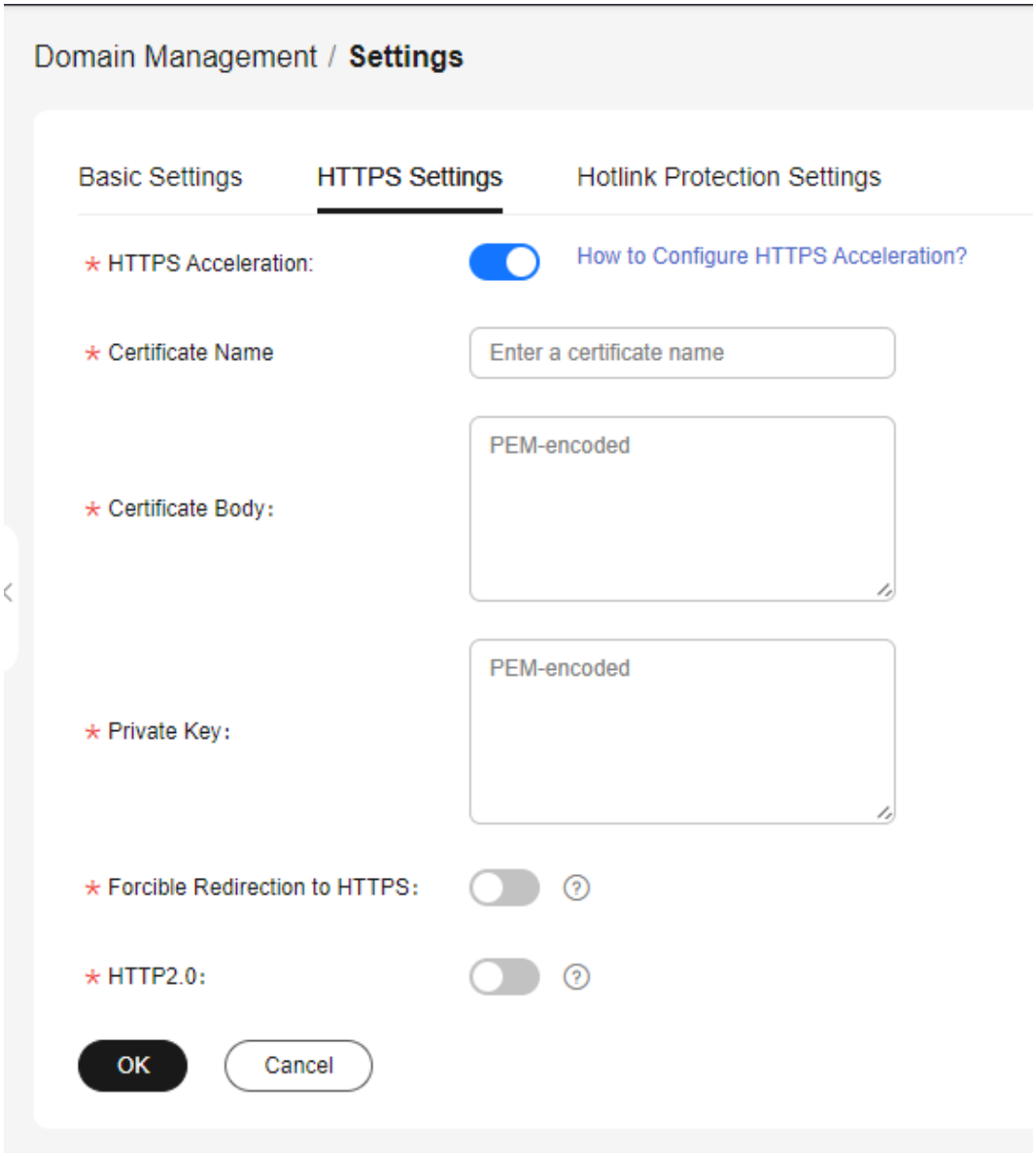
Figure 4-10 Configuring an HTTPS certificate



Set the certificate name, use a text editor to open the obtained certificate file and private key file, and copy the content to the **Certificate Body** and **Private Key** text boxes. Certificates issued by different organizations have the following differences:

- If your certificate is issued by the root CA, the certificate is a complete certificate. Copy the certificate content.

  Figure 4-11 HTTPS certificate

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- If your certificate is issued by an intermediate CA, the certificate file contains multiple certificates. You need to combine all the certificates into a single certificate. For details, see **Certificates Issued by Intermediate CAs**.

Step 5 Select whether to enable **Forcible Redirection to HTTPS** and **HTTP2.0**.

- **Forcible Redirection to HTTPS**: If this function is enabled, when you access media in VOD, all requests are redirected to HTTPS.
- **HTTP2.0**: If this function is enabled, all requests for accessing media in VOD comply with the HTTP/2 protocol.

Step 6 Verify whether HTTPS secure acceleration has taken effect.

If the playback URL starts with **https://** and you can use play video or audio via the URL, HTTPS secure acceleration has taken effect.

----End

Updating a Certificate

If your certificate is about to expire or has been revoked, you need to synchronize the new certificate to the HTTPS settings. The procedure of updating a certificate is the same as that of **enabling HTTPS**.

4.4.3 HTTPS Certificate Requirements

The HTTPS configuration only supports certificates or private keys in PEM format. The certificate/private key upload requirements vary depending on certificate issuing agencies.

Certificates Issued by Root CA

A Certificate issued by Root CA is a complete certificate. You only need to upload the certificate when configuring HTTPS.

Use the text program to open the certificate in the **PEM** format, then you can view the certificate content, as shown in **Figure 4-12**.

A certificate in **PEM** format

- The certificate starts with the **-----BEGIN CERTIFICATE-----** chain and ends with the **-----END CERTIFICATE-----** chain.
- Each line of the certificate content contains 64 characters, but the number of characters in the last line can be smaller than 64.
- No space is allowed in the certificate content.

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Figure 4-12 A certificate in **PEM** format

```
-----BEGIN CERTIFICATE-----
MIIDxDCCAqygAwIBAgIEAJgGCTANBgkqhkiG9w0BAQUFADBuMQswCQYDVQQGEwJj
bjELMAkGA1UECAwCZ2QxCzAJBgNVBAcMAnN6MQswCQYDVQQKDAJodzELMAkGA1UE
CwwCaHcxGDAWBgNVBAMMD21OT0MgUm9vdCBDQSBWMjERMA8GCSqGSIb3DQEJARYC
aHcwHhcNMTYwNTE3MDEyODQ2WhcNMjEwNTE2MDEyODQ2WjBdMQswCQYDVQQGEwJj
bjELMAkGA1UECBMCZ2QxCzAJBgNVBAoTAmh3MQswCQYDVQQLEwJodzEUMBIGA1UE
AxQLKi5vd3Nnby5jb20xETAPBgkqhkiG9w0BCQEWAmh3MIIBIjANBgkqhkiG9w0B
AQEFAAOCAQ8AMIIBCgKCAQEAxDKJJ/hArR+Sq2YyqOWUN2Jh822dGcexU58g909e
[redacted]
HRMEAjAAMCwGCWCGSAGG+EIBDQQfFh1PcGVuU1NMIEdlbmVyYXRlZCBDZXJ0aWZp
Y2F0ZTAdBgNVHQ4EFgQUmNstyLA+uGec0xx8f+XPLs3AiEUwHwYDVR0jBBgwFoAU
PRaAjcivt51G+7642KLZ+GbJTIQwDQYJKoZIhvcNAQEFBQADggEBABkMXMrUMhEH
ZNhbl9blt90NKQJpi7ugy7rj+vft4fUYeTvapsRwNutjWGVmnWB3HV85tnbIgVsa
0pP6yKbJ+mJhL5AB/crDMDMqGhywUEoG80kzEQJSeUHJ/R/iTaksmkqSPyDrbvaN
1DpIf5Sa7YA9VbWYpIZDuOhyk07HSZc8kcSmD+0K9gOke7QS1L3FKAvdgqJepeL6
A137VUmYTdh2mqS78LcpSs+SofipppOGgi5AuimZqp5xrn8Od6GjQqEc7nGH5foQ
1Jq8ekhn07Aqd7chFbDfW4qLSY7nEHT3uLzGME8Y9QQ4zs5H7lCaJVGXtoTQfpXR
nuMo/2NXiA0=
-----END CERTIFICATE-----
```

Certificates Issued by Intermediate CAs

The certificate file issued by an intermediate agency contains several certificates. You need to combine the certificates into an integral one, and upload it when configuring HTTPS security acceleration. A combined certificate is shown as **Figure 4-13**.

Use the text program to open all the certificates in the **PEM** format. Put the server certificate on the top and then the intermediate certificate. Generally, an instruction will be issued together with the certificate. Be aware of the rules in the instruction. The general rules are as follows:

- There are no lines between certificates.
- The formats of certificate chains are as follows:

  -----BEGIN CERTIFICATE-----

  -----END CERTIFICATE-----

  -----BEGIN CERTIFICATE-----

  -----END CERTIFICATE-----

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Figure 4-13 A combined certificate

```
-----BEGIN CERTIFICATE-----
MIIE/DCCA+SgAwIBAgIUOWwvEj4lj5OamNabjVbGY42BBcQwDQYJKoZIhvcNAQEL
BQAwgYIxCzAJBgNVBAYTAmNuMRIwEAYDVQQIDAlHdWFuZ0RvbmcxETAPBgNVBAcM
CFNoZW56aGVuMQ8wDQYDVQQKDAZIdWF3ZWkxCzAJBgNVBAsMAklUMS4wLAYDVQQD
DCVIdWF3ZWkgV2ViIFNlY3VyZSBJbnRlcm5ldCBHYXRld2F5IENBMB4XDTE3MTAx
ODAwNDA0NloXDTE4MTAxODAwNDA0NlowgZoxCzAJBgNVBAYTAkNOMRAwDgYDVQQI
DAdqaWFuZ3N1MRAwDgYDVQQHDAduYW5qaW5nMS4wLAYDVQQKDCVIdWF3ZWkgU29m
dHdhcmUgVGVjaG5vbG9naWVzIENvLiwgTHRkMRkwFwYDVQQLDBBDbG91ZGJ1IFNS
RSBEZXB0MRwwGgYDVQQDDBN3d3cuaHVhd2VpY2xvdWQuY29tMIIBIjANBgkqhkiG
9w0BAQEFAAOCAQ8AMIIBCgKCAQEA3f5hC6J20XSF/Y7Wb8o6l30yzgaUYWGLEX8t
1dQ1JAus93xMC2Jr6UOXmXR6WaRu5lZxpPfLT/IV6UnvMLnxJQBavqauykCSkadW
stYA9ttTI/FYq+MR1XKbNrqK/ADhRfmR4owS/3w1wxvdpwy5TRZ+V/D6TjxHZCjc
+8lSmUuLxsgoUe79B/ruccY1ufuqr3v0TToaNn4c37kwjJeKf+b2F/IqO/KF+9zF
[redacted]
AgWgMBMGA1UdJQQMMAoGCCsGAQUFBwMBMEIGA1UdEQQ7MDmCE3d3dy5odWF3ZWlj
bG91ZC5jb22CESouaHVhd2VpY2xvdWQuY29tgg9odWF3ZWljbG91ZC5jb20wDQYJ
KoZIhvcNAQELBQADggEBACsLP7Hj+4KY1ES38OnOWuwQ3st8axvhDD9jZGoninzW
JSGpdmO4NEshlvwSFdEHpjy/xKSLCIqg5Ue8tTI8zOF13U0ROnMeHSKSxJG6zc8X
h/3N217oBygPgvpmc6YX66kvwXmbA7KRniiYS0nmCi2KUyng5Bv4dsx21djlqQ3b
HI+i026Q9odLsmhsKOsFUC0vDKoMIJz0Socy7Cq1+tFWF9S79MI4QjxaXVEvpIEg
QLEze3BXSsoiWRkdfsdDB9s+UtdWeJy0HMh/otwUQQtB6areV2+CPthfmDENA+A8
IK6GzHyp/mgrwKdDh97aQ42ARreAv4KVFAiJGZ02LOY=
-----END CERTIFICATE-----
-----BEGIN CERTIFICATE-----
MIID2TCCAsGgAwIBAgIJALQPO9XxFFZmMA0GCSqGSIb3DQEBCwUAMIGCMQswCQYD
VQQGEwJjbjESMBAGA1UECAwJR3VhbmdEb25nMREwDwYDVQQHDAhTaGVuemhlbjEP
MA0GA1UECgwGSHVhd2VpMQswCQYDVQQLDAJJVDEuMCwGA1UEAwwlSHVhd2VpIFdl
YiBTZWN1cmUgSW50ZXJuZXQgR2F0ZXdheSBDQTAeFw0xNjA1MTAwOTAyMjdaFw0y
NjA1MDgwOTAyMjdaMIGCMQswCQYDVQQGEwJjbjESMBAGA1UECAwJR3VhbmdEb25n
MREwDwYDVQQHDAhTaGVuemhlbjEPMA0GA1UECgwGSHVhd2VpMQswCQYDVQQLDAJJ
VDEuMCwGA1UEAwwlSHVhd2VpIFdlYiBTZWN1cmUgSW50ZXJuZXQgR2F0ZXdheSBD
[redacted]
rG0CAwEAAaNQME4wHQYDVR0OBBYEFDB6DZZX4Am+isCoa48e4ZdrAXpsMB8GA1Ud
IwQYMBaAFDB6DZZX4Am+isCoa48e4ZdrAXpsMAwGA1UdEwQFMAMBAf8wDQYJKoZI
hvcNAQELBQADggEBAKN9kSjRX56yw2Ku5Mm3gZu/kQQw+mLkIuJEeDwS6LWjW0Hv
3l3xlv/Uxw4hQmo6OXqQ2OM4dfIJoVYKqiLlBCpXvO/X600rq3UPediEMaXkmM+F
tuJnoPCXmew7QvvQQvwis+0xmhpRPg0N6xIK01vIbAV69TkpwJW3dujlFuRJgSvn
rRab4gVi14x+bUgTb6HCvDH99PhADvXOuI1mk6Kb/JhCNbhRAHezyfLrvimxI0Ky
2KZWitN+M1UWvSYG8jmtDm+/FuA93V1yErRjKj92egCgMlu67lliddt7zzzzqW+U
QLU0ewUmUHQsV5mk62v1e8sRViHBlB2HJ3DU5gE=
-----END CERTIFICATE-----
```

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RSA Private Key

PEM files can contain certificates or private keys. If a PEM file contains only private keys, the file suffix may be replaced by KEY.

Use the text program to open the private key file in the PEM or KEY format, then you can view the private key content, as shown in **Figure 4-14**.

Content of an RSA private key:

- The private key starts with the **-----BEGIN RSA PRIVATE KEY-----** chain and ends with the **-----END RSA PRIVATE KEY-----** chain.
- Each line of the private key content contains 64 characters, but the number of characters in the last line can be smaller than 64.
- No space is allowed in the private key content.

Figure 4-14 An RSA private key

```
-----BEGIN RSA PRIVATE KEY-----
MIIEpQIBAAKCAQEAxDKJJ/hArR+Sq2YyqOWUN2Jh822dGcexU58g909eYlvLCqow
wEPqs6vyqQM3gKo8qCkNkmS5QgMPOFI4fx2G22mHvT0x8PHjm6GTQDPDniWaIuky
lufqVPD/zqK0oBl2AeAvbzKxWwRqf4JTLa3136B4l5yZVoDjRfU5EKY6LW1sD/00
5uF0qE3td5KQwQc6ZzbnkAof0Oyp5PbMfajM9My2mcvQJzWPLRxET3eWHYdBUtEg
1rxdrWxLheKjENzW3P7Mz/7KycIRxAlurl/Z9s8ytj3124AQY7NE1t1iL9wwA47k
0EumxTaLz8H/vHB1fLMouvYfsSDEr3Snf6eSSwIDAQABAoIBAQDCNmxC3qHXPgvI
EzBOtIPVl1PyzizXWi+U4U6WwUBjCQ6ijfoYOKLaHHnnCEIm4V2N8KV4prAkQjcM
[redacted]
xxrq/vizzNh6K1dBrZKmrWrAqGifkHqx2M3wwssfSzG3WhS0UT1nrUnONg9XLbl5
WeBd2Zp/Fn+tk2T9SsTotAgJAoGAOvmo5APBVRLILHwungLno8ZOYJopOtEPGFDp
v0bHNfgGIrfMcoKIx2xuX5cUe9MihRdyPV8aHYvd4ciE6yOGGq2ypVAt0SSS+TSL
GXJpezX9AjeWtQV8iWoEojIKKPs9FAHftS2aCbXXVJxwR1kbp8clyDxQ9yNNCr7o
OBG9XHECgYEA0xuJhoD8HMmoLJockHeMvHY9DqjcncFLwXyuKORKzRT5SiUy7tDJ
VV8cqljV95gNbae6tUp9zNO7mwlwD2ztjyjDc1gtW+Kpfj7VXImtURHrxKfZflNx
uQ/fbf/zaVpJ7QPcL7y671BGevC/JIZ/i2jBGQkQtn8d4rhk72C1kyw=
-----END RSA PRIVATE KEY-----
```

If the certificate chain of a private key file contains the following information: **-----BEGIN PRIVATE KEY-----** and **-----END PRIVATE KEY-----**, or **-----BEGIN ENCRYPTED PRIVATE KEY-----** and **-----END ENCRYPTED PRIVATE KEY-----**, you need to use the OpenSSL tool to run the following command to convert the format.

```
openssl rsa -in old_key.pem -out new_key.pem
```

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Format Conversion

The HTTPS configuration only supports certificates or private keys in **PEM** format. It is recommended that **OpenSSL** be used to convert certificates in other formats into the **PEM** format. The following examples illustrate some popular converting methods.

In the following examples, the name of certificates before conversion is **old_certificate** by default, and that of private keys before transformation is **old_key** by default. The new certificate and private key names are **new_certificate** and **new_key** respectively.

- **Converting DER to PEM**
  ```
  openssl x509 -inform der -in old_certificate.cer -out new_certificate.pem
  openssl rsa -inform DER -outform pem -in old_key.der -out new_key.pem
  ```
- **Converting P7B to PEM**
  ```
  openssl pkcs7 -print_certs -in old_certificate.p7b -out new_certificate.cer
  ```
- **Converting PFX to PEM**
  ```
  openssl pkcs12 -in old_certificat.pfx -nokeys -out new_certificate.pem
  openssl pkcs12 -in old_certificat.pfx -nocerts -out new_key.pem
  ```

To convert a PKCS8 private key to a PKCS1 one, run the following command:

```
openssl rsa -in old_certificat.pem -out pkcs1.pem
```

4.5 Configuring Hotlink Protection

4.5.1 Referer Validation

Referer validation allows you to control access sources based on the referer field carried in a request. CDN filters requests based on the configured blacklist or whitelist.

Notes

- This function is optional and is disabled by default.
- Whitelisting and blacklisting cannot be used simultaneously.
- A maximum of 100 domain names of up to four levels can be added to the blacklist or whitelist.
- The domain name configured in a blacklist or whitelist cannot contain a protocol name. The domain name is matched by prefix. For example, if you enter **^example.example*.com$**, **example.example.com** and **example.example01.com** are also matched.

Procedure

Step 1 Log in to the **VOD console**.

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

Step 3 Click **Configure** on the right of the domain name and choose the **Hotlink Protection Settings** tab.

Step 4 Click **Referer Validation**.

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Step 5 On the page displayed, toggle on the **Status** switch. Configure referer validation parameters, as shown in **Figure 4-15**.

NOTE

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

Figure 4-15 Referer validation settings

See **Table 4-3**.

Table 4-3 Parameters

Parameter	Description
Type	The blacklist and whitelist are supported. • **Blacklist** allows the access to media assets by all domains except for the blacklisted ones. • **Whitelist** denies the access to media assets by all domains except for the whitelisted ones. An empty referer indicates that the referer field in an HTTP request header is empty or there is no referer. • If you select **Blacklist** and **Include empty referer**, a request with empty referer will be denied. • If you select **Whitelist** and **Include empty referer**, a request with empty referer will be allowed.

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Parameter	Description
Rule	Domain names in the blacklist or whitelist. Domain names and IP addresses can be input at the same time and separated with semicolons (;). Wildcard domain names are allowed. A maximum of 100 domain names and IP addresses can be input. Example: www.example.com;*.test.com;192.168.0.0

Step 6 Click **OK**.

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

----End

4.5.2 URL Validation

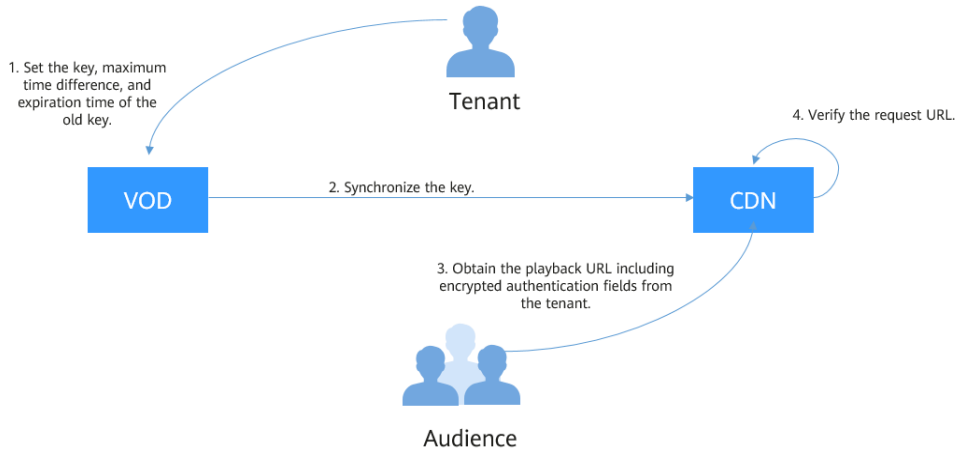
Referer validation can filter visitors' identities. However, the referer content can be forged, which cannot completely protect your VOD resources. Therefore, VOD provides URL validation. You can configure the key and generate the corresponding playback URL. The URL has a certain validity period, which effectively prevents VOD resources from being illegally stolen.

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 4-16** shows how URL validation works.

Figure 4-16 URL validation working principles



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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.

Notes

- This function is optional and is disabled by default.
- After this function is enabled, the original URLs cannot be used. New signed URLs must be generated based on rules.
- If the signed URL expires or the signature fails to be authenticated, the video fails to be played and the message "403 Forbidden" is returned.
- Algorithms A, B, and C do not support HLS and DASH playback scenarios.
- To disable URL validation, **submit a service ticket**.
- When URL validation is enabled, playback with multiple audio tracks and multilingual subtitles is not supported.

Procedure

Step 1 Log in to the **VOD console**.

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

Step 3 Click **Configure** on the right of the domain name and choose the **Hotlink Protection Settings** tab.

Step 4 Click **URL Validation**. The **URL Validation** dialog box is displayed.

Step 5 Configure URL validation parameters. **Table 4-4** describes the parameters.

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Figure 4-17 Configuring URL validation

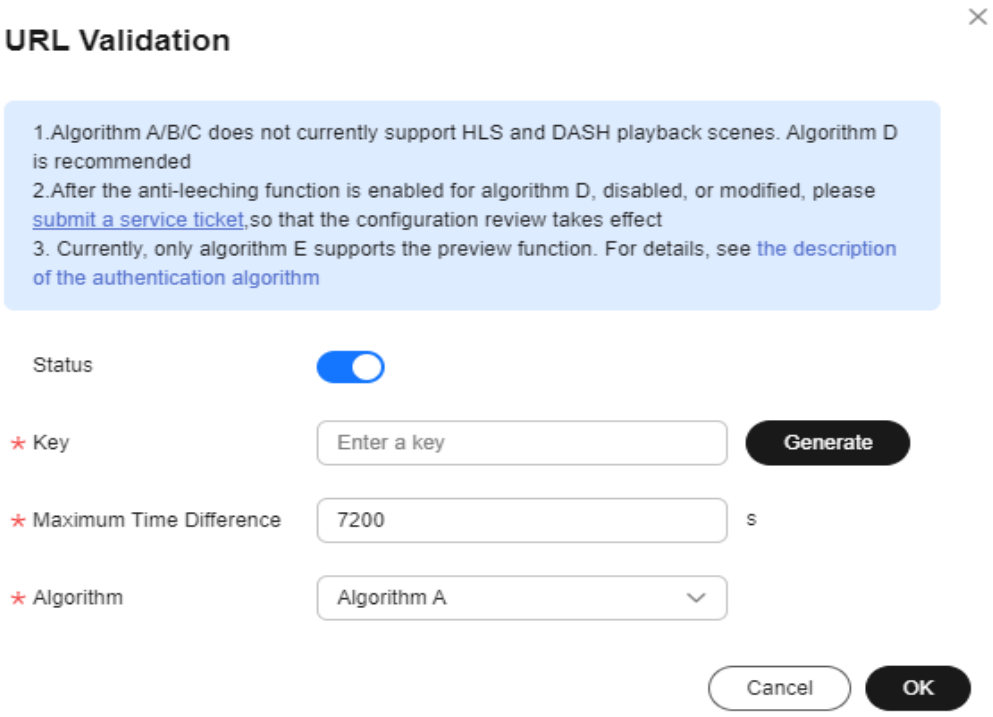

Table 4-4 Parameters

Parameter	Description
Key	Click **Generate** to generate a key value.
Maximum Time Difference	How long a signed URL remains valid. The default value is 120 minutes. For example, if the signed URL generation time is 1573806090 (Nov. 15, 2019 16:21:30 GMT+08:00) and the allowed time difference is 120 minutes, the signed 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 new key takes effect on Nov. 15, 2019 16:21:30 GMT+08:00 and **Expiration Time of the Old Key** is 60 minutes, the old signed URL expires at Nov. 15, 2019 17:21:30 GMT+08:00.

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Parameter	Description
Algorithm	Key encryption algorithm. The following algorithms are supported: Algorithms A, B, and C: The MD5 digest algorithm is used. For details, see **Encryption Algorithm A**, **Encryption Algorithm B**, and **Encryption Algorithm C**. Algorithm D: The symmetric encryption algorithm is used. For details, see **Encryption Algorithm D**. Algorithm E: The SHA-256 algorithm is used. For details, see **Encryption Algorithm E** (same as the **Signing Method C2** of CDN). Algorithm E is now displayed on the GUI but not available for your use. **NOTE** • Algorithms A, B, and C do not support HLS and DASH playback. Algorithm D or E is recommended. • Currently, algorithm E supports preview only for HLS and MP4 files. The preview function of MP4 files takes effect only when MOOV is in front of MDAT. After the preview function is enabled, the playback URL can be obtained from the VOD console. The default preview duration is 300s.
Authentication Scope	Specifies the files to be authenticated. Currently, you can authenticate all files, authenticate files with a specified file name extension, or choose not to authenticate files with a specified file name extension.
Authentication Inherit Config	Adds the authentication parameter to TS and MP4 files under M3U8/MPD index files, so that the files can be played after authentication succeeds. **NOTE** • If there are multi-layer M3U8/MPD files, only the first-layer M3U8/MPD files are parsed, and the TS/MP4 streams of M3U8/MPD files at other layers are not expanded. • The standard M3U8 format is supported. M3U8 files are parsed by line. If the parsing fails, responses from the origin server are returned to users. URIs starting with the **#EXT-X-MAP** tag and URLs/URIs not starting with the pound key (#) are supported. • The standard MPD format is supported. MPD files are parsed by line. If the parsing fails, responses from the origin server are returned to users. The URI between tags **<BaseURL>** and **</BaseURL>** is identified. The **SegmentTemplate** tag is not supported.
Preview	Only HLS and MP4 files can be previewed.

Step 6 Click **OK**.

Step 7 If you select algorithm D, you need to **submit a service ticket** for approval after configuring the parameters. The submitted information must contain the configured domain name and information listed in **Table 4-4**.

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

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Step 8 Verify whether the URL validation settings have taken effect.

Obtain the signed streaming URL and play the content via the URL. If the playback is successful, the URL validation settings have taken effect.

----End

Generating a Signed URL

From the console

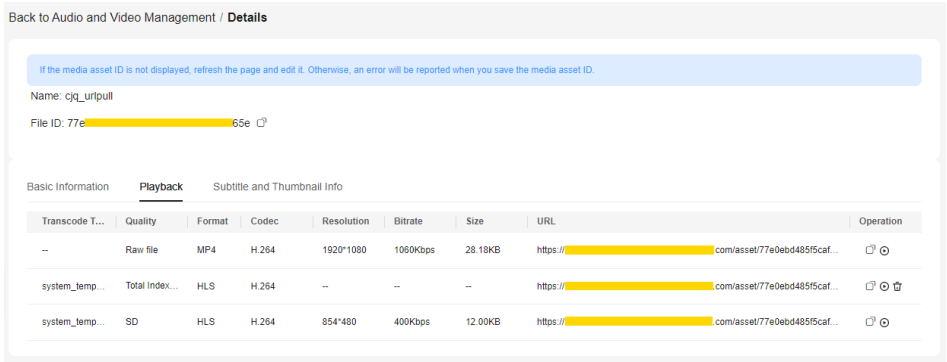
Step 1 Log in to the **VOD console**.

Step 2 In the navigation pane, choose **Management** > **Audio and Video Management**.

Step 3 Click **Details** in the row containing your media file and then choose the **Playback** tab.

URL is the original streaming URL of the media file. Click to obtain the signed URL.

Figure 4-18 Streaming URL



----End

Encryption Algorithm A

Signed URL format

```
Original URL?auth_key={timestamp}-{rand}-{uid}-{auth_key}
```

Formula for calculating **auth_key**

```
auth_key = MD5(/asset/{assetId}/{file_name}-{timestamp}-{rand}-{uid}-{private_key})
```

Table 4-5 Authentication fields

Field	Description
timestamp	Time when a signed URL is generated. The value is a Unix timestamp, which is the number of seconds since January 1, 1970. Example: 1564731935 (2019.08.02 15:45)

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Field	Description
rand	Random number. The recommended value is a UUID, which cannot contain hyphens (-). Example: f03cbe7c4a3849bc8d8769e3110e4533
uid	This parameter is not used now. Set it to **0**.
private_key	Key value set on the console. For details, see **Procedure**.

Signed URL example

```
Original URL: http://1.cdn.myhuaweicloud.com/asset/6b2d740f10b8697d8ea6672868ecdb6f/test.mp4
private_key: myPrivateKey
timestamp: 1547123166
rand: 477b3bbc253f467b8def6711128c7bec
uid: 0
```

Obtain **auth_key** based on the calculation formula.

```
auth_key = md5(/asset/6b2d740f10b8697d8ea6672868ecdb6f/
test.mp4-1547123166-477b3bbc253f467b8def6711128c7bec-0-myPrivateKey) =
584883719a3f722bf1a32a3b0a4d25dd
```

Signed URL based on algorithm A

```
http://1.cdn.myhuaweicloud.com/asset/6b2d740f10b8697d8ea6672868ecdb6f/test.mp4?
auth_key=1547123166-477b3bbc253f467b8def6711128c7bec-0-584883719a3f722bf1a32a3b0a4d25dd
```

Encryption Algorithm B

Signed URL format

```
https://{cdn_domain}/{date_YYYYmmddHHMM}/{md5sum}/asset/{asset_id}/{file_name}
```

Formula for calculating **md5sum**

```
md5sum = md5({private_key}{date_yyyyMMddHHmm}/asset/{asset_id}/{file_name})
```

Table 4-6 Authentication fields

Field	Description
date_yyyyMMddHHmm	Time when a signed URL is generated. The format is yyyyMMddHHmm. Example: 201908051445
file_name	Part starting behind the media asset ID of the original streaming URL to the end of the URL. Example: play_video/test.mp4
private_key	Key value set on the console. For details, see **Procedure**.

Signed URL example

```
Original URL: http://1.cdn.myhuaweicloud.com/asset/6b2d740f10b8697d8ea6672868ecdb6f/test.mp4
private_key: myPrivateKey
date_yyyyMMddHHmm: 201901102026
file_name: test.mp4
```

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Obtain **md5sum** based on the calculation formula.

```
md5sum = md5(myPrivateKey201901102026/asset/6b2d740f10b8697d8ea6672868ecdb6f/test.mp4) =
713ef643de8df076da6ec3c0545968cb
```

Signed URL based on algorithm B

```
http://1.cdn.myhuaweicloud.com/201901102026/713ef643de8df076da6ec3c0545968cb/asset/
6b2d740f10b8697d8ea6672868ecdb6f/test.mp4
```

Encryption Algorithm C

Signed URL format

```
https://{cdn_domain}/{md5hash}/{time_hex}/asset/{asset_id}/{file_name}
```

Formula for calculating **md5hash**

```
md5hash = md5({private_key}/asset/{asset_id}/{file_name}{time_hex})
```

Table 4-7 Authentication fields

Field	Description
file_name	Part starting behind the media asset ID of the original streaming URL to the end of the URL. Example: play_video/test.mp4
time_hex	Time when a signed URL is generated. The value is a hexadecimal Unix timestamp. Example: hex(1564987530)=5D47D08A
private_key	Key value set on the console. For details, see **Procedure**.

Signed URL example

```
Original URL: http://1.cdn.myhuaweicloud.com/asset/6b2d740f10b8697d8ea6672868ecdb6f/test.mp4
private_key: myPrivateKey
time_hex: hex(timestamp) = hex(1547123166) = 5C3739DE
file_name: test.mp4
```

Obtain **md5sum** based on the calculation formula.

```
md5hash=md5(myPrivateKey/asset/6b2d740f10b8697d8ea6672868ecdb6f/test.mp45C3739DE) =
afa20c956043fe6d130b16f2704ac870
```

Signed URL based on algorithm C

```
http://1.cdn.myhuaweicloud.com/afa20c956043fe6d130b16f2704ac870/5C3739DE/asset/
6b2d740f10b8697d8ea6672868ecdb6f/test.mp4
```

Encryption Algorithm D

Signed URL format

```
Original URL?auth_info={Encrypted string}.{EncodedIV}&plive={plive_starttime}
```

Formulas for calculating the encrypted string and EncodedIV:

- Original encrypted string = url_encoding({path}+"$"+{Timestamp})+"$"+{plive_starttime}

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- Encrypted string = aes_cbc_128_pkcs5padding(Original encrypted string,key,IV)
- EncodedIV = hex(IV)

Table 4-8 Authentication fields

Field	Description
path	Directory from the domain name to the last level, including the slash (/) behind the domain name and slash (/) behind the last level of directory, excluding the file name Example: /asset/32237c8f68fcc6071a2d8e3421eee20d/play_video/
Timestamp	Time when a signed URL is generated. The value is UTC time in yyyyMMddHHmmss format. Example: 20190805101025
key	Key value set on the console. For details, see **Procedure**.
(Optional) plive	Start time of pseudo-streaming, in UTC time. Specify this parameter only for **Pseudo-Streaming**. In other cases, this parameter is not required for calculating the signed URL.

IV	Randomly generated byte array. It can be up to 16 characters long.
	hex(): converts the byte array into a hexadecimal string.
	Sample code for generating IV is:
	`byte[] iv = new byte[16];`
	`SecureRandom secureRand = new SecureRandom();`
	`secureRand.nextBytes(iv);`

Signed URL example

```
Original URL: https://179.cdn-vod.huaweicloud.com/asset/32237c8f68fcc6071a2d8e3421eee20d/play_video/index.m3u8
path: /asset/32237c8f68fcc6071a2d8e3421eee20d/play_video/
key: 8Ks1qn14XRO28qOa
Timestamp: 20190805102430
plive: 1704074400
```

The encrypted string and EncodedIV are obtained according to the calculation formula.

```
Original encrypted string = url_encoding("/asset/32237c8f68fcc6071a2d8e3421eee20d/play_video/") + "$" + "20190805102430"+ "$" + "1704074400"
Encrypted string = aes_cbc_128_pkcs5padding(Original encrypted string,key,IV) = 34M%2F6KtYgxuAozdBLIVTe0dUVAZdvXsYQoYAnDmuhRHh1hshYg%2B2Tl0AmSwySDh%2BmkER44qYKpSP%2BgfsLM%2FIZe4F6K4n1Nx6ouGwyKfqdDA%3D
EncodedIV = hex(IV) = 79436d453636364e335941713330534e
```

Signed URL based on algorithm D

```
https://179.cdn-vod.huaweicloud.com/asset/32237c8f68fcc6071a2d8e3421eee20d/play_video/index.m3u8?auth_info=34M%2F6KtYgxuAozdBLIVTe0dUVAZdvXsYQoYAnDmuhRHh1hshYg%2B2Tl0AmSwySDh
```

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```
%2BmkER44qYKpSP%2BgfsLM%2FIZe4F6K4n1Nx6ouGwyKfqdDA
%3D.79436d453636364e335941713330534e&plive=1704074400
```

Encryption Algorithm E

CAUTION

- Algorithm E is now displayed on the GUI but not available for your use.
- The preview and pseudo-streaming functions cannot be enabled at the same time. The following URLs are for reference only. **exper** and **plive** cannot exist at the same time.

Signed URL format

```
Original URL?auth_key={authKey}&timestamp={timestamp}&exper={exper}&plive={plive_starttime}
```

Formula for calculating **authKey**:

- To enable preview: auth_key = sha256({PrivateKey}{fileName}{timestamp}*{exper}*
- To enable pseudo-streaming: auth_key = sha256({PrivateKey}{fileName}{timestamp}*{plive_starttime}*)

Table 4-9 Authentication fields

Field	Description
timestamp	Time when a signed URL is generated. The value is a Unix timestamp, which is the number of seconds since January 1, 1970. Unit: second. Example: 1564731935, that is, the time is 2019.08.02 15:45.
fileName	Back-to-origin URL. During authentication, the value must start with a slash (/) and cannot include the parameters behind **?** in the signed URL. Example: /asset/6b2d740f10b8697d8ea6672868ecdb6f/test.hls
PrivateKey	Signing key, which is used to generate a signed URL. The key can contain 16 to 32 characters in only letters and digits.
exper (optional)	Video preview duration, in second. Only MP4 and HLS videos can be previewed. Specify this parameter only for preview. In other cases, this parameter is not required for calculating the signed URL.

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Field	Description
(Optional) plive	Start time of pseudo-streaming, in UTC time. This field is valid only for the HLS format. Specify this parameter only for pseudo-streaming. In other cases, this parameter is not required for calculating the signed URL. The preview and **Pseudo-Streaming** functions cannot be enabled at the same time.

Signed URL example

```
Original URL: http://1.cdn.myhuaweicloud.com/asset/6b2d740f10b8697d8ea6672868ecdb6f/test.hls
private_key: 32d6b2d740f10b86
timestamp: 1547123166
fileName: /asset/6b2d740f10b8697d8ea6672868ecdb6f/test.hls
exper: 300
plive: 1704074400
```

Obtain **auth_key** based on the calculation formula.

- Enabling preview

  ```
  auth_key = sha256(32d6b2d740f10b86/asset/6b2d740f10b8697d8ea6672868ecdb6f/
  test.hls1547123166300) = 3a935cf1d8299fe63ec8d4e0afb5ef3304883a702a4e760f3c5ae838a4b69768
  ```

- Enabling pseudo-streaming

  ```
  auth_key = sha256(32d6b2d740f10b86/asset/6b2d740f10b8697d8ea6672868ecdb6f/
  test.hls15471231661704074400) =
  3a935cf1d8299fe63ec8d4e0afb5ef3304883a702a4e760f3c5ae838a4b69768
  ```

Signed URL based on algorithm E:

- Preview enabled

  ```
  http://1.cdn.myhuaweicloud.com/asset/6b2d740f10b8697d8ea6672868ecdb6f/test.hls?
  auth_key=3a935cf1d8299fe63ec8d4e0afb5ef3304883a702a4e760f3c5ae838a4b69768&timestamp=154
  7123166&exper=300
  ```

- Pseudo-streaming enabled

  ```
  http://1.cdn.myhuaweicloud.com/asset/6b2d740f10b8697d8ea6672868ecdb6f/test.hls?
  auth_key=3a935cf1d8299fe63ec8d4e0afb5ef3304883a702a4e760f3c5ae838a4b69768&timestamp=154
  7123166&plive=1704074400
  ```

4.6 Pseudo-Streaming

Pseudo-streaming leverages the playback control capability of VOD to play VOD files like a livestream. You can generate VOD files, specify the time of starting a livestream, and use VOD to distribute streaming-like content, reducing livestream risks and costs. Pseudo-streaming does not support fast forward and is ideal for online teaching videos, gala livestreaming, and broadcasting and television.

Highlights

Highlights of pseudo-streaming:

- Easy operation: Pseudo-streaming does not require livestreaming rooms. Any video can generate a pseudo livestream at any time. Pseudo-streaming can be implemented simply by enabling the transcoding and hotlink protection functions of VOD.

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- Enhanced livestream security: Pseudo-streaming allows reviewing and editing VOD files in advance, such as deleting inappropriate content, to keep the livestream secure.

Application Scenarios

Pseudo-streaming is mainly used for pre-recorded videos. A pseudo livestream starts at the specified time for users to watch. Users can obtain the link to the pseudo livestream in advance, but can watch the video only after the specified time.

Application scenarios:

- Online education: The validity period of the streaming URL is set for a recorded video to remind trainees to watch the video on time. If the streaming URL expires, trainees need to obtain another streaming URL to watch the video.
- Entertainment: Pre-recorded TV programs, such as variety shows, can be favorited by the target audience in advance and watched on time.
- Activities: The activity organizer pre-records the activity video and releases a bulletin with the streaming URL. Users can save the streaming URL in advance and access it when the activity starts.

Notes

Pseudo-streaming is still a feature of VOD. Here are some precautions of using pseudo-streaming:

- The source video quality is fundamental.
- Pseudo-streaming is applicable only to HLS videos, with segment duration of 2 to 4 seconds, even segment distribution, and bitrate lower than 5 Mbit/s.
- HLS files transcoded on Huawei Cloud VOD are recommended.
- Pseudo-streaming is a livestreaming-like service and does not allow pausing or stopping video playback, or modifying video content such as real-time transcoding and watermarking.
- Currently, audio of a video cannot be separated from the video.

Procedure

Step 1 Log in to the **VOD console**.

Step 2 In the navigation pane, choose **Audio and Video Uploads** > **Local Upload** to upload an audio/video file from the local PC.

For details, see **Audio/Video Upload**.

Step 3 Pseudo-streaming is applicable only to HLS videos, so you need to convert the video to an HLS one if it is not.

1. In the navigation pane, choose **Management** > **Audio and Video Management**.
2. Select the uploaded video and click **Transcode** to convert the video to an HLS one.

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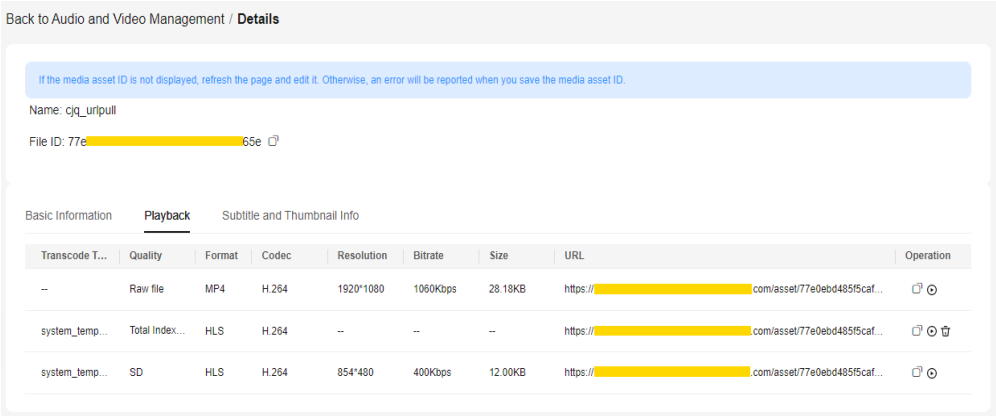
For details, see **Transcoding**.

3. Click **Details** on the right of the video file and view the HLS streaming URL under the **Playback** tab, as shown in **Figure 4-19**.

Figure 4-19 Streaming URL



Step 4 Enable URL validation before using pseudo-streaming.

1. In the navigation pane, choose **Domain Name Management**.
2. Click **Configure** on the right of the domain name and choose the **Hotlink Protection Settings** tab.
3. Click **URL Validation** and toggle on the **Status** switch.
4. Configure URL validation parameters by referring to **URL Validation**.

   The pseudo-streaming switch is displayed only when **Algorithm** is set to **Algorithm D** or **Algorithm E**. The pseudo-streaming switch must be toggled on, and pseudo-streaming is applicable only to HLS videos.
5. Calculate the signed URL for algorithm D or E by referring to **Encryption Algorithm D** or **Encryption Algorithm E**.

   After pseudo-streaming is enabled, the parameter **plive** is added to the encryption algorithm. **plive={*plive_starttime*}** is added to the streaming URL to calculate the encrypted string.

   Example: https://example.com/index.m3u8?auth_key={authKey}&timestamp={timestamp}&plive=1704074400

   plive_starttime indicates when the pseudo-streaming starts (in UTC time). For example, **1704074400** indicates that the pseudo-streaming starts at 10:00 on January 1, 2024.

Step 5 You can use pseudo-streaming by accessing the signed URL on an HLS-compatible player.

NOTICE

The Chrome browser does not support HLS by default. You need to install a plug-in.

----End

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5 Audio/Video Upload

5.1 Overview

Functions

After enabling VOD, you can upload audio/video files to VOD for management.

- **Local upload**: uploads audio/video files stored on local disks to VOD
- **Pull from URLs**: pulls source audio/video files from their URLs and then upload them to VOD

Constraints

Formats of audio/video files that can be uploaded:

- Video: MP4, TS, MOV, MXF, MPG, FLV, WMV, AVI, M4V, F4V, MPEG, 3GP, ASF, MKV, WebM, M3U8, VOB, RM, and MTS. An M3U8 file can be uploaded only by pulling it from its URL.
- Audio: MP3, OGG, WAV, WMA, APE, FLAC, AAC, AC3, MMF, AMR, M4A, M4R, WV, and MP2

If the name of the file to be uploaded contains spaces, the spaces will be deleted after the file is uploaded.

Prerequisites

- To categorize media files, create categories by referring to **Category Settings**.
- To keep yourself informed of the upload progress, configure event notifications by referring to **Overview**.
- To transcode these files, create a transcoding template by referring to **Transcoding Settings**.
- To process these files using a workflow, create a workflow by referring to **Workflow Settings**.

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5.2 Local Upload

Audio/Video files stored on local disks can be uploaded to VOD.

NOTICE

During local upload, do not refresh the page, clear the browser cache, or close the browser. If no operation is performed for a long time during file upload, you will be logged out. As a result, the upload fails.

Procedure

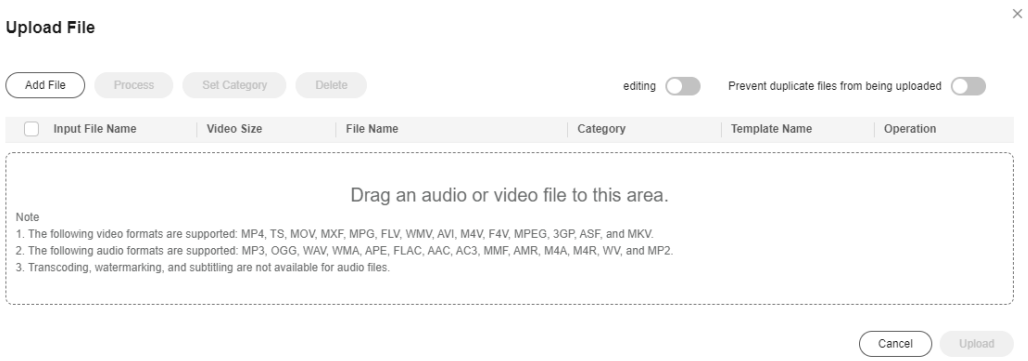
Step 1 Log in to the **VOD console**.

Step 2 In the navigation pane, choose **Audio and Video Uploads** > **Local Upload**.

Step 3 Click **Upload File**. The **Upload File** dialog box is displayed.

Step 4 Click **Add File** to add a local media file, or directly drag a file to the file area.

Figure 5-1 Local upload



Step 5 Toggle on the **Prevent duplicate files from being uploaded** switch to avoid waste of time and storage space.

Configure this parameter as required. If you add a duplicate media file, an error message is displayed in the upper right corner.

Step 6 Categorize uploaded files, change the file names, or process these files.

If audio/video processing is not required, retain the default settings. If audio/video processing is required, click **Process** and configure the parameters by referring to **Table 5-1**.

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Figure 5-2 Processing media files

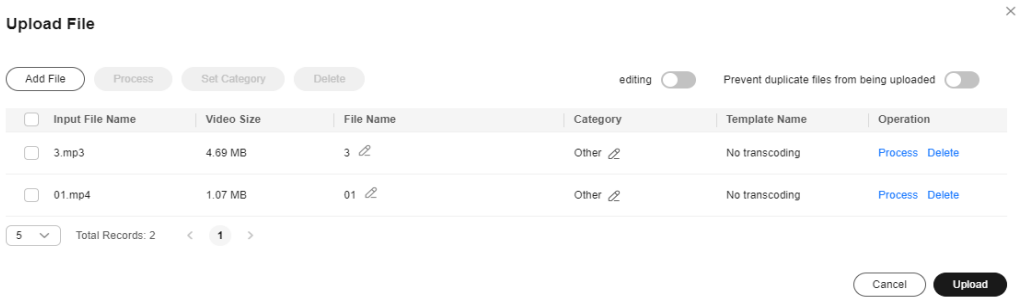

Table 5-1 Parameters

Parameter	Description
Transcoding template group	Select a preset template group or customize a template group by referring to **Transcoding Settings**.
Workflow	Select an existing workflow or create a workflow template by referring to **Workflow Settings**.

Step 7 Click **Upload**.

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

Step 8 View media file information on the **Audio and Video Management** page.

After a video file is uploaded, the first frame of the video is used as the thumbnail by default. If a transcoding template group or workflow was configured during media file upload, the configured parameters will automatically apply to the media file processing.

----End

5.3 Pull from URLs

Audio/Video files can be pulled from their URLs and uploaded to VOD.

Procedure

Step 1 Log in to the **VOD console**.

Step 2 In the navigation pane, choose **Audio and Video Uploads** > **Pull from URLs**.

Step 3 Click **Pull from URLs**. The **Pull from URLs** page is displayed, as shown in **Figure 5-3**.

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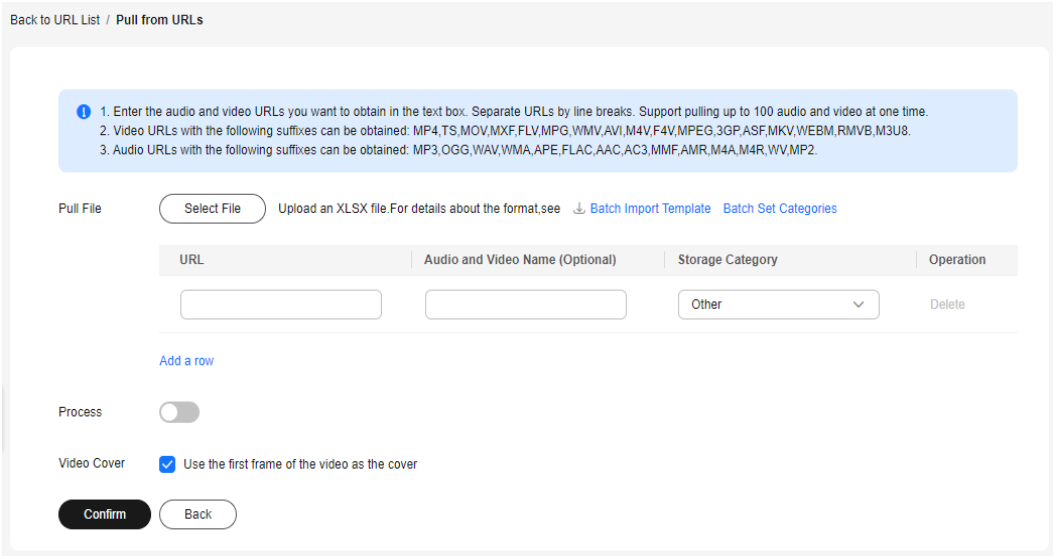
Figure 5-3 Settings of pull from URLs



See **Table 5-2**.

Table 5-2 Parameters

Parameter	Description
Pull File	Constraints: • A URL must contain the filename extension, for example, https://*xxxx*.mp4. • Files can be pulled from a maximum of 100 URLs. • Currently, only HTTPS (recommended) and HTTP (risky) are supported. You can add the file(s) to be pulled in either of the following ways: • Adding one file: Enter information about the audio/video file to be pulled in the audio/video file URL and audio/video file name columns. • Batch adding files: Click **Batch Import Template** to download the template file to the local PC. After all audio/video file URLs and names are added, click **Select File** to import files. **NOTE** Do not attach sensitive information such as authentication credentials to the URLs that pull content.
Process	Determine whether to process the obtained audio/video files. This function is disabled by default. To enable it, you need to select the processing mode, that is, to select a transcoding template group or a workflow.

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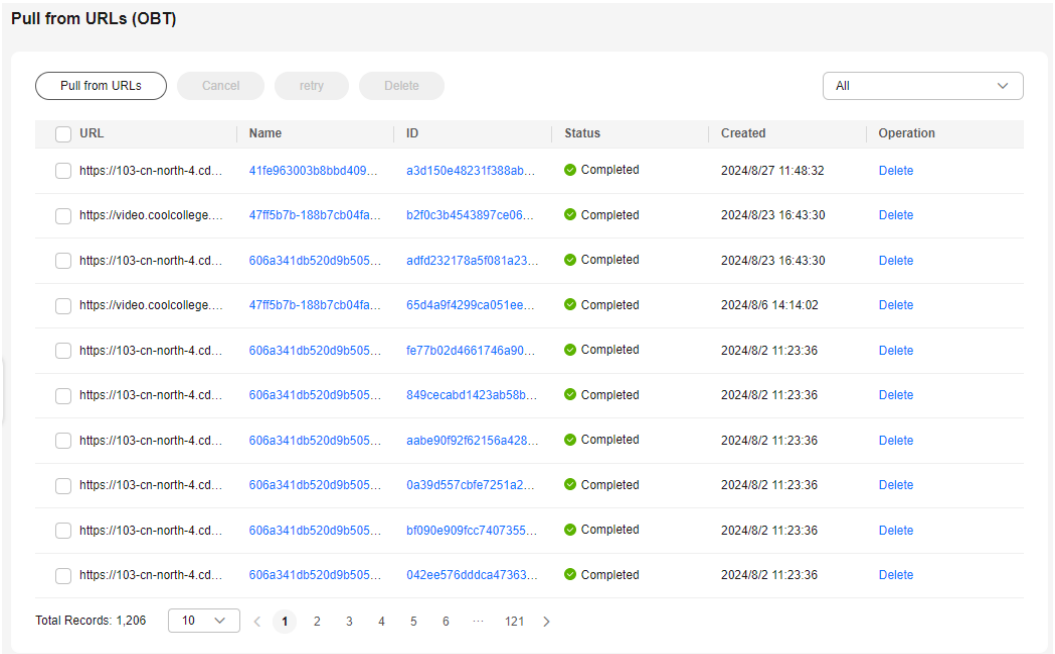
Parameter	Description
Select Process Mode	This parameter is displayed only when **Process** is enabled. Click **Select** on the right of **Select Process Mode**. On the dialog box displayed, configure the following parameters: • **Transcoding template group**: Select a preset template group or customize a template group by referring to **Creating a Template Group**. • **Workflow**: Select an existing workflow or create a workflow template by referring to **Workflow Settings**.
Video Cover	Sets whether to use the first frame of the video as the thumbnail.

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

When the status becomes **Completed**, the pull is successful. You can view audio/video information on the **Audio and Video Management** page.

Figure 5-4 URL pull status



----End

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6 Media Asset Management

6.1 Audio/Video Management

After **uploading audio/video files**, you can use functions such as transcoding, categorization, CDN pre-loading, storage class change, audio extraction, and one-click information export on the **Audio and Video Management** page. The management functions vary depending on audio and video files. See **Table 6-1**.

Table 6-1 Management functions

Function	Video	Audio
Uploading a Thumbnail	√	√
Subtitling	√	√
(Canceling) **Transcoding**	√	×
Pre-loading	√	√
Categorization	√	√
Changing the Storage Class	√	√
Restoring an Archived File	√	√
Audio Extraction	√	×
Publishing	√	√
Exporting	√	√
Searching for Audio/Video Files	√	√
Playback	√	√

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Function	Video	Audio
Deleting Audio/Video Files	√	√

Viewing Media Asset Information

You can click **Details** on the right of the audio/video file to view the following information:

- **Basic Information**

  Media asset name, ID, thumbnail, subtitle, duration, size, upload time, last update time, category, tag, and description.
- **Playback**

  Definitions, formats, video encoding formats, resolution levels, bitrates, sizes, and streaming URLs of the source file and transcoded file.
- **Subtitle and Thumbnail Info**

  If you have added subtitles and a thumbnail for the uploaded file, you can view the format and address of the subtitles and thumbnail on this page.

Modifying Basic Information

Under the **Basic Information** tab, you can change the category, tag, name, and description of the audio/video file.

Step 1 Click **Details** on the right of the audio/video file. Under the **Basic Information** tab, click **Edit**.

Step 2 Click **Set Category** to reset the category of the media asset.

Step 3 Specify **Category**, **Name**, and **Description** so that you can use advanced search to search for media files.

Step 4 Click **Save**. The updated description and category are displayed.

----End

Uploading a Thumbnail

After an audio/video file is uploaded, the first frame is captured as the thumbnail by default. You can also upload a JPG or PNG image as the thumbnail. Before using a video frame as the thumbnail, use **snapshot capturing** to capture a video frame.

Step 1 Click **Details** on the right of the audio/video file. Under the **Basic Information** tab, click **Edit**.

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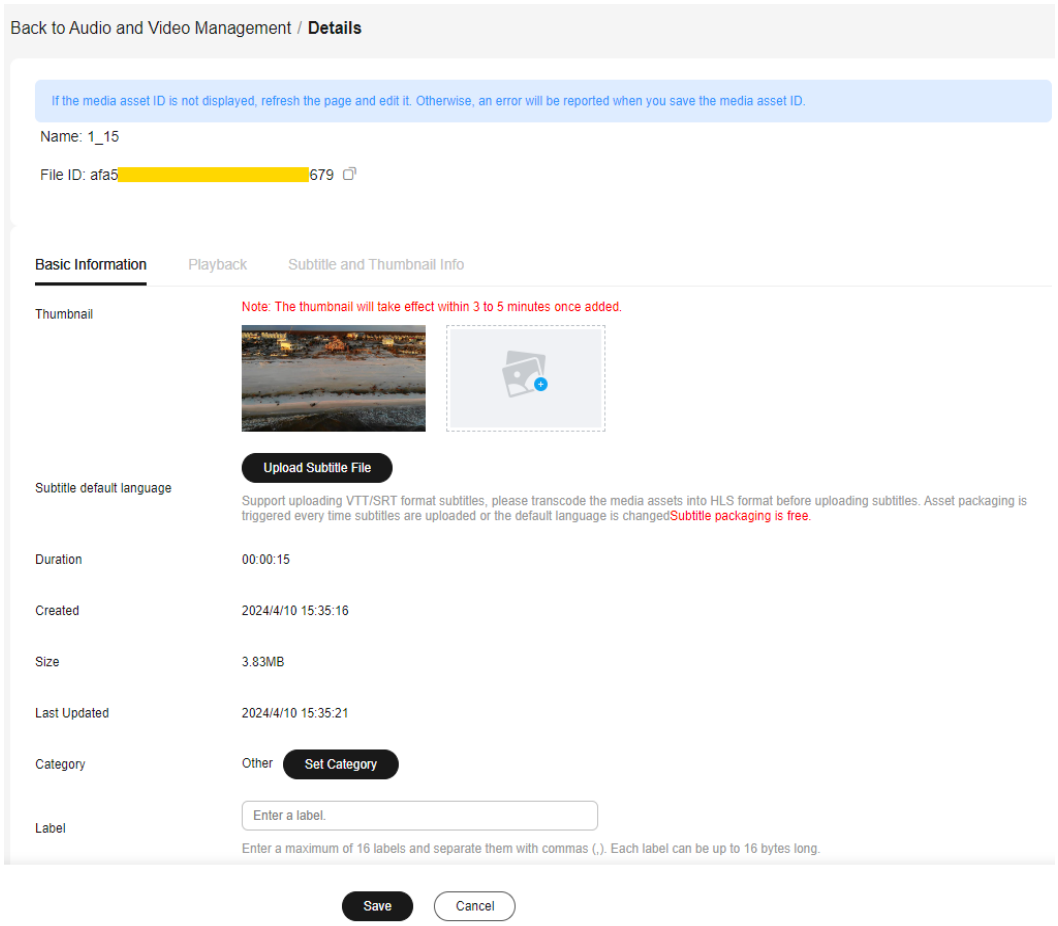
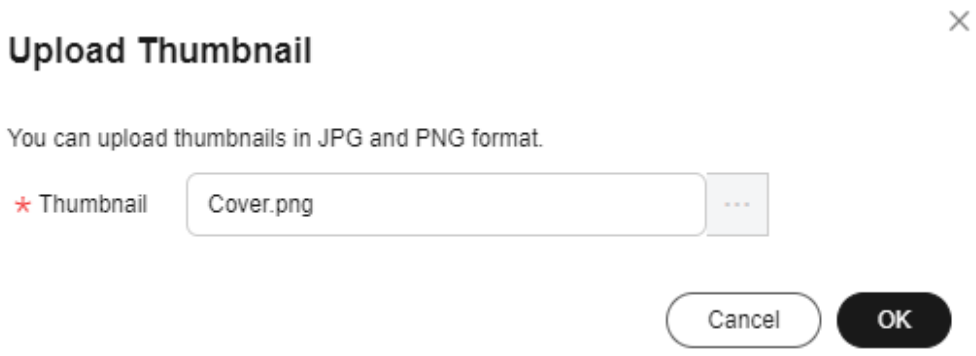
Figure 6-1 Media asset details



Step 2 Click the plus sign next to **Thumbnail**. In the **Upload Thumbnail** dialog box, select a local image file.

Figure 6-2 Uploading a thumbnail



Step 3 Click **OK**. The modification will take effect in 3 to 5 minutes.

----End

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Subtitling

You can add an SRT subtitle file in UTF-8 to an audio/video file.

NOTICE

Currently, only monolingual subtitle files can be uploaded on the console. To upload a multilingual subtitle file, see **Subtitle Management**. The supported formats of monolingual and multilingual subtitle files are different.

Step 1 Click **Details** on the right of the audio/video file. Under the **Basic Information** tab, click **Edit**.

Step 2 Click **Upload Subtitle File** and select a local subtitle file.

Step 3 Click **Save**.

Step 4 Return to the **Audio and Video Management** page. Select the audio/video file and click **Transcode** to transcode the file again and add subtitles.

Step 5 Click **Details** on the right of the audio/video file. The subtitle file URL is displayed under the **Subtitle and Thumbnail Info** tab.

----End

Transcoding

On the **Audio and Video Management** page, you can select one or more audio/video files for transcoding.

- Supported input audio formats: MP4, TS, MOV, FLV, MPG, MXF, WMV, ADTS, AVI, MKV, MPEG, VOB, RM, and MTS
- Supported input video codecs: H.264, H.265, MPEG-2, MPEG-4, MJPEG, WMV1/2/3, and ProRes 422
- Supported input audio codecs: AAC, AC3, EAC3, HE-AAC, MP2, MP3, PCM (s161e, s16be, s241e, s24be, DVD), and WMA

Step 1 Select one or more audio/video files and click **Transcode**.

Step 2 In the dialog box displayed, select a preset template or a custom template configured in **Transcoding Settings**, and click **OK**.

Step 3 View the status of the audio/video file on the **Audio and Video Management** page. The status becomes **Running**.

Step 4 After the transcoding is complete, click **Details** on the right of the audio/video file to obtain the streaming URL under the **Playback** tab.

----End

Pre-loading

During pre-loading, CDN PoPs pull the most recent content from the VOD origin server. When a user requests that content for the first time, CDN PoPs distribute the content for faster download and better user experience.

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Step 1 Select one or more audio/video files.

Step 2 Click **Pre-load**.

The time required to complete a pre-loading task depends on the number and size of files to be pre-loaded, and on network conditions.

----End

Categorization

Select one or more audio/video files and click **More Actions** > **Set Category** to categorize the selected audio/video files.

Changing the Storage Class

You can change the storage class of audio/video files in OBS on the **Management** > **Audio and Video Management** page. For details, see **OBS Storage Classes**.

The storage class of an uploaded audio/video file is Standard by default, and can be changed to Infrequent Access or Archive.

- Infrequent Access can be changed to Standard or downgraded to Archive.
- Archive can only be changed to Standard and cannot be directly changed to Infrequent Access.

The operations for changing the storage class of an audio/video are the same for all storage classes. The following describes how to change the storage class from Standard to Infrequent Access.

Step 1 Select one or more audio/video files and choose **Modify the storage type** > **infrequently accessed storage**.

Step 2 In the displayed dialog box, click **Confirm**.

Step 3 Refresh the **Audio and Video Management** page. The storage class of the audio/video files has been changed to Infrequent Access.

----End

Restoring an Archived File

Step 1 Select one or more audio/video files of the Archive storage class and click **Restore archived files**.

The **Restore archived files** dialog box is displayed.

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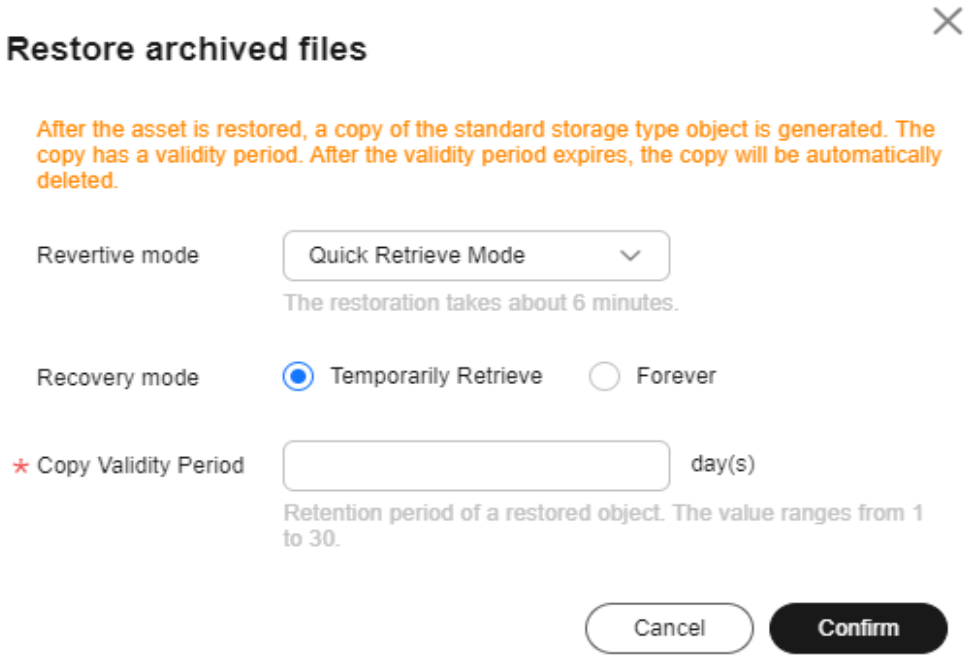
Figure 6-3 Restoring archived files



See **Table 6-2**.

Table 6-2 Parameters

Parameter	Description
Restoration mode	The time it takes an audio/video file to change the storage class from Archive to Standard. Options: • Quick retrieval mode: The change takes about six minutes. • Standard retrieval mode: The change takes about three to five hours.
Recovery mode	How long will an audio/video file remains in the Standard storage class after changing from Archive. Options: • **Temporarily**: After an audio/video file is temporarily retrieved, an object copy of the Standard storage class is generated. In this case, you can access the audio/video file stored in OBS, but the temporarily restored archived file cannot be transcoded. The copy has a validity period and will be automatically deleted after the validity period ends. The actual storage class of the audio/video file is Archive. • **Forever**: An audio/video file is permanently retrieved and its storage class becomes Standard.

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Parameter	Description
Copy Validity Period	Retention duration of the Standard object copy generated from the Archive audio/video file that is temporarily retrieved. Unit: day. Value range: 1 to 30.

Step 2 Click **Confirm**. The archived file has been restored.

When the retrieval time arrives, refresh the **Audio and Video Management** page.

- For temporary retrieval, the storage class of the audio/video is Archive.
- For permanent retrieval, the storage class of the audio/video is Standard.

----End

Audio Extraction

If you need the audio content of a video file, you can extract audio from the video file and then save the extracted audio file in MP3.

Step 1 Select one or more video files and click **More Actions** > **Extract Audio**.

Step 2 Refresh the audio/video management page. The status of the audio extraction task becomes **Running**.

Step 3 View the extracted audio file when **Transcoding Status** becomes **Completed**.

The extracted audio file and the source video file should have the same name. You can also check the audio file from its description.

----End

Publishing

Select one or more audio/video files and choose **More Actions** > **Publish** to publish the files. The files are in the **Published** status.

Exporting Media Asset Information

Select one or more audio/video files and choose **More Actions** > **Export** to export information about the selected files. If you do not select any file, information about all audio/video files is exported by default. The exported information about a media asset includes the ID, name, status, tag, category, resolution, streaming URL, thumbnail, and subtitle URL.

Searching for Audio/Video Files

If there are a large number of files on the **Audio and Video Management** page, you can use the filter criteria box in the upper part of the page to search for audio/video files, as shown in **Figure 6-4**.

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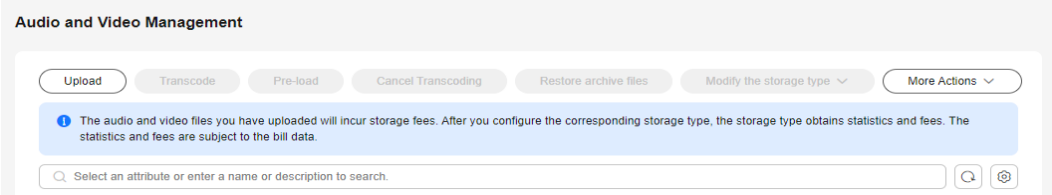
Figure 6-4 Searching for audio/video files



You can search for audio/video files by filter criteria (upload time, media asset status, transcoding status, name or description, media asset ID, tag, and category ID).

Notes:

- More than one filter criterion can be used for search. If media asset ID is the filter criterion, other filter criteria are invalid.
- Deleted media assets are displayed only when you search with media asset ID.
- The media asset status can be **Published** or **Unpublished**. The transcoding status can be **Queuing**, **Untranscoded**, **Completed**, or **Failed**.
- The media asset ID is the unique ID for identifying the uploaded source video. Once uploaded, the media asset will have an ID, which is independent of the transcoding status.
- The category ID identifies a category name. You can query the category ID on the **Global settings** > **Category** page.

Playback

Using this function will incur downlink traffic or bandwidth fees.

- **Preview on the console**

  You can preview transcoded video files in MP4, FLV, HLS, and DASH formats on the console. Source video file preview may fail, so transcode them before playing them.

  On the **Management** > **Audio and Video Management** page, you can:

  – Click the thumbnail of an audio/video file to preview it.

  – Click **Details** on the right of a video. On the page displayed, choose the **Playback** tab and click ⊙ in the **Operation** column to preview the video.

  NOTICE

  H.265 and HLS-encrypted videos cannot be previewed.

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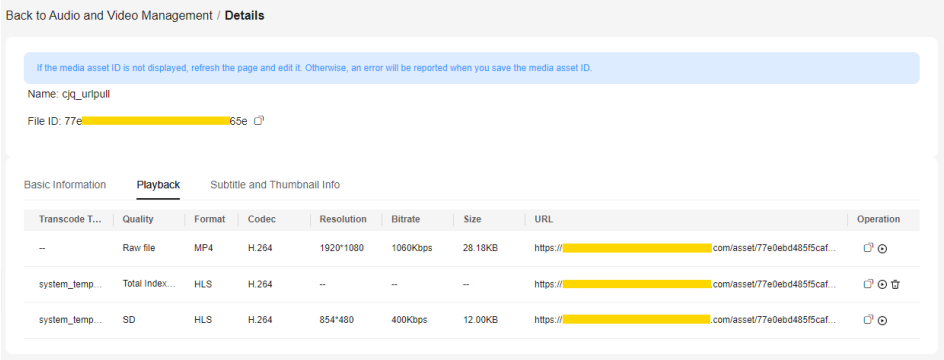
Figure 6-5 Streaming URL



- **Playback using a player**

  Click **Details** on the right of a video. On the page displayed, choose the **Playback** tab. Click in the **Operation** column to copy the streaming URL and play the video using a player.

  When you transcode an audio/video file again,

  – if transcoding parameters remain unchanged, the streaming URL remains unchanged.

  – if transcoding parameters are modified and

    ▪ the output format is MP4, the previous URL becomes invalid.

    ▪ the output format is HLS or DASH, the primary index URL remains unchanged. The secondary index URL changes and the previous URL becomes invalid.

Deleting Audio/Video Files

To delete one or more audio/video files, select them in the media asset list and choose **More Actions** > **Delete** above the list. Once deleted, all related resources, including the source file, transcoded file, and snapshot file, will be deleted permanently. The operation cannot be undone. Exercise caution when performing this operation.

6.2 Cold Storage of Media Assets

6.2.1 Cold Storage Based on Media Asset ID

The storage class of media assets can be batch changed from **Standard** to **Infrequent Access** or **Archive** by media asset ID.

Procedure

Step 1 Log in to the **VOD console**.

Step 2 In the navigation pane, choose **Management** > **Asset cooling**. The media asset cold storage page is displayed, as shown in **Figure 6-6**.

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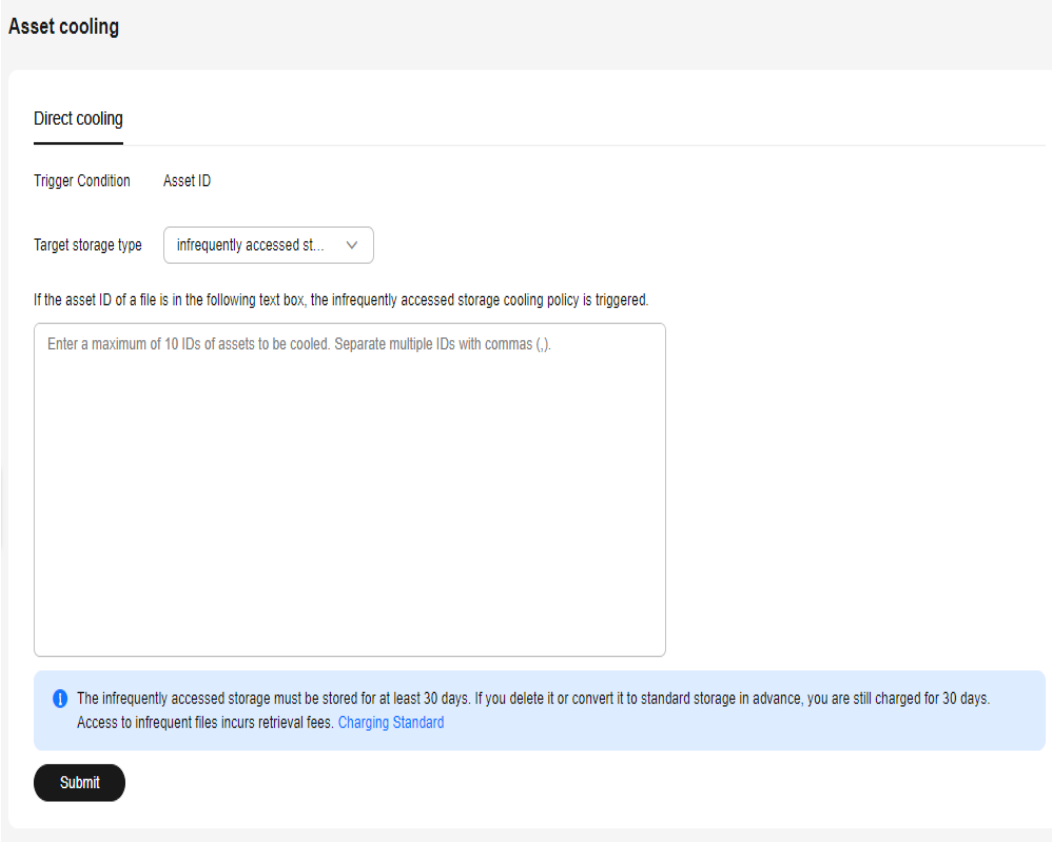
Figure 6-6 Media asset cold storage



See **Table 6-3**.

Table 6-3 Parameters

Parameter	Description
Trigger Condition	By media asset ID.
Target storage type	The storage class of a media asset can be changed from **Standard** to **Infrequent Access** or **Archive**
Media asset ID text box	Enter the IDs of the media assets on which cold storage will be performed. Use commas (,) to separate a maximum of 10 IDs.

Step 3 Click **Submit**. The batch operation has been completed.

Return to the **Management** > **Audio and Video Management** page and check whether the storage class of the media files has been changed to **Infrequent Access** or **Archive**.

----End

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6.2.2 Intelligent Cold Storage Policies

An intelligent cold storage policy can be created to specify the media asset upload time or storage duration, media asset category, and media asset storage class, and batch perform cold storage on media assets. You need to enable the intelligent cold storage policy after creating it.

Notes

- The storage class of media assets can be batch changed from **Standard** to **Infrequent Access** or **Archive**.
- The minimum storage period is 30 days for objects of the **Infrequent Access** storage class, and 90 days for those of the **Archive** storage class. If media files are retrieved or deleted before the storage period expires, you will still be charged based on the minimum storage period.

  Infrequent Access is used as an example. If the actual storage period is shorter than 30 days, you will be charged based on the minimum storage period (30 days). If the actual storage period is at least 30 days, you will be charged based on the actual storage period.
- Each tenant can execute a maximum of 50,000 cold storage tasks every day.

Procedure

Step 1 Log in to the **VOD console**.

Step 2 In the navigation pane, choose **Management** > **Asset cooling**.

Step 3 Choose the **Intelligent cooling policy** tab and click **Create an intelligent cooling policy**.

On the page displayed, configure a policy, as shown in **Table 6-4**. The policy is executed only for audio/video files that meet all filter criteria.

Table 6-4 Parameters

Category	Parameter	Description
Basic Information and Triggering Conditions	Policy name	Intelligent cold storage policy name. Only letters, digits, and underscores (_) are allowed.

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Category	Parameter	Description
	Media time condition	Conditions for media asset cold storage. Options: • **Specified upload time**: If this option is selected, you need to set the time range for uploading a media asset, including the start time and end time. Media assets uploaded within the time range will adopt cold storage in batches. If only the start time is specified, all media assets uploaded after the start time will adopt cold storage. If only the end time is specified, all media assets uploaded before the end time will adopt cold storage. • **Specified storage duration**: If this option is selected, you need to set the number of days after media file upload. The policy will be executed after this period.
	Media classification condition	(Optional) Select the media asset category for batch cold storage from the drop-down list box.
	Storage Type	Select the media asset storage class for batch cold storage from the drop-down list box.
Execute Configuration	Target storage type	Storage class after batch media asset cold storage.
	Start Date	Date when the policy takes effect. The date takes effect only after the policy is enabled. Batch cold storage is started at 00:00 (UTC time) on the next day of the effective date.

Step 4 Click **Submit**. The intelligent cold storage policy has been created.

The new intelligent cold storage policy is displayed on the **Intelligent cooling policy** tab under **Management** > **Asset cooling**.

Step 5 Click the icon in the **Enable/Disable** column of the new intelligent cold storage policy to enable the policy.

After the policy is enabled, media files will batch adopt cold storage at 00:00 (UTC time) on the next day of the effective date.

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Return to the **Management** > **Audio and Video Management** page and check whether the storage class of the media files has been changed to **Infrequent Access** or **Archive**.

----End

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7 Video Processing

7.1 Snapshot Capturing

Functions

You can take snapshots of uploaded video files as required. Currently, snapshots can be taken by time interval or at fixed time. After the snapshot is taken, you can set the snapshot as the video thumbnail. This function is billed based on the number of snapshots.

- Taking snapshots by time interval: The system takes snapshots at regular intervals from the first frame to the last frame. The interval cannot exceed 12 seconds.
- Taking snapshots at fixed time: The system takes snapshots at fixed time points. A maximum of 10 time points can be configured for a video.

Constraints

- You can take snapshots from an FLV, MP4, TS, MOV, MXF, MPG, WMV, AVI, M4V, F4V, MPEG, ASF, MKV, 3GP, WebM, VOB, RM, or MTS video.
- Snapshots are saved as JPG files.

Procedure

Step 1 Log in to the **VOD console**.

Step 2 In the navigation pane, choose **Video Processing** > **Snapshots**.

Step 3 Locate the target video file and click **Create Snapshot Task** in the **Operation** column or select video files and click **Create Snapshot Task** above the video list.

Step 4 Configure video snapshot parameters.

Snapshots can be taken at a specified interval, at a specified time point, or at a specified quantity.

- **By interval**

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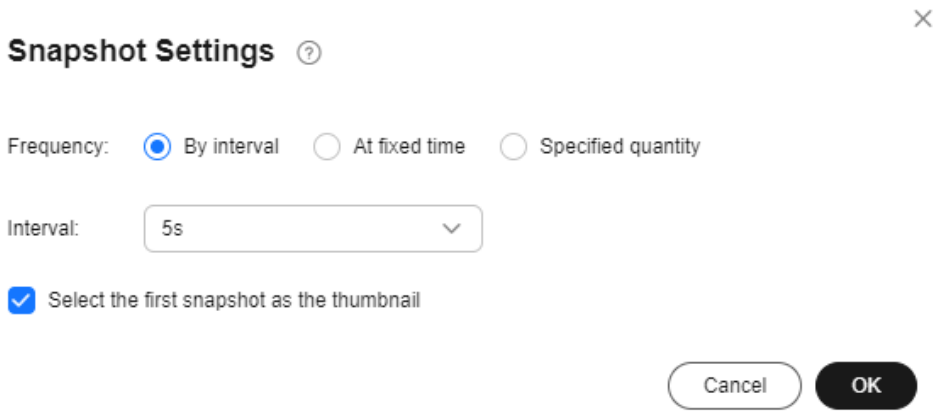
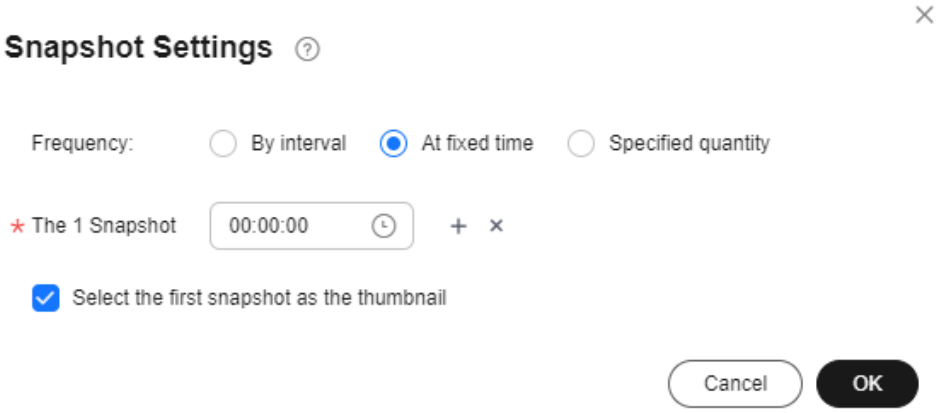
Figure 7-1 Snapshot settings



- **At fixed time**

Figure 7-2 Snapshot settings



- **Specified quantity**

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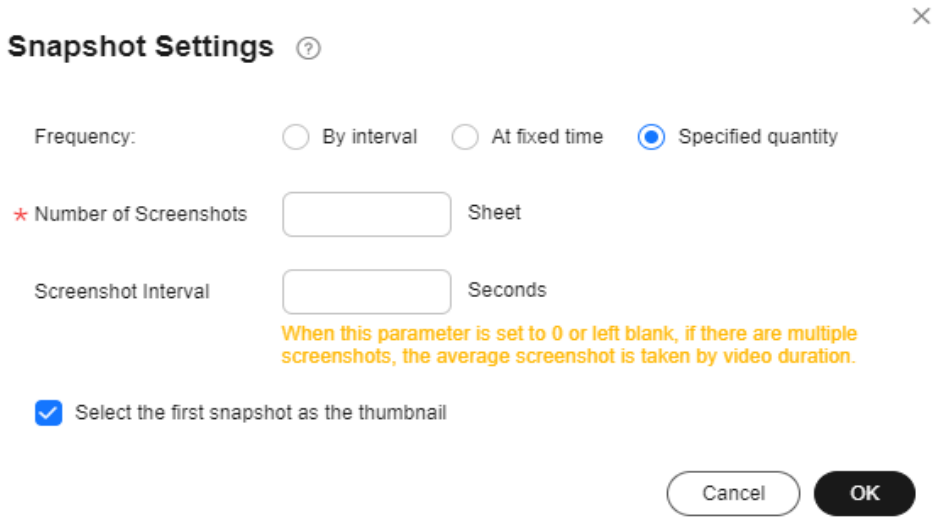
Figure 7-3 Snapshot settings



Step 5 Click **OK**.

If video status changes to **Captured**, snapshots have been captured.

Step 6 Click **Details** in the **Operation** column to view snapshot details.

If you select a snapshot as the video thumbnail, the configuration takes 3 to 5 minutes to complete.

----End

7.2 Workflow Management

VOD provides multiple media processing functions such as transcoding, snapshot capturing, and audio extraction. A workflow incorporates all these functions to help you process media files faster.

Prerequisites

A workflow has been created. For details, see **Workflow Settings**.

Procedure

Step 1 Log in to the **VOD console**.

Step 2 In the navigation pane, choose **Video Processing** > **Workflow Management**.

Step 3 Locate the target media file and click **Start** in the **Operation** column or select multiple files and click **Start Workflow** above the media list.

Step 4 Select a workflow and click **OK**.

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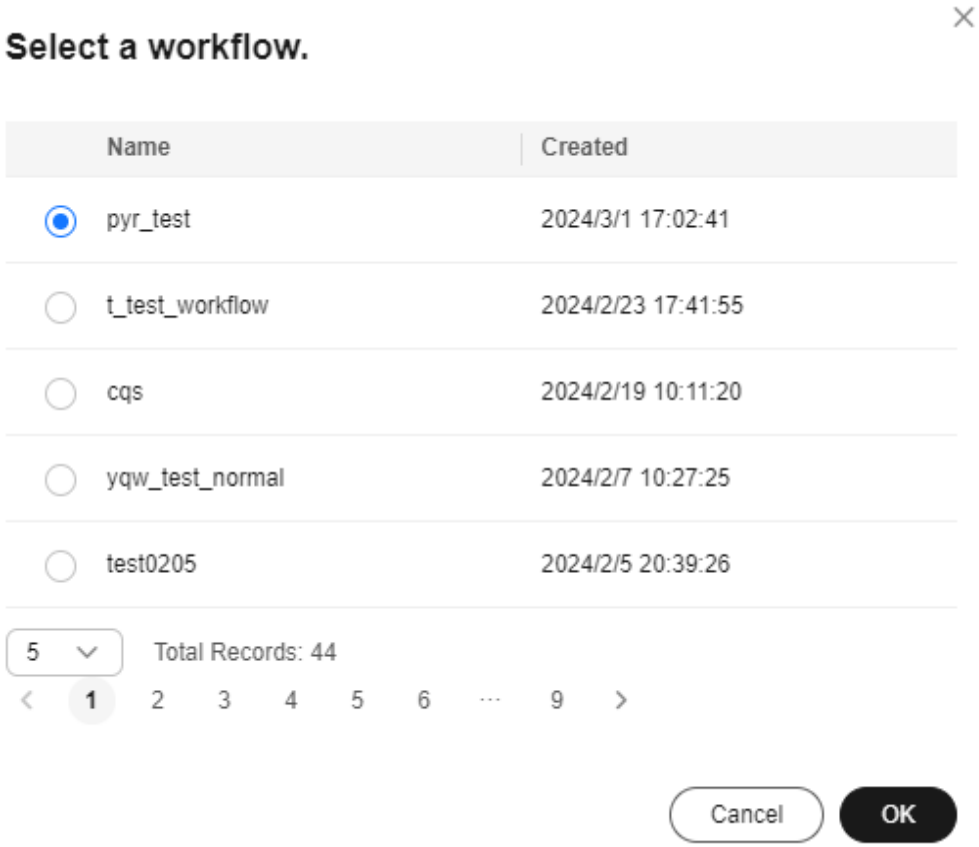
Figure 7-4 Selecting a workflow



Step 5 Click **View** in the **Operation** column to view workflow details.

If the workflow execution fails, you can view the task status and error information, as shown in **Figure 7-5**.

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Figure 7-5 Workflow details

----End

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8 Global Settings

8.1 Transcoding Settings

You can transcode an audio/video file during or after upload using one of the four system templates or a custom template. If you need to obtain the transcoding completion status through callback, configure **event notifications** before transcoding.

Scenarios

Audio and video distributed by VOD may be referenced by product websites and video websites or be played on devices like PCs and smartphones. VOD provides transcoding to change the audio/video encoding format, container format, resolution, and bitrate to adapt to different scenarios, devices, and network environments.

The transcoding function helps you achieve:

- Compatible with different devices. You can transcode the source audio/video into formats such as MP4 for playback on a wide range of devices.
- Adaptation to different network environments. You can set the output bitrate based on the network bandwidth.
- Low distribution costs. H.265 codec and low-bitrate HD can reduce the bitrate by about 20% without changing the resolution, thereby reducing media file distribution costs.
- HLS encryption. You can enable HLS encryption during transcoding to prevent secondary distribution if a media file is stolen.
- Copyright protection. You can add watermarks such as logos to your video.
- Audio extraction. Audio files can be extracted during transcoding. This function is used for those requiring audio only, such as radio stations and audio apps.
- Video extraction. You can disable audio and output video only.

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Transcoding Template Introduction

VOD provides four system transcoding templates. If you are a new user of VOD, system templates are recommended.

- **non_transcoding_template_group**: This template does not transcode audios/videos. If you do not select any transcoding template, this template takes effect by default.
- **system_template_group**: In this template, resolution, bitrate, and frame rate are preconfigured. If you are not familiar with these parameters, you are advised to use this template.
- **original_template_group**: This template only changes the audio/video container format.
- **adaptive_template_group**: With image enhancement preconfigured, this template is ideal for repairing corrupt videos.

If you are familiar with audio/video parameters and system templates cannot meet your requirements, you can create a transcoding template.

Constraints

- Input audios/videos of the following formats can be transcoded:
  - Supported input audio formats: MP4, TS, MOV, FLV, MPG, MXF, WMV, ADTS, AVI, MKV, MPEG, VOB, RM, and MTS
  - Supported input video codecs: H.264, H.265, MPEG-2, MPEG-4, MJPEG, WMV1/2/3, and ProRes 422
  - Supported input audio codecs: AAC, AC3, EAC3, HE-AAC, MP2, MP3, PCM (s161e, s16be, s241e, s24be, DVD), and WMA
- To retain transcoded outputs of different templates, you need to **submit a service ticket** to apply for this function.

Editing a System Template

A system template has common parameters such as video resolution and codec preconfigured. Before using a system template, you are advised to check whether the settings of the system template meet your requirements. If the settings do not, you can edit the system template.

Step 1 Log in to the **VOD console**.

Step 2 In the navigation pane, choose **Global Settings** > **Transcoding Templates**.

Step 3 Find the desired system template and click **Edit**. On the page displayed, modify template parameters.

The editable parameters vary depending on system templates.

- System template (**system_template_group**)

  You can change the video quality, container format, video codec, and watermark template, and enable low-bitrate HD and encryption. **Video Quality** has six options: LD, SD, HD, UHD, 2K, and 4K, as shown in **Table 8-3**.

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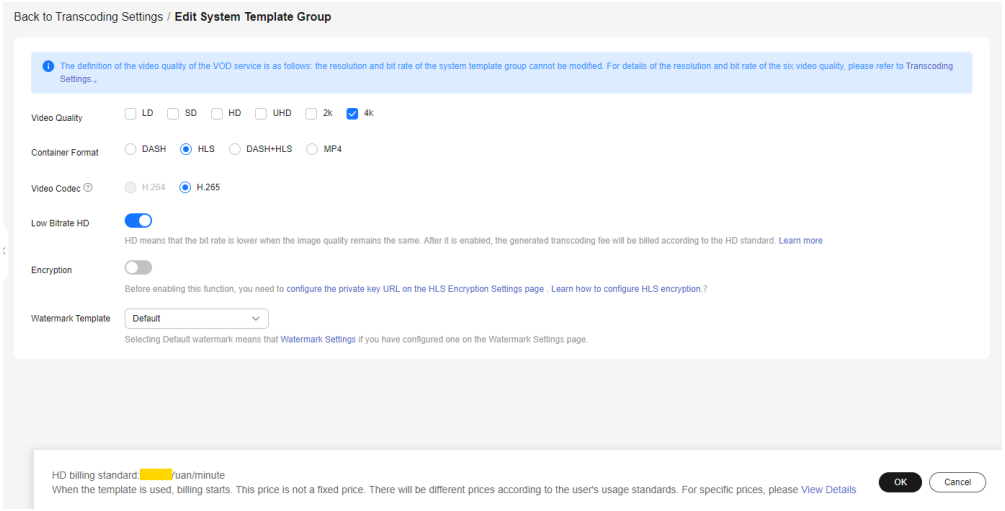
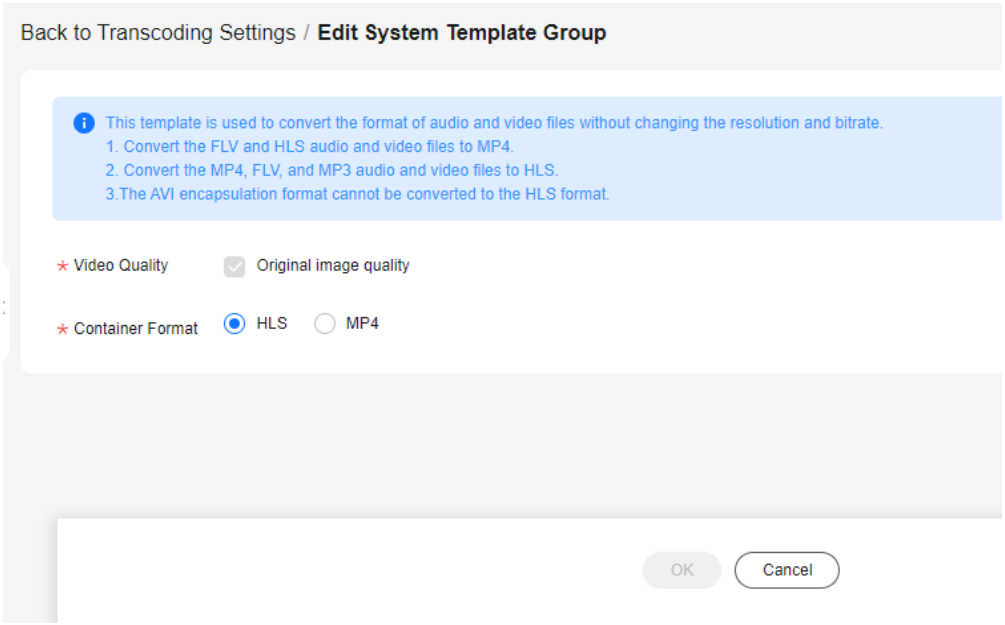
Figure 8-1 System templates



- Container template (**original_template_group**)

  You can change the format from FLV/HLS to MP4, or from MP3/MP4/FLV to HLS.

Figure 8-2 Container templates



- Adaptive template (**adaptive_template_group**)

  Video codec can only be H.264. You can change the resolution. If the resolution is not set, the input resolution is used by default. After enabling low-bitrate HD, you can use video enhancement.

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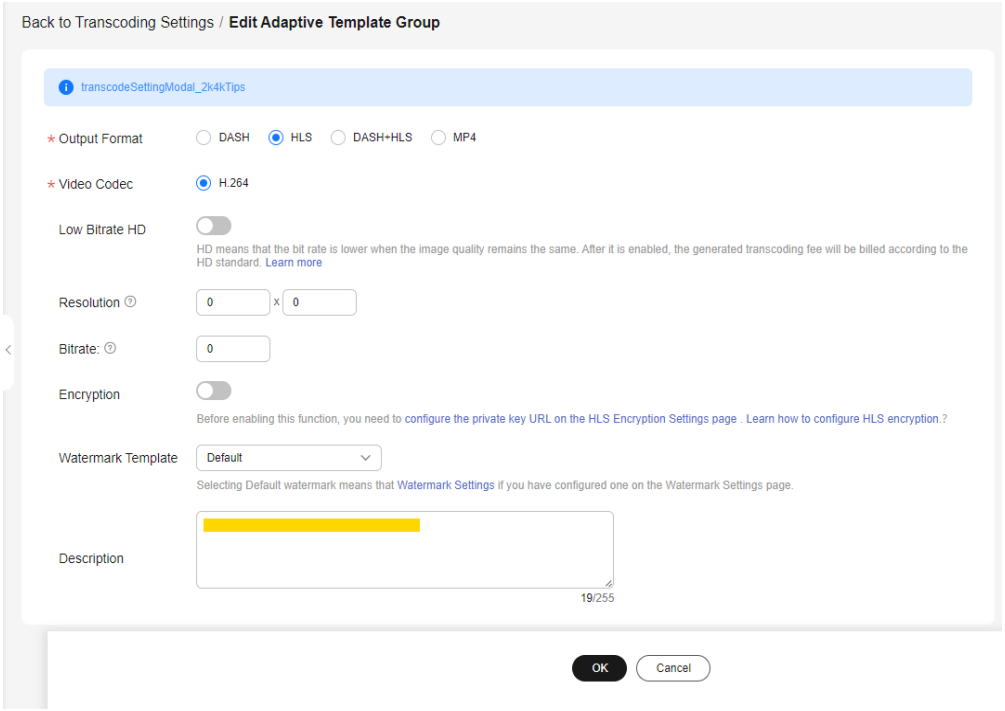
Figure 8-3 Adaptive templates



Step 4 Click **OK**.

----End

Creating a Template Group

If system presets cannot meet your requirements, you can create a transcoding template based on your needs. To customize an audio transcoding template, select **MP3** or **ADTS** for **Output Format**.

Step 1 Log in to the **VOD console**.

Step 2 In the navigation pane, choose **Global Settings** > **Transcoding Templates**.

Step 3 Click **Create Custom Template Group**. In the dialog box displayed, specify related parameters.

Step 4 Set **Basic Information** by referring to **Figure 8-4** and **Table 8-1**.

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Figure 8-4 Setting basic information

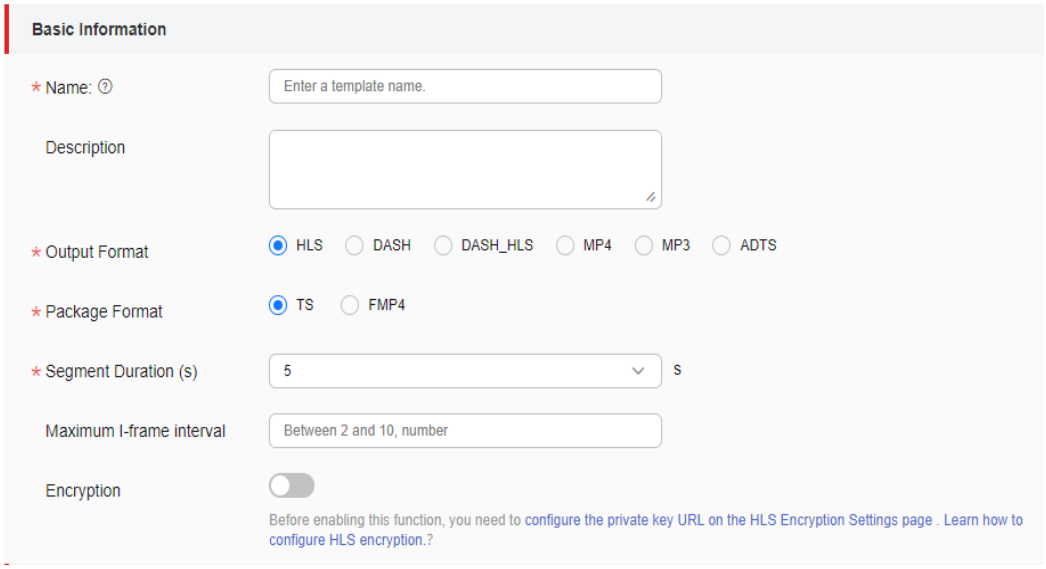

Table 8-1 Parameters

Parameter	Description
Name	A template name can contain a maximum of 128 characters in letters, underscores (_), and digits. Example: MP4_H264
Description	Description of a custom template.
Output Format	• Supported video formats: MP4, HLS, DASH_HLS, and DASH • Supported audio formats: ADTS and MP3 Note: If an audio format is selected, video parameters are disabled.
Package Format	Video container format. This parameter is displayed only when **Output Format** is set to **HLS** or **DASH_HLS**. Options: • **TS** • **FMP4**
Segment Duration (s)	HLS segment length. This parameter is available only when **Output Format** is set to **HLS** or **DASH_HLS**.
Maximum I-Frame Interval	Maximum I-frame interval. The value ranges from 2 to 10 (unit: second). Default value: **5**

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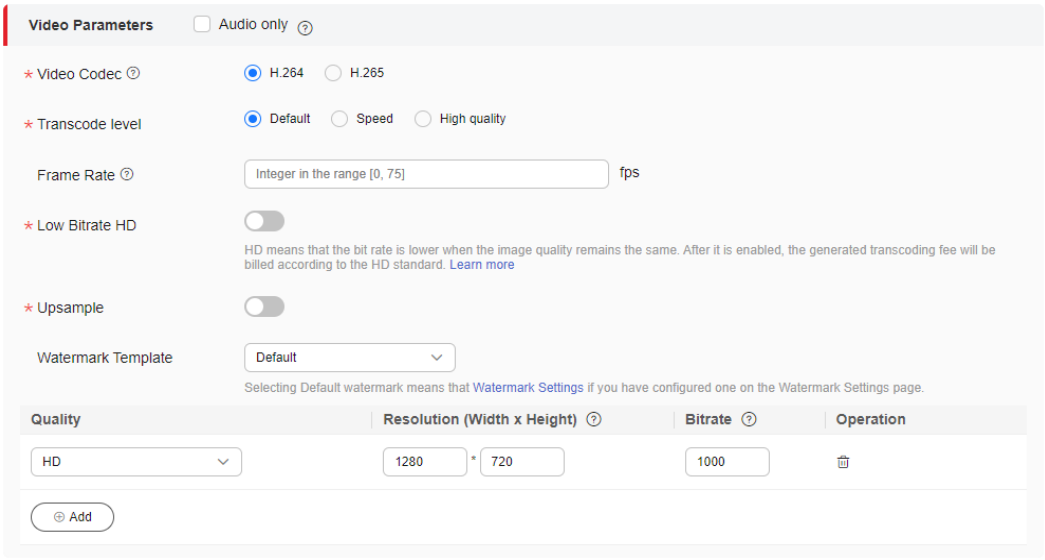
Parameter	Description
Encryption	Whether to encrypt output media files. Input audio/video files are not encrypted. This parameter is available only when **Output Format** is set to **HLS**. That is, only HLS audio/video files can be encrypted and output. Before enabling this function, obtain the key URL by referring to **HLS Encryption Settings**.

Step 5 Configure **Video Parameters** by referring to **Figure 8-5** and **Table 8-2**.

Figure 8-5 Video parameters



NOTE

If **Audio only** is selected, the output file does not contain any video information. This option is used for extracting audio from a video file. Perform 7 to configure audio parameters.

Table 8-2 Video parameters

Parameter	Description
Video Codec	H.264 and H.265 are available.
Transcode level	Video encoding quality level. Options: • **Default**: The default mode is used. • **Speed**: Efficiency is prioritized. • **High quality**: Transcoded video quality is prioritized.

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Parameter	Description
Frame Rate	Number of frames displayed per second. The value is an integer ranging from 0 to 75. If the value is set to **0** or **1**, the transcoded and input videos have the same frame rate.
Low Bitrate HD	Whether to enable low-bitrate HD. Low-bitrate HD means lower output bitrate at a given image quality. After this function is enabled, transcoding is charged based on the low-bitrate HD standard. For details, see **VOD Pricing Details**.
Upsample	Enabling this function improves video resolution and increases the number of sampling points.
Watermark Template	Select the default watermark template or a custom watermark template. • **Default**: If a default watermark template is set in **Watermark Settings**, the default template is used. • Custom watermark template: The watermark is added to the transcoded file.
Quality	Video quality. The options are 4K, 2K, UHD, HD, SD, and LD.
Resolution (Width x Height)	The default value is the recommended resolution for your selected video quality. You can change it based on your needs. • If the width or height is set to **0**, the side set to **0** is scaled in proportion to the other side. – When the width is **0** and the height is not, the width is scaled proportionally. – When the height is **0** and the width is not, the height is scaled proportionally. • If both the width and height are **0**, the transcoded file uses the resolution of the input file.
Bitrate	The default value is the recommended bitrate for your selected video quality. You can change it based on your needs. If the bitrate is set to **0**, the recommended bitrate for your input file is used for output.

NOTE

- There can be up to six outputs of different resolution levels.
- If you changed the default resolution, you are billed based on the configured resolution. For details, see **VOD Pricing Details**.

You are advised to use the recommended resolution and bitrate. See **Table 8-3**.

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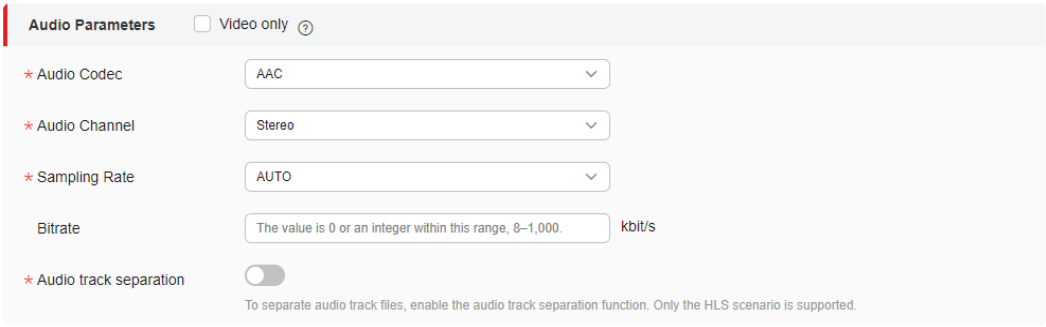
Table 8-3 Recommended resolutions and bitrates

Video Quality	Recommended Resolution	Recommended Bitrate for H.265 (kbit/s)	Recommended Bitrate for H.264 (kbit/s)
4K	3840 x 2160	5,600	8,000
2K	2560 x 1440	4,900	7,000
UHD	1920 x 1080	2,100	3,000
HD	1280 x 720	700	1,000
SD	854 x 480	500	600
LD	480 x 270	200	300

Step 6 Configure **Audio Parameters** by referring to **Figure 8-6** and **Table 8-4**.

Figure 8-6 Audio parameters



NOTE

If **Video only** is selected, the output file does not contain any audio information. This option is used for video extraction from a media file.

Table 8-4 Audio parameters

Parameter	Description
Audio Codec	Audio codec. **AAC** or **HEAAC1** is available. The default value is **AAC**.
Audio Channel	Number of audio sources during audio recording or number of speakers during audio playback. **Stereo** or **Mono** is available. The default value is **Stereo**.
Sampling Rate	Number of times that audio is collected per second. **AUTO**, **22050**, **32000**, **44100**, **48000**, and **96000** are available. The default value is **AUTO**, in Hz.

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Parameter	Description
Bitrate	Bitrate of an output audio, in kbit/s. The value is 0 or an integer ranging from 8 to 1,000. If this parameter is set to **0**, the audio bitrate is an adaptive value. As a result, the audio bitrate of the transcoded file may be greater than that of the input video. So set this parameter to a proper value other than **0**.
Audio track separation	If the audio track file needs to be separated from the video file, toggle on this switch. This function is applicable only to HLS. The audio in the transcoded file is stored separately.

Step 7 Click **OK**.

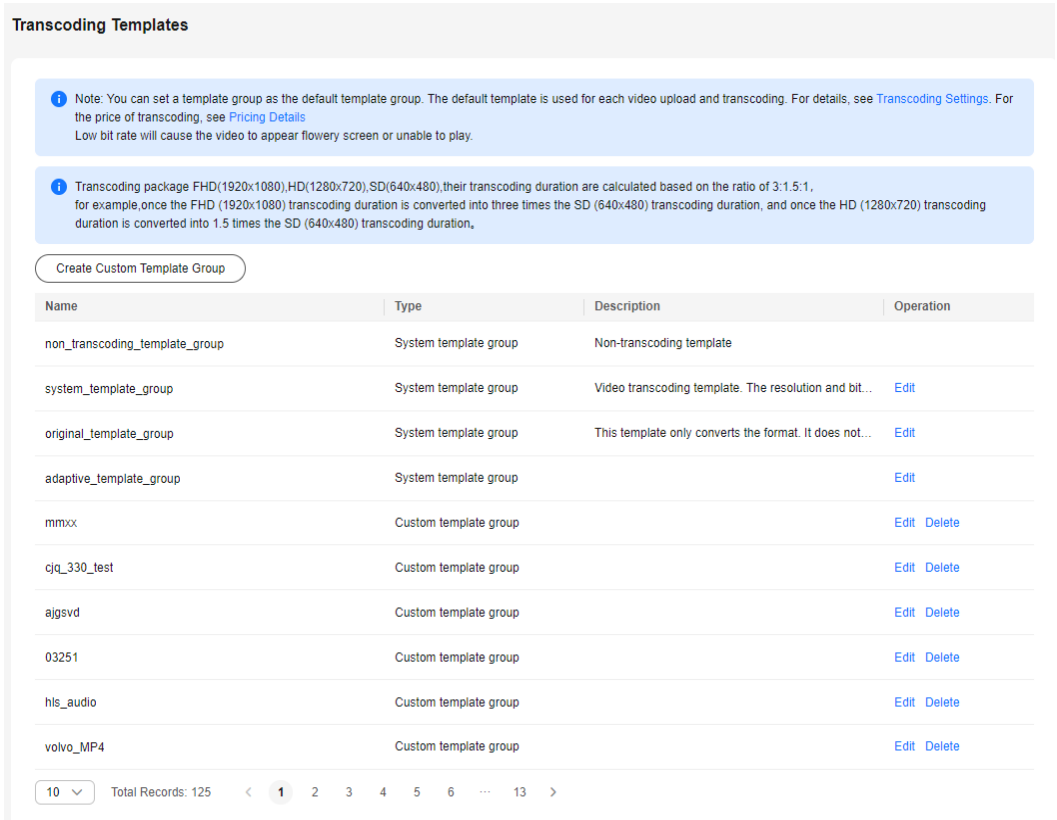
The new template is displayed on the **Transcoding Templates** page.

----End

Editing or Deleting a Custom Template

After a custom template is created, you can click **Edit** in the template list to modify the template. You can also click **Delete** to delete templates that you no longer need. If a template is deleted, audio/video using this template will not be deleted.

Figure 8-7 Editing a custom template



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8.2 Watermark Settings

You can upload an image and position it wherever you want your watermark to appear on your video.

Notes

- You can add watermarks only during transcoding. Therefore, adding watermarks will incur transcoding fees.
- If you do not need to add watermarks, set all watermark templates as non-default before transcoding, and select the default watermark in a transcoding template.
- If you cannot preview the watermark image, check the **domain name configuration**.

Constraints

- You can create a maximum of two watermark templates. That is, a maximum of two watermarks can be added to a video.
- Requirements for watermarks are as follows:
  - Watermarks can be PNG, JPG, or JPEG.
  - The resolution of a watermark must be between 8x8 and 4096x4096. The image size cannot exceed 10 MB.

Creating a Watermark Template

Step 1 Log in to the **VOD console**.

Step 2 In the navigation pane, choose **Global Settings** > **Watermark Templates**.

Step 3 Click **Create Watermark**. On the page displayed, configure watermark parameters.

Figure 8-8 Configuring watermark parameters

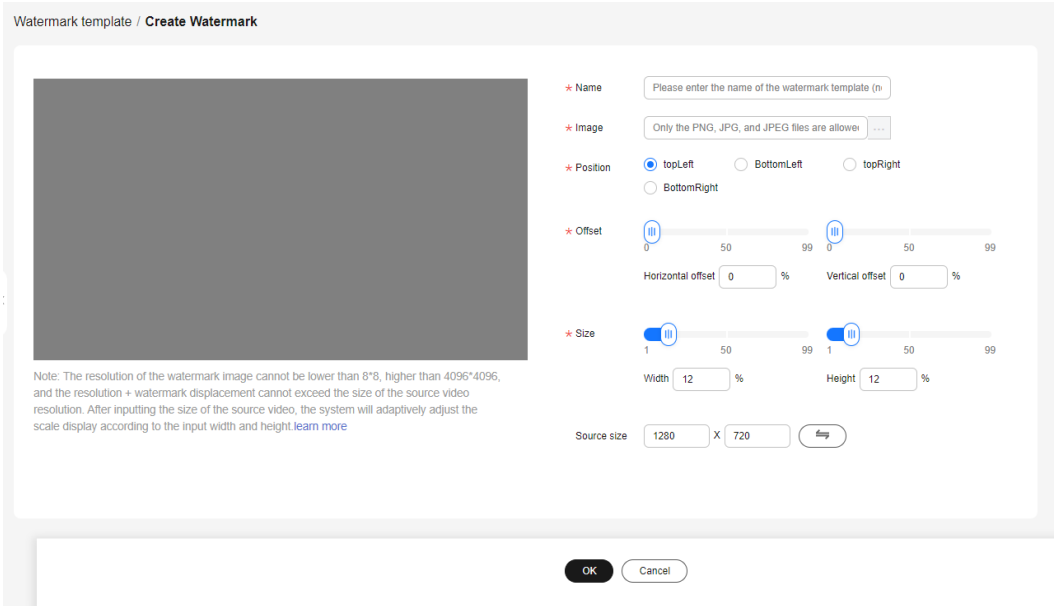

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Table 8-5 Parameters

Parameter	Description
Name	Enter a maximum of 128 characters.
Image	Only a PNG, JPG, or JPEG image no larger than 10 MB is allowed. The transparent PNG format is recommended.
Position	Initial position of the watermark, which defaults to upper right.
Offset	Set the horizontal or vertical offset based on the initial position.
Size	Size of the watermark image, which is zoomed in or out based on the preset ratio.
Source size	You can preview the watermark layered on the video.

Step 4 View the watermark in the preview area on the left.

Step 5 Click **OK**. The new template is added to the watermark template list.

Step 6 Click **Set as Default** in the **Operation** column to set a watermark template as a default one.

After the default watermark is set, **Default** is selected for **Watermark Template** by default. If you do not change it, the default watermark is added to videos. For details, see **Transcoding Settings**.

NOTICE

If you only need to add watermarks to some videos, you are advised to use a custom template instead of the default template.

----End

8.3 Security Settings

8.3.1 HLS Encryption Settings

Hotlink protection prevents unauthorized users from downloading and playing videos, but cannot prevent malicious paid users from downloading videos to their local PCs for secondary distribution. For this purpose, VOD provides HLS encryption. Encrypted videos cannot be distributed to others even if they are downloaded by malicious users.

NOTE

For details about HLS encryption, see **Protecting Videos with HLS Encryption**.

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Notes

- HLS encryption must be performed through transcoding, so transcoding fees are generated for HLS encryption.
- VOD does not perform HLS on inputs, but encrypts HLS outputs except for those in MP4 and DASH formats.
- Encryption and decryption comply with HLS specifications. Only players that support HLS streams can play the content.
- If the URL for obtaining the key is changed, you need to re-encrypt the video. Otherwise, the new encryption key does not take effect.
- If the streaming URL used after encryption is HTTPS, the KMS URL must also be HTTPS. Otherwise, the video cannot be previewed on the VOD console.

Prerequisites

The Key Management Service (KMS) and token generation service have been deployed. For details, see **Protecting Videos with HLS Encryption**.

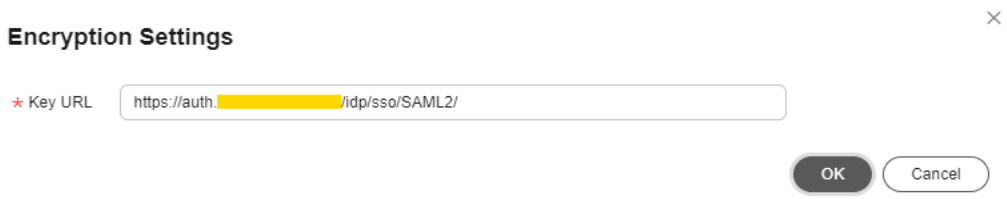
Procedure

Step 1 Log in to the **VOD console**.

Step 2 In the navigation pane, choose **Global Settings** > **Security**.

Step 3 Click **HLS Encryption Settings**. On the displayed page, enter the URL for obtaining the key. See **Figure 8-9**.

Figure 8-9 Encryption settings



Key URL: Enter the KMS address obtained in Prerequisites. HTTPS is recommended, as it is more secure than HTTP.

Example: https://domain-sample/get-key

Step 4 Click **OK**.

Step 5 After the configuration is complete, you need to use the **transcoding** function to encrypt video files. HLS encryption must be enabled for the transcoding template.

----End

8.4 Tenant Settings

Media asset cold storage can be set by tenant. Cold storage can be applied only to the source media asset file, or to the entire media asset file (including the source and the transcoded files).

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Procedure

Step 1 Log in to the **VOD console**.

Step 2 In the navigation pane, choose **Global Settings** > **Tenant Settings**.

See **Table 8-6**.

Figure 8-10 Tenant settings

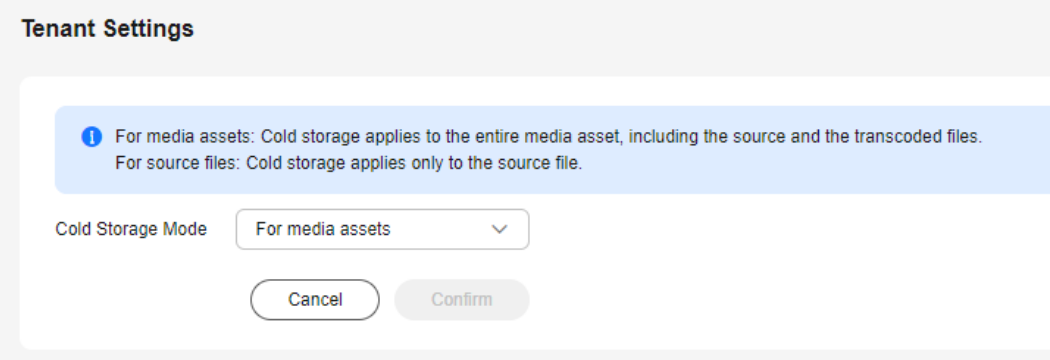

Table 8-6 Parameters

Parameter	Description
Cold Storage Mode	Sets the media asset cold storage mode. Options: • **For media assets**: Cold storage applies to the entire media asset, including the source and the transcoded files. • **For source files**: Cold storage applies only to the source file. Default value: **For media assets**

Step 3 Click **Confirm**.

----End

8.5 Authorizing Access to an OBS Bucket

You can authorize VOD to access the media resources you created in the OBS buckets.

Notes

- By default, the **Global Settings** > **Bucket Authorization** menu is not displayed. To display it, **submit a service ticket**.
- VOD only reads and writes resources in the authorized OBS buckets, but does not delete input files from the OBS buckets.
- If bucket authorization is canceled, you cannot manage the files that have been synchronized to VOD or play these files on the VOD console.

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Procedure

Step 1 Log in to the **VOD console**.

Step 2 In the navigation pane, choose **Global Settings** > **Bucket Authorization**. You can see the created OBS buckets.

Step 3 Click **Authorize** on the right of the desired bucket to authorize access to it under the current account.

----End

8.6 Category Settings

You can categorize audio and video files so that you can quickly find them by category. You can also call an API for **creating a media category** to categorize media files.

Constraints

- You can add up to 128 categories.
- You can add up to three levels of subcategories.
- If no category is set, the uploaded media files fall into the **Other** category by default.

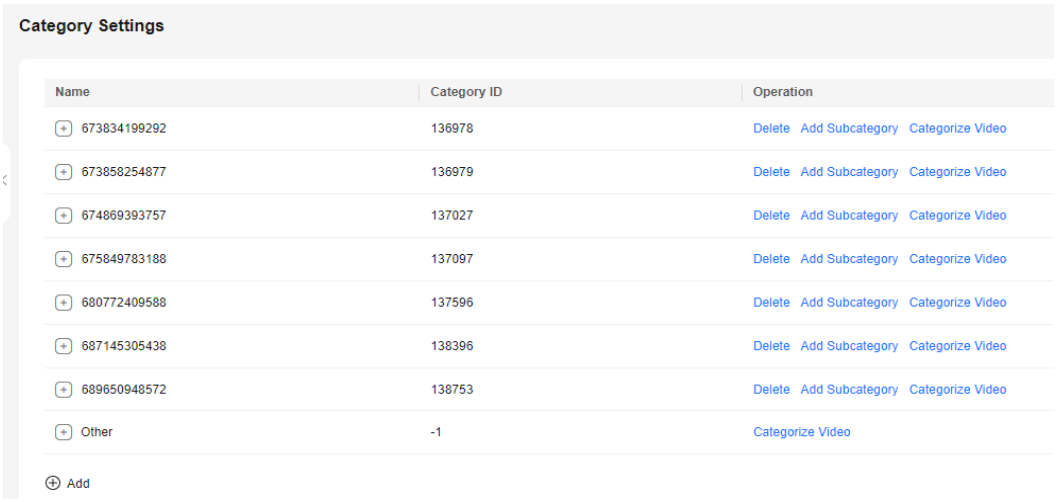
Adding a Category

Step 1 Log in to the **VOD console**.

Step 2 In the navigation pane, choose **Global Settings** > **Categories**.

Step 3 Click **Add** to add a category.

Figure 8-11 Adding a category



Step 4 Click **Add Subcategory** in the row containing the created category to create a subcategory.

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Step 5 Categorize audio and video files on the **Audio and Video Management** page or during **upload**.

Then, you can click **Categorize Video** to view all files under this category.

Step 6 Click **Delete** to delete an unwanted category.

The rules for deleting a category and subcategory are different:

- If you are going to delete a subcategory, files under this subcategory will be added to its category.
- If you are going to delete a category, files under this category will be added to the **Other** category.

----End

8.7 Notifications

8.7.1 Overview

VOD sends notification messages to notify you of the execution status of tasks such as transcoding and snapshot capturing in real time.

Currently, two notification services are available: MFS and SMN. If you are a new user, MFS is used by default. To use SMN, **submit a service ticket**.

CAUTION

The callback message forwarding mode can be switched only when you have modified the callback message logic.

Comparison Between MFS and SMN

The following table lists the differences between MFS and SMN.

Table 8-7 Service differences

Difference	MFS	SMN
Region restriction	MFS is not supported in CN North-Beijing1 and CN East-Shanghai2.	None
Timeliness	High, usually within 5 minutes.	Medium. Queuing occurs during global peak hours, and a delay of more than 10 minutes occurs occasionally.
Billing	Free of charge	SMN charges messages separately. For details, see **SMN Pricing Details**.

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Difference	MFS	SMN
Notification mode	Only REST messages can be sent.	Multiple types of messages, such as SMS messages, emails, and REST messages, can be sent.
JSON message body	Figure 8-12 shows an example of JSON message body.	Figure 8-13 shows an example of JSON message body.

Figure 8-12 JSON message body of MFS

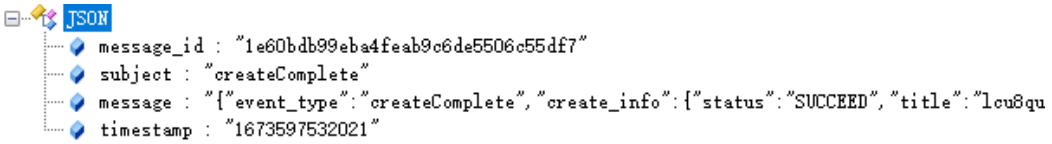

Figure 8-13 JSON message body of SMN

8.7.2 MFS

Message notifications of MFS are free of charge.

NOTICE

MFS is not supported in CN North-Beijing1 and CN East-Shanghai2.

Configuring Notifications

Step 1 Log in to the **VOD console**.

Step 2 In the navigation pane, choose **Global Settings** > **Notification Settings**.

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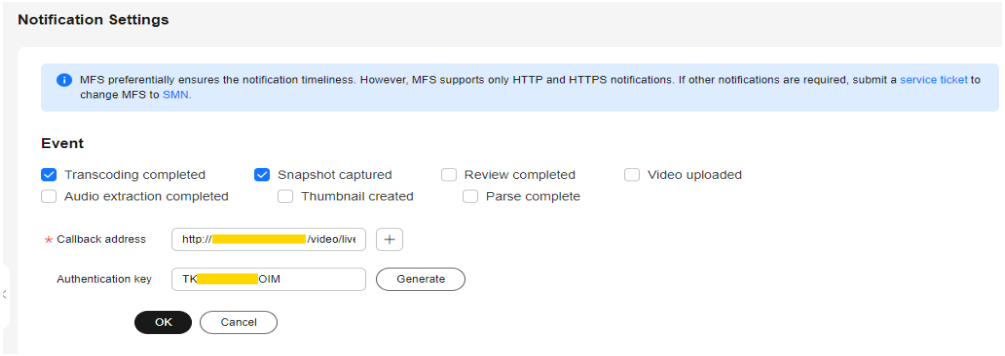
1. Select desired events and enter the callback address.
2. (Optional) If authentication is required, click **Generate** to generate an authentication key.

   MFS Notification Authentication Process shows the message notification authentication process.

NOTICE

If you select both **Snapshot captured** and **Thumbnail created**, only **Snapshot captured** will trigger notifications.

Figure 8-14 Configuring notifications



MFS supports only REST messages. For details about the JSON message template, see **Table 8-8**.

Table 8-8 JSON message

Parameter	Description	Type
event_type	Event type. The options are as follows: • transcodeComplete: transcoding (encryption) completed • thumbnailComplete: snapshot captured • reviewComplete: review completed • createComplete: media file created • audioExtractComplete: audio extracted • coverComplete: thumbnail created • parseComplete: media file parsed	String
transcode_info	Transcoding (including encryption) message. For details, see **Transcoding Message Body**.	TranscodeInfo
thumbnail_info	Snapshot message. For details, see **Snapshot Message Body**.	ThumbnailInfo
review_info	Review message. For details, see **Review Message Body**.	ReviewInfo

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Parameter	Description	Type
create_info	Media file upload message. For details, see **Media Upload and Audio Extraction Message Body**.	AssetInfo
audio_extract_info	Audio extraction message. For details, see **Media Upload and Audio Extraction Message Body**.	AssetInfo
cover_info	Thumbnail message. For details, see **Thumbnail Message Body**.	CoverInfo
parse_info	Media file parsing completion message. This parameter is available only when a media file has been parsed. For details, see **Media Asset Parsing Message Body**.	ParseInfo

Step 3 Click **OK**.

----End

MFS Notification Authentication Process

1. VOD generates a timestamp based on the current time and uses the key configured in **Step 2.2** to calculate the signature string using HmacSHA256(VOD_{timestamp}_{body}, key).

   The signature string and timestamp are sent to the device in the HTTP message header, which is header[auth_sign] and header[auth_timestamp], respectively. In the preceding information, body indicates the message attribute in the message body.
2. After receiving the response, the customer combines strings in the VOD_{timestamp}_{body} format and uses the key in the message header to check whether the signature string generated in HmacSHA256(VOD_{timestamp}_{body}, key) is the same as that in the message header. If they are the same, the authentication is successful.

8.7.3 SMN

SMN charges messages separately. For details, see **SMN Pricing Details**.

Functions

- A topic is a specified event for message publishing or subscription notification. It serves as a message sending channel, where publishers and subscribers can interact with each other. Before configuring notifications, you must create a topic.
- VOD notification types include **Transcoding completed**, **Snapshot captured**, **Review completed**, **Video uploaded**, **Audio extraction completed**, and **Thumbnail created**. Subscription is to associate a subscriber to a topic. A user can have multiple topics, and each topic has multiple subscribers.

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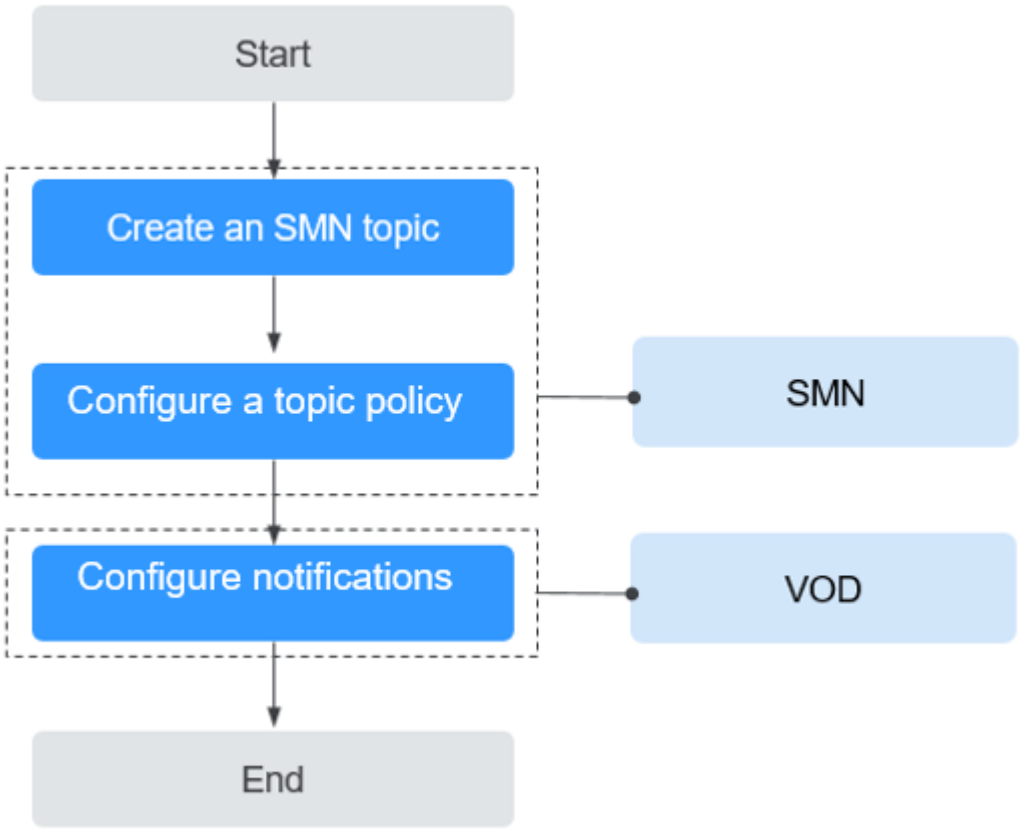
Process Flow

Figure 8-15 shows the process of configuring notifications.

Figure 8-15 Process of configuring notifications



1. **Create an SMN Topic** on the SMN console.
2. **Configure a topic policy** to authorize VOD to publish messages to the topic.
3. **Configure notifications** on the VOD console so that you can receive notifications during operations such as transcoding, snapshot capturing, and review.

Creating an SMN Topic

Step 1 Log in to the SMN console.

Step 2 In the navigation pane on the left, choose **Topic Management** > **Topics**.

Step 3 Click **Create Topic** in the upper right corner.

The **Create Topic** dialog box is displayed. Table 8-9 describes the required parameters.

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Table 8-9 Topic parameters

Parameter	Description
Topic Name	Specifies the topic name, which • Contains only letters, digits, hyphens (-), and underscores (_), and must start with a letter or digit. • Contains 1 to 255 characters. • Must be unique and cannot be modified after the topic is created.
Display Name	This parameter is optional. When sending an email: • If the display name is not specified, the sender is displayed as ***username*@example.com**. • If the display name is specified, the email sender is presented as ***Display name*<*username*@example.com>**.
Enterprise Project	Centrally manages cloud resources and members by project.
Tag	Specifies a key-value pair. Tags identify cloud resources so that you can easily categorize and search for your resources.

Step 4 Click **OK**.

Step 5 Click **Add Subscription** in the **Operation** column of the new topic. The **Add Subscription** dialog box is displayed.

Configure the subscription protocol and endpoints. See **Figure 8-16**.

Figure 8-16 Adding a subscription

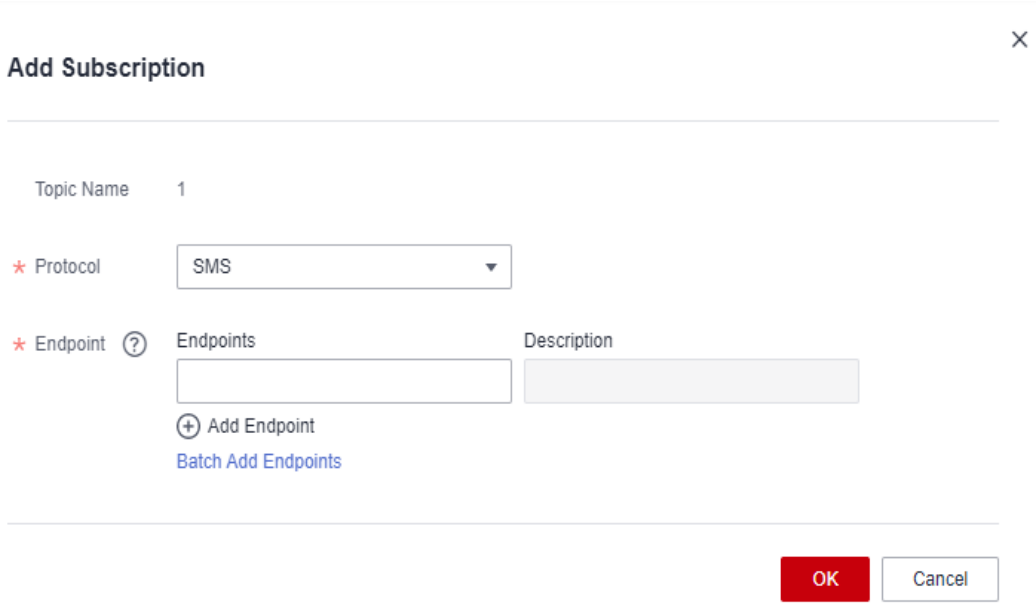

Table 8-10 describes the subscription parameters.

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Table 8-10 Subscription parameters

Parameter	Description
Topic Name	Name of the topic to be subscribed to. Retain the default value.
Protocol	Message notification method. Select a protocol from the drop-down list. The common protocols used by MPC are **SMS**, **Email**, **HTTP**, and **HTTPS**.
Endpoint	Specifies the IP address of a subscription endpoint. You can enter up to 10 SMS, email, HTTP, or HTTPS endpoints, one in each line. • **SMS**: Enter one or more valid phone numbers. The format is **+** *country code phone number*, for example, +8600000000000. Subscribers will receive a subscription confirmation message valid for 48 hours and must confirm the subscription to receive messages published to the topic. • **Email**: Enter one or more valid email addresses, for example, ***username*@example.com**. Subscribers will receive a subscription confirmation email valid for 48 hours and must confirm the subscription to receive messages published to the topic. • If you select **HTTP** or **HTTPS**, enter a public network address and confirm the subscription, for example, **https://example.com/notification/action**. HTTPS is recommended, as it is more secure than HTTP.

Step 6 Click **OK** to add a subscription. You can view the subscription on **Topic Management** > **Subscriptions**.

After the subscription is added, the configured subscription endpoint will receive a subscription confirmation message. The subscription confirmation link is valid for 48 hours. You need to confirm the subscription within the validity period so that you can receive messages published to the topic.

----End

Configuring a Topic Policy

Step 1 In the navigation pane of the SMN console, choose **Topic Management** > **Topics**.

Step 2 Click **More** > **Configure Topic Policy** in the **Operation** column.

Step 3 Configure topic policy parameters by referring to **Figure 8-17**.

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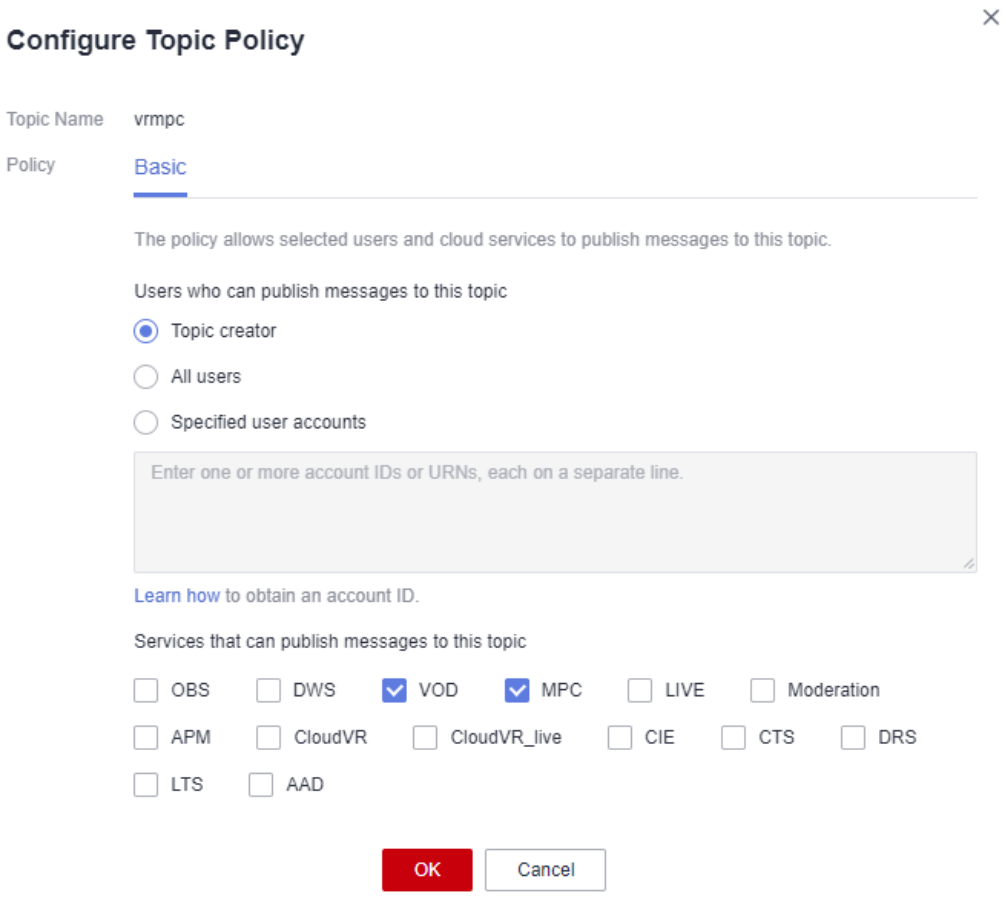
Figure 8-17 Configuring a topic policy



Topic policies are classified into basic mode and advanced mode. The basic mode simply specifies which users or cloud services have permissions to publish messages to a topic. See **Figure 8-17**.

Table 8-11 Description for configuring a topic policy in basic mode

Item	Settings	Description
Users who can publish messages to this topic	Topic creator	Only the topic creator has permission to publish messages to the topic.
	All users	All users have permission to publish messages to the topic.

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Item	Settings	Description
	Specified user accounts	Only specified users have permission to publish messages to the topic. Users are specified in the format **urn:csp:iam::domainId:root**, in which **domainId** indicates the account ID of a user. Every two users are separated with a comma (,). SMN does not limit the number of users you can specify, but the total length of a topic policy cannot exceed 30 KB. **NOTE** • Enter the account ID of the user and click **OK**. Other information is automatically supplemented by the system. • To obtain a user's account ID, log in to the SMN console, hover the mouse over the username in the upper right corner and choose **My Credentials** from the drop-down list.
Services that can publish messages to this topic	See **Figure 8-17**.	Select **VOD**. VOD has the permissions to access the topic.

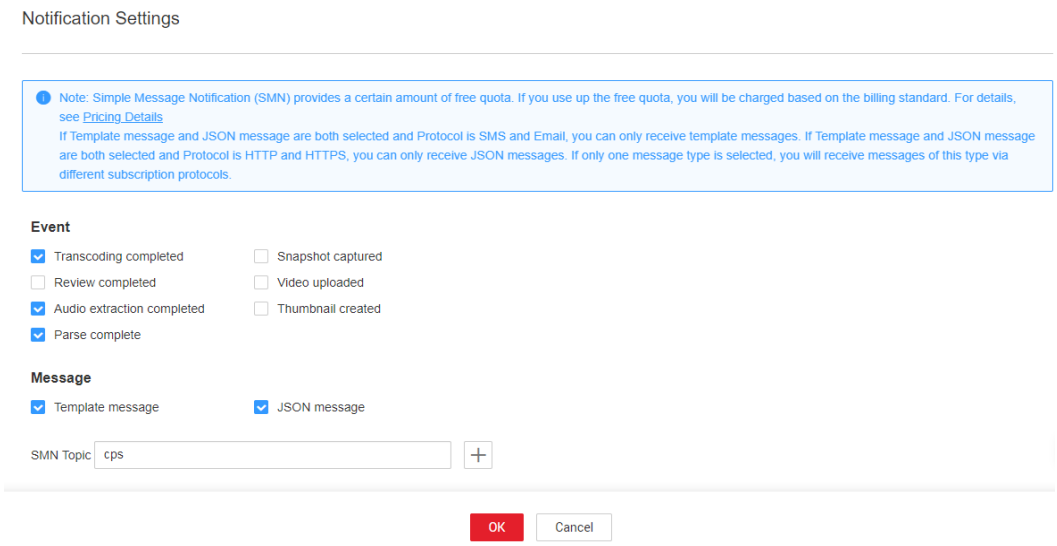
----End

Configuring Notifications

Step 1 Log in to the **VOD console**.

Step 2 In the navigation pane, choose **Global Settings** > **Notification Settings**.

Figure 8-18 Configuring notifications



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Step 3 Select one or more events.

NOTICE

If you select both **Snapshot captured** and **Thumbnail created**, only **Snapshot captured** will trigger notifications.

Step 4 Select one or more message types.

NOTE

If **Template message** and **JSON message** are both selected, you will receive template messages via SMS and email, and receive JSON messages via HTTP and HTTPS.

- Select **Template message**. Table 2 describes what a template message looks like. The variables in the notification text message are subject to the actual operation.

Table 8-12 Template message

Event	Status	Message Body
Transcoding completed	Completed	Dear user, your video transcoding task has been completed. Video ID: {asset_id}; name: {title}. Log in to the VOD console or call a VOD API to view transcoding details.
	Failed	Dear user, an error occurred when transcoding your video. Video ID: {asset_id}; name: {title}; error code: {err_code}; error information: {err_msg}.
Snapshot captured	Completed	Dear user, your snapshot task has been completed. Video ID: {asset_id}; name: {title}. Log in to the VOD console or call a VOD API to view snapshot details.
	Failed	Dear user, an error occurred when processing your snapshot task. Video ID: {asset_id}; name: {title}; error code: {err_code}; error information: {err_msg}.
Review completed	Completed	Dear user, your review task has been completed. Video ID: {asset_id}; name: {title}; review advice: {suggestion}. Log in to the VOD console or call a VOD API to view review details.
	Failed	Dear user, an error occurred when reviewing your video. Video ID: {asset_id}; name: {title}; error code: {err_code}; error information: {err_msg}.

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Event	Status	Message Body
Video uploaded	Completed	Dear user, your video has been uploaded. Video ID: {asset_id}; name: {title}. Log in to the VOD console or call a VOD API to view video details.
	Failed	Dear user, an error occurred when uploading your video. Video ID: {asset_id}; name: {title}; error code: {err_code}; error information: {err_msg}.
Audio extraction completed	Completed	Dear user, your audio extraction task has been completed. Audio ID: {asset_id}; name: {title}. Log in to the VOD console or call a VOD API to view audio details.
	Failed	Dear user, an error occurred when processing your audio extraction task. Audio ID: {asset_id}; name: {title}; error code: {err_code}; error information: {err_msg}.
Thumbnail created	Completed	Dear user, your video thumbnail has been created. Video ID: {asset_id}; name: {title}. Log in to the VOD console or call a VOD API to view video details.
	Failed	Dear user, your video thumbnail fails to be created. Video ID: {asset_id}; name: {title}; error code: {err_code}; error information: {err_msg}.
Parse complete	Completed	Dear user, your video has been parsed. Video ID: {asset_id}; name: {title}. Log in to the VOD console or call a VOD API to view video details.
	Failed	Dear user, an error occurred when parsing your video. Video ID: {asset_id}; name: {title}; error code: {err_code}; error information: {err_msg}.

- Select **JSON message**. **Table 3** describes what a template message looks like.

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Table 8-13 JSON message

Parameter	Description	Type
event_type	Event type. The options are as follows: – transcodeComplete: transcoding (encryption) completed – thumbnailComplete: snapshot captured – reviewComplete: review completed – createComplete: media file created – audioExtractComplete: audio extracted – coverComplete: thumbnail created – parseComplete: media file parsed	String
transcode_info	Transcoding (including encryption) message. For details, see **Transcoding Message Body**.	TranscodeInfo
thumbnail_info	Snapshot message. For details, see **Snapshot Message Body**.	ThumbnailInfo
review_info	Review message. For details, see **Review Message Body**.	ReviewInfo
create_info	Media file upload message. For details, see **Media Upload and Audio Extraction Message Body**.	AssetInfo
audio_extract_info	Audio extraction message. For details, see **Media Upload and Audio Extraction Message Body**.	AssetInfo
cover_info	Thumbnail message. For details, see **Thumbnail Message Body**.	CoverInfo
parse_info	Media file parsing completion message. This parameter is available only when a media file has been parsed. For details, see **Media Asset Parsing Message Body**.	ParseInfo

Step 5 Select an SMN topic.

Step 6 Click **OK**.

----End

8.8 Workflow Settings

You can create a workflow to transcode a media file and convert its container format, take snapshots, and extract audio. All tasks in the workflow are executed at the same time, accelerating media processing.

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Constraints

A workflow orchestrates at least one task. Repeated task orchestration is not allowed.

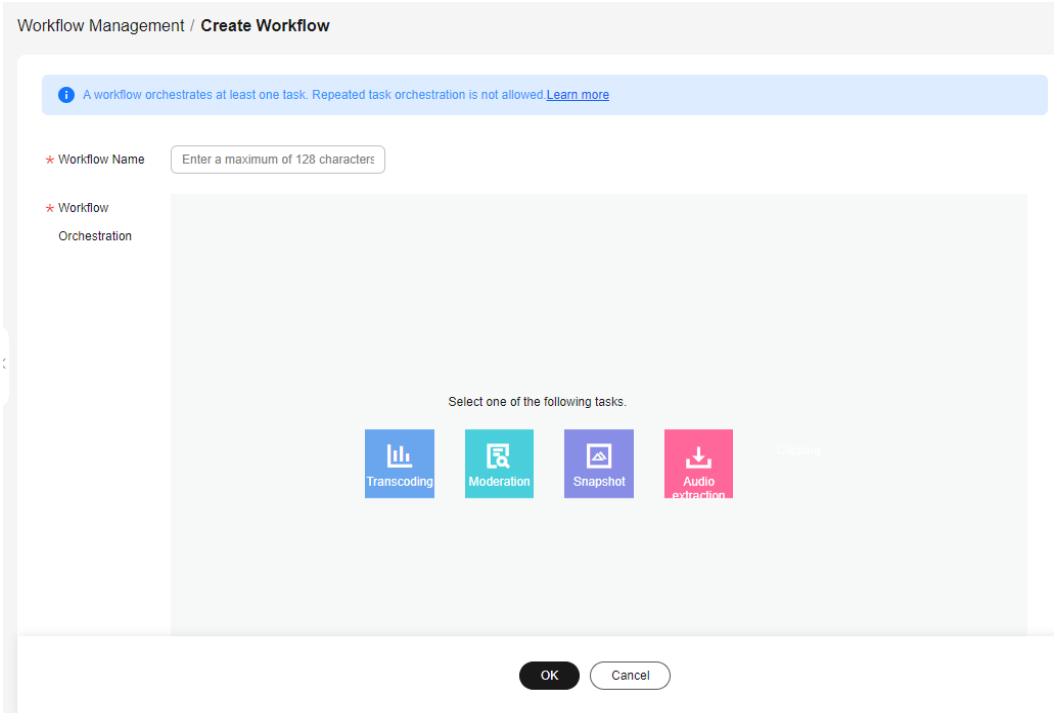
Creating a Workflow

Step 1 Log in to the **VOD console**.

Step 2 In the navigation pane, choose **Global Settings** > **Workflows**.

Step 3 Click **Create Workflow**.

Figure 8-19 Creating a workflow



Step 4 Enter a workflow name.

It cannot exceed 128 characters.

Step 5 In the **Workflow Orchestration** area, create a workflow.

1. Select a task.
2. Click + in the upper right corner of the selected task to add other tasks. You can also click × to delete a task and orchestrate the task again.

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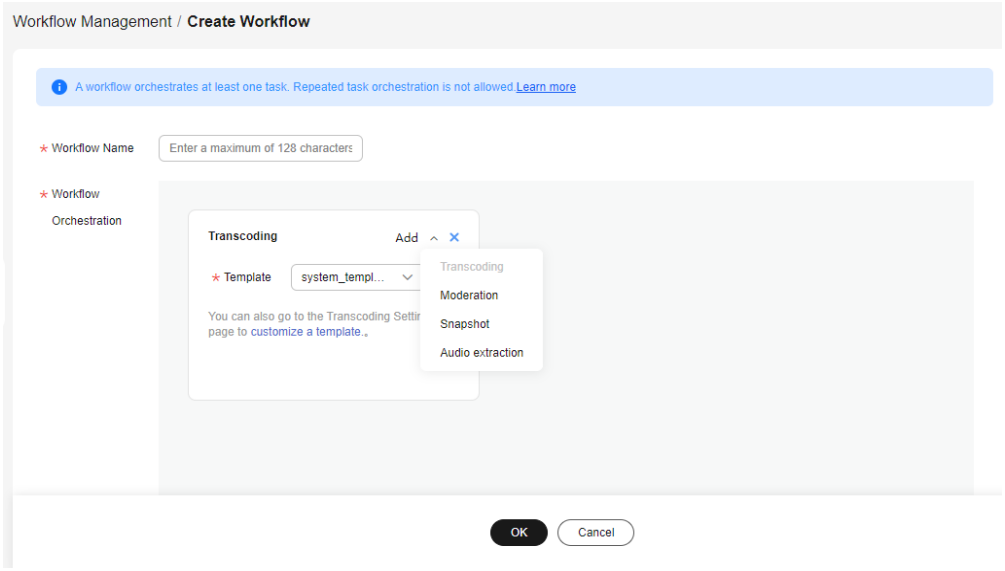
Figure 8-20 Orchestration



3. Set task parameters by referring to **Table 1**.

Table 8-14 Task configurations

Task Name	Task Parameters	Description
Transcoding	System template or custom template	If you want to use a custom template group, create a transcoding template first. For details about the restrictions on each transcoding template, see **Transcoding Settings**.
Snapshot	– By interval: The system takes snapshots from the first frame of a video based on the configured interval. – At fixed time: The system takes snapshots from a video at configured time points.	For details, see **Snapshot Capturing**.
Audio extraction	You do not need to set any parameters.	For details, see **Audio Extraction**.

Step 6 Click **OK**.

The created workflow is displayed in the workflow list.

Step 7 Use the workflow to process the audio/video in **Audio/Video Management** and **Audio/Video Upload**.

----End

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9 Review Management (in OBT)

9.1 Media Content Review

Huawei Cloud VOD provides the content review function to detect and filter out pornographic, terrorism-related, and politically sensitive information in media files. In doing so, inappropriate media files can be removed in a timely manner to avoid or reduce the adverse impact.

Notes

This function is not available in AP-Bangkok.

Review Process

VOD provides two review methods, review after upload and review before upload. Review after upload is available on the VOD console. It means, you upload audio and video and then review the content. If you want to use review before upload, call a VOD API.

Figure 9-1 Review process

- Intelligent review: The review module identifies pornographic, terrorism-related, and politically sensitive content in text, thumbnails, and snapshots. By default, this function is disabled.
- Manual review: In review details, check the suspected non-compliant media file again. If you confirm the problem, block the media file. Otherwise, approve it.
- Block: After you block a media file, its status changes to **Unpublished**. Media files in the **Unpublished** status can only be previewed on the console and cannot be downloaded or played. The streaming URL referenced by Internet is inaccessible.

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Prerequisites

By default, a system template is used for review. If you need to use a custom template, **create a review template** and set it as the default template.

Video Content Review

Intelligent review checks the thumbnail, title, description, and content of a video file.

Step 1 Log in to the **VOD console**.

Step 2 In the navigation pane, choose **Review Management** > **Content Moderation**.

Step 3 Select a video file and click **Review**. The video review is based on its configured default review template. You can edit the review template on the **Review Settings** page.

If the video status changed to **Approved**, **Pending review**, or **Rejected**, intelligent review is complete.

Step 4 Determine whether to start manual review.

You can start manual review in either of the following ways:

- Click ⌄ on the left of the video. A maximum of 10 video snapshots are displayed. The system marks non-compliant snapshots. You can re-check the marked snapshots.
- If snapshots are just part of a video and you need to re-check the whole video, click **View Details**.

  On the displayed page, snapshots containing pornographic, terrorism-related, or politically sensitive content are marked and texts containing such content are highlighted red. In the preview area, you can play the video for stricter review.

Step 5 Go back to the audio and video list and select multiple video files to approve or block them in batches.

----End

Audio Content Review

Intelligent review checks the thumbnail, title, and description of an audio file.

Step 1 Log in to the **VOD console**.

Step 2 In the navigation pane, choose **Review Management** > **Content Moderation**.

Step 3 Select an audio file and click **Review**. The audio review is based on its configured default review template. You can edit the review template on the **Review Settings** page.

If the audio status changed to **Approved**, **Pending review**, or **Rejected**, intelligent review is complete.

Step 4 Click **View Details** to view review details.

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On the displayed page, the thumbnail containing pornographic, terrorism-related, or politically sensitive content is marked and texts containing such content are highlighted red. You can block or approve the audio based on your re-check results.

Step 5 Go back to the audio and video list and select multiple audio files to approve or block them in batches.

----End

9.2 Review Settings

You can review audio and video files for any pornographic, terrorism-related, and politically sensitive content using a system review template or custom template.

Editing a System Template

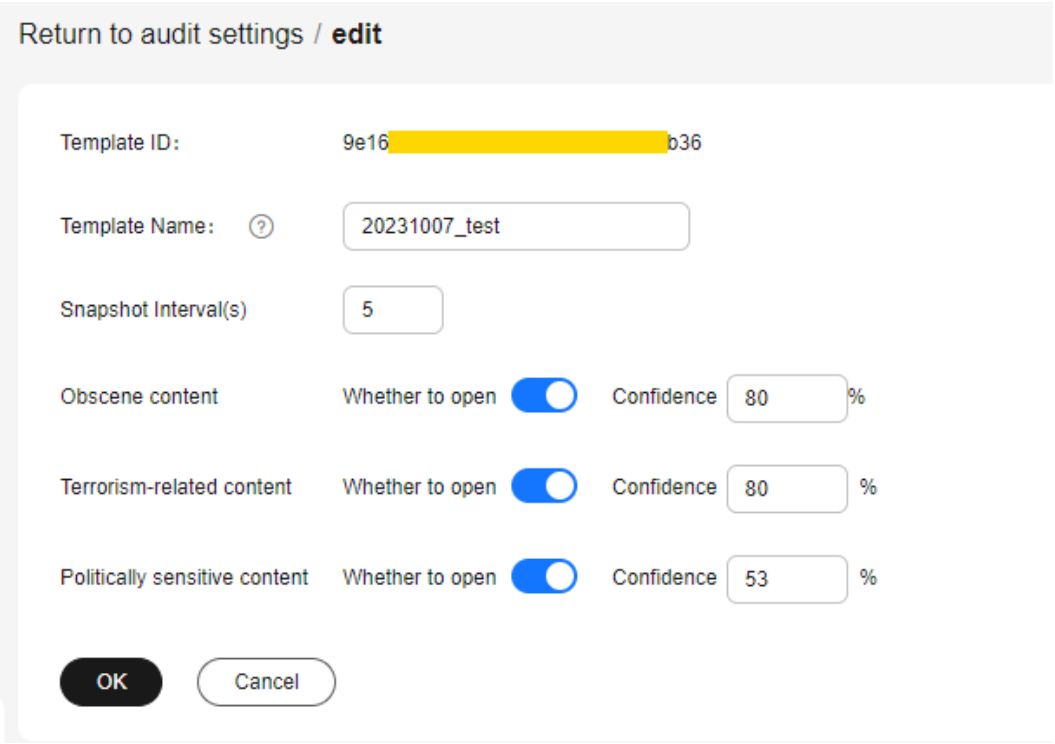
A system template has common parameters preconfigured. Before using a system template, you are advised to check whether the settings of the system template meet your requirements. If the settings do not, you can edit the system template.

Step 1 Log in to the **VOD console**.

Step 2 In the navigation pane, choose **Review Management** > **Review Settings**.

Step 3 Locate the system template and click **Edit**. On the displayed page, modify template parameters. See **Figure 9-2**.

Figure 9-2 Editing a system template



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Step 4 Click **OK**.

----End

Creating a Custom Template

If system presets cannot meet your requirements, you can create a review template based on your needs.

Step 1 Log in to the **VOD console**.

Step 2 In the navigation pane, choose **Review Management** > **Review Settings**.

Step 3 Click **Create Review Template**. See **Figure 9-3**. Configure related parameters by referring to **Table 9-1**.

Figure 9-3 Creating a review template

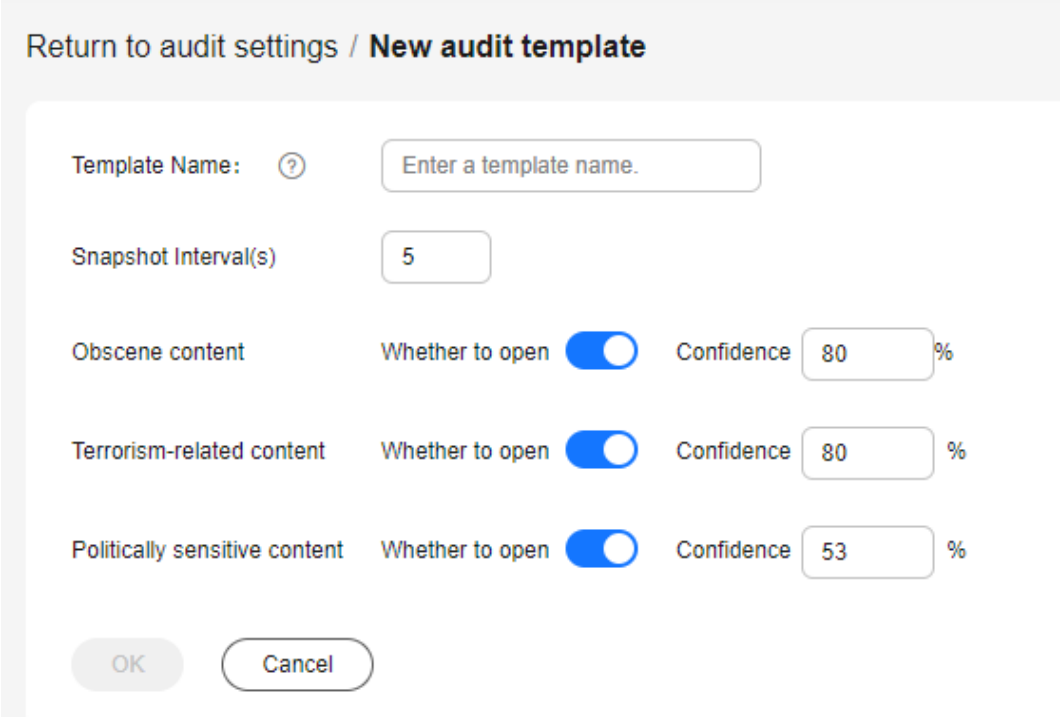

Table 9-1 Review parameters

Parameter	Description
Template name	A template name can be up to 128 characters long. Only letters, underscores (_), and digits are allowed. Example: MP4_H264
Snapshot Interval	The system automatically takes snapshots based on the interval. Value range: an integer ranging from 1 to 100

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Parameter	Description
Obscene content	You can enable one or more functions and then set the confidence level. The value of **Confidence Level** ranges from 0 to 100. The higher the confidence level, the more reliable the review results. If a check item is not enabled or the confidence level is set to **0**, this check item is not performed.
Terrorism-related content	
Politically sensitive content	

Step 4 Click **OK**.

The new template is displayed in the template list.

Step 5 Click **Set as Default** in the **Template Name** column to set the created template as the default template.

Then the system will review audio and video content based on the settings in the default template.

----End

Editing or Deleting a Custom Template

- After a custom template is created, you can click **Edit** in the template list to modify the template.
- You can also click **Delete** in the template list to delete an unwanted template. If a template is deleted, audio and video using this template will not be deleted.

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10 Usage Query

On the VOD console, you can view the traffic and peak bandwidth statistics of CDN, as well as the consumption of storage space and transcoding duration of the VOD origin server. There is a delay of about one hour in usage statistics.

Procedure

Step 1 Log in to the **VOD console**.

Step 2 In the navigation pane, choose **Querying the usage**.

Step 3 Select **Distribution traffic**, **Peak Distribution Bandwidth**, **Media Asset Management**, **Data retrieval**, or **Transcode** to view the statistics.

----End

Distribution Traffic

Select the time range, domain name, and time granularity to view CDN traffic statistics.

You can click **Download** to export the CDN traffic statistics to the local PC.

NOTE

- You can query data of the past 90 days.
- The maximum time span of a query is 31 days.
- You can query data of up to 20 domain names at a time.
- The minimum statistical granularity is five minutes. For example, data generated from November 6, 2020 08:00:00 (GMT+08:00) to November 6, 2020 08:04:59 (GMT+08:00) is displayed at the statistical point November 6, 2020 08:00:00 (GMT+08:00). The displayed data is the maximum value of the selected statistical granularity.

The statistical chart displays the total traffic trend of the selected domain name. You can point to the trend chart and scroll the mouse wheel to zoom in or out on the X-axis within a time range.

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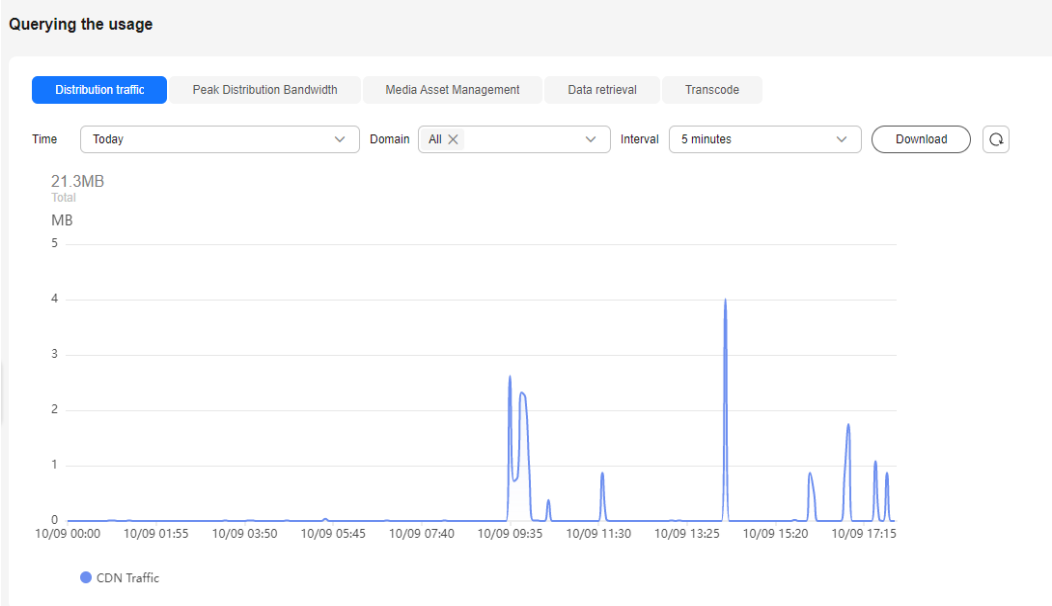
Figure 10-1 Total CDN traffic



Peak Distribution Bandwidth

Select the time range, domain name, and time granularity to view CDN peak bandwidth statistics.

You can click **Download** to export the CDN peak bandwidth statistics to the local PC.

NOTE

- You can query data of the past 90 days.
- The maximum time span of a query is 31 days.
- You can query data of up to 20 domain names at a time.
- The minimum statistical granularity is five minutes. For example, data generated from November 6, 2020 08:00:00 (GMT+08:00) to November 6, 2020 08:04:59 (GMT+08:00) is displayed at the statistical point November 6, 2020 08:00:00 (GMT+08:00). The displayed data is the maximum value of the selected statistical granularity.

The statistical chart displays the peak bandwidth trend of the selected domain name. You can point to the trend chart and scroll the mouse wheel to zoom in or out on the X-axis within a time range.

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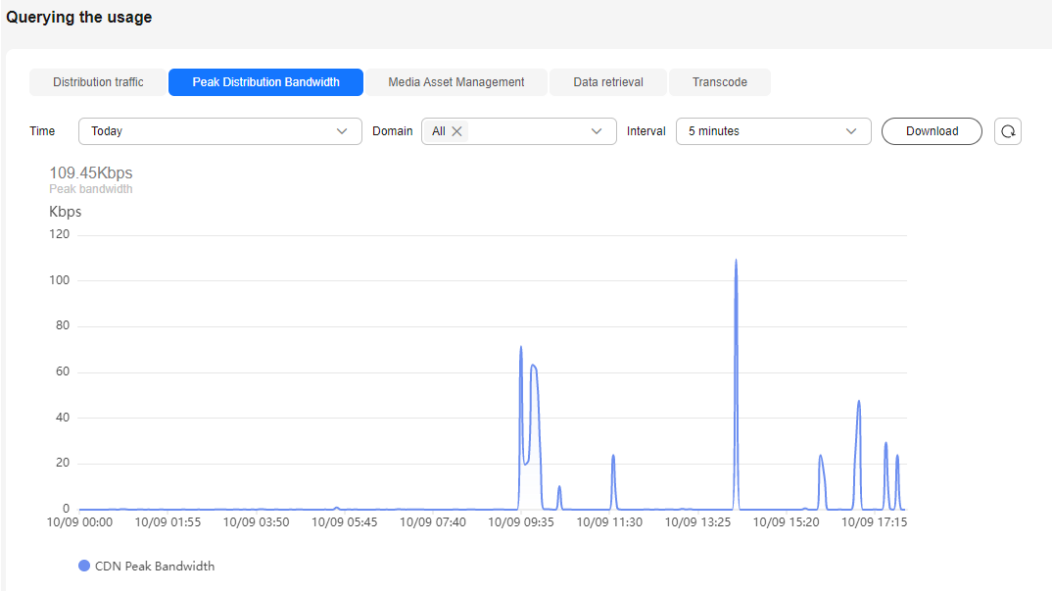
Figure 10-2 CDN peak bandwidth



Media Asset Management

Select the time range and time granularity to view the statistics of standard storage, infrequent access storage, and archive storage of media assets.

You can click **Download** to export the media asset storage statistics to the local PC.

NOTE

- You can query data of the past 30 days.
- The minimum statistical granularity is one hour. For example, data generated from November 6, 2020 08:00:00 (GMT+08:00) to November 6, 2020 09:00:00 (GMT+08:00) is displayed at the statistical point November 6, 2020 08:00:00 (GMT+08:00). The displayed data is the maximum value of the selected statistical granularity.

The statistical chart displays the standard storage volume of the media asset in the selected time range. You can point to the trend chart and scroll the mouse wheel to zoom in or out on the X-axis within a time range.

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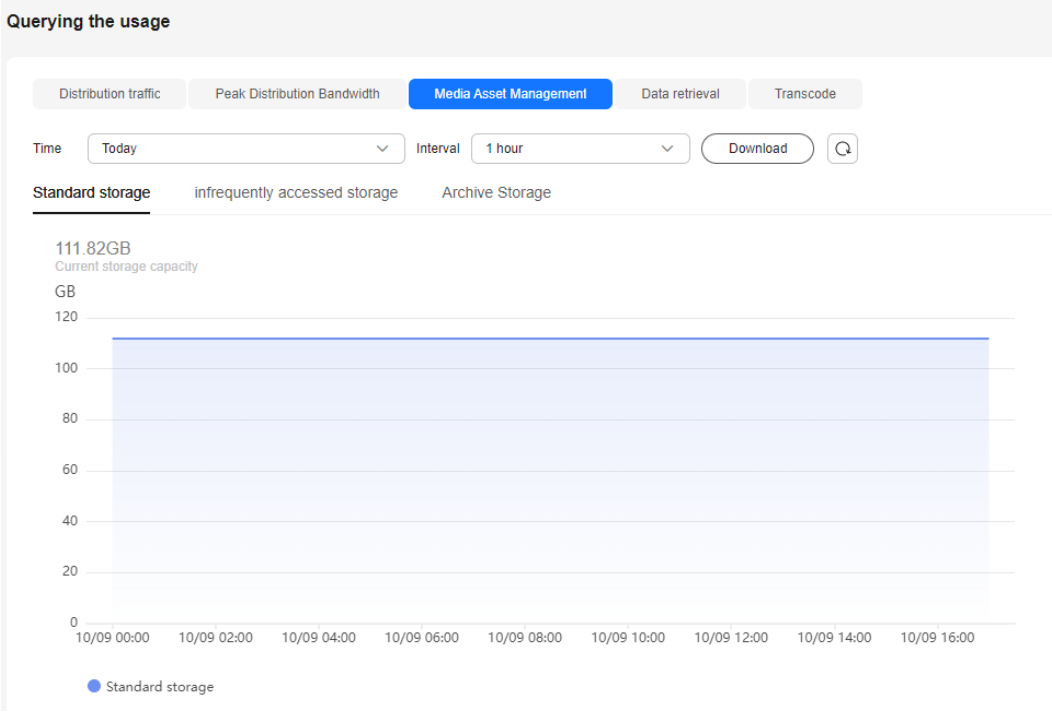
Figure 10-3 Standard storage statistics



Data Retrieval

Select the time range and time granularity to view the statistics of retrieving media assets of infrequent access storage and archive storage.

You can click **Download** to export the media asset retrieval statistics to the local PC.

NOTE

- You can query data of the past 30 days.
- The minimum statistical granularity is one hour. For example, data generated from November 6, 2020 08:00:00 (GMT+08:00) to November 6, 2020 09:00:00 (GMT+08:00) is displayed at the statistical point November 6, 2020 08:00:00 (GMT+08:00). The displayed data is the maximum value of the selected statistical granularity.

The statistical chart displays the statistics of the media asset whose storage class changes from infrequent access to standard in the selected time range. You can point to the trend chart and scroll the mouse wheel to zoom in or out on the X-axis within a time range.

If you choose **Restore Archive Storage**, you can view the statistics in the standard and quick retrieval modes.

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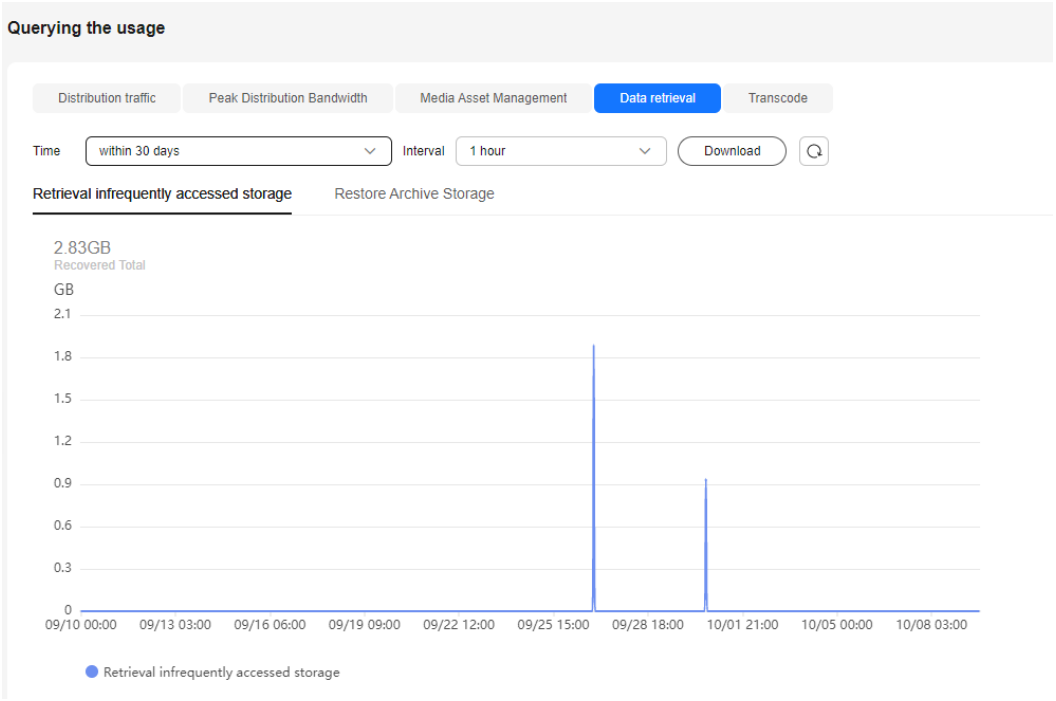
Figure 10-4 Statistics of the media asset whose storage class changes from infrequent access to standard



Transcoding

Select the time range and time granularity to view the total transcoding duration statistics of a media file.

You can click **Download** to export the total transcoding duration statistics of a media file to the local PC.

NOTE

- You can query data of the past 30 days.
- The minimum statistical granularity is one hour. For example, data generated from November 6, 2020 08:00:00 (GMT+08:00) to November 6, 2020 09:00:00 (GMT+08:00) is displayed at the statistical point November 6, 2020 08:00:00 (GMT+08:00). The displayed data is the maximum value of the selected statistical granularity.

The statistical chart displays the total transcoding duration in the selected time range. You can point to the trend chart and scroll the mouse wheel to zoom in or out on the X-axis within a time range.

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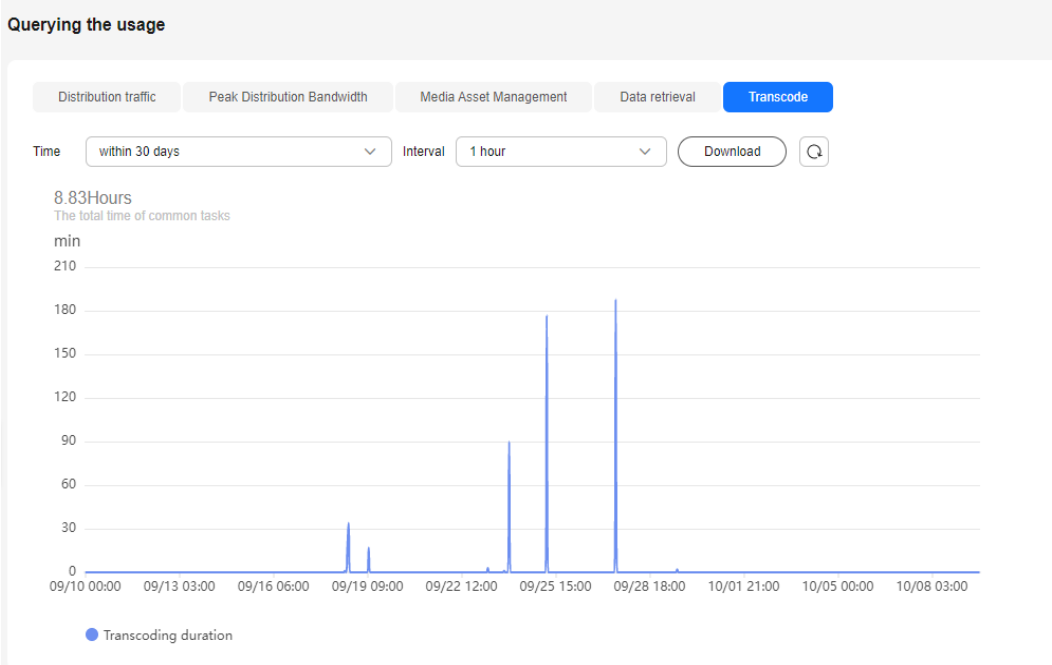
Figure 10-5 Total transcoding duration



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11 Data Analysis

11.1 Distribution Statistics

The distribution statistics function of VOD allows you to query data such as the traffic, bandwidth, and traffic hit ratio on CDN.

About Query

- You can query data of the past 90 days.
- You can query data of up to 20 domain names at a time.
- The maximum time span of a query is 31 days.
- The minimum statistical granularity is 5 minutes. For example, data generated from April 2, 2019 08:00:00 (GMT+08:00) to April 2, 2019 08:04:59 (GMT +08:00) is displayed at the statistical point April 2, 2019 08:00:00 (GMT +08:00).

Procedure

Step 1 Log in to the **VOD console**.

Step 2 In the navigation pane on the left, choose **Data Analysis** > **Distribution Statistics**.

Step 3 On the displayed page, select **Distribution traffic**, **Peak Distribution Bandwidth**, **Number of requests**, **Status Code**, **Traffic Hit Rate**, or **Request Hit Rate** to view the statistics.

----End

Distribution Traffic

Select **Time**, **Domain**, **Interval**, and **Transport Protocol** to view CDN traffic statistics within the specified time span, as shown in **Figure 11-1**.

Move the cursor to the trend chart and scroll the mouse wheel to zoom in or zoom out the X axis (time). You can click **Download** to export the statistics details to the local PC.

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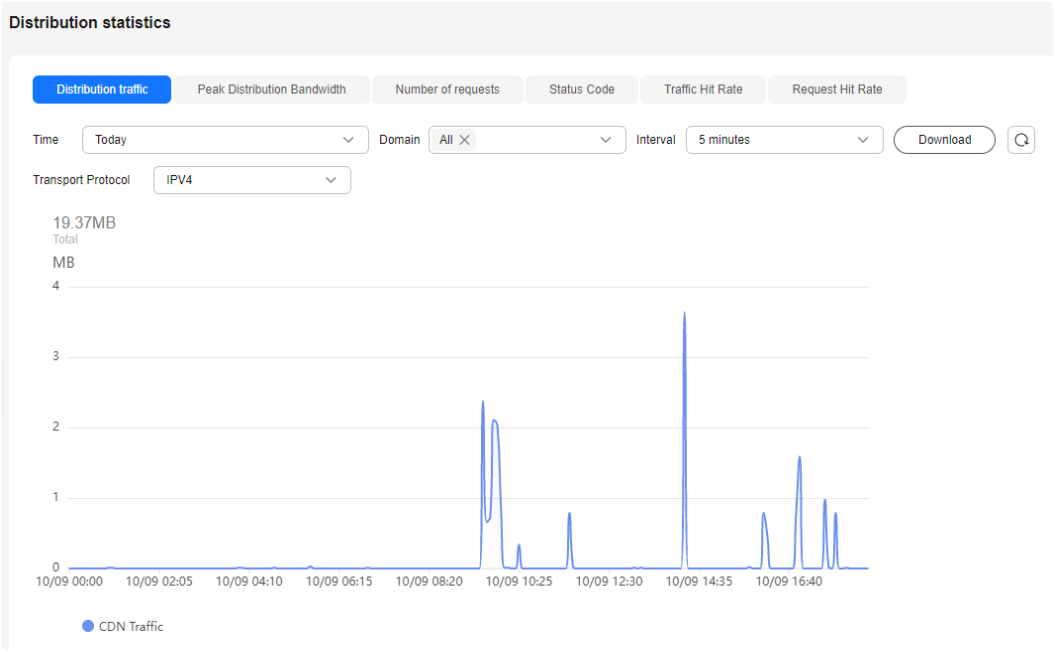
Figure 11-1 CDN traffic statistics

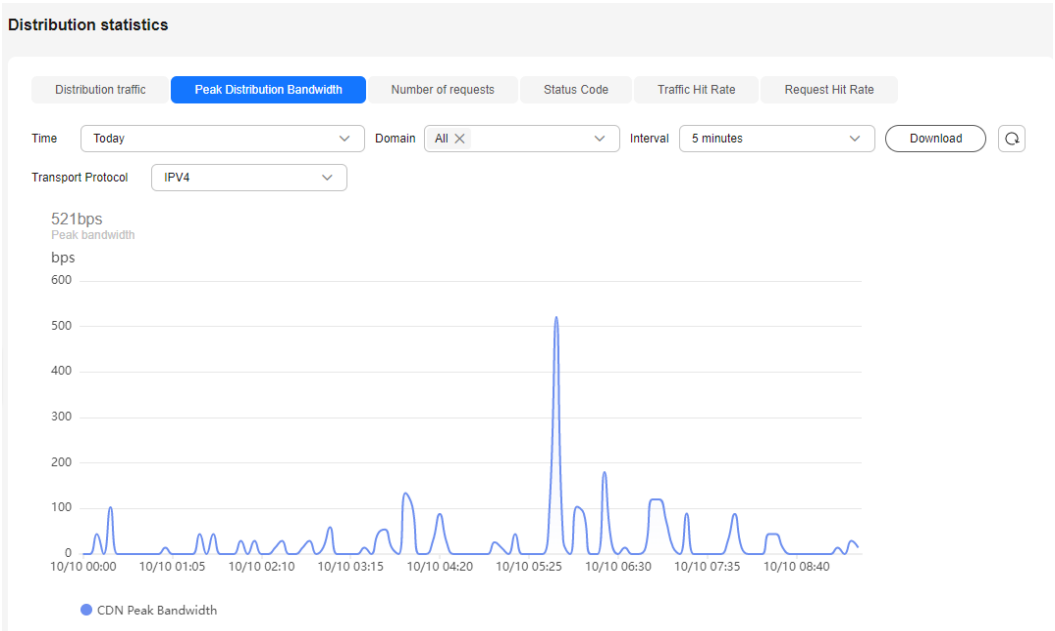


Peak Distribution Bandwidth

Select **Time**, **Domain**, **Interval**, and **Transport Protocol** to view peak CDN bandwidth statistics within the specified time span, as shown in **Figure 11-2**.

Move the cursor to the trend chart and scroll the mouse wheel to zoom in or zoom out the X axis (time). You can click **Download** to export the statistics details to the local PC.

Figure 11-2 CDN peak bandwidth statistics



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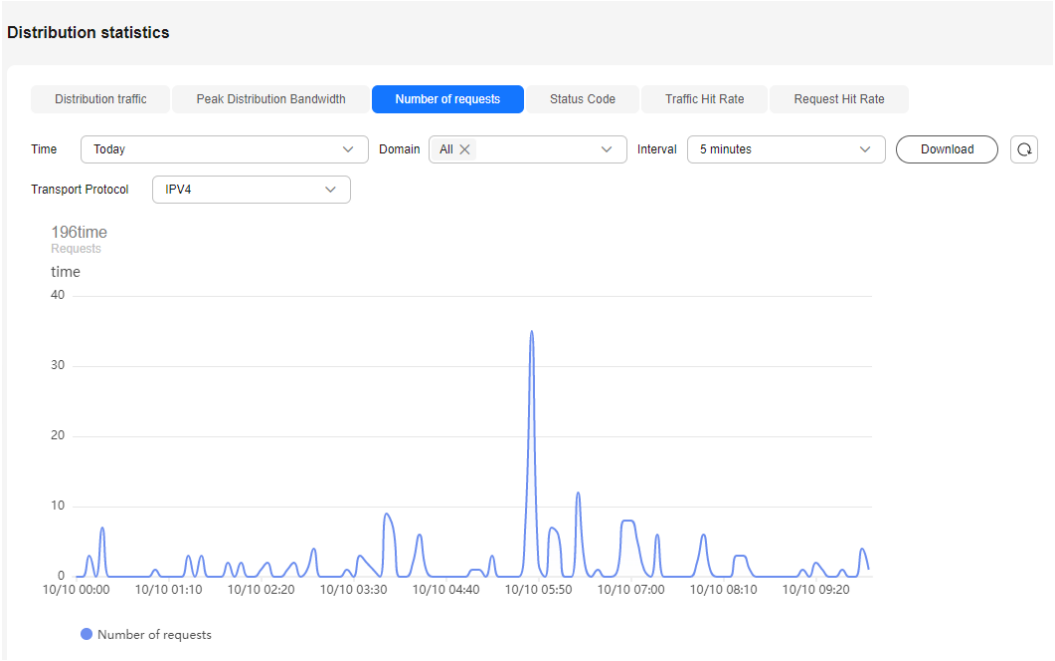
Number of Requests

Select **Time**, **Domain**, **Interval**, and **Transport Protocol** to view the number of requests within the specified time span, as shown in **Figure 11-3**.

Move the cursor to the trend chart and scroll the mouse wheel to zoom in or zoom out the X axis (time). You can click **Download** to export the statistics details to the local PC.

Figure 11-3 Statistics on the number of requests



Status Codes

Select **Time**, **Domain**, **Interval**, and **Status Code** to view the number of status codes within the specified time span, as shown in **Figure 11-4**.

Move the cursor to the trend chart and scroll the mouse wheel to zoom in or zoom out the X axis (time). You can click **Download** to export the statistics details to the local PC.

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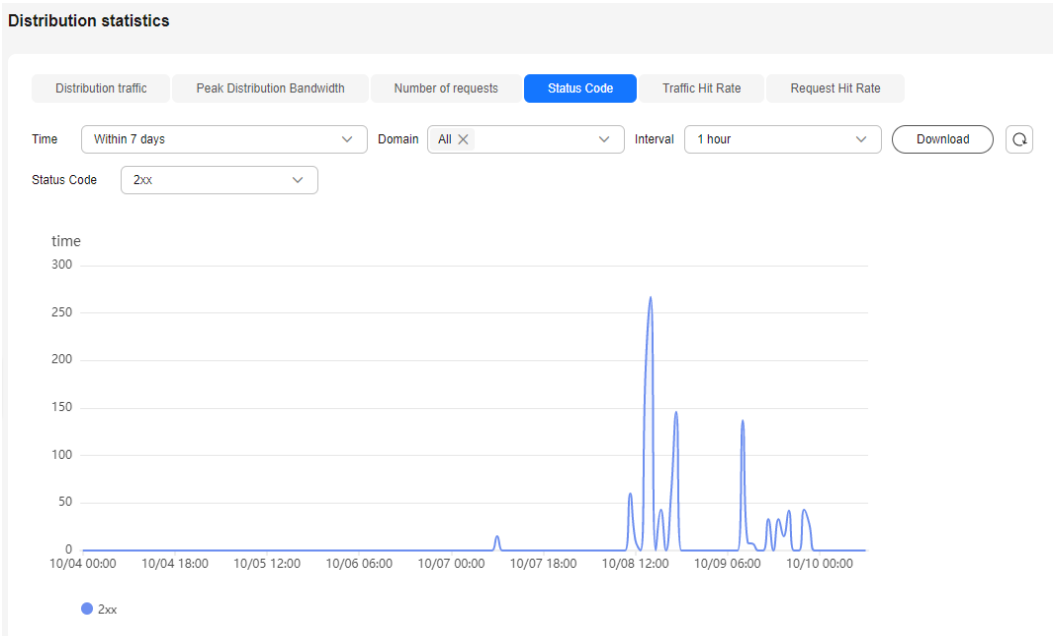
Figure 11-4 Status code statistics



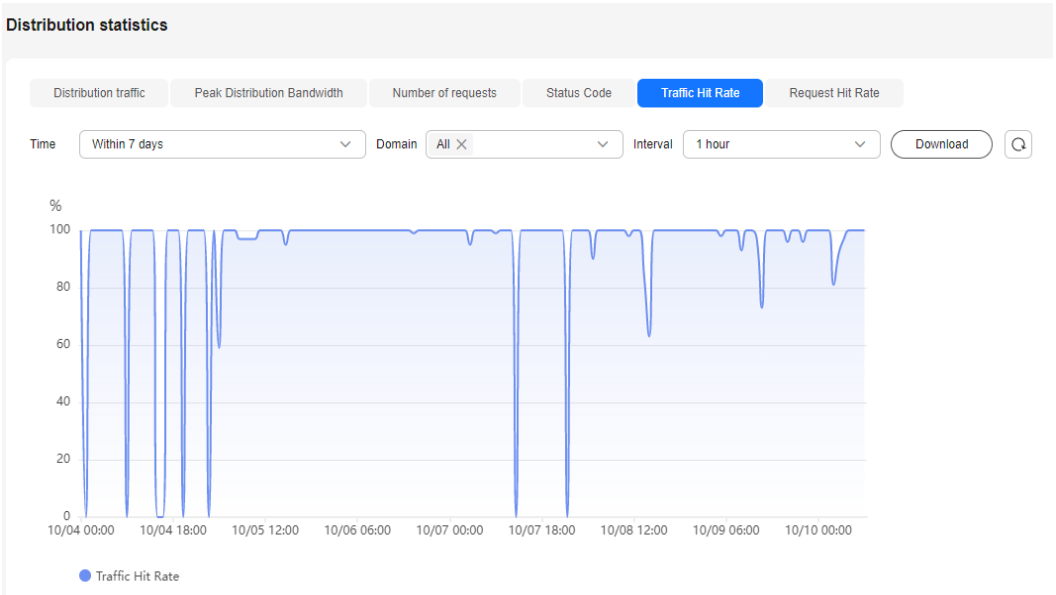
Traffic Hit Rate

Select **Time**, **Domain**, and **Interval** to view traffic hit rate statistics within the specified time span, as shown in **Figure 11-5**.

Traffic hit rate = Traffic consumed to hit the cache/Total traffic consumed by the requests. The total traffic consumed by the requests equals to the traffic consumed to hit the cache plus that consumed for origin pull.

Move the cursor to the trend chart and scroll the mouse wheel to zoom in or zoom out the X axis (time). You can click **Download** to export the statistics details to the local PC.

Figure 11-5 Traffic hit rate statistics



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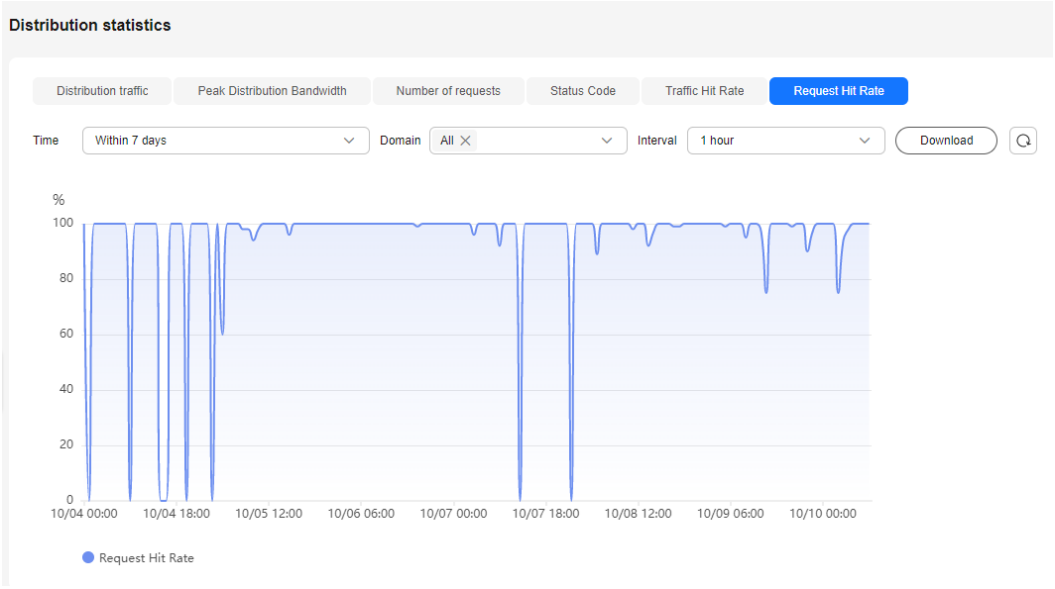
Request Hit Rate

Select **Time**, **Domain**, and **Interval** to view request hit rate statistics within the specified time span, as shown in **Figure 11-6**.

Request hit rate = Number of requests that hit the cache/Number of total requests

Move the cursor to the trend chart and scroll the mouse wheel to zoom in or zoom out the X axis (time). You can click **Download** to export the statistics details to the local PC.

Figure 11-6 Request hit rate statistics



11.2 Playback Statistics

The playback statistics function of VOD allows you to query the number of playback times and ranking (by playback times) of media files by domain name.

Notes

- You can query data about the most requested content of the current day only after 12:00 (Beijing time) of the next day.
- The most requested content is collected based on the number of requests for CDN. The number of requests may be greater than the number of playback times. Therefore, the most requested content may be different from the most played content.

About Query

- You can query data of the past month from yesterday or earlier.
- You can query the top 100 play time and traffic under all domain names or a single domain name.

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Procedure

Step 1 Log in to the **VOD console**.

Step 2 In the navigation pane, choose **Data Analysis** > **Playback Statistics**.

Step 3 Select **Play times TOP100** or **Play traffic TOP100** to view the statistics.

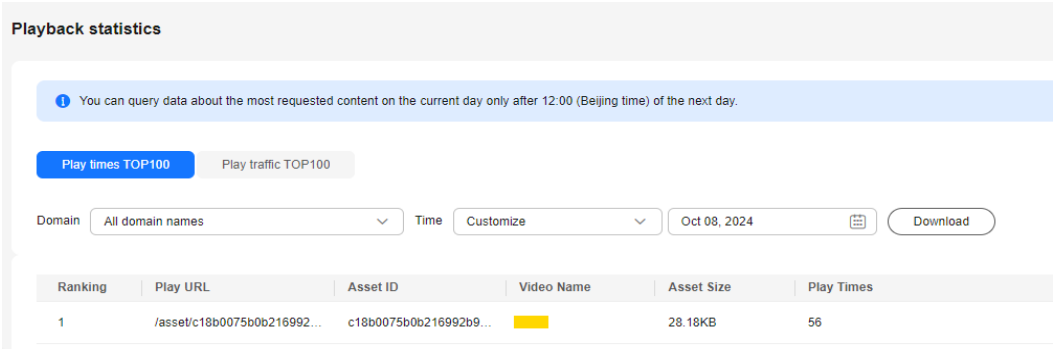
----End

Top 100 (By Playback Time)

Select **Domain** and **Time** (yesterday or a user-defined period) to view the data of the top 100 audio/video (by playback time).

You can click **Download** to export the statistics details to the local PC.

Figure 11-7 Top 100 (by playback time)

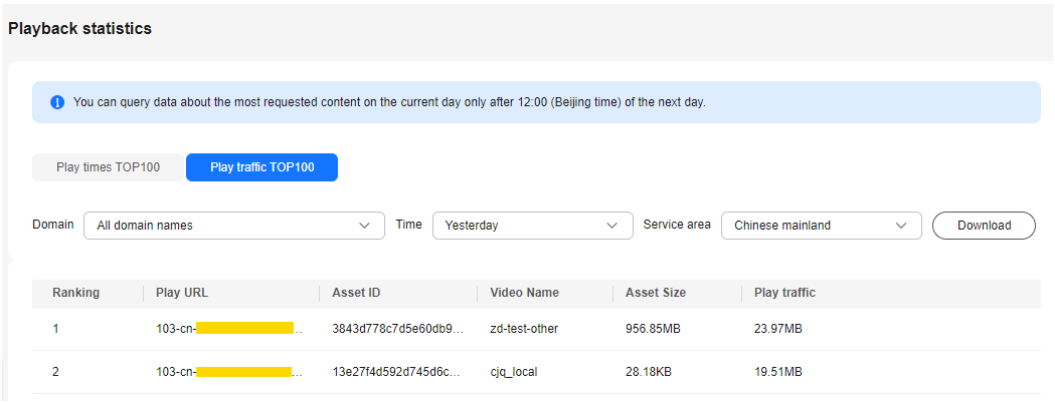


Top 100 (By Playback Traffic)

Select **Domain** and **Time** (yesterday or a user-defined period) to view the data of the top 100 audio/video (by playback traffic).

You can click **Download** to export the statistics details to the local PC.

Figure 11-8 Top 100 (by playback traffic)



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12 Viewing Monitoring Metrics

VOD is interconnected with **Cloud Eye**. You can use the console or APIs of CES to query monitoring metrics (traffic, access requests, and status code summary) and alarm information about VOD domain names.

NOTE

Currently, self-service configuration on the console is not enabled. To use this function, **submit a service ticket**.

Namespace

SYS.VOD

Monitoring Metrics

Table 12-1 Supported metrics

ID	Name	Description	Value Range	Monitored Object	Monitoring Interval (Raw Data)
flux	Traffic	Total traffic of a domain name in a specified period of time. Unit: bit/s	≥ 0 bit/s	Domain name	5 minutes
req_num	Access requests	Number of access requests to a domain name in a specified period of time. Unit: count	≥ 0 counts	Domain name	5 minutes

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ID	Name	Description	Value Range	Monitored Object	Monitoring Interval (Raw Data)
http_code_2*xx*	Status code summary 2*xx*	Number of server responses to requests whose status codes are 2*xx*. Unit: count	≥ 0 counts	Domain name	5 minutes
http_code_3*xx*	Status code summary 3*xx*	Number of server responses to requests whose status codes are 3*xx*. Unit: count	≥ 0 counts	Domain name	5 minutes
http_code_4*xx*	Status code summary 4*xx*	Number of server responses to requests whose status codes are 4*xx*. Unit: count	≥ 0 counts	Domain name	5 minutes
http_code_5*xx*	Status code summary 5*xx*	Number of server responses to requests whose status codes are 5*xx*. Unit: count	≥ 0 counts	Domain name	5 minutes

Dimensions

Key	Value
domain_name	VOD domain name

Adding a Graph

Add a graph to monitor VOD.

1. Log in to the console.

1. Click  in the upper left corner and select a region and a project.
2. Choose **Service List** > **Cloud Eye**.

   You can also enter **Cloud Eye** in the search box of the **Service List** page and click the search result to go to the Cloud Eye console.

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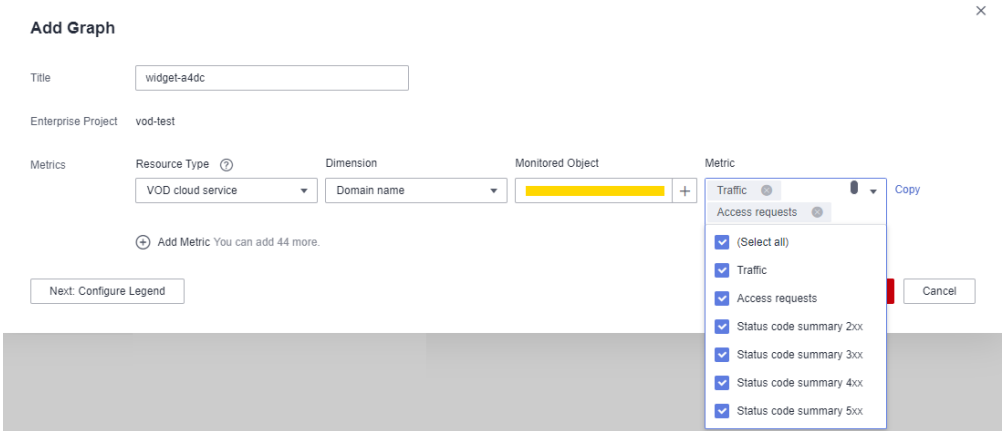
3. In the navigation pane on the left, choose **Dashboards** > **Dashboard**.
4. Switch to the dashboard to which you want to add a graph, and click **Add Graph** on the right.
5. On the **Add Graph** page, add the monitoring metrics related to VOD to the same graph.

Figure 12-1 Adding a graph



6. After the monitoring metric parameters are configured, click **OK**.

Viewing Monitoring Metrics

View the total traffic, total access requests, and status codes of a domain name.

1. Log in to the console.

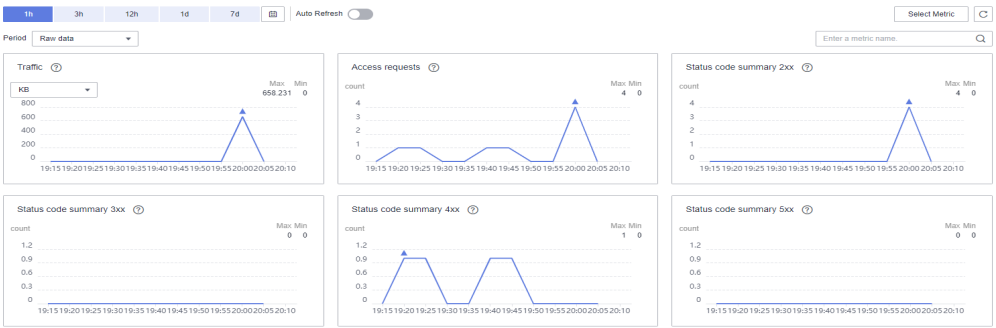
1. Click  in the upper left corner and select a region and a project.
2. Choose **Service List** > **Cloud Eye**.

   You can also enter **Cloud Eye** in the search box of the **Service List** page and click the search result to go to the Cloud Eye console.
3. In the navigation pane on the left, choose **Cloud Service Monitoring** > **VOD cloud service**.

   The **Cloud Service Monitoring** page is displayed.
4. In the **Operation** column of the target resource, click **View Metric**.

   On the monitoring metric page, view details about the total traffic, total access requests, and status codes of VOD domain names.

Figure 12-2 Monitoring metrics



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Creating an Alarm Rule

You can configure alarm rules to customize monitored objects and notification policies and to be informed of connection status at any time.

1. Log in to the console.

1. Click  in the upper left corner and select a region and a project.
2. Choose **Service List** > **Cloud Eye**.
3. In the navigation pane, choose **Alarm Management** > **Alarm Rules**.
4. On the **Alarm Rules** page, click **Create Alarm Rule** to add an alarm rule, or select an existing alarm rule and modify it.
5. After the parameters are configured, click **Create**.

   After the alarm rule is created, the system automatically notifies you if an alarm is triggered for the VOD service.

   NOTE

   For more information about alarm rules, see **Cloud Eye User Guide**.

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13 Querying Real-Time Traces

13.1 Key Operations Recorded by CTS

VOD has been interconnected with Cloud Trace Service (CTS), which allows you to record operations for future query, audit, and backtracking.

Prerequisites

You have enabled **CTS**.

Auditable Key Operations

Table 13-1 Operations that can be recorded by CTS

Operation	Resource Type	Trace Name
Creating a media asset	meta	createMeta
Modifying media asset information	meta	updateMeta
Deleting a media asset	meta	deleteMeta
Querying HLS keys	meta	showAssetCipher
Updating a thumbnail (snapshot)	meta	updateCoverByThumbnail
Creating an audio extraction task	meta	createExtractAudioTask
Canceling an audio extraction task	meta	cancelExtractAudioTask
Modifying media asset attributes	meta	updateAssetMeta

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Operation	Resource Type	Trace Name
Prefetching media assets on CDN	meta	createAssetPreheatingTask
Replicating media assets from OBS to VOD	meta	publishAssetFromObs
Publishing a media asset	meta	publishAssets
Unpublishing a media asset	meta	unpublishAssets
Confirming media asset upload	meta	confirmAssetUpload
Creating a media asset transcoding task	meta	createAssetProcessTask
Canceling a media asset transcoding task	meta	cancelAssetTranscodeTask
Creating a media asset review task	meta	createAssetReviewTask
Confirming media asset upload (V1.1)	meta	confirmAssetUploadV11
Changing the media asset storage mode	meta	updateStorageMode
Managing subtitles	meta	subtitleModify
Shielding resources	meta	shieldAsset
Setting the URL for obtaining the HLS key	meta	setEncryptConfiguration
Creating a transcoding template	transcodeTemplate	createTranscodeTemplate
Modifying a transcoding template	transcodeTemplate	updateTranscodeTemplate
Deleting a transcoding template	transcodeTemplate	deleteTranscodeTemplate
Creating a media asset category	category	createAssetCategory
Updating a media asset category	category	updateAssetCategory
Deleting a media asset category	category	deleteAssetCategory
Creating a template group set	transcodeTemplate	createTemplateGroupCollection

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Operation	Resource Type	Trace Name
Modifying a template group set	transcodeTemplate	updateTemplateGroupCollection
Deleting a template group set	transcodeTemplate	deleteTemplateGroupCollection
Creating a transcoding template group	transcodeTemplate	createTemplateGroup
Modifying a transcoding template group	transcodeTemplate	updateTemplateGroup
Deleting a transcoding template group	transcodeTemplate	deleteTemplateGroup
Creating a URL pull task	pullMetaTask	uploadMetaDataByUrl
Deleting a URL pull task	pullMetaTask	deleteUploadMetaDataByUrlTask
Resuming a URL pull task	pullMetaTask	retrievalUploadMetaDataByUrlTask
Canceling a URL pull task	pullMetaTask	stopUploadMetaDataByUrlTask
Configuring event notifications	message	notifySmnTopicConfig
Creating a review template	review	createReviewTemplate
Modifying a review template	review	updateReviewTemplate
Deleting a review template	review	deleteReviewTemplate
Starting a workflow task	workflow	startWorkflowTask
Creating a workflow	workflow	createWorkflow
Modifying a workflow	workflow	modifyWorkflow
Deleting a workflow	workflow	deleteWorkflow
Creating a watermark template	watermark	createWatermarkTemplate
Modifying a watermark template	watermark	updateWatermarkTemplate
Deleting a watermark template	watermark	deleteWatermarkTemplate
Confirming watermark upload	watermark	confirmImageUpload

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Operation	Resource Type	Trace Name
Enabling a watermark	watermark	enableWatermark
Modifying a watermark image	watermark	updateWatermarkImage
Modifying the HTTPS configuration of CDN	domain	modifyDomainHttpsConfig
Creating an acceleration domain name	domain	creatDomain
Setting URL authentication for acceleration domain names	domain	createDomainAuthInfoSet-ting
Enabling a CDN domain name	domain	enableDomain
Setting referer validation	domain	modifyRefererSetting
Modifying an acceleration domain name	domain	modifyDomain
Disabling an acceleration domain name	domain	disbleDomain
Deleting an acceleration domain name	domain	deleteDomain
Changing the CDN billing mode	bill	updateCdnBill
Enabling VOD	tenant	setTenantInfo

13.2 Viewing CTS Traces in the Trace List

Scenarios

Cloud Trace Service (CTS) records operations performed on cloud service resources. A record contains information such as the user who performed the operation, IP address, operation content, and returned response message. These records facilitate security auditing, issue tracking, and resource locating. They also help you plan and use resources, and identify high-risk or non-compliant operations.

What Is a Trace?

A trace is an operation log for a cloud service resource, tracked and stored by CTS. Traces record operations such as adding, modifying, or deleting cloud service resources. You can view them to identify who performed operations and when for detailed tracking.

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What Is a Management Tracker and Data Tracker?

A management tracker identifies and associates with all your cloud services, recording all user operations. It records management traces, which are operations performed by users on cloud service resources, such as their creation, modification, and deletion.

A data tracker records details of user operations on data in OBS buckets. It records data traces reported by OBS, detailing user operations on data in OBS buckets, including uploads and downloads.

Constraints

- Before the organization function is enabled, you can query the traces of a single account on the CTS console. After the organization function is enabled, you can only view multi-account traces on the **Trace List** page of each account, or in the OBS bucket or the **CTS/system** log stream configured for the management tracker with the organization function enabled. For details about organization trackers, see **Organization Trackers**.
- You can only query operation records of the last seven days on the CTS console. They are automatically deleted upon expiration and cannot be manually deleted. To store them for longer than seven days, configure transfer to Object Storage Service (OBS) or Log Tank Service (LTS) so that you can view them in OBS buckets or LTS log groups.
- After creating, modifying, or deleting a cloud service resource, you can query management traces on the CTS console 1 minute later and query data traces 5 minutes later.

Prerequisites

1. **Register with Huawei Cloud and complete real-name authentication.**

   If you already have a Huawei Cloud account, skip this step. If you do not have one, do as follows:

   a. Log in to the **Huawei Cloud official website**, and click **Sign Up** in the upper right corner.

   b. Complete the registration as prompted. For details, see **Registering with Huawei Cloud**.

      Your personal information page is displayed after the registration completes.

   c. Complete individual or enterprise real-name authentication by referring to **Real-Name Authentication**.

2. **Grant permissions for users.**

   If you log in to the console using a Huawei Cloud account, skip this step.

   If you log in to the console as an IAM user, first contact your CTS administrator (account owner or a user in the **admin** user group) to obtain the **CTS FullAccess** permissions. For details, see **Assigning Permissions to an IAM User**.

Viewing Traces

After you enable CTS and the management tracker is created, CTS starts recording operations on cloud resources. After a data tracker is created, CTS starts recording

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user operations on data in OBS buckets. CTS retains operation records of the latest seven days.

This section describes how to query and export operation records of the last seven days on the CTS console.

Viewing Real-Time Traces in the Trace List of the New Edition

Step 1 Log in to the **CTS console**.

Step 2 Log in to the management console, click  in the upper left corner, and choose **Management & Deployment** > **Cloud Trace Service**.

Step 3 In the navigation pane, choose **Trace List**.

Step 4 In the time range drop-down list above the trace list, select a desired query time range: **Last 1 hour**, **Last 1 day**, or **Last 1 week**. You can also select **Custom** to specify a custom time range within the last seven days.

Step 5 The search box above the trace list supports advanced queries. Combine one or more filters to refine your search.

Table 13-2 Trace filtering parameters

Parameter	Description
Trace Name	Name of a trace. The entered value is case-sensitive and requires an exact match. Fuzzy matching is not supported. For details about the operations that can be audited for each cloud service, see **Supported Services and Operations**section "Supported Services and Operations" in the *Cloud Trace Service User Guide*. Example: **updateAlarm**
Trace Source	Cloud service name abbreviation. The entered value is case-sensitive and requires an exact match. Fuzzy matching is not supported. Example: **IAM**
Resource Name	Name of a cloud resource involved in a trace. The entered value is case-sensitive and requires an exact match. Fuzzy matching is not supported. If the cloud resource involved in the trace does not have a resource name or the corresponding API operation does not involve the resource name parameter, leave this field empty. Example: **ecs-name**

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Parameter	Description
Resource ID	ID of a cloud resource involved in a trace. The entered value is case-sensitive and requires an exact match. Fuzzy matching is not supported. Leave this field empty if the resource has no resource ID or if resource creation failed. Example: *{VM ID}*
Trace ID	Value of the **trace_id** parameter for a trace reported to CTS. The entered value requires an exact match. Fuzzy matching is not supported. Example: **01d18a1b-56ee-11f0-ac81-******1e229**
Resource Type	Type of a resource involved in a trace. The entered value is case-sensitive and requires an exact match. Fuzzy matching is not supported. For details about the resource types of each cloud service, see **Supported Services and Operations**section "Supported Services and Operations" in the *Cloud Trace Service User Guide*. Example: **user**
Operator	User who triggers a trace. Select one or more operators from the drop-down list. If the value of **trace_type** in a trace is **SystemAction**, the operation is triggered by the service and the trace's operator may be empty. For details about the relationship between IAM identities and operators and the operator username format, see **Relationship Between IAM Identities and Operators**.
Trace Status	Select one of the following options from the drop-down list: • **normal**: The operation succeeded. • **warning**: The operation failed. • **incident**: The operation caused a fault that is more serious than a normal failure, for example, causing other faults.
Enterprise Project ID	ID of the enterprise project to which a resource belongs. To check enterprise project IDs, go to the Enterprise Project Management Service (EPS) console and choose **Project Management** in the navigation pane. Example: **b305ea24-c930-4922-b4b9-******1eb2**
Access Key	Temporary or permanent access key ID. To check access key IDs, hover over your username in the upper right corner of the console and select **My Credentials** from the pop-up list. On the displayed page, choose **Access Keys** in the navigation pane. Example: **HSTAB47V9V*******TLN9**

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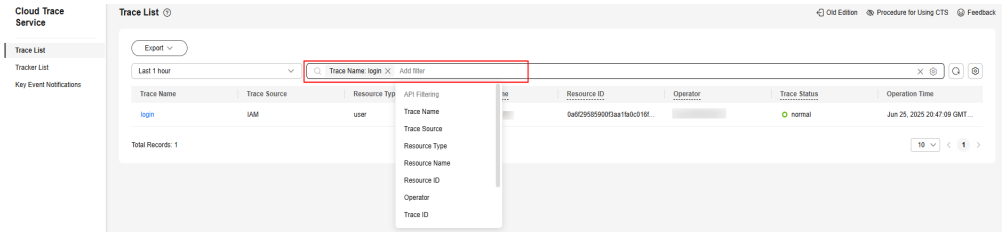

Step 6 On the **Trace List** page, you can also export and refresh the trace list, and customize columns to display.

- Enter any keyword in the search box and press **Enter** to filter desired traces.
- Click **Export** to export all traces in the query result as an .xlsx file. The file can contain up to 5,000 records.
- Click to view the latest information about traces.
- Click to customize the information to be displayed in the trace list. If **Auto wrapping** is enabled ( ), excess text will move down to the next line; otherwise, the text will be truncated. By default, this function is disabled.

Step 7 (Optional) On the **Trace List** page of the new edition, click **Old Edition** in the upper right corner to switch to the **Trace List** page of the old edition.

----End

Viewing Traces in the Trace List of the Old Edition

Step 1 Log in to the **CTS console**.

Step 2 Log in to the management console, click in the upper left corner, and choose **Management & Deployment** > **Cloud Trace Service**.

Step 3 In the navigation pane, choose **Trace List**.

Step 4 Each time you log in to the CTS console, the new edition is displayed by default. Click **Old Edition** in the upper right corner to switch to the trace list of the old edition.

Step 5 In the upper right corner of the page, set a desired query time range: **Last 1 hour**, **Last 1 day**, or **Last 1 week**. You can also click **Customize** to specify a custom time range within the last seven days.

Step 6 Set filters to search for your desired traces, as shown in **Figure 13-1**.

Figure 13-1 Filters

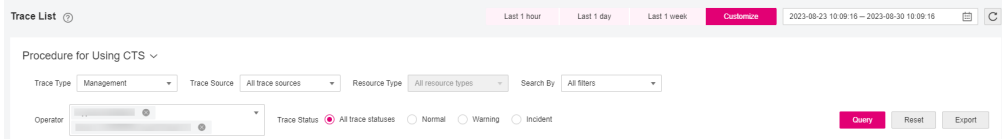

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Table 13-3 Trace filtering parameters

Parameter	Description
Trace Type	Select **Management** or **Data**. • Management traces record operations performed by users on cloud service resources, including creation, modification, and deletion. • Data traces are reported by OBS and record operations performed on data in OBS buckets, including uploads and downloads.
Trace Source	Select the name of the cloud service that triggers a trace from the drop-down list.
Resource type	Select the type of the resource involved in a trace from the drop-down list. For details about the resource types of each cloud service, see **Supported Services and Operations**section "Supported Services and Operations" in the *Cloud Trace Service User Guide*.
Search By	Select one of the following options: • **Resource ID**: ID of the cloud resource involved in a trace. Leave this field empty if the resource has no resource ID or if resource creation failed. • **Trace name**: name of a trace. For details about the operations that can be audited for each cloud service, see **Supported Services and Operations**section "Supported Services and Operations" in the *Cloud Trace Service User Guide*. • **Resource name**: name of the cloud resource involved in a trace. If the cloud resource involved in the trace does not have a resource name or the corresponding API operation does not involve the resource name parameter, leave this field empty.
Operator	User who triggers a trace. Select one or more operators from the drop-down list. If the value of **trace_type** in a trace is **SystemAction**, the operation is triggered by the service and the trace's operator may be empty. For details about the relationship between IAM identities and operators and the operator username format, see **Relationship Between IAM Identities and Operators**.
Trace Status	Select one of the following options: • **Normal**: The operation succeeded. • **Warning**: The operation failed. • **Incident**: The operation caused a fault that is more serious than a normal failure, for example, causing other faults.

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Step 7 Click **Query**.

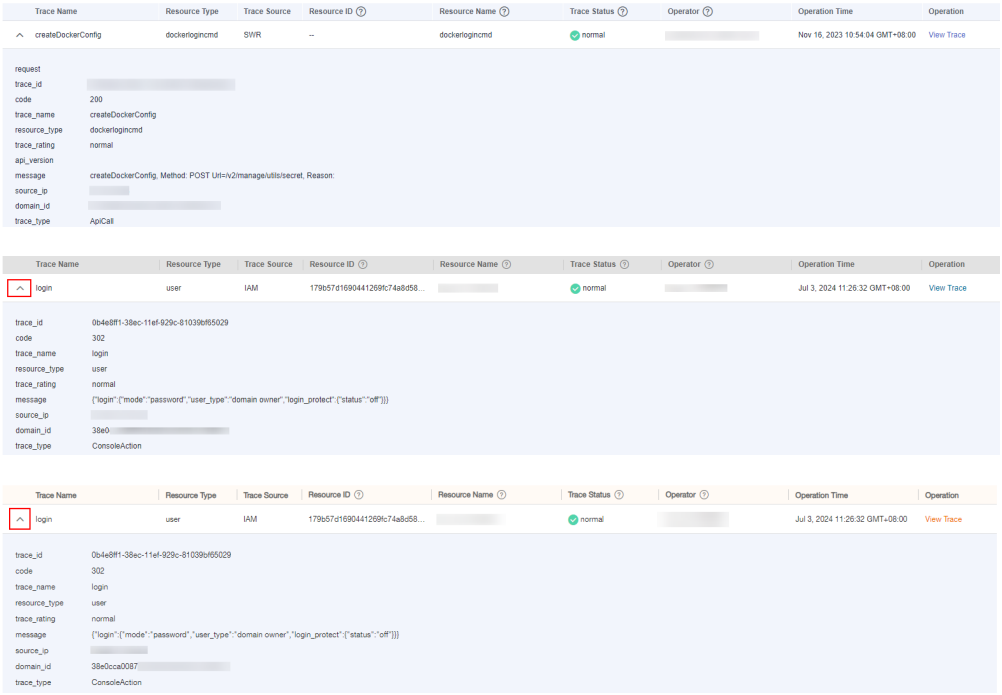
Step 8 On the **Trace List** page, you can also export and refresh the trace list.

- Click **Export** to export all traces in the query result as a CSV file. The file can contain up to 5,000 records.
- Click to view the latest information about traces.

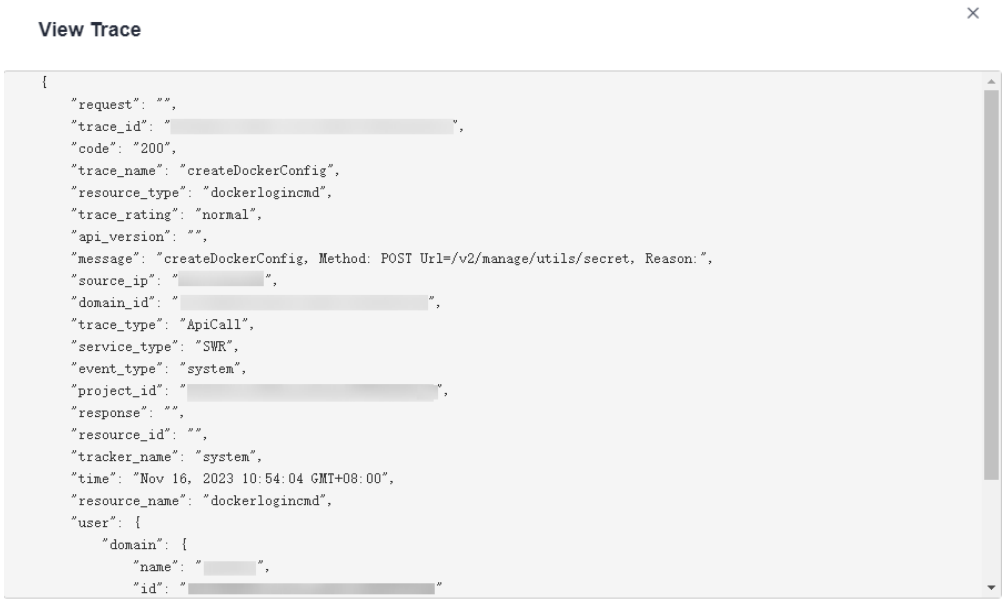
Step 9 In the **Tampered or Not** column of a trace, check whether the trace is tampered with.

- **No**: The trace is not tampered with.
- **Yes**: The trace is tampered with.

Step 10 Click on the left of a trace to expand its details.



Step 11 Click **View Trace** in the **Operation** column. The trace details are displayed.



Step 12 (Optional) On the **Trace List** page of the old edition, click **New Edition** in the upper right corner to switch to the **Trace List** page of the new edition.

----End

Helpful Links

- For details about the key fields in the trace structure, see **Trace StructureTrace Structure**section "Trace References" > "Trace Structure" in the *Cloud Trace Service User Guide* and **Example TracesExample Traces**section "Trace References" > "Example Traces" in the *Cloud Trace Service User Guide*.
- You can use the following examples to learn how to query a specific trace:
  - Use CTS to audit Elastic Volume Service (EVS) creation and deletion operations from the last two weeks. For details, see **Security Auditing**.
  - Use CTS to locate a fault or creation failure for an Elastic Cloud Server (ECS). For details, see **Fault Locating**.
  - Use CTS to check all operation records for an ECS. For details, see **Resource Tracking**.

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14 Appendix

14.1 Permissions Management

14.1.1 Creating a User and Granting VOD Permissions

This chapter describes how to use **IAM** to implement fine-grained permissions control for your VOD resources. With IAM, you can:

- Create IAM users for employees based on your enterprise's organizational structure. Each IAM user will have their own security credentials for accessing VOD resources.
- Grant only the permissions required for users to perform a specific task.
- Entrust a Huawei Cloud account or cloud service to perform efficient O&M on your VOD resources.

If your Huawei Cloud account does not require individual IAM users, skip this section.

This section describes the procedure for granting permissions (see **Figure 14-1**).

Prerequisites

Learn about the permissions (see **Permissions Management**) supported by VOD and choose policies or roles according to your requirements.

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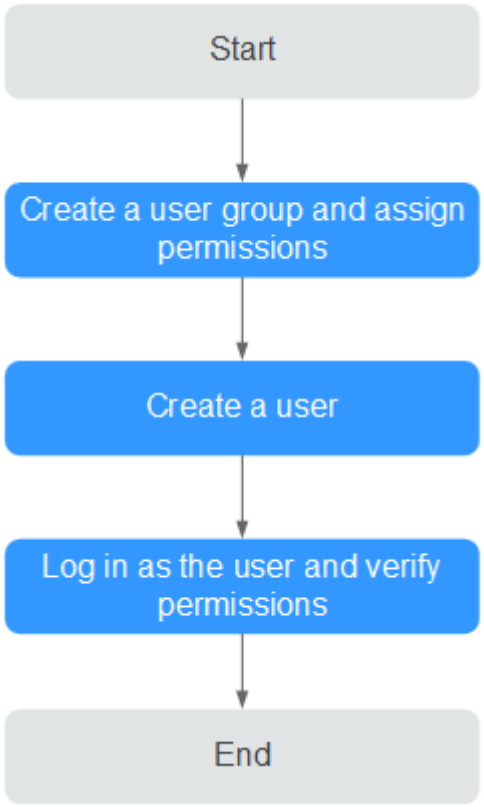
Process Flow

Figure 14-1 Process of granting VOD read-only permissions



1. **Create a user group and assign permissions** to it.

   Create a user group on the IAM console, and attach the **VOD Guest** policy to the group.

2. **Create an IAM user.**

   Create a user on the IAM console and add the user to the group created in **1**.

3. **Log in** and verify permissions.

   Log in to the console by using the user created, and verify that the user only has read permissions for VOD.

   - Choose **Service List** > **Video on Demand**. The VOD console is displayed. If a message is displayed indicating insufficient permissions for performing the operation, the **VOD Guest** policy has already taken effect.
   - Choose any other service in the **Service List**. If a message appears indicating insufficient permissions to access the service, the **VOD Guest** policy has already taken effect.

Creating a User for Media Isolation

VOD provides nine system policies: VOD Administrator, VOD Operator, VOD Guest, VOD Group Administrator, VOD Group Operator, VOD Group Guest, VOD FullAccess, VOD ReadOnlyAccess, and VOD CommonOperations. For details, see **Permissions Management**. The VOD Administrator, VOD Operator, and VOD Guest system policies can only be used to assign operation permissions. To isolate

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media files stored in VOD, you are advised to use the VOD Group Administrator, VOD Group Operator, and VOD Group Guest system policies, which can also be used to assign operation permissions. Media isolation indicates that only users in the same group can access or manage media created by other users in the group.

Table 14-1 shows an example of media isolation.

Table 14-1 Account permissions

Policy Group	User A (for Management)	User B (for Uploading)	User C (for Watching)
VOD Group Administrator	√	-	-
VOD Group Operator	-	√	-
VOD Group Guest	-	-	√

Regardless of whether an account in the preceding three policy groups is a low-permission or a high-permission one, the account can only operate media created by users in the same group. That is, users A, B, and C can only access media in their own groups.

If user A wants to operate media created by user B, user A must join the VOD Group Operator policy group to which user B belongs.

14.2 Obtaining a Project ID

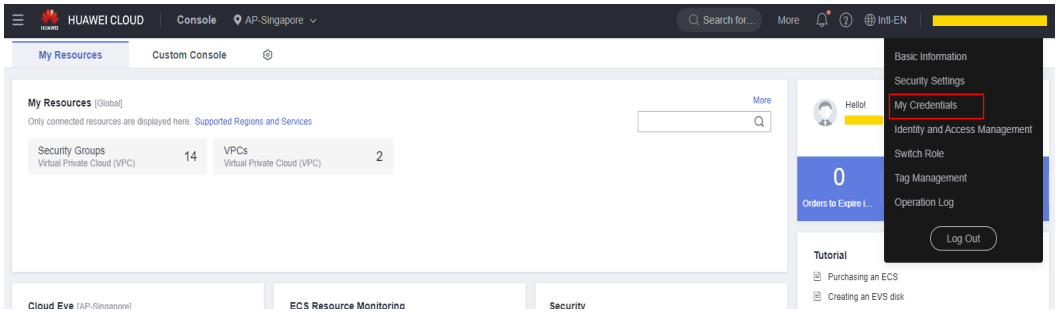
A project ID uniquely identifies a customer.

Procedure

Step 1 Log in to the **console**.

Step 2 Hover over the username in the upper right corner and select **My Credentials** from the drop-down list.

Figure 14-2 Console



Step 3 On the **API Credentials** page, view project IDs in the project list.

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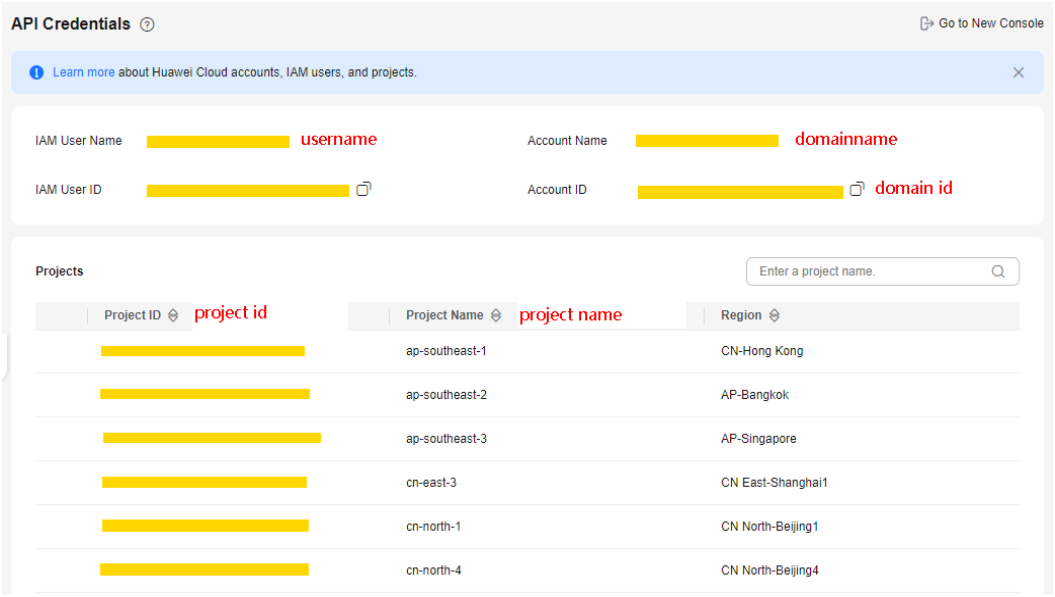
Figure 14-3 Obtaining a project ID



----End

14.3 Obtaining the AK/SK Pair

The access key ID (AK) and secret access key (SK) are a pair of access keys used together to authenticate users who wish to make API requests. The AK/AS pair provides functions similar to a password. If you want to call VOD APIs, the AK/SK pair is required to sign the requests. This ensures the confidentiality and integrity of the requests as well as the correctness of the identities of both parties. Access keys can be generated and managed on the **My Credentials** page.

Procedure

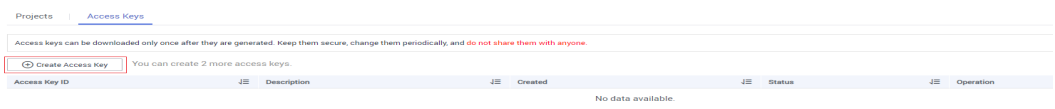
Step 1 Log in to the **console**.

Step 2 Point to the username and choose **My Credentials** from the drop-down list.

Step 3 In the navigation pane, choose **Access Keys**.

Step 4 Click **Create Access Key**. On the displayed page, enter the account and password and SMS verification code.

Figure 14-4 Access key



Step 5 Click **OK** to download the **credentials.csv** file that contains the AK and SK pair.

----End

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14.4 JSON Message Body

14.4.1 Transcoding Message Body

Sample Transcoding Success Message


```
{
   "event_type": "transcodeComplete",
   "transcode_info": {
      "asset_id": "14d7b2faba0dddd6b4e8936272d6bc3f",
      "status": "SUCCEED",
      "templateGroupName": "ssw",
      "output": [{
         "play_type": "HLS",
         "url": "https://179.cdn-vod.huaweicloud.com/asset/14d7b2faba0dddd6b4e8936272d6bc3f/
play_video/index.m3u8",
         "encrypted": 0,
         "meta_data": {
            "play_type": 0,
            "codec": "H_264",
            "duration": 0,
            "videoSize": 0,
            "width": 0,
            "hight": 0,
            "bitRate": 0,
            "frameRate": 0
         }
      }, {
         "play_type": "HLS",
         "url": "https://179.cdn-vod.huaweicloud.com/asset/14d7b2faba0dddd6b4e8936272d6bc3f/
play_video/58c6433759c2be34818085006af42d1e_1_1280X720_1500_0.m3u8",
         "encrypted": 0,
         "quality": "HD",
         "meta_data": {
            "play_type": 0,
            "codec": "H_264",
            "duration": 26,
            "videoSize": 3246080,
            "width": 1280,
            "hight": 720,
            "bitRate": 892,
            "frameRate": 1,
            "quality": "HD"
         }
      }]
   }
}
```


Transcoding Message Body Description

Table 14-2 TranscodeInfo structure

Parameter	Description
asset_id	Media ID
status	Event status • **SUCCEED**: Transcoding succeeded. • **FAILED**: Transcoding failed.

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Parameter	Description
template_group_name	Transcoding template group name
output	Transcoding output array. • If outputs are in HLS or DASH format, the number of members in this array is *n*+1, where *n* indicates the number of transcoding outputs. • If outputs are in MP4 format, the number of members in this array is *n*, where *n* indicates the number of transcoding outputs. This parameter is used only when **status** is **SUCCEED**. For details, see **Table 14-3**.
error_code	Error code. This parameter is used only when **status** is **FAILED**.
error_msg	Error description. This parameter is used only when **status** is **FAILED**.

Table 14-3 Output structure

Parameter	Description
play_type	Protocol type The value can be **hls**, **dash**, or **mp4**.
url	Access URL
encrypted	Whether the stream is encrypted The values can be **0** or **1**. • **0**: Unencrypted • **1**: Encrypted
quality	Video quality. The values can be: • **FLUENT** • **SD** • **HD** • **FULL_HD**

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Parameter	Description
meta_data	Playlist metadata. The values can be: • **pack_type**: packaging type, such as TS or MP4 • **duration**: video duration, in seconds • **size**: video size, in bytes • **width**: video width (unit: pixel) • **height**: video height (unit: pixel) • **bit_rate**: average video bitrate • **frame_rate**: in FPS

14.4.2 Snapshot Message Body

Sample Frame Capture Success Message

```
{
   "event_type": "thumbnailComplete",
   "thumbnail_info": {
       "asset_id": "14d7b2faba0dddd6b4e8936272d6bc3f",
       "status": "SUCCEED",
       "sample": [{
           "offset": 0,
           "url": "https://179.cdn-vod.huaweicloud.com/asset/14d7b2faba0dddd6b4e8936272d6bc3f/snapshot/
sample/0.jpg"
       }, {
           "offset": 5,
           "url": "https://179.cdn-vod.huaweicloud.com/asset/14d7b2faba0dddd6b4e8936272d6bc3f/snapshot/
sample/5.jpg"
       }, {
           "offset": 10,
           "url": "https://179.cdn-vod.huaweicloud.com/asset/14d7b2faba0dddd6b4e8936272d6bc3f/snapshot/
sample/10.jpg"
       }, {
           "offset": 15,
           "url": "https://179.cdn-vod.huaweicloud.com/asset/14d7b2faba0dddd6b4e8936272d6bc3f/snapshot/
sample/15.jpg"
       }, {
           "offset": 20,
           "url": "https://179.cdn-vod.huaweicloud.com/asset/14d7b2faba0dddd6b4e8936272d6bc3f/snapshot/
sample/20.jpg"
       }, {
           "offset": 25,
           "url": "https://179.cdn-vod.huaweicloud.com/asset/14d7b2faba0dddd6b4e8936272d6bc3f/snapshot/
sample/25.jpg"
       }],
       "dots": []
   }
}
```

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Snapshot Message Body Description

Table 14-4 ThumbnailInfo structure

Parameter	Description
asset_id	Media ID
status	Event status • SUCCEED • FAILED
sample	Sampling information. This parameter is used only when **status** is **SUCCEED**. • **offset**: time offset of a snapshot in the video, in seconds • **url**: URL for accessing the snapshot
dots	Snapshot information at a specified time point. This parameter is used only when **status** is **SUCCEED**. • **offset**: time offset of a snapshot in the video, in seconds • **url**: URL for accessing the snapshot
error_code	Error code. This parameter is used only when **status** is **FAILED**.
error_msg	Error description. This parameter is used only when **status** is **FAILED**.

14.4.3 Review Message Body

Sample Review Success Message


```
{
   "event_type": "reviewComplete",
   "review_info": {
      "asset_id": "793636b27b961fb5e35de6580203951b",
      "status": "SUCCEED",
      "suggestion": "BLOCK",
      "text": {
         "suggestion": "PASS"
      },
      "cover": [{
         "suggestion": "BLOCK",
         "offset": 0,
         "url": "https://179.cdn-vod.huaweicloud.com/asset/793636b27b961fb5e35de6580203951b/cover/
Cover0.jpg",
         "politics": [],
         "terrorism": [{
            "confidence": "0.0",
            "label": "bloody"
         }, {
            "confidence": "0.0",
            "label": "fire"
         }, {
            "confidence": "0.0",
            "label": "gun"
         }, {
            "confidence": "0.0",
```


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```
                "label": "knife"
            }, {
                "confidence": "0.0",
                "label": "flag"
            }, {
                "confidence": "0.0",
                "label": "symbol"
            }, {
                "confidence": "0.0",
                "label": "dress"
            }, {
                "confidence": "0.9984",
                "label": "crowd"
            }, {
                "confidence": "0.0",
                "label": "tiananmen"
            }, {
                "confidence": "0.0016",
                "label": "normal"
            }],
            "porn": [{
                "confidence": "0.6997",
                "label": "normal"
            }, {
                "confidence": "0.00040",
                "label": "porn"
            }, {
                "confidence": "0.2999",
                "label": "sexy"
            }]
        }],
        "video": [{
                    "suggestion": "BLOCK",
                    "offset": 0,
                    "url": "https://179.cdn-vod.huaweicloud.com/asset/793636b27b961fb5e35de6580203951b/
snapshot/sample0/0.jpg",
                    "politics": [],
                    "terrorism": [{
                        "confidence": "0.0",
                        "label": "bloody"
                    }, {
                        "confidence": "0.0",
                        "label": "fire"
                    }, {
                        "confidence": "0.0",
                        "label": "gun"
                    }, {
                        "confidence": "0.0",
                        "label": "knife"
                    }, {
                        "confidence": "0.0",
                        "label": "flag"
                    }, {
                        "confidence": "0.0",
                        "label": "symbol"
                    }, {
                        "confidence": "0.0",
                        "label": "dress"
                    }, {
                        "confidence": "0.9984",
                        "label": "crowd"
                    }, {
                        "confidence": "0.0",
                        "label": "tiananmen"
                    }, {
                        "confidence": "0.0016",
                        "label": "normal"
                    }],
                    "porn": [{
```

```
                    "confidence": "0.6997",
                    "label": "normal"
                }, {
                    "confidence": "0.00040",
                    "label": "porn"
                }, {
                    "confidence": "0.2999",
                    "label": "sexy"
                }]
            }, {
                "suggestion": "BLOCK",
                "offset": 1,
                "url": "https://179.cdn-vod.huaweicloud.com/asset/793636b27b961fb5e35de6580203951b/
snapshot/sample0/1.jpg",
                "politics": [],
                "terrorism": [{
                    "confidence": "0.0",
                    "label": "bloody"
                }, {
                    "confidence": "0.0",
                    "label": "fire"
                }, {
                    "confidence": "0.0",
                    "label": "gun"
                }, {
                    "confidence": "0.0",
                    "label": "knife"
                }, {
                    "confidence": "0.0",
                    "label": "flag"
                }, {
                    "confidence": "0.0",
                    "label": "symbol"
                }, {
                    "confidence": "0.0",
                    "label": "dress"
                }, {
                    "confidence": "0.9958",
                    "label": "crowd"
                }, {
                    "confidence": "0.0",
                    "label": "tiananmen"
                }, {
                    "confidence": "0.0042",
                    "label": "normal"
                }],
                "porn": [{
                    "confidence": "0.6993",
                    "label": "normal"
                }, {
                    "confidence": "0.001",
                    "label": "porn"
                }, {
                    "confidence": "0.2997",
                    "label": "sexy"
                }]
            }
```


Review Message Body Description

Table 14-5 ReviewInfo structure

Parameter	Description
asset_id	Media ID

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Parameter	Description
status	Event status • SUCCEED • FAILED
suggestion	Whether the check is passed. **block**: Sensitive information is detected and the information fails to pass the check. **pass**: No sensitive information is detected and the information passes the check. **review**: Manual review is required. When multiple scenarios are detected at the same time, the value of **suggestion** is subject to the scenario where sensitive information is most likely to be included. That is, if a block occurs in any scenario, the value of **suggestion** is **block**. If all scenarios pass the check, the value of **suggestion** is **pass**. In addition, if manual review is required in any scenario, the value of **suggestion** is **review**. This parameter is used only when **status** is **SUCCEED**.
text	Text detection results. This parameter is used only when **status** is **SUCCEED**. • **suggestion**: whether the check is passed – **block**: Sensitive information is detected and the information fails to pass the check. – **pass**: No sensitive information is detected and the information passes the check. – **review**: Manual review is required. • **politics**: A list of politically sensitive words are involved. • **porn**: A list of pornography-related words are involved. • **abuse**: A list of offensive words are involved.
cover	Thumbnail detection results. This parameter is used only when **status** is **SUCCEED**. For details, see **Table 14-6**.
video	Video detection results. This parameter is used only when **status** is **SUCCEED**. For details, see **Table 14-6**.
error_code	Error code. This parameter is used only when **status** is **FAILED**.
error_msg	Error description. This parameter is used only when **status** is **FAILED**.

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Table 14-6 PictureReviewRet structure

Parameter	Notes
suggestion	Whether the check is passed. **block**: Sensitive information is detected and the information fails to pass the check. **pass**: No sensitive information is detected and the information passes the check. **review**: Manual review is required.
url	URL for accessing the snapshot or thumbnail
offset	Time offset of a snapshot in the video, in seconds. This parameter is unavailable for thumbnailing.
politics	Review results of political factors. • **confidence**: The value ranges from 0 to 1. • **label**: information about the corresponding political figure
terrorism	Review results of terrorism-related content. • **confidence**: The value ranges from 0 to 1. • **label**: information about terrorism-related content (guns, knives, and fire)
porn	Review results of pornographic content. • **confidence**: The value ranges from 0 to 1. • **label**: information about pornographic content

14.4.4 Media Upload & Audio Extraction Message Body

Sample Upload Success Message


```
{
   "event_type": "createComplete",
   "create_info": {
       "status": "SUCCEED",
       "title": "Fake video",
       "url": "https://1111116.cdn-vod.huaweicloud.com/asset/
81b89afdb5e6c94c68e5028b2747b1f0/3729f0177453c9525b5196d6400f1bb6.flv",
       "asset_id": "81b89afdb5e6c94c68e5028b2747b1f0",
              "user_name":"tmp",
       "meta_data": {
          "play_type": 0,
          "pack_type": "FLV",
          "codec": "UNKNOWN",
          "duration": 0,
          "video_size": 0,
          "width": 0,
          "hight": 0,
          "bit_rate": 0,
```

```
            "frame_rate": 0
        }
    }
}
```

Sample Extraction Success Message

```
{
    "event_type": "audioExtractComplete",
    "audio_extract_info": {
        "status": "SUCCEED",
        "title": "1080p16m",
        "url": "https://1111116.cdn-vod.huaweicloud.com/asset/d98b70ff435cf417a0a450052be80109/
e8f3fd5c82bdb979188ab1a2cb66c08b.mp3",
        "asset_id": "d98b70ff435cf417a0a450052be80109",
        "meta_data": {
            "play_type": 0,
            "pack_type": "MP3",
            "codec": "UNKNOWN",
            "duration": 60,
            "video_size": 0,
            "width": 0,
            "hight": 0,
            "bit_rate": 128,
            "frame_rate": 0
        }
    }
}
```

Message Body Description

Table 14-7 AssetInfo structure

Parameter	Description
asset_id	ID of the new media
status	Event status • SUCCEED • FAILED
title	Name of the new media. This parameter is used only when **status** is **SUCCEED**.
url	URL for accessing the new media. This parameter is used only when **status** is **SUCCEED**.
meta_data	Metadata of the new media. This parameter is used only when **status** is **SUCCEED**.
error_code	Error code. This parameter is used only when **status** is **FAILED**.
error_msg	Error description. This parameter is used only when **status** is **FAILED**.

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14.4.5 Thumbnail Generation Message Body

The condition for triggering thumbnail generation is to use the first frame of a video.

Successful Thumbnail Generation (Using the First Frame of a Video)

```
{
   "event_type": "coverComplete",
   "cover_info": {
      "status": "FAILED",
      "title": "XC1",
      "asset_id": "13d570ca574035a3efd7014689c34507",
      "error_code": "VOD.10013",
      "error_msg": "null",
      "cover_type": "HEAD_FRAME_COVER",
      "cover_urls": [{
         "offset": 0,
         "url": "https://651.cdn-vod.huaweicloud.com/asset/10757496f83e0eef6b8593be4eee1175/cover/
Cover0.jpg"
      }]
   }
}
```

Message Body Description

Table 14-8 Cover_Info structure

Parameter	Description
status	Event status. • **SUCCEED**: Thumbnail generated. • **FAILED**: Thumbnail generation failed.
title	Media asset name.
asset_id	Media asset ID.
cover_type	Generated thumbnail type. • **HEAD_FRAME_COVER**: First frame as the thumbnail.
error_code	Error code. This parameter is available only when **status** is **FAILED**.
error_msg	Error description. This parameter is available only when **status** is **FAILED**.
cover_urls	URL of the thumbnail image. This parameter is available only when the thumbnail is generated.

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14.4.6 Media Asset Parsing Message Body

Sample Media Asset Parsing Message


```
{
   "event_type": "parseComplete",
      "parse_info": {
      "status": "SUCCEED",
      "asset_id": "d501e8fd23f550a432f2c528c3823fd8",
      "meta_data": {
          "play_type": 0,
          "pack_type": "MP4",
          "codec": "H.264",
          "audio_codec": "AAC",
          "audio_bit_rate": 126,
          "duration": 53,
          "video_size": 13454959,
          "width": 960,
          "hight": 540,
          "bit_rate": 1939,
          "frame_rate": 25,
          "audio_channels": 2,
          "sample": 48000
      },
      "original_url": "https://103.huaweicloud.com/asset/
d501e8fd23f550a432f2c528c3823fd8/3cb5b599a92c683c80306f7b4a2dd427.mp4"
   }

}
```


Message Body Description

Table 14-9 ParseInfo structure

Parameter	Description
asset_id	ID of the parsed media asset
status	Event status • **SUCCEED**: The media asset has been parsed. • **FAILED**: The media asset parsing failed.
fileAddr	Address of the OBS bucket where the source media file is. This parameter is used only when the source file is in the tenant bucket.
original_url	URL of the media asset.
meta_data	Media data of the media asset.
error_code	Error code. This parameter is used only when **status** is **FAILED**.
error_msg	Error description. This parameter is used only when **status** is **FAILED**.

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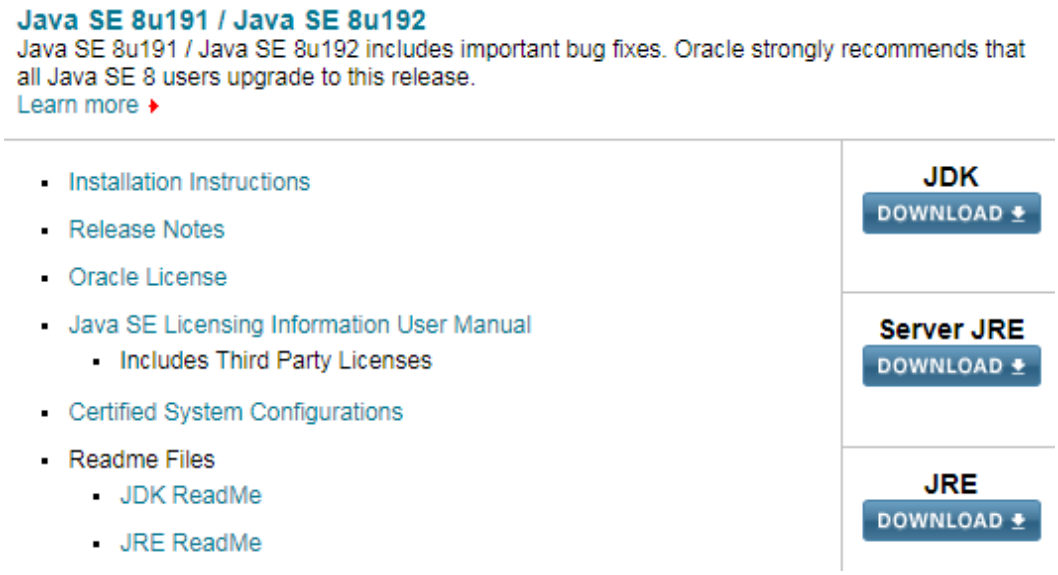
14.5 Installing JDK

This section describes how to install JDK on the Windows and Linux OSs and verify that the installation is successful.

Installing JDK in Windows

Step 1 Download the JDK file from the **official website**. JDK 8 is used as an example. Click **DOWNLOAD** below JDK.



Step 2 After the JDK file is downloaded, install the JDK as prompted. For example, install the JDK to the **C:\Program Files\Java\jdk1.8.0_131** directory on the local PC.

Step 3 Configure Java environment variables.

1. Right-click **Computer**, choose **Properties** > **Advanced system settings**.
2. Click the **Advanced** tab, and then click **Environment Variables**.
3. Set JAVA_HOME, PATH, and CLASSPATH (case-insensitive) in the **System variables** area. See **Table 14-10**.

   If the three variables already exist, click **Edit**. If not, click **New**.

Table 14-10 JAVA environment variables

Variable	Value	Description
JAVA_HOME	JDK installation path	Example: **C:\Program Files (x86)\Java\jdk1.8.0_1311**
PATH	%JAVA_HOME%\bin;%JAVA_HOME%\jre\bin	Add it to the end of the original **PATH** value.
CLASSPATH	.;%JAVA_HOME%\lib\dt.jar;%JAVA_HOME%\lib\tools.jar;	There is a dot (.) in front of the value.

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Step 4 Open the CLI and run **java -version**. The Java environment variables have been configured if the Java version is displayed.

The following is a successful response example:

```
C:\>java -version
java version "1.8.0_131"
Java(TM) SE Runtime Environment (build 1.8.0_131-b11)
Java HotSpot(TM) 64-Bit Server VM (build 25.131-b11, mixed mode)
```

----End

Installing JDK in Linux

Step 1 **Download the JDK installation package** based on system requirements. You are advised to download JDK1.8.

Select **Accept License Agreement** before downloading the package.

Figure 14-5 Downloading the JDK

Java SE Development Kit 8u191

You must accept the Oracle Binary Code License Agreement for Java SE to download this software.

○ Accept License Agreement ◉ Decline License Agreement

Product / File Description	File Size	Download
Linux ARM 32 Hard Float ABI	72.97 MB	jdk-8u191-linux-arm32-vfp-hflt.tar.gz
Linux ARM 64 Hard Float ABI	69.92 MB	jdk-8u191-linux-arm64-vfp-hflt.tar.gz
Linux x86	170.89 MB	jdk-8u191-linux-i586.rpm
Linux x86	185.69 MB	jdk-8u191-linux-i586.tar.gz
Linux x64	167.99 MB	jdk-8u191-linux-x64.rpm
Linux x64	182.87 MB	jdk-8u191-linux-x64.tar.gz
Mac OS X x64	245.92 MB	jdk-8u191-macosx-x64.dmg
Solaris SPARC 64-bit (SVR4 package)	133.04 MB	jdk-8u191-solaris-sparcv9.tar.Z
Solaris SPARC 64-bit	94.28 MB	jdk-8u191-solaris-sparcv9.tar.gz
Solaris x64 (SVR4 package)	134.04 MB	jdk-8u191-solaris-x64.tar.Z
Solaris x64	92.13 MB	jdk-8u191-solaris-x64.tar.gz
Windows x86	197.34 MB	jdk-8u191-windows-i586.exe
Windows x64	207.22 MB	jdk-8u191-windows-x64.exe

Step 2 Run the following command to decompress the installation package to the JDK directory:

```
tar -xvf jdk-8u191-linux-x64.tar.gz -C /home/vod/jdk/
```

Step 3 Set environment variables.

1. Run the **vi /etc/profile** command to open the **profile** file.
2. Add the following content to the end of the file:

```
#set java environment
export JAVA_HOME=/home/vod/jdk/jdk1.8.0_191
export JRE_HOME=/home/vod/jdk/jdk1.8.0_191/jre
export CLASSPATH=.:$JAVA_HOME/lib/dt.jar:$JRE_HOME/lib/tools.jar
export PATH=$JAVA_HOME/bin:$PATH
```

3. Run the **:wq!** command to save the file and exit.

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Step 4 Run the **java -version** command to verify whether JDK has been installed.

If the following JDK version information is displayed, the installation is successful:

```
[root@ecs-c525-web ~]# java -version
java version "1.8.0_191"
Java(TM) SE Runtime Environment (build 1.8.0_191-b11)
Java HotSpot(TM) 64-Bit Server VM (build 25.171-b11, mixed mode)
```

----End

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